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1997

15703. Lee, C.M. (1997): Environmental contaminants in potential prey of Aplomado Falcons in the lower Rio Grande valley, Texas. U.S. Fish and Wildlife Service Region 2 Contaminants Programm. Project number: 21410-I 130-2N19: 17 pp. (in English) ["Reintroduction of the northern aplomado falcon (Falco femoralis septentrionalis) into its former range in Texas began in 1985, and continued with a full scale release of captive-bred falcons in 1993 on Laguna Atascosa National Wildlife Refuge (NWR). A study was conducted in 1994 to determine whether contaminants in falcon prey posed a threat to the successful recovery of the species. Meadowlark (Stumella sp.), mourning dove (Zencâda macroum), cicadas, and dragonflies were collected from two areas on the Laguna Atascosa NWR and from two tracts on the Lower Rio Grande Valley NWR where falcons may disperse. Organophosphate pesticides and PAH's were below detection levels in all samples. With the exception of DDE, all other organochlorine pesticides were also below detection. Mercury concentrations in meadowlark were above levels in prey that have been associated with reproductive anomalies in sensitive aquatic birds, so there may be some concern about reproductive or chronic effects in the aplomado falcon from this heavy metal.] Address: U.S Fish and Wildlife Sewice, Corpus Christi Ecological Services Field Office, Campus Box 338,630O Ocean Dlive, Corpus Christi, Texas 78412, USA

15704. Mauersberger, R. (1997): Ein älterer Fund von Erythromma viridulum (Charpentier) in Brandenburg (Zygoptera: Coenagrionidae). Libellula 16(3/4): 191-192. (in German, with English summary) ["A female specimen collected 1971 in Brodowin near Eberswalde represents the third record for Brandenburg, Germany." (Author)] Address: Mauersberger, R., Waldstraße 4, 16278 Steinhöfel, Germany

15705. Jeziorski, P. (1998): Aeshna viridis does not belong to the fauna of the Czech Republic (Odonata: Aeshnidae). Klapalekiana 34: 67-68. (in Czech with English summary) ["Collections of dragonflies from several Czech museums were studied by the author. The record of A. viridis Eversmann, 1836 from the Czech Republic is shown to be based on a wrong determination of a specimen of Aeshna (0.F. Muller, 1764). A list of 12 species of Aeshnidae known to occur in the Czech Republic is included." (Author)] Address: Jeziorski, P., Na belide 1, CZ-73564 Havirov-Suchá

1998

15706. Naylor, G. (1998): The Banded Demoiselle (Calopteryx splendens (Harris)) in north Cumbria in 1998. Carlisle Naturalist 6(2): 31-32. (in English) ["C. splendens was, until recently, restricted in its northern outpost to a few sites along the lower reaches of the river Waver occupying the 10 km grid squares NY15 and NY25. In 1996, as was reported in this newsletter (Clarke and Garner 1996), there were sightings at some places along the river Wampool and close to the river Eden, which expanded its range into squares NY24 and NY35. The records from the Wampool were the first known from that river and those for the Eden were the first there for almost 40 years. The expected continuation of this expansion in 1997 did not come about, but there was one additional record near Rockcliffe, which was also reported in this newsletter (Naylor 1997). This was in another new square, NY36. The expected resurgence seems to have arrived in 1998. Firstly, the Environment Agency reported very large numbers in the usual Waver sites (this also happened in 1996). On 16th July Stephen Hewitt and I observed a female Calopteryx in Rickerby Park, Carlisle and although we could not be certain which species, splendens or virgo, it is very unlikely to have been the latter. This again was a new square (NY45). Two weeks later I found a male and female splendens on the banks of the Eden at Cargo. David Clarke followed up this report and saw at least 7 (males and females) at the same site on the next day. During this visit, a local fisherman reported having seen them there in 1997. DC saw another one there on 15th August. At around this time I made an unsuccessful search of the area at Rockcliffe, where I had seen one in 1997. It would appear from these observations that there may now be an established population along the river Eden from at least Carlisle down to Rockcliffe and that searches of other parts of this stretch of river and possibly upstream from Rickerby Park may produce

more sightings. The flight period is from late May to mid-August so make a note of those dates in your diary for 1999. Clarke, D.J. & Garner, S., 1996, A dispersal of the C. splendens in the Solway area in 1996, Carlisle Naturalist 4 (2): 38. Naylor, G.R., 1997, A further record of the C. splendens on the River Eden, Carlisle Naturalist 5(2): 35."] Address: Naylor, G., 2 Fell Cottages, Milton, Brampton, Carlisle, UK

2000

15707. Brünner-Garten, K. (2000): Lernvermögen entscheidet über den Erfolg: Frosch kontra Libelle. Galathea 16/2: 71. (in German, with English summary) ["Frogs always try to catch dragonflies. Usually the eye-controlled vertebrate looks for success with a sudden mighty leap. After failing an extra-intelligent frog was spectated that got its prey by an underwater attack! The egglaying female dragonfly was not able to compete with this tactic." (Author)] Address: Brünner-Garten, K., Kellerstraße 9 d , 90530 Wendelstein, Germany

15708. de Jong, T. (2000): Poelen vol libellen. De levende Natuur 101(4): 127-132. (in Dutch, with English summary) ["Ponds with dragonflies. Since 1990 a few hundred ponds have either been restored or newly created in the eastern part of the province of Utrecht. These ponds are important breeding places for amphibians, but also fish, dragonflies and plants use these ponds. In this article the effects of the creation and restoration of ponds on the presence of dragonflies are discussed. Sixty ponds were investigated. In these ponds 29 species of dragonflies were found. There are large differences in the presence of species of dragonflies in the different ponds. Therefore data on the abiotic and biotic characteristics of all ponds were collected to obtain some insight in how an 'ideal' pond for dragonflies can be created. Analysis of these data shows that the most important features of a good pond for dragonflies are a surface of at least 100 m², a minimum depth of 50 cm of water, a sloping bank and plenty of sunlight. The requirements for a good pond for dragonflies are largely the same as for ponds for amphibians. If properly managed, ponds can play an important role as stepping stones in a rural landscape." (Author)] Address: de Jong, T., VIRIDIS, p/a Rijnlaan 25, 4105 GS Culemborg, The Netherlands. E-mail: Viridis@planet,nl

15709. Kagimoto, B. (2000): An old male of Orthetrum poecuops miyajimaense guarded females without copulation with the male before. Tombo 42: 14. (in Japanese, with English summary) ["At the habitat in Miyajima-island on August 16. 1999. Tne author and Mr. Masahiko Saeki had observed 5 times that an old male of O. poecilops miyajimaense Yuki et Doi made his territory in flight, and even when the females appeared he did not want to copulate with them but only guarded their ovipositions."] Address: not stated

15710. Kita, H. (2000): Non-contact sitting-oviposition of Ictmogomphus clavatus. Tombo 42: 54. (in Japanese, with English summary) ["After a female of I. clavatus laid eggs onto floating plant a few times by the usual contact flying-oviposition, he rested on a leaf and protruded eggs with adhesive thread (Figure). This method is called as "non-contact sitting-oviposition" (Eda, 1960).] Address: Kita, H., Takiyama 6-2-15-308, Higashikunime City, Tokyo, 203-0033, Japan

15711. Kumar, H.N.; Singh, M.E.; Sharma, A.K.; Sing, M.R.; Amanda Kumar, M. (2000): Faunal component in the diet of liontailed macaque. Primate Rep. 58: 57-65. (in English) ["Macaca silenus is a habitat specialist, restricted to the climax rainforests of Western Ghats, India. It is primarily a frugivorous sp., but its diet also includes a variety of animals. On dragonflies it is feeding occasionally: head first and the body later. In addition to the wings, the legs are also sometimes rejected." (Authors)] Address: Singh, M.E., Biopsychol. Lab., Univ. Mysore, Mysore- -570 006, India

15712. Lopes, F.; De Marco, P. (2000): Comportamento terrritorial em insetos: aspectos coriceituais e estudos de casos. Oecologia Brasiliensis 8: 193-222. (in Portuguese, with English summary) ["Our objective in this review, about insect territorial behaviour, isn't to provide an exhaustive discussion on this issue, but to establish the major theoretical aspects on this theme, for anyone that initiate their studies on it. The paper includes: a) a review about the concept of territoriality, based on the former ideas developed from vertebrate studies and its applicability to insects; b) the major problems in the use these concepts, in special mistakes with other terms related to the spatial distribution of individuals or other behaviors, associated to competition for resources; c) theoretical considerations on territoriality and, d) case studies in Odonata, as examples on those issues." (Authors)] Address: De Marco, P., Laboratorio Ecologia Teorica e Sintese, Departamento de Biologia Geral, Universidade Federal de Goias, BR-74001-970, Goiania, GO, Brazil. E-mail: pdemarco@icb.ufg.br

