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1996

24680. Takamura, K. (1996): Life cycle of the damselfly Calopteryx atrata in relation to pesticide contamination. Ecotoxicology 5(1): 1-8. ["The life cycle of the damselfly Calopteryx atrata was investigated in relation to pesticide contamination occurring in its aquatic habitat. Calopteryx atrata emerged from the River Onogawa around May and stayed as immature adults in forests away from the stream. From late June to mid-August, mature adults were engaged in reproduction at the stream. On the other hand, pesticide contamination occurred from April to August with its peak in May and June, following transplantation of young rice plants. Mature nymphs of C. atrata experienced pesticide contamination, but may have tolerated it. Hatched nymphs had high susceptibility to two of the commonly used insecticides, fenitrothion (mortality occurred at >4.0 g l^{-1} in 24 h and at >2.0 g l^{-1} in 48 h) and fenthion (>2.0 g l^{-1} in 24 h and >1.0 g l^{-1} in 48 h). Hatching was estimated to occur mainly in August, when pesticide contamination was not as high as the susceptibility level. However, the level of pesticide contamination in August is variable due to its origin from aerial spraying, so hatched nymphs may experience a hazardous amount of pesticides depending on the year or place. The population of C. atrata does not escape the risk of pesticide contamination completely and may be affected by it." (Author)] Address: Takamura, K., Division Environmental Biology, National Institute for Environmental Studies, Yatabe, Tsukuba, Ibaraki 305, Japan

1999

24681. Singh, J.; Singh, A. (1999): New records of dragonflies from the Haryana State (India). Fraseria (NS) 6: 13-14. (in English) [The list of 14 odonate species collected from Haryana is as follows: Acisoma panorpoides*, Brachydiplax sobrina*, Brachythemis contaminata, Crocothemis servilia, Diplacodes trivialis, Indothemis carnatica*, Paragomphus lineatus*, Neurothemis tullia*, Orthetrum sabina, Pantala flavescens, Tramea basilaris burmeisteri, Trithemis pallidinervis, Rhyothemis variegata*, Selysiothemis nigra*. Out of the above 14 species, 4 species and 3 subspecies are reported for the first time from Haryana; they are here indicated with an asterisk.] Address: Singh, J., Dept Zool., Punjabi Univ., Patiala, 147 002 India

2000

24682. Kirti, J.; Singh, A. (2000): Species diversity in dragonflies of Kanjli wetland (Punjab). Geobios (Jodhpur) 27(2-3): 133. (in English) [The Kanjli wetland is situated on Kapurthala - Amritsar road at a distance of 3 km from Kapurthala city (India). Without giving collection data, 15 species of Anisoptera were collected. Urothemis s. signata and Rhyothemis v. variegata are new records from Punjab State. Both these species are quite dominant and occur in large numbers.] Address: Kirti, J.S., Dept Zoology, Punjabi University, Patiala - 147 002 (Punjab), India. E-mail archu_speak@ yahoo.co.in

2002

24683. Lecomte, T. (2002): Sympetrum danae (Sulzer, 1776) espèce nouvelle pour le Marais Vernier (département de l'Eure). Martinia 18(2): 67-68. (in French, with English summary) ["S. danae, a new species for the Vernier marsh (Eure department). In spite of searches begun since 1971 in Vernier marsh region, S. danae was discovered only in August 1999 in the nature reserve of Coutils de Bouquelon and its surroundings." (Author)] Address: Lecomte, T., R.N.V. des Courtils de Bouquelon, la Courtilière, La Vallée. F-27500 Bouquelon, France

2003

24684. Kirti, J.S.; Singh, A. (2003): Taxonomic significance of hamule in some species of family Gomphidae (Odonata). Fraseria (N.S.) 7(1/2): 3-8. (in English) ["In the present communication, ten species of family Gomphidae, viz. Ictinogomphus rapax, Nepogomphus modestus, Ophiogomphus reductus, Onychogomphus biforceps, O. striatus, O. bistrigatus, O. schmidti, Burmagomphus pyramidalis, Anisogomphus occipitalis and Paragomphus lineatus have been examined to describe and illustrate both the pairs of hamules. Significant taxonomic variations in the structure of hamule of these species are reported for the first time." (Authors)] Address: Singh, A., Dept of Zoology, Punjabi University, Patiala - 147 002 (Punjab), India. Email: archu_speak@yahoo.co.in

24685. Kirti, J.S.; Singh, A. (2003): Studies on the male secondary genitalia of Indian species of genus Diplacodes Kirby (Odonata: Anisoptera, Libellulidae). Ann. Entomol. 21(1-2): 5-10. (in English) ["Male accessory genital structures of three Indian species of D. trivialis, D. lefebvrei and D. nebulosa have been studied and illustrated. A key to the species has also been formulated." (Authors)] Address: Kirti, J.S., Dept Zoology & Environmental Sciences, Punjabi University, Patiala, India

24686. Nakataki, M.; Hirama, Y.; Kosugi, T. (2003): Insects of Bekanbeushi Marsh, Akkeshi-cho, Hokkaido. Sylvicola 21: 45-82. (in Japanese, with English title) [23 odonate species are documented: Coenagrion lanceolatum, C. ecomutum, Enallagma boreale circulation, Lestes sponsa, Sympecma paedisca, Mnais costalis, Davidius moiwanus moiwanus, Aeshna juncea, A. subarctica, A. crenata, Cordulia aenea

amurensis, Somatochlora viridiaenea, S. japonica, S. graeseri aureola, Orthetrum albistylum speciosum, Libellula quadrimaculata asahinai, Sympetrum striolatum imitoides, S. frequens, S. eroticum, S. parvulum, S. pedemontanum elatum, S. infuscatum, S. danae] Address: Nakatani, M., 2-6, Meiji-cho, Nemuro City, 087-0003, Japan

2006

24687. Costa, C.; Ide, S. (2006): 7. Odonata. In: Insectos inmaduros: metamorfosis e identificación Volume 5 of M3M (Series). Volume 5 of Monografías tercer milenio: m3m. Editors Cleide Costa, Sergio Ide. Publisher Sociedad Entomológica Aragonesa, 2006. ISBN 849328078X, 97884932807-89. 233 pages: 59-62. (in Spanish) [The paper includes a key at family level for the Neotropical region with focus on Brazil.] Address: not stated

24688. Nakataki, M.; Hirama, Y.; Kosugi, T. (2006): Insects of North Okhotsk Prefectural Natural Park, Northern Hokkaido. Sylvicola 24: 1-70. (in Japanese, with English title) [34 odonate species are documented.] Address: Nakatani, M., 2-6, Meiji-cho, Nemuro City, 087-0003, Japan

2007

24689. Nakataki, M.; Hirama, Y.; Kosugi, T. (2007): Insects fauna of Sharidake Prefectural Natural Park, Eastern Hokkaido. Sylvicola 25: 1-47. (in Japanese, with English title) [10 odonate species are documented.] Address: Nakatani, M., 2-6, Meiji-cho, Nemuro City, 087-0003, Japan

2010

24690. Jinguji, H.; Ueda, T.; Tsunoda, M.; Aihara, S.; Saito, M. (2010): Effects of Fipronil insecticide application on Sympetrum sp. larvae and adults in Experimental rice paddy field. Transactions of The Japanese Society of Irrigation, Drainage and Rural Engineering 78(2): 219-226. (in Japanese, with English summary) ["The effect of on sowing and before transplanting application of the phenyl pyrazole insecticide, fipronil, on the survivorship Sympetrum spp. was investigated in plots of an experimental rice paddy field. In addition, the effect of two pesticide applications on rice weevils was investigated. A total of nine paddy plots were used in this study: three were treated with fipronil at the before transplanting application, three at the on sowing application, and the three remaining plots were left untreated for use as controls. Fipronil concentrations in paddy water at the time of application in before transplanting and on sowing treatments reached 1.45 and 1.20 pg/L, respectively. A comparison of experimental and control plots revealed a marked absence of Sympetrum frequens larvae, exuviae and adults from fipronil-treated fields. Adult density of Sympetrum sp. and members of Lestidae in paddy fields before transplanting application were considerably lower than in control plots. Our results show that before transplanting application is more effective than on sowing application for treating rice weevils, but that on sowing application may still be harm against dragonflies." (Authors)] Address: Jinguji, H., Miyagi Univ., 2-2-1 Hatatate, Taihaku-ku, Sendai, Miyagi 982-0215, Japan

24691. Kadoya, T.; Suda, S.-i.; Washitani, I. (2010): Effects of ecological traits on extinction risk of dragonfly species. Japanese Journal of Ecology 60(2): 187-192. (in Japanese, with English title) ["Even under similar environmental changes, the extinction risk of species varies depending on their ecological characteristics. Analytical methods using statistical models to clarify the ecological factors behind differences in extinction risk between species are being developed. In this paper, we introduce a study that assesses the extinction risk of each species of Japanese dragonflies and analyzes the effect of ecological characteristics on extinction risk. Such an inter-species comparison approach is effective in identifying anthropogenic factors that have a significant effect on the extinction risk of species." (Authors/Google translate)] Address: Kadoya, T., Environ. Biology Division, National Inst. for Environ. Studies, Japan. Email: kadoya@nies.go.jp

24692. Nakataki, M.; Hirama, Y.; Matsumoto, K. (2010): Insects fauna of Akan National Park V, Hokkaido. Sylvicola 28: 21-42. (in Japanese, with English title) [14 or 17-VII-2010; Enallagma circulation, Somatochlora japonica, Somatochlora viridiaenea, Orthetrum j. japonicum, and Sympetrum pedemontanum elatum are documented.] Address: Nakatani, M., 2-6, Meiji-cho, Nemuro City, 087-0003, Japan

2011

24693. Eda, S. (2011): Memorial address for Professor Shojiro Asahina. Insects (New Series) 14(2): 161-162. (in Japanese) [Obituary] Address: Eda, S., 3-4-25 Sawamura, Matsumoto, Nagano 390-0877, Japan. E-mail: SND 02767@nifty.com

24694. Garrison, M. (2011): Damselflies of Chicagoland. A Photo Field Guide, version 2. The Field Museum, Chicago (Publisher): 135 pp. (in English) [https://fieldguides.fieldmuseum.org/sites/default/files/rapid-color-guides-pdfs/388_0.pdf] Address: Garrison, Marla, Biology Faculty, McHenry County College, Crystal Lake, IL, USA. Email: mgarriso@mchenry.edu

24695. Rakotomanana, H.; Nakamura, M. (2011): Breeding ecology of the Malagasy endemic Nelicourvi weaver Ploceus nelicourvi. Ornithological Science 11(1): 39-46. (in English) ["The Nelicourvi Weaver Ploceus nelicourvi is endemic to Madagascar and information on its breeding biology is scarce and fragmentary. The behavior and parental care of the Nelicourvi Weaver were investigated in Maromizaha Park, eastern Madagascar, from November 2009 to January 2010. We found three nests located 250–700 m apart, suspended 3–10 m above the ground from branches of Nastus spp. (Poaceae) and Trema orientalis (Ulmaceae) above open areas such as streams or trails. The nests were bulky woven structures each with an extended entrance tunnel (ca. 14 cm long). Over a period of about 12 days, the males built the nest structures and the females contributed the nest lining material. The female alone incubated the eggs for about 15 days, and undertook most of the brooding of the young, with only some assistance from the male. During the nestling period, which lasted 13–25 days, both sexes delivered food (mainly beetles, grasshoppers, caterpillars and occasionally small chameleons) to the nestlings. These results suggest that the Nelicourvi Weaver is a socially monogamous bird." (Authors) Between 0,5 and 0,8 % of prey items delivered to nestlings were Odonata.] Address: Rakotomanana, H., Dept of Animal Biology, Faculty of Science, University of Antananarivo, Antananarivo (101), Madagascar. Email: rakotomh@refer.mg

24696. Takagi, M.; Akatani, K. (2011): The diet of Ryukyu Scops Owl Otus elegans interpositus owlets on Minami-

daito Island. Ornithological Science 10(2): 151-156. (in English) ["We identified the diet of owlets of the Daito subspecies of the Ryukyu Scops Owl Otus elegans interpositus on Minami-daito Island during late May and early June 2009, by means of high-resolution color photography. Cockroaches were provided by parents to their young at all eight nests studied, and contributed the largest single component of the diet (33%). Orthoptera species, which inhabited open grassland habitats, constituted >20% of the total occurrences in the diet of owlets. It is suggested that Ryukyu Scops Owls depend heavily on food items obtained from habitats that have been modified by human activity on Minami-daito Island. Diets for owlets differed widely among nests, and the differences were considered to result from individual differences among parents and/or the environments surrounding each nest." (Authors)] Address: Takagi, M., Dept of Biology and Geosciences, Graduate School of Science, Osaka City University, Osaka 558–5858, Japan. Email: mtakagi@sci.osaka-cu.ac.jp

2012

24697. Amakawa, T.; Takeno, K.; Yasumitsu, Y.; Sasaki, K. (2012): Evaluation of sewerage system development in Seno River using biotic indices. Journal of Environmental Conservation Engineering 41(1): 48-52. (in Japanese, with English summary) ["Effects of sewerage system improvement on profiles of benthic animal in Seno River which domestic wastewater was discharged were investigated from 1998 to 2000. Improvement was carried out 2000 to 2003. From 1998 to 2005, pollution index, bio index, diversity index and p.p index were improved about 2, 3, 2.5 and 1.6 times, respectively. The improvement of water quality in Seno River due to the sewage system development was suggested by the evaluations of biotic indices such as pollution index, bio index, diversity and p.p index. ... St-7 is the confluence with the Hataga River. Before 1998, there were few species of organisms, most of which were Semisulcospira libertina. Since 2003, however, many species have appeared, including Trichoptera, Ephemeroptera, and Odonata, among others, along with organisms that do not tolerate pollution. This indicates that the water quality has improved up to the middle reaches of the river, as the waterworks have stopped the domestic wastewater that had flowed from the upstream." (Authors)] Address: Amakawa, T., Graduate School of Engineering, Hirosaki International University, Japan

24698. Katayama, M.; Tatsuta, H. (2012): Relative abundance and its seasonal variation of Zygopteran larvae on Okinawajima Island. Japanese Journal of Entomology (New Series) 15(1): 15-20. (in Japanese, with English summary) ["Odonata are prevalent in both terrestrial and aquatic environments. Although morphological traits are well described in most of the species in Japan, there is little information on larval ecology of these species especially in Ryukyu Islands. We investigated the larval assemblage of damselflies in two ponds on Okinawajima Island, Japan, for 13 months. In total, four species were found in one of the ponds (Ögimi) and three in the other (Kunigami). Among these, Paracercion melanotum (Selys) dominated the assemblages, accounting for up to 71% of the total abundance in both ponds. Based on the best model selected by AIC, we found that the relative frequency of the larvae varied among damselfly species, seasons, and macrophyte species of habitats. Moreover, patterns of seasonal changes and habitat selection in respect to macrophyte species also varied among damselfly species." (Authors) Paracercion melanotum, Ceriagrion auranticum ryukyuanum, Ischnura senegalensis, Agriocnemis pygmaea, A. femina oryzae, Pseudagrion microcephalum] Address: Katayama, M., University of the Ryukyus, Nishihara, Okinawa 903-0213, Japan

24699. Mitamura, T.; Arakawa, A.; Kishi, M.; Yamada, M.; Okazaki, K. (2012): Survey of Aquatic Insects in Paddy Fields Using Underwater Light Traps. Annual Report of the Society of Plant Protection of North Japan 63: 150-156. (in Japanese, with English summary) ["Aquatic insects in paddy fields collected using underwater light traps were investigated in Fukushima prefecture. 10, 118 individuals (6 orders, 18 families) were collected from 2008 to 2011 in six areas. Using underwater light trap was more effective than dipping a D-flame hand net for individual collection in seven taxa: Guignotus japonicus, Noterus japonicus, Peltodytes intermedius, Hydrophilidae spp., Ranatra chinensis, Microveliinae spp., and Baetidae spp. For the six taxa: Lissorhoptrus oryzophilus, Notonecta triguttata, Sigara spp., Appasus spp., Zygoptera spp., and Trichoptera spp., no significant differences were found between the use of light traps and that of hand nets. Seasonal changes in the number of several species were apparent in the case of using underwater light traps. These results indicate that underwater light traps are effective for surveying biodiversity in paddy fields." (Authors)] Address: Mitamura, T., Fukushima Agricultural Technology Centre, Takakura, Hiwadamachi, Koriyama, Fukushima, 963-0531, Japan

24700. Nakano, K. (2012): The insects on the road in minato-ku, Tokyo. - Observation in 7 years. Japanese Journal of Environmental Entomology and Zoology 23(4): 199-205. (in Japanese, with English summary) ["Species composition and abundance of insects were investigated using a direct observation method along the roadside in Minato-ku, Tokyo, Japan, from June 2005 to December 2011. In total, 1,638 individuals of 11 orders were found. The most common orders were Coleoptera (52.8% of individuals), Lepidoptera (17.4 %), Blattaria (12 %), Hemiptera (11.5 %), Hymenoptera (11.5%), and Diptera (2%), while Odonata, Orthoptera, Mantodea, Dermaptera, and Neuroptera each represented less than 1%. Large numbers of individuals were found in July and August. The herbivore feeding habit was the most abundant. Four species that are expanding their ranges northward were recorded." (Author) Sympetrum sp., Pseudothemis zonata, Orthetrum albistylum speciosum, and Anotoqaster sieboldii are listed.] Address: Nakano, K., 2-26-7-603 Shiba, Minatoku, Tokyo, 105-0014 Japan.

24701. Sekizaki, Y.; Suda, S.; Kadoya, T.; Washitani, I. (2012): Effects of common carp on damselfly assemblages in rural reservoir ponds in Japan: Indirect effects mediated by aquatic plants. Japanese Journal of Conservation Ecology 17(1): 25-35. (in Japanese, with English summary) ["To clarify the factors affecting damselfly assemblages in reservoir ponds, we surveyed the density of adults in 56 study ponds in rural areas of Iwate Prefecture, Japan, during 2008 to 2010. To compare the impact of indirect effects of common carp (Cyprinus carpio) with direct effects from environmental factors, we quantified indirect effects of common carp that were mediated by aquatic plants. For environmental factors, we examined the coverage of aquatic plants, the presence of marginal forests, the presence/absence of bullfrogs (Rana catesbeiana), forest dimensions, and pond density around each pond. Our results revealed that the presence of common carp had significant negative effects on the coverages of floating-leaved plants and submerged plants. In addition, the coverage of aquatic plants, which was defined as a function of carp occurrence, had significant positive effects on damselfly densities. This indicates that the introduction of

common carp is the strongest operator in this region, modifying damselfly assemblages by reducing the local availability of aquatic plants." (Authors)] Address: Sekizaki, Y., Lab. Conservation Ecol., Dept Ecosystem Studies, Graduate School of Agricultural & Life Sciences, University of Tokyo, 1-1-1 Yayoi, Bunkyo City, Tokyo Metropolis 113-8657, Japan. Email: yui.skz-@gmail.com

24702. Thongphak, D.; Promdeesan, K.; Hanlaoedrit, C. (2012): Diversity and community structure of terrestrial invertebrates in an irrigated rice ecosystem. International Journal of Environmental and Rural Development 3(1): 68-71. (in Japanese, with English summary) ["Diversity and community structure of terrestrial invertebrates in rice ecosystems were studied in rice fields under irrigated condition from January to April 2011. The research revealed that terrestrial invertebrate fauna comprised 84 species of insects in 72 families and 10 orders. Arachnids are the most abundant with 18 species in 10 families, amounting to a total of 102 terrestrial invertebrate species from irrigated rice ecosystem in Khon Kaen. The majority of insects belonged to Order Hymenoptera (29 species) followed by Homoptera (15 species), Coleoptera (11 species) and Diptera (9 species). The community structure of terrestrial invertebrates consisted of natural enemies (70 species) followed by insect pest (26 species), insect visitor (5 species) and scavenger (2 species)." (Authors) Two odonates species were found, but no details are given.] Address: Thongphak, D., Fac. Agriculture, Khon Kaen University, Khon Kaen, Thailand. Email: duathg@kku.ac.th

24703. Tsuji, Y.; Wada, K.; Watanabe, K. (2012): Non-woody plant diet of wild Japanese Macaques: Herbaceous plants, ferns, fungi, seaweeds and animal matter. Primate Research 28(1): 21-48. (in Japanese, with English summary) ["We studied about the non-woody plant diets of wild Japanese macaques (Macaco fuse at a), including herbaceous plants, ferns, mushrooms, seaweeds, and animal matter, in order to make clear how many numbers of non-woody plant food items were eaten by the macaques all over across Japan. This is useful information for both fundamental and applied studies of this species. Through a web-searching using “Web of Science" and “Google scholar", we collected 266 data sets from 215 articles from 49 study sites. The macaques fed on 460 species of herbaceous plants (from 258 genus/67 family). 30 species of ferns (from 24 genus/15 family: 15), 61 species of fungi (from 42 geni/19 families), 3 species of moss (from 3 geni / 3 families), and 11 species of seaweeds (from 11 geni/7 families), respectively. For the herbaceous plants and ferns, we also studied the parts eaten. Macaques mainly fed on leaves and stems of the herbaceous plants. This was different from that of woody plant diets, for which the macaques evenly fed on leaves, fruits, buds. bark, and flowers. On the other hand, the macaques fed on 136 animal species, mainly insects (108 species, from 103 geni/15 orders). They fed on only a few numbers of vertebrates (reptiles, amphibian. fish, and birds). The macaques fed on soil in many study sites. If we add information from Tsuji et al. (2011) about woody plant diets studied most intensively, the macaques in total fed on 1.154 species of plants and animals, and 2.406 dietary items of these plants. We also discussed about the usefulness of reviewing previous descriptive data." (Authors) The following 22 Odonata taxa are listed as diet: Sympetrum frequens, Lyriothemis pachygastra, Orthetrum albistylum, Aeshnidae sp., Planaeschna milnei, Gynacantha japonica, Mnais pruinosa, Calopteryx cornelia, C. japonica, Aciagrion migratum, Ceriagrion nipponicum, Cercion calamorum, C. sexlineatum, Copera annulata, Indolestes peregrinus, Epiophlebia superstes, Tanypteryx pryeri, Asiagomphus pryeri, Gomphus postocularis, Anotogaster sieboldii, Epitheca marginata, Macromia amphigena] Address: Tsuji, Y., 41-2 Kanrin. Inuyama Aiclii 484-8506 Japan. Email: tuji.yarnato.4n@ kyoto-u.ac.jp

2013

24704. Kitagawa, T.; Masuda, S.; Morishita, T.; Oda, Y.; Hosoya, K. (2013): Present status of the Japanese eight-barbel loach in the Naka-ikemi Wetland, Fukui Prefecture, Japan. Japanese Journal of Ichthyology 60(1): 27-33. (in Japanese, with English summary) ["The status of the endangered Lefua echigonia in the Naka-ikemi Wetland, Fukui Prefecture, officially registered as a sanctuary at the Ramsar Convention 2012, was surveyed from October 2010 to August 2012. The loach population, comprising approximately 300 individuals, was restricted to a small spring covering an area of only 84 m², a fraction of the total wetland area (250,000 m²). The size frequency distribution of the collected individuals showed bimodal peaks in May to August, and showed a unimodal peak in April, September and October. The loach population is considered highly vulnerable and in need of significant protective measures." (Authors) The list of aquatic animals collected from the Naka-ikemi Wetland, Fukui Prefecture includes Anotogaster sieboldii.] Address: Kitagawa, T., Program in Environmental Management, Graduate School of Agriculture, Kinki University, Nakamachi, Nara 631–8505, Japan. Email: ho_bo_larks@yahoo.co.jp

24705. Nakamura, M.; Rakotosoa, R.S.; Rakotomanana, H. (2013): Additional reports on the breeding ecology of Chabert's Vanga Leptopterus chabert and Red-tailed Vanga Calicalicus madagascariensis. J. Yamashina Inst. Ornithol. 45: 53-58. (in English) ["The Vangidae, an endemic family in Madagascar, provides one of the most striking examples of adaptive radiation. However, basic information on the breeding biology of each species is still lacking. To provide additional information on the clutch size of the Chabert's Vanga Leptopterus chabert and on the mating system of the Red-tailed Vanga Calicalicus madagascariensis, we studied the breeding ecology of these two species in southwestern Madagascar between October and November, 2011. The clutch size for Chabert's Vanga was 3 or 4 (n=5 nests). Both mates of the Red-tailed Vanga shared duties in egg incubation and brooding, and delivered insects to the nestlings in the single observed nest. These results suggest that the Red-tailed Vanga is a socially monogamous species." (Authors) Prey (n = 313) delivered by the Red-tailed Vanga. Prey items were recorded during the nestling period. Odonata 8 items (= 2.6%)] Address: Nakamura, M., Lab. Animal Ecol., Dept Biology, Joetsu Univ. of Education, 1 YamayashikiMachi, Joetsu-Shi, Niigata 943-8512, Japan. E-mail: masahiko@juen.ac.jp

24706. Tanaka, K.; Hamasaki, K.; Matsumoto, K.; Kamada, T. (2013): Changes in species richness of aquatic insects in a newly constructed biotope. Japanese Journal of Entomology (New Series) 16(4): 189-199. (in Japanese, with English summary) ["A biotope, with an area of 1500 m² and consisting of ponds and water canals, was constructed in the experimental field of Koibuchi College of Agriculture and Nutrition, Mito, Ibaraki Prefecture, Japan, in 2004. To assess the suitability of this biotope as a habitat for insects, we surveyed the populations of odonate adults and aquatic insects (coleopterans, hemipterans, and odonate nymphs) in this biotope during 2006-2011. We observed 31 odonate species and at least 41 species of aquatic insects during this period. Thus, this biotope may provide a profitable habitat for

these insects. The species richness, i.e., the number of species, of odonates and aquatic insects increased until 2007, and then decreased in 2008. This decrease may be attributed to the accumulation of mud at the bottom of the water bodies, which may deteriorate the quality of the habitat for aquatic insects. To recover habitat quality, we dredged up mud from the bottom of the water bodies in December 2008. Following 2009, the species richness of odonates and aquatic insects increased again. We estimate the process and factors responsible for the changes in the species richness of odonates and aquatic insects, and discuss some approaches for managing the biotope." (Authors)] Address: Hamasaki, K., Kyousei Science Center for Life & Nature, Nara Women 's University, Kitauoyahigashimachi, Nara 630-8506, Japan

24707. Tawa, K.; Nakanishi, K.; Murakami, D.; Nishida, T.; Sawada, H. (2013): The habitat status of large-sized aquatic animals in an ill-drained paddy field and an adjacent side ditch. Japanese Journal of Conservation Ecology) 18: 77-89 (2013): 77-89. (in Japanese, with English summary) ["We examined the habitat status of aquatic animals within an ill-drained paddy field and an adjacent side ditch in Shiga, Japan, from March to November. A comparison of fauna throughout the season revealed that aquatic species were richer in the paddy than in the side ditch. Specifically, both anuran tadpoles and aquatic insects (Odonata [Orthetrum spp., Sympetrum spp.], Hemiptera, and Coleoptera) were abundant in the paddy, indicating that the paddy environment offers low predation pressure and an abundant food supply, respectively, to these species. In contrast, stream-dwelling aquatic animals (Semisulcaspira libertina and Geothelphusa dehaani) were more abundant in the side ditch than in the paddy. Thus, both the paddy and the side ditch contributed to the conservation of a greater variety of aquatic animal species in ill-drained paddy fields. We then compared the fauna between the cropping and non-cropping season. A number of permanent-water species, such as Misgurnus anguillicaudatus, Cynops pyrrhogaster, and aquatic insects, were captured in the paddy during both seasons, presumably due to the presence of areas of permanent water remaining in the paddy even during the non-cropping season. These waters may have served as refugia habitats and overwintering sites for many aquatic animal species." (Authors)] Address: Tawa, K., Graduate School of Environmental Science, University of Shiga Prefecture, 2500 Hassaka, Hikone, Shiga 522-8533, Japan. Email: zi14ktawa@gmail.com

24708. Yamada, S.; Iwakiri, J.; Tatiyama, R.; Kawano, M. (2013): Studies on benthic fauna in some rivers of the southern Miyazaki prefecture, southern Kyushu, Japan. Bulletin of The Miyazaki Prefectural Museum of Nature and History 33: 21-33. (in Japnese) ["A survey of the benthic fauna inhabiting the upper, middle and lower reaches of the Sakatani and Hiroto Rivers, which flow through the southern part of Miyazaki Prefecture, was conducted, and 56 species of benthic fauna from 14 orders and 29 families were identified. The most numerous species were Ephemeroptera, followed by Trichoptera and Plecoptera, which accounted for 64% of the total. The majority of species found in both rivers were species that preferred clear water, and it can be said that the water quality is good. The number of species found at each survey site ranged from 15 to 35, suggesting a rich benthic fauna. Compared to the results of a survey conducted by the Miyazaki Institute of Health and Environment in April and May 1994, the SPT values of both rivers appear to have slightly decreased, but the proportion of Trichoptera and Plecoptera, which are indicators of an increase in the number of biological species and clean water, is high." (Authors) The list of taxa includes Sinogomphus flavolimbatus and Onychogomphus viridicostus.] Address: Yamada, S., Miyazaki Prefectural Museum of Nature & History, 2-4-4 Jingu, Miyazaki City, Miyazaki, 880-0053, Japan

2014

24709. Matushkina, N.O. (2014): Dragonflies (Odonata) of the Kanivskiy Nature Reserve. A brief guide to larvae and exuviae. Kyiv: 16 pp. (in Ukrainian) ["Dragonflies are amphibiotic insects, the larvae of which develop in water bodies of various types - from streams, rivers and swamps to man-made ponds and ditches. Using the proposed key, it is possible to identify mature larvae that have clearly visible wing rudiments and larval skins (exuvia) that remain after winging. Younger larvae are identified only to the family level. To identify species, as well as some genera from the families Coenagrionidae and Libellulidae, special identifiers must be used (see the list of recommended literature), namely, the identification should be carried out at high magnification with binoculars, making temporary preparations of individual body parts. The identification key below does not include species whose distribution is limited to certain regions of Ukraine (mainly the Carpathians and the South), or which are rare or few in number in the Middle Dnieper region." (Author/Google translate)] Address: https://vdoc.pub/documents/odonata-6jkh48bouvk0

24710. Smith, K.G., Barrios, V., Darwall, W.R.T. and Numa, C. (Editors); Boudot, J.-P.; Kalkmann, V.J (2014): The status and diversity of freshwater biodiversity in the Eastern Mediterranean. Chapter 5. Odonata (dragonflies and damselflies). Cambridge, UK, Malaga, Spain and Gland, Switzerland: IUCN: xiv+132pp. (in English) [Chapter 5. Odonata (dragonflies and damselflies): 57; 5.1 Overview of the regional odonate fauna: 58; 5.2 Conservation status: 60; 5.2.1 Threatened species: 60; 5.2.2 Data Deficient species: 60; 5.3 Patterns of species richness: 62; 5.3.1 All species: 62; 5.3.2 Threatened species: 63; 5.4 Major threats to Odonata: 63; 5.5 Conclusion and conservation recommendations: 66; 5.6 References: 67] Address: https://portals.iucn.org/library/sites/library/files-/documents/RL-262.2-001.pdf

24711. Tawa, K.; Nakanishi, K.; Murakami, D.; Sawada, H. (2014): Seasonal changes of aquatic animals in a paddy field without Nakaboshi midseason drainage. Japanese Journal of Environmental Entomology and Zoology 25(1): 11-21. (in Japanese, with English summary) ["We examined seasonal changes in the number of aquatic animals in a paddy field without midseason drainage (Nakaboshi) in Shiga, Japan, from May to August (cropping season), 2011. A total of 3,630 individuals belonging to 36 taxa (1 fish, 3 amphibians, 23 aquatic insects, 5 molluscs, 2 crustaceans, 1 leech, 1 oligochaete) were collected in the study paddy. After midseason drainage began in conventional paddies nearby, aquatic animals in the study paddy showed increased species richness and higher values of three diversity indexes (Simpson's diversity index, the Shannon–Wiener index, and Pielou's evenness value). In this season, the oriental weather loach, Misgurnus anguillicaudatus, Viviparidae spp. and many aquatic insects (Odonata [larvae of Zygoptera spp., Orthetrum spp., and Sympetrum spp.], Hemiptera, Coleoptera, and Ephemeroptera) were abundant in the study paddy. These results suggested that the study paddy served as a refuge for reproduction and growth of aquatic animals during midseason drainage in conventional paddies. Therefore, a paddy field without midseason

drainage might be effective for conservation of paddy biodiversity." (Authors)] Address: Tawa, K., Graduate School of Environmental Science, The University of Shiga Prefecture, 2500 Hassaka, Hikone, Shiga 522-8533, Japan

2015

24712. Genkai-Kato, M.; Minami, Y.; Inoue, M. (2015): Future prospects for aquatic insects as human food resources. Japanese Journal of Ecology 65(2): 77-85. (in Japanese, with English summary) ["Insects as food will become an important issue in the 21st century due to population growth and global food insecurity. Most insects eaten currently by humans are terrestrial species. Some aquatic insect species are consumed in Japan, such as stoneflies, caddisflies, and dobsonflies. This study assessed the potential of aquatic insects in streams as food resources for humans using field and questionnaire surveys. Field surveys were conducted to estimate the abundance of large-bodied aquatic insects, such as dobsonfly (Protohermes grandis) and caddisfly (Stenopsyche spp.) larvae and stonefly nymphs (Perlidae). The biomass of the benthic invertebrate communities was 0.1–7.5 g/m2 in dry weight, and the proportion of large-bodied insects to the total benthic invertebrates averaged 63%. The catch per unit effort (CPUE) of large-bodied aquatic insects was correlated positively with the biomass of benthic invertebrates. Considering the life histories of these insects and climate, large-bodied, edible aquatic insects could be collected efficiently from winter to early spring. Questionnaire surveys revealed a degree of distaste for the consumption of insects, or entomophagy, because of the appearance of insects. However, some people changed their negative attitude toward entomophagy after tasting cooked insects. We concluded that aquatic insects could be accepted as food items if their appearance on the plate is altered and that greater media communication and educational programs are needed to raise public awareness of the valuable roles that insects play in human life." (Authors) The paper includes references to Odonata. A figured "Deep-fried dragonfly larvae" is not an Odonata.] Address: Genkai-Kato, M., Graduate School of Kuroshio Science, Kochi Univ., Japan. Email: genkai@kochi-u.ac.jp

24713. Koch, U. (2015): Wildermuth, Hansruedi & Andreas Martens (2014): Taschenlexikon der Libellen Europas. Alle Arten von den Azoren bis zum Ural im Porträt. - 824 S., über 600 farbige Abbildungen, 6 Zeichnungen, 179 Tabellen. Quelle & Meyer Verlag GmbH & Co., Wiebelsheim, € 29,95. ISBN: 978-3-494-01558-3. Hessische Faunistische Briefe 34(1/2): 28- (in German) [Review.] Address: not stated

24714. Koji, S.; Ito, K.; Hidaka, K.; Nakamura, K. (2015): Effects of the low labor input farming, “V-furrow direct seeding method” on arthropod and plant diversity in rice paddy fields. Japanese Journal of Ecology 65(2): 279-290. (in Japanese, with English title) ["In the no-till V-furrow direct seeding method, which is a labor-saving method for rice cultivation, water is supplied once in winter, plowing is performed, and then the water is drained and the field is dried before the sowing season. The field is flooded from after rice emergence (mid-June or later in Suzu City, Ishikawa Prefecture) until just before harvest, and drainage treatment (mid-summer drainage) is not performed. In addition, no insecticides are applied to seedling boxes. This V-furrow direct seeding management method may have a different impact on rice field biodiversity than conventional transplanting cultivation. In this paper, we compared the communities of aquatic bugs and stink bugs, paddy field weeds, and arthropods on rice plants in V-furrow direct seeding and transplanting rice paddies in Suzu City, Ishikawa Prefecture, and obtained the following results: (1) The density of aquatic bugs and stink bugs that breed from mid-June onwards was higher in V-furrow direct seeding. This was thought to be due to the fact that the flooding period coincided with the insect breeding and migration seasons, and that insecticides were not used in the seedling box. (2) In the V-furrow direct seeding, there was a large and stable water area in the summer, where rare aquatic plants such as Water Plantain grew, making it an effective conservation site. (3) The biological communities of the two farming methods were significantly different in all of the surveyed groups, suggesting that the heterogeneity of the environment caused by the mixture of the two farming methods may increase the beta diversity of the flora and fauna in the paddy fields. On the other hand, the following effects were also observed with the V-furrow direct seeding: (1) Water drainage occurs from April to mid-June, making it unsuitable for species that breed in water during this period. (2) The density of some pest insects (rice water weevil, green rice leafhopper) increased because early control was not performed. In the V-furrow direct seeding paddy fields in this study, as with conventional transplant cultivation, insecticides were sprayed twice in mid-August, raising concerns about the negative impact on biodiversity. The results of this study suggest that the diversity of paddy flora and fauna may be conserved in the future by mixing two farming methods in one area and establishing different biological communities for each." (Authors/Google translate) The paper includes notes to effects of pesticides on Odonata.] Address: Koji, S., Satoyama Satoumi Project, Kanazawa University, Japan

24715. Ogawa, H.; Katano, O.; Yokota, M.; Strussmann, C.A. (2015): Diet of torrent catfish Liobagrus reini and fluvial sculpin Cottus pollux in the Aki River, Tokyo Metropolis. Nippon Suisan Gakkaishi 81(3): 438-446. (in Japanese, with English summary) ["We investigated the diet of two benthic species, the torrent catfish Liobagms reini and the fluvial sculpin Cottus pollux (large-egg type), from May 2013 to January 2014 in the Aki River, Tokyo, Japan. The diet was analyzed by volume of ingested prey animals and index of relative importance (IRI). Both species mainly preyed on Ephemeroptera, Trichoptera and Diptera. The catfish preyed on ephemeropteran nymphs selectively throughout the year, whereas the sculpin did not prey on it selectively in winter. The differences between the two species might result from different foraging tactics but their diets overlapped greatly in about half of the months examined. This fact suggests the potential for competition for food resources between them when benthic invertebrates are not abundant." (Authors) No Odonata have been preyed.] Address: Ogawa, H., Graduate School of Marine Science and Technology, Tokyo University of Marine Science & Technology, Minato, Tokyo 108-8477, Japan

24716. Takasaki, Y. (2015): Reminiscence of dragonflies of Nagoya Higashiyama and Nagoya Castle, Nagoya, Aichi Prefecture, Japan, sixty years ago. Bulletin of Nagoya Biodiversity Center 2: 37-52. (in Japanese, with English title) [oas 82 "From before the war to just after the war, the area from Higashiyama in Chikusa Ward on the eastern edge of Nagoya City to Yagoto in Showa Ward and Ishikawabashi in Mizuho Ward was one of the favorite collecting areas for insect enthusiasts who lived in Nagoya before and during the war. The area around Nagoya Castle, located on the northwest end of the terrace adjacent to the northwest area that still retains the appearance of the Owari Plain countryside across the Yata River, also retained a relatively natural state. These places were also convenient fields for the author,

who spent his junior and senior high school years in the late 1940s and early 1950s. This is a record of the dragonfly fauna of that time, mainly from around 1947 to 1958, including species that are now completely unseen in Higashiyama and Nagoya Castle, and is left here for future generations." (Author) The author documents the total loss of habitats and odonate species by urban development.] Address: Takasaki, Y., 14, Fujimoriittyome, Meito-ku, Nagoya, Aichi, 465-0026, Japan

24717. Teramato, Y. (2015): Availability of treated water for a threatened species compensatory mitigation project, Mortonagrion hirosei. Journal of Environmental Conservation Engineering 44(10): 557-567. (in Japanese) ["From the perspectives of both maintaining biodiversity and effectively using water resources, the establishment of conservation techniques using treated water is currently an urgent task. In this study, we clarified the impact of using treated water on the population of the endangered Hinumaito dragonfly, focusing on the conservation of its habitat (compensatory mitigation). The survey compared the habitat and population size of the habitat created within the Miyagawa Purification Center in Ise City, Mie Prefecture, in 2006 (using clean water) and 2007 (using grey water). As a result, it was confirmed that the habitat of the Hinumaito dragonfly in 2007 was maintained in a good condition similar to that in 2006, and the population size was also similar to that of the previous year. This suggests that there is no problem in using grey water to create a habitat for the Hinumaito dragonfly, at least in the short term. However, it is possible that the impact of grey water on the reeds that form the habitat of this species and on the food resources of the Hinumaito dragonfly may be delayed. For this reason, continued monitoring of the environment is necessary." (Author/-Google translate)] Address: Teramoto, Y., Graduate School of Life & Environmental Sciences, Dep Sustainable Environmental Studies, University of Tsukuba, Japan

24718. Usio, N. (2015): Effectiveness of wildlife-friendly farming on Sado Island, a globally-important agricultural heritage system site in Japan. Japanese Journal of Ecology 65(3): 269-277. (in Japanese, with English title) ["Paddy fields not only provide a place for growing crops, but also provide habitats and feeding grounds for various creatures that once used floodplain wetlands. In recent years, the importance of paddy fields as alternative wetlands has been reevaluated, and efforts to develop bio-symbiotic farming methods that aim to balance agricultural production with the restoration of biodiversity are being made throughout the country. In Sado City, in conjunction with the reintroduction of the Japanese crested ibis (Nipponia nippon) that began in 2008, the "Crested Ibis Living Village Crested Ibis" certification system was introduced for rice farming, with the focus on the restoration of biodiversity in paddy fields. As of 2013, efforts to cultivate certified rice are underway in approximately 24% of the paddy fields on the island. In recognition of this environmental conservation system for farmland that is integrated with consumers, the rural and satoyama landscapes where the crested ibises live, and the unique culture influenced by the gold mines, Sado City was designated a Globally Important Agricultural Heritage System (GIAHS) by the Food and Agriculture Organization of the United Nations (FAO) in 2011. This report introduces the impact of bio-symbiotic agriculture in Sado City on rice paddy biodiversity, including ibises, amphibians, fish, and large benthic invertebrates (benthic animals). The effectiveness of bio-symbiotic agriculture varies depending on taxonomic groups, environmental factors and land use inside and outside the paddy field, and spatial scale. In particular, efforts to create stable flooded environments during the cultivation and non-cultivation seasons, efforts to reduce pesticides and chemical fertilizers, and efforts to ensure connectivity between paddy fields and waterways are considered to be effective in improving paddy field biodiversity. In Sado City, efforts to adopt diverse farming methods have been shown to improve paddy field biodiversity, and it is believed that maintaining and improving the diversity of farming methods and utilizing the results in the sale of certified rice will be important in promoting the sustainable regeneration of Satochi and Satoyama." (Author/Google translate) The paper includes Odonata, without further specification.] Address: Usio, N., Institute of Nature & Environmental Technology, Kanazawa University, Japan. Email: usio@se.kanazawa-u.ac.jp

2016

24719. Dontchev, K.; Matsui, M. (2016): Food habits of the American Bullfrog Lithobates catesbeianus in the city of Kyoto, Central Japan. Current Herpetology 35(2): 93-100. (in English) ["By forced vomiting of stomach contents, we examined the diet of Lithobates catesbeianus inhabiting the city region of Kyoto, central Japan. Among various animal taxa consumed, crustaceans, including Asellota and Oniscoidea in juveniles and introduced American crayfish Procambarus clarkii and native crab Potamon dehaani in adults, occupied the largest proportion in number. In volume, the crayfish and crab also comprised the larger part, and the rest was composed mainly of beetles, bugs, and centipedes. Food habits of L. catesbeianus from Kyoto are characterized by the following points: (1) the frog tends to take a smaller number of larger prey as its body size increases; (2) aquatic prey animals, especially crustaceans, seem to be more important than terrestrial ones; (3) feeding intensity seems to be constant throughout the active seasons, including the breeding season; and (4) vertebrates comprise only very small proportion of the diet, despite their apparent availability, strongly contrasting to previous studies in other localities. Effects of predation on native animals seem to be not very large at present." (Authors) The table of diet composition includes Odonata.] Address: Matsui, M., Fukakusa Bo-cho 12–13, Fushimi-ku, Kyoto 612-0871, Japan. Email: fumi@zoo.zool.kyoto-u.-ac.jp

24720. Hisamatsu, S. (2016): An introduction of the website “Odonata of Ehime Prefecture”. Japanese Journal of Entomology (New Series) 19(2): 63-65. (in Japanese, with English summary) ["The website “Odonata of Ehime Prefecture” (https://sites.google.com/site/ ehimenotonbo/) was awarded the Akitsu Prize 2015 by the Entomological Society of Japan. This website introduces 90 species of Odonata, which have been recorded from Ehime Prefecture, Japan, and mainly consists of following pages: 1) pictorial books of Japanese Odonata, 2) instruments for dragonfly collecting, 3) how to prepare dragonfly specimens, 4) message board, 5) body structure of Odonata, 6) historical review of the studies of Odonata in Ehime Prefecture, 7) distribution and seasonal prevalence of Odonata, 8) photos of Odonata, and 9) bibliography." (Author)] Address: Hisamatsu, S., Biodiversity Center, Ehime Prefectural Institute of Public Health & Environmental Science, Sanbancho 8.234, Matsuyama, Ehime 790.0003, Japan. Email: sthisamatsu@gmail.com

24721. Katagi, T.; Tanaka, H. (2016): Metabolism, bioaccumulation, and toxicity of pesticides in aquatic insect larvae. Journal of Pesticide Science 41(2): 25-37. (in English) ["Aquatic insects having a high diversity are good biotic indicators for freshwater quality. Their larvae living in freshwater are sensitive to pesticides, and its impacts has been examined not

only through laboratory toxicity studies using water and sediment exposure but also through higher-tier micro-/mesocosm studies and field monitoring. Many sophisticated statistical methods have been applied to assess the impacts of pesticides at levels from species to community, but their body burden has been studied much less, especially in relation to toxicity. We review the uptake, metabolism with relevant detoxifying enzymes, and depuration of pesticides in aquatic insect larvae, which determine their body burden and help to understand the toxicity profiles specific to each chemical class. We also discuss experimental conditions, environmental factors, and species sensitivity in relation to the bioconcentration/-accumulation and toxicity of pesticides." (Authors) The paper includes references to Odonata (Enallagma, Ischnura).] Address: Tanaka, H., Environmental Health Science Lab., Sumitomo Chemical Co., Ltd., 4–2–1 Takatsukasa, Takarazuka, Hyogo 665–8555, Japan. E-mail: tanakah15@sc.sumitomo-chem.co.jp

24722. Kirti, J.S.; Singh, A.; Kaur, S. (2016): Further studies on male genitalia of Neurothemis intermedia (Rambur) and Neurothemis tullia (Drury) (Odonata: Libellulidae). World Wide Journal of Multidisciplinary Research and Development 2(5): 36-39. (in English) ["Re-description of the male secondary genitalic attributes of two already described subspecies of genus Neurothemis i.e. N. i. intermedia and N. t. tullia have been given in the present manuscript. The significance of most important taxonomic features of penis, i.e. lateral lobes, medial process and apical lobes have been emphasized." (Authors)] Address: Kirti, J.S., Dept Zoology & Environmental Sciences, Punjabi Univ., Patiala, India

24723. Ohba, S.-y.; Tsuda, Y. (2016): A comparison of predacious aquatic insect fauna and density in ground pools and concrete pools created during the Great East Japan Earthquake in 2011. Medical Entomology and Zoology 67(1): 45-50. (in English) [" The tsunami caused by the Great East Japan Earthquake on March 11, 2011 hit the Pacific coast and caused heavy destruction of natural and man-made environments in north-eastern Japan. This study focuses on mosquito larvae and their potential aquatic insect predators associated with ground pools and pools that appeared in the concrete foundations of destroyed houses (concrete pool) in inundated areas in Miyagi Prefecture, Japan. Field samplings were conducted on late July 2013. Culex inatomii, Cx. pipiens group, Cx. tritaeniorhynchus, and Cx. orientalis were collected from ground pools and concrete pools. The abundance of Cx. inatomii and Cx. pipiens groups in concrete pools was significantly greater than that in the ground pools. A large number of Hydroglyphus japonicus were collected as potential mosquito predators, followed by Micronecta spp., Enochrus japonicus, Rhantus sturalis, Aquarius paludum paludum and Hydrochara a nis, categorized as “flight dispersers,” which might immigrate rapidly from the non-inundated rice fields or wetlands. Stepwise generalized linear models suggested that larval abundance of Cx. inatomii in the pools studied was affected by the vegetation cover and habitat type (ground pool or concrete pool), but not by water depth, salinity, presence of predators, and bottom type (sand or concrete) of aquatic bodies. Concrete pools and covered with dense vegetation provide breeding habitat for Cx. inatomii along with their potential predators." (Authors) Odonata (Libellulidae, Aeshnidae, Zygoptera) are not further specified.] Address: Ohba, S.-y., Biological Laboratory, Faculty of Education, Nagasaki University, 1-14 Bunkyo, Nagasaki 852-8521, Japan. Email: ooba@nagasaki-u.ac.jp

24724. Takasaki, Y. (2016): Dragonflies and butterflies of Meitoku Koen Park, Meito-ku, Nagoya, Aichi Prefecture, Japan. Bulletin of Nagoya Biodiversity Center 3: 43-53. (in Japanese) ["This is a record of the past and present of dragonflies and butterflies in Meitoku Park in Meito Ward, which does not receive much attention as a natural environment. Even though it is a limited taxonomic group, it is possible to infer to some extent from this the quality of the overall natural state. Even in the case of other city parks and green spaces, where it is difficult to say that the past and present conditions of the biota in the area are accurately understood, even if conservation activities and awareness campaigns are being carried out enthusiastically, it is desirable to pay attention to the importance of collecting and recording basic information on the natural environment. We hope that this paper will be a starting point for such efforts. We also considered the problems in investigating the insect fauna in the city's parks and green spaces." (Author/Google translate) 38 odonate species are documented.] Address: Takasaki, Y., 14, Fujimoriittyome, Meito-ku, Nagoya, Aichi, 465-0026, Japan

24725. Thongphak, D.; Boonthaiiwai, C. (2016): Diversity of aquatic insects in the organic and conventional rice fields in Khon Kaen Thailand. International Journal of Environmental and Rural Development 7(2): 57-62. (in English) ["Water quality has significant effects toward the diversity and distribution of aquatic insect. The application of fertilizer and pesticides may degrade water quality and affect to diversity of aquatic insects. Aquatic insect in rice fields was surveyed to compare the diversity between organic and conventional rice fields in Khon Kaen province during June to October 2015. Three replication of sampling by aquatic sweep net were conducted at sampling sites. The result showed that aquatic insect was represented by 17 species belongs to 16 families of 6 orders. The order Hemiptera was the highest in abundance groups in the fields (5 families) followed by Odonata [Agriocnemis, Brachythemis, Crocothemis, sic: Orthemis, Sympetrum, Prodasineura], Diptera (3 families), Coleoptera (2 families), Ephemeroptera was the lowest in abundance (2 families) and Collembola (unidentified family). The richness of aquatic insects in the organic rice field was found slightly higher than the conventional one. The species diversity index (H') was 0.427 in organic site and conventional site was 0.401. This study is considered to have no significant in diversity or abundance of aquatic insects between organic and conventional rice field. Order Hemiptera was found abundant and dominant among other orders." (Authors)] Address: Thongphak, D., Entomology Section, Dept of Plant Science & Agriculture Resources, Faculty of Agriculture, Khon Kaen University, Khon Kaen, Thailand. Email: duathg@kku.ac.th