15713. Raab, R.; Chwala, E. (2000): Die Libellen (Insecta: Odonata) des dynamischen Altarmsystems der Donau bei Regelsbrunn (Niederösterreich). Abh. Zool.-Bot. Ges. Österreich 31: 125-147. (in German, with English summary) ["Between 1995 and 1997 on 20 all-day field trips a total of 9025 individuals of 32 dragonfly species were recorded at a dynamic floodplain of the River Danube near Regelsbrunn. The most abundant species was Platycnemis pennipes with 52 % of the total catch, followed by E. viridulum with 20 %. In 1995 and 1996 the four most widely distributed species were P. pennipes, Calopteryx splendens, Ischnura elegans and Orthetrum cancellatum. The paper discusses species composition and the expected effects of hydrological Connectivity."] Address: Raab, R., Quadenstr. 13, 2232 Deutsch-Wagram, Austria. E-mail: rainer-.raab@gmx.at

2001

15714. Glotzhober, R.C.; Chapman, E. (2001): Second location for two rare Odonata in Ohio, Nannothemis bella and Ladona julia, (Odonata: Libellulidae) discovered at Singer Lake Bog, Summit County, Ohio. The Great Lakes Entomologist 34(2): 63-66. (in English) ["Previously the

dragonflies (Odonata, Libellulidae) Ladona julia and Nannothemis bella were known in Ohio from only one extant population each: L. julia from extreme northwest Ohio in Williams County and N. bella from west-central Ohio in Champaign County. During the summer of 2000 populations of each of these species were found in close proximity to each other at Singer Lake, a wetlands complex in southern Summit County in northeastern Ohio. This new location is also home to a population of another rare Ohio dragonfly, Dorocordulia libera (Odonata, Corduliidae) that was discovered during 1999. The Singer Lake wetlands are proving to be a very significant habitat for Ohio Odonata." (Authors)]

15715. Booker, J.S. (2002): Enallagma civile (Odonata: Coenagrionidae) life history and production in a west Texas playa. M.Sc. thesis, University of North Texas: IV + 46 pp. (in English) ["Conclusions: This study was conducted to describe the life history of Enallagma civile and the other Odonates that inhabit playa habitats in the Southern High Plains of Texas. It was learned that Enallagma civile has a low secondary production estimate of 66.8 mg/m2. It was also determined that this species, Enallagma civile, had a developmental time of approximately 21 days in a playa setting. Another important fact was that E. civile was the earliest colonizer of all of the Odonate species studied. It was recorded in the playa at least one week earlier than all of the other Odonates. Odonate populations in the playa continued to increase in size throughout the study. Some populations grew more quickly than others. For instance, the damselfly, Lestes disjunctus, had the population that grew the slowest. Its average population estimate per m² changed from 0 to approximately 3 in an eight-week time period. On the opposite end of the spectrum, the damselfly, Enallagma civile, had an average population estimate per m² which increased in size from 2 to approximately 670 naiads in the same eight-week time period. When the playa began to lose water and thus dwindled in size, the Odonate populations all had significant decreases in size. The naiads either became prey for another organism, emerged or died due to lack of water or lack of food. None of the species in this study were able to continue increases in their population sizes during this time. The period after this drought is what is unique. Some of the species continued to have numbers that dwindled, while others maintained relatively similar amounts of naiads. One species, Anax junius, actually had a population explosion after the drought when the playa began to refill close to the beginning of September. During the course of this study, much was learned about the niches that Odonates occupy in a playa. The populations of some prominent dragonfly species were studied and their quantities were estimated for different periods during one season. Sizes of head capsules were studied in an effort to determine the development of Odonate populations over a period of time. In addition, field sampling showed high points in population sizes and trends in growth. Research was conducted of the life histories of Odonates and a lot of information was gained about the productivity of dragonflies. This study was a valuable proponent to the collection of information available about playa habitats." (Author)] Address: not stated

2002

15716. Kirti, J.S., Singh, A. (2002): Studies on the male secondary genitalia of two species of genus Sympetrum Newman (Libellulidae: Anisoptera). Fraseria (N.S.) 7: 9-12. (in English) ["The structure of the male secondary apparatus of two species of genus Sympetrum Newman, i.e. S. commixtum (Selys) and S. haematoneura Fraser have been described and illustrated for the first time." (Authors)] Address: Kirti, J.S., Dept of Zoology, Punjabi University, PATIALA - 147 002 (Punjab), India. E-mail archu_speak@yahoo.co.in

15717. MacKenzie, R.A.; Kaster, J.L. (2002): A preservative-free emergent trap for the isotopic and elemental analysis of emergent insects from a wetland system. The Great Lakes Entomologist 35: 47-51. (in English) ["This study reports a cost-effective, live emergent trap designed for the preservative-free use in both biogeochemical and ecological analyses of emerging insects. The trap proved to be advantageous in several ways. First, the simple design made the trap time-efficient since it was easy to set-up, change, and maintain. Second, live sampling not only provided uncontaminated organisms for elemental and stable isotopic analyses, it minimized disfigurement. This resulted in rapid and easy handling, as well as identification, of adult insects. Finally, trap avoidance by ephemeropterans and odonates, a common problem encountered in the literature, was minimal and organisms from both insect orders were successfully collected." (Authors)] Address: MacKenzie, R.A., The Center for Great Lakes Studies at the WATER Institute, University of Wisconsin-Milwaukee, 600 E. Greenfield Ave., Milwaukee, WI, 53204

2004

15718. Mitra, A. (2004): A checklist of the Odonata of Sikkim, with some new records. Opusc. zool. Flumin. 216: 1-8. (in English) ["74 species and subspecies know to occur in the Himalayan state of Sikkim (India) are listed. The locality data and collection dates are provided for 20 species that are new to the state. A complete regional bibliography is appended." (Author)] Address: Mitra, A., 208/K/8 Raja Ram Mohan Roy Road, Netaji Sarak, Calcutta-700008, India

15719. Samway, M.; Taylor, S. (2004): Removal of invasive alien trees gives damselflies a reprieve. Rostrum 63: 1. (in English) ["Under the auspices of the Working for Water Programme, invasive alien vegetation is being removed in some places in South Africa. This is having an enormously positive impact on certain species that were feared extinct. In the Northern Province Pseudagrion newtoni has returned to restored sites, while in the Western Cape several species are recovering, e.g. Metacnemis angusta, Proischnura polychromaticum and Chlorolestes umbratus. Some of these very rare and threatened species are now able to expand back to their former geographical extent.] Address: Samways, M.J., Dept Entomol. & Nematol., Univ. Stellenbosch, Private Bag X1, ZA-7602, Matieland, South Africa. E-mail: samways@sun.ac.za

15720. Fleck, G. (2005): Contribution à la connaissance des Odonates de Nouvelle-Calédonie: notes sur la larve supposée de Synthemis ariadne Lieftinck, 1975 (Odonata, Anisoptera, Synthemistidae). Bulletin de la Société entomologique de France 110(2): 165-166. (in French, with English summary) ["Contribution to the knowledge of the Odonata of New Caledonia: notes on the supposed larva of S. ariadne. New morphological and biological elements on the supposed larva of S. ariadne complete the previously published works." (Author)] Address: Fleck, G., Lab. Ent., Mus. Natn. Hist. Nat., 45 rue Buffon, F-75005 Paris, France. E-mail: fleckgunther@gmail.com

15721. Hatakeyama, S.; Sugaya, Y.; Ogamino, Y. (2005): The acute toxicity of fenthion, an organophosphorus insecticide on damselfly and freshwater shrimp through fenthion-accumulated midge larvae. Jpn. J. Environ. Toxicol. 8(1): 13-22. (in Japanese, with English summary) ["Effects of dietary fenthion (hereafter MPP), an organophosphorus insecticide, on mortality of damselfly larvae, Ischnura senegalensis, and freshwater shrimp, Macrobrachium rdpponense, were assessed using an insecticide-tolerant strain of Chironomus yoshimatsui (Chironomid) as a prey organism. Midge larvae had been exposed to MPP of 125, 250, 500 and 1000/ig/L, respectively, for 24-hrs, and resultant, accumulated MPP at 0.9, 2.1, 11.8 and 68 ng/g (wet wt.). In addition, fenthion sulfoxide (FSO) was detected in the midge larvae at higher levels rather than MPP itself. Individual shrimp and damselfly larva (each, ten replicates) were daily fed on MPP accumulated midge larvae (3 or 4 individuals/d) in a flowthrough aquarium. All damselfly larvae died within 3 days by ingesting the midge larvae accumulated 2.1 (2.8) or 11.8 (17.7) ng/g of MPP (FSO in parentheses). While, mortality of the shrimp fed on the midge larvae accumulated 0.9 or 2.1 ng/g MPP increased slowly to 40 and 80%, respectively, until 24 days after start of the experiment. Both predators continuedto eat the MPP-accumulated midge larvae without showing hesitation, suggesting that they lack ability to keep away from toxic prey. We estimated the exposure levels of MPP and FSO in the live midge larvae that brought 50% mortality of predators used for the tests." (Authors)] Address: Hatakeyama, S., National Institute for Environment Studies, Japan

15722. Jakab, T.; Müller, Z.; Devai, G.; Miskolczi, M. (2005): Adatok a Tisza-tó és környéke szitakötofaunájához (Odonata) az 1998-1999. évi gyujtések és megfigyelések alapján. Studia Odonatologica Hungarica 9: 5-31. (in Hungarian, with English summary) ["The paper presents faunistical data on dragonflies collected (larvae, exuviae and adults) and observed (adults) from the shallow lake type reservoir Tisza-tó and its surrounding (in- and outflows, leaking canals). Initially the authors present the methods employed in the field work and in data processing, and introduce the literature they have considered in the identification of species and in reporting faunistic data. Thereafter they provide a detailed survey of collection and observation results from the area. Finally they summarize and evaluate the data on the dragonfly fauna. Collections and observations were made in two years (1998 and 1999), with the participation of 3 specialists on 58 days and 60 localities in the seven cells (DT65, DT66, DT76, DT77, DT78, DT87 and DT88) of the UTM grid map. In the faunistic report data on 459 larvae (241 males and 218 females), 244 exuviae (122 males and 122 females) and 916 adults (595 males and 321 females) are given in detail, representing 959 data (186 larvae, 107 exuviae and 666 adults). The number of observational data without the number of individuals is 154, thus the total number of data is 1113. By this study 39 species (13 Zygoptera and 26 Anisoptera) were found to occur in the area, out of which 1 comes from the very frequent, 16 from the frequent, 12 from the less frequent, 5 from the rare and 5 from the sporadic class of country-wide occurrence frequency." (Author)]

15723. Landwer, B.H.P.; Sites, R.W. (2005): Diagnostic efficacy of morphological characters of larval Tramea lacerata Hagen and Tramea onusta Hagen (Odonata: Libellulidae) in the Prairie region of Missouri. The Great Lakes Entomologist 38(3/4): 155-163. (in English) ["Distinguishing among species of larvae of the dragonfly genus Tramea historically has been problematic, largely due to conflicting characterizations of the larvae of T. lacerata Hagen and T. onusta Hagen (Odonata: Libellulidae) in the literature. The various systematic treatments usually focused on relative lengths of morphological characters to distinguish the species, but often contradicted one another and themselves as to what the diagnostic values actually were. We traced much of the confusion back to errors in the original larval description of T. onusta. We used morphometric analyses to determine the efficacy of previously published characterizations to distinguish between the larvae of T. lacerata and T. onusta. Previous characterizations, especially those involving relative lengths of the caudal appendages, were generally found to be inadequate for distinguishing larvae of the two species. The most reliable characteristic for distinguishing the two species was found to be the length of the epiproct relative to the length of the paraprocts." (Authors)] Address: Landwer, B., Enns Entomology Museum, Division of Plant Sciences, University of Missouri, Columbia, MO 65211, USA. E-mail: brett.landwer@mdc.mo.gov

15724. Marzoq, M.K. (2005): Relative growth and morphological variability in Ischnura evansi (Morton) (Odonata: Coenagrionidae). Marina Mesopotamica 20(1): 27-38. (in English) ["Morphological variability was studied in a laboratory reared adults of I. evansi. Total body length, head width, thorax length, abdomen length and width length were measured in 44 ♂♂ and 69 ♀♀ phenotype (23 blue, 28 orange and 18 orange-brown females). Result indicated that males were smaller than females in all character, females phenotypes were significant difference, linear regression equation for relationship between body length and abdomen length as well as wing length for males and females are significant.Gynochrome 2females were larger than androchromes, as body size is related to larval nourishment, this suggest an effect of maintenance of polymorphism. The difference of the mean body mass between sexes is significant, head width and wing length increased with body

length." (Author)] Address: Marzoq, M.K., Dept. Biology, College of Education, Univ. Basrah, Iraq

15725. McWilliams, L.A. (2005): Variation in diet of the Mexican Free-Tailed Bat (Tadarida brasiliensis mexicana). Journal of Mammalogy 86(3): 599-605. (in English) ["This study documents the diet of Mexican free-tailed bats (Tadarida brasiliensis mexicana) at Carlsbad Cavern, Carlsbad Caverns National Park, Eddy County, New Mexico, and provides information on seasonal variation in food habits of this species throughout its summer residence. Diet was determined from 1,303 fecal samples. 11 orders and 38 families of insects, unidentified insects, 2 orders of Arachnida (Araneae and Acari), bat hair, and mist net were consumed, with Lepidoptera and Coleoptera occurring at greatest percentage volumes and percentage frequencies in the diet. Diet varied significantly throughout the season. 22 food categories exhibited statistically significant variation among sampling sessions. Amounts of Coleoptera, Lepidoptera, Formicidae, Psyllidae, Hymenoptera, and Diptera consumed showed the greatest differences among sampling sessions." (Author)] Address: McWilliams, Lisa, Dept Biol. Sciences, 101 Cary Hall, Auburn Univ., AL 36849, USA. E-mail: mcwilla@auburn.edu

15726. Osborn, R. (2005): Odonata as indicators of habitat quality at lakes in Louisiana, United States. Odonatologica 34(3): 259-270. (in English) ["Larval Odonata were sampled at 3 lakes. Environmental variables such as chemical composition, water current, turbidity, and vegetation cover were measured. Cross Lake had the most species and greater diversity of species than Chaplin' s and Sibley lakes. Most Zygoptera species were found at Cross Lake where carbon availability was highest. Classification and ordination analysis produced similar species groups, providing strong evidence for species assemblages being determined by the measured environmental variables. Tolerant species included Enallagma civile, Erythemis simplicicollis and Plathemis lydia. Species only present at Cross Lake (incl. Argia sedula, Enallagma basidens, Ischnura hastata, I. kellicotti, Celithemis eponina, Erpetogomphus designatus, Libellula luctuosa, L. pulchella, Nasiaeschna pentacantha) were associated with lower levels of ammonia, conductivity, pH, and higher levels of oxygen and increased vegetation. Cross Lake provided habitat that could support more species and was important for species that were less tolerant of ammonia and anoxia. This study provides baseline data for future monitoring and conservation management of these lakes." (Author)] Address: Osborn, R., Dept Biol. Sci., Box 19498, Northwestern State Univ., Natchitoches, LA 71497, USA

15727. Perez Bote, J.L.; Ferri Yanez, F.; Torrejon Sanroman, J.M.; Garcia Jimenez, J.M.; Perianes Carrasco, M. (2005): Nueva cita de Coenagrion mercuriale (Charpentier, 1840) (Odonata, Coenagrionidae) en Extremadura. Boletín de la S.E.A. 37: 306. (in Spanish) [male of C. mercuriale, Río Retín (Valencia de las Torres, Badajoz), UTM: 29SQC5755; 18.08.04; leg.: F. Ferri.] Address: Perez Bote, J.L., Área de Zoología, Facultad de Ciencias, Universidad de Extremadura, Avda. de Elvas s/n, E-06071 Badajoz, Spain. E-mail: jlperez@unex.es

15728. Walker, J.C. (2005): Gomphus fraternus (Odonata: Gomphidae), a new Missouri state record. The Great Lakes Entomologist 38(1/2): 104-105. (in English) ["A male Gomphus fraternus (Say) (Odonata: Gomphidae) was vouchered from the Meramec River at Castlewood State Park, St. Louis, County, Missouri on 7 June 2005. The collection of this specimen is a new state record for Missouri and represents a significant range extension south and westward for this species." (Author)] Address: Walker, Jane, 1Washington University Tyson Research Center, P.O. Box 258, Eureka, MO 63025, USA. E-mail: walker@biology.wustl.edu

2006

15729. Dapkus, D. (2006): Interesting records of insects in Pavilniai Regional Park. New and rare for Lithuania insect species 17: 83-85. (in English) ["Pavilniai Regional Park (Vilnius district) was established in 1992 with the aim to protect hilly landscapes created after the last glaciation. It is the smallest regional park in Lithuania (its area is 2153 ha). Anyway, the park is very heterogenous having different kinds of meadows in the slopes of hills (altitudes of the park ranges up to 100 meters), forests and urbanized territories. The river Vilnia crosses the park and has steep slopes and exposures. [...] Odonata. Gomphidae. Ophiogomphus cecilia (Fourcroy, 1785). (Author)] Address: Dapkus, D., Department of Zoology, Vilnius Pedagogical University, Studentu str. 39, LT-08106 Vilnius, Lithuania. E-mail: daldap@vpu.lt