24726. Yamabuki, H.; Ichion, E.; Hiramatsu, K.; Chono, S.; Yanai, S. (2016): Examination of the food webs in irrigation and drainage canals on an alluvial fan using carbon and nitrogen stable isotope ratios. Journal of Rainwater Catchment Systems 21(2): 23-35. (in Japanese, with English summary) ["We examined the food webs in the main irrigation and drainage canals on the alluvial fan of the Tedori River (Ishikawa Prefecture, Japan) by measuring the carbon and nitrogen stable isotope ratios in food sources, aquatic insects, other benthic animals, and freshwater fishes in the upper, middle, and lower reaches. The results showed that the food webs in the canals mainly comprised aquatic insects, freshwater shellfish, and fish that originated from the canal bed sediment, and periphyton on the concrete-lined bed and side walls, and cobbles and boulders on the channel bed. The results also showed that the carbon and nitrogen stable isotope ratios of the periphyton increased in the lower reaches due to a decrease in flow velocity and an increase in the

anthropogenic nitrogen load; the increases in the stable isotope ratios of the primary producers triggered increases in the stable isotope ratios of the entire food chain. The nitrogen of high stable isotope ratio conveyed by diadromous fish from a sea also might triggered the increase in the nitrogen stable isotope ratio of the entire food chain. Upstream migration of fishes and downstream migration of aquatic insects left gaps in the stable isotope ratios between predators and prey. Sustainable management of the cobbles and boulders will contribute to the conservation and rehabilitation of aquatic fauna and will promote water purification in the canals by increasing the number of aquatic insects that feed on periphyton and the number of fishes that feed on aquatic insects [including Odonata] and periphyton." (Authors)] Address: Yamabuki, H-, Faculty of Bioresources & Environmental Sciences, Ishikawa Prefectural Univ., 1-308 Suematsu, Nonoichi, Ishikawa 921-8836, Japan. Email:ichion@ishikawa-pu.ac.jp

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24727. Glotzhober, R.C.; McShaffrey, D. (2017): Dragonflies and Damselflies of Ohio. Field Guide. Ohio Dept of Natural Resources: 67 pp. (in English) [https://dam.assets.ohio.gov/image/upload/ohiodnr.gov/documents/wildlife/backyard-wildlife/Dragonflies%20and% 20Damselflies%20of%20Ohio-%20Field%20Guide%20pub320.pdf]

24728. Nakano, K. (2017): The insect fauna observed along the roadside and at three open spaces in Minato-ku, Tokyo from 2012 to 2016. Japanese Journal of Environmental Entomology and Zoology 28(4): 189-195. (in Japanese, with English summary) ["The species composition and abundance of insects were investigated using a direct-observation method along the roadside and in three open spaces in Minato-ku, Tokyo, from January 2012 to December 2016. In total, 1,598 individuals of 11 orders were found, including Coleoptera (60.3%), Lepidoptera (19.6%), Hemiptera (7.3%), Blattaria (4.6%), Hymenoptera (4.6%) and Diptera (2.7%) as the major orders, as well as Orthoptera, Odonata, Dermaptera, Mantodea and Neuroptera, which represented less than 1%. Many insect individuals were found in July and August." (Author) Three specimens of Sympetrum sp., S. frequens, and S. infuscatum were recorded.] Address: Nakano, K., Shiba, Minato-ku, Tokyo, 105-0014 Japan

24729. Takasaki, Y. (2017): Dragonflies and butterflies of Itakaryokuti Park, Meito-ku, Nagoya, Aichi Prefecture, Japan. Bulletin of Nagoya Biodiversity Center 4: 89-106. (in Japanese) ["Inadaka Green Space is one of Nagoya City's urban parks, with a vast area mostly covered with secondary forest and various still water areas such as Tsukanoiike Pond, making it an excellent environment and one of the city's natural sites. Since 1975, we have been conducting surveys of the dragonflies and butterflies in the area every year. To the average person, it may appear at first glance that there has been no significant change in the overall landscape of the park, such as the distribution of vegetation and the topography, but in recent years, the number of species has decreased significantly. The exact cause of this is not entirely clear, but in light of this situation, we believe that the government and conservation and protection-related parties should be more aware of the importance of accurately and continuously understanding and recording the biota of urban parks, which are considered to be natural sites of the city, and similar environments." (Authors) 45 odonate species are documented.] Address: Takasaki, Y., 14, Fujimoriittyome, Meito-ku, Nagoya, Aichi, 465-0026, Japan

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24730. Kobayashi, S.; Morita, Y.; Nakaya, Y.; Nagamine, T.; Onuma, M.; Okano, T.; Haga, A.; Yamamoto, I.; Higa, M.; Naruse, T.; Nakamura, Y.; Denda, T.; Izawa, M. (2018): Dietary habits of the endangered Okinawa Rail. Ornithological Science 17(1): 19-35. (in Japanese, with English summary) ["Many species of flightless rail are endemic to small islands and endangered, or have become extinct during historical times. However, our understanding of their basic ecological knowledge remains limited. The Okinawa Rail Hypotaenidia okinawae is a flightless species of rail endemic to Okinawajima Island in the Ryukyu Archipelago, Japan. In this study we have quantified the dietary components of the Okinawa Rail using gizzard contents classified by the frequency of occurrence and wet weight. The Okinawa Rail feeds on a wide variety of animals and plants throughout the year, but the frequency of occurrence and wet weight of animal matter significantly exceeds those of plant matter. The number of items present in the gizzard did not differ among seasons, ages and between sexes. Grit was present in almost all individuals and the wet weight did not differ between sexes or among age groups. Although the diet was observed to be diverse, the primary dietary component of both sexes, all ages, and throughout the year appears to be land snails, indicating their great significance as a source of food." (Authors) The list of identified animal remains in adulte Okinawa Rail gizzards includes Matrona basilaris japonica.] Address: Kobayashi, S., Graduate School of Engineering & Science, University of the Ryukyus, 1 Senbaru, Nishihara Okinawa903–0213, Japan. E-mail: cheirotonus.jambar@gmail.com

24731. Makihara, H.; Sugiarto; Fujima, T.; Nurjit, W.; Matsumoto, K.; Maedo, K.; Ueda, A.; Taki, H. (2018): Bibliography of fauna and ecology of insects in East Kalimantan, Indonesia. Bulletin of the Forestry and Forest Products Research Institute 17(2): 187-208. (in Japanese) ["This paper presents a chronological summary of reports on insect species and ecology in East Kalimantan, focusing on surveys conducted by the authors since the late 1990s, with brief commentary. It also presents a list of 45 new insect species from two orders and three families described in the course of the authors' surveys, as well as images of six Scarabaeidae and 34 Cerambycidae." (Authors/Google translate) The list of publications includes only one reference to Odonata: Dolný, A., Bárta, D., Lhota, S., Rusdianto and Drozd, P. (2011) Dragonflies (Odonata) in the Bornean rain forest as indicators of changes in biodiversity resulting from forest modification and destruction. Tropical Zoology 24, 63-86.] Address: Nurjit, W., Inst. Biology, Indonesian Acad. Sciences, Indonesia

24732. Nakagawa, H.; Sato, T. (2018): Fauna of aquatic insects with identification keys in tributaries of Minami-Tawa River, Hokkaido, Japan. Forest research, Kyoto 80: 1-4. (in Japanese, with English summary) [A teneral Davidius moiwanus is the only dragonfly species that has been documented in the period of June to October 2013.] Address: Nakagawa, H., Field Science Education and Research Center, Kyoto University, Japan

24733. Suzuki, M.; Hirai, N.; Ishii, M. (2018): Effects of pond drying on the aquatic macroinvertebrate community of an ecological pond created in an urban area in Osaka, Japan. Japanese Journal of Environmental Entomology and Zoology 29(1): 1-12. (in Japanese, with English summary) ["We investigated the effects of pond drying on the aquatic macroinvertebrate community of an ecological pond established in 2009 in an urban area of Osaka, Japan. We compared

the community before (2011 and 2012) and after (2013 and 2014) pond drying, in the winter of 2012–2013, based on community surveys conducted monthly from April to December in 2011–2014. A total of 15,130 individuals of 52 taxa were observed during the survey: 3,316 individuals of 22 taxa in 2011; 3,765 individuals of 23 taxa in 2012; 3,365 individuals of 37 taxa in 2013; and 4,684 individuals of 29 taxa in 2014. Although no clear temporal trend was observed for taxa richness throughout the survey period, the annual cumulative richness was highest in 2013, after the pond drying. The dominant taxa were Neocaridina sp. in 2011 and 2012 (47% and 52%, respectively, in terms of relative dominance); Chironominae spp. in 2013 (17%); and Naididae spp. in 2014 (49%). Analysis using non-metric multidimensional scaling revealed substantial differences in the community structure before and after pond drying, demonstrating a temporal increase in species diversity. Our results suggested that pond drying was a promising measure to enhance and restore the species diversity of aquatic macroinvertebrate communities in ecological ponds in urban areas." (Authors) The following odonate taxa are listed: Ischnura spp.; Sympetrum spp.; Epophthalmia elegans; Anax spp.; Paracercion calamorum; Orthetrum spp.; Crocothemis servilia; Rhyothemis fuliginosa; Anaciaeschna martini; Copera annulata] Address: Suzuki, M., Graduate School of Life & Environmental Sciences, Osaka Prefecture Univ., Nakaku Gakuencho 1-1, Sakai, Osaka 599-8531, Japan.

24734. Ueda, K.; Ashizawa, J.; Fujimoto, Y. (2018): Species composition and seasonal occurrence of odonates in Lake Izunuma-Uchinuma and the surrounding areas, Miyagi Prefecture, Japan. Izunuma-Uchinuma Wetland Researches 12: 9-16. (in Japanese, with English summary) ["Seasonal changes in species composition and abundance of odonate adults were investigated in Lake Izunuma-Uchinuma and the surrounding areas, northeastern Miyagi Prefecture, Japan, from May through October 2014. 35 species and 6,802 individuals belonging to ten families of odonate adults were observed during the study period. The species richness and abundance of odonates were high from June to September and peaked in July. The dominant species were Deielia phaon and Paracercion hieroglyphicum in June and July and then shifted to Sympetrum infuscatum and S. frequens during August to October. The four dominant species, D. phaon, P. hieroglyphicum, S. infuscatum and Ischnura asiatica accounted for 73.7% of the total observed adults. The endangered species such as P. plagiosum represented two or lower percentage of the observed individuals, suggesting the importance of conservation for these endangered species." (Authors)] Address: Ueda, K., Inst. Agro-Environmental Sci., NARO, 3-1-3 Kannondai, Tsukuba-shi, Ibaraki, 305-8604, Japan

24735. Yoshioka, S.; Kimura, T. (2018): What does the red-eared slider eat on the tidal flats? Comparing the diet of the invasive alien species Trachemys scripta elegans inhabiting the tidal flat and freshwaters. Japanese Journal of Benthology 72(2): 83-93. (in Japanese, with English summary) ["T. scripta elegans, is a freshwater turtle native to the South Central United States of America and Northeastern Mexico. It was introduced into Japan in the late 1960s and is currently the dominant and widely distributed species throughout the country. The species is salt tolerant, and its distribution has recently expanded into tidal flats; however, its ecology in the tidal flats is unknown. The aim of the present study was to analyze the diet of T. s. elegans inhabiting the tidal flats. We collected 46 individuals from the tidal flats and adjacent freshwater waterway of the Tanakagawa River in the Mie Prefecture in Nov. 2014 and from April to November 2015. We compared the intestinal content of the turtles from both the habitats. They consumed a wide variety of plants and animals in both the habitats, with no difference between the habitats in terms of food intake per body weight. There was a higher ratio of animal to plant matter in juveniles and adults from the tidal flats than that in those from the freshwater waterways. In this animal matter, there was a high incidence of decapod species, such as the tidal flat crabs Helice tridens and Macrophthalmus japonicus. To the best of our knowledge, the present study is the first to suggest that the red-eared slider affects the tidal flat ecosystems by preying on the native tidal flat organisms." (Authors) The diet includes an imago ("terrestrial insects") of "Odonata sp.".] Address: Kimura, T., Graduate school of Bioresource, Mie Univ., 1577 Kurimamachiya, Tsu, Mie 514–8507, Japan. Email: k-taeko@bio.mie-u.ac.jp

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24736. Higashikawa, W.; Yoshimura, M.; Yagi, T.; Maeto, K. (2019): Conservation study focusing on habitat use in darter (meadowhawk) populations that used to flourish in the rice paddy fields of Japan. Japanese Journal of Limnology (Rikusuigaku Zasshi) 80(3): 107-124. (in Japanese, with English summary) ["Recent decreases in population size of some Sympetrum species that used to flourish in paddy fields in Satoyama, Japan, are thought to be caused by the development of rice cropping systems. As habitat use is species-specific, some conservation studies have shown that the causes of the decline in darter populations may also be species-specific. While eggs and larvae of lentic species like S. frequens decrease owing to the effect of pesticides, those of S. pedemontanum elatum, which lives along weakly flowing water, are not influenced by these chemicals, although they have decreased with the modernization of water management in paddy fields. It is also known that drying of the soil surface in no-till farming areas does not reduce the population size of S. infuscatum, whose eggs have a higher resistance to drought than those of other darter species. For the conservation of darters, we should investigate habitat use during the developmental stages of each species, identify the causes of population decline, and maintain a suitable balance within the microhabitats required by each darter species. Such designed habitats will contribute to the conservation of not only darters, but also many other aquatic organisms endangered in the paddy fields of Satoyama." (Authors)] Address: Higashikawa, W., Lab. Insect Biodiversity & Ecosystem Science, Graduate School Agricultural Sci., Kobe Univ., Hyogo 657-8501, Japan. Email: higashi_n34@yahoo.co.jp

24737. Kirti, J.S.; Kaur, S.; Singh, A. (2019): Redescription of male genitalia of six species of genus Orthetrum Newman (Anisoptera: Libellulidae) from North West India. Biological Forum – An International Journal 11(1): 107-116. (in English) ["The structure of the male secondary apparatus of O. brunneum, O. glaucum, O. japonicum internum, O. pruinosum neglectum, O. taeniolatum and O. triangulare have been redescribed and illustrated in detail based on the specimens from India. The importance of various morphological attributes like anterior lamina, hamule, vesicular spermalis and penis of male secondary apparatus have been highlighted based on this study." (Authors)] Address: Kirti, J.S., Dept Zoology & Environmental Sciences, Punjabi Univ. Patiala (Punjab), India

24738. Lino, J.; Koneri, R.; Butarbutar, R.R. (2019): Keanekaragaman Capung (Odonata) Di Tepi Sungai Kali Desa Kali Kabupaten Minahasa Sulawesi Utara [Diversity of

Dragonflies (Odonata) on the banks of the Kali River, Kali Village, Minahasa Regency, North Sulawesi]. Jurnal Mipa Unsrat Online 8(2): 59-62. (in Indonesian, with English summary) ["This study aims to identify species and analyze the diversity of dragonflies in Kali River Kali Village, Minahasa Regency, North Sulawesi. ... This research was carried out on the river banks which are located in three habitat types, namely on the banks of secondary forest rivers, plantation banks, and residential riverbanks. Three transect lines were made on each habitat with a length of 300 meters. The dragonfly composition obtained consisted of 6 families, 19 species and 1,785 individuals. Most of the species are from family Libellulidae. Species with the highest abundance are Neurothemis ramburii and Orthetrum pruinosum. The species richness index in the Kali River River was categorized as low, the economic index was categorized as moderate, and the species evenness index was classified as high." (Authors)] Address: Lino, J., Jurusan Biologi FMIPA UNSRAT, Jl. Kampus Unsrat, Manado, Indonesia 95115; E-mail: juniatilino@gmail.com

24739. Mitsui, S.; Ito, K.; Aikawa, T.; Chokki, H.; Sato, T.; Karube, H.; Matsumoto, R.; Senou, H. (2019): The aquatic fauna of the water moats of the Odawara Castle Park, Odawara City, Kanagawa Prefecture. Natural History Report of Kanagawa 40: 75-83. (in Japanese) [Japan; larvae of Ictinogomphus pertinax, Epophthalmia elegans, and Pseudothemis zonata were collected.] Address: Karube, H., Kanagawa Prefect. Mus. Nat. Hist., 499 Iryuda, Odawara, Kanagawa, 250, Japan. E-mail: paruki@nh-kanagawa-museum.jp

24740. Mizutani, M.; Sagawa, S. (2019): Evaluation of aquatic animal abundance as prey for the Oriental White Stork Ciconia boyciana in winter paddy fields in Wakasa Town, Fukui Prefecture. Japanese Journal of Ornithology 68(2): 209-215. (in Japanese, with English summary) ["We investigated the number of individuals and biomass of aquatic animals as prey for C. boyciana in winter paddy fields in Tobadani, Wakasa Town, Fukui Prefecture. Analysis of the prey biomass revealed that the red swamp crayfish Procambarus clarkii was most abundant, followed by the oriental weather loach Misgurnus anguillicaudatus and Odonata larvae. It is known that storks generally prey on these taxa. Aquatic prey animals were more abundant in plowed paddy fields with a rough surface than in plowed fields with smooth surfaces or in unplowed fields. The results suggest that the temporary puddles made when plowing boggy paddy fields provide suitable habitats for these aquatic animals." (Authors)] Address: Mizutani, M., Institute of Nature Education in Shiga Heights, Fac. Education, Shinshu Univ., Shigakogen, Yamanouchi-machi, Shimotakai-gun, Nagano 381–0401, Japan. Email: mmizuki.agr@gmail.com

24741. Rodrigues, M.E.; De Oliveira Roque, F.; Guillermo-Ferreira, R.; Saito, V.S.; Samways, M.J. (2019): Egg-laying traits reflect shifts in dragonfly assemblages in response to different amount of tropical forest cover. Insect Conservation and Diversity 12(3): 231-240. (in English) ["(1) Oviposition site selection by aquatic insects is usually influenced by both aquatic and terrestrial cues. Landscape changes (e.g. native vegetation loss) can affect the level of the reproductive success in aquatic insects, changing local species composition and richness. (2) We investigate whether forest cover loss around streams influences the number of species with exophytic (species which lay eggs directly on the water surface), endophytic (species which lay their eggs directly into plant tissue), or epiphytic (species which lay eggs on the exposed surface of rocks, leaves, trunks or other substrates protruding from the stream surface) oviposition behaviour in dragonfly assemblages. (3) We sampled adult dragonflies in 116 streams in a Neotropical savanna region in Brazil. The relationship between species richness for each behavioural category, and the proportion of forest cover around the streams, was tested using regression analysis. (4) We collected 2413 dragonfly individuals, belonging to 8 families, 30 genera, and 63 species. Of these, 25 species were classified as exophytic, 28 as epiphytic, and 10 as endophytic. Our results show that the number of species with exophytic or epiphytic behaviour was strongly related to riparian forest loss. (5) Forest loss changes the habitat, and here, specifically changes site suitability for oviposition. We highlight the importance of using behavioural traits as a bioindicator tool for the assessment of anthropogenic impacts on tropical forest." (Authors)] Address: Rodrigues, M.E., Depto de Ciencias Biologicas, CCBS, Rodovia Jorge Amado, Km 16, Salobrinho, Ilheus, Bahia, CEP: 45 662-900, Brazil. E-mail: rodrigues.mbio@gmail.com

24742. Sackey, J.; Nuru, Z.Y.; Mlungisin, N.; Maaza, M. (2019): Investigation of the morphological cell structures and their optical significances of Aeshna cyanea. IET Nanobiotechnol.ogy 13(8): 857-859. (in English) ["The transparent wing of Aeshna cyanea [cf] has been investigated using scanning electron microscopy (SEM), optical microscopy (OPM), energy-dispersive X-ray spectroscopy (EDS) and reflectance spectroscopy. Four cells (D1–D4) were studied and classified according to their general morphology. The OPM depicted the vein-joint characterised by the distribution of resilin. EDS technique showed common elements such as carbon, oxygen, and chlorine. SEM analysis revealed thin membranes reinforced with a network of hallow veins. Spikes and round shape of microstructures were identified. The roughness of the pruinosity was estimated, which indicates the shape and curvature of the microstructures that essentially play a significant role in the optical response observed. The study can be essential to design and improve micro-air vehicles.] Address: Sackey, Juliet, NanosciencesAfrican Network (NANOAFNET), iThemba LABS, Somerset West, Western Cape Province, South Africa. E-mail: juliyalley@gmail.com

24743. Uchida, N.; Kubota, K.; Aita, S.; Kazama, S. (2019): Relationship between stream insects' biomass and environmental DNA derived by metabarcoding and quantitive PCR. Journal of Japan Society of Civil Engineers, Ser. G (Environmental Research) 75(7): II281-III288. (in Japanese, with English summary) ["Invertebrate species DNA of the cytochrome oxidase subunit 1 region were quantified using environmental DNA (eDNA) extracted from river water using quantitative PCR (qPCR). Subsequently, metabarcoding was conducted to obtain the proportion of stream insects of six taxonomic orders (Ephemeroptera, Plecoptera, Trichoptera, Diptera, Odonata, Coleoptera) in the community. Finally, eDNA concentrations of the six taxonomic groups were calculated by multiplying the proportion of each taxonomy and the quantified invertebrate DNA concentration. As a result, aquatic insect eDNA concentrations displayed significant positive correlations with aquatic insect individuals collected by the conventional surber net sampling (Spearman's rank correlation = 0.74,$p < 0.01$). Furthermore, positive correlations were observed between the population densities and eDNA concentrations for orders Ephemeroptera, Plecoptera, and Dipetra. These results indicate that the combination of eDNA metabarcoding and qPCR can be an effective way to estimate the abundance of stream insect." (Authors)] Address: Uchida, N., Student Member Graduate School of Engineering, Tohoku University (6-06 Aoba, Aramaki, Aoba-

ku, Sendai, Tohoku-ken 980-8579) E-mail: nonko.uchida.s8@dc.tohoku.ac.jp

24744. Wildermuth, H. & Martens, A. (2019): Die Libellen Europas. Alle Arten von den Azoren bis zum Ural im Porträt. Quelle & Meyer, Wiebelsheim: 958 pp. (in German) ["Dragonflies are fascinating and mysterious insects. Anyone who has begun to observe these beautiful and diverse animals will soon want to know more about the way of life of this animal group. In this book, Hansruedi Wildermuth and Andreas Martens cover all the dragonflies found in Europe. Besides the explanations of the names, the appearance, behaviour and habitat of the individual species and their larvae are described in detail. Brilliant and useful photos, as well as tables of the seasonal occurrence and distribution maps, supplement the portraits. This book is not only an indispensable reference book for professional entomologist, but also a valuable companion for those who are just starting to deal with this fascinating insect group." (Publisher)] Address: Quelle & Meyer Verlag, Wiebelsheim

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24745. Funakoshi, K.; Osawa, T.; Nagayama, T.; Sato, A.; Katsuta, S.; Osawa, Y.; Osawa, K. (2020): Bat ecology in crevices of elevated railways of the Kyushu-Shinkansen train in Yatsushiro City, Japan, with special reference to usage of artificial roosts and foraging habits in the Oriental free-tailed bat Tadarida insignis. Honyurui Kagaku (Mammalian Science) 60(1): 15-31. (in Japanese, with English summary) ["We observed the three bat species Tadarida insignis, Pipistrellus abramus, and Vespertilio sinensis at joint surfaces of a railway viaduct of the Kyushu-Shinkansen train in Yatsushiro City. In addition, one echolocation call was recorded, which is characterized by 36 kHz (peak frequency) on average, and differs from that of other species that occur in the Kyushu District. Dense clusters of hibernation colonies of T. insignis were observed for the first time. A V. sinensis colony was also observed first in Kumamoto Prefecture. T. insignis and P. abramus formed maternity colonies in July. The slits of the hibernating site were narrow, with a width of about 3 cm. The population size of T. insignis peaked once in May and once in October, whereas that of P. abramus peaked only in September. Emergence time of the first bat was about 22 minutes after sunset in P. abramus, and 36 minutes after sunset in T. insignis. T. insignis fed mainly on Lepidoptera, Hemiptera, Diptera, Neuroptera, Coleoptera, and Odonata, and the respective proportion fluctuated seasonally; agricultural pests were also included in the diet. Surveying structures such as viaducts is thus useful to assess occurrence and biology of different bat species." (Authors) 8.1% (=124) of feces of Tadarida insignis in Yatsushiro City, Kumamoto between 2015 to 2016 included prey items identified belonging to Odonata.] Address: Funakoshi, K., Biological Laboratory, Faculty of Intercultural Studies, The International University of Kagoshima, Kagoshima 891-0197, Japan. Email: funakoshi@int.iuk.ac.jp

24746. Imai, K.; Yoshimura, M.; Sakai, M.; Natuhara, Y. (2020): Aquatic insect communities in second-order streams in catchments with and without deer-exclusion fencing one year after fence establishment. Japanese Journal of Environmental Entomology and Zoology 31(3): 101-109. (in Japanese, with English summary) ["To stop overbrowsing of understory vegetation by sika deer (Cervus nippon Temminck, 1838) in the primary forest at the Ashiu Forest Research Station, Japan, a deer-exclusion fence was built in 2006. To examine the effects of overbrowsing on aquatic insect communities, aquatic insects were collected from second-order streams in two neighboring catchments with similar area and geographical features in 2007: one surrounded by the fence (exclosure catchment, EC) and another outside the fence (control catchment, CC). Here, we report the population density, life habit, and functional feeding group of all collected insects (69 taxa) in the EC and CC. We found that the total number of observed taxa and individuals was larger in the CC than the EC, and the population density of each taxon tended to be higher in the CC than the EC for life habit/functional feeding groups that had a higher tolerance to fine sediment. Our results indicate that in the CC, overbrowsing of understory vegetation and resultant soil erosion may have increased the amount of fine sediment in second-order streams and affected the community structure of the aquatic insects." (Authors) Odonata are treated at genus level: Epiophlebia, Gomphidae unidentified, Lanthus, and Sieboldius.] Address: Imai, K., Faculty of Education, Kyoto University of Education, Kyoto 612-8522, Japan. Email: imai@kyokyo-u.ac.jp

24747. Küry, D. (2020): Wildermuth H. Martens, A. (2018): Die Libellen Europas. Alle Arten von den Azoren bis zum Ural im Porträt. Quelle & Meyer, Wiebelsheim, ISBN 978-3 494-01690-0. Alpine Entomology 4: 21-22. (in German) [Review.] Address: Küry, D., Life Science AG, Basel, Switzerland. Email: daniel.kuery@lifescience.ch

24748. Matsumoto, R.; Suwabe, S.; Karube, H. (2020): Diet of Xenopus laevis and Lithobates catesbeianus Trapped in Nakaogino Area, Atsugi, Kanagawa Prefecture, Japan. Bulletin of the Kanagawa Prefectural Museum (Natural Science) 49: 85-99. (in Japanese, with English summary) ["Atsugi Children's Wood Park is located in Nakaogino, Atsugi, Kanagawa Prefecture. Since 2015, two alien species, African clawed frogs (Xenopus laevis) and American bullfrogs (Lithobates catesbeianus), have been found in ponds and waterways that were newly created in this park, an area previously occupied by disused rice-fields. These new ponds are important habitats for several rare endemic species, including Sympecma paedisca and Libellula quadrimaculata. The primary threat posed by the two alien frog species is considered to be predation, and we therefore examined the stomach contents of individual frogs trapped in this park. The results indicate that the diet of X. laevis is dominated by aquatic arthropods, especially larval Odonata, although a Japanese Eight-barbel loach (Lefua echigonia), an Endangered IB species in the Red data book of Kanagawa Prefecture, was also identified. L. catesbeianus, on the other hand, preyed on various arthropods, more than half of which were terrestrial species. However, L. catesbeianus fed less frequently on aquatic species than X. laevis, larval odonatans were again dominant among its aquatic prey. The predation pressure exerted by the two alien species on S. paedisca and L. quadrimaculata could not be determined decisively in this study, given the number of sampled individuals and the limited sampling period. However, as the artificial ponds are small, with few places to escape from predators, the alien species could be threat to any vertebrate or invertebrate living there. The invasion of alien species into newly built ponds in the Atsugi Children's Wood Park has continued, despite continued monitoring. Active control of alien species is crucial for conservation of rare endemic species in this area." (Authors)] Address: Suwabe, S., Atsugi Children's Wood Club, Kanagawa Dragonfly Research & Conservation Network 3-12-11, Asahi, Atsugi, Kanagawa 243-0014, Japan. Email: s.k-suwabe@athena.ocn.ne.jp

24749. Mizota, H.; Funo, T.; Ohtani, T. (2020): Changes in

feeding patterns of Brown Hawk-Owls Ninox scutulata japonica during the nestling period. Japanese Journal of Ornithology 69(2): 223-234. (in Japanese, with English summary) ["The main prey of Ninox scutulata japonica during the breeding season consists of Coleoptera, although Lepidoptera are also delivered frequently to nestlings during the early nestling period. Changes in the frequency of food items delivered during the nestling period are unclear because Brown Hawk-Owl forage for insects at night. To evaluate how prey abundance in the nesting territory affects changes in the frequency of delivery of Coleoptera and Lepidoptera to nestlings, we collected prey remains around the nest site, and surveyed the amount of insects consumed as the main prey of the Brown Hawk-Owl. In order to be able to discuss the characteristics of feeding ecology, we also investigated the body parts of insects that Brown Hawk-Owls delivered to their nest. Although there were fewer individual Lepidoptera than Coleoptera within the territory of the owls, adult owls frequently delivered Lepidoptera to their chicks until the middle of the nestling period. Brown Hawk-Owls then switched their main prey from Lepidoptera to Coleoptera, according to the abundance of insects within their territory, towards the end of the nestling period. These results suggest that Brown Hawk-Owls selectively delivered Lepidoptera to their nestlings until the middle of the nestling period, but that this selectivity disappeared toward the end of the nestling period. Heads, thoraxes, and abdomens of Lepidoptera, and abdomens of Coleoptera were delivered frequently to nestlings suggesting that Brown Hawk-Owls may select soft exoskeletons of Lepidoptera and Coleoptera due to the undeveloped digestive organs of their chicks. To understand the species-specific feeding ecology of the Brown Hawk-Owl, we should investigate the species' feeding pattern in relation to the development of the digestive organs of the nestlings." (Authors) Appendix 1. Food remains of Brown Hawk-Owls from the 2005 and 2006 breeding seasons: Pseudothemis zonata, Pantala flavescens, Anax parthenope.] Address: Mizota, H. Collaborative Researcher, Museum Nature & Human Activities, Hyogo, 6 Yayoigaoka, Sanda, Hyougo 669–1546, Japan

24750. Murakami, H.; Hisamatsu, S.; Takechi, R.; Kurokawa, Y.; Matsui, H. (2020): Effects of water management of reservoirs on nymphal development in Sympetrum uniforme in Tyuyo, Ehime Prefecture, Japan. Japanese Journal of Conservation Ecology 25(2): 279-286. (in Japanese, with English summary) ["Some dragonflies in East Asia have adapted to traditional paddy cultivation by matching their phenology to the paddy growth cycle, water regime, and the forest and grassland landscapes surrounding the paddy fields. An endangered dragonfly, S. uniforme, lays eggs in reservoirs that supply water to paddy fields and is highly influenced by traditional water management regimes. Here, we studied the effects of water management of reservoirs on S. uniforme in Ehime Prefecture, Japan. The water-level management regimes and adult abundances (mature and immature) were surveyed at selected reservoirs. Samples of sand and gravel were collected at each reservoir just below the maximum water level. The samples were kept dry throughout the winter, watered the next spring, and larvae that hatched were counted. Many larvae hatched from the sand and gravel samples, which were collected from areas that dry out in winter. For one reservoir, although the water management regime and spawning rate were similar to those at other reservoirs, few larvae hatched, and the adult emergence rate was low." (Authors)] Address: Murakami, H., Ehime Prefectural Institute of Public Health & Environmental Science, 8-234, Sanban-cho, Matsuyama, Ehime, 790-0003, Japan. Email: murakami-hiroshi1@pref.ehime.lg.jp

24751. Ohtaka, A.; Kimura, N.; Nagasawa, K.; Nishi, K.; Fujimoto, S.; Abe, H.; Ueda, H.; Tomikawa, K.; Hiruta, S.; Yoshinari, G.; Tandida, K.; Kobayashi, T.; Nohara, S.; Takahashi, M. (2020): Water environments and benthic fauna in the spring-fed Gudari-numa Stream in Hakkoda Mountains, northern Japan. Biology of Inland Waters 35: 1-26. (in Japanese, with English summary) ["Water environments and benthic invertebrate fauna were studied in a spring-fed Gudari-numa Stream in Hakkoda Mountains, Aomori Prefecture, northern Japan during 2014-2019. The stream has ever-cool and less organic overlying water and productive bottoms with abundant attached algae. A total of more than 129 species of benthic invertebrates belonging to eleven phyla were recorded from the stream. Along with epigean forms, the benthic fauna contained rich stygobites such as Pseudocrangonyx amphipods, nerillid and lumbriculid annelids along with stygophile forms in the shallow hyporheic zone. The zoobenthic assemblages entirely lacked several groups of animals which arc common in neighboring streams, for example, odonates, heptageniids and net-spinning trichopterans, while the community had rich and abundant diamesine and orthocladiinc chironomids, and planariid flatworms. The lopsided structure of the zoobenthic community could be related with the strongly localized organic matters to the bottoms as well as ever cool and stable environments." (Authors) Larve of Epiophlebia superstes and Davidius m. moiwanus have been collected.] Address: Ohtaka, A., Dept of Natural Science, Fac. Eduation, Hirosaki Univ. Bunkyo-cho 1, Flirosaki, Aomori 036-8560, Japan. Email: ohtaka@hirosaki-u.ac.jp

24752. Osawa, S.; Yokobori, K.; Shimamura, M. (2020): The removal effect of overgrowing Nymphaea cv. in a biotope pond for restoration of the dragonfly fauna. Journal of the Japanese Society of Revegetation Technology 45(4): 453-456. (in Japanese) ["We examined the effect of removing horticultural water lilies on the overgrowth of a dragonfly pond after its creation. A 15 m² open-water area was created in a water area covered with lilies, and the number of dragonfly visits was compared with that of a non-removed area. Ten surveys were conducted from early summer to autumn, resulting in a total of 127 visits from nine species of three families. Comparing the breeding periods, when visits are most frequent, showed significantly more frequent visits to the open-water area for Orthetrum albistylum speciosum (open-water area: average 1.5-4 times, lush-water area: average 0.3-0.7 times) and Anax parthenope (same: average 2-3.3 times, lush-water area: average 0.7-1 time). Although not observed in large numbers, A. nigrofasciatus tended to visit the open-water area more frequently than the lush-water area, where it was not observed. On the other hand, for A. nigrofasciatus, which does not necessarily require large open water areas for breeding, no significant difference was observed in the number of visits between conditions. Although the removal of overgrown water lilies is expected to have a certain effect on restoring the dragonfly fauna, the number of previously recorded species that were expected to visit was not high, and it is thought that the habitat conditions of dragonflies in the surrounding areas of the target water area also had an impact." (Authors-/DeepL).] Address: Osawa, S., 1866 Kameino, Fujisawa, Kanagawa 025-08880, Japan E-mail: osawa.satoshi@nihon-u.ac.jp

24753. Taira, (2020): Aquatic fauna at small streams in Kasuga-yama Primeval Forest, Nara Prefecture, central Japan (1) Aquatic fauna in riffles and records of aquatic insect adults. Bioligy of Inland Waters 34: 1-10. (in Japanese, with English summary) ["This study aimed to clarify the aquatic fauna in riffles and reveal adult records of aquatic insects in

small mountain streams, Mizuya Stream and Noto Stream, flowing through Kasuga-yama Primeval Forest in Nara Prefecture. A large number of Gammarus nipponensis and Nemouridae (Nemoura and Amphinemura) nymphs were collected from two streams, nymphs of Baetis thermicus were predominated in both streams. However, the other fauna was fairly different between two streams. In Mizuya Stream, large numbers of Elmidae and Naididae were collected. In Noto stream, some Ephemeroptera species (e.g., Paraleptophlebia japonica, Ameletus montanus, Epeorus cumulus) and Simulidae larvae were predominant in numbers." (Authors) The study includes records of Mnais pruinosa, Planaeschna milnei milnei, Stylogomphus suzukii, Orthetrum melania and Anotogaster sieboldii.] Address: Taira, A. Faculty of Liberal Arts & Sciences, Osaka Prefecture University, Gakuen-cho 1-1, Naka-ku, Sakai, Osaka 599 -8531, Japan

24754. Uchida, N.; Kubota, K.; Aita, S.; Sazama, S. (2020): Time-series transition of the community structure of aquatic insects at middle domain of Natori river basin in Miyagi Prefecture as revealed by eDNA metabarcoding analysis. Ecology and Civil Engineering 23(1): 21-36. (in Japanese, with English summary) ["The time-series change of the community structure of aquatic insects were investigated using environmental DNA (eDNA) metabarcoding analysis and a conventional Surber net sampling method. Field sampling was conducted from May to December in 2016 once per month at 2 sites located middle domain of the Hirose River and the Natori River in the Natori river basin, Miyagi prefecture, Japan. DNA extracted from river water samples were processed in metabarcoding targeting the cytochrome oxidase subunit 1 gene in mitochondrial DNA, and 8 taxonomic Orders of aquatic insects (Ephemeroptera, Plecoptera, Trichoptera, Diptera, Coleoptera, Odonata, Hemiptera) were detected through bioinformatics process. Collected insects by a surbernet sampling were identified morphologically at family level to compare with eDNA Outputs. As a result, the member of taxa in communities were mostly composed by Ephemeroptera and Diptera families and the trend of time-series change of taxa richness were consistent between two methods. Furthermore, the taxa that many individuals were collected by a surbernet sampling tended to obtain a large number of sequence reads in eDNA analysis. In addition, community structures by relative abundance from eDNA metabarcoding and the conventional method showed the same transition pattern after a flood disturbance, i.e. the ratio of swimmers increased immediately after the disturbance and the ratio of crawlers increased later. Our results showed that eDNA metabarcoding targeting aquatic insects can describe the time-series transition of the community structure using relative abundance based on the number of sequence reads even though taxa members and taxa richness were not same with a conventional sampling method." (Authors)] Address: Uchida, N., Graduate School of Engineering, Tohoku University, 6~6~06, Aoba, Aramaki, Aoba, Sendai, Miyagi 980-8579, Japan. Email: n.kame02@gmail

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24755. Dzhurtubaev, Y.; Zamorov, V.; Dzhurtubaev, M.; Shadrin, N.; Yakovenko, V. (2021): Long-term dynamics of the macrozoobenthos in the Kytai Lake (Danube River, Odessa region, Ukraine). Plankton Benthos Res 16(1): 11-23. ["Species composition and quantitative characteristics of the macrozoobenthos in the Kytai Lake were studied. During 2006–2012, 272 macrozoobenthic samples were collected from the littoral and sublittoral zones of the lake. A total of 66 species were identified in the collected samples. In 2006–2009, the number of species increased from the upper to the lower reaches of the lake, with all 66 species recorded in the latter. However, with increasing salinity and decreasing dissolved oxygen content, the total number of macrozoobenthic species dropped up to 12 in 2012, with the highest number observed at the lower reaches. The average annual macrozoobenthic abundance and biomass in the littoral zone (836±33.08 ind. m² and 19.7±0.78 g m², respectively) were comparable to those in the sublittoral zone (879±35.16 ind. m² and 9.19±0.36 g m², respectively). In summer 2012, during the period of maximum development, the macrozoobenthic abundance and biomass in the littoral zone were 346 ind. m² and 3.26 g m², respectively. The Shannon-Weaver diversity index reached 3.26 bits ind^{-1} in the littoral zone in 2006–2008 and then decreased to 2.34 bits ind^{-1} in 2010–2012. The Pielou evenness indices during these periods were 0.66 and 0.61, respectively. In August 2009–2012, the correlation coefficient between salinity and macrozoobenthic abundance was -0.97. In July 2006–2012, the correlation coefficient between dissolved oxygen content and macrozoobenthic biomass was 0.89, whereas that between dissolved oxygen content and macrozoobenthic species number was 0.95. Results of the correlation and multiple regression analyses revealed the key role of oxygen depletion in decreasing the macrozoobenthic species richness and its development. Principal component analysis indicated that the first two principal components, related to transparency, oxygen, salinity, and temperature, explained most of the total variance of the data. Transparency, oxygen, and temperature positively influenced the macrozoobenthic species composition and quantitative characteristics, whereas salinity exerted a negative influence." (Authors) The species list includes Ischnura elegans, I. pumilio, Coenagrion pulchellum, C. scitulum, Platycnemis pennipes, Aeshna grandis, and Libellula quadrimaculata.] Address: Dzhurtubaev, Y., Fac. Biology, Dept of Hydrobiology & General Ecology, I. I. Mechnikov Odessa National University, Odessa 65082, Ukraine. E-mail, yakovenko_vla@ukr.net

24756. Fukuhara, H.; Kimura, N.; Nagasaka, M.; Nohara, S. (2021): Effects of floods on shore aquatic invertebrates of pools at the Kamitashiro of the Ozegahara mire. Japanese Journal of Limnology (Rikusuigaku Zasshi) 82: 171-188. (in Japanese, with English summary) ["The Ozegahara mire is the largest mire (altitude; about 1400 m, length; 6 km, width; 2 km, area; 7.6 km^2) in Honshu of Japan. Floods over mire have frequently occurred in the Ozegahara mire under recent climatic changes, resulting pouring flooded waters into many pools. Shore aquatic invertebrates were collected at 12 pools in the Kamitashiro of the Ozegahara mire in October 2018, to estimate the influence of floods on population of macroinvertebrates. The animals were collected by the unit-time sampling method using a hand net. We grouped pools into two types, 5 pools receiving occasional floods (OFPool) and 7 pools receiving frequent flooding (FFPool) based on observation of muddy pools, images by a drone, altitude of pools and invaded fishes into pools by a recent heavy flood (accumulated rainfall; 84 mm, 20-21 May 2019) struck to this mire. Twenty-five taxa appeared in OFPool and 26 taxa in FFPool, determining 27 taxa in all pools studied. Average abundance of order level taxa except Hydrachnellae were low in FFPool, especially total abundance of invertebrates showed significant difference between OFPool and FFPool, and Diptera population also. Hydrachnellae had also an inclination of low abundance in FFPool. Chironomidae (Diptera) indicated significantly low population in FFPool, especially Tanypdinae, indicating the strong influence of floods on this taxon. Biomass of families excluding Chironomidae did not indicate significant difference between

OFPool and FFPool. Appearance of Notonecta reuteri reuteri, Chaoborus sp. and Setodes sp. were rare in FFPool. Flooded waters disturbed vigorously shoreline of pools. It is estimated that the lowering of the shore aquatic invertebrate abundance is probably caused by loss of animals in pool water, detritus, dead leaves and stems with attached algae and fungi with animals accumulating at the pool shore. Predation by fishes invaded to pools through floods may also decrease population of shore aquatic invertebrates." (Authors) The following odonate taxa are treated: Ischnura asiatica, Enallagma circulatum, Coenagrion terne, C. lanceolatum, Coenagrionidae not det., Aeshna crenata, Aeshna not det., Trigomphus melampus, Trigomphus sp., Gomphidae not det., Cordulia amurensis, Corduliidae not det., Sympetrum s. speciosum, Leucorrhinia dubia orientalis, and Libellulidae not det.] Address: Fukuhara, H., 929-0342 Kahokugata Lake Research Inst., Tsubata-machi, Kahoku-gun, Ishikawa 929-0342, Japan. Email: fusaka.f.haruo@gmail.com

24757. Fukuoka, T.; Kubo, S.; Ota, M.; Ohba, S.-y.; Yuma, M. (2021): Feeding habits and prey selection of the diving beetle Cybister brevis (Coleoptera: Dytiscidae) larvae. Japanese Journal of Environmental Entomology and Zoology 32(1): 1-7. (in Japanese, with English summary) ["C. brevis population has recently declined. Therefore, it is important to investigate their larval feeding habits to conserve the species. Previous studies have reported that invertebrates such as aquatic insects are an important food source for C. brevis. However, the relationship between food availability in paddy fields and the feeding habits of diving beetles has never been analyzed in detail. In corroboration with earlier findings, we observed C. brevis larvae feeding on invertebrates, mainly aquatic insects. This indicates that C. brevis larvae maintain consistent feeding habits regardless of their distribution. Analysis of prey selectivity via the Jacobs index suggested that Sigara spp. were preferred in the younger stage and Libellulidae larvae and C. brevis larvae were preferred in the older stage. Prey animals were captured according to body size. C. brevis larvae did not prefer Anisops ogasawarensis, which suggests that they have difficulty capturing prey that is stationary in water. Thus, it is critical to conserve diverse aquatic insect habitats to maintain C. brevis populations" (Authors) Orthetrum spp., Lyriothemis pachygastra and Zygoptera sp. are listed as prey.] Address: Taichi Fukuoka, T., Graduate School of Science & Technology, Ryukoku University, 1-5 Yokotani, Seta Oe, Otsu, Shiga 520-2194, Japan. Email: t20m062@mail.ryukoku.ac.jp

24758. Katnoria, N.; Walia, G.K. (2021): A cytological study of euphaeid damselflies (Odonata: Zygoptera) from India. Chromosome Science 34(3-4): 55-61. (in English) ["Cytological studies of seven species of family Euphaeidae were carried out. Among them three Dysphaea and two Euphaea species were investigated for the first time. All the species investigated possessed n=13 complement which is typical number of the family. C-bands were mostly appeared on terminal regions of all the autosomal bivalents in the seven species. The smallest chromosome (m) bivalents in Bayadera indica and Dysphaea ethela were C-negative, while less amount of Cheterochromatin in D. walli. C-bands were observed on both terminals of m bivalents in D. gloriosa and Euphaea fraseri. In the X chromosomes, terminal C-band on one side appeared in Anisopleura lestoides, B. indica and D. walli and dark C-bands on both terminals in E. fraseri and E. ochracea. Entire C-positive X chromosomes was observed in D. ethela and D. gloriosa. Nucleolar organizer regions (NORs) were observed at chiasmatic ends of either one or both terminals of autosomal bivalents. X chromosome possessed dark NOR on one terminal in A. lestoides, D. gloriosa, D. walli and E. ochracea and entirely NOR rich in B. indica, D. ethela and E. fraseri. The m bivalent possessed NOR on one terminal in D. ethela and D. gloriosa, while it was NOR-negative in B. indica, D. walli, and E. fraseri. In sequence specific staining, variable signals were seen but most of the species showed DAPI bright and CMA3 light regions at terminal ends." (Authors)] Address: Katnoria, Neha, Dept Zoology & Environmental Sciences, Punjabi University, Patiala, India. Email: neha29katnoria@gmail.com

24759. Nakajima, J.; Miyawaki, T. (2021): Aquatic biota in a wetland biotope constructed by excavating fallow field. Ecology and Civil Engineering 24(1): 79-94. (in Japanese, with English summary) ["The changes of water environment and aquatic biota were investigated over a three-year period in an artificial wetland biotope (Tebika Biotope) constructed by excavating fallow field. We identified 93 aquatic animal species in 18 orders and 4 submerged plants, so it was thought that this biotope was effective in biodiversity conservation. There was a marked seasonality in the number of aquatic insect species, with an increase in summer (mainly in August) and a decrease in winter (mainly in February). The species number and diversity index (Shannon-Wiener's H') was greater at a site of still water with ecotones. On the other hand, some unique species were found in the monotonous flowing water environment. Almost all the aquatic insects identified in this biotope were found in the ponds within 2 km of the biotope. This suggests that the aquatic biota of an artificial wetland biotope is highly dependent on the surrounding biota, and that ecotones and diverse flow regimes are important for the conservation of biodiversity. The growth of submerged plants and changes in the number of aquatic insect species suggest that the biota of this biotope may have been adversely affected by the invasive alien species, a crayfish Procambarus clarkii, and a snail, Pomacea canaliculata." (Authors) Table 1. survey from April 2011 to March 2014: Sympecma paedisca, Lestes sponsa, Copera annulata, Ceriagrion melanurum, C. nipponicum, Paracercion calamorum, Ischnura senegalensis, Anaciaeschna martini, Anax parthenope, Trigomphus interruptus, Epophthalmia elegans, Rhyothemis fuliginosa, Sympetrum eroticum, S. kunckeli, Pseudothemis zonata, Crocothemis servilia, Pantala flavescens, Lyriothemis pachygastra, Orthetrum albistylum, 0. japonicum, 0. melania] Address: Nakajima, J., Fukuoka Institute of Health & Environmental Sciences, Mukaizano 39, Dazaifu, Fukuoka 818-0135, Japan. Email: nakajima@fihes.pref.fukuoka.jp

24760. Sugita, N.; Ebihara, A.; Hosoya, T.; Jinbo, U.; Nakae, M.; Yukawa, T. (2021): Integrated analysis of specimen information for Japanese endangered species and perspectives regarding its application to conservation studies. Japanese Journal of Conservation Ecology 26(2): 229-247. (in Japanese, with English summary) ["Most Japanese endangered species assigned to the Red List of the Ministry of the Environment lack biological data for practical conservation plans because it is difficult to collect specimens due to inaccessible habitats or small population sizes. Natural history museums store many specimens of extinct or endangered species. Specimens of endangered species stored in museums facilitate the collection of biological information such as species distributions and morphological and genetic data. However, because occurrence records of endangered species are dispersed over paper specimen catalogues or checklists, analyses based on more integrated data are necessary. In this study, we integrated the occurrence records of species ranked as Extinct, Extinct in the Wild, Critically Endangered, and Endangered on the Red List in Japan, into one

accessible dataset based on specimen data. The data indicate that museums in Japan hold more than one specimen of 95.9% of endangered species, with at least 58,415 specimens preserved overall. Together with museums overseas, specimens of 97.0% of endangered species were confirmed. In total, there were more than 20 specimens of 26.5% of endangered species that would be suitable for estimates of genetic diversity within a population. These natural history specimens could be applied to various practical research endeavors, which would be useful for conservation efforts for endangered species. On the other hand, some incomplete data and sampling bias were observed in relation to collection taxa, sites, and date. Although staff at natural history museums in Japan have contributed to the digitalization of specimen data and the sharing of databases via the internet, we still need to improve the reliability and coverage of endangered species through systematic collection of such specimens, enhancement of the quality of specimen data, and continuous management of preserved specimens." (Authors) Table 1 documents data for Odonata.] Address: Sugita, N., Dept Zool., Division of Biological Science, Graduate School of Fac. Science, Kyoto Univ., Kitashirakawaoiwakecho, Sakyo-ku, Kyoto 606-8502, Japan. Email: nsugita@rikkyo.ac.jp

24761. Takasaki, Y. (2021): Boyeria maclachlani (Odonata, Aeshnidae) in Nagoya City, Aichi Prefecture, Japan. Bulletin of Nagoya Biodiversity Center 8: 37-39. (in Japanese, with English title) ["B. maclachlani was previously a rare species in Nagoya City, and had not been recorded since the 1960s. However, following its rediscovery in 2018, this study summarizes its habitat in Nagoya City." (Author/Google translate)] Address: Takasaki, Y., 14 Fujimori 1-chome, meito-ku, Nagoya, Aichi 465-0025, Japan

24762. Tanaka, Y. (2021): Hunting behavior of Hymenoptera and Odonata. Japanese Journal of Entomology (New Series) 24(1): 9-11. (in Japanese, with English title) [Verbatim: 5. Pseudothemis zonata Burmeister, 1839 The technique of combining moving insects and birds captured on video using leaves in the background as a positioning point was devised to analyze the hunting behavior of dragonflies. In the photograph, a pair of photos of a Pseudothemis zonata and its prey (a type of fly) was combined every 1/30 seconds. P. zonata, which flies around occupying sunny spots in the forest and a 10 m square space around it, is a species whose hunting behavior is easy to photograph. By taking hundreds of photos, the composite photos necessary for behavior analysis can be obtained. Here, a photo is shown of the prey moving in the same direction in the sky ahead of the direction of travel, but various examples were obtained of the prey moving backwards, downwards, and in the opposite direction. The conclusions drawn from these analyses were that (1) it predicts the future position of the prey while moving to an appropriate position below the prey (altitude difference 3 to 4 times the body length), (2) it rises in one go while fine-tuning the prediction and reality, and (3) it stretches its legs out in front like a sieve to scoop up the prey. The direction it was looking four steps before it was about to capture the prey is shown with a red arrow, and the position of the prey at that time is shown with a red circle. It seems that the predicted position is set a little ahead, taking into account the possibility that the prey will speed up. The altitude difference before the rise seems to be important, and it responds sensitively to the movement of the prey, as shown by the red circle. (Katsushika-ku, Tokyo, 18.vii.2018). 6. Fan-tailed Dragonfly Sinictinogomphus clavatus Fabricius, 1775 The fan-tailed dragonfly waits for prey by perching on branches or grass stalks. Red dragonflies, blue-tailed skimmers, and large blue-tailed skimmers do not fly around either, but wait for prey that passes overhead. However, the fan-tailed dragonfly is a little different, as it perches high (over 1m). It looks around widely to catch flying grasshoppers and dragonflies. The photo shows a composite of 1/30 second intervals of a dragonfly perching on the tip of a reed, capturing a flying grasshopper. It can be seen that the fan-tailed dragonfly also predicts the meeting point. When capturing small prey such as the blue-tailed grasshopper, this species also stretches its legs forward like a basket, just like the red-tailed dragonfly. When catching large prey such as locusts, they spread their legs wide to catch them. To illustrate this, a black frame has been inserted at the bottom of the photo 1/60th of a second before the capture. In the top two photos, the mouthparts are not moving and there is no sign of tearing the prey off, so it looks like they are finishing it off. When they caught a common skimmer, they changed their grip on the prey and bit into its throat (between the head and thorax) while carrying it, just like when a silver dragonfly caught a scarlet skimmer. Although they are birds of prey, when a black kite catches a sea bass (about the size of a Japanese dwarf bass), if the fish thrashes about, they will sometimes bite into its throat for just under a second. They are both flying carnivores, so perhaps their behavior is similar. (Katsushika-ku, Tokyo, 7.vii.2020). 7. Ischnura senegalensis Rambur, 1842 Damselflies hunt small insects that are usually resting on leaves. Their behavior is to land on leaves and search for prey in the surrounding area. When they find something, they pounce on it and hold it against the leaf. They retreat, move away from the leaf, and return to their original spot to eat the prey. If they can no longer find prey in the surrounding area, they slowly move on to find the next place to land while searching for prey. Now, in this photo, a damselfly was resting on a spike of Japanese knotweed searching for prey, when a fly flew to the spike of Japanese knotweed in front of them and landed there. The dragonfly leaves the spike and starts backing up. The bottom group of photos, 1/30 second intervals. It went out of the frame, but I couldn't follow it because it was set on a tripod. Next, it appeared from the left at high speed and grabbed the fly on the right, top row. Even though the interval is twice as long as the bottom row at 1/60 seconds, the dragonflies are far apart, and the image is blurred even though the shutter speed is 1/1000, so we can see that the dragonflies rush in quickly. In other words, they back up, take a running start, and then attack. Since I saw this hunt in 2018, I was able to respond without any discomfort when I saw the hunting of the yellow-legged hawk moth in 3. (Katsushika-ku, Tokyo, 24.ix.2018). 8. White-winged dragonfly Anax parthenope julius Brauer, 1865 Even birds have difficulty hunting dragonflies, which have excellent flying abilities. Swallows and wagtails can catch dragonflies in flight (immediately after they emerge or while flying in tandem). However, if they are in a tandem and laying eggs, the chances of catching them are higher. Little grebes, water birds that are good at diving, hunt in a way that makes the most of their characteristics. When they find a White-tailed Dragonfly resting on a post in the pond while it is laying eggs, they approach and dive 5 to 10 meters before it (the diving position has been adjusted in the photo). When it comes to the bottom of the post, it leaps out of the water in one go and captures the White-tailed Dragonfly. The success rate is low at 2 or 3 out of 10. Furthermore, it only hunts dragonflies when it is accompanied by young, so they can only be observed from late July to August when breeding has been successful. They have also been photographed diving and leaping out to hunt with fan-tailed dragonflies resting on posts and with Scarlet Skimmers laying eggs. (Nerima-ku, Tokyo, 14.viii.2018). (Google translate)] Address: Tanaka, Y., 3–49–24 Kameido, Koto-ku, Tokyo 136–0071, Japan

24763. Tateishi, Y.; Takahashi, M.; Azuma, N. (2021): Diet of the Eurasian Hobby breeding in Western Aomori, Northern Honshu. Bird Research 17: A1-A9. (in Japanese, with English summary) ["Diet of the Eurasian Hobby Falco subbuteo nesting in Western Aomori was determined from a study of food debris and parental pellets at five and seven nests in 2018 and 2019, respectively, and a video of parental feeding behavior for one nest in 2019 (Nest 2019 A). The food debris analysis indicated that the food items included small birds and insects, including 32 species of 21 families of birds, three species of one family of bats, and 24 species of 14 families of insects. The predated birds included Oriental Greenfinch (18.3% of preyed birds), Barn Swallow (17.9%), Chestnut-cheeked Starling (15.3%), and Eurasian Tree Sparrow (14.1%). Most of the predated insects were Cicadidae (52.8% of preyed insects) and Odonata (44.1%). In the parental feedings recorded by video, parents delivered insects (145 times) more than birds (23 times) to nestlings. These results indicate that hobbies breeding in Western Aomori mainly predated small birds and insects that inhabit the area around the nesting sites." (Authors) Most frequent prey in Odonata are Anotogaster sieboldii and Sympetrum infuscatum.] Address: Tateishi, Y., Graduated School of Faculty of Agriculture & Life Science, Hirosaki University, 3 Bunkyocho, Hirosaki, Aomori 036-8224, Japan

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24764. Iida, T.; Murakami, T.; Minami, M.; Fujii, T. (2022): Genetic diversity assessment of Nannophya pygmaea populations inhabiting spring-fed marshes in Kani, Japan. Japanese Journal of Conservation Ecology 27(1): 75-85. (in Japanese, with English summary) ["Nannophya pygmaea Rambur 1842 inhabits spring-fed marshes in Kani, Japan. To support the conservation of the genetic diversity of the N. pygmaea population, its genetic diversity and genetic differentiation were assessed by comparing the sequences of a 658-bp-long fragment of the mitochondrial DNA cytochrome c oxidase subunit I gene. Based on DNA polymorphisms in the gene, the 294 N. pygmaea specimens collected in this study were divided into eight haplotypes. There was no significant correlation between haplotype diversity and area and slope of the marshes, pH and electric conductivity of surface water, or vegetation height around the marshes. Furthermore, there was no significant genetic differentiation between marshes, and the N. pygmaea population was considered to be a single population that migrates among marshes without gene exchange restriction. To maintain the genetic diversity of the N. pygmaea population, it is necessary to prevent the decline of habitat suitability and the loss of marshes, which could limit gene exchange. Therefore, we will continue to monitor the water quality and sediment inflow of the marshes and remove accumulated sediment and plants that invade from the surrounding area, as well as periodically evaluate the genetic diversity of the N. pygmaea population." (Authors)] Address: Fujii, T., College of Bioscience & Biotechnology, Chubu University, 1200 Matsumotocho Kasugai, Aichi 487-8501, Japan. Email: fujii_t@isc.chubu.ac.jp

24765. Kumar, R.R.; Prasath, K.A.; Gurunath, K.; Krishnan, L.H.; Rajkumar, S. (2022): Computational analysis of a corrugated dragonfly airfoil at low Reynolds Number. International Journal of Engineering Research and Modern Education 7(2): 61-69. (in English) ["The chord Reynolds number of micro air vehicles are usually in the range of 104 to 105. The laminar flow separation is a common phenomenon occurring in a flow over a body. The corrugated dragonfly airfoil has the potential ability to sustain an attached flow at low Reynolds number, thereby suppressing laminar flow separation or large laminar bubbles. In this project an optimized corrugated dragonfly airfoil is designed from the survey of standard airfoils. The flow properties of the corrugated dragonfly airfoil are measured at different angles of attack such as 0º, 5º, 10º and 15º for the Reynolds number of 5×104 in which the MAVs usually operates. The aerodynamic performance of corrugated dragonfly airfoil is compared with a traditional NACA 0012 airfoil at the same Re and also with a corrugated dragonfly airfoil at a different Re of 34000. The corrugated airfoil is meshed using GAMBIT and the computational fluid flow analysis is carried out using FLUENT on the corrugated dragonfly airfoil at low Reynolds number of 5×104. The flow behavior around the airfoil is analyzed and simulations are carried out to predict the behavior of unsteady flow structures around the airfoil at different angles of attack." (Authors)] Address: Kumar, R.R., Dept of Aeronautical Engineering, Dhanalakshmi Srinivasan Engineering College, Perambalur, Tamil Nadu

24766. Ueda, K.; Fujimoto, Y. (2022): Seasonal occurrences, reproductive seasons, and habitat environments of an endangered damselfly Paracercion plagiosum (Odonata: Coenagrionidae) in ponds neighboring Lake Izunuma–Uchinuma, Japan. Japanese Journal of Entomology (New Series) 25(4): 153-164. (in Japanese, with English summary) ["We investigated the seasonal occurrences, reproductive seasons, and habitat environments of P. plagiosum in ponds neighboring Lake Izunuma–Uchinuma of the northern Miyagi Prefecture, Japan. P. plagiosum was observed from early June to mid-August in both ponds, with the peak of the adults observed in late June. Reproductive behavior (tandem linkage, mating, and egg-laying) was observed from late June to early August in both ponds, and the aquatic plant composition differed between the two ponds. Several species of emerged plants were observed at the water edge, and the floating-leaved plants Trapa spp. were observed on the water surface. However, the free-floating plant Utricularia australis was observed only in one of the targeted ponds. In the Pond A dominated by Trapa spp., all egg-laying of this species occurred in Trapa spp., but in the Pond B where Trapa spp. and U. australis coexisted, 70% of egg-laying occurred in U. australis. This suggests that egg-laying on the U. australis may be a factor that increases the fitness of this species compared to Trapa spp. In Lake Izunuma–Uchinuma, Nelumbo nucifera and Trapa spp. have become dominant over a wide area of the lake due to eutrophication, and the environment in which U. australis grows has become precious. Environmental management of the ponds and restoration activity of lakeshore vegetation zone in Lake Izunuma–Uchinuma will be important for the conservation of this endangered species." (Authors)] Address: Ueda, K., Research Inst. Science for Safety & Sustainability, National Inst. of Advanced Industrial Science & Technology, 16–1 Onogawa, Tsukuba, Ibaraki 305–8569, Japan. Email: maraka@hotmail.co.jp

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24767. Mizui, S.; Luong, Q.-T.; Katsuhara, K.; Nakata, K. (2023): Predation on larvae of two Japanese native dragonfly species by the North American invasive crayfish Procambarus clarkii. Cancer 32: 19-27. (in Japanese, with English summary) ["We conducted laboratory experiments to examine the predation effects on larvae of two Japanese native dragonfly species by the North American invasive crayfish Procambarus clarkii. We put a larval individual of either Trigomphus interruptus or Coenagrionidae spp. in experimental aquaria, and after 24 hours we added an individual of P.

clarkii of two different body size groups; small size group: total length (TL) <50 mm and large size group: TL> 60 mm. After seven days, we observed whether the larval individuals of the dragonflies survived or not. We confirmed the severe predation on both of the two taxa of dragonfly larvae by P. clarkii. In T. interruptus, the survival rate was significantly lower compared to the control group (i.e., no crayfish) both in the small and large size groups. In Coenagrionidae spp., the survival rate of larvae in the small size group was significantly lower than the control group. In the large size group of P. clarkii, predation on the dragonfly larvae was also observed, but there was no significant difference compared to the control group. These results indicate that P. clarkii especially in small size can have a marked negative effect on dragonfly larvae through severe predation, if P. clarkii invades the habitats of dragonfly larvae." (Authors)] Address: Nakata, K., Graduate School of Environmental & Life Science, Okayama Univ., 3–1–1 Tsushima-naka, Okayama, Okayama 700–8530, Japan. Email: nakatak@cc.okayama-u.ac.jp

24768. Ozaki, K.; Nishikawa, K. (2023): Feeding habits of the Japanese Fire-belly Newt (Ampbihia: Urodela: Salamandridae) in Central Honshu, Japan. Current Herpetology 42(2): 162-170. (in English) ["Cynops pyrrhogaster, is a near threatened species that is conservation dependent. Here, we examine feeding habits across the year within a genetically divergent intraspecific lineage of this species (the Central Lineage) to provide information to support future insitu and ex-situ conservation activities. Stomach contents from newts were collected in a paddy field habitat, Kyoto City, central Honshu, Japan for two consecutive years. Throughout the year, dipteran aquatic larvae were the most important food source both for males and females, although terrestrial invertebrates were also important prey for the newts. During periods of low prey availability shed skin could also be a relatively valuable source of food. Sympatric frogs and newts appear to target different prey and this may facilitate their co-existence. Our study provides new information on suitable prey items for the Central Lineage of C. pyrrhogaster both in its natural habitat and in captivity." (Authors) 1,22% of 971 prey items from 322 newts attribute to "Odonata".] Address: Ozaki, K., Graduate School of Human & Environmental Studies, Kyoto University, Yoshida Nihonmatsu-cho, Sakyo, Kyoto 606–8501, Japan. Email: imorigame@outlook.jp

24769. Bohr, H. (2024): Zwei außergewöhnliche Libellen-Beobachtungen für das Saarland: Orthetrum albistylum (Selys, 1848) und Sympetrum pedemontanum (O.F. Müller in Allioni, 1766). Abhandlungen der Delattinia 49: 273 -274. (in German, with English summary) [Kiesweihergebiet Nennig, Saarland, Germany; 20.08.2023 (O. albistylum); 16.09.2023 (S. pedemontanum)] Address: Bohr, H., Saarstr.13, 66798 Wallerfangen, Germany. Eail: hubert.bohr@web.de

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24770. Lam, E. (2024): Dragonflies of North America. Princton University Press: 448 pp. (in English) ["A comprehensive, fully illustrated guide to every dragonfly species found in North America. ... This premier field guide provides all the information you need to identify every male and female dragonfly found in North America, whether in the field, in the hand, or under the microscope. The extensive illustrations are the heart of the book. Close-up color portraits of each species, often several times life size, show the best possible specimens for close examination. Each sex is depicted using multiple images, with postures and viewpoints consistently maintained to aid comparison. Dragonflies of North America is the ultimate guide to these extraordinary insects. Covers all 329 North American species, including distinctive subspecies and variations Features nearly 1,900 highly detailed paintings and drawings, providing clarity and consistency that photographs cannot match Illustrates each species with multiple views for easy identification and comparison Gives an invaluable introduction to dragonfly anatomy, behavior, and life cycle Offers additional guidance for the most challenging species that defy field identification, highlighting anatomical characteristics to aid identification in the hand Includes a distribution map for every species" (Publisher)]

24771. Lamouille-Hébert, M.; Arthaud, F.; Datry, T. (2024): Climate change and the biodiversity of alpine ponds: Challenges and perspectives. Ecology and Evolution, 14, e10883: 14 pp. (in English) ["Inland waters are among the most threatened biodiversity hotspots. Ponds located in alpine areas are experiencing more rapid and dramatic water temperature increases than any other biome. Despite their prevalence, alpine ponds and their biodiversity responses to climate change have been poorly explored, reflecting their small size and difficult access. To understand the effects of climate change on alpine pond biodiversity, we performed a comprehensive literature review for papers published since 1955. Through analysis of their geographic distribution, environmental features, and biodiversity values, we identified which environmental factors related to climate change would have direct or indirect effects on alpine pond biodiversity. We then synthesized this information to produce a conceptual model of the effects of climate change on alpine pond biodiversity. Increased water temperature, reduced hydroperiod, and loss of connectivity between alpine ponds were the main drivers of biodiversity geographic distribution, leading to predictable changes in spatial patterns of biodiversity. We identified three major research gaps that, if addressed, can guide conservation and restoration strategies for alpine ponds biodiversity in an uncertain future." (Authors) The study includes references to Odonata (Somatochlora alpestris)] Address: Lamouille-Hébert, Marie, INRAE, UR, RiverLy, Centre Lyon-Grenoble, Auvergne-Rhône-Alpes, 5 rue de la Doua CS70077, 69626 Villeurbanne Cedex, France. Email: marie.hebert@fne-aura.org

24772. Ma'Rifah, D.N. (2024): [Biodiversity of dragonflies (Odonata) in the Ringin River in Peron village, Kendal Regency, Central Java]. BSc thesis, Faculty of Science and Technology, Walisongo State Islamic University Semarang: XXIII + 119 pp. (in Indonesian) ["This study aims to analyze the diversity index of Odonata in the Ringin River watershed in Peron Village, Limbangan District, Kendal Regency, Central Java with a qualitative descriptive research type and was carried out on July 20-30, 2023. Three stations namely the Batu Suming tourist area. Peron village rice fields and plantations, and the area near the access bridge connecting the road in Peron village with the exploration method (visual day flying) and water sampling using water samples in river waters. The diversity of Odonata ... namely Orthetrum glaucum, Neurothemis ramburii, Cratilla metallica, Macrodiplax cora, and Orthetrum sabina with the results of the diversity index ranging from 0.06-0.14%, 0.2%, 0.3-0.4%, 0.2-0.3% and 0.1%. The diversity index of Stations I, II, III (1.49; 1.55; 1.43) is low. The evenness index of Stations I, II, III (0.92; 0.96; 0.8) is almost even. The dominance of Stations I, II, III (0.25; 0.22; 0.27) is low. The density values from highest to lowest species are C. metallica, M. cora, N. ramburii, O. glaucum and O. sabina (0.071; 0.042; 0.041; 0.01; 0.018). The FBI (Family Biotic Index) value of the Libellulidae family is 2, meaning the water quality is very good and not polluted by organic materials.

This proves that Odonata, especially the Anisoptera suborder, can be an early bioindicator of water quality in a body of water." (Author/Google translate)] Address: https://eprints.walisongo.ac.id/id/eprint/26939/1/1708016020_DIAN%20NAILI%20MA_RIFAH_FULL%20SKRIPSI %20-%20Dian%20Naili%20Ma_rifah.pdf

24773. McShaffrey, D.; Spring, M.; McCormac, J. (2024): A Naturalist's Guide to the Odonata of Ohio. Ohio Biological Survey. 401 pp. (in English) ["Dragonflies and damselflies — the Odonata — are large and eminently watchable insects that have enthralled naturalists for many generations. This book offers an introduction to 170 species that have been found in Ohio, including a guide to their identification, details about their fascinating behavior and complex life histories, and an overview of their context as part of our natural world. Striking photographs of living insects illustrate the male and female of each species, as well as the different color forms of many variable odonates. Maps of recent records based on extensive field surveys show where each species may be found in Ohio and how their distributions have changed over time. Designed with the non-specialist in mind, this book will be a valuable resource for anyone wishing to learn more about Ohio's fascinating insect diversity." (Publisher)

24774. Nakai, H.; Takahashi, R.; Ohta, T. (2024): Feeding habits of Cottus pollux middle-egg type in the Sendai River system, Tottori Prefecture. Aquatic Animals 2024 Volume 2024 AA2024-18: 8 pp. (in Japanese, with English summary) ["Collection surveys were conducted to investigate the feeding habits of amphidromous sculpin Cottus pollux middle-egg type in the Sendai River system in Tottori Prefecture. At the sampling station, located approximately 13 km upstream from the river mouth, newly recruited individuals with standard lengths of around 30 mm occurred in June. The stomach contents index (SCI) of C. pollux middle-egg type showed a decreasing trend from summer to autumn. Particularly, the low percentage of individuals with stomach contents in autumn suggests a potential shortage of food resources. Analysis of the index of relative importance of food items (IRI) indicated that the C. pollux middle-egg type primarily relied on aquatic insects of Trichoptera and Ephemeroptera. The increase in the percentage of IRI for Diptera in autumn, when food resources were scarce for the C. pollux middle-egg type, suggests that Diptera could compensate for food shortages. Although C. pollux middle-egg type is listed as an endangered species, the lower reaches of the Sendai River system are considered valuable habitat for this species due to the presence of suitable environmental conditions." (Authors) Odonata are preyed between mid-February and mid-May.] Address: Ohata, T., Faculty of Environmental Studies, Tottori University of Environmental Studies, 1-1-1 Wakabadai-kita, Tottori, Tottori, 689-1111, Japan. Email: oota-t@kankyo-u.ac.jp.

24775. Patterson, C.W. (2024): Interspecific behavioural interference and range dynamics: genomic analysis of rubyspot damselflies. Durham theses, Department of Biosciences, Durham University: 235 pp. (in English) ["The ongoing reshuffle of Earth's biota, particularly from climate change, has increased the necessity to understand and predict how the spatial distribution of species can shift. In this thesis, I further our knowledge of the processes that influences the ranges of species by conducting novel research into the how interspecific behavioural interference affects range dynamics. Interspecific behavioural interference is any aggressive or mating behaviour by one species that is directed towards and has a negative impact on the fitness of another. I primarily using next-generation sequence data to conduct phylogenetic, phylogeographic, and population genetic analysis on rubyspot damselflies (Hetaerina). The research focuses on smoky rubyspot damselflies (Hetaerina titia) which exhibit a striking seasonal polyphenism in wing colouration which influences the degree of interspecific behavioural interference seen between individuals and populations. Chapter 2 provides a synthesis of past research into how interspecific behavioural interference affects range dynamics across taxa and then outlines potential future avenues of research. Chapter 3 presents a de-novo chromosome level draft genome of H. titia which is the first chromosome level draft genome for a broad winged damselfly (Calopterygidae). Chapter 4 determines the spatiotemporal dynamics of the speciation cycle across several species of Hetaerina supporting the hypothesis that time since divergence predicts the stage of the non-ecological speciation cycle. Genetic sequencing identifies a region of secondary contact between two lineages of H. titia separated by an estimated 3.6 million years. One individual is identified as an F1 hybrid, suggesting that reproductive isolation exists between Pacific and Atlantic lineages of smoky rubyspot. Chapter 5 uses multivariate models of trait evolution to test for coevolution between the peak and off-peak seasonal phenotype of H. titia. Models do not support co-evolution but do support different selective regimes in different geographic regions. Finally, Chapter 6, uses population genetics and species distribution models to show that populations of H. titia that reside in higher latitudes likely originate from a range expansion from Florida since the last glacial maximum (LGM). Consequently, the loss of polyphenism in high latitude populations may be an adaptation to novel species assemblies that arose since the LGM. Collectively, this thesis provides novel research into the ecological and evolutionary consequences of interspecific behavioural interference, particularly into spatial and temporal dynamics of species distributions." (Author)] Address: https://etheses.dur.ac.uk/15756/1/Patterson000899143_upload.pdf

24776. Rasool, J.; Yaqoob, M.; Wa, W.; Rukshanda Hanif, R.; Ayoub, L.; Sheikh, S.A.; Rasool, K. (2024): Diversity and abundance of pollinators in Coriander. Indian Journal of Entomology Online published Ref. No. e24051 DoI. No.: 10.55446/IJE.2024.2051: 3 pp. (in English) ["Coriander (Coriandrum sativum) is a highly cross-pollinated crop and attracts a diverse array of insect species, facilitating efficient pollination. To investigate these a study was conducted. The results revealed the presence of 31 insect species, categorized under Diptera (13), Hymenoptera (10), Lepidoptera (3), Hemiptera (3), Odonata (1) [Ischnura senegalensis] and Coleoptera (1). Among these, Eristalis arbustorum exhibited the highest relative abundance (0.074). Diversity indices, including the Shannon-Weiner diversity index (0.193) and species evenness (0.056), were maximized for this species. In terms of species richness (d), Diptera recorded the highest value (2.076), followed by Hymenoptera (1.557), Lepidoptera (0.346), Hemiptera (0.346), Odonata (0.000) and Coleoptera (0.000) were more important." (Authors)] Address: Ayoub, L., Division of Entomology, Fac. Agriculture, Sher-e-Kashmir Univ. of Agricultural Sci. & Tech., Wadura campus, Sopore 193201, Jammu and Kashmir, India. Email: liyaqatayoub@gmail.com

24777. Sivtseva, L.V. (2024): Fauna of dragonflies (Odonata) of Yakutia. Dissertation for the degree of candidate of biological sciences Supervisor: Doctor of Biological Sciences Vinokurov Nikolay Nikolaevich, Institute of Biological Problems of the Cryolithozone of the Siberian Branch of the Russian Academy of Sciences - a separate division of the Federal State Budgetary Institution of Science, the Federal Research Center "Yakut Scientific Center of the Siberian Branch

of the Russian Academy of Sciences" Manuscript rights Sivtseva Lena Valentinovna 1.5.14. - Entomology (Biological sciences). Yakutsk: 160 pp. (in Russian) ["Conclusions: 1. The fauna of dragonflies of Yakutia includes 37 species belonging to 2 suborders, 7 families and 15 genera. 6 species are presented for the first time, of which Calopteryx splendens njuja is described as a local subspecies. The distribution boundaries have been expanded to the north and northeast of Asia for 7 species. 2. With respect to the longitudinal component, the fauna of Yakutia is dominated by eastern Palearctic species, and by the nature of the latitudinal-altitude distribution, temperate species prevail. The smallest number of species are those with ranges that cover the western and central parts of the Palearctic to varying degrees. The core of the fauna is made up of widespread temperate species with eastern Palearctic and trans-Eurasian ranges. 3. The uneven distribution of species in Yakutia is due to differences in natural and climatic factors of habitat conditions. The fauna of the middle taiga subzone is the most diverse. The impoverishment of the fauna of the plain northern taiga and mountain northern and middle taiga regions occurs due to the reduction in the number of temperate species and species ecologically confined to flowing water bodies. The originality of the fauna of Southwestern Yakutia is determined by the presence of the West-Central Palerctic Calopteryx splendens and the Euro-Baikal Aeshna grandis and Leucorrhinia albifrons. 4. The main biogeographical boundary separating the northern mountain taiga fauna of Yakutia from the plain northern and middle taiga faunas runs along the western spurs of the Verkhoyansk Range. In the south, the Stanovoy Range acts as a significant boundary between the fauna of Yakutia on one side, and Transbaikalia and the Amur Region on the other. 5. In Yakutia, three main ecological groups of species are distinguished in water bodies, taking into account their flowage: limnophiles, eurybionts and rheophiles, of which more than half of the studied species (53%) are ecologically confined to stagnant water bodies. 6. In Central Yakutia, 6 phenological groups of dragonflies were identified: wintering, late spring-summer, late spring-late summer, summer, summer-late summer and summer-autumn. The total duration of the imago flight does not exceed 5 months, and does not differ significantly from that in other parts of the continent located at the same latitude outside the permafrost zone. 7. The most optimal conditions for flight activity are air temperature (t) 20-29º? and relative humidity (f) 35-65%. A decrease in activity is observed at t = 30º? and f = 30%. Wind speed of 0–2 m/s is comfortable for all species of dragonflies, at a wind of 2.5–3 m/s the flight activity of Zygoptera is strongly inhibited, and for most Anisoptera a wind increase above 5–7 m/s is critical." (Author/Google translate) https://www.biosoil.ru/storage/entities/dissertation/101/Files/%D0%94%D0%B8%D1%81%D1%81%D0%B5%D 1%80%D1%82%D0%B0%D1%86%D0%B8%D1%8F.pdf] Address: Sivtseva, Lena, Institute for Biological Problems of Cryolithozone SB RAS, Lenina Prospekt, 41, 677980, Yakutsk, Russia. E-mail: sivtseva_l@mail.ru

24778. Subramanian, K.A.; Sinha, B. (2024): Insecta: Odonata. Zool. Surv. India. Faunal Diversity of Tale Wildlife Sanctuary, Arunachal Pradesh, India: Conservation Area Series, 77: 115-136. (in English) ["The diversity and distribution of Odonates of Tale Wildlife Sanctuary is summarized based on field surveys carried out between 2015-2017. A total of 44 species belonging to 31 genera, eight families and two suborders were recorded. The fauna of the sanctuary is characterized by species which are found in hill streams and marshes. The family Libellulidae dominate the fauna with 25 species which were largely recorded from open habitats in the fringes of the sanctuary. Threat assessment of odonates of the region was carried out by IUCN as part of Freshwater Biodiversity Assessment of Eastern Himalaya (Mitra et al., 2010). The important threats odonates faces in the region are habitat destruction along hill streams, riparian deforestation, agriculture expansion and agrochemical runoff." (Authors)] Address: Subramanian, K.A., Zoological Survey of India, Southern Regional Centre, Chennai, India

24779. Yoshida, M.A.; Miyawaki, Y. (2024): Predation on endangered Gomphid dragonfly larvae by nonnative channel catfish. Izunuma-Uchinuma Wetland Researches 18: 39-51. (in Japanese, with English summary) [" Larvae of endangered gomphid dragonflies were found in the stomach contents of channel catfish Ictalurus punctatus, an invasive alien species, collected in the lower Yodo River, Osaka Prefecture, Japan in 2020–2023. The following dragonfly species were identified: Stylurus annulatus (25 individuals), S. oculatus (6 individuals), Melligomphus viridicostus (2 individuals), Shaogomphus postocularis, Nihonogomphus viridis, and Sieboldius albardae (1 individual each). One of the channel catfish collected in April 2022 fed on 20 larvae of S. annulatus, which is listed as Vulnerable (VU) in the Red List of Japan. Predation pressure from channel catfish may cause a decline in the population of S. annulatus. Ongoing accumulation of information on the feeding habits of channel catfish will reveal its impact on native aquatic organisms, including threatened insect species." (Authors)] Address: Yoshida, M.A., NIES Lake Biwa Branch Office, 5-34 Yanagasaki, Otsu, Shiga 520-0022, Japan. Email: makoto.a.yoshida@gmail.com

24780. Zoralski, R.; Buczynski, P.; Tonczyk, G. (2024): Drapiezcy i ofiary. Muchówki lowikowate (Diptera: Asilidae) i bzygowate (Diptera: Syrphidae) stwierdzone w miejscach bytowania wazek (Odonata) we Wdzydzkim Parku Krajobrazowym (Bory Tucholskie) podczas XX Sympozjum Sekcji Odonatologicznej Polskiego Towarzystwa Entomologicznego. Predators and prey. Robberflies (Diptera, Asilidae) and hoverflies (Diptera: Syrphidae) recorded in dragonfly (Odonata) habitats in the Wdzydze Landscape Park (Tuchola Forest, N Poland) during the 20th Symposium of the Odonatological Section of the Polish Entomological Society. Odonatrix 2010 (2024): 11 pp. (in Polish, with English summary) ["This paper provides new data on the occurrence of Asilidae and Syrphidae in the Wdzydze Landscape Park (partly in the Tuchola Forest) in northern Poland. The fieldwork was carried out in dragonfly-rich habitats. A total of 43 species of hoverflies and 8 species of robber flies were recorded at eight sites. The presence of three hoverfly species that are very rare in Poland – Chrysogaster virescens, Sphegina clavata and Chalcosyrphus piger – and of the robber fly Echthistus rufinervis underscores the natural value and uniqueness of this region's biotopes. Nine other hoverfly species were recorded in the Tuchola Forest area for the first time. The potential predator-prey relationships between Asilidae, Syrphidae and Odonata are briefly discussed." (Authors)] Address: Zoralski, R., ul. Norwida 9, 84-240 Reda, Poland. Email: robert@insects.pl

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24781. Adeyemo, E.A.; Umoren, O.D. (2025): Evaluation of research on African dragonflies and damselflies (order Odonata) fauna from two decades (2000 to 2020). Munis Entomology & Zoology 20 (supplement): 3863-3882. (in English) ["Odonata are widely recognized as bioindicators of freshwater ecosystem health and biodiversity. This study presents a critical evaluation of research conducted on African

Odonata fauna over the two-decade period from 2000 to 2020. Drawing from a comprehensive review of 132 peer-reviewed publications, the study categorizes the research into four thematic areas: taxonomy, distribution, ecology, and conservation. Findings reveal a strong emphasis on taxonomic and distributional studies, with a notable concentration of research efforts in countries such as South Africa, Nigeria, and Kenya. Conversely, significant knowledge gaps exist in ecological and conservation-related investigations, particularly in Central and parts of West Africa. These disparities highlight the urgent need for more regionally inclusive and interdisciplinary studies, along with the development of conservation strategies that reflect the ecological diversity across the continent. Strengthening local scientific capacity and encouraging citizen science are also recommended as viable pathways to advancing odonatological research and biodiversity monitoring in Africa." (Authors)] Address: Adeyemo, E.A., Dept. Zoology, Obafemi Awolowo University, Ile-Ife, Nigeria. Email: adeyemoadeoye97@gmail.com

24782. Adnan, N.A.A.; Rahman, A.A.; Kassim, N.F.A.; Seri, N.A. (2025): Distribution and population abundance of odonates in relation to abiotic factors in an urbanized freshwater ecosystem: A case study from Universiti Sains Malaysia. Pertanika Journal of Science & Technology 33(4): 1923-1942. (in English) ["This study examines the distribution and abundance of odonates at Universiti Sains Malaysia, with a particular focus on assessing population abundance and identifying key biotic and abiotic factors influencing their distribution. Over a nine-week sampling period, a total of 1,256 individuals were recorded, comprising four dragonfly species Brachythemis contaminata, Brachydiplax chalybea, Orthetrum testaceum, Crocothemis servilia and Ischnura senegalensis. A hotspot analysis conducted using ArcGIS identified Sampling Station 2 (SS2) as a primary aggregation zone, accounting for 69.82% (877 individuals) of total odonate observations, largely attributed to its proximity to water bodies. The presence of Hydrilla verticillata emerged as a crucial factor in determining habitat suitability; however, its degradation due to algal blooms at SS1 and SS2 was associated with a decline in odonate abundance, particularly among species reliant on healthy aquatic vegetation. Statistical analysis revealed a moderate positive correlation between odonate abundance and abiotic parameters such as air temperature ($r = 0.544$, $p < 0.001$), relative humidity ($r = 0.400$, $p = 0.008$), and wind speed. However, multiple regression analysis indicated that only relative humidity ($p = 0.009$) and air temperature ($p = 0.024$) significantly influenced odonate abundance, while wind speed ($p = 0.064$) did not exhibit a statistically significant effect. Future research is recommended to investigate additional abiotic and biotic factors to further refine our understanding of odonate ecology and their role in freshwater ecosystem health assessment." (Authors)] Address: Adnan, N.A.A., School of Biological Sciences, Universiti Sains Malaysia, 11800, Pulau Pinang, Malaysia. Email: alisaadnan23@gmail.com

24783. Aldasoro, M.; Diaz de Cerio, O.; Russo, D.; Vallejo, N.; Olasagasti, L.; Goiti, U.; Aihartza, J. (2025): Molecular dietary analysis reveals plasticity in habitat requirements of a clutter specialist bat. Basic and Applied Ecology 84: 101-109. (in English) ["In recent decades, there has been significant progress in studying the foraging habitats of bats. However, these studies provide only a limited understanding of their requirements. Metabarcoding allows species-level identification of consumed prey, allowing us to determine their source habitats. In this study, we sampled faeces from three Rhinolophus hipposideros colonies in different climatic zones from spring to late August. Using metabarcoding, we examined how the lesser horseshoe bat diet changes over time and whether their most-consumed prey varies seasonally across landscapes. Our results show that bat diets change seasonally and differ between colonies, often presumably in response to new prey outbreaks. We deduced from the prey eaten by bats that they have varied habitat requirements. While woodland and shrubs are primary prey source habitats, bats also rely on other environments. We inferred that, in particular, open habitats are exploited more frequently than expected, indicating a high degree of plasticity in their trophic habitat needs. Therefore, protecting diverse, interconnected landscapes with varied prey is crucial for their conservation" (Authors)] Address: Aldasoro, Miren, Dept Zool. & Animal Cell Biol., Fac. Science & Technology, Univ. of the Basque Country UPV/EHU, Sarriena s/n, 48940, Leioa, The Basque Country, Spain. Email: miren.aldasoro@ehu.eus

24784. Ali, S.; Gao, J.; Hussain, A.; Rasool, A.; Abdullah, S.; Ali, A. (2025): Ecological integrity assessment of alpine lotic ecosystems: A case study of a high-altitude National Park in Northern Pakistan. Water 2025, 17, 1948. https://doi.org/10.3390/w17131948: 21 pp. (in English) ["This study assesses the ecological status of alpine lotic ecosystems in Khunjerab National Park, Pakistan, situated at approximately 4000 m in the Karakoram Range along the Pakistan–China border. An integrative approach was employed, evaluating alpine stream ecosystems through benthic macroinvertebrate indices in conjunction with physicochemical habitat parameters. Samples were gathered using kick nets and hand-picking at seventeen randomly selected sites in early spring and summer. The study recorded 710 summer taxa from 41 families and seven orders, and 1250 early spring taxa from 30 families and six orders. The abundance of macroinvertebrates increased in early spring, while taxonomic diversity increased during the summer. Statistical tests revealed a strong relationship between water quality conditions and biological features. The biotic index reached its peak in early spring, while diversity indices peaked in summer when Ephemeroptera dominated. Due to the macroinvertebrate source in early spring, the majority of EPT taxa were abundant at all alpine stream sites during early spring, except for upstream sites in summer. The indices from the biotic metric evaluation revealed low levels of natural environmental disturbance caused by humans. This research is significant in terms of natural resource conservation and health assessment based on the benthic fauna community structure in alpine streams. ... Neuroptera, Odonata, and Heteroptera showed low densities in both seasons." (Authors)] Address: Ali, S., Key Lab. of Watershed Geographic Sciences, Nanjing Inst. of Geography & Limnology, Chinese Acad. Sciences, 73 East Beijing Rd, Nanjing 210008, China. Email: salar.ali@uobs.edu.pk

24785. Andrade, D.; Fortunato, M.H.T.; Pamplin, P.A.Z. (2025): Análise da estrutura da comunidae de insectos aquáticisnoplanal de poços de caldas, Minas Gerais. Regnellea Scientia 11(1): 1-16. (in Portuguese, with English summary) ["The research was conducted in the Poços de Caldas Plateau, Minas Gerais, Brazil, in areas with a volcanic caldera, assessing the aquatic insect community in three locations: the Pedra Branca Ecological Sanctuary (preserved natural environments) and two urban areas in Poços de Caldas (one preserved and the other impacted). Three sampling points were carried out in each area, with sediment collection and measurements of physicochemical variables. A total of 3,400 specimens, representing nine orders and 42 families, were collected. The results showed higher abundance and diversity in preserved environments, with the Chironomidae family being predominant, especially in impacted areas. Statistical analyses, such as CCA and NMDS, revealed significant

differences in community composition between preserved and impacted locations. Impacted urban areas presented lower water quality, with high levels of total dissolved solids (TDS) and low dissolved oxygen (DO) concentration, highlighting the importance of environmental conservation." (Authors) Odonata are treated at family level.] Address: Pamplin, P.A.Z., Docente do Programa de Pós-Graduação em Ciências Ambientais, PPGCA/UNIFAL-MG, Brazil. Email: paulo.pamplin@unifal-mg.edu.br

24786. Andriani, B.; Faizah, U. (2025): Biodiversitas Capung sebagai Bioindikator Kualitas Perairan di Kawasan Wisata Air Terjun Dlundung, Mojokerto - Dragonfly biodiversity as a bioindicator of water quality in the Dlundung Waterfall Tourism Area, Mojokerto. Sains dan Matematika 10(1): 16-22. (in Indonesian, with English summary) ["… dragonfly nymphs are sensitive to environmental changes. Dlundung Waterfall, located in Mojokerto Regency, has clear water from welirang mountain springs which makes it a habitat for dragonflies to breed. This study needs to be conducted because research that discusses dragonfly diversity in the area is still very limited. This study aims to identify and analyze dragonfly species diversity as a bioindicator agent of water quality in the Dlundung Waterfall Area. This research was conducted in October-November 2022 in the Dlundung Waterfall Area, using the cruising method (fisual day flying) and using the sweeping technique. The analysis carried out included analyzing the Shannon-Wiener diversity index (H'), evenness index (E), and Dominance index (D). Based on the research, 46 dragonflies were obtained which included 4 species, 4 genera, and 4 different families including Orthetrum migratum [sic, an Australian species], Vestalis luctuosa, Euphaea variegata, and Heliocypha fenestrate. A dragonfly diversity index of 1.24, an evenness index of 0.90, and a dominance index of 0.31 were obtained, reflecting the fairly stable condition of the Dlundung Waterfall ecosystem. The presence of dragonflies can be used as a bioindicator of water quality, high dragonfly diversity indicates good water quality and vice versa. Dragonfly diversity is directly related to the sustainability of freshwater ecosystems, thus supporting the achievement of SDG 6 (clean water conservation), SDG 13 (climate change mitigation), SDG 14 (aquatic ecosystem health), and SDG 15 (biodiversity protection)." (Authors)] Address: Faizah, Ulfi, Program Studi Biologi, Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Negeri Surabaya, Jalan Ketintang, Ketintang, Gayungan, Kota Surabaya, Jawa Timur 60231, Indonesia

24787. Anufriieva, E.V.; Shapovalov, M.I.; Shadrin, N.V. (2025): Amphibiotic insects in hypersaline water ecostystems. Problems of aquatic entomology in Russia and neighboring countries: Proceedings of the XVth All-Russian Trichopterological and Xth All-Russian with International Participation Symposium on Amphibiotic and Aquatic Insects; K.L. Khetagurov North–Ossetian State University. Vladikavkaz: IPC SOGU, 2025: 18-30. (in Russian, with English summary) ["Hypersaline reservoirs are widespread on the planet, are among the most extreme habitats on Earth and have pronounced features of the trophic structure. The study of such habitats can expand our understanding of the organization of life in extreme environments. Representatives of the Insecta class are an important element of the heterotrophic link of hypersaline water ecosystems, so the task of studying the patterns of formation of their species diversity in such reservoirs is relevant. The paper presents a brief overview of species from the orders Plecoptera, Ephemeroptera, Odonata, Heteroptera, Coleoptera and Diptera, whose habitat is noted in hypersaline reservoirs." (Authors) And that's what you get if a country is focused in producing missiles and drones ... "Odonata. Most dragonfly species are typical inhabitants of fresh water, some species are able to survive in conditions of increased and high salinity. High salinity tolerance is noted for the Australian endemic species Austrolestes annulosus (Selys, 1862) from the family Lestidae. It is widespread throughout most of Australia, with the exception of the northern and north-eastern parts (Woodall, 1998). Larvae are noted in lakes from the north-west of New South Wales, with a maximum salinity of water up to 34.5–37.5 g/l (Timms, 1993). The dragonfly Erythrodiplax berenice (Drury, 1773), named Seaside Dragonlet, is a species of true dragonflies Libellulidae. It inhabits mainly coastal swamps, mangroves, and alkaline lakes in eastern North America (Needham et al., 2000; Wilson, 2008). Outside North America, this species is found along the Atlantic coast from Mexico south to Venezuela, along the Pacific coast from Baja California to Oaxaca, Mexico, and on some Caribbean islands (Dunkle 1989, 2000; Shortess 1930). Nymphs of this species have been reported to live in saltwater bodies with salinity up to 48 g/L (Dunson, 1980). Larvae of Gomphus sp. exist in Lake Moinaki (Crimea) at a salinity of 55–60 g/L (Yakovenko et al., 2024)."] Address: Anufriieva, E.V., Laboratory of extreme Ecosystems, Federal Research Center «A.O. Kovalevsky Institute of Biology of the Southern Seas of the Russian Academy of Sciences», Sevastopol, Temporarily occupied Ukraine. Email: lena_anufriieva@mail.ru

24788. Apfelbaum, S.I.; Lehnhardt, S.M.; Boston, M.; Daly, L.; Pinnow, G.; Gillespie, K.; Waller, D.M. (2025): Native grass enhances bird, dragonfly, butterfly and plant biodiversity relative to conventional crops in Midwest, USA. Agriculture 15, 1666. 18 pp. (in English) ["Conspicuous declines in native grassland habitats have triggered sharp reductions in grassland birds, dragonflies, butterflies, and native plant populations and diversity. We compared these biotic groups among three crop type treatments: corn, alfalfa, and a perennial native grass, Virginia wild rye, (Elymus virginicus L.) or VWR. This crop type had 2-3X higher bird, dragonfly, butterfly and plant species richness, diversity, and faunal abundance relative to alfalfa and corn types. VWR crop fields also support more obligate grassland bird species and higher populations of dragonfly and butterfly species associated with grasslands and wet meadows. In contrast, the corn and alfalfa types support few or no obligatory grassland birds and mostly non-native insects such as the white cabbage looper (Artogeia rapae L.), the common yellow sulfur butterfly (Colias philodice Godart.), and the mobile and migratory Anax junius. In sum, the VWR perennial native grass crop type offers a special opportunity to improve the diversity and abundance of grassland bird species, beneficial insect species, and many native plant species within agricultural landscapes."] In the supplemental material, Tramea lacerata, Pachydiplax longipennis, Anax junius, Libellula pulchella, and Plathemis lydia are listed. Address: Apfelbaum, SI., Applied Ecological Institute, Inc., N673 Mill Rd., Juda, WI 53550, US. Email: steve@aeinstitute.org

24789. Arango-Quintero, S.; Sánchez, C.I.; González, W.Z.; Bota-Sierra, C. (2025): Rhionaeschna caligo revisited: female and larval descriptions, new geographical records and natural history notes (Odonata: Aeshnidae). Zootaxa 5659(1): 104-116. (in English, with Spanish summary) ["Rhionaeschna caligo Bota-Sierra, 2014, endemic to the páramos of the northwestern Central Cordillera of the Colombian Andes, was described in 2014 based on eight males. Females, larvae, and many aspects of this species' natural history were previously unknown. This article presents the results of three expeditions

carried out in 2024 to the Belmira páramo complex (Antioquia, Colombia), providing the first description of the female and last instar larva of R. caligo. In addition, a new distribution record is included, accompanied by photographs and natural history notes that complement the information on its ecology and behavior." (Authors)] Address: Arango-Quintero, S., Grupo de Entomología Universidad de Antioquia (GEUA), Universidad de Antioquia, Medellín, Antioquia, Colombia. Email: sebastian.arango4@udea.edu.co

24790. Armanda, D.; Muzoffar, F.; Putra Sofyan, M.G.P.; Napitupulu, B.F.; Kurnia, I. (2025): Keanekaragaman Capung (Odonata) pada Taman di Kota Bogor. Bioeksakta 5(1): 7-16. (in Indonesian, with English summary) ["Green open space (GOS) is important to the urban ecosystem. The green open space area plays an ecological, economic, and socio-cultural role. Odonata are ecosystem elements that can be found in urban ecosystems, including GOS. This study aims to identify dragonfly species in Bogor city parks. The research was carried out in January 2023 in 44 parks in Bogor City, consisting of city parks (21 parks), residential parks (21 parks), and two city forests. Five species of dragonflies were found in 10 parks in Bogor City, while 35 parks had no dragonfly species. The species found were Orthetrum sabina, O. testaceum, Pantala flavescens, Neurothemis ramburii, and Libellago lineata. A total of 50 individuals were found throughout the park, with Pantala flavescens being the most numerous species with 37 individuals. The H' value for all park locations is 0.89 and the E value is 0.55. The most widely distributed species, P. flavescens, was found in seven parks, while four other species were found between 1-3 parks." (Authors)] Address: Kurnia, I., Program Studi Ekowisata, Sekolah Vokasi, IPB University, Bogor 16151, Indonesia. Email: insankurnia@apps.ipb.ac.id

24791. Bakhshi, Y. (2025): New data on the Odonata fauna in northwestern Iran - provinces Zanjan and Qazvin. International Dragonfly Fund Report 192: 1-26. (in English) ["New data on the Odonata fauna of the provinces of Zanjan and Qazvin in north-western Iran are presented. These data are based on adult specimens of Odonata collected from various sites. The study investigates the species distribution and faunal composition of Odonata in the study area. In total, 14 species of Anisoptera and 9 species of Zygoptera were recorded, including the first documentation of 17 species in Zanjan and 15 species in Qazvin. Photographs of the collected odonates are included, along with comments on their diagnostic characteristics and distribution. Additionally, a case of abnormality in the male caudal appendages of Ischnura pumilio is reported, possibly attributable to either a genetic defect or environmental factors." (Author)] Address: Bakhshi, Y., Independent researcher, 6391954383, Izeh, Khuzestan Province, Iran. Email: bakhshiyaser@gmail.com

24792. Barderas, E.B.; Bardera, R.; Rodriguez-Sevillano, A.A.; Matias-Garcia, J.C. (2025): Numerical study of the aerodynamic performance of dragonfly wing airfoils for small RPAS. AIAA 2025-3763, Session: Airfoil/Wing/Configuration Aerodynamics II. Published Online:16 Jul 2025https://doi.org/10.2514/6.2025-3763: (in English) [Verbatim: Dragonflies highlight among four-winged insects for their decoupled forewing and hindwing operation, which allows for extraordinary flight maneuvers and even gliding, a rare capability in insects. Dragonfly wings exhibit complex aerodynamics due to their undulating structure. This work explores how variations in this corrugation and the orientation of the leading edge affect the aerodynamic performance of a conventional wing of a small RPA (designed between INTA and ETSIAE) and evaluate the feasibility for integration into small RPAS. For this purpose, an experimental analysis has been conducted using three dragonfly-inspired cross airfoils, and compared them with the Eppler 186 airfoil (of the vehicle). The obtained data has demonstrated that all dragonfly configurations delay the stall condition from 15º to 20º, and the DW-C presents a significantly higher lift coefficient across the entire range of angles of attack. During cruise flight, the lift coefficient is eight times greater than that of the conventional airfoil, while the aerodynamic efficiency achieves a notable improvement of two times higher, highlighting its superior performance under these conditions.] Address: not stated

24793. Bariroh, A.; Azzahra, A.F.; Afyna, D.A.; Ani, F.N.Q.; Wardah, N.; Fardhani, I.; Akhsani, F. (2025): Keanekaragaman capung sebagai bioindikator kualitas perairan di Joyosuko, Tombro, dan Bedengan. Filogeni: Jurnal Mahasiswa Biologi 5(2): 153-165. (in Indonesian, with English summary) ["This study examined the diversity and distribution of dragonflies across three distinct habitats in Malang City: Joyosuko Metro River, Tombro Rice Fields, and Bedengan Campground. Observations were conducted from April to May 2025 through direct sampling using an insect net for one hour at each site during morning, midday, and afternoon sessions. Species identification was assisted by the Picture Insect application and field guides, with data analyzed using the Shannon-Wiener diversity index and species evenness index. ...." (Authors)] Address: Akhsani, F., Departemen Biologi Fakultas Matematika dan Ilmu Pengetahuan Alam Universitas Negeri Malang, Indonesia. Email: farid.akhsani.fmipa@um.ac.id