15730. Dyatlova, E.S. (2006): Analitical review of odonatological studies in the South-Western Ukraine. 11(6): 195-203. ["Species composition of present odonate fauna (Insecta: Odonata) in the South-Western Ukraine has been analysed. According to our and literary data 54 species of 24 genera belonging to 8 families occur in the region. Sympetrum pedemontanum and Coenagrion scitulum were recorded by us in the investigated area for the first time. The phenology (seasonal dynamics of flight) of Odonata in the South-Western Ukraine has been described. The list of rare species which should be protected in the region is proposed." (Author)] Address: Dyatlova, Elena, Inst. of Zoology, Faculty of Biology, I.I. Mechnikov University of Odessa, Odessa, Ukraine. E-mail: lena.dyatlova@gmail.com

15731. Iwata, T.; Fujioka, M. (2006): Effects of winter flooding on aquatic fauna in lotus and rice fields during the growing season. Japanese Journal of Conservation Ecology 11: 94-104. (in Japanese, with English summary) ["We compared the aquatic fauna in ordinary rice fields, which are dry in winter, with those in lotus fields, which are flooded in winter. We carried out biweekly sampling of zooplankton and small aquatic animals at 15 pairs of adjacent rice and lotus fields in Ibaraki Prefecture, Japan, during the crop-growing season, when both types of paddy arc flooded. Zooplankton were more abundant in the lotus fields than in the rice fields. The total number and biomass of small aquatic animals peaked in early June in the rice fields, but continued to increase in July in the lotus fields. In the rice fields, crayfish (Procambarus clarkii) dominated

in May and tadpoles and insects dominated in June. In the lotus fields, Rana japonica tadpoles dominated from April to May and fish dominated from June to July. Some insects (Rhantus pulverosus and Berosus signaticollis), fish (Carassius spp., Pseudorasbora parva), and R. japonica tadpoles were more abundant in the lotus fields than in the rice fields, while dragonfly larva (Sympetrum spp.) and Hyla japonica tadpoles were more abundant in the rice fields than in the lotus fields. The observed differences in fauna may be the result not only of winter flooding but also of differences in water management and in the application of fertilizer and pesticides." (Authors)] Address: Iwata, T., College of Agrobiological Resources, University of Tsukuba, Japan

15732. Tushabe, H.; Kalema, J.; Byaruhanga, A.; Asasira, J.; Ssegawa, P.; Balmford, A.; Davenport, T.; Fjeldsa, J.; Friis, I.; Pain, D.; Pomeroy, D.; Williams P.; Williams, C. (2006): A nationwide assessment of the biodiversity value of Uganda's Important Bird Areas network. Conservation Biology 20(1): 85-99. (in English) ["BirdLife International's Important Bird Areas (IBA) program is the most developed global system for identifying sites of conservation priority. There have been few assessments, however, of the conservation value of IBAs for nonavian taxa. We combined past data with extensive new survey results for Uganda's IBAs in the most comprehensive assessment to date of the wider biodiversity value of a tropical country's IBA network. The combined data set included more than 35,000 site × species records for birds, butterflies, and woody plants at 86 Ugandan sites (23,400 km2), including 29 of the country's 30 IBAs, with data on additional taxa for many sites. Uganda's IBAs contained at least 70% of the country's butterfly and woody plant species, 86% of its dragonflies and 97% of its birds. They also included 21 of Uganda's 22 major vegetation types. For butterflies, dragonflies, and some families of plants assessed, species of high conservation concern were well represented (less so for the latter). The IBAs successfully represented wider biodiversity largely because many have distinctive avifaunas and, as shown by high cross-taxon congruence in complementarity, such sites tended to be distinctive for other groups too. Cross-taxon congruence in overall species richness was weaker and mainly associated with differences in site size. When compared with alternative sets of sites selected using complementarity-based, area-based, or random site-selection algorithms, the IBA network was efficient in terms of the number of sites required to represent species but inefficient in terms of total area. This was mainly because IBA selection considers factors other than area, however, which probably improves both the cost-effectiveness of the network and the persistence of represented species. ... Nevertheless, for dragonflies, grasses, and sedges, the data gaps were small enough to make a provisional assessment worthwhile. Although dragonfly species lists were lacking for six IBAs, 86% of the 231 species on the national list have already been recorded from IBAs (Table 1), including 11 of the 13 Ugandan species recently assessed as threatened or near threatened in a provisional red list of East African dragonflies (assessment by V. Clausnitzer, K. D. B. Dijkstra, and F. Suhling, personal communication)." (Authors)] Address: Tushabe, H., Makerere University Institute of Environment and Natural Resources, P.O. Box 7298, Kampala, Uganda. E-mail: htushabe@hotmail.com

2007

15733. Bauer, U. (2007): Beobachtungen am Rettenberger Weiher (Landkreis Augsburg). Berichte des Naturwissenschaftlichen Vereins für Schwaben e.V. 111: 45-45. (in German) [Bavaria, Germany; records of Libellula quadrimaculata, Calopteryx splendens, Anax imperator, and Somatochlora spec are listed.] Address: Bauer, W., Schrofenstraße 33, 86163 A ugsburg, Germany

15734. Bienek, R.; Hickner, S. (2007): The effects of colonization by Zebra Mussels, Dreissena polymorpha on fitness in two anisopteran species: Hagenius brevistylus and Didymops transversa. University of Michigan Biological Station, Pellston, MI Ola Fincke, University of Oklahoma, Mentor Biology 390: Evolution: 14 pp. (in English) ["The colonization of two Anisopteran larvae (Hagenius brevistylus and Didymops transversa) by Dreissena polymorpha was studied in Douglas Lake after the recent mussel invasion from the Lake Huron watershed. Our objectives included measuring the frequency of the zebra mussels on larvae and exuviae, and measuring fitness indirectly by means of “righting” tests, or how long it took the D. transversa larvae to “right” itself after being placed upside down. We hypothesized that larvae with zebra mussels attached would show a decrease in fitness because of the increased energy costs. Because we found a low frequency of larvae with mussels, colonization was induced. Our results indicated that as the number of zebra mussels per larva increased, so did “righting” time. “Righting” time also increased as the ratio of mussel weight to larva weight increases. None of the H. brevistylus were able to right themselves when observed. There was a significant difference between the average “righting” time for D. transversa larvae before after colonization. The larvae with mussels had a higher “righting” time than larvae without mussel attachment, supporting our hypothesis. Because the majority of our larvae were induced with zebra mussels, they had a higher ratio of mussel weight to larval weight than is found in naturally occurring populations in Douglas Lake from previous studies. This indicates that although a large load of zebra mussels may decrease fitness, the occurrence is unusual and may not have an effect on large populations in Lakes."] Address: Bienek, Rosalie, University of Michigan Biological Station, Pellston, MI; Ola Fincke, University of Oklahoma, Mentor, Biology 390: Evolution, August 13, 2007

15735. DuBois, R.B.; Stettner, C.R. (2007): Gomphus spicatus (Odonata: Gomphidae) rediscovered in Illinois and Libellula semifasciata (Odonata: Libellulidae) recorded near Wisconsin. The Great Lakes Entomologist 40(1/2): 99-100. (in English) ["We collected one adult male of G. spicatus and observed several other males during the mid-afternoon of 10 June 2007 near the Dead River in Illinois Beach State Park (South Unit), Lake County, Illinois. The specimen is deposited in the Odonata Collection of the Wisconsin Department of Natural Resources (WDNR),

which is housed at the WDNR Superior Service Center. The males of G. spicatus were perched on a gravel access road where it intersected a hiking trail immediately adjacent to the river, less than 1 km from its mouth at Lake Michigan. The Dead River at the site is a slowly flowing stream that is blocked by a sand bar much of the year, forming an elongated pond. On 22 June 2007, one of us (CRS) returned to the South Unit and observed several G. spicatus at each of two interdunal wetlands (pannes) on the calcareous moist sands of the lake plain, about 800 m north of the mouth of the Dead River (about 600 m from the original G. spicatus site). Our findings suggest that these sites, which are located less than 30 km from the three lakes where G. spicatus was found over 100 years ago, likely provided breeding habitat for G. spicatus in 2007. Further surveys of Odonata at the Dead River and the nearby pannes are recommended to determine if populations of G. spicatus are persisting in those areas, and surveys of the odonate faunas of Clear, Fox, and Sand lakes would be helpful as well. A single adult female Libellula semifasciata Burmeister (Odonata: Libellulidae), commonly called painted skimmer, was also collected on the hiking trail along the Dead River on 10 June 2007 and is deposited in the WDNR Odonata Collection. A number of adult L. semifasciata had been observed by CRS along the same hiking trail on several previous occasions and several individuals were again present along that trail on 22 June 2007. The finding of L. semifasciata evidently breeding at the Dead River site, which is within 8 km of the Wisconsin state line, is noteworthy because that species has not been found in Wisconsin since Muttkowski (1908) reported it from Milwaukee County in 1903 (Smith et al. 2003; Wisconsin Odonata Survey 2008). Populations of L. semifasciata may persist, and should be looked for, in the southern tier of counties of Wisconsin, especially in Kenosha County near Lake Michigan." (Authors)] Address: DuBois, R., Dept Natural Resources, Bureau of Endangered Resources, Ecol. Inventory and Monitoring Section, 1401 Tower Avenue, Superior, Wisconsin 54880, USA. E-mail: Robert.Dubois@wisconsin.gov