24794. Bernard, R.; Daraz, B.; Ravelomanana, A.; Dijkstra, K.-D.A. (2025): Six new species of Nesocordulia McLachlan, 1882 reveal an insular evolutionary radiation of dragonflies on Madagascar (Odonata: Anisoptera: Libelluloidea). Zootaxa 5660(2): 151-193. (in English) ["Nesocordulia McLachlan, 1882 is a poorly known dragonfly genus endemic to Madagascar and the Comoros. the genus is revised, and all twelve species are described, including six new ones: N. coloratissima sp. nov., N. evanida sp. nov., N. fossa sp. nov., N. ipsio sp. nov., N. lyricauda sp. nov., and N. odonator sp. nov. all are well-defined, with notably distinct male cerci, hamules, and colouration. while an identification key for males of all species is provided, this is based on single specimens for six of them. females are known for only six species. while several radiations of damselfly genera had been recognised in the Malagasy Region already, Nesocordulia is the first to be uncovered in the suborder Anisoptera. due to the scarcity of data, the exact drivers of their diversification remain unclear, however. while seven species are known from the humid and subhumid forest zone of eastern and north-western Madagascar, and only N. coloratissima and N. villiersi Legrand, 1984 appear confined to the drier west and to the Comoros respectively, the exact collection localities of three species remain unknown. although the limited data suggest that most species are localised, the few species with more records appear to be fairly widespread. the species' ecology is almost unknown, with more details provided on the habitat and behaviour of N. evanida only, and their conservation status is also largely unknown. Four species have not been recorded for over a century, however, while only N. coloratissima and N. evanida were confirmed to inhabit anthropogenically influenced landscapes." (Authors)] Address: Bernard, R., Lab. Nature Education & Conservation, Fac. Biology, Adam Mickiewicz Univ. in Poznan, Uniwersytetu Poznanskiego 6, PL-61-614 Poznan, Poland. Email: rbernard@amu.edu.pl

24795. Bulas, T.; Schmidt, B.R.; Vorburger, C.; Fabian, Y. (2025): Responses of rice paddy dragonflies to fertilisation

in a mesocosm experiment. Agriculture, Ecosystems & Environment 393(1): 7 pp. (in English) ["Highlights: •Study on impact of nitrogen fertilisers on dragonflies in Swiss rice paddies. •Mesocosm experiment with three dragonfly species exposed to mineral and organic fertilisers. •No significant negative effects on dragonfly survival, emergence time, or body size. •Organic fertiliser showed potential benefits for dragonfly development •Findings support rice paddies as habitats for dragonfly conservation. Abstract: Freshwater biodiversity has been decreasing globally, with wetland habitats facing significant loss due to climate change and changes in land use. In Switzerland, over 90% of low-elevation wetland habitats have been lost since 1850, mainly due to land transformation for agriculture. Recently, farmers started cultivating paddy rice in Switzerland to meet the increasing food demand and to support wetland biodiversity, particularly dragonflies. However, rice is often produced at high fertiliser levels, raising concerns about potentially harmful effects of high nutrient levels on dragonflies developing in rice paddies. Here, we assessed the impacts of nitrogen fertilisers on dragonflies from a conservation perspective. We exposed three dragonfly species to mineral and organic fertilisers at different concentrations in experimental mesocosms mimicking rice paddies. The effects of fertilisation on survival as well as development time and size at emergence were quantified. In total, 77% of all dragonfly larvae survived until emergence, and survival was not significantly affected by either fertiliser type at concentrations that are used in Swiss rice paddies (ranging from 25kg N/ha to 150kg N/ha). Also, there were no negative impacts of any fertiliser type and concentration on emergence time and body size, which albeit differed significantly among the three dragonfly species. The study thus provides valuable and encouraging insights for conservation and management strategies aimed at promoting wetland biodiversity, particularly the diverse and vulnerable dragonflies, through paddy rice cultivation." (Authors)] Address: Bulas, Thea., Agricultural Landscapes & Biodiversity, Dept Agroecology & Environment, Agroscope Reckenholzstr. 191, Zürich 8046, Switzerland. Email: thea.bulas@agroscope.admin.ch

24796. Bullion, C. (2025): Factors contributing to the reliability of data in Odonata Citizen Science. PhD thesis, Kent State University, College of Arts and Sciences / Department of Biological Sciences: VIII + 144 pp. (in English) ["The geographical, social, and temporal characteristics of the eastern United States have created a dynamic community science landscape, which presents multiple examples of community science at varying degrees of success. In this dissertation, we examined how human and ecological factors impact biodiversity monitoring and information trade-offs in community science, using community science observations in Ohio, USA, as a focal case study. We examined these data in the context of three information quality scenarios. We analyzed usage trends in community science initiatives and investigated their efficacy and potential effects on our understanding and portrayal of this charismatic system: a comparison of performance between traditional and community science-based odonate sampling in underserved regions, examination of environmental trends shaping odonate biodiversity monitoring in two unstructured datasets, and an analysis of socioeconomic factors impacting community science participation. Chapter II compares patterns between unstructured Odonata community science observations and structured sampling across the east-central United States, highlighting a large and distinct data gap covering much of central Appalachia. We sampled five field sites in a north-to-south transect spanning from northern Ohio to southwest Virginia and compared them to iNaturalist observations from the same areas to draw conclusions about spatial biases and the efficacy of community science platforms in biodiversity monitoring. Our results found that structured sampling was largely consistent with patterns recorded by community scientists, suggesting that the latter could serve as a viable alternative to traditional methods and that drivers of spatial biases in these datasets could be multifaceted. In Chapter III, we compared how well two popular unstructured sampling methods, iNaturalist and natural history collections (NHCs), captured odonate biodiversity. This study uses Ohio as an ideal case study due to the Ohio Dragonfly Survey, a massive statewide community science survey that ran from 2017 to 2019 and generated large volumes of records. We found that iNaturalist yielded more records and demonstrated higher species richness than NHCs, while NHCs exhibited more even species abundance and performed better with limited samples. Both methods reflected distinct species compositions and differing responses to geographical factors - community science data were shaped by population density and land use, whereas NHC observations remained more stable across regions. Our findings suggest that integrating both approaches could enhance biodiversity monitoring, particularly in undersampled areas. Chapter IV examines the influence of observer bias and socioeconomic factors on community science data, focusing on odonate reporting patterns in Ohio. Community science projects vary in structure, and both structured and unstructured approaches are susceptible to biases driven by species detectability, human perception, and accessibility. Taxonomic biases, particularly in unstructured datasets like iNaturalist, can distort biodiversity records, favoring visually striking or easily identifiable species. Likewise, socioeconomic and technological factors, including income, education, and internet access, can further shape participation and data quality. Odonates, with their diverse coloration and sexual dimorphism, provide an ideal case study for examining these biases, while Ohio's active community science network offers a robust dataset to assess how human-driven and organism-based factors interact to influence reporting trends. We used iNaturalist survey data to gauge participants' opinions on decision making when choosing to report to the platform, and then directly compared male-female reporting discrepancy in visually dimorphic odonate species in Ohio to Census-based socioeconomic factors. Our findings demonstrate both discrepancies in what iNaturalist users claim to be most important when engaging with the platform, but strong socioeconomic drivers shaping observer bias. Understanding these biases is crucial when planning biodiversity monitoring efforts, addressing gaps in species distributions, and ensuring community science data contribute meaningfully to conservation strategies. Taken together, this collective of studies demonstrates how human behavior, ecological factors, and data biases shape biodiversity monitoring in community science. By comparing community science with traditional sampling, evaluating data trends across unstructured and natural history sources, and examining socioeconomic and perceptual biases in species reporting, this dissertation aims to highlight both the potential and limitations of community science." (Author)] Address: https://etd.ohiolink.edu/acprod/odb_etd/ws/-send_file/send?accession=kent1752088241425035&disposition=inlin e

24797. Calvão, L.B.; Faria, A.P.J.; de Paiva, C.K.S.; Oliveira-Junior, J.M.B.; Muzón, J.; Córdoba-Aguillar, A.; Juen, L. (2025): Thorax temperature and niche characteristics as predictors of abundance of Amazonian Odonata. PLOS One 20(6): 15 pp. (in English) ["Environmental architecture and body temperature drive the distribution of ectothermic species, especially those with specific ecophysiological requirements or

narrow ecological niches. In this study, we evaluated the connection between thorax temperature and niche specialization concerning the abundance and species contribution to the beta diversity of adult Odonata in Amazonian streams, employing the Species Contribution to Beta Diversity (SCBD). Our hypotheses were (i) Odonata species' thorax temperature is positively correlated with both morphology (thorax width) and air temperature and differ between suborders. (ii) The thorax temperature of the Odonata assemblage serves as a more influential predictor than niche specialization in determining species abundance and SCBD. We sampled 46 streams in an anthropized landscape in the Northeastern and Southeastern regions of Pará state, Brazil. Notably, niche breadth emerged as the variable influencing the abundance and SCBD of the Odonata assemblage. Niche position is negatively related with abundance only for Zygoptera. Anisoptera exhibited a negative relationship between abundance and thoracic temperature. On the other hand, Zygoptera had positive relationship between abundance and thoracic temperature. In summary, our results underscore the necessity of considering both niche and ecophysiological predictors to comprehensively assess the Odonata assemblage in Amazonian streams. This holistic approach has implications for conservation efforts and bioassessment practices, offering valuable insights into the collective response of Odonata as a group." (Authors)] Address: Córdoba-Aguillar, A., Depto de Ecología Evolutiva, Instituto de Ecología, Univ. Nacional Autónoma de México, Ciudad Universitaria, Mexico City, Mexico. Email: acordoba@iecologia.unam.mx

24798. Castillo-Pérez, E.U.; Castillo-Pérez, A.S.; Suárez-Tovar, C.M.; Rivera-Duarte, J.D.; González-Tokman, D.; Córdoba-Aguilar, A. (2025): The physiological cost of being hot: High thermal stress and disturbance decrease energy reserves in dragonflies in the wild. Biology 14(8):956: 16 pp. (in English) ["Anthropogenic disturbance alters macro-and microclimatic conditions, often increasing ambient temperatures. These changes can strongly affect insects, particularly those experiencing high thermal stress (i.e., large differences between body and environmental temperature), as prolonged exposure to elevated temperatures can reduce their energetic reserves due to increased metabolic demands and physiological stress. We evaluated thermal stress in 16 insect dragonfly species during two sampling periods (2019 and 2022) in preserved and disturbed sites within a tropical dry forest in western Mexico. Also, we compared energetic condition (lipid and protein content) and thoracic mass for the seven most abundant species between both habitat types. In preserved sites, insects showed higher thermal stress at lower maximum temperatures, which decreased as temperatures increased. Dragonflies in disturbed sites maintained consistent levels of thermal stress. Abstract: Anthropogenic disturbance alters macro- and microclimatic conditions, often increasing ambient temperatures. These changes can strongly affect insects, particularly those experiencing high thermal stress (i.e., large differences between body and environmental temperature), as prolonged exposure to elevated temperatures can reduce their energetic reserves due to increased metabolic demands and physiological stress. We evaluated thermal stress in 16 insect dragonfly species during two sampling periods (2019 and 2022) in preserved and disturbed sites within a tropical dry forest in western Mexico. Also, we compared energetic condition (lipid and protein content) and thoracic mass for the seven most abundant species between both habitat types. In preserved sites, insects showed higher thermal stress at lower maximum temperatures, which decreased as temperatures increased. Dragonflies in disturbed sites maintained consistent levels of thermal stress across the temperature gradient. Thermal stress was linked to lower lipid and protein content, and individuals from disturbed sites had reduced energy reserves. We also found a weak but consistent positive relationship between mean ambient temperature and protein content. In preserved sites, thoracic mass increased with thermal stress, but only at high mean temperatures. These findings suggest that although species can persist in disturbed environments, their energetic condition may be compromised, potentially affecting their performance and fitness. Preserving suitable habitats is essential for preserving both biodiversity and ecological function." (Authors)] Address: Córdoba-Aguilar, A., Instituto de Ecología, Univ. Nacional Autónoma de México, Circuito Exterior, Ciudad Universitaria, Coyoacán, Mexico City 04510, Mexico. Email: acordoba@iecologia.unam.mx

24799. Caven, A.J.; Forsberg, M.L. (2025): Whooping crane nesting behaviour, parental care, and ecology at Wood Buffalo National Park. Proceedings of the North American Crane Workshop 16: 52-68. (in English) ["We studied Whooping crane (Grus americana) nesting behavior and movement patterns at Wood Buffalo National Park using an instantaneous scan sampling approach. We also photo-documented important behavioral and ecological observations. Data were collected from 2 to 9 June 2023 from before 3:00 to after 22:00 hours. We completed 88 hours of observation and documented nest swapping about every 3.2 hours. The female incubated/brooded 3.3-10.9% more than the male, and the probability of incubation/brooding declined by 49% after the second chick began pipping and by 99% after both chicks had hatched. The eldest chick was successfully provisioned 16 hours and 33 minutes after hatching. The provisioning rate declined from morning to evening and increased with time since hatch. Parents stayed significantly closer to the elder chick ($\bar{x}$ = 0.32 m) than the second chick ($\bar{x}$ = 6.70 m), despite the first moving 9% further from the nest per hour after hatch. The second chick hatched nearly 40 hours after the first. The eldest chick consumed mainly Odonata spp. and Araneae spp. Adults had a more diverse diet that also included snails (Gastropoda spp.), small fish (Osteichthyes spp.), leeches (Hirudinea spp.), and biting flies (Diptera spp.). The male appeared flightless with only a couple of primary feathers remaining on each wing when the eldest chick hatched. We also describe the features of the whooping crane breeding site and the associated avian community. Though insights are based on data from a single nest, they provide a rich description that can improve our understanding of nesting ecology in a remote landscape." (Authors)] Address: Caven, A.J., International Crane Foundation, E11376 Shady Lane Road, Baraboo, Wisconsin 53913, USA

24800. Chen, P.-Y.; Dong, X.; Durand, J.; Yuan, H.-W. (2025): Impact of emergent macrophyte mowing on an aquatic insect community in urban ponds: A case study in an artificial wetland in Southeast Asia. Wetlands 45:73: 13 pp. (in English) [Taiwan "Urban ponds increase biodiversity by providing essential habitats, mitigating heat, and serving as refuges for aquatic species. Macrophyte management, particularly mowing, plays a crucial role in altering vegetation structure and influencing water quality factors. However, the effects on aquatic insect communities remain unclear, as previous studies have not explicitly differentiated between direct and indirect effects. Additionally, little is known about how the total effect of mowing varies over time and with increasing water temperature. To address this gap, we conducted paired treatment experiments (with/without macrophyte mowing) from April to September in a Southeast Asian urban wetland. Using Bayesian structural causal modelling, we quantified both

the total and direct effects of mowing on aquatic insect communities. Our results show that mowing primarily increases aquatic insect abundance via indirect pathways, with impacts varying by family and season. In summer, mowing increased the abundance of midge larvae (Chironomidae), likely due to their tolerance to high water temperature, whereas damselfly larvae (Coenagrionidae) require cooler conditions. Conversely, during spring and fall, mowing decreased the abundance of both midge larvae and damselfly larvae. Mowing also increases water temperature and dissolved oxygen, further affecting aquatic insect abundance. Overall, our research provides a novel mechanistic understanding of how emergent macrophyte mowing influences aquatic insect communities, addressing key methodological limitations in previous studies. These findings can inform more effective macrophyte management strategies to enhance aquatic biodiversity in urban ecosystems." (Authors)] Address: Pin-Yuan Chen, P.-Y., Dept Land, Air & Water Resources, Univ. California, Daivs, CA 95616, USA. Email: pyjchen@ucdavis.edu

24801. Chhetri, A.; Miya, M.S. (2025): Diversity and seasonal abundance of dragonflies and damselflies in the Lake cluster of Pokhara Valley, Nepal. Psyche: A Journal of Entomology Volume 2025, Article ID 9368532, 12 pp. (in English) ["There was a lack of information on Odonata of Lake Cluster of Pokhara Valley (LCPV), one of the vital Ramsar sites in Nepal. Therefore, this study aimed to evaluate the diversity of Odonata and monthly variations in diversity in the three lakes (Maidi, Gunde, and Kamalpokhari) of LCPV. Odonates were sampled by the direct observation method along the transects laid on the existing trails around the lakes (three transects in each). A total of 27 species of Odonata from six families were documented. Of these, 15 were Anisoptera and 12 were Zygoptera. Species richness and abundance were the highest in Maidi and lowest in Kamalpokhari. However, there was no statistically significant difference in species richness and Shannon and Simpson's diversities between the lakes, showing similarities in odonates' community composition. Libellulidae and Coenagrionidae were the three lakes' most diverse and abundant families. Shannon and Simpson's diversities significantly differed between families in all lakes. September and November have the highest diversity and abundance. A significant difference in Odonata composition was found between the months. This research provides valuable insights into Odonata's diversity at a Ramsar site in Nepal and underscores the potential for further ecological research and conservation efforts." (Authors)] Address: Chhetri, Apeksha, Institute of Forestry, Pokhara Campus, Tribhuvan Univ., Pokhara 33700, Nepal. Email: apeksha5747@gmail.com

24802. Chovanec, A. (2025): Veränderung der Libellenfauna eines Kleingewässers nach 28 Jahren unter besonderer Berücksichtigung phänologischer Aspekte. Libellula 44(1/2): 1-28. (in German, with English summary) ["Changes in the dragonfly fauna at a small pond after 28 years, with special regard to phenological aspects – In 2024, three artificial ponds (KG1–3) in Mödling (Lower Austria) were subject to a comprehensive odonatological study. KG1 was constructed in 1990, KG2 in 2011 and KG3 in 2017. 32 fieldtrips were carried out between 23-iii and 9-xi-2024 revealing a total of 21 odonate species, with 16 of them certainly, probably, or possibly autochthonous. The record of Sympetrum meridionale, which is "critically endangered" in Austria, should be especially highlighted. In a study performed at KG1 in 1996, 26 species were found with 20 of them autochthonous. Despite the existence of three waterbodies with different typological characteristics, the species inventory found in 2004 was reduced. This can be explained by the following points: shading caused by trees and shrubs around the water bodies, floating and submerged macrophytes overgrowing KG1, reed overgrowing KG2, drying out of KG2 (due to a leaking clay bottom) and KG3 (due to a leaking pond liner). Higher temperatures caused by climate change resulted in significant differences in the seasonal patterns and flying periods in most species between 1996 and 2024. In 2024, the flying season of Pyrrhosoma nymphula, for example, started one month earlier than in 1996. The early record of a young Sympecma fusca in June 2024 is also remarkable." (Author)] Address: Chovanec, A., Krotenbachgasse 68, 2345 Brunn am Gebirge, Austria. Email: andreas.chovanec@bml.gv.at

24803. Christie, M.; Medina Espinoza, E.F.; Faasen, T. (2025): Erythiagrion, a new genus of damselfly from Peru, with description of its type species Erythiagrion alidae (Odonata: Coenagrionidae). International Journal of Odonatology 28: 50-60. (in English) ["Erythiagrion gen. n. is erected and Erythiagrion alidae sp. n. is described and illustrated. The genus Erythiagrion can be recognized morphologically by the following character combination: rounded frons, long abdomen (abdomen/HW length: 1.6-1.9), absence of pretarsal supplementary tooth and CuA ending at or within one cell distance of vein descending from subnodus. Additionally, males have a medial bifid process on posterior edge of both prothorax and S10 and an entirely yellow HW pterostigma bordered by a black spot. The general coloration of adults is black and bright yellow with a red abdominal tip." (Authors)] Address: Christie, M., Crossways, Mill Lane, Exeter, Devon, EX3 0PJ, UK. E-mail: m.c.f.christie@gmail.com

24804. Colchen, T.; Pays, O.; Harmange, C.; Morin, J.; Moreau, E.; Bonnet, M.; Pagano, A. (2025): Antipredator responses of native amphibian tadpoles to the presence of invasive alien African clawed frogs. Animal Behaviour 226, August 2025, 123255: 10 pp. (in English) ["Highlights: •Invasive alien species can cause a local decline and extinction in prey population. • Antipredator responses of native prey to alien species remain sparsely documented. • Pelophylax spp. tadpoles were exposed to Xenopus laevis. • Tadpoles displayed greatest distance from X. laevis, and they were more aggregated. • The presence of X. laevis induced significant indirect effects in native tadpoles. Biological invasions are a primary driver of global environmental changes. Invasive alien species can affect ecosystem dynamics, including interspecific relationships such as competition and predation. Although widely recognized, the impacts of invasive predators on native prey remain sparsely documented, particularly in amphibians. African clawed frog, Xenopus laevis, which is native to South Africa, has successfully established populations in western France and has expanded its range in recent decades. African clawed frog is known to prey on native amphibians; however, the indirect effects of predation risk remain unknown. Using 10 min video recordings, whether Pelophylax spp. tadpoles, which is a native frog common in French wetlands, showed antipredator responses to the invasive African clawed frog was tested. These responses were compared with those to other predators, including native Odonata larvae and alien red swamp crayfish, Procambarus clarkii. Native tadpoles displayed the greatest distance from the predator, and they were more aggregated (with a smaller nearest neighbour distance) when exposed to African clawed frogs compared with other predators. However, the time individuals spent swimming and exploring as well as the average speed during exploration did not differ among predators. This study focuses on the ability of native tadpoles to recognize and respond to invasive predators,

emphasizing the ecological challenges faced by native populations." (Authors)] Address: Colchen, Tatiana, Univ Angers, BIODIVAG, Angers, France. Email: tatiana.colchen@gmail.fr

24805. Dalla Via, M.; Checuz, R.; Prosser, F.; Sartor, L.; Fava, F.; Pellizzon, R.; Cassol, M.; Wildermuth, H.; Vettorazzo, E.; Zanatta, K.; Buczyñski, P.; Ottolenghi, C. (2025): An increasingly threatened dragonfly associates with traditional agriculture at the edge of its range. Journal of Insect Conservation (2025) 29:57: 12 pp. (in English) ["Background: Groundwater-dependent wetlands are becoming increasingly rare, as are the taxa they selectively sustain. The latter include Somatochlora flavomaculata, a corduliid dragonfly that is declining in Southern Europe. Study area and methods: During years 2023, 2024 and early 2025 counts of S. flavomaculata imagos and, to a lesser extent, exuviae were conducted on topographically related groundwater-dependent wetlands with widely differing hydrogeology, vegetation, and human activities. The study area was divided into twenty-one transects containing combinations of relevant habitats, from which species-habitat associations were inferred. Results: Conditions suitable for S. flavomaculata were consistent with established and emerging knowledge of the habitat preferences of this and other specialist dragonflies. Habitats included temporary fishless water and periodically flooded sunny sedgebeds within patchy forested areas. The most attractive sites also harbored abundant aquatic true moss, including Drepanocladus aduncus. However, while favorable for S. flavomaculata and partially for its congener S. metallica, these specialized habitat features were absent from a locally significant breeding site. Discussion: This study suggested that surface groundwater per se may be critical at the margins of S. flavomaculata distribution, favored by simple water management structures, such as ditches and culverts that accumulate organic material and maintain optimal connections to groundwater. Continued human maintenance was critical; in particular the persistently wet bottom of drainage ditches, which experience temporary water loss in summer, was an essential by-product of traditional agriculture organized as small fields enclosed by bushy treelines and ditches (bocage). Implications for insect conservation: This study provides new insights into the lowland habitats of S. flavomaculata at the edge of its range, revealing their dependence on specific human activities, with direct implications for conservation." (Authors)] Address: Ottolenghi, C., Indepedent Researcher & Université Paris Cité, Paris 75006, France. Email: chris.ottolenghi@u-paris.fr

24806. Das, D.K. (2025): Diversity of Odonata in the urban ecostystem of Habiganj, Bangladesh. Bangladesh J. Zool. 53(1): 19-30. (in English) [Odonata are “sensitive to environmental changes; therefore, acts as an ecological indicator. Field-based investigation on their diversity, abundance, and status is crucial to assess the ecological condition of any given landscape. Therefore, this study was carried out in an urban area of Habiganj Sadar Upazila between March 2020 and February 2021. Opportunistic surveys across different habitat types of two selected sites were followed for data collection. From the study, a total of 42 species of Odonata under 29 genera, 7 families, and 2 suborders have been recorded. Suborder Anisoptera contained the highest number of species (n=25), and Libellulidae was the dominant family (n=21) among 7 families. From the recorded species, 11 species were very common, 10 species were common, 6 species were uncommon, and 14 species were rare. Shannon-Wiener diversity index showed site A and the rainy season having the highest diversity (H' = 3.1475 and H' = 3.1119, respectively) of odonates. This preliminary study will provide information for future conservation steps for this charismatic insect group in the study area." (Author)] Address: Das, D.K., Dept Zoology, Jahangirnagar Univ. Savar, Dhaka-1342, Bangladesh. Email: diptakumar3@gmail.com

24807. Deepak, R. (2025): First report of odonates (Insecta: Odonata) from a tourist spot at polo forest (Abhapur, Sabarkantha, Gujarat). International Journal of Entomology Research 10(6): 22-23. (in English) [Polo forest is a dry deciduous forest located in Aravalli range near Abhapur village at Vijaynagar Tehsil in Sabarkantha district of Gujarat, India. Trithemis kirbyi, Disparoneura quadrimaculata and Pseudagrion rubriceps are reported for the first time in Polo forest.] Address: Deepak, R., Dept Zool., Mohanlal Sukhadia Univ. Udaipur, Rajasthan, India. Email: DEEPAKRAWAL5@gmail.com

24808. Deepak, R.; Jaynesh, D.; Yamini, S. (2025): Molecular phylogenetics of six dragonfly species (Odonata: Anisoptera: Libellulidae) of Udaipur region (Rajasthan). The Bioscan 20(2): 199-201. (in English) ["In current study, mitochondrial COI gene sequencing of Brachythemis contaminata, Indothemis carnatica, Orthetrum sabina, Trithemis aurora, T. kirbyi, T. pallidinervis collected from Udai Sagar lake of Udaipur region was done using Sanger sequencing protocol. All six reported species show 100% similarity to the NCBI Genbank database. Molecular phylogenesis was done using BLAST (Basic Local Alignment Search Tool). All six Sequences were submitted to Genbank, which would be useful to identify dragonflies in future studies. This study provides phylogeny trees and idea of evolutionary relationship of six dragonfly species." (Authors)] Address: Deepak, R., Dept Zool., Mohanlal Sukhadia Univ. Udaipur, India. Email: DEEPAKRAWAL5@gmail.com

24809. Deepak, R.; Yamini, S.; Jaynesh, D. (2025): Alpha-diversity of odonates (Insecta: Odonata) at Dhebar Lake (Salumbar, Rajasthan) in breeding season. International Journal of Lakes and Rivers 18(1): 25-31. (in English) [" In current study, total 19 species under 13 genera and 5 families are reported, out of which 11 species under 8 genera and 3 families reported as Anisoptera and 8 species under 5 genera and 2 families reported in Zygoptera. All families were found almost in equal proportions except Aeshnidae which was reported lesser in number." (Authors) The list of species includes the data deficit-species Orolestes durga Lahiri, 1987] Address: Deepak, R., Dept of Zoology, Mohanlal Sukhadia University Udaipur, India. Email: DEEPAKRAWAL5@gmail.com

24810. Degtyarev N. I. (2025): Arthropods (Arthropoda) of the Pryteletsky part of the Altaisky Biosphere Reserve based on the results of field research in 2024. Field Research in the Altai Biosphere Reserve 7]: 44-59. (in Russian, with English summary) ["Based on field collections and observations, 191 species were discovered in the Altaisky Nature Reserve in 2024, of which Somatochlora exuberata Bartenev, 1910 was recorded for the first time at the reserve territory." (Author) Eight odonate species were recorded: Aeshna crenata, A. juncea, Coenagrion hastulatum, Enallagma cyathigerum, Lestes sponsa, S. exuberata, Sympetrum danae, and S. flaveolum.] Address: Degtyarev N. I., Federal State Budgetary Institution "Central Black Earth State Nature Biosphere Reserve named after prof. V. V. Alekhine", Kursk Region, Russia. E-mail: dni_catipo@mail.ru

24811. Dias-Oliveira, T.M.; Santos, J.C.; Urso-Guimarães, M.V.; Vilela, D.S. (2025): The F-0 exuvia of Micrathyria almeidai Santos, 1945 (Odonata: Libellulidae). Zootaxa 5646(3): 344-350. (in English) ["Here, we describe, illustrate, and diagnose

the F-0 exuvia of M. almeidai, collected from the Serra do Japi Municipal Biological Reserve, Jundiaí, São Paulo, Brazil (23°14'10" "S 46°57'11" W, 1053m asl) inhabiting lentic environments. The exuvia can be distinguished from other congeners based on the morphology of the mandibula and prementum." (Authors)] Address: Dias de Oliveira, T.M., Inst. Federal de Educação, Ciência e Tecnologia do Sul de Minas - Campus Inconfidentes, Inconfidentes, Minas Gerais, Brazil.

24812. Dow, R.A.; Giman, B. (2025): Odonata from the Glenealy Belaga Oil Palm Plantation Area, Belaga, Kapit Division, Sarawak, Borneo. Faunistic Studies in Southeast Asian and Pacific Island Odonata 48: 1-11. (in English) ["Belaga District in Sarawak's Kapit Division has been poorly studied for Odonata, with almost all work done in the district at altitudes of 700-1400m a.s.l. in mountainous terrain. Here we describe the results of sampling of Odonata carried out at the Glenealy Belaga Oil Palm Plantations, located just below the Dulit Range in Belaga District, conducted in May 2024. The sampled sites are in a relatively (for Belaga District) low lying area (sampled sites in the range ca. 160-230m a.s.l.). The plantation straddles the Belaga River and includes areas of High Conservation Value Forest and a riparian buffer around the Belaga River. Sampled locations in the three estates forming the plantation are listed and indicated on a map. All 53 species collected during the survey are listed, with additional comments where appropriate. Five of the species were recorded from Kapit Division for the first time and a further 15 (for a total of 20) were recorded from Belaga District for the first time. The most significant records are those of Coeliccia kenyah, Oligoaeschna platyura, Macromia corycia and the true Pornothemis serrata, these are discussed in the Discussion." (Authors)] Address: Dow, R.A., Institute of Biodiversity & Environmental Conservation, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak, Malaysia. Naturalis Biodiversity Centre, P.O. Box 9517, 2300 RA Leiden, The Netherlands. Email: rory.dow230@yahoo.co.uk

24813. Dow, R.A.; Gesriantuti, N.; Lupiyaningdyah, P. (2025): A new species of Amphicnemis Selys, 1863 from Sumatra, Indonesia and first records of two other species of Amphicnemis for the island (Odonata: Zygoptera: Coenagrionidae). Zootaxa 5659(2): 273-282. (in English) ["Amphicnemis reri sp. nov. is described from tropical Peat Swamp Forest (PSF) in the Kampar Peninsula, Riau Province, Sumatra, Indonesia (holotype male, pools in PSF, Meranti Estate Block B Transect, Kampar Peninsula, Pelalawan, Riau, Sumatra, Indonesia, 0.3363N, 102.6440E, 7 ii 2023, deposited with the Indonesian National Research and Innovation Agency). The female (supposition) is also described. Amphicnemis bebar Dow, Choong & Ng, 2010 and A. hoisen Dow, Choong & Ng, 2010, both originally described from Peninsular Malaysia, are recorded from Sumatra for the first time; variation in these species is discussed and, in the case of A. bebar is illustrated. Species groups within Amphicnemis Selys, 1863 are defined and briefly discussed." (Authors)] Address: Dow, R.A., Inst. of Biodiversity & Environmental Conservation, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak, Malaysia. Naturalis Biodiversity Centre, P.O. Box 9517, 2300 RA Leiden, The Netherlands. Email: rory.dow230@yahoo.co.uk

24814. Egbon, I.N.; Dingha, B.N.; Mukoko, G.N.; Jackai, L.E. (2025): Intercropping enhances a rthropod diversity and ecological balance in cowpea, hemp, and watermelon systems. Insects 2025, 16, 724. https://doi.org/10.3390/ insects1607-0724: 23 pp. (in English) ["This study investigates arthropod assemblage in cowpea, hemp, and watermelon grown both as monocrops and intercrops using three sampling techniques: direct visual counts, sticky cards, and pan traps. A total of 31,774 arthropods were collected, spanning two classes [Arachnida (0.07%) and Insecta (99.93%)], 11 orders, and 82 families representing diverse functional groups. Arachnids were represented by a single family (Araneae). Among insects, the composition included Diptera (36.81%), Thysanoptera (24.64%), Hemiptera (19.43%), Hymenoptera (11.58%), Coleoptera (6.84%), Lepidoptera (0.076%) and Blattodea, Odonata [Libellulidae], Orthoptera, Psocodea (.0.005%). Roughly 10% of the total arthropods were pollinators, while the remainder were primarily herbivores and predators. Apidae were abundant in all treatments except for watermelon monocrops. Intercropping supported more pollinators, particularly Apidae, Halictidae, and Sarcophagidae. However, herbivores dominated (>50%) in each system, largely due to high presence of thrips and cicadellids. Predators accounted for approximately 30%, with dolichopodids (Diptera) being the most dominant. Watermelon yield increased by 30.60% in the intercrop systems. While intercropping increases overall arthropod abundance, it also creates a more balanced community where beneficial organisms are not heavily outnumbered by pests and contributes to enhanced ecological resilience and crop performance." (Authors)] Address: Dingha, Beatrice, Dept Natural Resources & Environmental Design, North Carolina A&T State Univ., Greensboro, NC 27411, USA. Email: bndingha@ncat.edu

24815. Egnell, M. (2025): Cannibalism in a changing world - temperature effects: Investigating the thermal effects on cannibalism, body size, and activity level in a damselfly species. BSc. thesis, Uppsala University, Disciplinary Domain of Science and Technology, Biology, Department of Ecology and Genetics, Animal ecology. Uppsala University, Disciplinary Domain of Science and Technology, Biology, Biology Education Centre, Sweden: 29 pp. (in English) ["Climate change affects species distribution and diversity, partly due to an increased mean temperature. While the effects of temperature on organism growth, development, and survival are well-researched, relatively few studies have investigated how temperature affects competition. Understanding these effects is important, as they may shape intraspecific and interspecific interactions, ultimately affecting communities. In this study, I investigated an extreme form of intraspecific competition, cannibalism, in larvae of Lestes sponsa. In a mesocosm laboratory experiment, I examined the effects of temperature on cannibalism, body size, and activity by rearing the larvae at 20 °C, 23 °C, and 26°C for four weeks. I also studied the thermal effects on the oxygen saturation of mesocosms. Temperature was associated with an increase in cannibalism, although this effect was not statistically significant ($p = 0.078$), and body size was significantly larger at higher temperatures. However, there was no significant thermal effect on activity or oxygen saturation. These results imply that other factors, such as metabolism or aggressiveness, may explain the increased cannibalism observed at higher temperatures. This study contributes to our understanding of how climate change can influence population and community dynamics, improving our ability to predict future biodiversity changes." (Author) https://uu.diva-portal.org/smash/get/diva2:1975919/FULLTEXT01.pdf] Address: Egnell, Mira, Uppsala University, Disciplinary Domain of Science & Technology, Biology, Dept of Ecology & Genetics, Animal ecology. Uppsala Univ., Disciplinary Domain of Science & Technology, Biology, Biology Education Centre, Sweden

24816. Fliedner, H. (2025): The scientific names of Friedrich Försters odonate taxa. International Dragonfly Fund - Report 191: 1-128. (in English, with German summary) ["This paper explains the almost 200 scientific names given to the

Odonata by the German scientist Friedrich Förster (1865-1918), as well as the names of other scientists into which these taxa are currently classified. Förster's life and work are presented, followed by explanations of the names and there is a discussion of what he preferred when assigning names and an evaluation of his work." (Authors)] Address: Fliedner, H., Louis-Seegelken-Str. 106, 28717 Bremen, Germany. Email: H.Fliedner@t-online.de

24817. García-Bravo, C.; Tomas-López, D. (2025): Odonate diversity in a gypsum quarry wetland within an anthropized landscape: Insights from the Lagunas de Horna pond complex (Getafe, Madrid). Boletín de la Sociedad Entomológica Aragonesa 76: 162-166. (in English, with Spanish summary) ["The recently named "blue zones" of urban Green Infrastructure are gaining importance in urban planning and management. In this context, artificial wetlands that have been naturalized, which for various reasons become part of the urban matrix, can provide essential ecosystem services and can be areas of special interest for conservation of local or regional biodiversity. During three visits in spring and summer of 2024, adult odonates were surveyed at Lagunas de Horna, a naturalized pond complex originated by gypsum exploitation listed in the Catalog of Protected Wetlands of the Community of Madrid (Spain). Thirteen species were recorded (8 dragonflies and 5 damselflies), including Coenagrion scitulum, a species listed in the Atlas and Red Book of Invertebrates of Spain, the second most recent record of this species in the Community of Madrid and the closest to the protected Southeast Regional Park, where it has not been detected yet. This study demonstrates how artificial wetlands, even in highly altered environments surrounded by infrastructure, can support diverse odonate communities. These findings highlight the potential of Lagunas de Horna pond complex as a model of biodiversity conservation possibilites for other similar post-mining wetlands." (Authors)] Address: García-Bravo, C., Asociación para el Seguimiento de la Biodiversidad de Getafe: Getafe, Madrid, Spain. Email:cristiangarciabrav@gmail.com

24818. González-Soriano, E.; Ortega-Salas, H. (2025): Las “libélulas helicóptero” de México (Odonata: Coenagrionidae: Pseudostigmatinae): Diversidad, distribución e historia natural - The “helicopter damselflies” of Mexico (Odonata: Coenagrionidae: Pseudostigmatinae): Diversity, distribution and natural history. Dugesiana 32(2): 105-113. (in Spanish, with English summary) ["The “helicopter damselflies” comprise a group of zygopterans characterized by their large size and with unique life history traits. Current molecular studies of the suborder Zygoptera place them as a subfamily within the large group of Coenagrionidae. Mexico hosts three of the six recognized genera of helicopter damselflies in America: Mecistogaster, Megaloprepus and Pseudostigma. Among its members some of the largest odonates in the world are included. Most species occur in humid tropical forests (including montane mesophytic forest), apart from Mecistogaster ornata Rambur, 1842 which has colonized and apparently successfully adapted to both humid and dry tropical forests. As far as is known, the naiads of these species are exclusive phytotelmata inhabitants, living in brome liads, bamboo nodes and in water stored at tree holes. Some of its species are considered indicators of tropical forest disturbance in the Americas. Notes on the diversity, current distribution and natural history of Mexican helicopter damselflies are presented with a key to separate the species of the group." (Authors)] Address: González-Soriano, E., Depto de Zoología, Instituto de Biología, Universidad Nacional Autónoma de México, aparta do Postal 70-153, 04510, Coyoacán, Ciudad de México, México. Email: esoriano@ib.unam.mx

24819. Gotoh, T.; Suzuki, H.; Moriyama, M.; Futahashi, R.; Osanai-Futahashi, M. (2025): Acquisition and repeated alteration of (TTGGG)n telomeric repeats in Odonata (dragonflies and damselflies). Insect Biochemistry and Molecular Biology 182, 104353: 10 pp. (in English) ["Highlights: •(TTGGG)n was demonstrated to be the typical telomeric repeat sequence in Odonata. •Clear (TTGGG)n signals were detected at the chromosome ends in both dragonflies and damselflies. •(TTGGG)n southern hybridization results suggest that telomeric repeat sequence has repeatedly diverged in Odonata, even within genera such as Sympetrum. •Telomerase genes were found in Odonata species including (TTGGG)n negative species, and more than two telomerase genes are present in some species. Abstract: Chromosome ends of most eukaryotes are composed of simple telomeric repeats. For arthropods, TTAGG pentanucleotide repeats, (TTAGG)n has been considered as the ancestral telomeric repeat. However, in the order Odonata, the earliest diverged group in insects that contains dragonflies and damselflies, (TTAGG)n signal has been almost undetectable in most examined species. Here, we report the pentanucleotide repeat (TTGGG)n as the typical telomeric repeat sequence for Odonata. Based on genomic information from ten Odonata species, (TTGGG)n was considered the most likely candidate for telomeric repeat sequences. By fluorescence in situ hybridization (FISH) using 12 Odonata species, clear (TTGGG)n signals were detected at the chromosome ends in both dragonflies and damselflies. By Southern hybridization using 63 Odonata species, strong (TTGGG)n signals were detected from the majority of species covering all three suborders of Odonata, indicating that the telomeric repeat of the common ancestor of extant Odonata is (TTGGG)n. Notably, there were a few Odonata species in which (TTGGG)n signals were faint or absent, suggesting that the telomeric repeat sequence has repeatedly diverged in Odonata, even within genera such as Sympetrum. We also identified telomerase genes in both dragonflies and damselflies, and in some species, more than two telomerase genes are suggested to be present. Overall, this study demonstrates the ancestral acquisition of novel telomeric repeats and their repeated alteration in Odonata." (Authors) Tanypteryx hageni, Pantala flavescens, Sympetrum striolatum, S. sanguineum, Pyrrhosoma nymphula, Ceriagrion tenellum, Ischnura elegans, I. senegalensis, Platycnemis pennipes, Hetaerina titia] Address: Osanai-Futahashi, Mizuko, Graduate School Sci. & Engineering, Ibaraki Univ., 2-1-1, Bunkyo, Mito, Ibaraki, 310-8512, Japan. Email: mizuko.osanai-futahashi.sci@vc.ibaraki.ac.jp

24820. Hager, J. (2025): Ein Leben für Gelbbauchunken und Libellen – Dieter Mey zum 70. Geburtstag. Landschaftspflege und Naturschutz in Thüringen 61(2): 92. (in German) [Dieter Mey is a well known, regionally active odonatologist in Thüringen, Germany. Regrettably, the odonatological bibliography is very incomplete.] Address: Hager, J., Joseph-von-Eichendorff-Weg 12, 37308 Heilbad Heiligenstadt, Germany. Email: j.hager@t-online.de

24821. Haque, M.T.; Paul, S.; Khan, M.K. (2025): Heatwaves reduce mating frequency in an aquatic insect. Biology Open 14(8): bio062091. 5 pp. (in English) ["Heatwaves are becoming more frequent and intense across the globe due to global warming. Heatwaves – unusual daytime and nighttime high temperatures over three consecutive days – can disrupt physiological functions of organisms, reducing fitness. Insects are stressed because of the increasing frequency and intensity of temperature extremes. While many studies have focused on insect behaviour during heatwaves in laboratory settings, the impact of natural heatwaves in the wild remains understudied. Here, we investigated the impact of natural heatwaves

on mating behaviour, flight activity, and local abundance in the Xanthagrion erythroneurum. We found that damselfly mating frequency decreased, while flight number and net population abundance remained unchanged during natural heatwaves. The decreased mating frequency may suggest a sex-specific decoupling of mate-searching efforts under thermal stress. Heatwave driven disruptions in mating behaviours and the occurrence of more frequent and acute heatwaves in the future may have long-term consequences for damselfly populations. Our results provide crucial data of the behaviour of thermally sensitive insects to heatwaves, which could assist in developing effective conservation strategies for maintaining biodiversity in a warming world." (Authors)] Address: Khan, M.K., Dept of Applied Bioscience, Macquarie Univ., North Ryde 2109, Australia. Email: bmbkawsar@gmail.com

24822. Haque, M.T.; Paul, S.; Herberstein, M.E.; Khan, M.K. (2025): Seasonal plasticity of thermal tolerance indicates resilience to future climate in Australian damselflies. Oecologia 207, 109: 11 pp. (in English) ["An animal's response to climate warming is predominantly governed by its thermal tolerance. Seasonal temperature variation may indicate the boundaries of plasticity in insect thermal tolerance, which could predict the capacity to adapt to future climates. Here, we assess the changes in thermal breadth (the difference between the critical thermal maximum (CTmax) and critical thermal minimum (CTmin)) to estimate the thermal safety margin in Ischnura heterosticta and Xanthagrion erythroneurum across different seasons. For both species, CTmax and CTmin increased with monthly temperature, with a stronger increase of CTmin in summer. Overall, thermal breadth was broad in spring and autumn (around 41 degrees) but in summer we observed a large number of individuals with substantially narrower thermal breadth (down to 26–35 degrees). Our results establish considerable seasonal thermal plasticity in damselflies, which might provide a degree of resilience in future climates, yet during the most critical season (summer), heat spikes might push a substantial proportion of the population beyond their limits." (Authors)] Address: Khan, M.K., School of Natural Sciences, Macquarie University, North Ryde, 2109, Australia. Email: bmbkawsar@gmail.com

24823. Haruno, M.; Motoi, I.; Takumi, K.; Atsunobu, M. (2025): Food habits of domestic introduced fish Coreoperca kawamebari in Gokase River System, Miyazaki Prefecture, Kyushu, Japan: examination of predation on diadromous shrimps. Ichthy, Natural History of Fishes of Japan 55: 9-14. (in Japanese, with English summary) ["The present study surveyed stomach contents of Coreoperca kawamebari which domestically introduced into the Gokase River System (northern Miyazaki Prefecture, Kyushu, Japan) to understand the predation impacts on native diadromous shrimps. The stomach contents comparison before/after season of diadromous shrimp migration revealed that percent volume and frequency of a diadromous shrimp (Paratya compressa) in the stomachs of larger C. kawamebari (> 50 mm in standard length) tended to increase after migration season. Furthermore, shrimp and fish individuals were found in the stomachs of smaller C. kawamebari specimens than previously reported. According to these results, C. kawamebari should be considered as a domestic invasive species that might have an impact on diadromous animal populations, and strict caution is required regarding the introduction and occurrence of this species in waters connected to the sea." (Authors) After (September–October 2024) season of diadromous shrimp migration, Odonata contributed with 3.1% of individuals, and with 25% of larger (>50 mm) prey items.] Address: Email: harunousagi8686@gmail.com

24824. Haque, M.T.; Paul, S.; Khan, M.K. (2025): Heatwaves reduce mating frequency in an aquatic insect Biology Open (2025) 14, bio062091. doi:10.1242/bio.062091. 5 pp (in English) ["Heatwaves are becoming more frequent and intense across the globe due to global warming. Heatwaves – unusual daytime and nighttime high temperatures over three consecutive days – can disrupt physiological functions of organisms, reducing fitness. Insects are stressed because of the increasing frequency and intensity of temperature extremes. While many studies have focused on insect behaviour during heatwaves in laboratory settings, the impact of natural heatwaves in the wild remains understudied. Here, we investigated the impact of natural heatwaves on mating behaviour, flight activity, and local abundance in Xanthagrion erythroneurum. We found that damselfly mating frequency decreased, while flight number and net population abundance remained unchanged during natural heatwaves. The decreased mating frequency may suggest a sex-specific decoupling of mate-searching efforts under thermal stress. Heatwave driven disruptions in mating behaviours and the occurrence of more frequent and acute heatwaves in the future may have long-term consequences for damselfly populations. Our results provide crucial data of the behaviour of thermally sensitive insects to heatwaves, which could assist in developing effective conservation strategies for maintaining biodiversity in a warming world."] Address: Khan, M.K., Dept Applied Bioscience, Macquarie Univ. North Ryde 2109, Australia. Email: bmbkawsar@gmail.com

24825. Henkens, R.J.H.G.; Cormont, A.; van Swaay, C.; Wamelink, G.W.W. (2025): Klimaatverandering en de natuurdoelen: Uitdagingen, maar ook handvatten voor herstel. Landschap: tijdschrift voor landschapsecologie en milieukunde 42(2): 96-103. (in Dutch, with English summary) [„Climate change and the nature goals: Climate change challenges nature policy, but also offers tools for recovery: Climate change is already causing significant shifts in ecosystems, notably through changes in species composition. Long-term monitoring data from the Dutch Network for Ecological Monitoring (NEM) reveal a consistent pattern: species with a preference for warmer conditions are becoming more prevalent, while cold-adapted species are increasingly at risk. This trend is evident across several species groups, such as dragonflies, butterflies, and breeding birds, and is captured by indicators like the Community Temperature Index (CTI) and the Multi-Species Indicator (MSI). These developments have major implications for biodiversity conservation in the Netherlands. Many current conservation targets, including those defined under the Birds and Habitats Directives (VHR) and safeguarded through the Natura 2000 network, may become increasingly difficult or even impossible to achieve. Some target species may disappear due to climate-induced habitat unsuitability, while other—more heat-tolerant—species may arrive or expand. To respond effectively, climate adaptation strategies must focus on restoring ecological resilience. Key measures include enhancing habitat heterogeneity, improving landscape connectivity, and restoring natural hydrological regimes. For mobile species, functional ecological corridors are essential to enable range shifts in response to changing climatic conditions. Moreover, strategic spatial planning, including transboundary coordination, is necessary to support such adaptation efforts and safeguard biodiversity in the long term." (Authors) Address: Henkens, R., Wageningen Environmental Research, Droevendaalsesteeg 3, 6708 PB Wageningen, Netherlands. Email: rene.henkens@wur.nl

24826. Hermann, M.; Amekor, M.K.; Contrucci, E.; Evarita, A.M.; Peeters, E.T.H.M.; Van den Brink, P.J. (2025): Multiple stressor effects of a neonicotinoid, heatwaves, and elevated

temperatures on aquatic insect emergence. Environmental Science & Technology 59: 14226-14238. (in English) ["Intensive agricultural practices, including neonicotinoid insecticides, and climate change are two potential drivers of global insect decline, contributing to biodiversity loss. However, ecologically realistic field experiments investigating these multiple stressor effects on emerging aquatic insects are scarce. To empirically test whether exposure to imidacloprid (1, 10 µg/L) and two different climate change scenarios (i) elevated temperatures (+4 °C vs. ambient temperatures) and (ii) reoccurring heatwaves (+0 to 8 °C) may cause a decline in insect emergence, we conducted an outdoor mesocosm study. Aquatic insect communities were exposed to single and combined stressors, while emergence was monitored during a 3-month period. We report significant losses in insect biomass and abundance under single and combined treatments. The high imidacloprid treatment and elevated temperatures combined caused a significant 47% decline in total insect biomass across the insect orders Diptera, Ephemeroptera, Coleoptera, Hymenoptera, Hemiptera, Odonata, and Trichoptera. Community structure and population dynamics were significantly affected, with Diptera and Ephemeroptera being most sensitive to the high and both imidacloprid treatments, respectively. Diptera dominated but was significantly reduced by the high imidacloprid and heatwave combination. Temperature-enhanced imidacloprid toxicity and the significant threat these stressors pose to aquatic insect communities highlight the need for effective climate change mitigation strategies to conserve aquatic insect biodiversity." (Authors)] Address: Hermann, M., Dept Aquatic Ecology, Eawag, Swiss Federal Institute of Aquatic Science & Technology, Dübendorf, Switzerland. Email: markus.hermann@eawag.ch

24827. Hopkins, P. (2025): A second survey of the dragonfly (Odonata) fauna of Siem Pang Wildlife Sanctuary, northeast Cambodia. Cambodian Journal of Natural History 2025: 64-76. (in English, with Cambidian summary) [" The dragonfly fauna of Cambodia is one of the least studied within the Indochina region. A second survey of the dragonflies of Siem Pang Wildlife Sanctuary in northeast Cambodia was undertaken in June 2024. This was a follow up to the first survey of the sanctuary in November 2022. Fifty-seven species were recorded during the second survey, including 17 species not previously recorded. This brings the list of dragonfly species found within the sanctuary to a total of 74. Additional species included the second record for Cambodia of Anax indicus, as well as nationally scarce species such as Platylestes platystylus and Orientogomphus minor. Further additions to the dragonfly fauna of Siem Pang Wildlife Sanctuary remain likely given the short survey period of this study and limited time spent within higher elevation, semi-evergreen/evergreen forest areas in the northwest of the sanctuary next to the Lao border." (Author)] Address: Hopkins, P., 9 New Street, Penryn, Cornwall, TR10 8EB, UK. Email paulhopkins2@tinyworld.co.uk

24828. Hudson, O.; Kaindoa, E.W.; Nkya, J.; Limwagu, A.; Kaddumukasa, M.A.; Okumu, F.O.; Kayondo, J.K.; Akol, A.M.; Tripet, F. (2025): Semi-field experiments reveal contrasted predation and movement patterns of aquatic macroinvertebrate predators of Anopheles gambiae larvae. Malaria Journal 24:4: 11 pp. (in English) ["Background: Members of the Anopheles gambiae complex are major malaria vectors in sub-Saharan Africa. Their larval stages inhabit a variety of aquatic habitats in which, under natural circumstances, they are preyed upon by different taxa of aquatic macroinvertebrate predators. Understanding the potential impact of predators on malaria vector larval population dynamics is important for enabling integrated local mosquito control programmes with a stronger emphasis on biocontrol approaches. This study experimentally evaluated the predation efficacy and foraging strategy of three common aquatic macroinvertebrate predators of An. gambiae, diving beetles (Coleoptera), backswimmers (Hemiptera), and dragonfly nymphs in a semi-field system in South-Eastern Tanzania. Methods: An array of alternating small and large basins used as aquatic habitats was created in two compartments of a semi-field system and filled with well water. Field-collected adult diving beetles, backswimmers or dragonfly nymphs were randomly assigned to these habitats and Anopheles arabiensis larvae were added as prey in half of the habitats. The number of mosquito larvae consumed, predator mobility across habitats and mortality were recorded at 24, 48 and 72 h. Results: The presence of An. gambiae larvae in habitats significantly increased the survival of backswimmer and dragonfly nymphs, which are not mobile. In contrast, diving beetles survived well under any initial condition by preferentially flying away from habitats without prey to nearby larger habitats with prey. The larval predation rates of predacious diving beetle, backswimmer and dragonfly nymphs were stable over time at a mean of 3.2, 7.0 and 9.6 larvae consumed each day. Conclusion: This study demonstrates that aquatic macroinvertebrate predators display adaptive foraging behaviour in response to prey presence and aquatic habitat size. It also confirms the ability of these predators to significantly reduce An. gambiae larval densities in aquatic habitats, thus their potential for consideration as additional biocontrol tools for mosquito population reduction." (Authors)] Address: Onen, H., Dept of Zoology, Entomology & Fisheries Sciences, College of Natural Sciences, School of Biosciences, Makerere University, P.O. Box 7062 Kampala, Uganda. Email: honen@uvri.go.ug

24829. Iqbal, M.; Kuswanto, A.; Aprillia, I.; Widayanti, G.A. (2025): Dragonflies of Enggano Island (Sumatra) revisited. Agrion 29(2): 50-54. ["This paper discusses the diversity of dragonflies on Enggano Island, Sumatra, Indonesia. Field surveys and photographic documentation were conducted to review the island's documented dragonfly fauna. A total of 33 species are reported for the island, including four endemic taxa. Photographic documentation of three of the four endemic taxa is presented, namely Heliocypha angusta oceanis, Agrionoptera insignis nereis and Neurothemis ramburii oceanis. The study provides further insight into the understanding of the Odonata of the isolated Enggano Island." (Authors)] Address: Dept of Biology, Universitas Indo Global Mandiri, Palembang 30129, Indonesia. Email: miqbal@uigm.ac.id

24830. Iqbal, M. (2025): New records of Podolestes buwaldai (Zygoptera: Megapodagrionidae) from South Sumatra Province, Indonesia. Agrion 29(2): 42-45. (in English) ["Buwalda's Flatwing Podolestes buwaldai Lieftinck, 1940, an IUCN red-listed Near Threatened damselfly species, has been recorded from Peninsular Malaysia and Sumatra, Indonesia. Until comparatively recently published records for Sumatra were limited to the type series. New records are reported here for new observations made in 2017 and 2020 in the peat-swamp forests of South Sumatra Province, Indonesia. These records extend the known range of P. buwaldai in Sumatra to South Sumatra Province." (Authors)] Address: Iqbal, M., Dept. Biol., Universitas Indo Global Mandiri, Palembang 30129, Indonesia. Email: miqbal@uigm.ac.id

24831. Iqbal, M.; Amey, T.; Kusuma, I.; Alim, S.S.; Husni, A. (2025): Rediscovery of Mortonagrion amoenum, a rare damselfly (Coenagrionidae) from Indonesia. Agrion 29(2): 46-49. (in English) ["The rediscovery of M. amoenum (Ris, 1915),

a rare and endemic damselfly from Indonesia is reported. A biodiversity survey conducted on 6 July 2021, in Simeulue Island (Aceh, Sumatra), documented the presence of this IUCN red-listed Vulnerable species in a forested area with small streams and marshy conditions." (Authors)] Address: Iqbal, M., Dept of Biology, Universitas Indo Global Mandiri, Palembang 30129, Indonesia. Email: miqbal@uigm.ac.id

24832. Irsa, A.F.N.; Sumarga, E.; Sholihah, A. (2025): Diversity of dragonflies (Order: Odonata) in Mount Ciremai National Park, West Java. IOP Conf. Ser.: Earth Environ. Sci. 1506 012003: 9 pp. (in English) ["Odonata are known as bioindicators of aquatic health due to their sensitivity to environmental changes. This study investigated Odonata diversity across various potential habitats within Mount Ciremai National Park (TNGC), a conservation area characterized by numerous water sources used for irrigation and tourism. The study was conducted from February – April 2024 at eleven points across TNGC, including six points in Kuningan and five points in Majalengka. The visual day flying method was used to collect data, resulting in 32 species with a total of 830 individuals observed. Five of these species are endemic to Java Island, i.e., Drepanosticta gazella, D. sundana, D. spatulifera, Heliogomphus drescheri and Heliocypha fenestrata. Ciayakan, a site in Kuningan, had the highest species richness (18 species, 215 individuals) and diversity index (H' = 2.27). Argiocnemis rubescens showed the highest relative abundance (36 individuals, 63.16%) in Argalingga, while Pantala flavescens was the most abundant species of all locations observed and the second highest relative abundance (123 individuals, 61.22%). Conservation efforts should therefore prioritize targeted management strategies to mitigate localized threats such as deforestation, agricultural expansion, pollution, and tourism development." (Authors)] Address: Irsa, A.A.N., Master of Biology Study Program, School of Life Sciences & Technology, Institut Teknologi Bandung. Jl. Ganesa No. 10, Bandung West Java, Indonesia. Email: alfifazaa@gmail.com

24833. Isnaini, A.; Jufril, A.W.; Artayasa, P. (2025): Dragonfly species diversity in the Lemor Botanical Garden, East Lombok. Jurnal Biologi Tropis 25(3): 2767-2772. (in Indonesian, with English summary) ["The research was conducted from October to December 2024 using an exploratory method with transect techniques and purposive random sampling at ten selected observation points representing different microhabitats. Species identification was carried out using Odonata taxonomic references, and data were analyzed using the Shannon-Wiener diversity index. The results showed there were 6 families and 21 species successfully identified. The diversity index of dragonfly species was 2.95, categorized as moderate, indicating that the area maintains relatively good environmental conditions that support various dragonfly species. These findings provide valuable baseline data for future biodiversity conservation and ecological studies in the region." (Authors) Idionyx yolanda, Trithemis festiva, Brachydiplax chalybea, Brachythemis contaminata, Crocothemis servilia, Diplacodes trivialis, Lathrecista asiatica, Neurothemis fluctuans, N. ramburii, N. terminata, Orthetrum sabina, O. testaceum, Pantala flavescens, Euphaea variegata, E. lara, Heliocypha fenestrata, Agriocnemis femina, A. pygmaea, Ischnura senegalensis, Pseudagrion rubriceps, Copera marginipes] Address: Isnaini, Amalia, Pendidikan Biologi, Universitas Mataram, Mataram, Indonesia; Email: amaliaisnaini16@gmail.com

24834. Jiménez, R.R.; Smith, K.G.; Brooks, T.M.; Scalera, R.; Mair, L.; Nunes, A.L.; Costello, K.E.; Macfarlane, N.B.W. (2025): Guiding action on invasive alien species towards meeting the EU's Biodiversity Strategy for 2030. NeoBiota 99: 109-129. (in English) ["Invasive alien species (IAS) are a major threat to global biodiversity. The total cost of biological invasions across all European Union member states has been estimated at 129.9 billion US dollars between 1960 and 2020. It is, therefore, crucial to implement effective measures for IAS management. In Europe, the overarching mechanism for this is established through the European Union (EU) Biodiversity Strategy 2030, which aims to halve the number of Red List species threatened by IAS by 2030, namely by stepping up the implementation of the EU IAS Regulation. To support the implementation of the strategy, we use the Species Threat Abatement and Restoration (STAR) methodology to identify and quantify opportunities to reduce species extinction risk in the EU by managing invasive alien species (IAS), focusing specifically on its threat abatement component (STAR-t). Using data from the European Red List on extinction risk, threats and distribution for terrestrial and freshwater species groups (both animals and plants) threatened by IAS, we identified key geographic areas and species for intervention. The countries and territories providing the largest opportunities to contribute towards reducing EU species extinction risk through managing IAS are the Canary Islands [Spain] (20.8% of total EU STAR-t attributed to IAS), Madeira [Portugal] (14.2%), mainland Spain (11.9%), Italy (9.3%), Azores [Portugal] (5.4%) and Greece (5.3%). For specific IAS, the greatest opportunities to reduce regional species extinction risk by mitigating threats from IAS come from managing feral goats (12.4%), mouflons (8.1%), rabbits (5.3%) and rats (4.6%). This work showcases the first application of STAR at a regional scale to measure opportunities for threat abatement caused by IAS and provides practical application in guiding the management actions with the highest conservation gains towards the EU Biodiversity Strategy 2030." (Authors) Table 1: Percentage of species groups documented as threatened by invasive alien species (IAS) under threats 8.1 and 8.4 of the IUCN threat classification scheme. This result does not reflect the severity of the IAS to the species. Percentage (%): Odonata 0,3. Sorry dear authors, is there any empirical base for that?] Address: Email: Randall R. Jiménez: randall.jimenez@iucn.org

24835. Joest, R. (2025): Wasserbüffel als Landschaftspfleger – Erhaltung von Libellenlebensräumen in einem beweideten Niedermoor im Zeitraum 2014 bis 2024. Libellula 44 (1/2): 41–61. (in German, with English summary) ["Water buffalo as landscape managers – conservation of dragonfly habitats in a grazed fen in the period 2014 to 2024 – The nature reserve Woeste near Bad Sassendorf (North Rhine Westphalia) is home to a regionally remarkable dragonfly fauna. To prevent scrub encroachment, it has been subject to year-round grazing by water buffaloes in low density since 2005. Since studies of the dragonfly fauna in grazed wetlands are rare, this article describes the dragonfly community of the Woeste in 2014, 2019, and 2024 and analyzes it with re gard to grazing by water buffalo. A total of 35 dragonfly species (2014: 29, 2019: 27, 2024: 29) were recorded, of which there was evidence of reproduction in the area for at least 28 (2014: 19, 2019: 21, 2024: 23). These included Lestes dryas (vulnerable) and Ischnura pumilio (near threatened), two species on the national Red List, and 11 species with declining populations nationwide. In addition to ubiquitous species of still waters, species of the gen era Lestes and Sympetrum are among the characteristic species of the Woeste due to their abundance and reproductive behavior, the consistency of their occurrence in the three sur vey years and the completeness of the species spectrum. In particular, Lestes dryas, which occurred annually in large numbers, and Sympetrum meridionale, which has

been recorded since 2014, should be mentioned here. Compared to the years 2014, 2020, and 2022, the cover of willow and alder shrubs on the pond complexes surveyed remained approximately the same or decreased in the pond complexes that had been mechanically cleared of shrubs in 2018. Since then, no renewed scrub encroachment was evident there until the end of the study in the summer of 2024, six years later. On the water bodies cleared of woody plants and grazed by water buffalo, the number of dragonfly species recorded was relatively stable in the three years surveyed. Their overall abundance even increased in most cases. A negative effect of grazing on the dragonfly fauna in the period 2014 to 2024 was not evident from the analysed data. Rather, grazing had evidently helped to keep the intermittently wet shallow waters open and to maintain early successional stages suitable for dragonflies." (Author) Address: Joest, R., Arbeitsgemeinschaft Biologischer Umweltschutz, Biologische Station Soest, Teichstr. 19, 59505 Bad Sassendorf, Germany. Email: r.joest@abu-naturschutz.de

24836. Kaltsas, D.; Alvanou, L.; Ekklisiarchos, J.; Raptis, D.I.; Avtzis, D.N. (2025): Canopy cover drives Odonata diversity and conservation prioritization in the protected wetland complex of Thermaikos Gulf (Greece). Forests 2025, 16, 1181: 22 pp. (in English) ["Odonata constitute an important invertebrate group that is strongly dependent on water conditions and sensitive to habitat disturbances, rendering them reliable indicators of habitat quality of both aquatic and terrestrial habitats. We studied the compositional and diversity patterns of Odonates in total, and separately for Zygoptera and Anisoptera in relation to geographic and ecological parameters at the riparian zone of four rivers and one canal within the Axios Delta National Park and the Natura 2000 SAC GR1220002 in northern Greece, using the line transect technique. In total, 6252 individuals belonging to 28 species were identified. The compositional and diversity patterns were significantly different between agricultural and natural sites. Odonata assemblages at croplands were comparatively poorer, dominated by a few, widely distributed, taxonomically proximal species, tolerant to environmental changes, as a result of modifications and consequent alterations of abiotic conditions at croplands, which also led to higher local contribution to ß-diversity and species turnover. The absence of several percher, endophytic, and threatened species from agricultural sites led to significantly lower diversity, as a result of environmental filtering due to ecophysiological restrictions. Taxonomic and functional diversity, uniqueness, and Dragonfly Biotic Index (DBI) were significantly higher in riparian forests, due to the sensitivity of damselflies to dehydration, and the avoidance of habitat loss and extreme temperatures by dragonflies, which prefer natural shelters near the ecotone. The newly introduced Conservation Value Index (CVI) revealed 21 conservation hotspots of Odonata (14 at canopy cover sites), widely distributed within the borders of NATURA 2000 SAC GR1220002." (Authors) Calopteryx splendens, Erythromma lindenii, E. viridulum, Ischnura elegans, Chalcolestes parvidens, Lestes barbarus, L. macrostigma, Platycnemis pennipes, Aeshna affinis, A. mixta, Anax imperator, A. parthenope, Isoaeshna isoceles, Gomphus vulgatissimus, Lindenia tetraphylla, Onychogomphus forcipatus, Ophiogomphus cecilia, Stylurus flavipes, Crocothemis erythraea, Libellula fulva, Orthetrum albistylum, O. brunneum, O. cancellatum, O. coerulescens, Sympetrum fonscolombii, S. meridionale, S. sanguineum, S. striolatum] Address: Avtzis, D.N. Forest Res. Inst., Hellenic Agricultural Organization "Dimitra", 57006 Vassilika, Greece. Email: dimitrios.avtzis@elgo.gr

24837. Karagöz, H.; Hacet, N. (2025): Odonata fauna of Kırklareli province, with updated species list of Longoz Forest in Thrace Region (Türkiye). Brachytron 25(2): 1-13. (in English, with Dutch summary) [This study was conducted to investigate the Odonata fauna of Kırklareli province in the Thrace Region. It was carried out at 58 different localities in various wetlands in the Kırklareli province in 2022 and 2023. Lestes dryas, Erythromma viridulum, Cordulia aenea and Libellula quadrimaculata were recorded for the first time in this province. Of these species, C. aenea is also a new record for the Turkish Thrace Region. Three species recorded during this study are listed as Threatened in the Red List of European odonates: Cordulegaster insignis, C. picta and Somatochlora borisi; the latter species is endemic to the Balkans. For these species, a new location was found. In the Longoz Forests, which have a special habitat, ten new species have been added to the list, which brings the total number of species to 29."] Address: Karagöz, H., Trakya Univ., Insti. Natural & Applied Sci., Edirne, Türkiye. Email: hasim.karagoz39@gmail.com

24838. Karani, A.; Njoroge, L. (2025): Southernmost record of the threatened Platycypha amboniensis Martin, 1915 (Odonata: Chlorocyphidae), endemic to the highlands of Central Kenya. Entomological Communications, 7, 2025: ec07015: 4 pp. (in English) ["Habitat fragmentation poses a significant global challenge to tropical forests, impacting on species, including endemic aquatic insects. Peripheral populations of range-restricted species are particularly vulnerable in rapidly changing landscapes. This study presents the southernmost occurrence of Kenya Jewel (P. amboniensis) and the first from a restored forest in upland Kenya. This damselfly is globally threatened, extremely rare in the region, and is confined to the montane streams of Central Kenya's highlands. This occurrence is compared with the species' distribution in Central Kenya, with a discussion on conservation measures. This finding not only extends the known range and extent of occurrence of P. amboniensis but also provides evidence that the species is persisting in isolated patches outside protected areas, necessitating urgent conservation action." (Authors)] Address: Karani, A., University of Embu, Embu, Kenya; Centre for Ecosystem Restoration Kenya, Limuru, Kenya; National Museums of Kenya, Nairobi, Kenya. Email: akaranigold@gmail.com

24839. Kargl, V.; Chovanec, A. (2025): Wildschweinsuhlen im Lainzer Tiergarten in Wien als Habitat für Libellen. Libellula 44(1/2): 63-78. (in German, with English summary) ["Wild boar wallows in the Lainzer Tiergarten in Vienna as habitat of Odonata – In literature, wild boar wallows are mentioned as a possible reproductive habitat of Libellula depressa, L. quadrimaculata and Orthetrum coerulescens. For other pioneer species, such as O. brunneum, no information is available. This study evaluates the role of wild boar wallows as a habitat for dragonflies and determines the species diversity in a habitat, which is strongly influenced by the disturbance by wild boars (Sus scrofa). At five study sites in the Lainzer Tiergarten (Vienna, Austria) 32 surveys were carried out from March to October 2018. A total of six certainly autochthonous species were detected: L. depressa, L. quadrimaculata, O. brunneum, O. coerulescens, Aeshna cyanea, and Sympetrum striolatum. Furthermore, the species Coenagrion puella, Pyrrhosoma nymphula, Anax imperator, Ischnura pumilio, Cordulegaster bidentata, Sympetrum meridionale, and S. vulgatum were classified as probably or possibly autochthonous. Due to the activity of the wild boars the puddles are kept in an early succession stage. A reduction of the wild boar population by regulation measures may lead to changes in the species composition at the study sites." (Authors)] Address: Kargl, Victoria, Naturhistorisches Museum Wien, Burgring 7, 1010 Wien, Austria. Email: victoria.kargl@nhm.at

24840. Kim, J. (2025): Analysis of ecological structures and terrestrial insect characteristics across successional stages of abandoned paddy fields. Dissertation, Environmental Design, The Graduate School of Environmental Studies, Seoul National University: VII + 75 pp. (in Korean, with English summary) ["Abandoned paddy fields contribute to agricultural biodiversity by forming unique ecosystems influenced by factors like abandonment duration, vegetation, moisture, and surrounding seed resources. However, their ecological impacts on terrestrial insects at large scales remain underexplored. In South Korea, socio-structural changes and an aging population have led to a decline in rice paddy area, leaving abandoned fields without specific uses. In Gyeonggi Province, with its high population density and constant disturbances, agricultural land is vital not only for food production but also for ecosystem services, and it's deemed highly vulnerable to abandonment. This study analyzed the ecological structure and insect characteristics of abandoned paddy fields in Gyeonggi Province by succession stage using satellite data and field sampling. Results revealed significant species diversity differences between cultivated paddies and abandoned fields, linked to succession-driven environmental changes. ANOVA and Tukey HSD tests showed herbaceous-woody mixed abandoned paddy fields had significantly higher diversity indices than cultivated paddies ($p = 0.029$). Cultivated paddies exhibited higher dominance indices than woody-dominated abandoned paddy fields ($p = 0.035$) and herbaceous-woody mixed abandoned paddy fields ($p = 0.011$). Herbaceous-woody mixed abandoned paddy fields had the highest diversity and lowest dominance indices, highlighting their importance for biodiversity and stability. Key insect groups in herbaceous-woody mixed abandoned paddy fields included Mantodea and Odonata [Ischnura asiatica and Orthetrum albistylum are mentioned], benefiting from abundant resources and habitat complexity. In a similar context, in woody-dominated abandoned paddy fields, the occurrence of beetles (Coleoptera), flies (Diptera), and wasps (Hymenoptera), such as Chrysomela vigintipunctata and Agelastica coerulea, which feed on or utilize woody plants, was particularly notable. This indicates that terrestrial insect communities can vary depending on vegetation composition, habitat complexity, and surrounding ecological contexts. These findings highlight that the ecological structure of habitats plays a crucial role in supporting diverse insect communities and their ecosystem functions across both cultivated and abandoned paddy fields. Additionally, herbaceous-woody mixed and woody-dominated abandoned paddy fields near agricultural land are considered to provide essential ecosystem services, such as serving as habitats for natural enemies of agricultural pests and facilitating the influx of pollinators. Moreover, they are expected to contribute to enhancing agricultural biodiversity. … In fact, the results of an insect survey of a rice paddy in the Mando Plain located inside the DMZ also confirmed that the number of Odonata species was high (Park et al., 2012). It is thought that the moist environment in the mixed herb and woody space was suitable for the habitat of Odonata species such as Ischnura asiatica and Orthetrum albistylum that lay eggs on the stems of aquatic plants and on the open water surface. (Author)] Address: https://s-space.snu.ac.kr/bitstream/103-71/221892/1/000000187029.pdf

24841. Kosterin, O.E.; Onishko, V.V. (2025): Updates to the fauna of dragonflies (Odonata) of Novosibirskaya Oblast of Russia and Novosibirsk City, with the first record of Pantala flavescens (Fabricius, 1798) (Libellulidae) in West Siberia. Euroasian Entomological Journal 24(3): 147-152. (in English, with Russian summary) ["In early June 2023, Coenagrion glaciale has been for the first time recorded in Novosibirskaya Oblast and District 3 km W of Koltsovo Town. On 13.VI.2024, a male of Ophiogomphus obscurus has been photographically registered in Iskitim District, for the first time in Novosibirskaya Oblast as well. The findings of these two species were quite expectable in Novosibirskaya Oblast. Many new findings of C. glaciale in Ural and Siberia have been submitted in recent years to iNaturalist.org. On 12–13. VIII. 2024, single young individuals of two migrant species, a male of P. flavescens and a female of Sympetrum fonscolombii, have been found at Baltiyskaya Street at the margin of Sovetskiy District of Novosibirsk City: the former species for the first time in West Siberia and the latter one for the second time in Novosibirkaya Oblast. These two dragonflies most probably represented local progenis of migrant individuals which had arrived to Novosibirsk from the south early in summer." (Authors)] Address: Kosterin, O.E., Institute of Cytology & Genetics, Siberian Branch, Russian Acad. Sciences, Lavrentiev Ave 10, 630090 Novosibirsk, Russia. E-mail: kosterin@bionet.nsc.ru

24842. Kumar, D.; Saxena, K. (2025): Effects of temperature and relative humidity on abundance of dragonfly species in Sikar district, Rajasthan (India). Journal of Entomology and Zoology Studies 13(4): 111-114. (in English) ["Insects are not only living creatures in themselves but they are the living flags of life quality circumstances on this unique planet. They symbolize what exists and what should exist for better life conditions. Dragonflies are can be taken as the living indicators of balance or imbalance in our ecological environment. The study carried out in Sikar district shows that temperature and relative humidity are the effective controlling factors of abundance of these insects. Their existing numbers increases for specific values of temperature and humidity. Data were collected for November, 2023 to October, 2024 period, from the selected places of Sikar district, where generally dragonflies are found in abundance. Results show that dragonfly specimens are scarce during the March-June months, when temperatures range from 13.8° to 41.9°C and relative humidity levels range from 23 to 53%. Dragonflies are more common in the months of July to October when they find a balance of temperature and relative humidity." (Authors)] Address: Saxena, K., Dept Zoology, Government Meera Girls College, Udaipur, Rajasthan, India

24843. Lameira, H.L.N.; Guerrero-Moreno, M.A.; Cruz da Silva, E.; Oliveira, F.A.; Teodósio, M.A.; Dias-Silva, K.; Ferreira Moura, Jr., F.; Juen, L. (2025): Citizen Science as a monitoring tool in aquatic ecology: Trends, gaps, and future perspectives. Sustainability 17(11), 4972; https://doi.org/10.3390/su17114972. 25 pp. (in English) ["Aquatic ecosystems are essential for biodiversity and ecosystem services, but anthropogenic pressures threaten them. In this context, citizen science has emerged as an innovative strategy for biodiversity conservation and environmental monitoring. We conducted a scientometric analysis to identify patterns and gaps in the scientific literature on citizen science in aquatic ecology. We analyzed 185 articles published between 2003 and 2024 on the Web of Science and Scopus databases, with the highest number of publications on the topic (15.14%) in 2023. USA, Australia, and UK were the most productive and frequently studied countries. Studies focused on marine ecosystems (50.28%), while freshwater environments, such as rivers (12.99%), remain under-represented. Taxonomic groups such as fish (30.64%) and aquatic mammals (13.87%) were most commonly studied. The focus of monitoring was on ecology and species conservation. The projects adopted a contributory model of citizen engagement (92.97%), with a predominance of urban citizens (60.51%). Participants were trained through online platforms (25.75%) and in-person courses

(21.56%), while communication methods involved sharing photos and videos (38.77%) and online uploads (23.79%). Therefore, expanding studies on freshwater ecosystems and rural and traditional communities, and integrating different levels of citizen participation, is essential." (Authors) The paper includes references to Odonata." (Authors)] Address: Lameira, H. Programa de Pós-Graduação em Sociedade, Natureza e Desenvolvimento (PPGSND), Instituto de Biodiversidade e Florestas (IBEF), Universidade Federal do Oeste do Pará (UFOPA), Vera Paz Street, s/n (Tapajós Unit), Salé District, Santarém 68040-255, Pará, Brazil. Emal: lameirahelton@gmail.com

24844. Lemke, M. (2025): Contribution to the knowledge of Odonata (Insecta) in Moldova: Iasi county. Journal of Experimental and Molecular Biology 26(2): 137-164. (in English) ["From 21-vi to 29-vi-2024 I made an odonatological study trip to Iasi County, northeastern Romania. During this trip I examined 39 sites of both standing and flowing water and noticed 23 species of Odonata. Many sites are threatened by littering and drying out. The results of the trip demonstrate the summer aspect of the Southeast European Odonata fauna; neither spring nor autumn species were observed. Interesting from a faunistic point of view are the very early observation of immature Sympecma fusca at two sites, the northernmost record of Somatochlora meridionalis east of the Carpathians, and the almost complete absence of species of the genera Lestes, Aeshna, Gomphus s.l., Libellula and Sympetrum. The mentions of some species in the literature are critically examined." (Author)] Address: Lemke, M., Gymnasialstr. 30, 66557 Illingen, Germany. Email: malemke@gmx.de

24845. Li, Z.; Pu, S.; Lu, J.; Song, R.; Zhang, H.; Lu, X.; Wang, Y. (2025): Transferring face recognition techniques to entomology: An ArcFace and ResNet approach for improving dragonfly classification. Applied Sciences 15(13), 7598; https://doi.org/10.3390/app15137598: 15 pp. (in English) ["Dragonfly classification is crucial for biodiversity conservation. Traditional taxonomic approaches require extensive training and experience, limiting their efficiency. Computer vision offers promising solutions for dragonfly taxonomy. In this study, we adapt the face recognition algorithms for the classification of dragonfly species, achieving efficient recognition of categories with extremely small differences between classes. Meanwhile, this method can also reclassify data that were incorrectly labelled. The model is mainly built based on the classic face recognition algorithm (ResNet50+ArcFace), and ResNet50 is used as the comparison algorithm for model performance. Three datasets with different inter-class data distributions were constructed based on two dragonfly image data sources: Data1, Data2 and Data3. Ultimately, our model achieved Top1 accuracy rates of 94.3%, 85.7%, and 90.2% on the three datasets, surpassing ResNet50 by 0.6, 1.5, and 1.6 percentage points, respectively. Under the confidence thresholds of 0.7, 0.8, 0.9, and 0.95, the Top1 accuracy rates on the three datasets were 96.0%, 97.4%, 98.7%, and 99.2%, respectively. In conclusion, our research provides a novel approach for species classification. Furthermore, it can calculate the similarity between classes while predicting categories, thereby offering the potential to provide technical support for biological research on the similarity between species." (Authors)] Address: Zhang, H., Key Lab. of Genetic Evolution & Animal Models, Kunming Inst. of Zoology, Chinese Academy of Sciences, Kunming 650201, China. Email: zhanghaomiao@mail.kiz.ac.cn

24846. Linklater, D.; Ivanova, E.P. (2025): The discovery of mechano-bactericidal surfaces. Microbiology Australia 46(2): 63-66. (in English) ["There is a long evolutionary history of bacteria adapting to surface colonisation and biofilm formation and a similar timeline of evolutionary advances for insects to develop resistance towards bacterial colonisation and biofilm formation. Many nanostructured surfaces are superhydrophobic, meaning they repel water and therefore other contaminants. A decade ago, we discovered that the superhydrophobic nanopillared surfaces of insect wings (e.g. cicadas, dragonflies and damselflies) kill bacteria through physical disintegration rather than repelling their attachment. It is now well documented that the biomimetic nanostructures, such as pillars and spikes, can physically damage bacterial cells, leading to cell lysis and death. Research involving replication of these nanostructures on biomaterials and implantable devices could eliminate the need for antibiotics to kill bacteria on such surfaces, offering a promising alternative for preventing infections." (Authors)] Address: Ivanova, Elena P., School of Science, STEM College, RMIT University, Melbourne, VIC 3000, Australia. Email: elena.ivanova@rmit.edu.au

24847. Liu, G.; Lin, Z.; Soininen, J.; Dalu, T.; Juvigny-Khenafou, N.P.D.; Khan, S.; Mu, H.; Oduro, C.; Qi, X.; Qu, X.; Riis, T.; Wijewardene, L.; Zhang, M.; Li, J.; Wu, Y.; Wu, N. (2025): Standardized diversity estimation uncovers global distribution patterns and drivers of stream insects. npj Biodiversity 4, 27: 11 pp. (in English) ["Freshwater insect biodiversity is under global threat from anthropogenic stressors, yet the roles of natural and anthropogenic drivers remain unclear. Here, we examine 783 river basins to map the global diversity and explore the effects of sampling bias, natural, and anthropogenic factors on four major taxa: Ephemeroptera, Plecoptera, Trichoptera and Odonata (EPTO). About 62% of basins were under-sampled, especially in the Global South. Standardized diversity metrics (especially Shannon- and Simpson-based) better captured global diversity patterns of insect than observed diversity. Standardized taxonomic and functional diversity showed two latitudinal peaks, with a minor peak at the equator and a higher peak at ~40°N. Landscape factors had the highest relative impact on taxonomic diversity, while both climatic and landscape factors were primary drivers of functional diversity. By controlling for sampling biases, we provide more accurate insights into the drivers of freshwater insect diversity to inform effective stream conservation and management." (Authors)] Address: Li, J., Dept of Geography & Spatial Information Techniques, School of Civil & Environmental Engineering & Geography Science, Ningbo University, Ningbo, China. Email: lijialin@nbu.edu.cn

24848. Mandal, A.H.; Sadhu, A.; Ghosh, S.; Saha, N.C.; Mossotto, C.; Pastorino, P.; Saha, S.; Faggio, C. (2025): Evaluating the impact of neonicotinoids on aquatic non-target species: A comprehensive review. Environmental Toxicology and Pharmacology 113, January 2025, 104606: 15 pp. (in English) ["Neonicotinoid insecticides (NNIs) are the fastest-growing class in agricultural protection. They target nicotinic acetylcholine receptors (nAChR) in pests, stimulating the nervous system at low doses and causing paralysis and death at higher concentrations. NNIs are used in crop protection, seed treatment, forestry, agriculture, and flea control in domestic cattle. Effective at lower concentrations and offering long-term control, NNIs are favoured for their systemic activity. However, due to their water solubility, mobility, and moderate persistence, NNIs easily contaminate adjacent aquatic environments via runoff, leaching, or spray drift. While less toxic to vertebrates, their widespread use poses threats to aquatic and terrestrial organisms, causing neurotoxicity, nephrotoxicity, cytotoxicity, genotoxicity, immunotoxicity, hepatotoxicity, endocrine disruption, and reproductive malformations. This review synthesizes research

to address knowledge gaps on the environmental impact of NNIs and proposes policies to mitigate their harmful effects on aquatic non-target species." (Authors) The study includes a reference to Odonata.] Address: Shubhajit Saha, S., Fishery & Ecotoxicology Research Lab., Dept Zoology, Univ. Burdwan, Burdwan, India. Email: s.saha.bgc.wbsu@gmail.com

24849. Månefjord, H.; Yamoa, A.S.; Gbogbo, Y.A.; Müller, L.; Runemark, A.; Kouakou, B.K.; Boateng, R.; Huzortey, A.A.; Badu, I.K.; Wahlberg, N.; Brydegaard, M.; Zoueu, J.T.; Anderson, B.; Li, M. (2025): Stratification of insect diversity and daily activity patterns in the West African virgin forest Taï assessed by entomological Lidar. Scientific Reports 15, Article number: 25663: 12 pp. (in English) ["Lidar technology was utilized to non-destructively explore the diverse insect life in the Taï virgin forest of Côte d'Ivoire. This study employed an entomological Lidar scanned at different elevation angles, combined with traditional insect trapping at different canopy heights, to investigate the composition and spatial–temporal distribution of insects within the forest canopy. We detected stratified patterns of insect activity at various canopy heights, revealing differences in the composition of Lidar signals reflecting divergent species composition with height and time-of-day, indicative of height-dependent insect biodiversity. The optical properties of captured insects, including wing specularity and polarimetric response, were analyzed and correlated with Lidar signals, revealing distinct insect clusters and activity patterns at different canopy heights. These findings show the potential of using Lidar to non-invasively assess insect diversity continuously across complex canopies to uncover species composition in ecosystems with high species diversity. ... The zipline stood out, however, being the only trap to capture Odonata and Orthoptera, except for a few manual sweep netting catches. ... Observations in Fig. 5o–q could represent species belonging to the Odonata order based on the low wingbeat frequency, specular wing signals, and them primarily being observed in the open sky." (Authors)] Address: Li, M., Dept of Physics, Lund University, Sölvegatan 14C, 22363 Lund, Sweden

24850. Manger R. 2024. The parasitic infection rate of Dragonfly midges (Forcipomyia paludis) in De Wieden. Brachytron 25(1): 1-8. (in English, with Dutch summary) ["Targeted research was conducted in De Wieden on the occurrence of the dragonfly midge (Forcipomyia paludis) during June and July 2024. Only 18 dragonfly species were observed, of which 7 were infected by the dragonfly midge. The average infection rate was 7.8%. Almost all midges were observed at the base of the forewings, at the level of the cubital veins. The dragonfly midge appears to be less common in De Wieden than in De Weerribben. The difference in the infection rate of the dragonfly fauna between the two areas cannot be explained. It might be that the rather low density of Cladium mariscus, the management or the succession stage are responsible for this."] Address: Email: rene@mangereco.nl

24851. Mathur, M.; Parihar, D. (2025): A review on the impact of polluted water on insect diversity (odonates). International Journal of Novel Research and Development 10(5): 31-35. (in English) ["Water pollution poses a critical environmental threat, significantly impacting the biodiversity of aquatic ecosystems. A comprehensive review of previous research highlights that pollution disrupts habitats, diminishes food availability, and increases the risk of disease outbreaks, ultimately leading to a decline in species diversity. Furthermore, the ecological consequences of reduced odonate diversity extend beyond insect populations, affecting entire aquatic food webs and ecosystem stability. Among the various organisms affected, aquatic insects serve as essential bioindicators as a result of their sensitivity to changes in water quality. This study focuses on the relationship between water pollution and odonate diversity, emphasizing the role of specific indicator species in assessing ecosystem health. Our findings reveal that ponds with healthy water quality support a higher abundance of odonate species, particularly Trithemis festiva and Bradinopyga geminata, which thrive in relatively unpolluted environments. Conversely, in ponds classified as having poor or extremely poor water quality, odonate species such as Zyxomma petiolatum and Ceriagrion cerinorubellum were more prevalent, indicating contamination. These results imply that odonates can effectively reflect water quality variations and pollution levels. The study further examines the influence of key pollutants, including heavy metal and pesticides, with nutrient-rich runoff from agricultural and industrial sources, on aquatic insect populations. Considering these findings, this study underscores the urgent need for stricter environmental regulations, sustainable water management practices, and targeted conservation efforts to mitigate pollution and preserve freshwater biodiversity." (Authors)] Address: Mathur, M., Lachoo Memorial College of Science & Technology, Autonomous, Jodhpur, India

24852. Mauser, K.M.; Baumeyer, J.; Eshghi, S.; Gorb, S.N.; Manfrin, A.; Brühl, C.A. (2025): Short-term mating success in relation to fluctuating wing asymmetry in the male Azure Damselfly Coenagrion puella. Basic and Applied Ecology 86: 55-65. (in English) ["As top flying predators, damselflies rely on wing symmetry and functionality. However, already during aquatic larval development, environmental stressors, including anthropogenic ones, can affect their development and impair wing morphology raising the question whether such alterations affect reproductive fitness. To investigate the role of wing morphology in mating success, we collected males of C. puella observed in copulation wheels (indicating short-term mating success) or actively chasing other wheel or tandem formations (unsuccessful mating attempts at the time of capture). 20 individuals of each group were collected at two locations differing in environmental and anthropogenic pressures: one regularly used for recreational fishing and surrounded by agriculture in the Rhine Valley and one consisting of research ponds in the Palatinate Forest with restricted public access. Wing morphology and symmetry were assessed via computer-vision by comparing several cell shape and position dependent variables as well as wing size and number of cells and junctions using the recently developed software WingAnalogy. Mating males in the Palatinate Forest exhibited higher cell shape asymmetry than mating males in the Rhine Valley. In these individuals, the cell shape asymmetry was more pronounced in the distal part of the wing than in the proximal part. Mating males had lower body weight (-5%) and smaller wings (-3%) compared to chasing males at both locations. Our results challenge the general theory that stress-induced lower body weight and higher asymmetry diminish short-term mating success. Instead, they underscore the ecological importance of population-specific factors, like female availability or male-male competition, and environmental conditions that shape mating dynamics. Our results suggest that anthropogenic stressors in aquatic habitats have implications for terrestrial food webs by affecting the reproductive interactions of adult amphibiotic top predators, such as damselflies. This highlights the need to consider cross-ecosystem carry-over effects in ecological monitoring and conservation strategies." (Authors)] Address: Ken M. Mauser, K.M., iES Landau, Inst. for Environ. Sci., Univ. Kaiserslautern-Landau, Landau, Germany. Email: ken.mauser@rptu.de

24853. Mekhlif, A.F. (2025): Review of complementary impact of using aquatic insect predators in mosquito biocontrol.

Journal of Applied Entomologist 5(1): 33-40. (in English) ["Mosquitoes are the most important blood-sucking arthropods of their annoyance and transmission pathogens of many serious and fatal human diseases, accounting for more than 17% of all infectious diseases. Globalization and climate changes have enhanced the dispersal of native mosquito species and endemic diseases and invasive new habitats. Mosquitoes have a complex life cycle, in which adults are terrestrial and select aquatic habitats for egg oviposition and immatures development. Culex spp. differ from Anophelin and Aedes species in that they can grow in brackish or mild organic polluted water. For mosquito control, the aquatic stages can be more easily controlled than flying adult insect pests. In recent decades, insect pest control has focused on biological control, which is an ecologically acceptable and practical alternative to insecticides in mosquito vector control. Predaceous insects are more efficient in pest control. Hematophagous mosquito populations in many temporary and permanent water resources can be controlled by laboratory cultivation and maintenance of the entomophagous insects that naturally inhabit aquatic ecosystems or introduction from other fauna. Also, the nonconsumptive effect of the predators reduces the vector fitness and alters the egg oviposition behavior of the gravid females. Understanding the mosquito (prey)-predator relationship and cohabitation can establish and choose effective mosquito predators. Today, there are applications of mosquito predators, besides promising others in mosquito vectors of borne diseases control programs. Most of these aquatic predators have been identified as mainly belonging to the following orders: Diptera (Culicidae, Chaoboridae, Ephydridae, and Chirinomidae), Coleoptera (Dytiscidae and Hydrophilidae), Hemiptera (Notonectidae, Coroxidae, Nepidae, Belostomatidae), and species from the suborders Anisoptera and Zygoptera of the Odonata order. This review reports the most applied and promising insect mosquito predators by their predation capacity and surplus killing. Also gives scope for oviposition avoidance by females as one strategy in mosquito control." (Authors) Odonata are treated at pages 37-38.] Address: Mekhlif, A.F., Dept of Biology, College of Education for Pure Science, Mosul University, Mosul, Iraq

24854. Melhanah, S.R.T.; Budi, M.R.; Agus, D.A.; Asie, N.Y.; Dewi, S.; Pandriyani; Sinaga, J. (2025): Abundance and diversity of spiders and dragonflies during cyaenne pepper cultivation in peatland of Palangka Raya City. Russian Journal of Agricultural and Socio-Economic Sciences 5(161): 102-107. (in English) [Indonesian province of Central Kalimantan, Borneo; "Kalampangan Village in Palangka Raya City is one of the centers for Cayenne pepper production. Farmers often use chemical insecticides to control pests. However, the continuous use of chemical insecticides reduces the population of natural pest enemies, such as spiders and dragonflies. Preserving these natural enemies is necessary to suppress pest populations. This study aims to determine the abundance and diversity of spiders and dragonflies in Cayenne pepper cultivation on peatland. The research was conducted from March to May 2023 in Palangka Raya City. The study took place in a 4,800 m² Cayenne pepper field, divided into four trial plots, each measuring 30 × 40 m². Observations were made at 3–8 Weeks After Planting (WAP). Data were collected using purposive sampling with sweep nets and hand-sorting methods. The biodiversity of spiders and dragonflies was analyzed using the Shannon-Weaver Diversity Index (H'). The results showed a total of 529 individuals, consisting of 329 spiders (4 species) and 200 dragonflies (Brachythemis contaminata, Crocothemis. servilia, Orthetrum sabina, Rhyothemis phyllis, Agriocnemis pygmaea, Ceriagrion tenellum [sic]). The diversity index (H') for spiders and dragonflies was in the moderate category (1.57–1.87), while the dominance index (D) was in the low category (0.21–0.28)." (Authors)] Address: Melhanah, S., Fac. Agriculture, Univ.of Palangka Raya, Indonesia. Email: melhanah@yahoo.co.id

24855. Mendonça, A.J.E.; Datto-Liberato, F.H.; Guillermo-Ferreira, R. (2025): Description of the last instar larva of Mnesarete guttifera (Selys, 1873) (Odonata: Calopterygidae). Zootaxa 5647(4): 395-398. (in English) ["Here, we describe the last instar larva of M. guttifera. During an expedition in 2018, we collected the larvae of M. guttifera in a stream called Rio do Peixe, right next to the Cachoeira do Rolador (waterfall) located at the Serra da Canastra National Park (SCNP) in Minas Gerais state, Southeastern Brazil (20°15'28"S, 46°24'36"W, 514m). We placed each individual in plastic vials until their complete emergence. The adults and their exuviae were preserved in 80% alcohol and deposited in the LESTES collection at the Federal University of Triângulo Mineiro, Uberaba, Minas Gerais, Brazil." (Authors)] Address: Guillermo-Ferreira, R., Lestes Lab, Centre of Entomology & Experimental Biology, Federal University of Triângulo Mineiro, Uberaba, MG, Brazil. Email: rhainer.ferreira@uftm.edu.br

24856. Merien, M. (2025): Carové's Giant Dragonfly: What's in a name? The Weta. 59: 18-22. (in English) ["Uropetala carovei is endemic to Aotearoa New Zealand. Commonly called the Bush Giant Dragonfly or Carové's Giant Dragonfly, it is New Zealand's largest dragonfly. But where does the name Carové come from, for which the dragonfly is named, both in the species name and common name? This is the tale of multiple individuals, countries and one name." (Author)] Address: Merien, Morgane, Canterbury Museum, Christchurch, New Zealand. Email: morganemerien@gmail.com

24857. Michalska, M.; Weryński, L.; Blazejowski, B. (2025): I like that boulder, that is a nice boulder – new fossils from Owadów-Brzezinki. Przeglad Geologiczny 73(6): 590-595. (in Polish, with English summary) ["For over a decade, the Late Jurassic palaeontological site Owadów-Brzezinki has yielded numerous fossils, including species new to science. Although research results are published regularly, some groups and taxa discovered have yet to be described and published. Here, we present the latest finds, focusing on groups currently being described. Initial detailed research on fossil insects has confirmed the presence of three orders: Coleoptera, Odonata and Orthoptera. The current interpretation of insect taphonomy and the challenges involved in searching for fossil insects are briefly discussed. Previously undescribed vertebrate fossils include the jaw apparatuses of Pycnodontiformes fish. Recently, an almost complete skeleton of a primitive teleost and three series of actinopterygian vertebrae with associated bones were found. Among new reptile finds, an almost completely preserved turtle carapace has been identified, though its systematic position remains unresolved. Plesiosaurian material was previously represented only by isolated teeth, but recent results of the fieldwork yielded section of axial skeleton and associated limb elements, thus representing the first postcranial skeleton of a plesiosaur from the site. These findings underscore the significant scientific potential of the Owadów-Brzezinki site and highlight its close relationship with similar Late Jurassic faunal assemblages from Great Britain." (Authors) Fig. 2. demonstrates a dragonfly wing from Late Jurassic (Tithonian), Kcynia Formation (Unit III).] Address: Michalska, Monika, Instytut Paleobiologii PAN, ul. Twarda 51/55; 00–818 Warszawa, Poland. Email: m.michalska@twarda.pan.pl

24858. Michel, A.; Lebrun, J.D.; Chaumont, C.; Girondin, M.; Tournebize, J.; Archaimbault, V.; Jeliazkov, A. (2025): Benthic

macroinvertebrate diversity and function in an agricultural constructed wetland affected by agrochemical pressure (Seine-et-Marne, France). Environmental Science and Pollution Research 32(7): 3679-3697. (in English) ["Constructed wetlands (CWs), originally designed to mitigate chemical water pollution, often host noticeable aquatic fauna. However, little is known about the impact of the contaminants circulating within CWs on this local fauna, questioning the role of CWs as ecological refuges or traps. We aimed to assess the potential of an agricultural CWs in northern France to act as an ecological trap for aquatic fauna [including Odonata]and the potential consequences on wetland functioning. We made faunistic inventories of benthic macroinvertebrates, using litterbags, from March to June 2022 in two zones within the CWs with contrasting levels of agrochemical contamination and in one unpolluted comparison pond. We calculated community diversity and sensitivity indices (e.g., species at risk, SPEARpesticides index). We measured wetland functioning by monitoring the leaf-litter breakdown. Results showed that pesticide fluxes were related to community composition changes and had negative effects on taxonomic diversity (Shannon index) and functional traits (shredder/scraper feeding mode). The negative link between pesticides and the leaf-litter breakdown was less clear, mainly because of the high level of integration of this response. This study reveals that CWs under agrochemical pressure may act as potential ecological traps for benthic macroinvertebrates and highlights the relevance of studying this group as an early-warning indicator of chemical risk in nature-based solutions." (Authors)] Address: Michel, A., University Paris-Saclay, INRAE, HYCAR, 1 Rue Pierre-Gilles de Gennes, 10030, 92761, Antony Cedex, CS, France

24859. Mikolajczuk, P.; Góral, N. (2025): Stwierdzenie oczobarwnicy jeziornej Erythromma lindenii (Selys 1840) (Odonata: Coenagrionidae) w Poznaniu. A record of goblet-marked damselfly Erythromma lindenii (Selys 1840) (Odonata: Coenagrionidae) from the city of Poznan (W Poland). Odonatrix 218: 1-4. (in Polish, with English summary) ["This note discusses the occurrence of E. lindenii at Lake Kierskie in Poznan in 2024, which, together with an earlier observation from Lake Bninskie in 2018, may indicate an eastward expansion of the species in Poland." (Authors)] Address: Mikolajczuk, P., Sekcja Odonatologiczna Polskiego Towarzystwa Entomologicznego, Uniw. Marii Curie-Sklodowskiej, Instytut Nauk Biologicznych, Katedra Zoologii i Ochrony Przyrody, ul. Akademicka 19, 20-033 Lublin, Poland. Email: gugapm@wp.pl

24860. Monnerat, C. (2025): First record of Brachytron pratense and Isoaeschna isoceles on the island of Evia, Greece (2025). Libellula 44(1/2): 131-136. (in English, with German summary) ["In the first decade of April 2024, several males of Brachytron pratense and one to two males of Isoaeschna isoceles (formerly known as Aeshna isosceles) were recorded on the island of Evia at Límni Distos and in the immediate vicinity. The records of both species made during little prospected periods are an addition to the checklist of the island. The adult record on 8 April 2024 of I. isoceles being the earliest for Greece and the abundance of mature B. pratense illustrates an emergence as early as the second or third decade of March." (Author)] Address: Monnerat, C., Info fauna, Avenue de Bellevaux 51, 2000 Neuchâtel, Switzerland. Email: christian.monnerat@infofauna.ch

24861. Mooduto, M.I.; Syahribulan (2025): Biodiversity and seasonal abundance of dragonflies (Order: Odonata) in the urban areas of Makassar city and Gowa regency, South Sulawesi, Indonesia. Journal of Tropical Biodiversity and Biotechnology 10(3), p. jtbb16786. doi: 10.22146/jtbb.16786.: 22 pp. (in English) ["Odonata at the nymph stage, act as bioindicators of water quality, and at the adult stage, they act as predators of small insects. Seasonal changes and environmental issues in urban areas can affect the existence of dragonfly populations. This study aims to identify species diversity, abundance, similarity, and the relationship between biotic vegetation characteristics and abiotic seasonal elements. The study was conducted in freshwater habitats, including running water and stagnant water habitats, in Makassar City and Gowa Regency during the dry and rainy seasons. Data collection was conducted using the Visual Encounter Survey (VES) method and specimen collection using insect nets. The results showed 12 species from 2 families, 11 species from Makassar City, and 6 species from Gowa Regency. The Shannon-Wiener diversity index showed that the dry season's diversity value is H' = 1.39 and the rainy season's value is H' = 1.72. The abundance of dragonflies showed that the species Agriocnemis pygmaea and Brachythemis contaminata were the most frequently observed species. Additionally, one particular research site shared the same species across six different aquatic environments. There was a correlation between the abundance of dragonflies in each research location and the variation of abiotic variables. Differences in vegetation composition also affected the structure of the dragonfly community." (Authors)] Address: Syahribulan, Dept Biol., Fac. Mathematics & Natural Sci., Universitas Hasanuddin. Jl. Perintis Kemerdekaan Km. 10, Makassar 90245, South Sulawesi, Indonesia. Email: syahribulan@unhas.ac.id