15736. Eijk, J.-L. van (2007): Large population of Orthetrum coerulescens in the northeastern part of the Achterhoek, province of Gelderland. Brachytron 10(2): 205-211. (in Dutch, with English summary) ["In 2005, a large population of Orthetrum coerulescens was discovered near Eibergen, in the province of Gelderland. On 16 locations, 75 individuals were seen. Mating and deposition of eggs was noticed at several locations. The nearest known populations are at a distance of 25 kilometers. The habitat is described as ditches and artificial brooks which are partly fed by local groundwater. It is argumented that the role of this ground water is of vital importance. It prevents the brooks from desiccation during summer and prevents the water to freeze in winter. The author states that more populations are to be discovered since the type of habitat is poorly visited by odonatologists." (Author)] Address: van Eijk, J.-L., Bruno Walterstraat 7, 7556 DV Hengelo, Netherlands

15737. Fleck, G. (2007): Contribution à la connaissance des Odonates de Nouvelle-Calédonie: une larve du genre Metaphya Laidlaw, 1912 (Anisoptera, Corduliidae). Bulletin de la Société entomologique de France 112(2): 183-186. (in French, with English summary) ["Contribution to the knowledge of the Odonata of New Caledonia: a larva of the genus Metaphya Laidlaw, 1912 (Anisoptera, Corduliidae). The larva of Metaphya elongata Campion, 1921, is illustrated and described for the first time. The larvae of this genus were unknown until now. A larval generic diagnosis is proposed." (Author)] Address: Fleck, G., Lab. Ent., Mus. Natn. Hist. Nat., 45 rue Buffon, F-75005 Paris, France. E-mail: fleckgunther@gmail.com

15738. George, J. (2007): Lundy's lentic waters: Their biology and ecology. Extract from J George, 'Lundy Studies' (2007). Copyright Lundy Field Society and the authors: 103-128. (in English) ["Research on the Lundy freshwater ecosystems in the late 1970s, 1980s and early 1990s showed that the major standing water bodies (lentic waters) supported different populations of organisms, particularly in the planktonic and macroinvertebrate groups. Recent research in the autumn of 2003, spring 2005 and winter 2006 not only demonstrated that these differences still are present, but also gained information on seasonal changes occurring in these waters. Four water bodies, Pondsbury, the Rocket Pole Pond, Quarry Pool and the larger pond at Quarter Wall have been studied at all seasons. Differences can be related to the position of the pond on the island and hence degree of exposure, the amount of plant cover and the input of decaying material and nutrients. At various times during the last 27 years smaller, often temporary, bodies of water have been surveyed e.g. pools in North Quarry, smaller pond at Quarter Wall, pond in Barton Field. Brief descriptions of these small ecosystems are given here." (Author) Ischnura elegans and Sympetrum striolatum are listed.] Address: George, Jennifer, Sabella, Gays Lane, Holyport, Maidenhead, Berks, SL6 2HL, UK. E-mail: georgej@wmin.ac.uk

2008

15739. Escolà, J. (2008): Nova cita de Coenagrion hastulatum (Charpentier, 1825) a Catalunya (Odonata: Coenagrionidae). Boletín de la S.E.A. 42(1): 434. (in Spanish) [Female Coenagrion hastulatum), Vall d'Aran, Provincia de Lérida (Cataluña), 7-VII-2007, 13.45h, 20ºC, 1884 masl (UTM 31TCH22).] Address: Escolà i Garriga, J., Avda. Barcelona nº48 1er-1a 08700 Igualada (Barcelona), Spain

15740. Krakowiak, P.J.; Pennuto, C.M. (2008): Fish and macroinvertebrate communities in tributary streams of Eastern Lake Erie with and without Round Gobies (Neogobius melanostomus, Pallas 1814). J. Great Lakes Res. 34: 675-689. (in English) ["Round gobies have had significant impacts on benthic fish and invertebrate communities in nearshore habitats of the Great Lakes. As round gobies have become more abundant in lake habitats, there has been an expansion of their populations into tributary streams and rivers. We compared stream invertebrate and fish communities in New York tributaries to Lake Erie with round gobies present and absent. Four of six benthic invertebrate metrics differed between streams with and without round gobies. Streams with round gobies present

had reduced Shannon diversity, EPT richness, and EPT/chironomid ratios, and increased macroinvertebrate density relative to streams without round gobies, but there was no difference in non-Diptera density, or total taxa richness. None of the four fish metrics examined differed between streams with and without round gobies. However, darters occurred in all streams lacking round gobies, but did not occur in any streams with round gobies. Comparisons with historical fish and macroinvertebrate distributional data support our suspicion of goby-induced community changes. In these New York streams, round gobies seem to have had significant impacts on invertebrate communities via their consumptive behavior, whereas the impacts on fish communities are less evident. If round gobies continue to expand their distribution inland, the resultant alterations in macroinvertebrate communities may impact the suitability of tributary streams as spawning and nursery habitat for several sport fish species and for energy dynamics in tributary streams." (Authors)] Address: Pennuto, C.M., Dept of Biology, Buffalo State College, 1300 Elmwood Avenue Buffalo, New York 14222, USA.

15741. Larsen, T. (2008): New record of the Keeled Skimmer (Orthetrum coerulescens) in Denmark. Ent. Meddr 76: 165-168. (in English, with Danish summary) ["Three populations of O. coerulescens were registered July 2006 at Søby Brunkulslejer, Sepstrup Sande and Nørre Vium. These are the first documented records in Denmark since 1936." (Author)] Address: Larsen, T., Dept Terrestrial Ecol., National Environmental Research Inst., Vejlsøvej 25, 8600 Silkeborg, Denmark. E-mail: natursyn@gmail.com

15742. Mitra, A. (2008): Dragonfly (Odonata: Insecta) fauna of Bhutan - an annotated and updated check-list with ten new records. Fraseria (N.S.) 7: 105-109. (in English) ["In eastern Bhutan, 18 species and subspecies of dragonflies were collected from the Kuruchu Reservoir area at Mongar, eight from Samdrup Jongkhar, one from Kanglung and one from Yongphula. From southern Bhutan, six species and subspecies were collected from Sarpang, five from Gelephu and eight from Tsirang. Ten species and subspecies of those are now to Bhutan and include Pseudagrion rubricops, Drepanosticta carmlchaeli, Lestes dorothea, Neurobasis ch. chinensis, Scatmogomphus bistrigatus, Diplacodes nebulosa, D. lefebvrei, Trithemis palUc/inervls, Tramea virginia and Urothemis s. signata. Aeshna p. petalura was encountered for the first time although Tsuda reported its presence in 1991. Specimens are deposited at the museum maintained by the Department of Zoology, Sherubtse College, Kanglung, Bhutan. An up-to date check-list of 50 species and subspecies of dragonflies known from Bhutan is also provided." (Author)] Address: Mitra, A., Dept of Zoology, Sherubtse College, Kanglung, Bhutan. E-mail: amitodonata@yahoo.com

15743. Teixeira-Gamarra, M.C.; Aoki, C.; Dutra, S.L.; Pinto, N.S.; De Marco Jr., P. (2008): Diversidade de Odonata da Reserva Particular do Patrimônio Natural Engenheiro Eliezer Batista. In: Descobrindo o paraíso: aspectos biológicos da reserva particular do patrimônio natural engenheiro Eliezer Batista: 206-219. (in Portuguese) [Brazil, Reserva Particular do Patrimônio Natural Engenheiro Eliezer Batista (RPPN EBB), Serra do Amolar Serra do Amolar region. 224 odonate specimens were collected. Libellulidae showed the highest richness and abundance among the families recorded with five species within the genus Erythrodiplax. Triacanthagyna sp. and Micrathyria romani had not yet been recorded for the State of Mato Grosso do Sul. In sum, 24 taxa are listed.] Address: De Marco Jr., P., Lab. Ecologia Teórica e Síntese, Depto de Ecologia, Universidade Federal de Goiás, Brasil. E-mail: pdemarco@icb.ufg.br

15744. Theischinger, G. (2008): Notable range extensions of dragonflies in New South Wales - More species in Victoria? Victorian Entomologist 38(4): 59-65. (in English) ["Theischinger & Hawking (2003) mentioned that Criseargiolestcs griseus, Petalura gigantea, Austroaeschna obscura and Cordulephya montana were recently collected only a few kilometers from the New South Wales/Victoria border. None of them was recorded from Victoria in the meantime, it should, however, only be a matter of time until this will happen. Since 2003 records from south-eastern New South Wales of two more species, Pseudagrion ignifer Tillyard and Acanthaeschna victoria Martin, have become available that make their occurrence in Victoria more likely. In the following the records that extend the known distribution of P. ignifer markedly further to the south and that make more believable a previously ignored record of A. victoria from Victoria are discussed. Finally details are given of a 17 years old record from Victoria of Griseargiolestcs eboracus (Tillyard) whose occurrence in Victoria and taxonomic status were recently questioned. Some characters useful for the detection of the three species are discussed and illustrated."] Address: Theischinger G., 2A Hammerley Road, Grays Point, NSW 2232, Australia. E-mail: Gunther.Theischinger@environment.nsw.gov.au

2009

15745. Clarke, D. (2009): Keeled Skimmers at Glasson Moss NNR. The Carlisle Naturalist 17(2): 47. (in English) [Verbatim: Before 2005, Orthetrum coerulescens was not known in Cumbria north of their regular site near Grange-in-Borrowdale (NY21). In that year I found them, for the first time but evidently well-established, on runnels just below Carrock Fell (NY33) –see Carlisle Naturalist 13:2, p.9. The species is a specialist in slow-moving boggy runnels and in Cumbria at least is never associated with static water. The finding of two males of the species on a dragonfly walk at Glasson Moss led by Mike and Anne Abbs on Saturday 25th July this year was completely unexpected and by far the most northerly record for the county. The insects were evidently showing interest in water trickling over the firebreak at the corner of a pool not far from the Kirkbride–Bowness road. Photographs were obtained, including a fine one by Darren Robson taken on 27th. As there is little flowing water at Glasson Moss, it is perhaps doubtful whether the species could establish there, but this is at least further indication of its relative mobility and therefore of the potential for range extension. Given the amount of apparently suitable habitat at moderate altitudes in Cumbria, the species might well be expected to colonise sites above its

present altitudinal limits of c. 250 m a.s.l. – as well as just spreading further afield.] Address: Clarke, D., Burnfoot, Cumwhitton, Brampton, Cumbria CA8 9EX, UK

15746. Faúndez, E.I. (2009): De Monstruos y Prodigios (24): un caso teratológico en Rhionaeschna variegala (Fabricius, 1775) (Odonata: Aeshnidae). Boletín de la Sociedad Entomológica Aragonesa 44: 597-598. (in Spanish, with English summary) ["A teratologic specimen of R. variegata from Chile with tarsal and pretarsal malformations in the mesothoracic and metathoracic left legs is described." (Author)] Address: Faúndez, E., Grupo Entomon, Laboratorio de Entomología, Instituto de la Patagonia, Univ. de Magallanes. Casilla 113-D Punta Arenas, Chile. E-mail: ed.faundez@gmail.com

15747. Ferreira, S.; Grosso Silva, J.M.; Sousa, P. (2009): The Dragonflies of Serra da Estrela Natural Park, Portugal (Insecta, Odonata). Boletín de la Sociedad Entomológica Aragonesa 44: 417-424. (in English, with Spanish summary) ["The state of knowledge of the odonatofauna of Serra da Estrela Natural Park (Portugal) is presented with comments. Eleven species are recorded for the first time from the Park, including the legally protected Coenagrion mercuriale and new records of Oxygastra curtisii are presented. Furthermore, past and present records of Aeshna juncea and Sympetrum flaveolum from Portugal are discussed, and analysed in the context of their distribution in the Iberian Peninsula. Conservation relevance of the Serra da Estrela Natural Park on Portuguese Odonata and its threats are discussed and the necessity of further studies pointed out…. Regarding the altitudinal range, we watched a Cordulegaster boltonii “hill-topping” around the tower at Torre (1993 m) on 03-VIII-2005" (Authors)] Address: Ferreira, Sónia, CIBIO/UP - Centre de Investigate) em Biodiversidade e Recursos Geneticos, Universidade do Porto, Campus Agrärio de Vairao, P-4485-661 Vairäo, Portugal. E-mail: hiporame@gmail.com

15748. Johnson, J. (2009): Two new odonates for Oregon in two days. Argia 21(3): 22-23. (in English) ["Male Lestes forcipatus at a pond about 14 miles north of Enterprise, Wallowa County, Oregon, 3-VIII-2009. Female Aeshna tuberculifera at a borrow pit near Fry Meadow, Union County, Oregon, 3-VIII-2009." (Author)] Address: Johnson, J., Vancouver, Washington, USA. E-mail: jt_johnson@comcast.net

15749. Matsui, A. (2009): Growth of several fish and dragonfly species in the drainage system of a consolidated paddy field. Japanese Journal of Conservation Ecology 14: 3-11. (in Japanese, with English summary) ["This study examined the growth of aquatic animals in the canal system constituting the main, lateral, and farm drains in a consolidated paddy field, with emphasis on canal structure and year-round water flow in the canals. A field survey at six sites, which involved three different canal levels, was carried out in Chikusei, Ibaraki Prefecture, Japan (36°21´N, 139°59´E). Sampling was conducted at monthly intervals from April 2001 to March 2002. Of the freshwater fish, young-of-the-year (YOY) Zacco platypus appeared in September, while YOY Misgurnus anguillicaudatus appeared in May. Last instars of Calopteryx atrata were collected only in June, suggesting emergence about this time, while those of Orthetrum albistylum speciosum were collected in May and July, suggesting a longer duration of emergence. Since populations of the four species decreased during the non-irrigation season when the water level was low, I propose that a marsh be developed as a wintering site in the lower reaches of the canal system in consolidated paddy fields." (Author)] Address: not stated

15750. Mishra, S.K. (2009): Insecta: Odonata. Zoological Survey. India, Fauna of Bandhavgarh Tiger Reserve, Conservation Area Series 40: 25-38. (in English) ["Bandhavgarh lies on the extreme north-eastern border of the state of Madhya Pradesh in district Umaria (which was earlier a part of Sahadol district) and the northern flanks of the eastern Satpura mountain range. It is located on the coordinates 23 °30" 12" to 23° 46" 30" Nand 80° 47' 15" to 81°11' 45" E at altitudes between 410 m and 810 m. Presently the Reserve's area falls in the two distncts Umaria and Katni." "The identification of Odonata collections made from Bandhavgarh Tiger Reserve has revealed 32 species belonging to 24 genera under 7 families. These include 8 species of damselflies (Zygoptera) and 24 species of dragonflies (Anisoptera)." (Author)] Address: Mishra, S.K., Zoological Survey of India, Central Regional Station, Labalpur-482002, India

15751. Nakanishi, K.; Taiwa, K.; Kanbara, B.; Noma, N.; Sawada, H. (2009): Comparisions of macro-aquatic animal communities among paddy fields under different cultivation management systems. Jpn. J. Environment. Entomol. Zool. 20(3): 103-114. (in Japanese, with English summary) ["To examine the effects of differences in cultivation management, we conducted censuses of macro-aquatic animal communities in paddy fields in Takashima, Shiga prefecture, during April-September, 2008. Among a number of species we selected the following three orders of aquatic insects (Odonata. Hemiptera, and Coleoptera) and fish such as loach, Misgurnus anguillicaudatus as target organisms. Four types of paddy fields were set up under different vultivation management systems with two replicates for each treatment: 1) conventional management with an application of standard amounts of agrochemicals and kept dry during winter, 2) reduced-agrochemical management and kepi dry during winter. 3) no agrochemical management and kept dry during winter, and 4) no agrochemical management and flooded year round. In paddy fields under the conventional and reduced-agrochemical management systems.Aquatic insects were fewer in terms of the number of species and individuals. This was largely to the result: enhanced mortality of aquatic insects, which were assumed to have been killed by agrochemicals used in the early season. In the winter-flooded paddies aquatic insects were most abundant, both in the number of species and individuals throughout the census period. This suggested the critical importance of paddies as units of conservation of aquatic insects. By contrast, loach were less abundant in the winter-flooded paddies, indicating their low suitability as a spawning site and habitat for young fish. To account for this phenomenon, the persistent presence of aquatic inserts that act as fish food, and the low availability of plank-

ton as a food resource were suggested and discussed." (Authors)] Address: Nakanishi, K., School of Environmental Science, Univ. of Shiga Prefecture. Hikone, Shiga 522-8533, Japan. E-mail: k_mw_newt@hotmail.com