24862. Moser, M.; Krogmann, L.; Wanke, D. (2025): Some insects are more equal than others: A comparison of popular large language model chatbots' treatment of different insect groups. Integrative Conservation 4(2): 254-267. (in English) ["Bees and butterflies are generally viewed positively in society, whereas other insects, such as wasps or flies, are often underappreciated despite their essential ecological roles. As biodiversity loss continues to pose a major challenge for humankind, it necessitates a re-evaluation of these biases to support the protection of biodiversity as a whole. With large language model (LLM) chatbots becoming increasingly integrated into daily life for information dissemination and education purposes, understanding their inherent biases is vital. In this study, we tested 10 popular Western LLM chatbots using simple prompts to assess how they portray bees and wasps. Butterflies, moths, flies, and mosquitoes were also included for comparison to evaluate broader societal perceptions. Our results show that bees and butterflies are indeed depicted positively by the LLM chatbots and moths somewhat positively, while wasps, flies, and mosquitoes are associated with more negative portrayals. We found that LLMs mirror prevailing human biases toward different insect groups and their perceived importance in nature conservation. Moreover, we demonstrate that LLM chatbots tend to oversimplify insect diversity by predominantly restricting “bees” to honeybees and “wasps” to yellowjackets, thereby neglecting the broader biodiversity that includes wild bees and parasitoid wasps. The chatbots also appeared to favor Nearctic species when recommending conservation priorities. By highlighting these biases and discussing their implications, our research underscores the importance of nuanced science communication and expert involvement in decision-making for nature conservation. Addressing such biases is essential to prevent the reinforcement of public misconceptions and to promote the protection of ecologically indispensable yet less popular insect groups." (Authors) We received lists of 10 insect groups from each LLM chatbot, which were classified using the scoring system described above. The points for each insect group were then totaled. Butterflies scored the highest with 96 points, followed closely by

bees with 90 points. Dragonflies ranked third with 74 points. Other groups included ants (64 points), moths (62 points), beetles (60 points), damselflies (54 points), grasshoppers (41 points), and crickets (30 points).] Address: Moser, Marina, State Museum of Natural History Stuttgart, Stuttgart, Germany. Email: marina.moser@smns-bw.de

24863. Mueller, A.S.; Demers-Potvin, A.V.; Larsson, H.C.E. (2025): New family of fossil dragonfly (Odonata, Cavilabiata) from the late Cretaceous (Campanian) Dinosaur Park Formation, Alberta, Canada. Canadian Journal of Earth Sciences 62(8): 1373–1381. (in English) ["A new dragonfly species, Cordualadensa acorni gen. et sp. nov., assigned to Cordualadensidae fam. nov. (Odonata, Cavilabiata), is described from Dinosaur Provincial Park (DPP). The taxon represents the oldest known North American fossil taxon within Cavilabiata and the only Mesozoic dragonfly for Canada. This discovery provides a missing link in the evolutionary transition from the early Cretaceous Cavilabiata to extant families and introduces one of the few dragonflies known from the late Cretaceous fossil record. The specimen described herein also confirms that insect impression fossils can be preserved in the Dinosaur Park Formation (DPF) and suggests that the diversity of the entomofauna preserved in DPP's fossil assemblage is only beginning to be fully appreciated. The presence of dragonflies in the DPF also supports the hypothesis that Campanian Alberta had a sufficiently high insect biomass to support insect predators at higher trophic levels."] Address: Mueller, A.S., Dept of Biology, McGill University, Montréal, QC, Canada. Email: andre.mueller@mail.mcgill.ca

24864. Müller, O.; Brochard, C.; Ikemeyer, D.; Snegovaya, N.; Lemke, M.; Schneider, T. (2025): Description of the larvae and exuviae of Thecagaster charpentieri (Kolenati, 1846) and Thecagaster brevistigma (Selys, 1854) with a re-description of the exuviae of Thecagaster coronata (Morton, 1916) (Odonata: Cordulegastridae). Zootaxa 5653(2): 211-228. (in English) ["The larvae and exuviae of T. charpentieri are described and depicted. Larval stages collected in Georgia was the basis for the additional description of an early larval stage of this species. A leg of the larvae was used for molecular genetic verification. Further exuviae of T. charpentieri were collected in Azerbaijan. Morphological comparisons were conducted between the exuviae of T. charpentieri and those of the larvae and exuviae described so far of the "bidentata group" now assembled together in the restored genus Thecagaster Selys, 1854. The exuviae of T. coronata was re-described taking into account an earlier description by Seidenbusch et al. (2015). In addition, the exuvia of the closely related T. brevistigma is described and compared to T. coronata." (Authors)] Address: Müller, O., Birkenweg 6d, 15306 Libbenichen, Germany. Email: mueller.ole@gmail.com

24865. Muhammad, S.I.; Ringim, A.S.; Abubakar, H.M.; Abdullahi, H.A.: Jalo, M.I.; Abdul, I.D.; Salami, K.D.; Abdulazeez, K.A.; Miga, H.I.; Mamman, B.Y.; Dangora, I.I.; Sufi, D.A.; Umar, D.A.; Musa, D.M.; Magaji, A.S.; Kazeh, N.W.; Ismail, D.; Bala, M.M.; Chiroma, S.; Dogara, M.M. (2025): Conservation Status of Avian and Fauna in the Hadejia Wetlands National Park: A Ramsar Site Assessment. Scientific African 28, e02742: 12 pp. (in English) ["The Hadejia Wetlands National Park (HWNP), a crucial Ramsar site serves as an essential wintering ground for numerous bird species. This study, conducted from June 2023 to June 2024, utilized a combination of direct and indirect approaches and ArcGIS, to provide the most comprehensive data on avian and other fauna of the HWNP. We recorded a total of 80,399 individual birds representing 246 species. ... Furthermore, we identified 49 butterfly species, ...15 reptile species, and 13 mammal species. ... Additionally, the study documented 257 individuals of 10 dragonfly species. The three most abundant species of dragonflies were Brachythemis impartita with 159 individuals observed in 17 encounters, Crocothemis servilia with 29 individuals in five encounters, and Orthetrum azureum with 19 individuals in seven encounters" (Authors)] Address: Muhammad, S.I., Centre for Arid Zone & Wetlands Ecol., Federal Univ. Dutse, P.M.B. 7156, Jigawa State, Nigeria. Email: sulaiman.muhd@yahoo.com

24866. Muharani, S.; Yulita, R.; Nugraha, F.A.D.; Satria, R. (2025): Preliminary checklist of dragonfly (Odonata) in Patotogat Island, Mentawai, West Sumatra, through photographic approach. Jurnal Biologi Universitas Andalas 13(1): 22-28. (in Indonesian, with English summary) [Teinobasis ruficollis, Aethriamanta gracilis, Agrionoptera insignis, Diplacodes trivialis, Neurothemis fluctuans, Orchithemis pulcherrima] Address: Satria, R., Pusat Riset Keanekaragaman Hayati Sumatera, Departemen Biologi, Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Negeri Padang, Indonesia. Email: rijalsatria@yahoo.co.id

24867. Murail, C.; Baude, M.; Bergerot, B.; Geslin, B.; Legay, N.; Villalta, I.; Greulich, S. (2025): From stream to bloom: Exploring the potential role of aquatic insects for pollination in wetland environments. Journal of Applied Entomology 149(5): 711-724. (in English) ["The substantial loss of insects we are experiencing today has been highlighted all over the world. There is a growing concern about the global decline of pollinators and its impact on terrestrial and agricultural ecosystems, but the focus of scientists towards bees remains the rule. Therefore, the role of other insect taxa in pollination is still overlooked. Our review focused on some of these neglected pollinating taxa, the winged aquatic insects, i.e., insects with an aquatic larval stage such as Ephemeroptera, Trichoptera, Plecoptera (ETP), Megaloptera and some aquatic Diptera. We first documented the visitors of aquatic and wetland flowering plants, anticipating a greater presence of aquatic insects on these plants compared to terrestrial pollinators. Secondly, we documented plant visits, pollen found in gut contents and pollen transfers performed by aquatic insects. Our results revealed a surprisingly low proportion of aquatic insects visiting both aquatic and wetland plants, suggesting a potential gap in the literature. The scarcity of articles dedicated to pollen transfer by aquatic insects also indicates that they are fewly considered in ecological studies. While the role of aquatic insects in pollination is not well documented in the literature, records of their flower visits and pollen found on them or in their gut contents do exist and are promising clues to consider them as effective pollinators. Future research is needed to provide new insights into the importance of winged aquatic insects for the reproductive success of plants, which could also be an argument for the importance of wetland conservation. ... The ecology of Odonata is better known for both aquatic and terrestrial phases (Del-Claro and Guillermo 2019). We reported several Odonata in the course of our survey. Given the plant species where Odonata have been recorded, with very large floating flowers (waterlilies), it is likely that dragonflies and damselflies just perch on flowers as a support, with no particular purpose to visit them. In addition, their impact on pollination is probably more detrimental than beneficial, as they are known to predate valuable pollinators such as bees (Knight et al. 2005). In summary, Odonata appear to be less good candidates for pollination, justifying a more specific interest in ETP, Megaloptera and Diptera in our following discussion." (Authors)] Address: Murail, Cassandre, Interdisciplinary Research Unit CItés, TERritoires, Environnement et Sociétés (CNRS UMR 7324 CITERES), Univ.

of Tours, Tours, France. Email: cassandre.murail-zimmermann-@univ-tours.fr

24868. Nakagawa, H.; Mori, T. (2025): Mesoclimate scale effects of river intermittency on aquatic insects in Seto Inland Sea watersheds, Western Japan. Limnology 26: 19-30. (in English) ["The responses of assemblages and ecosystems to river intermittency are often considered on large spatial scales, such as those associated with the Köppen climate classification. However, river intermittency may naturally occur even in humid regions, and the effects may differ from those where intermittency occurs throughout the area. This study aimed to examine the differences in taxonomic and trait composition of aquatic insects between intermittent rivers in the Seto Inland Sea watersheds and neighboring humid-temperate rivers in Japan using national census data. While the climate in the most part of the Japanese Archipelago is categorized as humid-temperate, and rivers are usually perennial, local climate in the Seto Inland Sea watersheds has low summer precipitation compared with that in neighboring regions, thereby resulting in river intermittency. Consistent with the previous studies in the regions where rivers are intermittent on a large spatial scale, we observed that aquatic insects with multivoltinism and/or aerial respiration notably tolerated river intermittency. In contrast, the aquatic insect fauna in Japanese intermittent rivers represented subsets of those in the humid-temperate rivers, although previous studies such in Mediterranean regions have reported high endemism and species diversity in intermittent rivers. These results highlight the importance of exploring the role of river intermittency on small to medium spatial scales, as well as on large scales, to project effects of ongoing and future climate changes on species diversity…. Although most taxa, including those with drought-resistant traits, tended to be distributed in humidtemperate rivers as frequently as or more frequently than in intermittent rivers, several taxa with the reproductive trait of multivoltinity, such as Odonata species (Ceriagrion spp. and Aciagrion spp.), and those with aerial respiration, such as Hemipteran species (Ranatra unicolor), were characteristic to intermittent rivers." (Authors)] Address: Nakagawa, H., Aqua Restoration Research Center, Public Works Research Institute, Kasada.Machi, Kawashima, Kakamigahara, Gifu 501.6021, Japan. Email: hikarunakagawa-@icloud.com

24869. Mursali, I. Z., Lamangantjo, C. J.; Baderan, D.W.K.; Hamidun, M.S.; Zakaria, Z. (2025): Insect species diversity in oil palm plantation area Wonosari Sub-District Boalemo District. Jurnal Biologi Tropis 25(3): 2424-2429. (in Indonesian, with English summary) ["Each habitat has a drastically varied species composition as a result of oil palm plantations filtering out natural forest wildlife, leaving only a limited range of taxa to survive. Among the animal groups with the greatest diversity are insects. The purpose of this study was to determine the diversity of flying insects found in the oil palm plantation area of Wonosari District, Boalemo Regency. The method used in this research is exploration with three observation stations. Station I is adjacent to residential areas, station II is in the oil palm plantation area and station III is adjacent to residents' plantations. Sampling using the trap trap technique using the sweeping net method (insect net) which is commonly used for collecting flying insects. Sample identification in the Biology laboratory, Faculty of Mathematics and Natural Sciences, Gorontalo State University. The data obtained were analyzed descriptively. The results in this study obtained 12 species included in 5 orders and 8 families, namely … and Family Libellulidae (Neurothemis terminata) with a total of 24 individuals. Of all the flying insects found, the Diversity Index was 2.362, which indicates that diversity is classified as moderate." (Authors)] Address: Mursali, I.Z., Dept of Biology, Faculty of Mathematics & Science, Gorontalo State University, Indonesia. Email: intanmursali90@gmail.com

24870. Nederstigt, T.A.P.; Frische, R.K.M.; Ouwehand, J.; Vijver, M.G. (2ß25): Impacts of a nano-enabled pesticide formulation ($nTiO_2$-coated carbendazim) and its constituents on the freshwater snail Lymnaea stagnalis & damselfly Ischnura elegans assessed via in-situ bioassays. (in English) ["Novel pesticidal products in which active substances are delivered via nanoscale carrier systems have been suggested to offer functional and environmental benefits over conventional pesticide formulations. Nevertheless, non-target impacts associated with such nano-enabled pesticides remain largely unexplored. The current study compares effects from a nano-TiO2-coated formulation of carbendazim (i.e., $nTiO_2$-coated carbendazim) with those of its active substance (i.e., the fungicide carbendazim), coating material (i.e., nanoscale TiO_2), and a treatment in which the latter two are combined, by means of in-situ bioassays. Bioassays focused on Lymnaea stagnalis and larvae of Ischnura elegans, two invertebrate species representing different niches. For L. stagnalis, effects on survival, growth, and feeding were assessed over 29 days, and resource utilization rates of microbial communities present on its provided food source were analyzed to determine feeding-related indirect effects. For I. elegans, survival, feeding, emergence (i.e., development into imagines), and body size upon emergence were assessed over 57 days. Mortality rates of L. stagnalis increased by ~40 % in nTiO2 and ~50 % in combined (i.e., carbendazim & $nTiO_2$) treatments applied at environmentally realistic concentrations, but insignificantly in $nTiO_2$-coated carbendazim treatments. We argue that differences in this regard are likely to have arisen from contrasting photocatalytic activity of the nTiO2 utilized in respective treatments. Microbial community carbon utilization profiles exhibited minimal differences between treatments. I. elegans survival, feeding and growth rates were unaffected, but a slight decrease in emergence time was observed across treatments. The findings of the current study highlight that photocatalytic properties of nanomaterials can be an important factor for consideration regarding non-target impacts of nano-enabled products with agricultural applications."] Address: Nederstigt, T.A.P., Institute of Environmental Sciences (CML), Leiden Univ., Leiden, The Netherlands. Email: t.a.p.nederstigt@cml.leiden-univ.nl

24871. Nicolai, B. (2025): Neubesiedlung und Phänologie von Sympecma fusca an einem Erdfall-Weiher im nördlichen Harzvorland 2024 (Odonata: Lestidae). Libellula 44(1/2): 29-40. (in German, with English summary) [" New colonisation and phenology of Sympecma fusca at a sinkhole lake in the Northern Harz Foreland, Germany 2024 (Odonata: Lestidae) – Following the reappearance of the previously dried-up sinkhole lake Leth near Halberstadt in the winter of 2023/24, a rich odonate fauna developed over the season, with evidence of reproduction for at least 20 species. This included colonisation by Sympecma fusca. After ovipositions in April and early May, a large number of larvae developed, which emerged as early as mid-June. Emergence was observed between 18 June and 12 August 2024, with more than 50% of the population having emerged by mid-July. On average, this is around two weeks earlier than previously reported. At temperatures of around 30°C, individual emerging took less than 30 minutes. The seasonally early emergence is attributed to the favourable microclimatic conditions with higher temperatures. The high emergence numbers could be due to low optimal food supply predation pressure on Sympecma larvae during their development." (Author)] Address: Nicolai, B., Herbingstr. 20,

38820 Halberstadt, Germany. Email: nicolaibea@gmx.de

24872. Nurdia Maulia, P.; Hasanuddin, F.; Nikmat Syarifuddin, R. (2025): Exploration of natural enemies in environmentally friendly rice cultivation in Carawali Village, Sidenreng Rappang Regency. Agricola 15(2): 193-200. (in Bahasa Indonesia, with English summary) ["Abstract This study aims to explore the presence of natural enemies in environmentally friendly rice (Oryza sativa L.) plantations in Carawali Village, Sidenreng Rappang Regency. This study used two sampling methods, namely absolute and relative methods, to identify the types of predators and parasitoids that play a role in natural pest control. Four types of natural enemies found include ladybugs (Epilachina), Paiderus (Paiderus sp.), spiders (Araneus diadematus), and dragonflies (Libellago lineata), which have an important role in maintaining the balance of agricultural ecosystems. The results of observations showed that spiders were the dominant predators with a total of 34 individuals, followed by dragonflies with 14 individuals, ladybugs with 12 individuals, and Paiderus with 8 individuals. These quantitative data were analyzed using the Shannon diversity index to determine the level of species diversity and the Simpson index to measure species dominance. Based on the results of the analysis, the diversity of natural enemies in rice plantations at the research location was included in the moderate category, indicating relatively good ecosystem stability. This research provides an important contribution to environmentally friendly biological control-based pest management, which is expected to support sustainable agriculture and reduce dependence on chemical pesticides." (Authors)] Address: Nurdia Maulia, P., Universitas Muhammadiyah Sidenreng Rappang, Sidenreng Rappang, Indonesia. Email: Nurdia880@gmail.com

24873. Nyambe, N. (2025): Benthic macroinvertebrates as ecological health indicators in the Luapula basin for potential inter-basin water transfer to the Kafue basin. MSc thesis, School of Mines, Dept of Geology, Integrated Water Resources Management, Univ. of Zambia. 160 pp. (in English) ["Water scarcity is a global challenge, affecting sustainable development, human well-being and ecosystem health. In Zambia, the Kafue River Basin, an important economic and ecological resource, faces growing water demand that exceeds its natural supply and supply capacity, leading to resource allocation conflicts. In response, the government is considering inter-basin water transfers from the resource-abundant Luapula River Basin. However, such transfers could pose significant environmental risks to both basins. This study evaluated the ecological health of rivers and streams in the Luapula Basin using benthic macroinvertebrate assemblages and water quality parameters. The Luapula Basin was divided into three hydro-environmental zones using remote sensing techniques. Macroinvertebrate samples were collected from designated sites across these zones, with in situ measurements of physicochemical variables. Laboratory analyses of water samples followed APHA (1998) standards. Similarity Percentage (SIMPER) was used to assess macroinvertebrate compositional heterogeneity, the Zambia Invertebrate Scoring System (ZISS) and Shannon Diversity Index was used to evaluate river health and biodiversity and Canonical Correspondence Analysis (CCA) was employed to determine how altitude and water quality influence macroinvertebrate distribution. Seasonal and zonal variations in biodiversity, stream health and water quality were tested using multivariate and univariate ANOVA, while Pearson correlation analyses explored relationships between biodiversity attributes and health indicators. Pollution-tolerant taxa, such as Decapoda, Odonata, Gastropoda and Hemiptera, dominated the macroinvertebrate community, while sensitive Ephemeroptera families were present seasonally, especially during the wet season. SIMPER analysis indicated spatial differentiation among zones, with dry and wet season dissimilarities of 56.67% and 63.33%, respectively. Most sites were classified as moderately impaired based on ZISS scores, with a few showing major seasonal impairments. MANOVA revealed significant inter-zone differences in biodiversity and health metrics ($p < 0.05$), driven by ZISS scores ($p < 0.05$) and taxa richness ($p < 0.01$). Taxa richness, ZISS scores and Shannon diversity were positively correlated, while evenness correlated negatively. Functional feeding group (FFG) analysis indicated a heterotrophic system dominated by gathering collectors, predators and scrapers, with limited riparian-shredder linkages and a prevalence of polyvoltine prey populations. Water quality showed significant seasonal variations (MANOVA: $p < 0.001$), with ANOVA identifying turbidity, hardness, calcium, magnesium, chloride, potassium and faecal coliforms as key drivers. The water quality index highlighted iron, turbidity and faecal coliforms as major contaminants, with seasonal improvements varying by zone. CCA linked dry-season macroinvertebrate assemblages to altitude, iron, sodium, chloride, potassium, turbidity, magnesium, and hardness. In contrast, wet-season assemblages were shaped by altitude, faecal coliforms, pH, potassium, conductivity, and dissolved solids. The study concludes that the Luapula Basin experiences moderate ecological impairment, with seasonal water quality fluctuations driven by natural and anthropogenic factors. Planned water transfers risk further ecological degradation, emphasising the need for comprehensive hydrological and ecological assessments to guide sustainable resource management." Taxa including Odonata are treated at family level.] Address: https://dspace.unza.zm/server/api/core/bitstreams/a81608e4-38fc-4c67-9bd9-f2f6b53f251f/content

24874. Ohata, F.; Fukuoka, M.; Okamura, Y.; Nakajima, K. (2025): Aquatic organisms (benthos and fishes) and biological water quality assessment in streams in Nagoya City, Aichi Prefecture, Japan. Bulletin of Nagoya Biodiversity Center 12: 37-57. (in Japanese, with English summary) ["We conducted surveys of benthos and fish at 25 sites in 15 major rivers in Nagoya City. As a result, 146 taxon of benthos [Atrocalopteryx atrata, Ischnura sp., Paracercion sp., Anax parthenope julius, Anisogomphus maacki, Davidius sp., Melligomphus viridicostus, Shaogomphus postocularis, Nihonogomphus viridis, Sieboldius albardae, Macromia amphigena amphigena, Orthetrum albistylum speciosum, O. triangulare melania, Pseudothemis zonata] and 38 taxon of fish, including unidentified species, were documented. Biological water quality assessments were performed based on the results of the benthos surveys. Four methods were employed for this assessment: the indicator species method, the Japanese version of average score method, the EPT species count method, and the Zelinca-Marvan method. The outcomes of these methods were compared to evaluate consistency and accuracy. Additionally, a comparison between the results of these biological water quality assessments and those from existing water quality surveys revealed discrepancies in some locations, where biological water quality assessment scores were lower than those derived from chemical evaluations. Factors contributing to these discrepancies were including variations in sediment composition, water depth, current velocity, riparian vegetation, and water level fluctuations influenced by tidal effects." (Authors)] Address: Ohata, F., Nagoya City Institute for Environmental Sciences, 5-16-8 Toyoda, Minami-ku, Nagoya, Aichi 457-0841, Japan. Email ohata@ncies.net

24875. Okude, G.; Ogihara, M.H.; Moriyama, M.; Yamagishi, T.; Yamamoto, H.; Fukatsu, T.; Futahashi, R. (2025): Identification of ecdysteroids and ecdysteroidogenic genes in dragonflies

and damselflies. Scientific Reports volume 15, 21971: 12 pp. (in English) ["Ecdysteroids are critical in regulating biological processes such as ecdysis, metamorphosis, embryogenesis, and reproduction in insects. Nevertheless, the ecdysteroid repertoire and expression patterns of their synthesis genes in Odonata, which belong to the most-ancestral winged insect group, have remained elusive. In this study, we examined the ecdysteroid profile of eight Odonata species [Lestes temporalis, Mnais costalis, Ischnura senegalensis, Asiagomphus melaenops, Sympetrum infuscatum, S. frequens, Pseudothemis zonata, Orthetrum albistylum] and the ecdysteroid fluctuation during metamorphosis in I. senegalensis and P. zonata. We found that ecdysone and 20-hydroxyecdysone (20E) titers corresponded to the progression of ecdysis in the penultimate nymphal instar and metamorphosis in the final nymphal instar, whereas 7-dehydrocholesterol was consistently present in the hemolymph of all the examined species and developmental stages. Considering that a higher amount of 20E was detected than ecdysone, 20E is important for inducing ecdysis and metamorphosis in Odonata, like other insects. We also confirmed that the majority of ecdysteroidogenic genes were conserved in Odonata, and their stage- and region-specific expression patterns were examined in I. senegalensis and P. zonata. Unexpectedly, most ecdysteroidogenic genes were expressed in a variety of tissues. Our study provides insights into the evolution and diversification of the ecdysteroidogenic pathway among insects." (Authors)] Address: Okude, G., Dept Biol. Sciences, Graduate School of Science, Univ. of Tokyo, Tokyo 113-0033, Japan. Email: gentaokude@gmail.com;

24876. Olthoff, M.; Ikemeyer, D. (2025): Ausbreitung von Leucorrhinia pectoralis in Westfalen (Odonata: Libellulidae). Libellula 44(1/2): 99-114. (in German, with English summary). "Expansion of L. pectoralis in Westphalia, Germany (Odonata: Libellulidae) – In the period 2019–2024, a survey of L. pectoralis was carried out in 18 bog and heathland areas in the Münsterland region. The species was found in 16 areas with ten indigenous and four potentially indigenous populations. In the nature reserves Burlo- Vardingholter Venn (51–100 individuals) and Eper Venn (21–50 individuals), records were made on a scale previously not known in North Rhine-Westphalia. Until now, L. pectoralis was regarded as a very rare species in this federal state with only a few records. The study confirms a spread and increasing establishment of the species. The rise in temperature due to climate change, which favours the thermophilous species, is seen as a major reason for this. The species also benefits from nature conservation measures such as the rewetting of bogs or the desludging of heathland ponds. Diffuse nutrient inputs into oligotrophic bogs and the associated change in vegetation structure also appear to be beneficial to the species. It is necessary to check whether the NATURA 2000 network in its current form does justice to the protection of this Annex II species in North Rhine-Westphalia. The majority of populations were found in Special Areas of Conservation (SAC), what can generally be regarded as a success of the designation of these protected areas. However, only a small proportion of these SAC are designated for the protection of L. pectoralis. A subsequent registration of the species within existing SAC and thus consideration of the species in the context of future management is recommended." (Authors) Address: Olthoff, M., Naturschutzzentrum Kreis Coesfeld e.V., Am Hagenbach 11, 48301 Nottuln-Darup, Germany. Email: matthias.olthoff@naturschutzzentrum-coesfeld.de

24877. Ono, T. (2025): Why was Nannophya pygmaea found in the riverbed environment instead wetlands during the Edo period? Bulletin of Nagoya Biodiversity Center 12: 165-171. (in Japanese, with English title) ["The habitats of N. pygmaea are scattered throughout the Tokai region (Japan), but most of them are shallow marshes recharged by spring water that is unique to this region. Records of N. pygmaea appear in documents from the Edo period, but all of these descriptions refer to the "riverside of the Yata River," which seems to be a slightly different location from the marsh environment in which the dragonfly inhabits sustainably. This paper examines the reason for this. In the Edo period, there were many marsh environments in which the dragonfly inhabited sustainably in the hilly areas surrounding the Yata River, but it is also thought that the "riverside of the Yata River" also had a waterside environment that allowed the dragonfly to inhabit, at least temporarily. Therefore, it is thought that the description "the dragonfly inhabits the riverside of the Yata River" was created because the individuals that inhabited (stayed) there were observed and described by feudal lords with natural history knowledge." (Author/Google translate)] Address: Ono, T., 2-1-B510, Sunadabashi, Higashi-ku, Nagoya, Aichi 461-0045, Japan. Email: tono@kinjo-u.ac.jp

24878. Ortega Navarro, J.P. (2025): Comportamiento depredatorio de ninfas de odonatos bajo perturbaciones acústicas de baja frecuencia. BSc. thesis, Universidad El Bosque – Programa de Biología, Bogotá D.C.: 54 pp. (in Spanish, with English summary) ["Noise pollution released by human activities can harm aquatic macroinvertebrate communities by modifying their behavioral patterns. The effect of low-frequency acoustic disturbances on the predatory behavior of Anax amazili nymphs was evaluated, with the hypothesis that acoustic waves in the water would affect successful predation and the natural predatory behavior of the nymphs. It was found that low-frequency acoustic disturbances do not negatively affect successful predation or predatory behavior of A. amazili nymphs. However, nymphs under low-frequency acoustic disturbances may display predation-related behaviors in inappropriate contexts, which may be related to a state of alertness. Nymphs maintained shy behavior and a moderate activity level in all treatments, but also demonstrated exploratory behavior, especially under 50 Hz waves, suggesting that an increase in wave frequency can induce exploratory behavior in odonate nymphs." (Author)] Address: https://repositorio.unbosque.edu.co/server/api/core/bitstreams/03ca71a4-0c0b-42a0-b705-2df475a055b4/content

24879. Ouma, K.O.; Shane, A.; Monde, C.; Syampungani, S. (2025): Benthic macroinvertebrates as bioindicators of stream health within the Central African copperbelt. Water, Air & Soil Pollution 236(443): 23 pp. (in English) ["Globally, stream ecosystem health in mining regions, including the Central African Copperbelt (CACB), is threatened by increased aquatic metal pollution. Stream biomonitoring and bioassessment offers an eco-friendly nature-based approach to determine the aquatic ecological conditions and inform management interventions in mining landscapes. This study conducted monthly between May 2022 and April 2023, explored the taxonomic and functional responses of macroinvertebrates as bioindicators of the ecological condition of four streams in the north-western Zambian Copperbelt of the CACB. 252 sediment samples were collected and analysed for metals. 144 macroinvertebrate samples were collected to determine their taxonomic and functional traits. ANOVA (analysis-of-variance), SIMPER (similarity-percentage), ANOSIM (analysis-of-similarities), CCA (canonical correspondence analysis) and multidimensional biotic index analyses were conducted to correlate environmental and biotic variables. Metal concentrations (mg/kg) in sediments followed the order As (5.27) < Pb (5.75) < Zn (44.6) < Ni (89.3) < Cu (187.5). From ANOVA, the macroinvertebrate community was significantly dominated by Insecta families, mostly Diptera

(23.3%) and Coleoptera (16.7%). Trophically, predators significantly dominated in the order Odonata (34.7%) > Hemiptera (31.8%) > Diptera (18.9%). SIMPER depicted a strong influence of Cu, EC, velocity, sediment texture and organic matter on macroinvertebrate diversity and spatial distribution. ANOSIM indicated the highest community dissimilarity at the most impacted stream (KYABR). Habitat assessment metrics, including ZISS-1, ASPT, and EPT/Chironomidae ratio, registered a "good ecological status" with the presence of pollution-sensitive taxa (Helodidae and Perlidae), in concordance with environmental variables, confirming the suitability of macroinvertebrates as proxy bioindicators of stream health in mining landscapes. The study confirms the potential of macroinvertebrates, as potential bioindicators of stream health in mining landscapes. Their diversity and distribution is strongly influenced by Cu, EC, velocity, and sediment characteristics while habitat assessment metrics indicate a "good ecological status" despite moderate metal contamination." (Authors) In the supplemental material, Odonata are treated at family level: Aeshnidae, Coenagrionidae, Libellulidae] Address: Ouma, K.O., Dept of Zoology & Aquatic Sciences, School of Natural Resources, Copperbelt University, P. O. Box 21692, Kitwe, Zambia. Email: kenochieng8477@gmail.com

24880. Panchana, K.; Herrera, I.; Vargas, A.; Mella-Méndez, I.; Flores-Peredo, R. (2025): Whiskers in the city: domestic cat predation in Ecuadorian coastal cities and associated factors. Urban Ecosystems 28(56): 18 pp. (in English) ["Domestic cats pose a latent threat to wildlife that lives within the remnants of natural vegetation in urban ecosystems. Both intrinsic (e.g., age, weight, sterilization status) and extrinsic factors (e.g., night confinement, interaction time with owners at home) can influence the number of prey items caught by cats. We assessed the fauna predation by domestic cats in three cities on the coast of Ecuador. We aimed to: (i) evaluate the composition of the prey brought home by cats, counting the taxa number and their capture frequency, as well as their conservation status, and (ii) identify the intrinsic and extrinsic factors that influence the quantity of prey brought home by cats (henceforth referred to as 'prey captured'). A citizen science approach was employed to gather information about wildlife taxa caught and brought home by 100 cats in 50 households between March and October 2023. Cats captured 132 prey items, of which 53.8% were invertebrates, 27.3% reptiles, 8.3% birds, 6.8% small mammals, and 3.8% amphibians. These prey items belonged to 53 taxa, 56.6% native and 15.1% non-native. Non-native reptiles Hemidactylus sp. and Anolis sagrei were the most frequently captured taxa, and ten native taxa were among the most commonly captured, particularly odonates. This is the first study to register predation of cats on amphibians in northwestern South America. The capture by cats of Coniophanes dromiciformis, a vulnerable and probably endemic snake, is noteworthy. Three factors—age, nocturnal confinement, and the presence of toys in their homes—were the most important factors that contributed to predation events. We recommend controlling these factors to reduce the potential impacts caused by domestic cats on wildlife." (Authors) The paper documents 50 (23 Odonata taxa) cases of invertebrate capture by cats, including Erythemis vesiculosa (n=5), Erythrodiplax umbrata (n=4), Pantala flavescens (n=4), Odonata (n=3), Erythrodiplax sp. (n=2), Coryphaeschna adnexa (n=1), Dythemis sterilis (n=1), Gynacantha sp. (n=1), Tholymis citrina (n=1), and Tramea darwini (n=1).] Address: Herrera, Ileana, Escuela de Ciencias Ambientales, Universidad Espíritu Santo, Guayaquil, 091650, Ecuador. Email: herrera.ita@gmail.com

24881. Patil, V.; Mhaske, C.; Stalin, D.; Patil, P.; Saste M.; Patil, P. (2025): Assessment of faunal diversity of forests surrounding Dabhil village in Sawantwadi taluka, Sindhudurg, M.S., India. Biophilia Insights 3(1): 10 pp. (in English) ["Forests are among the most bio-diverse ecosystems on Earth, playing a pivotal role as habitats for an array of flora and fauna. Their complex structure, comprising various canopy layers, understory vegetation, and diverse microhabitats, offers niches and resources crucial for the survival and proliferation of countless species commonly referred to as biodiversity. Despite the valuable ecosystem services provided by forests, the present era is marked by a widespread and pervasive occurrence of deforestation, primarily propelled by infrastructural projects like dams and highways. This extensive deforestation engenders various environmental problems, underscoring the pressing need for scientific interventions and sustainable practices to address these challenges and ensure the continued well-being of our planet. The present study focuses on the assessment of faunal diversity within the forests surrounding the Dabhil Mauli River in the Konkan region of Maharashtra. The bio-diversity survey was conducted, revealing a high species richness. Systematic direct field observations were employed to evaluate the present state of the forests, emphasizing ecological dynamics, biodiversity metrics, and inter-species interactions. The study documented a total of 145 species of fauna, including 70 species of birds, 8 species of mammals, 52 species of butterflies and moths, 5 species of Odonata [Trithemis aurora, Neurothemis tullia, Heliocypha bisignata, Vestalis gracilis, Agriocnemis pieris], 5 species of spiders, and 5 species of reptiles." (Authors)] Address: Patil, V., Manager-Projects, Vanashakti, Mumbai-400046, Maharashtra, India. Email: vicky.vanashakti@gmail.com

24882. Payra, P.; Bhanja, A.; Kandar, P. (2025): Diversity and composition of aquatic insects in three perennial rural ponds of Ramnagar-I Block, East Midnapore, West Bengal, India. International Journal of Ecology and Environmental Sciences 51(3): 297-309. (in English) ["This investigation focused on the diversity of aquatic insects in three perennial rural ponds located in the Ramnagar-I block of East Midnapore, West Bengal, India. Insects comprise about four-fifths of the world's fauna and are recognized as the most diverse and successful group within the animal kingdom. Many of these insects spend at least part of their life cycle in water, making them aquatic insects. They represent a vital component of the littoral fauna in aquatic ecosystems and play a crucial role in the trophic structure and functions of cultivable water bodies. From March 2023 to February 2024, a total of 1,637 individuals were recorded, belonging to 6 orders, 15 families, and 29 genera across the three ponds (P1, P2, and P3). The rich assemblage of aquatic insects found in these ponds suggests a relatively healthy and stable ecosystem, supported by good water quality. The dominant families observed included Gerridae (14.91%), Coenagrionidae (18.51%), and Nepidae (13.62%), highlighting their significant ecological roles at these sites. Seasonal variations in species richness were apparent across the ponds. The highest numbers of individual occurrences were recorded during the post-monsoon season (P1: 12.16%, P2: 10.63%, P3: 9.22%), whereas the lowest were noted in winter (P1: 7.27%, P2: 6.17%, P3: 5.19%). Among the recorded species, the most dominant taxa included Baetis sp. (Ephemeroptera), Gerris spinolae (Hemiptera), and Ischnura senegalensis). The seasonal environmental variations largely account for the diversity of insects in the three ponds, as factors such as temperature, dissolved oxygen, and vegetation cover significantly influence species abundance and distribution." (Authors) Seven odonate taxa are listed: Urothemis signata, Pantala flavescens, Anax sp., I. senegalensis, Agriocnemis pygmaea, Amphiallagma parvum, Pseudagrion sp.] Address: Payra, P., Dept of Fisheries Science, Ramnagar

College, Depal, 721453, Purba Medinipur, West Bengal, India. Email: pijushpayra@gmail.com

24883. Pernicka, M. (2025): Effect of plant protection products on the selected fitness characteristics of non-target aquatic invertebrates on the example of odonates. MSc. thesis, Department Laboratory of Growth Regulators, Univerzita Palackého v Olomouci: 66 pp. (in Czech, with English summary) ["This thesis focuses on the synergism of the insecticide Magma (etofenprox) and the herbicide Sultan (metazachlor) on Odonata larvae. The theoretical part reviews current knowledge on the impact of pesticides on the environment and on non-target aquatic organisms. In the experimental part, the individual and combined effects of etofenprox and metazachlor on larvae of Enallagma cyathigerum were studied. To determine the stress level of the larvae, mortality, exuviae and levels of proteins, HSP and lipids were monitored. Exposure to the insecticide led to an increase in the level of HSP70 compared to the herbicide and their combination. Herbicide exposure led to an increase in the concentration of HSP83 compared to the group exposed to the combination. In other cases, the changes in stress characteristics were insignificant. The combined effect of both pesticides was not proven, but the results show that even sublethal concentrations of the selected pesticides can negatively affect non-target aquatic organisms. Further research on the relationship of HSP70 and HSP83 to chemical stressors is needed to explain these results." (Author)] Address: https://theses.cz/id/1khgsr/Pernicka_DP.pdf

24884. Petzold, F. (2025): Präsenzmonitoring der Libellen in Thüringen. Zwischenbericht zum zweiten Monitoringdurchgang. Landschaftspflege und Naturschutz in Thüringen 61(2): 82-86. (in German) ["The extensive survey of the dragonfly fauna using a uniform methodology has provided, for the first time, comprehensive and easily comparable data from two monitoring cycles spaced seven to nine years apart. This significant increase in knowledge about the status and development of the dragonfly fauna provides an important basis for sound analyses of population development and threats, as well as for the development of targeted conservation measures in a period characterized by dynamic faunal changes. The collected data are an important complement to the monitoring of FFH species within the FFH sampling area backdrop (2019–2023, FFH species were detected in 41 water bodies outside the state and federal sampling areas of the FFH monitoring). The monitoring methodology applied has proven to be a good compromise between what is economically and practically feasible and what is technically necessary. In order to maintain an up-to-date overview of the development of the dragonfly fauna in view of the current highly dynamic faunal changes, continuation of presence monitoring is absolutely necessary." (Author/Google translate)] Address: Petzold, F., Pappelallee 73, 10437 Berlin, Germany. Email: falk_petzold@web.de

24885. Phan, Q.T.; Hopkins, P.; Kim, J.; Keetapithchayakul, T.S. (2025): Updated distribution range for Nannophyopsis clara (Odonata: Libellulidae). Agrion 29(2): 35-39. (in English) ["N. clara (Needham, 1930) is a rarely recorded dragonfly of the family Libellulidae, known from southern and eastern China, Taiwan, northeastern Thailand, northern Vietnam and northeast India. Based on new field surveys and verified records from iNaturalist and GBIF, this study updates its distribution to include central and southern Vietnam — marking the southernmost records to date — as well as new observations from northeast India and central China. Despite these findings, the species shows a fragmented distribution, warranting a reassessment of its current IUCN red-list status as Least Concern." (Authors)] Address: Quoc Toan Phan, Q.T., Center for Entom. & Parasitology Res., College of Medicine and Pharmacy, Duy Tan University, 120 Hoang Minh Thao, Lien Chieu, Da Nang, Vietnam. Email: a[pqtoan84@gmail.com

24886. Pont, P. (2025): Occupation of the channels of a braided river by the Odonata. Conférence internationale I.S. Rivers 2025, Jun 2025, Lyon, France. 5 pp. (in French, with English summary) ["Eygues river is a 114 kilometre tributary of the Rhône taking its source at about 1100 m above sea level draining the Baronnies massif (Drôme, Hautes Alpes, Vaucluse). Six reaches 2 to 4 km long with active braiding in the middle of the 20th century spread over the entire basin were selected. On each reache, the odonate stand is inventoried by a standardized protocol and two geomorphological parameters are characterized: the evolution of a active channel width between 1960 and 2021 and the diversity of the channel system. The richness of the dragonfly population in the different reache varies between 6 and 31 species, the total richness of all sections combined reaches 37 species. The correlation between the richness of the odonate population and the diversity of the channel network is strong while it is low with the retraction rate of the active channel width. The main and secondary channels are poor and host species adapted to the fast current. The alluvial and phreatic channels and ponds are home to most of the wealth and each of these types constitutes the optimum habitat for different species."] Address: Pont, P., Groupe Sympetrum - Etude des Odonates en Rhône Alpes, France. Email: pont.bernard@orange.fr

24887. Popescu, I.E.; Gostin, I.N. (2025): A Biodiversity Hotspot for European Invertebrates of Community Importance (Natura 2000), Bârnova-Repedea Forest in Romania (ROSCI0135). Conservation 2025, 5(3), 41. 36 pp. (in English) ["ROSCI0135 Bârnova-Repedea Forest, covering 12,236.20 ha, is a relatively large Natura 2000 site from Romania, though not as large as other Natura 2000 sites. However, in terms of the number of invertebrate species of community importance, with 18 species present, Bârnova Forest ranks as the fourth richest site in Romania, with the following species" abd including Cordulegaster heros and Coenagrion ornatum." (Authors] Address: Popescu, I.E., Faculty of Biology, Alexandru Ioan Cuza University of Ias,i, Bdul Carol I, No. 11, 700506 Iasi, Romania. Email: irinagostin@yahoo.com

24888. Popova, O.N.; Haritonov, A.Yu. (2025): Ecology and Biology of Enallagma cyathigerum (Charpentier, 1840) (Odonata) under Unstable Water Conditions in the South of Western Siberia. Contemporary Problems of Ecology 18: 55-71. (in English) [nv; "The peculiarities of ecology and biology of the damselfly Enallagma cyathigerum have been revealed as a result of long-term research in the Barabinsk forest steppe. The species lives in all permanent reservoirs (rivers, river channels, lakes, and ponds), where its most numerous populations have been identified. It also inhabits temporary reservoirs, surviving in them during periods of drying out due to the egg phase. Biotopic preferences in the choice of habitat have been found: larvae live only in nonreed hydrocenoses, which is associated with the ecological standards of the species. There has been a decrease in the number of E. cyathigerum during the last 20 years despite the increase in humidity in the region, which we explain by consequences of climate warming: weather disasters in summer and an increase in the temperature of air and, accordingly, of water in reservoirs, leading to deterioration of the hydrology of reservoirs and suffocation of aquatic organisms. The study of the development of E. cyathigerum in the Kargat River and Lake Fadikha in 2004–2006 has revealed a 1-year life cycle of the species, the population structure of which differs in

the river and lake due to various hydrological and temperature regimes. The species population in the Kargat River was unified over all 3 years, while in Lake Fadikha it was unified in the high-water year of 2004, relatively unified in the low-water year of 2005, and divided into two seasonal groups (summer with wintering larvae and summer–autumn with wintering eggs) in the low-water year of 2006. This complicated population structure in Lake Fadikha in 2006 is a result of an increase in water temperature (due to an increase in the mean daily air temperature and a decrease in the water level in the lake) and is a kind of species adaptation to the deterioration of habitat conditions in the low-water period: eggs are present in the lake almost all year round (wintering and nonwintering), the age of larvae differs, and imagoes fly on land from spring to autumn. This adaptive feature of E. cyathigerum may partly explain its relatively high abundance, eurybiontness, and large range (almost the entire Palearctic)." (Authors)] Address: Popova, Olga, Institute of Systematics & Ecology of Animals, Siberian Branch, Russian Academy of Sciences, 630091, Novosibirsk, Russia

24889. Protopopova, O.N.; Sivtseva, L.V. (2025): First record of Common Cuckoo (Cuculus canorus Linnaeus, 1758) parasitizing Green-headed Wagtail (Motacilla taivana (Swinhoe, 1863)) nests. Amurian Zoological Journal. XVII(2): 262-268. (in Russian, with English summary) ["The paper documents the first confirmed brood parasitism of Common Cuckoo on Green-headed Wagtail in Central Yakutia. A largely understudied M. taivana has nested regularly in Yakutsk since 2019. The 2024 observations at the Arctic State Agrotechnological University racetrack revealed the novel host-parasite relationship. Neck-collar sampling showed divergent chick diets: wagtail chicks primarily consumed Diptera (Culicidae larvae/adults), whereas cuckoo chicks fed on larger prey including Sympetrum flaveolum, Gomphocerus sibiricus (Orthoptera), and Silphidae beetles (Coleoptera)." (Authors) Three odonate species were identified as prey: Lestes sponsa, Lestes dryas, and S. flaveolum.] Address: Protopopova, Olga, Insti. of Biological Problems of Cryolithozone of the Siberian Branch of the Russian Acad. of Sci., 41 Lenina Ave., 677980, Yakutsk, Russia. E-mail: north-02@mail.ru

24890. Puff, F.; Schulze, C.H.; Novella-Fernandez, R.; Hilpold, A.; Pinkert, S.; Guariento, E. (2025): Artificial ponds do not support the natural functional and taxonomic composition of alpine dragon- and damselfly communities. Global Ecology and Conservation 62, e03708: 14 pp. (in English) ["Alpine regions host diverse habitats and rich biodiversity. Yet, aquatic environments, crucial for many threatened alpine species, are underrepresented in conservation throughout the Alps. Among many factors, anthropogenization impacts alpine aquatic ecosystems. While anthropogenic ponds are proposed for biodiversity support, their suitability for the natural alpine freshwater biota remains unclear. Odonata, with their ectothermic physiology and semi-aquatic life cycle, are greatly constrained by both temperature and habitat features, thus potentially facing additive constraints in alpine artificial waters. This study investigated Odonata communities in artificial and natural water bodies at 41 different elevations, analyzing abundance, diversity and traits associated with thermoregulation (body size and color lightness), life history (voltinism) and habitat preference (thermophily and habitat breadth). Temperature differently affected traits related to thermoregulation in dragonfly and damselfly communities, with an increase in body size and decrease in color lightness along decreasing temperature (i.e. increasing elevation) in dragonflies and an increase in color lightness in damselflies. Concurringly, damselfly abundances strongly decreased towards cold temperatures. In both suborders thermophily and habitat breadth decreased with decreasing temperature, but these trends were less pronounced in anthropogenic sites. Trait variation of dragonflies follows trends predicted by thermal melanism and Bergmann's rule, while the absence of such trends in damselflies suggest limited thermoregulatory potential. The additive constraints of temperature and anthropogenic disturbance in alpine anthropogenic sites prevent alpine species to utilize such water bodies and challenges their potential for nature conservation in the face of global warming and biodiversity decline." (Authors)] Address: Puff, F., Dept Botany & Biodiversity Res., University Vienna, Rennweg 14, 1030 Vienna, Austria

24891. Ranasinhage, C.L.N.; Perera, K.M.A.R.; Abegunawardhana, P.D. (2025): Assessing biodiversity conservation through EUDR compliant rubber cultivation in Sri Lanka: A case study of Ingiriya Rubber Estates. Proceedings of the 29th Forestry and Environment Symposium: 170. (in English) [Verbatim: "Deforestation and habitat destruction are among the most critical global environmental challenges, leading to significant loss of biodiversity. In response to these issues, the European Union Deforestation Regulation (EUDR), enacted in 2023, seeks to mitigate deforestation associated with agricultural expansion by ensuring that products entering the EU market are not grown or raised on land that was subject to deforestation. The regulation applies to seven commodities: cattle, cocoa, coffee, oil palm, rubber, soya, wood, and their derivative products. This study investigates the implications of the EUDR for biodiversity conservation within rubber plantations in Sri Lanka. The study was conducted in August 2024 at a rubber estate located in Ingiriya, Poruwadanda, Sri Lanka, which operates in compliance with the EUDR. The study site is bordered on one side by the Mawak Oya River, and the habitat types identified within the area include forest patches, rubber plantations and grasslands. The total study area encompassed 6 acres of rubber state. This comprehensive approach aimed to provide an in-depth understanding of the local biodiversity present within the estate. Species were systematically identified within rubber plantations, and its surrounding habitats utilizing a combination of random sampling, visual observations, and opportunistic methods. A total of 57 faunal species were recorded during the survey comprising 45 species of vertebrates distributed across five taxonomic classes (mammalia, avian, amphibian, reptiles and fish) and 12 invertebrate species belonging to two class Lepidoptera (6) and Odonates (6) were documented. Vertebrate species included representatives from various orders Anura (4), Squamata (11), Testudines (1), Passeriformes (3), Psittaciformes (4), Accipitriformes (1), Columbiformes (1), Piciformes (2), Suliformes (1), Primates (1), Artiodactyla (1), Chiroptera (1), Carnivorac (1), Rodentia (1), Lagomorpha (1), Cypriniformes (6), Synbranchiformes (1), Siluriformes (1), Cyprinodontiformes (1), Anabantiformes (1), and Beloniformes (1). The baseline data generated during the period provides an idea about various species present in the area. Notable observations included the presence of the vulnerable endemic fish species (Pethia nigrofasciata) and the endemic bird species (Loriculus beryllinus), both of which were found in robust populations within the study area. The results of this study indicate that implementing rubber cultivation practices in accordance with the EUDR may effectively safeguard biodiversity by preventing further deforestation, habitat fragmentation and ensuring the conservation of adjacent ecosystems. Specific EUDR practices implemented include, geolocation mapping, chain of custody documentation, restricting rubber cultivation to previously cleared agricultural lands, maintaining buffer zones, and conducting regular monitoring for deforestation. This study recommended future research is necessary to explore long-

term ecological outcomes and investigate the adaptability of these practices over the time." (Authors)] Address: Ranasinhage, C.L.N., Dept Zoology, Univ. of Colombo, Sri Lanka. Email: charithlakshan827@gmail. com

24892. Rasmussen, J.F.; Martens, A. (2025): First record of Forcipomyia paludis (Diptera: Ceratopogonidae) on Odonata wings on the island of Bornholm, Denmark, with a review of the species on European islands. Libellula 44(1/2): 123-126 (in English, with German summary) ["On 24 June 2023 females of the biting midge Forcipomyia paludis were photographed sitting on the wings of a male Cordulia aenea at the lake Bastemose, Bornholm, Denmark. A brief overview of island records in the Baltic Sea and other European islands is given." (Authors)] Martens, A., I nstitute of Biology, University of Education Karlsruhe, Bismarckstr. 10, 76133 Karlsruhe, Germany. Email: andreas.martens@ph-karlsruhe.de

24893. Rohman, A.; Subchan, W.; Faradilla, Y.; Firmansyah, P. (2025): Dragonfly (Odonata) community structure in Bandealit Resort, Meru Betiri National Park. Jurnal Biodjati 10(1): 90-104. (in English) ["Bandealit Resort is a conservation area encompassing diverse habitats, providing a suitable environment for dragonflies to thrive as permanent inhabitants. The region plays a crucial role in supplying vital water for the life cycle of dragonflies. Human activities occurring in the upstream areas, such as agriculture, can potentially deteriorate water quality due to pollution. This work is highly significant due to the lack of recent monitoring data on dragonflies in the area and the pivotal role of dragonflies as bioindicators. This study aimed to analyze the composition and organization of the dragonfly population at Bandealit Resort (MBNP). A total of twelve dragonfly species were documented, among which were two species that are exclusive to Java. The Shannon-Wiener index study indicated a classification of modest diversity. The Terjun Block had the highest dominance index (D) of 0.27, whilst the Pringtali Block had the highest uniformity index (e^H/S) of 0.86. The species with the most excellent importance index (IVI) in different blocks are as follows: Euphaea variegata and Vestalis luctuosa in Pringtali Block, Nososticta insignis in Terjun Block, and Crocothemis servilia in East Muara Block. The canonical corresponding analysis (CCA) revealed that V. luctuosa, Heliocypha fenestrata, and Nososticta insignis exhibited a correlation with air humidity. In contrast, Copera marginipes, Pantala flavescens, C. servilia, and Diplacodes trivialis demonstrated a correlation with light intensity, wind speed, and air temperature. This research holds significance as it directly examines the relationship between dragonfly communities and abiotic parameters within the Bandealit Resort, Meru Betiri National Park (MBNP)." (Authors)] Address: Rohman, A., Biology Education, Fac. Teacher Training & Education, University of Jember, Indonesia. Email: abdu.fkip@unej.ac.id

24894. Rosen, R.; Staat, S.; Andrews, M.; Budhathoki, Y.; Jackson, H.; Kwisera, B.; Mecham, J. (2025): Additional predators (Nonhosts) and a new amphibian host of the digenetic trematode cercaria of Proterometra macrostoma in laboratory experiments. Comparative Parasitology 92(1): 56-61. (in English) ["The consumption of digenetic trematode cercariae by nonhosts can affect energy transfer in aquatic ecosystems and simultaneously reduce the numbers of these infectious agents. Recently, crayfish (i.e., Faxonius juvenilis and Procambarus spp.) were documented as predators/nonhosts of the digenetic trematode cercaria of Proterometra macrostoma in laboratory experiments. The objective of this study was to assess additional invertebrate and vertebrate predators of this cercaria species during experiments, which included nymphs of Pachydiplax longipennis and Enallagma signatum, mosquitofish (Gambusia sp.), and Cope's gray tree frog tadpoles (Hyla chrysoscelis). Individuals of each species were divided into 2 groups and exposed to 2 levels of 2–3-hr-old cercariae in 10.8-cm culture dishes filled with 200 ml of spring water. The high exposure (HE; 4–6 cercariae/predator) level was approximately 2× the number of cercariae compared to the low exposure (LE; 2–3 cercariae/predator) level. All 4 potential predators ingested cercariae, but in terms of the average percentage of cercariae consumed following 7 hr of exposure in the LE and HE trials, Gambusia sp. (LE = 83.3%; HE = 80%) appeared to be the most successful predator, followed by P. longipennis (LE = 67%; HE = 45%), E. signatum (LE = 41.7%; HE = 33.3%), and H. chrysoscelis (LE = 20.8%; HE = 37.5%). There was a significant difference in the mean number of cercariae consumed after 7 hr postexposure (PE) in the LE vs. HE groups for Gambusia sp. For both Gambusia sp. and P. longipennis, LE and HE groups ingested the majority of the cercariae to which they were exposed within the first hour. By comparison, a more gradual consumption was noted for E. signatum and H. chrysoscelis. Living distomes of P. macrostoma were recovered from H. chrysoscelis stomachs following ingestion on days 1 and 6 PE. This suggests that some amphibians may serve as definitive hosts for this parasite, which has only previously been reported from centrarchid fish. Collectively, these results suggest a broad food niche for P. macrostoma cercariae in aquatic food webs with regard to nonhosts." (Authors)] Address: Rosen, R., Biology Dept, Berea College, Berea, Kentucky 40404, USA

24895. Rüppell, G.; Hilfert-Rüppell, D. (2025): Slow motion analysis of flight curves of in nature flying Odonata. International Journal of Odonatology 28: 23-39. (in Englis) ["Slow-motion recordings were used to analyze the flight of different species of dragonflies in the field. The flapping frequencies during the turns increased. The measures leading to curves correspond in Anisoptera and Zygoptera. At slow curves the wings of the outer curve were steeper inclined on upstroke than those of the inner curve, and the opposite was true for the downstroke. The stroke paths on the outside were steeper and beginning higher up, while on the inside they flapped flatter and lower down. Banking of the body and thus also of the stroke plane occurred during fast curves. The faster and tighter the curve, the steeper the banking. The methods employed by Odonata to achieve the banking position and furthermore the numbers of wing beats required for 180° turns are presented. The results from the field are compared with those from various laboratories. There are similarities, but also peculiarities of the curved flight that were only observed in the field." (Authors)] Address: Rüppell, G., An der Wasserfurche 32, 38162 Cremlingen, Germany. Email: georg.rueppell@protonmail.com

24896. Russo, L. (2025): Roadside surveys as a method for nonlethal insect monitoring. Psyche: A Journal of Entomology 2025, Article ID 8881730. 11 pp. (in English) ["Insects are a megadiverse group of organisms, which makes them difficult to survey without large, lethal collections. At the same time, we have increasing concerns about declines in insect biomass and diversity, which could have serious implications for ecosystem functioning. Current methods of insect monitoring are high in cost and labor and expertise intensive, often requiring large amounts of physical storage space that must be maintained indefinitely, making them difficult to sustain to the degree and extent that would be required to track population level changes in insect species at local or regional scales. Traditional methods can also be slow, sometimes requiring years to process and identify all the specimens collected. Moreover, there are concerns about the potential role of destructive sampling methods in exacerbating already declining groups of insects. Due to this,

nonlethal, sustainable, rapid, and low-cost methods of monitoring and surveying are needed. I combined modern technological methods, including photographic vouchers and community science programs (i.e., iNaturalist), and surveys of insect roadkill to test as a potential nonlethal method of monitoring insect populations. I repeated these surveys on a weekly basis under appropriate weather conditions along a highway bridge for the duration of a year and recorded 4917 specimens with 3061 specimens (62.2%) identified to 152 species, and an additional 1506 (30.6%) to 111 genera. I found this method promising for nonlethal monitoring because photographic vouchers required less time and space to use and maintain, and using the expertise of community scientists lowered initial barriers to participation. This method also had a rapid turnaround time and was straightforward to repeat without adding significant bias. The roadkill surveys avoided additional insect mortality as they involved insects that had already been killed by vehicular traffic." (Author) The following roadkill specimens were collected along the James White Parkway, Tennessee River, in Knoxville, Tennessee, USA: Neurocordulia yamaskanensis, Pantala hymenaea, Stylurus plagiatus, Tramea sp., Coenagrionidae, and Odonata. The abundance of sampled specimens was 1-3.] Address: Russo, Laura, Dept of Ecology & Evolutionary Biology, Univ. of Tennessee, Knoxville, Tennessee 37996, USA. Email: lrusso@utk.edu

24897. Ryu, S.; Zhang, H.; Palmon, T.; Salcedo, M.K.; Passd, G.; Sochae, J.J. (2025): Insect wing circulation: transient perfusion through a microfluidic dragonfly forewing model. Lab on a Chip 15: 3718-3729. (in English) ["Insect wings are made of an acellular composite material that forms a thin membrane and a complex network of veins. Veins are tubes that not only serve to stabilize the wing membrane, but they are also filled with hemolymph (insect blood). Thus, veins supply the sensory organs located on the wing veins with water and nutrients and enable the removal of waste products. In addition, the composite material of the wing is permanently hydrated by the hemolymph and thus retains the necessary flexibility. Hemolymph flow through the microfluidic vein network is therefore crucial for the functionality of insect wings. However, how perfusion occurs throughout the vein network in relation to hemolymph circulation is poorly understood. To investigate the dynamics of transient perfusion in complex wing venation, we developed a microfluidic wing vein model of the forewing of Anax junius, using polydimethylsiloxane. Transient perfusion was simulated by injecting dye into the model filled with clear water; inversely, clear water was injected into dye in a separate trial. Visualized perfusion patterns suggest that the perfused portion of the vein network logarithmically increased with respect to time, which could be explained by a theoretical model of a simplified wing vein network, and that time differences occurred between the arrival of a new substance and the complete removal of an old substance in veins. Our biomimetic wing vein device enables further investigation into the unique circulatory system and transport phenomena of the insect wing. Also, our microfluidics-based approach proves a potential use of microfluidics in entomology and related fields." (Authors)] Address: Ryu, S., Dept of Mechanical & Materials Engineering, University of Nebraska-Lincoln, Lincoln, USA. Email: sryu2-@unl.edu

24898. Sabrina, H.K.; Siriyah, S.L.; Saputro, N.W.D. (2025): Insect species composition in local Durian Loji Plantation in Karawang, West Jawa. Jurnal Biologi Tropis 25(3): 2679-2694. (in Indonesian, with English summary) ["Durian (Durio zibethinus) belong to a popular fruit in Southeast Asia and is widely distributed across various regions, particularly in Indonesia. Karawang regency, as one of the part of west java province, is one of the producers of local durian, known as durian loji. Successful durian cultivation is influenced by various biotic factors, among which insect biodiversity plays a critical role in pollination, pest control, and nutrient cycling. However, comprehensive studies on insect diversity in durian agroecosystems, particularly in Karawang, remain scarce. This study aimed to explore the insect community structure within Loji durian plantations to provide baseline data on species composition and ecological roles. Field sampling was conducted using three methods: sweep nets for aerial insects, beating sheets for foliage-dwelling species, and pitfall traps for ground-active arthropods. A total of 29 insect morphospecies from 9 orders were identified, including Coleoptera, Hymenoptera, Diptera, Dermaptera, Orthoptera, Hemiptera, Odonata [Neurothemis terminata, Brachydiplax chalybea, Copera vittata], Mantodea, and Lepidoptera. Our findings show that all morphospecies occupied various trophic levels, including herbivores, predators, and decomposers. These findings highlight the ecological significance of insects in maintaining durian plantation health and suggest the need for sustainable farming practices to conserve beneficial species while managing pests. Further research should investigate the seasonal variations and the impact of agricultural practices on insect community structure and diversity." (Authors)] Address: Siriyah, Siti Latifatus, Program Studi Agroteknologi, Fakultas Pertanian Universitas Singaperbangsa Karawang, Indonesia. Email: sitilatifatuss@-staff.unsika.ac.id

24899. Sadasivan, K.; Jose, J.; Palot, M.J.; Sudheer, S.; Augustine, T.; Kochunarayanan, B.; Nair, V.P.; George, M. (2025): A new species of Lyriothemis Brauer, 1868 (Odonata, Libellulidae) from the Western Ghats of Peninsular India. Entomon 50(2): 203-214. (in English) ["A new species of phytotelmabreeding dragonfly, Lyriothemis abrahami sp. nov., is described from the Western Ghats of Peninsular India. The new taxon was previously misidentified as L. flava Oguma, 1915 (= L. tricolor Ris, 1916). In contrast to L. flava, the new species is sexually dimorphic, with males easily identified based on the characteristic shape of the hamules. Females are identified by their jet black and yellow colour with triangular yellow streaks on the dorsum of the abdomen and the distinct triangular shape of the vulvar lamina. Photographs of mature adults, tenerals, hamules, illustrations of vesica seminalis, vulvar lamina, and a key to Lyriothemis of the Indian subcontinent are provided." (Authors)] Address: George, M., PG & Res. Dept Zoology, Alphonsa College, Arunapuram, Pala 686574, Kottayam, Kerala, India. Email: mayarosegeorge@gmail.com

24900. Sánchez-Herrera, M.; Maharaj, G. (2025): Promoting equity between the Global North and Global South in entomological research. Current Opinion in Insect Science 69:101357: 13 pp. (in English) ["Highlights: *Global insect decline threatens vital ecosystem services worldwide. *International collaboration is key to effective global challenges in entomology. *The Global South's insect diversity is underrepresented in conservation efforts. International collaborations in entomological research are crucial for addressing global biodiversity challenges, particularly in the Global South, where much of the world's insect diversity is concentrated. These partnerships enable the sharing of knowledge, resources, and expertise across borders, leading to more comprehensive and impactful research outcomes. For the Global South, equitable collaborations are essential to ensure that local researchers are contributors and equal partners in the research process. Hallmarks of mutual partnerships include co-developing research questions, sharing the benefits of research outcomes, and receiving fair compensation and support. Emphasizing equity in these collaborations helps to address historical imbalances, strengthens

local research capacities, and ensures that the perspectives and needs of Global South researchers are fully integrated into the global scientific community. Equitable international collaborations enhance the quality and relevance of entomological research, contributing to better research, monitoring and conservation worldwide." (Authors) The paper includes references to Odonata.] Address: Maharaj, Gyanpriya, Centre for Study of Biol. Diversity. Dept Biol., Univ. Guyana: Georgetown, Guyana. Email: gyanpriya.maharaj@uog.edu.gy

24901. Sarsavan, A.; Pawar, M.; Sharma, S.K. (2025): Lesser Blue-wing Rhyothemis triangularis Kirby, 1889 (Insecta: Libellulidae), a new addition to the dragonfly diversity of Rajasthan, India. Journal of Threatened Taxa 17(6): 27167-27170. (in English) ["The present study reports the first confirmed record of R. triangularis from Udaipur District, Rajasthan, India. Previously unreported in the state, this finding significantly expands this dragonfly's known geographical range into a new area. During the wetland monitoring program in September 2024, an opportunistic sighting of a dragonfly was observed in Jhadol and Gogunda, two adjoining blocks (tehsils) of Udaipur District. The previous findings of this species are mainly from the high rainfall zone, but the present finding is from a drier zone of western India, having low rainfall. The findings contribute to the understanding of the species distribution and ecological preferences, particularly in semi-arid regions like Jhadol and Gogunda block of Udaipur District. These findings contribute to the natural history of the species and highlight the habitat quality and suitability for this species in low-rainfall areas." (Authors)] Address: Sarsavan, A., Foundation for Ecol. Security, post box no. 29, Jahangirpura, Hadgud, Anand district, Gujarat 388370, India

24902. Sathasivam, K.; Sathasivam, R. (2025): A survey of the Odonate diversity of the Palni Hills, Western Ghats, India. International Dragonfly Fund - Report 193: 1-17. (in English) ["The odonates recorded during four brief surveys conducted in the Lower Palni Hills, Western Ghats, India in 2022 and 2024 are reported. Thirty-seven species were recorded, including a gomphid that does not match the description of any known species. Fourteen of the species recorded represent additions to the odonate fauna of the Palnis. Remarks are made on the habitats that were surveyed. The updated checklist is presented." (Authors)] Address: Sathasivam, Kumaran & Ramila, 229 Jadamuni Koil Street, Madurai 625 001, Tamil Nadu, India. Email: k_sathasivam@yahoo.co. in; Email: ramila.sathasivam@gmail.com

24903. Schwartz, B.; Benstead, P.; Dow, R.A.; Matthey, D.; Post, M. (2025): A photographic survey of Odonata in Sabah, Malaysia, 2023. Faunistic Studies in South-East Asian and Pacific Island Odonata 47: 1-60. (in English) ["This report provides a summary of photographic documentation of Odonata at 101 sites in Sabah, in Malaysian Borneo, during two trips: January 9 to 30, 2023, and October 2 to 14, 2023. We report 130 species documented in photographs of 1,383 individuals. This represents 68% of the 190 taxa reported to occur in Sabah prior to this trip. Notable photographic records are described and include 8 species recorded in Sabah for the first time (one of which is a new genus for Borneo). Some species that may be new and undescribed, or known and undescribed, were photographed. A complete list of all records and corresponding iNaturalist observations, species x site data, habitat descriptions, weather conditions, search time, and counts for species observed at each site are included in tables." (Authors)] Address: Schwartz, B., Dept Biol., Texas State Univ., San Marcos, Texas, USA. Email: bs37@txstate.edu

24904. Sharma, M.; Oli, B.R.; & Gautam, I. (2025): Odonate diversity and community turnover along elevational gradients in the Karnali River Basin, Nepal. Nepalese Journal of Zoology 9(1): 30-39. (in English) ["Odonates are bioindicators, and understanding their species composition pattern along elevational gradients is essential for conservation initiatives. This study investigates the diversity and distribution patterns of Odonata along an elevational gradient (544–2987 m above sea level (asl)) in the Karnali River basin of western Nepal. Sampling was conducted across 15 sites during pre-monsoon, monsoon, and post-monsoon seasons of 2022 using the belt transect method in lentic and lotic habitats. The Shannon Diversity Index, Simpson's Index, and beta (ß) diversity (both incidence-based and abundance-based) were used to describe the odonate assemblages. A total of 90 species representing 54 genera and 12 families (five Anisoptera and seven Zygoptera) were recorded. Libellulidae and Coenagrionidae emerged as the most species-rich families among Odonata, respectively. Diversity indices fluctuated with elevation, with the Shannon (3.58) and Simpson (0.96) indices peaking at 646 m and declining sharply at higher altitudes. Polynomial regression revealed a significant negative correlation ($r = -0.81$, $p < 0.001$) between species richness and elevation. ß-diversity analysis showed high dissimilarity and turnover among sites, with incidence-based dissimilarity (mean ß_sor = 0.572) and abundance-based dissimilarity (mean dBC = 0.664) both driven primarily by species turnover. Lentic habitats showed higher ß-diversity (mean ß_sor = 0.607) than lotic habitats (mean dBC = 0.595). Most species exhibited narrow elevational ranges, primarily below 1600 m, while a few were widespread, including Pantala flavescens, which were recorded from lower to higher elevation ranges. These findings highlight significant spatial variation in odonate assemblages across elevations, underscoring the ecological sensitivity of montane aquatic habitats to altitudinal and potentially climatic gradients. ... Among dragonfly species, Crocothemis servilia has the highest abundance (n=274), while Gynacanthaeschna sikkima (n=2) and Watanabeopetalia atkinsoni (n=2) were the least abundant species. Likewise, the damselfly species with the highest abundance was Ceriagrion coromandelianum (n=290), and the least abundant damselfly species were Lestes viridulus, Anisopleura subplatystyla, Coeliccia renifera, and Aciagrion approximans, with only four individuals of each one (Annex 1). The abundance, species richness, and diversity of Odonata varied between study sites. Among anisopterans, Libellulidae (n=33) was the dominant family, while Chlorogomphidae was the family with the least species richness (n=1). For zygopterians, Coenagrionidae (n=19) has high species richness, while family Synlestidae has the lowest species richness (n=1) (Tab. 3, suppl. file 1). Most of the species (n=56) shared both lentic and lotic habitats, while 17 species were confined to lentic and 18 species were inhabitants of lotic habitats. Bradinopyga geminata was recorded in urban areas near both lentic and lotic habitats." (Authors)] Address: Gautam, I., Nat. History Museum, Inst. of Science & Technology, Tribhuvan Univ., Swayambhu, Kathmandu, Nepal. Email: ishan.gautam@nhm.tu.edu.np

24905. Shitta, K.B.; Yusuf, Z.O.; Badaki, J.A.; Audu-Ohida, H. (2025): Distribution and diversity of insects' species in the Federal University Lokoja Zoo and Conservatory area Kogi State Nigeria. Confluence Journal of Pure & Applied Sci. 4(1): 133-147. (in English) [" Insects are a vital part of the ecosystem, they aid in the production of fruits seeds, vegetables and flowers. They also serve as food for birds and fish. However, with increasing agricultural, industrial and human activities in the modification of the environment, their population

and distribution could decline hence, the study which was aimed at investigating the insects' distribution and different species available in the study area the Federal University Lokoja Zoo and Conservatory, Kogi State Nigeria (Latitude 7° 51' 33" N; Longitude 6° 41' 22" E; Altitude 145m above sea level.). Insects were collected every other week from February to May 2024. Pitfall traps were set up, Yellow-pan traps were mounted in selected locations of the study area, Knock-down techniques were adopted for some species of insects, and a sweep net was also used, all as methods to effectively collect the insects. Identification of the collected insects were done using keys in the insectary of the Department of Zoology, Federal University Lokoja. 213 insects were encountered in total belonging to 33 species, 22 families, and 6 orders, were sampled from the study area. Analysed results using descriptive statistics showed that the most abundant group of insects in the study area were Coleoptera (38.03%), followed by Lepidoptera (21.13%), and Orthoptera (15.50%) while the least abundant was the Diptera (5.63%). Diptera was the most even (E = 0.8938), followed by Odonata (E = 0.8242) and Hymenoptera (E = 0.7252). The study revealed that Coleopterans were the most dominant and Lepidopterans were the most diverse. Finally, the study indicates that the Federal University Lokoja Zoo and Conservatory is rich in insects' abundance and diversity. Each of the species exhibits differences in abundance and distribution and this is a useful information for planning of conservation measures. The richness of the insect's species in the study area also indicates a beneficial contribution to habitat quality within the Zoo and environs." (Authors)] Address: Shitta, K.B., Dept of Zoology, Fac. of Science, Federal Univ. Lokoja, P.M.B. 1154 Lokoja, Kogi State, Nigeria. Email: kefasshitta2@gmail.com

24906. Shitta, K.B.; Badaki, J.A.; Alege, G.O.; Ngwamah, J.S.; Ifatimehin, O.O.; Suleiman, M.N.; Adamu, M. (2025): Insects species richness and diversity at the zoo premises of Federal University Lokoja, Kogi State Nigeria. Scientia Africana 24(2): 149-158. (in English) ["Insects play vital role in the ecosystem, their activities such as burrowing help to facilitate decomposition of organisms. They also serve as food for birds, fish and humans. However, with increasing anthropogenic activities, their population could decline, and this was the motivation for the study which was aimed at investigating the insects' richness and diversity at the Federal University Lokoja Zoo and Conservatory, Felele Campus, Kogi State Nigeria (7° 51' 33" N; 6° 41' 22" E; Altitude 145m asl). Weekly samples of insects were conducted between February and May 2024 using Pitfall traps, Yellow-pan traps, Knock-down techniques, and sweep net methods. Insects collected were identified using keys in the insectary of the Department of Zoology, Federal University Lokoja. A total of 386 insects belonging to 35 species, 25 families, and 6 orders, were sampled from the study area. Data were analysed using descriptive statistics and results obtained showed that the most abundant group of insects were Coleoptera (34.72%), Lepidoptera (23.05%), and Orthoptera (13.99%) while the least abundant was the Diptera (5.96%) respectively. The order Lepidoptera had the highest richness index [Margalef's index (D) = 2.3740] and diversity index [Shannon's index (H) = 1.9950]. The order Diptera was the most even (E = 0.9938), followed by Odonata (E = 0.9142) and Hymenoptera (E = 0.8152). The survey indicates that the Zoo premises of Federal University Lokoja is rich in insects' abundance and diversity. The richness of the insect species in the study area also indicates a beneficial contribution to habitat quality within the Zoo and its surroundings." (Authors) The study includs North American and Australian species.] Address: Shitta, K.B., Dept of Zoology, Federal Univ. Lokoja, P.M.B. 1154 Lokoja, Kogi State Nigeria. Email: kefasshitta2@gmail.com

24907. Simkins, A.T.; Sutherland, W.J.; Dicks, L.V.; Hilton-Taylor, C.; Grace, M.K.; Butchart, S.H.M.; Senior, R.A.; Petrovan, S.O. (2025): Past conservation efforts reveal which actions lead to positive outcomes for species. PLoS Biol 23(3): e3003051. https://doi.org/10.1371/journal.pbio.3003051: 21 pp. (in English) ["Understanding the consequences of past conservation efforts is essential to inform the means of maintaining and restoring species. Data from the IUCN Red List for 67,217 animal species were reviewed and analyzed to determine (i) which conservation actions have been implemented for different species, (ii) which types of species have improved in status and (iii) which actions are likely to have driven the improvements. At least 51.8% (34,847) of assessed species have actions reported, mostly comprising protected areas (82.7%). Proportionately more actions were reported for tetrapods and warm-water reef-building corals, and fewer for fish, Odonata and crustaceans. Species at greater risk of extinction have a wider range of species-targeted actions reported compared with less threatened species, reflecting differences in documentation and conservation efforts. Six times more species have deteriorated than improved in status, as reflected in their IUCN Red List category. Almost all species that improved have conservation actions in place, and typically were previously at high risk of extinction, have smaller ranges and were less likely to be documented as threatened by hunting and habitat loss or degradation. Improvements in status were driven by a wide range of actions, especially reintroductions; for amphibians and birds, area management was also important. While conservation interventions have reduced the extinction risk of some of the most threatened species, in very few cases has full recovery been achieved. Scaling up the extent and intensity of conservation interventions, particularly landscape-scale actions that benefit broadly distributed species, is urgently needed to assist the recovery of biodiversity." (Authors)] Address: Simkins, Ashley, Dept of Zoology, Univ. of Cambridge, Cambridge, UK. Email: ats43@cam.ac.uk

24908. Siregar, A.Z.; Joshi, R.C.; Basyuni, M.; Priawandiputra, W.; Hasanuddin, A.; Sim, Y. (2025): Insect diversity of mangrove ecosystems in Beras Basah village, Langkat, North Sumatra, Indonesia. Journal of Tropical Crop Science 12(1): 89-102. (in English) ["This study aimed to investigate the diversity of insects, including stingless bees (Heterotrigona) in the mangrove ecosystem of Beras Basah Village, Langkat Regency, North Sumatra, Indonesia. The mangrove plantation in Beras Basah Village contained 11 species, … Insect identification from four observations using sweep nets, yellow sticky traps, and blue pan traps resulted in the collection of 1,525 individual insects belonging to eight orders, 17 families, and 19 genera. These insects included ten predators and pests, comprising five Odonata species (Neurothemis terminata, Orthetrum sabina, O. testaceum, Potamarcha congener, Zyxomma obtusum) and five ant species (Camponotus spp., Crematogaster spp., Nylanderia spp., Odontoponera denticulate, Pheidole spp.). The insect functional status within the mangrove area was determined to include seven species of scavengers, 12 species of herbivores, two species of pollinators, 19 species of predators, one species of parasitoid, and four species of insect disease vectors. This study provides valuable insights into the insect diversity and ecological roles within the mangrove ecosystem of Beras Basah Village, contributing to a better understanding of the conservation and management of this important habitat." (Authors)] Address: Siregar, Ameilia Zuliyanti, Dept Agro-Technology, Fac. Agriculture, Univ. of Sumatera Utara Jl. Dr. A. Sofyan No.3 Medan, 20155, Sumatera Utara, Indonesia. Email: ameilia@usu.ac.id

24909. Sneh Yadav; Singh, R.S.; Maurya, C.L.; Biswas, S.K.; Kumar, S.; Sing, H.C. (2025): A study on diversity of insect pests and natural enemies inhabiting the Chickpea (Cicer arietinum Linnaeus) agro-ecosystem in the Kanpur region of Uttar Pradesh, India, using Simpson's Index. Journal of Advances in Biology & Biotechnology 28(7): 1154-1163. (in English) ["… We identified seven insect pest and natural enemy species [including Crocothemis servilia] (Authors)] Address: Sneh Yadav, Dept Ent., C.S.A.U.A. & T., Kanpur (U.P.), India

24910. Šigutová, H.; Pyszko, P.; Bílková, E.; Dolný, A. (2025): Highly conserved ecosystems facing climate change: Rapid shifts in Odonata assemblages of Central European bogs. Global Change Biology 31: e70183. 14 pp. (in English) ["Freshwater diversity is declining at an alarming rate worldwide, and climate change is a key driver. However, attributing biological shifts solely to climate warming remains challenging because of confounding anthropogenic stressors. Peatbogs, being highly conserved, strictly protected, and minimally disturbed, offer a unique study system to isolate climate effects. We compared odonate assemblages in 27 Central European raised and transitional bogs between two sets of standardized surveys approximately 20 years apart (1998–2006 and 2020–2024). During this period, the mean annual air temperature has increased by 1.23°C. We tracked species richness, composition, taxonomic diversity, and functional traits (thermal tolerance, conservation value indicators, and selected morphological and life-history traits) and also examined phylogenetic patterns of species turnover. Although species richness remained stable, assemblage composition shifted markedly from cold-adapted, vulnerable bog specialists toward warm-adapted habitat generalists with lower conservation value. Notably, Ponto-Mediterranean species and those with a lower upper elevational limit increased their occupancy. Although the phylogenetic signal across the evolutionary tree of odonates was low, implying that the responses of the species to climate change were independent of their phylogenetic position, we revealed frequent genus-level replacements. These findings reinforce the position of odonates as a model group for detecting climate-driven changes in freshwater communities. Our study has revealed that climate warming alone can trigger profound reorganization of insect communities in inherently stable peatbog habitats. Specific traits linked to vulnerability (e.g., thermal index, red list status) and specialization proved to be promising predictors of future shifts in odonatofauna of temperate peatlands. The pronounced changes documented here may precede irreversible transformations of these unique ecosystems, highlighting the urgency of monitoring bog habitats and maintaining their stability under ongoing global change."] Address: Šigutová, Hana, Dept Zool., Fac. Science, Palacký Univ., Olomouc, Czech Republic.

24911. Soh, S.-H.; Ngiam, R.W.J. (2025): Biodiversity Record: Damselflies Mortonagrion falcatum and Aciagrion borneense at Tuas. Nature in Singapore 18: e2025051: 2 pp. (in English) [Singapore Island, Tuas, near Tuas Link 4; 28 Dec 2024 at around 1010 hrs, 2.i. 2025 at around 1058 hrs, (M. falcatum) & 19.i.-2025 at around 0923 hrs. (M. falcatum, A. borneense)] Address: Zick Soh, S.-H.: Email: ss82zick@gmail.com

24912. Solomons, D.R. (2025): Characterisation of microplastic concentrations in sediment, water and secondary consumer organisms (Odonata, Gomphidae) in two South African streams. MSc thesis, Faculty of Science, Department of Zoology, Aquatic Health, University of Johannesburg: 140 pp. (in English) ["Microplastic pollution has emerged as a pervasive environmental issue, affecting diverse ecosystems and organisms globally. Despite increasing recognition of its widespread presence, the impacts of microplastics on freshwater ecosystems remain inadequately understood. This study aimed to explore the spatial and temporal dynamics of microplastics in two streams (Maretlwane and Sterkstroom), which together constitute the Gwathle catchment draining the Magaliesberg mountains in the North West province, South Africa. Microplastic concentrations were quantified in sediment, water and club-tailed dragonfly larvae (Odonata, Gomphidae: [Paragomphus cognatus and not specified]), which represent a typical and abundant secondary consumer organism in the sediment biotope. 13 sites were sampled across the two streams during both the wet summer and dry winter seasons (March and September 2022, respectively). Sites were sampled in the pristine headwaters of each stream (i.e. nature reserve land) as well as from a variety of landscapes that the streams encounter downstream, which included agricultural, mining and urban-impacted landscapes. In addition to the comparison of microplastic concentrations among different land uses, various hydrological parameters were measured at each site in order to relate these to microplastic concentrations. Microplastic abundance across the sediment, water and biotic samples was quantified under a stereomicroscope using a hot needle test and characterisation of the polymer composition of the dominant particle types was performed using Raman spectroscopy. Building on previous research on microplastic ingestion by primary consumers in the same streams, this study examines whether there is trophic transfer of microplastics to secondary consumers. Laboratory analyses revealed sediment microplastic concentrations averaging 72.82 particles/kg and water concentrations at 0.08 particles/L during the dry season, both higher than in the wet season. Dragonfly larvae exhibited higher mean concentrations in the wet season, averaging 0.79 particles/g. Microplastic abundance in sediment and water samples (but not dragonfly larvae) was significantly elevated at sites outside nature reserves compared to those inside nature reserves. The effects of individual land uses (urban, agriculture and mining) on stream microplastic abundance were not significant and showed mixed trends, with microplastic abundance being highest in urban landscapes for sediment and water, but for dragonfly larvae microplastics were highest in agricultural areas. Whilst positive linear trends between microplastic abundance and hydrological variables (stream velocity, depth and discharge) were detected, these were not significant. A clear trend for both streams was a strong positive relationship between water and sediment microplastic abundance and distance downstream, indicating an accumulation of microplastics down the length of the Gwathle catchment. This is the first study in a southern African context to provide evidence indicating the trophic transfer of microplastics in stream ecosystems, highlighting their pervasive nature and stressing the need for further research on their effects on ecosystem health and function. Additionally, it underscores the importance of further research investigating land-use impacts and in-stream dynamics on microplastic abundances." (Author)] Address: https://ujcontent.uj.ac.za/esploro/outputs/graduate/Characterisation-of-microplastic-concentrations-in-sediment/9 955-190807691

24913. Sotério de Souza, D. (2025): Ciência Cidadã e seu potencial no envoi de dados sobre libélulas (Insecta: Odonata) no bioma Caatinga. Educ. Ci. e Saúde 12(1): 18-28. (in Portugese, with English summary) ["Citizen Science is understood as the participation of science enthusiasts in the collection and submission of scientific data, and has emerged as an effective tool for monitoring and understanding species. The objective of this study was to explore the potential of citizen science in collecting data on insects of the order Odonata in the Caatinga biome. The study used data from the iNaturalist

platform, whose analyses were performed using the R Studio and QGIS software. As a result, of a total of 477 records of odonates analyzed, the genera Erythrodiplax and Erythemis stood out with the highest number of observations for the Caatinga, demonstrating a considerable diversity of species for the biome. However, the study also highlighted gaps, such as the absence of records in some regions, which reinforces the need to expand the network of collaborators and observers. The research highlighted the importance of citizen science in obtaining data in large areas and at low cost. Therefore, the study showed the potential of citizen science in mapping odonates in the Caatinga."] Address: Sotério de Souza, D., Licenciada em Ciências Biológicas, Unidade Acadêmica de Biologia e Química, Univ. Federal de Campina Grande, Cuité-PB, Brasil. Email: danielasoterios@gmail.com

24914. Starzak, R.; Cieplok, A.; Czerniawski, R.; Spyra, A. (2025): The role of artificial lakes located in forests in the context of small retention, biodiversity and climatic changes — Evidence from southern Poland. Ecology and Evolution, 2025; 15: e70775. https://doi.org/10.1002/ece3.70775: 19 pp. (in English) ["Drought has an effect on hydrologic conditions and water quality under climate change. Small water retention in forests is one of the priority investment programs implemented in recent years, supported by the European Union. This study aimed to assess the ecological conditions of forest lakes using macrophytes and benthos organism diversity as an ecological indicator of ecosystem conditions under climatic changes. The study was carried out in forest artificial lakes serving as surface water retention in the context of biodiversity in climatic changes and its role in the retention of water. Despite systematic maintenance activities, a long period of lake existence significantly determines the natural biological processes occurring in lakes and riparian habitats. The analysis showed low values of salinity indicators and the concentration of nitrogen and phosphorus. The pH ranged from 6.2 to 7.6; showing slightly acidic conditions or within the limits of neutral. The model of plant associations showed the occurrence of 24 species of plants within nine plant assemblages in the Phragmitetea and Potametea classes of associations (Biocenotic index 1.007–1.692). Despite human activities, lake condition, as assessed by the ESMI index or the biocenotic diversity indices, is good (0.416–0.648). Climate change, expressed by an increase in the frequency of dry years, creates a situation of changes in filling lakes with water, which, taking into account their small depth, results in dynamically changing conditions for the development of phytolittoral. Along with the phytolittoral changes, benthos communities change, their density and the number of taxa also fluctuate. It should be assumed that with ongoing climate change, these phenomena will probably intensify, which will lead to changes in entire ecosystems at plant and animal levels." (Authors) (Odonate) taxa are treated at family level.] Address: Spyra, Aneta, Dept of Hydrobiology Faculty of Biology & Environmental Protection, The University of Silesia, ul. Bankowa 9, 40-007 Katowice, Poland. E-mail: aneta.spyra@us.edu.pl

24915. Stoenescu, A.-M.; Stan, C.; Stanica, F (2025): Occurrence and diversity of insect species in a jujube orchard in Southern Oltenia, Romania. Notulae Botanicae Horti Agrobotanici Cluj-Napoca, 53(2), 14508. https://doi.org/10.15835/nbha53214508: 20 pp. (in English) ["This study aimed to address the lack of comprehensive research on the occurrence and diversity of insect species in jujube orchards. The research focused on identifying key insect species and assessing their potential impacts on the orchard ecosystem. Insect species were sampled from 2022 to 2024 using field surveys with direct observation, and their diversity was analysed based on occurrence. 12 orders, 42 families, and 57 species were identified over the three-year study period. … Predators … Odonata [Orthetrum sp., Platycnemis pennipes, Calopteryx splendens] orders. (Authors)] Address: Stoenescu, Ana-Maria, Univ. of Craiova, Faculty of Horticulture, Dept of Horticulture & Food Science, Str. A.I. Cuza, 13, Craiova, 200585, Romania. Email: anamaria.stoenescu@edu.ucv.ro

24916. Sumanapala, F.; Ranasinghe, W.; Weerakoon (2025): A new species of Ceylonosticta (Odonata: Platystictidae) from the Peak Wilderness Mountain Range of Sri Lanka. International Journal of Odonatology 28: 61-70. (in English) ["The genus Ceylonosticta is represented by 22 species distributed mainly in the wet lowlands and Central highlands of Sri Lanka. The present work describes another new species from this region. Ceylonosticta sripadensis sp. n. is restricted to the Peak Wilderness Mountain range and can be distinguished from its congeners by the shape of the caudal appendages of the male and prothorax details. Distinct backward directed setae on the posterior lobe of the prothorax of both sexes are especially characteristic. Phylogenetic analysis using mitochondrial 16S and COI genes indicates that the species is a member of the Ceylonosticta mojca species group. The discovery highlights the need for further taxonomic work on Ceylonosticta and the conservation importance of the Peak Wilderness Mountain Range of Sri Lanka." (Authors)] Address: Sumanapalaa, A.P., Dept of Zoology & Environment Sciences, Faculty of Science, University of Colombo, Sri Lanka. Email: apsumanapala@gmail.com

24917. Sun, W.-; Wang, L.; Wang Y.Q. (2025): Wing–wing coupling enhances the aerodynamic performance of dragonflies during forward flight. Physics of Fluids 37, 013610 (2025): (in English) ["Dragonflies have garnered significant attention due to their ability to perform various complex flight maneuvers. As a dipteran insect, the wing–wing coupling between forewing and hindwing (FW and HW) in dragonflies plays a crucial role in aerodynamic performance. In this study, a numerical simulation model is developed to elucidate the impact mechanism of wing–wing coupling in dragonflies during forward flight. The results reveal that the wing–wing coupling mainly enhances the aerodynamic force for hindwing, thereby improving the aerodynamic performance of dragonflies. There is a synergy between flapping deviation angle and phase angle. Dragonflies with negative flapping deviation angle and a suitable phase angle about 45° can generate high horizontal force and propulsive efficiency significantly while maintaining the vertical force. The effect of wing–wing coupling is related to the wing spacing of dragonflies, and proves to be advantageous at small dimensionless wing spacing (less than 2.5). These findings deepen our understanding of the exceptional flight capabilities of dragonflies and provide valuable insights for the design of tandem flapping wings." (Authors)] Address: wangyanqing@mail.neu.edu.cn

24918. Sutherland, L.N.; Carter, P.R.; Abbott, J.; Beatty, C.; Bota-Sierra, C.A.; Büsse, S.; Cano-Cobos, Y.; Combey, R.; Cordero-Rivera, A.; Dike, C.U.; Frandsen, P.; Goodman, A.; Guillermo-Ferreira, R.; Guralnick, R.; Hadfiled, R.K.; Jijon, G.; Juen, L.; Kalkman, V.J.; Kohli, M.; Lin, Y.F.; Fomekong-Lontchi, J.; Lupiyaningdyah, P.; Newton, L.; Onsongo, V.; Pessacq, P., Sánchez-Herrera, M.; Sánchez-Guillén, R.A.; Tennessen, K.; Tolman, E.; Ware, J.; Wellenreuther, M.; Bybee, S. (2025): Zygoptera systematics: past, present, and future. Insect Systematics and Diversity 9(4), June 2025, 5, https://doi.org/10.1093/isd/ixaf013: 27 pp. (in English) ["Odonata is a midsized insect order (~6420 species) containing Anisoptera

(3,120 species), Zygoptera (~3,297 species), and the intermediate Anisozygoptera (~3 species). In this review of the suborder Zygoptera, we provide a brief overview of their biology, ecology, and natural history. We also review the current state of their systematics and phylogenetics, highlighting remaining higher-level classification (eg family, superfamily) issues to address. Lastly, we will emphasize areas that are still in need of exploration which would greatly improve our understanding of the group." (Authors)] Address: Sutherland, Laura, Dept Biol., 4102 LSB, Brigham Young Univ., Provo, UT 84602, USA. Email: lns25@byu.edu

24919. Sysiak, M.; Maszczyk, P.; Mikulski, A. (2025): Threat to the predator suppresses defence of its prey. R. Soc. Open Sci. 12: 241711. https://doi.org/10.1098/rsos.241711: 12 pp. (in English) ["Many studies have shown that prey can optimize their defence mechanisms based on cues indicating predator presence and pressure. However, little is known about whether prey can assess the actual threat by considering both predator density and the motivational state of cannibalistic predators, which can be influenced by threats from higher order predators. We conducted laboratory experiments to test the hypothesis that high predator density, combined with chemical cues indicating predator stress (e.g. alarm and disturbance cues), may inhibit prey defences. Using Daphnia and Zygoptera/Anisoptera larvae [Ischnura elegans, Brachytron pratense], we observed that Daphnia's strong response to low-density predator kairomones was suppressed when exposed to high-density predator kairomones and disturbance cues. Surprisingly, we found no evidence of a suppressive response to alarm cues. Our study is to our knowledge, the first to show that prey uses predator stress cues to avoid unnecessary defences, suggesting a 'cascade of fear' in which fear at one trophic level reduces fear at a lower level. Furthermore, it is to our knowledge the first to demonstrate that prey can reduce their anti-predator response in the presence of high densities of cannibalistic predators." (Authors)] Address: Sysiak, Monika, Dept of Hydrobiology, Inst. Ecology, Faculty of Biology, University of Warsaw, Zwirki i Wigury 101, Warsaw 02-089, Poland. Email: ma.sysiak@student.uw.edu.pl

24920. Tanczuk, A. (2025): Peat excavations on fens – potential role of anthropogenic peat pools in supporting Odonata in Poland and central Europe. Polish Journal of Entomology 94: 50-74. (in English) ["Peatlands are one the most threatened habitats in Europe. They have been dried and changed into hay meadows and the peat was extracted for heating purposes. Climatic changes have also contributed to the vanishing of peatlands. This is why, water organisms are becoming endangered or extinct. In Poland, fens are the most common among peatlands, yet still, the fauna of invertebrates, in this case Odonata, is not fully examined, especially in anthropogenic habitats such as peat excavations. Such water bodies seem to be the last hope for tyrphophiles, since the pits are deep and the water mirror is visible which ensures reproduction. On account of degradation of natural habitats, anthropogenic waters are in the centre of attention; they may become the secondary habitats for aquatic organisms, including dragonflies. Peat excavations are able to support populations of plants and animals. Nevertheless, they are still a by-product of extracting peat for a fuel and horticultural purposes and not the object of deliberate protection. Still, more have to be explored in the context on specific factors important for dragonflies living in peat excavations, in order to plan the conservation in a directed way. There are only few articles particularly about that subject in Poland and most of the authors concentrate mainly on peat pools on sphagnum bogs. There are some publications in Europe, though, with the ideas for protection and conservation of dragonflies. Nevertheless, more should be added concerning dragonflies on peat excavations specifically, since the naturalness of the habitat is not the main issue as far as biodiversity of odonatofauna is concerned. The aim of this article is to find available articles and papers which are focused on odonatofauna of peat excavations on fens (alkaline fens, where possible) to evaluate such habitats as useful anthropogenic water bodies in conservation of dragonflies." (Authors)] Address: Tanczuk, Agnieszka Maria Curie-Sklodowska University in Lublin, Institute of Biological Sciences, Dept of Zoology & Nature Protection, Akademicka Str. 19, 20-033 Lublin, Poland. Email: atanczuk@gmail.com

24921. Tarwotjo, U.; Rahadian, R.; Hadi, M. (2025): Abundance and diversity of insects on apple water tree during fruit season using different colours and different height placement of sticky trap. Journal of Physics: Conference Series 1217, 012140: 6 pp. (in English) ["The objective of this research were to determine the abundance and diversity of insects on apple water tree and to measure the effectiveness of several colours and height placement of sticky trap on fruit flies and other insects on apple water tree during fruit season. Sampling of insects was conducting in an apple water field during fruit season in Demak Central Java Indonesia using sticky trap with methyl eugenol attractant. There were three different sticky trap colours i.e., yellow, white, and blue; and two height of trap placement i.e., one meter and three meter, were used. Parameters observed included the number of fruit flies in each colour, height placement of sticky trap, and the taxon of insects. The data was analysed into Shannon-Wiener diversity and abundances of insects on each colours and height placement of sticky traps. The results showed that the insects found consist of 5 orders (Diptera, Hymenoptera, Coleoptera, Lepidoptera, and Odonata ["Blue, three meters high, Calopterygidae"]), and 21 families. Most families are found in the order Diptera (8 families), Hymenoptera (4 families), and Coleoptera (3 families). The Diptera family consists of Tephritidae, Culicidae, Agromyzidae, Muscidae, Asillidae, Mycetophyllide, Drosophyllidae, Bombyllidae. In short, the insects on apple water tree were more abundant in 3 meter height and they tend to be attracted on yellow sticky trap." (Authors)] Address: Rahadian, R., Dept Biology, Faculty of Sciences & Mathematics, Diponegoro Univ., Jl. Prof. Soedarto, SH, Tembalang, Semarang 50275, Indonesia. Email: rully.rahadian@live.undip.aci.id

24922. Tauru, H.; Krieg-Jacquier, R.; Boudot, J.-P.; Bolender, M.; Ecuyer, L. (2025): Premières mentions de Trithemis annulata (Palisot de Beauvois, 1807), dans les départements de l'Ain, de la Loire et du Rhône (Odonata: Libellulidae). Martinia 39(5): 28-38. (in French, with English summary) ["First records of T. annulata in the Ain, Loire, and Rhône departments, France. In September 2023, several observations of T. annulata were made in the departments of Rhône, Ain, and Loire. These are the first records of this species in the northern part of the former Rhône-Alpes region and the northernmost within the biogeographical zone known as the Rhône plain. Despite monitoring a few sites and new observations in 2024, the species' autochthony could not be confirmed by collecting exuviae or observing emergences, though mating and egg-laying behaviour make it a possibility. The gradual colonization of France by this Afrotropical species is examined both in the context of ongoing climate change and its establishment in man-made water bodies such as former gravel pits." (Authors)] Address: Tauru, H., FNE Rhône, 22 rue Édouard Aynard, 69100 Villeurbanne, France. Email: hugo.tauru@fne-aura.org

24923. Teixeira, K.; Santos, A.d.S.; Vilela, D.S.; Ribeiro, C.;

Rodrigues, M.E. (2025): The importance of different biomes (Atlantic Forest, Cerrado, and Caatinga) in the regional structuring of Neotropical dragonfly assemblages. Diversity 17(5):345: 15 pp. (in English) ["Understanding how assemblages are structured is important for ecology, especially in tropical regions that exhibit high biodiversity and are currently experiencing high rates of loss and modification of natural environments caused by anthropogenic impacts. Understanding the structuring of assemblages across different regions at different spatial scales allows us to comprehend how environmental modifications can affect biodiversity on a local and regional scale. The objective of this study was to evaluate the biodiversity of Odonata species using taxonomic diversity metrics (richness and composition) in areas of Cerrado, Atlantic Forest, and Caatinga and to evaluate which sets of local and spatial environmental variables are associated with these assemblages among the different areas evaluated. The study was conducted in the state of Bahia, where 49 streams were sampled, including 17 in the Atlantic Forest, 18 in the Caatinga, and 15 in the Cerrado. Our results demonstrate a high diversity of Odonata species, with 95 species collected. We found a similar species richness among the regions sampled. However, each region presented a distinct composition, with greater similarity between the Cerrado and the Caatinga. Spatial predictors along with some environmental variables were associated with the Caatinga and Cerrado. Some environmental variables, such as the amount of riparian vegetation and aquatic vegetation, were associated with the Cerrado. The results highlighted that each of the evaluated regions are fundamental for maintaining and conserving the regional dragonfly biodiversity. The lack of conservation of aquatic ecosystems in the different regions leads to local species loss and, consequently, to a loss of regional Odonata biodiversity." (Authors)] Address: Teixeira Karolina, Programa de Pós-Graduação em Desenvolvimento e Meio Ambiente, Universidade Estadual de Santa Cruz, Ilhéus 45662-900, Bahia, Brazil. Email: karolina1275@gmail.com

24924. Thalhuber, J.T.; Chumchal, M.M.; Drenner, R.W.; Nowlin, W.H.; Williams, D.A.; Barst, B.D.; Kennedy, J.H.; Mitchell, W.A.; Self, M.; Willoughby, F.M.; Zudock, W. (2025): Diet and methyl mercury contamination of nestling red-winged blackbirds. Environmental Toxicology and Chemistry 44(1): 59-67. (in English) [Methyl mercury (MeHg) is a widespread environmental contaminant that can have adverse effects on the health of vertebrate wildlife. This study focused on diets and MeHg contamination of nestling red-winged blackbirds (Agelaius phoeniceus) from a wetland in north Texas, USA. In previous research at the study site, a risk assessment model suggested that if emergent aquatic insects (i.e., odonates) were the dominant prey item in nestling diets, the health of nestling red-winged blackbirds could be negatively affected. The purpose of this study was to follow up on an earlier risk assessment and determine whether nestling red-winged blackbirds were accumulating elevated concentrations of MeHg at our study site. We had four objectives: (1) estimate the proportion of emergent aquatic insects, spiders, and terrestrial insects in diets of nestling red-winged blackbirds using a stable isotope-based dietary mixing model; (2) assess the concentrations of MeHg in emergent aquatic insects, spiders, and terrestrial insects; (3) assess the concentrations of MeHg in blood of nestling red-winged blackbirds; and (4) determine whether nestling red-winged blackbirds had MeHg concentrations that were high enough to pose a health risk. We found that nestling red-winged blackbirds had a diet dominated by terrestrial insect prey with low concentrations of MeHg and that the nestlings had low concentrations of MeHg in their blood, well below hazardous levels. The results of the study suggest that caution must be used when interpreting risk assessment models for nestling red-winged blackbirds. Because their diets can consist of varying proportions of emergent aquatic insects, spiders, and terrestrial insects, risk assessments based on estimates of diet from the literature that suggest nestlings could be at risk from Hg contamination should be followed up with studies to assess diet and/or the actual level of contamination of nestlings." (Authors)] Address: Chumchal, M., Biology Dept, Texas Christian Univ., Fort Worth, TX, USA. Email: m.m.chumchal@tcu.edu

24925. Timm, R.; Pillukat, A.; Martens, M. (2025): Lestes barbarus als neu entdeckter Wirt der Libellengnitze Forcipomyia paludis (Odonata: Lestidae; Diptera: Ceratopogonidae). Libellula 44 (1/2) 2025: 127–130. (in German, with English summary) [„L. barbarus as a new host of F. paludis – On 9 June 2024, in the Eschenrieder Moos west of Munich, Germany, a freshly emerged female of L. barbarus with one biting midge attached on the underside of the left hindwing was documented by photos. This is the first record of F. paludis as a parasite of L. barbarus." (Authors)] Address: Timm, R., St. Konrad-Str. 10, 85540 Haar, Germany.