15752. Neves dos Santos, A.; Racca-Filho, F.; Neves dos Santos, L.; Gerson Araújo, F. (2009): El pez Trachelyopterus striatulus (Siluriformes: Auchenipteridae) como herramienta de muestreo de la entomofauna en un embalse tropical. Revista de Biología Tropical 57(4): 1081-1091. ["The fish T. striatulus used to sample insects in a tropical reservoir. … Insectivorous fishes represent good users of these ecosystems and analyzing the aquatic organisms present in fish stomachs, is an alternative way to determine resource abundance and utilization. In this paper, the potential of Trachelyopterus striatulus as an insect sampler was examined through dietary analyses of 383 individuals caught between April 1999 and March 2000 in Lajes Reservoir, a 30 km² oligotrophic impoundment in Southeast Brazil. We estimated frequency of occurrence and Schoener's index of similarity. Diet changes among seasons and reservoir zones were addressed with DCA and ANOVA analyses. Its diet was 92.1% insects (ten orders and nine families). Hymenoptera (57.90%), Odonata (39.76%) [Aeshnidae (inmatures) *37.74 *34.32 *44.27; Aeshnidae (adultes) 3.77 1.35 3.05], Trichoptera (27.41%), Ephemeroptera (26.25%) and Coleoptera (28.96%) were the most common groups. Highest insect occurrence and richness were recorded in autumn–summer, a period of greater rainfall and insect activity. Formicidae, the dominant prey item in all seasons, appeared to be especially important in spring, a season marked by shortness of food resources. Trichoptera and Ephemeroptera were the most consumed prey items in the other seasons. Highest insect occurrence and richness were recorded in the middle and upper reservoir zones, respectively. Trichoptera and Ephemeroptera prevailed in the upper zone, where small pristine rivers and tributaries are abundant, whereas Formicidae and Belostomatidae predominated in the lower and middle zones. Because of its abundance in many freshwater ecosystems of Brazil, the ubiquity of insects in its digestive tract and the low level of prey degradation, T. striatulus has potential as an insect sampler of Neotropical reservoirs. However, conventional sampling in Lajes Reservoir is necessary to compare the effectiveness of T. striatulus with other insect sampling methods." (Authors)] Address: Neves dos Santos, A.F.G., Depto de Zootecnia e Desenvolvimento Agro-Sócio-Ambiental Sustentável, Univ. Federal Fluminense, Rua Vital Brasil, 64, Fac. de Veterinária, Niterói, RJ - Brasil. E-mail: alejandrafilippo@hotmail.com

15753. Trapero Quintana, A.D.; Puerta de Armas, Y.; Rodríguez Fonseca, R.; Cabrera Anaya, A. (2009): El conocimiento sobre las libélulas (Odonata) en la comunidad "La Redonda", Santiago de Cuba. Boletín de la Sociedad Entomológica Aragonesa 44: 556-558. (in Spanish, with English summary) [… A survey was conducted with 83 persons of all ages at La Redonda, east of Santiago de Cuba, between April 15th and June 30th, 2007. 31% of them know dragonflies as "cigarillos" ("cigarettes"), while 44% locate them in the surroundings of the Sevilla River, which borders the village. In general terms the survey reflects a positive opinion about the existence of odonates in the environment of La Redonda, although there is a lack of knowledge about the biology of the group. We recommend the development of environmental education activities aimed at the villagers." (Authors)] Address: Trapero Quintana, A., Depto de Biología de la Universidad de Oriente, Patricio s/n, Santiago, Cuba, CP 90500, Cuba. E-mail: atrapero@cnt.uo.edu.cu

2010

15754. Brauckmann, C.; Gröning, E.; Ilger J.-M. (2010): Von den ältesten Insekten. Entomologie heute 22: 17-40. (in German, with English summary) ["The present article is a compilation on the most ancient Hexapoda (Devonian, Carboniferous), with special reference to the Konservatlagerstätte of Hagen-Vorhalle (Ruhr area, Germany). Since its discovery in 1982, this locality has yielded 310 specimens of Pterygota, many of them nearly completely preserved. The insect fauna of Hagen-Vorhalle includes 18 species, distributed to 5 main groups: Palaeodictyoptera, Megasecoptera, Diaphanopterodea, Odonatoptera, and basal Neoptera. Several species of the Neoptera were infested with parasitic mites or their larval instars. The main importance of the locality is caused by (1) the high stratigraphical age (Namurian B, Marsdenian, early Late Carboniferous), (2) the great frequency of specimens, and (3) unusually complete preservation which permits more detailed reconstructions of several groups of the Pterygota." (Authors)] Address: Brauckmann, C., Inst. Geologie & Paläontologie, TU Clausthal, Leibnizstraße 10, 38678 Clausthal-Zellerfeld, Germany. E-mail: carsten.brauckmann@tu-clausthal.de

15755. Cano Villegas, F.J.; Conesa García, M.A.; Irurita Fernández J.M. (2010): Nuevos datos de Lestes macrostigma (Eversmann, 1832) (Odonata) en el Parque Nacional de Doñana (Andalucía, España). Boletín de la S.E.A 46: 518-520. (in Spanish, with English summary) [The presence of L. macrostigma in Doñana National Park is reported and its emergence is confirmed in three areas within the Park.] Address: Cano Villegas, F.J., Departamento de Ciencias Ambientales, Área de Zoología, Universidad Pablo de Olavide, 41013 (Sevilla). E-mail: fjcanovi1@wanadoo.es

15756. Chainthong, D.; Sartori, M.; Boonsoong, B. (2010): Stylogomphus thongphaphumensis (Odonata: Anisoptera: Gomphidae), a new gomphid dragonfly and the first record of S. malayanus Sasamoto, 2001 from Thailand. Zootaxa 4763 (2): 231-245. (in English) ["S. thongphaphumensis sp. nov. is described from a type series of specimens reared from larvae (holotype ♂, Huai Khayeng, Thong Pha Phum district, Kanchanaburi Province; 14°36'20N 98°34'38E, 206 m a.s.l., larva collected on 14.XII.2014; adult emerged on 30.IV.2015). All larvae were collected from the same locality in western Thailand. Description of the larva (based on preserved exuviae) is provided as well. The adult of this species can be distinguished from other Stylogomphus Fraser, 1922, by the morphology of the male anal appendages, pterothoracic pattern, abdominal pattern, male genitalia and female valvula vulvae (detail provided in the differential diagnosis below). This is the first

species of Stylogomphus to be described from Thailand. This study also reports the first record of S. malayanus Sasamoto, 2001, from Thailand." (Authors)] Address: Boonsoong, B., Animal Systematics and Ecology Speciality Research Unit (ASESRU), Dept of Zoology, faculty of Science, Kasetsart Univ., Bangkok 10900, Thailand. E-mail: fscibtb@ku.ac.th

15757. Copp, G.H.; Tarkan, S.; Godard, M.J.; Edmonds, N.J.; Wesley, K.J. (2010): Preliminary assessment of feral goldfish impacts on ponds, with particular reference to native crucian carp. Aquatic Invasions 5(4): 413-422. (in English) ["Introductions of an Asian cyprinid, goldfish Carassius auratus, are known to pose a genetic threat to crucian carp Carassius carassius, which is native to northern parts of central and western Europe, including southeast England. However, there are no known studies in Europe of goldfish impacts on crucian carp growth and life-history traits, nor on the recipient ecosystems. The present study is the first such attempt, and compares the plants, invertebrates and fish biology (growth, condition, reproduction) in six ponds, two containing crucian carp only (allopatry), two containing goldfish only (allopatry), and two with both species (sympatry). Feral goldfish growth was greatest in sympatry with native crucian carp, whereas crucian carp growth was similar regardless of goldfish presence or absence. However, body condition (LK) and relative fecundity (per unit of body weight) of crucian carp was greatest in sympatry with feral goldfish. LK increased significantly with increasing water conductivity in goldfish but not in crucian carp, and LK was not related to pond invertebrate densities in either fish species. Differences in the plant and aquatic invertebrate communities observed in the study ponds could not be attributed to the introduction and establishment of goldfish, however non-native plant and invertebrate species were observed only in ponds containing goldfish. Differences in growth and condition between the two Carassius species does not appear to be due to differences in available food, so elevated somatic growth and reproductive output in crucian carp and faster growth in goldfish in sympatry may be due to non-dietary competitive interactions. The present preliminary study highlights the difficulties of assessing 'real world' impacts of non-native species on native species and ecosystems as well as the need for further study of feral goldfish impacts on European pond ecosystems in general and on native congener crucian carp in particular." (Authors)] Address: Copp, G.H., Centre for Environment, Fisheries & Aquaculture Science, Lowestoft, Suffolk, UK. E-mail: gordon.copp@cefas.co.uk