24926. Tolman, E.R.; Gamett, E.; Beatty, C.D.; Goodman, A.; Hahn, B.; Benischek, C.; Castillo, G.; Derderian, E.; Fernandez-Juarez, S.; Gallafent, B.; Jenson, J.; Jordan, D.; Schneider, M.; Salazar, R.; Tamano, T.; Wei, M.; Idec, J.; Guralnick, R.; Ware, J.L.; Kohli, M.K. (2025): The blueprint for survival: the blue dasher dragonfy as a model for urban adaptation. BMC Ecology and Evolution (2025) 25:67: 17 pp. (in English) ["Background: Human alteration of natural environments and habitats is a major driver of species decline. However, a handful of species thrive in human altered environments. The biology, distribution, population structure, and molecular adaptations enabling certain species to thrive in human-altered habitats are not well understood. Here, we evaluate the population and functional genomics, ecological niche and distributions, and geometric morphometrics of P. longipennis, one of the most ubiquitously observed insects in human altered habitats. Results: Using resequencing data we identify a number of genes involved with the success of the blue dasher in human altered habitats, including loci contributing to immune function and response to oxidative stress. Some genes related to these functions are found in regions of strong population structure, while others are not, potentially indicating both regional and widespread adaptations to urban environments within this species. Using one of the most robust locality datasets for any species to date, we also generate habitat suitability predictions which show that P. longipennis has spread with urbanization, suggesting humans have created suitable habitat for this species. These results complement morphological and genomic data showing P. longipennis (particularly East of the Rocky Mountains) has the capacity to rapidly disperse to newly suitable habitats. Conclusions: We confirm that P. longipennis is well equipped to deal with the stress of urban habitats, by observing large swaths of suitable habitat of P. longipennis throughout its range, both within and outside of major cities and towns, and identifying conserved and population specific molecular mechanisms related to urban stress. Furthermore, we observe minor variability in suitable habitat of P. longipennis throughout the years; we do not note any substantial loss or gain in habitat, suggesting its resiliency to fluctuations in temperature and precipitation throughout the United States. Given the shared barriers to colonizing an urban habitat, we expect that many of the molecular adaptations to urban environments we have identified in P. longipennis could be found in other animals that are broadly tied to urban habitats." (Authors)] Address: Tolman, E., Dept Biol. Sci., Virginia Tech, Blacksburg, VA, USA. Email: etolman@amnh.org

24927. Tong, A. (2025): Where dragonflies return: Towards an ento-metropolis. MS thesis, Department of Landscape Architecture, Harvard University Graduate School of Design: 72 pp. (in English) ["Somatochlora hineana, a key ecological indicator of groundwater-based ecosystems, faces extinction in the United States. Its most genetically diverse remaining habitat - the Des Plaines River watershed in Illinois – is experiencing significant groundwater depletion and encroachment through urbanization, thereby threatening the species' survival. This proposal reimagines single-purpose infrastructure easements as shared commons for people and wildlife, and operates at three layers: point, repurposing groundwater wells into dragonfly habitats; line, transforming transmission corridors into flight pathways; and field, integrating these elements into a systemic urban framework for long-term coexistence. Over time, the return of the dragonfly would mark the site's transformation into a new kind of public space, offering a cultural identity shaped by confronting insect agency. Each summer, swarms of dragonflies would become a celebrated spectacle, signaling restored balance between human infrastructure and the natural world. By centering more-thanhuman perspectives, this vision challenges conventional infrastructure design, advocating for landscapes as adaptive commons—spaces of ecological reciprocity rather than extraction and control." (Author)] Address: not stated

24928. Tóth-Ludányi, M. (2025): Az idegenhonos, inváziós jelzorák (Pacifastacus leniusculus (Dana, 1852)) magyarországi elterjedése és ökológiája [The distribution and ecology of the alien, invasive signal crayfish Pacifastacus leniusculus (Dana, 1852)) in Hungary]. PhD thesis, Juhász-Nagy Pál Doktori Iskola, University of Debrecen: 48 pp. (in Hungarian, with English summary) ["4.3.2. Impact of P. leniusculus on protected macroinvertebrates: Despite the invasion of P. leniusculus, the Pearl Brook is still characterised by the occurrence of several protected species, including Agnetina elegantula, Aquarius najas, Calopteryx virgo, Cordulegaster bidentata, C. heros, Gomphus vulgatissimus, Macronychus quadrituberculatus, Oligoneuriella rhenana, Onychogomphus forcipatus, Ophiogomphus cecilia and Unio crassus. Among the protected aquatic macroinvertebrate species in the Pearl Dam, the highest population densities were found for C. virgo (2.94 ± 1.08 individuals/m² ± S.E.), G. vulgatissimus (4.32 ± 1.66 individuals/m² ± S.E.) and O. cecilia (5.58 ± 1.57 individuals/m² ± SE). Several protected species were also present in Kersa, such as Aeshna isosceles, Astacus astacus, C. virgo, C. heros, Eurylophella karelica, G. vulgatissimus, O. forcipatus, O. cecilia and Unio crassus. Populations of C. virgo, C. heros, G. vulgatissimus, O. forcipatus, O. cecilia and U. crassus also occurred in the Pearl Creek and Kerka. We used the three protected species with the highest single species densities as a basis for comparison, i.e. C. virgo, G. vulgatissimus and O. forcipatus. The GLM analysis showed that the relative abundance of C. virgo and O. forcipatus was significantly lower in the presence of P. leniusculus, whereas the relative abundance of G. vulgatissimus showed no significant relationship with the abundance of the indicator crayfish. (Author/ DeepL.com. For a version published in a scientific journal see: Roessink, I., Magura, T., Müller. Z. (2022) The current status of Pacifastacus leniusculus (Dana, 1852) and their effect on aquatic macroinvertebrate communities in Hungarian watercourses. Aquatic Invasions 17(4): 543–559, https://doi.org/10. 3391/ai.2022.-17.4.05.] Address: https://dea.lib.unideb.hu/items/674703a-3-9033-45a5-aa44-e80c2d0d2b6f

24929. Trapero-Quintana, A.; Hernández Vázquez, A.M.; Rodríguez, J.Y.; Cordero-Rivera, A.; Reyes, Y.B.; Darias, M.M.; Rodríguez, U. (2025): Diversity of odonates in the Protected Natural Landscape Valley of the Ariguanabo River, Artemisa, Cuba. Notulae odonatologicae 10(5): 195-204. (in English) ["Cuba, the largest island in the Caribbean, hosts a diverse odonate fauna comprising 88 species across six families and 41 genera, including six endemic species. The Protected Natural Landscape of the Valley of the Ariguanabo River, located in Artemisa Province near San Antonio de los Baños, serves as a critical refuge for local biodiversity. This study updates the inventory of dragonflies in the area, adding 15 new species to previously published records, bringing the total to 50 species. Notably, Tramea lacerata was recorded for the first time in the archipelago since 1962, and Coryphaeschna ingens represents only the third record of this species in Cuba. These findings underscore the importance of the Valley of the Ariguanabo River as a key refuge for odonate diversity on the island." (Authors)] Address: Trapero-Quintana, A., Tecnologías y Servicios Agrarios, (TRAGSA) Madrid, Spain

24930. Tuneu-Corral, C.; Andrianalijaona, C.; Benirina, F.D.; Goodman, S.M.; Mata, V.A.; Tantely, M.L.; Cabeza, M.; Montauban, C.; Lopez-Bosch, D.; Lopez-Baucells, A. (2025): Beyond borders: The role of protected areas in promoting bat-mediated pest suppression in rural areas of Madagascar. Agriculture, Ecosystems and Environment 387, 109590: 16 pp. (in English) ["Protected areas can play a crucial role in enhancing agricultural sustainability by supporting ecosystem services that mitigate key challenges faced by rural farming communities. In Madagascar, subsistence agriculture is a major driver of deforestation and biodiversity loss, worsened by pest-related agricultural and harvest losses. Insectivorous bats are widely known natural enemies of agricultural pests, but the role of protected areas in safeguarding this service in surrounding rural landscapes is unclear. This study investigates the benefits provided by insectivorous bats roosting within protected areas of northern Madagascar, focusing on their potential to suppress agricultural pests and disease vectors. We used molecular techniques to analyse the diet of bats based on faecal samples from several species and locations. We found that most bat species consumed arthropod pests affecting rice and other crops, as well as several vectors of pathogens that cause diseases in humans and animals, such as mosquito vectors of Plasmodium sp. Given their mobility and home ranges, we suggest that certain bat species roosting in protected areas have the dispersal capacity to forage in nearby agricultural landscapes, contributing to pest suppression and disease risk reduction. Hence, protecting bat roosts within and around protected areas may offer a cost-effective means to enhance agricultural productivity and public health. These findings underscore the need to integrate ecosystem services into conservation and land-use management strategies, fostering sustainability and rural welfare in Madagascar." (Authors) In one case, in bat faecal samples a dragonfly was found.] Address: Tuneu-Corral, C., BiBio Res. Group, Natural Sci. Mus. of Granollers, Av. Francesc Macia 51, Granollers, Catalonia 08402, Spain. Email: tuneucorral@gmail.com

24931. van Leeuwen, C.H.A.; Csabai, Z.; Szloboda, A.; Móra, A.; Declerck, S.A.J. (2025): Length–dry mass relationships of aquatic insects: Geographic and taxonomic variation in a digital database. Freshawater Biology 70(7), e70056. 12 pp (in English) ["1. Aquatic insects are an abundant, yet declining, taxonomically heterogeneous group with special importance in both aquatic and terrestrial ecosystems. Accurate estimations of insect biomass during their aquatic life stages are essential to advance our fundamental knowledge about insects, their roles in ecosystems, and their vulnerability to human impact. However, assessing insect biomass from samples using classical drying techniques is time-consuming and

prohibits the use of samples for other analyses. 2. A widely applied method is therefore to use length–dry mass power regressions to obtain dry mass (DM) from body lengths (BL) using literature-derived parameter values. However, the application of this method relies on reliable and accessible parameter values, preferably matching the studied specimens both taxonomically and geographically. 3. Here, we aimed to increase parameter accessibility in the literature to (1) facilitate researchers in employing more appropriate length–mass regressions in their studies, (2) identify knowledge gaps that can direct future research towards unexplored regions and understudied taxonomic groups, and (3) visualise the relative contribution of geographic variation (differences among continents) and taxonomic variation (differences among families within each order) to regression lines. 4. We compiled a parameter dataset based on 25 publications for eight insect orders with aquatic life stages: Coleoptera, Diptera, Ephemeroptera, Hemiptera, Megaloptera/Neuroptera, Odonata, Plecoptera, and Trichoptera, and made the dataset available digitally. This parameter dataset is derived from over 15,000 measured insects of 84 (sub)families and 233 genera from all continents, except Africa and Antarctica. We found parameter values to be widely available at the order level, but at the resolution of family and genus levels, values were missing for 65% and 94% of the taxa, respectively. 5. Identified knowledge gaps were the need for (1) more data on variation among families that is collected standardised within the same geographic regions, (2) targeted collections of data for different orders within the same study areas, to reveal variation among families and genera, and (3) careful reporting of the exact methodologies used, to identify variation introduced by methodological dissimilarities. Geographic and taxonomic variation is visually presented in figures for further interpretation. 6. We conclude that length-mass regressions can be a powerful method, but due to data shortage at the genus and family taxonomic levels, order-level regressions with less reliability are necessarily applied. By providing parameters in a new digital dataset, we hope to facilitate users in more efficient assessment of parameter availability for studied taxa in any geographic region. The identified knowledge gaps can be used to direct future research efforts. More accessible parameter data will facilitate more reliable assessments of aquatic insect biomass and benefit future studies on this important and abundant group of organisms, bridging aquatic and terrestrial ecosystems." (Authors)} Address: van Leeuwen, C., Dept of Aquatic Ecology, Netherlands Institute of Ecology (NIOO-KNAW), Wageningen, the Netherlands. Email: casper.vanleeuwen@ru.nl

24932. van Nieuwpoort, J.C.; Schrama, M.; Spitzen, J.; Boerlijst, S.P. (2025): Beyond the target insects: impacts of Bti on aquatic macrofauna communities. Parasites & Vectors 18, 271: 8 pp. (in English) ["Background: The larvicide Bacillus thuringiensis israelensis (Bti) was introduced as a pest control method in the 1980s, claiming not only to be effective, but also to target specific insect groups including Culicidae and Simulidae, with no substantial effects on non-target species or to the local ecosystem. Methods: To test these claims, we applied Bti to a naturally colonized, replicated set of aquatic macrocosms under realistic, field-like conditions, and investigated impacts on non-target species, including effects on related taxa and higher trophic levels. Results: Our results indicate limited effects on most invertebrate prey taxa, with the exception of a decimation of the Chironomidae, which compose up to 50% of the biomass of these aquatic ecosystems. Effects on invertebrate predators including Hemiptera, Odonata and Coleoptera were investigated but were only observed for 1 species of Odonata: a small but significantly negative effect on larvae of Ischnura elegans. Conclusions: Overall, our results support the claim that, when used during short intervals at small spatial extents, Bti has limited effects on aquatic ecosystems, and that effects are relatively short-lived. However, negative effects on Chironomidae and Odonata larvae [I. elegans] warrant careful use of the substance at natural water ecosystems, especially as the former insect family constitutes the basis of the aquatic food in soft-sediment freshwater aquatic systems and Bti leads to a local temporary near-complete wipeout of this Diptera family. Overall, our results highlight the need to define and limit the spatial and adhere to the advised temporal extent at which Bti is used." (Authors)] Address: Boerlijst, S.P., Inst. Environ. Sci. Leiden, Dept Environ. Biology, Univ. Leiden, Einsteinweg 2, 2333CC, Leiden, Netherlands. Email: sam.boerlijst@deltares.nl

24933. Veeraperumal Senthil Nathan, J.P.; Navamani Chellapandian, M.; Raja, V.; Rajendran, P.; Lee, I.E.; Kulandaiyappan, N.K.; Stanislaus Arputharaj, B.; Singh, S.; Varshney, D. (2025): Multi-disciplinary investigations on the best fying wing configuration for hybrid unmanned aerial vehicles: A new approach to design. Machines 2025, 13, 604. https://doi.org/-10.3390/machines13070604: 58 pp. (in English) ["Flying wing Unmanned Aerial Vehicles (UAVs) are an interesting flight configuration, considering its benefits over aerodynamic, structural and added stealth aspects. The existing configurations are thoroughly studied from the literature survey and useful observations with respect to design and analysis are obtained. The proposed design method includes distinct calculations of the UAV and modelling using 3D experience. The created innovative models are simulated with the help of computational fluid dynamics techniques in ANSYS Fluent to obtain the aerodynamic parameters such as forces, pressure and velocity. The optimization process continues to add more desired modifications to the model, to finalize the best design of flying wing frame for the chosen application and mission profile. In total, nine models are developed starting with the base model, then leading to the conventional, advanced and nature inspired configurations such as the falcon and dragonfly models, as it has an added advantage of producing high maneuverability and lift. Following this, fluid structure interaction analysis has been performed for the best performing configurations, resulting in the determination of variations in the structural behavior with the imposition of advanced composite materials, namely, boron, Kevlar, glass and carbon fiber-reinforced polymers. In addition to this, a hybrid material is designed by combining two composites that resulted in superior material performance when imposed. Control dynamic study is performed for the maneuvers planned as per mission profile, to ensure stability during flight. All the resulting parameters obtained are compared with one another to choose the best frame of the flying wing body, along with the optimum material to be utilized for future analysis and development." (Authors)] Address: Lee, I.E., Fac. Artificial Intelligence & Engineering (FAIE), Multimedia Univ., Persiaran Multimedia, Cyberjaya 63100, Selangor, Malaysia. Email: ielee@mmu.edu.my

24934. Vital, P.; Vilela, D.S.; Rodrigues de Castro, I.; Souza, M.B.; Jacques, G. (2025): Comunidae de Odonata em um ambiete antropizado no Cerrado de Minas Gerais - Odonata community in an anthropized environment in the Cerrado of Minas Gerais. Acta Biologica Brasiliensia 8(1): 125-138. (in Portuguese, with English summary) ["The Cerrado is considered one of the world's biodiversity hotspots and faces intense habitat loss due to anthropization, which can alter the availability of aquatic habitats and reduce water quality, critical factors for the survival and reproduction of different animals, such as dragonflies. Therefore, this study aimed to inventory the Odonata community in an anthropized environment

in the Cerrado, in Minas Gerais. A total of 205 specimens were collected, belonging to 43 species and five families, demonstrating that anthropized environments in the Cerrado can harbor a considerable diversity of dragonflies. The presence of Cerrado fragments and the vegetation cover around the artificial lakes may be crucial factors in sustaining this diversity, highlighting the role of these areas as refuges for the Odonatofauna. Despite the predominance of generalist species, the record of Micrathyria divergens Westfall, 1992, an endemic and vulnerable species, in an anthropized environment is remarkable, expanding its ecological and distribution knowledge." (Authors)] Address: Jacques, G., Instituto Federal de Educação, Ciência e Tecnologia de Minas Gerais. Campus Bambuí, Brazil. Email: gabriel.jacques@ifmg.edu.br

24935. Voss, H.K. (2025): The emperor dragonfly. Wildlife in the Natural Garden. A Journey of Discovery: 74-75. (in English) ["With a wing span of up to 11 cm, the emperor dragonfly takes the title of largest dragonfly in these parts. In both the English and the Latin name (Anax imperator) we find the word emperor, and behaving like an emperor is exactly what this animal does. It can stay in the air for hours at a time, claims and defends its own territory; and all those who dare trespass on this domain are swiftly banished or devoured." (Author)] Address: not stated

24936. Vukoja, A.; Bogdanovic, T.; Rašeta, D.; Ivanišic R.I.; Iva, M.; Miljanic, N.; Pavicic, I.; Marjanovic Cermak, A.M.; Ilic, K.; Petrinec, B. (2025): Analysis of radionuclide accumulation in dragonflies (Odonata) in the Mura-Drava-Danube Biosphere Reserve. Proceedings of the 14th Symposium of the Croatian Society for Radiation Protection. Publisher: Zagreb: HDZZ-CRPA: 128-129. (in Croatian/English) [Verbatim: The presence of radionuclides is an important parameter for health of aquatic habitats. However, radionuclides are difficult to detect in certain cases, considering they could be present in very low concentrations. To develop methodology for detecting radionuclides in the environment, we analyzed the possibility of using animal species that accumulate radionuclides as indicator species. Dragonflies were sampled in 9 different locations within the Mura-Drava-Danube Biosphere Reserve, close to their aquatic habitats. Using the gamma-spectrometry method, activities of 238U, 228Th and 40K were determined with ORTEC HPGe detector system. Measured activity concentrations in river water ranged from 80 to 100 Bq/m³ for 238U, from 9 to 18 Bq/m³ for 228Th, and from 210 to 370 Bq/m³ for 40K. On the other hand, activity concentrations in dragonfly samples ranged from 1.3 to 28 Bq/kg for 238U, 2.6 to 6 Bq/kg for 228Th and 110 to 250 Bq/kg for 40K. This research has shown that dragonflies are an important component of radionuclide circulation in aquatic habitats, and could be as considered bioindicator species.] Address: https://www.croris.hr/crosbi/publikacija/prilog-skup/880813

24937. Wade, C.D.; Sutherland, L.N.; Lupiyaningdyah, P.; Bennett, S.P.; Pham, T.H.; Powell, G.S.; Bybee, S.M. (2025): High throughput sequence data for association and description of female Calicnemia haksik (Odonata: Platycnemididae). Insect Systematics and Diversity 9(3): 6 pp. (in English) ["High throughput sequencing is an effective method for associating sexually dimorphic species. Increasing the available taxonomic understanding of females is important for biodiversity and conservation efforts. Here, we confirm the association of females caught in copulation with Calicnemia haksik Wilson & Reels, 2003 males in Vietnam using high throughput sequencing (92 loci) and provide the description of the female." (Authors)] Address: Sutherland, Laura, Dept Biol., Brigham Young Univ., 4102 LSB, Provo, UT 84604, USA. Email: lns25@byu.edu

24938. Wang, T.; Wang, H.; Yang, X.; Yang, J.; He, Y.; Wu, Z.; Fan, Z.; Sun, Z.; Chi, X.; Li, H. (2025): Macrophyte life forms shape macroinvertebrate composition more than richness: implications for urban stream wetland conservation. Urban Ecosystems 28, 92: (in English) ["The aesthetic value of macrophytes has been considered in priority in the re-vegetation of urban wetlands. Aquatic vegetation can simultaneously act as nurses and support the biodiversity of other aquatic organisms such as benthic macroinvertebrates. However, the ecosystem service of macrophytes in biological conservation has been usually neglected in the traditional landscape design of urban blue space. The present study investigated the diversity and composition of benthic macroinvertebrates associated with different life forms of macrophytes including two submerged plants – Elodea nuttallii (Planch.) H. St. John and Hydrilla verticillata (Linnaeus f.) Royle, and two floating-leaved plants – Nymphaea alba Linnaeus and Nymphoides peltata (S. G. Gmelin) Kuntze in the Licang Stream Wetland Park, Qingdao, China. We found that the life form of macrophytes discriminated the phylum-, genus- and functional feeding group (FFG) composition rather than the richness of benthic macroinvertebrates. Notably, the phylum-level composition of benthic macroinvertebrates remained uniform beneath the floating-leaved vegetation and in the unvegetated bare sites, despite a variance in the dominant macroinvertebrate genus between the substrates of N. alba and N. peltata. Conversely, the submerged vegetation appeared to “attract” a greater abundance of Arthropoda and predators, predominantly species of Cercion (damselflies). Therefore, if the biological conservation of benthic macroinvertebrates is considered as the central goal of urban wetland re-vegetation, the restoration of submerged vegetation may be more significant since they function as spawning bed and hatchery for Arthropoda. The effects of urbanization on freshwater diversity of macrophytes and macroinvertebrates need further study." (Authors)] Address: Wang, H., Key Lab. of Intelligent Health Perception & Ecological Restoration of Rivers & Lakes, Ministry of Education, Hubei University of Technology, Wuhan, 430068, China

24939. Wankhade, L.N.; Bidwai, P.A.; Deogade, D.L.; Mude, U.P. (2025): A study on some Insect fauna of Chandewani, Karanja (Ghadge) Tahsil, District Wardha, Maharashtra. Indian J. Applied & Pure Bio. 40(2): 869-877. (in English) ["A short survey of biodiversity in Chandewani area of Karanja (Ghadge), District Wardha was undertaken to study the insect fauna. During survey about 48 species of insect pest belonging to 10 order and 31 families were studied and identified. The order Coleoptera and Lepidoptera was found to be dominant with 11 species each followed by order Orthoptera with 9 species, order Diptera with 6, order Hemiptera with 4, order Odonata with Nepogomphus modestus, Diplacodes trivialis, Trithemis aurora, order Hymenoptera, Blattodea, Mantodea and Embioptera each with 1 species was reported. The insect pest recorded and identified in this study was agricultural and predatory pest." (Authors)] Address: Wankhade, L.N., Dept of Zoology, Narayanrao Kale Smruti Model College, Karanja Ghadge - 442203, India. Email: lokesh.wankhade@gmail.com

24940. Ware, J.; Tolman, E.; Goodman, A. (2025): These three great Odonata books are soon to be flying off the shelves! American Entomologist 71(2): 59-60. (in English) [Reviews of: Dragonflies of North America Ed Lam author and illustrator October 2024; 448 pp. Princeton University Press ISBN: 978-0691232874; $35 (softcover); A Naturalist’s Guide to the Odonata of Ohio Dave McShaffrey MaLisa Springand Jim McCormac June 2024; 401 pp. Ohio Biological Survey ISBN: 979-8987700631; $65 (softcover); Conservation of

Dragonflies: Sentinels for Freshwater Conservation Michael J. Samways August 2024; 640 pp. CABI and the Royal Entomological Society ISBN: 978-1789248371; $130 (hardcover); also ePDF and Kindle..] Address: Ware, Jessica, Dept of Biology, 415 Boyden Hall, Rutgers University, Newark, NJ, 07102, USA. E-mail: jware42@andromeda.rutgers

24941. Warr, A. (2025): First occurrence and behaviour of Aeshna affinis Vander Linden (Southern Migrant Hawker) in Worcestershire. J. Br. Dragonfly Society 41(1): 51-58. (in English) ["A. affinis has recently increased its breeding range in the UK and it seemed only a matter of time before the species arrived in Worcestershire. This paper documents the first occurrence in the county and details the field observations of adult male behaviour and habitat selection, together with the use of photography to determine the minimum number of males present; also an individual's approximate duration spent on the site." (Author)] Address: Warr, A., 14 Bromsgrove Street, Worcester, Worcestershire WR3 8AR, UK

24942. Wildermuth, H. (2025): Interaktionen zwischen Teufelsabbiss Succisa pratensis Moench (Caprifoliaceae), Insekten und Spinnen (Insecta, Arachnida). ENTOMO HELVETICA 18: 21 – 42. (in German, with English and French summaries). ["Interactions between the Devil's-bit Scabious Succisa pratensis Moench (Caprifoliaceae), insects and spiders (Insecta, Arachnida). − Between 2021 and 2024, a total of 137 insect and 11 spider species were recorded on S. pratensis in the eastern Swiss Plateau. The study focused on the photographic documentation of direct and indirect interactions with S. pratensis. Their populations provided arthropods with nectar, pollen, fruits and leaves as well as places for ambush hunters, hunting grounds for flying hunters, anchoring frames for spider webs, rendez-vous and mating sites for butterflies and spiders as well as basking sites and hiding places for orthopterans and other insects. The one-sided use by insects and spiders was hardly disadvantageous for the plant, but advantageous in the context of the nutrition-pollination symbiosis with bees and butterflies. There was hardly any competition between the users. Spiders as predators benefitted from the attractiveness of the inflorescences for insects. Kleptoparasitism by wasps in orb-weaving spiders and commensalism by tiny flies (Milichiidae) on spider victims were rarely observed." (Author) The publications includes observations of ten odonate species using S. pratensis meadows as copulation, hunting or maturation biotope.] Address: Wildermuth, H., Haltbergstr. 43, 8630 Rüti, Switzerland. E-mail: hansruedi@wildermuth.ch

24943. Wildermuth, H.; Schneider, B. (2025): Bachstelzen Motacilla alba auf Libellenjagd. Ornithologischer Beobachter 122: 174-184. (in German, with English summary) ["White Wagtails feed mainly on small flies and mosquitoes, as well as other insects on occasion. Their prey spectrum also includes dragonflies. Based on direct observations, photographs, and film recordings mainly done at a gravel pit pond, we describe in detail the behaviour of wagtails when hunting dragonflies as well as the reactions of the insects to the predator's attacks. The White Wagtails searched for their food either by walking along the waterline or catching it in flight. They started their hunting flights from the shallow gravel bank, sometimes also from an elevated perch. They mainly preyed on emerging and teneral damselflies, which reacted to attacks by dropping or hiding behind the emergence substrate by «sidling». Flying dragonflies, especially tandems of Enallagma cyathigerum, were pursued above the water surface and captured in sometimes acrobatic flight manoeuvres. The success rate for 57 hunting flights was 77% (44 successful hunts). During their breeding season, White Wagtails collected larvae ready to emerge and freshly emerged dragonflies on the banks of the pond and carried them to the nest as a bundle in their beak." (Authors)] Address: Wildermuth, H., Haltbergstr. 43, 8630 Rüti, Switzerland. E-mail: hansruedi@wildermuth.ch

24944. Wildermuth, H.; Wildermuth, S.; Roesti, C.; Roesti, D.; Kohl, S. (2025): Further contribution to the knowledge of the dragonfly fauna of Albania (Odonata). Libellula 44(1/2): 79-97. (in German, with English summary) ["On a nature and photo trip to southern Albania, 30 dragonfly species were recorded at 20 different locations. Onychogomphus forcipatus proved to be the most common species. Calopteryx splendens, C. virgo, Enallagma cyathigerum, Ischnura elegans, and Orthetrum cancellatum were also widespread. Species of which hitherto there have only been a few or single records in Albania were documented with one locality each: Lindenia tetraphylla, Cordulegaster heros, Orthetrum albistylum and Selysiothemis nigra, while the otherwise common Platycnemis pennipes was not recorded. The varying information on the individual species in the literature indicates how poor the knowledge of Albania's dragonfly fauna is. Further studies are needed regarding the conservation and the protection of rare species and their habitats in this country." (Authors] Address: Wildermuth, H., Haltbergstr. 43, 8630 Rüti, Switzerland. Email: Hansruedi-@wildermuth.ch

24945. Wilkie, C.; Law, A.; Thackeray, S.J.; Ward, C.; August, T.; Baker, A.; Belmont, J.; Carvalho, L.; Chapman, D.; Dobel, A.; Miller, C.; Pringle, H.; Scott, M.; Siriwardena, G.; Taylor, P.; Willby, N. (2025): Landscape-scale responses of freshwater biodiversity to connectivity and stressors. Global Ecology and Biogeography, 2025; 34:e70069. 14 pp. (in English) ["Aim: There is compelling evidence that drivers and patterns of biodiversity and ecosystem functioning vary across multiple spatial scales, from global to regional, landscape and patch. However, macroecological processes impacting freshwater biodiversity are poorly understood compared to marine and terrestrial ecosystems. Despite step changes in data availability, we have a fragmented view beyond the local scale of how hydrological and landscape connectivity interact with ecosystem stressors to shape freshwater biodiversity and functioning. While macroecological patterns can vary substantially among taxonomic groups, previous studies have focussed on individual habitat types, sites or taxonomic groups within landscapes, hindering direct comparisons. We present a cross-landscape, multi-species analysis of the interactive effects of landscape and hydrological connectivity and stressors on standing freshwater quality and the diversity of several major freshwater taxonomic groups. Location: Great Britain (United Kingdom). Time Period: 2000–2016. Major Taxa Studied: Phytoplankton chlorophyll-a, macrophytes, molluscs, Coleoptera, Odonata, fish and birds. Methods: Using random forests and generalised additive modelling, we quantified the interactive effects of landscape and hydrological connectivity and stressors on water quality (phytoplankton chlorophyll-a) and the diversity of selected taxa in standing freshwaters. Results: We found evidence of connectivity changing from positive to negative relationships with biotic responses with increasing human-induced stress levels. Some species groups showed the inverse, reflecting complexities of modelling at large, crosslandscape scales. Almost all responses were affected by stress or connectivity, often interacting and with non-linear relationships. Main Conclusions: Patterns in stressor-connectivity interactions differed across taxa, but were important in shaping 6 of 8 biotic responses. This emphasises the need for taxon-specific analyses to resolve freshwater ecological responses to stressors, connectivity, and their interactions. Our results also highlight that connectivity effects must be integrated in landscape-

scale, evidence-led decision-making, designed to reduce impacts of stressors on water quality and biodiversity." (Authors)] Address: Wikie, C., School of Mathematics & Statistics, Univ. of Glasgow, Glasgow, UK. Email: craig.wilkie@glasgow.ac.uk

24946. Wilson, K.D.P. (2025): New Book: Conservation of Dragonflies. Sentinels for Freshwater Conservation. Author: Michael J Samways, 539 pages, colour photos, colour illustrations. Publisher: CABI Publishing - June 2024. Hardback ISBN-13: 9781789248371. ePDF: 9781789248388, ePub: 9781789248395. DOI: 10.1079/9781789248395.0000. Publisher's preview pdf [link]. 56: (in English) [Book review] Address: Wilson, K.D.P., 18 Chatsworth Rd, Brighton, E Sussex, BN1 5DB, UK. E-mail: kdpwilson@gmail.com

24947. Wilson, K.D.P. (2025): New Book: Dragonfly Behavior. Discovering the Dynamic Life of an Ancient Order of Insects. Authors: Georg Rüppell & Dagmar Hilfert-Rüppell, 229 pp., 290 colour photos, 30 b/w illustrations. Publisher: Springer Nature - December 2024. Hardback ISBN: 978-3-662-70233-8. ebook: 978-3-662-70234-5. DOI: https://doi.org/10.1007/978-3-662-70234-514. 55: (in English) [Book review] Address: Wilson, K.D.P., 18 Chatsworth Rd, Brighton, E Sussex, BN1 5DB, UK. E-mail: kdpwilson@gmail.com

24948. Witjaksono, B. (2025): Hybridity and authenticity of Ichwan Noor's sculpture: A case study of Bedhaya Kinjeng Wesi sculpture in Yogyakarta International Airport Bambang. Journal of Urban Society's Arts 12(1): 56-71. (in English, with Indonesian summary) ["The Bedhaya Kinjeng Wesi (literally mean Iron Dragonfly Bedhaya) sculpture represents a significant intersection of traditional Javanese culture and contemporary art at Yogyakarta International Airport (YIA). This study examines how hybridity and authenticity manifest in this commissioned artwork created by sculptor Ichwan Noor between September 2019 and January 2020. Using qualitative methods including participant observation, visual documentation, and interviews, this research analyzes the complex negotiation process that occurred between institutional stakeholders, cultural authorities, and artistic vision. The findings reveal that the sculpture's creation involved a unique creative sequence: first, a traditional dance form (Bedhaya Kinjeng Wesi Dance) was developed as reference material, then reinterpreted through contemporary sculptural techniques. The resulting artwork demonstrates hybridity through its combination of traditional dance postures, symbolic elements from local oral tradition, and modern materials and aesthetics. This case study contributes to our understanding of how authenticity is negotiated in public art that serves both cultural representation and tourism functions, particularly in postcolonial contexts where local identity intersects with global modernity. Rather than seeing hybridity and authenticity as opposing forces, this research suggests they operate as complementary processes in contemporary cultural production." (Authors) The form of the bedhaya dancer statue, which has dragonfly wings, can also be interpreted to indicate at a glance that it is similar to a fairy (Western fairy tale). By incorporating elements of Western culture such as fairy tales in the Bedhaya Kinjeng Wesi statue, mimicry, which is the process of imitating or borrowing various cultural elements, also occurs.] Address: Yohana Ari Ratnaningtyas. Email: yohanaarir@isi.ac.id

24949. Wos, G.; Amer, N.R.; Antol, A.; Stoks, R.; Sniegula, S. (2025): Warming and latitude shape the non-consumptive effects of native and invasive alien crayfish predators on damselfly prey. NeoBiota 98: 223-245. (in English) ["There is increasing concern that the effects of biological invasions may be magnified by other human induced global changes. Here, we compare the non-consumptive effects imposed by invasive vs. native predators and how these (differential) responses to both predator types depend on warming and prey latitude. We raised damselfly larvae from central- and high-latitudes in incubators under two temperatures (current [20 °C] and warming [24 °C]) and further exposed them to one of three predator cues: noble (native), signal (invasive at both latitudes) and spiny-cheek (invasive at central- but absent at high latitudes) crayfish. Growth rate increased in central-latitude but decreased in high latitude prey in response to both noble and signal crayfish. The spiny-cheek crayfish only reduced growth rate in high-latitude prey. Cues from all three crayfish species generally caused a higher net energy budget, but only under warming. Our results demonstrated that high-latitude prey were able to recognize a novel invasive predator (spiny-cheek crayfish) cue, and revealed differential growth responses of central- and high-latitude prey toward the shared invasive predator (signal crayfish). Our data provide rare support for the concern that global change factors may magnify the impact of both native and novel invasive predators." (Authors)] Address: Wos, G., Institute of Nature Conservation Polish Academy of Sciences, al. Adama Mickiewicza 33, 31-120 Krakow, Poland. Email: wos.gui@gmail.com

24950. Xamidulla, M.D.; Shohista, Y. (2025): Importance of dragonfly (Insecta, Odonata) for human economic activity in southern Fergana. Yyngi O'Zbekiston, yngi Tadqiqotla Jurna 2(8): 1048-1051. (in Uzbek, with Russian and English summaries) [Uzbekistan; the publication gives a brief review on Odonata, with some thought about regional impacts of pollution on Odonata.] Address: Shohista, Yuldasheva, Fergana State University, Uzbekistan

24951. Yang, G.-H.; Yang, G.-h.; Wei, Y.-Y.; Li, Z.-f.; Song, R.-b.; Wen, Y.-c.; Li, X.-l.; Zi, D.-d.; Lyu, X.-m.; Zhang, H.-m. (2025): Epiophlebia laidlawi daliensis, a new subspecies from Hengduan Mountains in Yunnan (Insecta, Odonata, Epiophlebiidae). Zootaxa 5653(3): 343-363. (in English) ["A new subspecies Epiophlebia laidlawi daliensis Zhang, Yang, Wei & Lyu, subsp. nov. is described from adult and larval specimens collected at Mt Cangshan in the Hengduan Mountains, Dali Bai Autonomous Prefecture, Yunnan, China. The holotype male was collected by Hao-miao Zhang and Rui-bin Song on 22 May 2022. Both sexes and larva of the new subspecies are compared with those of Epiophlebia l. laidlawi Tillyard, 1921 and E. superstes (Selys, 1889). A total of 15 sequences of ITS1 and 17 sequences of ITS2 were analysed and used for the phylogenetic comparisons. According to this analysis, E. l. daliensis subsp. nov. and E. l. laidlawi share a very close phylogenetic relationship, while E. l. daliensis, subsp. nov. and E. superstes are genetically more distant from one another than are E. l. laidlawi and E. superstes. Both neighbor-joining (NJ) and maximum likelihood (ML) methods produced consistent phylogenetic trees, with all E. l. daliensis specimens clustering with E. l. laidlawi. The existence of the named 'species' E. sinensis Li & Nel, 2012 (which in molecular analyses is retrieved within E. superstes) is considered doubtful, hence it is not considered here. Its status will be evaluated in another publication." (Authors)] Address: Zhang, H.-m., Kunming Natural History Museum of Zoology, Kunming Institute of Zoology, Chinese Academy of Sciences, Kunming, Yunnan 650223, China. Email: zhanghaomiao@mail.kiz.ac.cn

24952. Yazici, R.; Yilmaz, M.; Yazicioglu, O. (2025): Exploring prey selectivity and feeding habits of wels catfish (Silurus glanis L., 1758) in a deep Anatolian reservoir: Seasonal, length, and age-dependent diet analysis. Aquaculture Nutrition 2025, Article ID 4619857: 14 pp. (in English) ["Feeding habits and

dietary preferences of wels catfish were investigated in Siddikli Dam Lake through the examination of 200 individuals. The results revealed that the species predominantly exhibited piscivorous feeding characteristics, with Tinca tinca (IRI% =78.93) identified as the primary food source. The food items in the stomach showed a wide spectrum, ranging from benthic invertebrates, crustaceans, molluscs, amphibians, and mammals to fishes. The study not only assessed the general food composition of wels catfish but also delved into the seasonal variations in diet composition. It was found that the stomach fullness index (FI) varied significantly among the seasons, with Winter showing the highest values (0.827). On the other hand, the lowest value was detected in the Autumn season (0.480). Age and length groups were also considered, with notable differences in stomach FI and diet composition observed across different stages of growth. Food preference analysis highlighted the selective tendencies of wels catfish towards certain food types, with Atherina boyeri and T. tinca emerging as preferred choices in different size groups. For small, medium, and large length individuals, the most preferred prey fish were A. boyeri (Va=0.39518, χ^2= 31.2336), T. tinca (Va=0.63564, χ^2=82.8073) and T. tinca (Va= 0.666495, χ^2=88.4307), respectively. The findings provide valuable insights into the feeding behaviour of wels catfish, underscoring the importance of understanding these patterns for effective management and conservation efforts. Further research should aim to explore the ecological implications of these feeding habits on the overall aquatic ecosystem." (Authors)] Address: Yazici, R., Lab. & Veterinary Health Program, Veterinary Dept, Çiçekdagi Vocational School, Kirsehir Ahi Evran University, Kirsehir, Türkiye. Email: rmznyzci@gmail.com

24953. Yu, X. (2025): A new species Orthetrum aberrans sp. nov. (Odonata: Libellulidae) from China. Zootaxa 5642(1): 75-88. (in English) [O. aberrans sp. nov. "is described on the basis of both molecular and morphological evidence. The species is characterized by reduced pruinosity on the body. According to molecular analysis the new species is closely related to O. albistylum and O. cancellatum. Males of the new species resemble O. albistylum in morphology whereas females are rather similar to O. cancellatum. The present study suggests that the new species might be derived from the hybridization of O. albistylum and O. cancellatum but this is not yet confirmed." (Author)] Address: Yu, X., College of Life Sci., Chongqing Normal Univ. Chongqing, 401331 China

24954. Yu, X.; Liu, X. (2025): A new species of Lestes from southern China (Odonata: Lestidae). Odonatologica 54(1/2): 127-142. (in English) ["Lestes yaojiae sp. nov., a new metallic green coloured Lestes species is described from high montane wetlands along the Yangzi River in Chongqing and Hubei provinces of China, based on both morphological and molecular evidence. The morphological differences between the new species and phylogenetically close species are discussed. The discovery of the new species facilitates the knowledge of the distributional pattern of the metallic green Lestes group in China." (Authors)] Address: Yu, X., College of Life Sciences, Chongqing Normal University, Chongqing, 401331, China. Email: lannysummer@163.com

24955. Yurdakul, F.; Salur, A. (2025): Ecological assessment of Odonata larvae in Turkish wetlands: A case study from Tokat province. Munis Entomology & Zoology 20(2): 3369-3381. (in English) ["… detailed sampling of Odonata larvae was conducted across 22 diverse localities spanning the Erbaa, Niksar, and Resadiye districts of Tokat province, with the aim of evaluating their faunistic characteristics and ecological relationships. Through extensive field collection efforts, researchers gathered a substantial dataset comprising 1,642 individual specimens. Subsequent taxonomic analysis and identification work revealed a rich diversity of odonates, encompassing 13 distinct genus distributed across 7 families, all of which were identified within a broader taxa group containing 18 species. Notably, this research represents the first documented occurrence of these larval specimens within the study area, making it a significant contribution to the region's biodiversity records. Throughout the text, detailed information is provided regarding the faunistic distribution of the collected specimens and the various habitat types in which they were found across the study region." (Authors)] Address: Yurdakul, F., Hitit University, Graduate Education Institute, Biology, Çorum, Türkiye. E-mail: yurdakulferhat89@gmail.com

24956. Zhan, Z.; He, G.; Huang, Z. (2025): Numerical study on aerodynamic performance of the wrinkled flexible dragonfly forewing in gliding flying. Journal of Applied Mathematics and Physics 13: 1199-1211. (in English) ["Dragonflies are highly skilled flyers in the natural world, capable of performing flight maneuvers such as lateral flight, hovering, and backward flight—many of which are difficult for human aircraft to achieve. The exceptional flight abilities of dragonflies are closely related to their wings. The wrinkled and venous structures on their wings provide aerodynamic advantages that flat wings with equal thickness, equal projected area, and identical shape profiles do not possess. At the same time, dragonfly wings have a certain degree of flexibility, which causes deformation under aerodynamic forces during flight. This deformation, in turn, affects the aerodynamic characteristics of the wings. To reveal the impact of the wing wrinkling and flexibility on the aerodynamic properties, this study established a three-dimensional CFD model and CSD model of the dragonfly's wrinkled forewing based on previous measurements and research results using 3D modeling software. Modal analysis was performed to verify the model's accuracy. Using the CFD method and a CFD/CSD bidirectional fluid-structure coupling calculation method, numerical simulations were conducted on the aerodynamic characteristics of both rigid and flexible wrinkled forewings, as well as flat forewings with equal thickness, equal projected area, and identical shape profiles during gliding flight. The results showed that the stronger leading-edge vortex and the attached vortices within the wrinkled structure improve the aerodynamic performance of the dragonfly's forewings. Additionally, for the wrinkled forewings, the flexibility factor causes the wing veins and membrane to deform under aerodynamic loads. The pressure difference between the upper and lower surfaces of the flexible forewing is reduced compared to the rigid forewing, leading to a decrease in both lift and drag. However, in terms of the final result, the aerodynamic performance of the dragonfly's forewings is enhanced." (Authors)] Address: Zhan, Z., The School of Aviation & Aerospace, Nanchang Hangkong University, Nanchang, China. Email: 18879125916@163.com

24957. Zhang, L.; Wang, K.; Zhang, X.; Liu, S.; Jing, Z.; Lu, J.; Cui, X.; Liu, Z. (2025): Research on the aerodynamic performance and bionic application of dragonfly wing corrugation. Bioinspiration & Biomimetics 20(3), 36008. (in English) ["To investigate the aerodynamic performance of dragonfly wing corrugations under gliding conditions, a new method of corrugation deformation is proposed. Firstly, the coordinate transformation functions that describe the amplitude and camber deformation of the corrugation and numerical simulation model are established. Then the effects of the corrugation structural parameters on airfoil performance are investigated by orthogonal experiment. Subsequently, the optimal structural parameters are selected sequentially, and the mechanism of

the corrugation producing a high lift-to-drag ratio is analyzed. The results show that the optimized corrugation parameters are: corrugation profile as profile 5, amplitude coefficient λ = 0.8, vertex x-coordinate a = 0.9 c, vertex y-coordinate b = 0.04 c. The optimal airfoil achieves the highest lift-to-drag ratio of 5.090, which is increased by 42.82% compared with the flat airfoil (FA). The cambered corrugation airfoil can suppress flow separation. The high-pressure area generated within pressure surface corrugation can increase the pressure difference between the upper and lower surfaces, which is the main reason for the high lift-to-drag ratio. Finally, the bionic airfoils are built by arranging the corrugation on the FFA-W3-211 airfoil, which prove that the dragonfly corrugation with a low Reynolds number is also applicable to the wind turbine airfoil with a high Reynolds number, thereby increasing the lift-to-drag ratio of the prototype airfoil by 1.22%." (Authors)] Address: Zhang, L., College of Mechanical & Electronic Engineering, China Univ. of Petroleum, Qingdao, Shandong, People's Republic of China. Email: zlj-2@163.com

24958. Zhang, W.; Wang, M.; Zhao, A.; Liu, Y.; Ren, Y.; Dang, H.; Xu, J.; Wei, C.; Yang, Y.; Liu, H. (2025): Can damselfly larvae serve as bioindicator species for assessing contamination of organophosphate esters in aquatic environments? Ecological Indicators 178, September 2025, 113865: 12 pp. (in English) ["Highlights: •Contamination of OPEs in the damselfly larvae was firstly investigated. •A significant bioaccumulation of TBEP in damselfly larvae was observed. •Damselfly larvae were excellent bioindicators for OPE contamination in water. Abstract: Damselfly larvae have been widely used to evaluate the environmental quality of freshwater ecosystems. However, there have been limited studies on the pollution characteristics of organophosphate esters (OPEs) in damselfly larvae. This study investigated the pollution profiles, influencing factors, and biological enrichment of OPEs in a total of 358 damselfly larvae for the first time. The results demonstrated that the concentration of OPEs in the damselfly larvae ranged from 20.56 to 2363.02 ng/g wet weight (ww), exceeding levels reported in previous studies on other aquatic organisms. Tris(2-butoxyethyl) phosphate (TBEP) was identified as the main OPE, ranging from 1.56 to 2318.94 ng/g (ww) and accounting for 7.59–98.13 % of total OPEs detected. Damselfly larvae exhibited significant biological enrichment for TBEP with an enrichment factor of 249,917 L/kg, probably due to their inherent high sensitivity to this pollutant. However, there was no significant correlation between logKow (octanol-water partition coefficient) and log BCF (bioconcentration factor), suggesting that logKow may not be the sole factor affecting biological enrichment of OPE compounds in damselfly larvae. OPE concentrations in damselfly larvae showed a positive correlation with water temperature, whereas a significantly negative correlation with total nitrogen levels. The main sources contributing to OPE pollution were daily activities and ship traffic, industrial production processes, and pesticide applications in agricultural practices. These findings suggest that damselfly larvae can serve as bioindicators for assessing OPE compound contamination in aquatic environments.] Address: Wang, M., Key Laboratory of Zoological Systematics & Application, School of Life Sciences, Hebei University, Baoding 071002, China. Email: meiwang@hbu.edu.cn

24959. Zheng, G.; Zhang, S.; Wang, Y.; Pan, A.; Xu, B.; Xu, Y.; Zhang, X. (2025): Preparation of a multifunctional bio-based adhesive inspired by the structure of dragonfly wings. Composites Part B Engineering 298(4):112374: (in English) ["Highlights: *A multifunctional soy protein adhesive was prepared inspired by dragonfly wings. *The stripping work of the prepared plywood increased by 2 times to 0.99 J. *The dry/wet shear strength of the prepared plywood increased by 117.2% and 119.3%. *The mildew time of the liquid/solid adhesive was extended to 30/50 days. *The LOI of cured soy protein adhesive increased by 41.7% to 34.6%. Abstract: Traditional formaldehyde-based adhesives have problems such as dependence on petrochemical resources and release of formaldehyde. Therefore, preparing multifunctional bio-based adhesives with excellent mechanical properties to replace formaldehyde-based adhesives plays an important role in environmental sustainability. In this paper, a soy protein adhesive that combines high toughness and strength was developed inspired by dragonfly wings. This strategy is based on a rigid neural network (CNF) framework and SPI-based dynamic network system. Functionalized nanofibers (CNF@TP) were tightly connected to SPI through Schiff base reaction and strong hydrogen bonding. The dry and wet shear strength of plywood prepared with modified adhesive reached 1.89 MPa and 1.25 MPa respectively, which were 117.2% and 119.3% higher than SPI adhesive. The inorganic mineral component (ZnO) formed an organic-inorganic hybrid structure with soy protein, which improved the mildew resistance, flame retardancy and UV resistance of the adhesive. The storage time of the liquid/solid adhesive was extended to 30/50 days respectively. Crosslinker (TGA) strengthened the cross-linked network, the moisture absorption rate of the adhesive decreased to 11.9%, the residual rate increased to 56.8%, improved the water resistance. This bionic structure engineering (BSE) provides a research idea for the development of multifunctional composite materials with strong performance. This technology is expected to be applied to many fields such as plywood industry, aerospace and cultural relics restoration." (Authors)] Address: Zhang, X., Coll. Chemistry & Materials Engineering, Zhejiang A&F Univ., Hangzhou, China. Email: 20110039@zafu.edu.cn

24960. Zheng, K.; Wong, M.K.L.; Tsang, T.P.N.; Leong, C.M. (2025): Bridging Citizen Science and expert surveys in urban biodiversity monitoring: Insights from insect diversity in Macao. Biodiversity Data Journal 13: e153402: 15 pp. (in English) ["Urban ecosystems present unique challenges for biodiversity monitoring, demanding efficient methods to document species diversity in rapidly changing environments. This study quantifies insect diversity in Macao SAR — a hyper-urbanised region — by integrating data on 1,339 species documented in expert-led surveys and 1,012 species recorded in citizen-science observations between 2019 and 2023. Striking divergence emerged between the expert and citizen-science datasets: only 462 species (33.5% of total diversity) were detected by both groups, with experts documenting 877 unique taxa often requiring specialised collection or morphological analysis, while citizen scientists contributed 550 distinctive species through spatially explicit, image-based records. Together, these approaches achieved 96.59% estimated species coverage within five years, demonstrating that combining community-driven data with expert methods accelerates comprehensive biodiversity documentation. Citizen-science platforms played a pivotal role by providing high-resolution geotagged imagery which enabled experts to validate records and resolve taxonomic ambiguities. Meanwhile, expert surveys detected cryptic taxa overlooked by citizen scientists. The rapid species coverage achieved through this synergy highlights the transformative potential of integrated frameworks. By mobilizing the scalability of citizen science to fill spatial and taxonomic gaps, while leveraging expert precision to ensure rigour, urban biodiversity monitoring can adapt to the rapid pace of ecological change. …." (Authors) 49 odonate species were recorded, but no details are given.] Address: Zheng, K., Dept of Life Sciences, Beijing Normal-Hong Kong Baptist University, Zhuhai, China