15758. Janský, V.; David, S. (2010): Dragonflies (Odonata) of NR Šúr. In: Majzlan, O. & Vidlicka, L. (eds) 2010. Príroda rezervácie Šúr: 119-126. (in Slovakian, with English summary) ["During the inventory research of the Šúr Nature Reserve in the years 2008 and 2009, 32 dragonfly species of 8 families has been recorded. This represents 45,7 % of the dragonfly species of Slovakia. Together with former results of NEMÈÁKOVÁ (1960), MALCHÁREK (1986), ŠÍBL and SEGINKOVÁ (2001), a few records of KRNO (1996) and rare found of a migrant Lindenia tetraphylla by Trpiš in 1954, total number of dragonfly species for this territory is 44. Libellula fulva found in 2009 is the last new species for the protected area." (Authors)] Address: Slovenské národné múzeum – Prírodovedné múzeum, Vajanského nábr. 2, P.O.Box 13, 810 06 Bratislava 16, Slovakia. E-mail: entomo@snm.sk

15759. Jiskra, (2010): Recent occurrence of Siberian Winter Damsel (Sympecma paedisca) in the Karlovy Vary region. Sbornik Muzea Karl Ovarskeho Kraje 18: 219-222. (in Czech, with English summary) ["Siberian Winter Damsel (Sympecma paedisca) is an endangered species in the whole Europe. In the Czech Republic it occurs only in western and northwestern Bohemia. Typical biotopes of damselflies are various ponds with abundant littoral vegetation. Recently, the occurrence of Siberian Winter Damsel in the Karlovy Vary region was recorded at 21 localities. The most of records comes from smaller ponds, which are used for extensive fish farming and from the pools at the lignite mine dumps. Damselflies are endangered by the inappropriate reclamations of mine dumps and sand pits as well as by intensive fish farming, which is connected with damage of the littoral vegetation, excessive fertilization and liming of ponds." (Author)] Address: not stated

15760. Nössing, T.B.; Winkler Werth, F. (2010): Die Libellen in den Naturparks Trudner Horn und Rieserferner-Ahrn. Naturparks Südtirol Unter der Lupe. Autonome Provinz Bozen - Südtirol Provincia Autonoma di Bolzano - Alto adige: 32 pp. (in German) [General on dragonflies, with special reference to the fauna of South Tyrol/Alto Adige (Italy) and to the work of the regional working group, "Libella". An account is presented of the 24 species so far recorded from the 2 Nature Parks.] Address: Nössing, T.B., Abteilung Natur und Landschaft, Amt für Naturparke, Rittner Straße 4, 39100 Bozen, Italy. E-mail: naturparke.bozen@provinz.bz.it

15761. Rasmussen, R.D.; Otten, J.G.; Dixon, J.W. (2010): New state record and notable range extension for Libellula semifasciata (Odonata: Libellulidae). The Great Lakes Entomologist 43: 91-93. (in English) ["L. semifasciata, is an eastern species of dragonfly that has never been documented in Iowa. In this note we report two observations and the collection of a voucher for this species in southeast Iowa in the last three years. Based on other records of this species, including those from neighboring states and more northerly latitudes, we propose that these observations are evidence of a range extension." (Authors)] Address: Rasmussen, R.D., Muscatine Soil & Water Conservation District, 3500 Oakview Dr, Ste A, Muscatine, Iowa 52761, USA. E-mail: rd_rass@hotmail.com

2011

15762. Arndt, E; Domdei, J. (2011): Influence of beaver ponds on the macroinvertebrate benthic community in lowland brooks. Polish Journal of Ecology 59(4): 799-811. (in English) [Sachsen-Anhalt, Germany; "Beavers (Castor fiber) alter stream ecosystems by dam building resulting in a lower stream velocity, retention of sediments and organic matter as well as modifying physical, chemical and geomorphological conditions in these streams. the effects of

beaver dams on invertebrate benthic communities were examined in two semi-natural lowland brooks. For this purpose, beaver ponds and reference sections upstream and downstream of each pond were sampled. Mollusca, Crustacea and five orders of aquatic insects were analyzed according taxa richness, abundances, micro-habitat preferences and feeding types to characterize the macroinvertebrate communities. Detailed data in downstream sections and taxa-related parameters of insects (upstream and downstream sections) were analyzed first time. - the abundance of Trichoptera, Plecoptera and Crustacea as well as taxa numbers of ePt taxa decreased significantly in the ponds compared to the free-flowing sections. Odonata and Ephemeroptera did not respond in abundance but in a change of the species composition, because lentic species replaced the lotic species in the impoundment section. - only the number of molluscs increased in the ponds. - regarding the microhabitat preferences, lithal dwellers dominated in all free-flowing sections, whereas its proportion decreased in the ponds. - on the opposite, pelal dwellers increased in the impounded area. - significant differences were also found in proportions of shredders and passive filter feeders (decreasing in ponds), whereas predators increased in the ponds compared to the downstream section of the brooks. ... There occur 10 critical endangered and further 12 endangered species of aquatic insects in the brook system. Ophiogomphus cecilia is listed in Annex II of the European Habitats Directive. ... Calopteryx virgo is the only of these endangered species which could be recorded also in one of the beaver dams. ... Cordulegaster boltonii (Endangered) were limited to brook sections upstream of the ponds." (Authors)] Address: Arndt, E., Department 1, Anhalt University of Applied Sciences, Strenzfelder Allee 28, D-06406 Bernburg, Germany. E-mail: e.arndt@loel.hs-anhalt.de

15763. Chiba, W.A.C.; Passerini, M.D.; Tundisi, J.G. (2011): Metal contamination in benthic macroinvertebrates in a sub-basin in the southeast of Brazil. Brazilian Journal of Biology 71(2): 391-399. ["Benthic macroinvertebrates have many useful properties that make possible the use of these organisms as sentinel in biomonitoring programmes in freshwater. Combined with the characteristics of the water and sediment, benthic macroinvertebrates are potential indicators of environmental quality. Thus, the spatial occurrence of potentially toxic metals (Al, Zn, Cr, Co, Cu, Fe, Mn and Ni) in the water, sediment and benthic macroinvertebrates samples were investigated in a sub-basin in the southeast of Brazil in the city of São Carlos, São Paulo state, with the aim of verifying the metals and environment interaction with benthic communities regarding bioaccumulation. Hypothetically, there can be contamination by metals in the aquatic environment in the city due to lack of industrial effluent treatment. All samples were analysed by the USEPA adapted method and processed in an atomic absorption spectrophotometer. The sub-basin studied is contaminated by toxic metals in superficial water, sediment and benthic macroinvertebrates. The Bioaccumulation Factor showed a tendency for metal bioaccumulation by the benthic organisms for almost all the metal species. The results show a potential human and ecosystem health risk, contributing to metal contamination studies in aquatic environments in urban areas." (Authors)] Address: Chiba, WAC, Programa de Pós-graduação em Ecologia e Recursos Naturais, Centro de Ciências Biológicas e da Saúde, Universidade Federal de São Carlos – UFSCar, Rod. Washington Luís, Km 235, CP 676, CEP 13565-905, São Carlos, SP, Brazil

15764. Conze, K.-J. (2011): Die Libellenfauna in Nordrhein-Westfalen – aktueller Stand und Aktivitäten des AK Libellen NRW. Entomologie heute 24: 287-295. (in German, with English summary) ["Since 1996 the working group for the conservation and faunistic mapping of the dragonflies in North Rhine-Westphalia has comprehensively collected all country specific data of these insects. For that all available faunistic literature was evaluated; in addition, in the last 15 years about 250 collaborators reported more than 180,000 data sets of field observations. Up to now 81 of the 140 dragonfly species known from Europe have been also reported from Germany. In North Rhine-Westphalia 73 species have been observed so far; 66 species appear to be established, i.e. they are constantly found and are reproducing. While southern species are spreading and populations of streaming water species are increasing, species typically for fens and specialists for nutrient-poor water bodies are remarkably decreasing above average. Altogether the dragonfly fauna in North Rhine-Westphalia shows great dynamics, driven by the geographical situation being the transient area between low- and highland and the atlantic and the continental biogeographical regions as well as by the effects of climate change and the effects of the accelerated anthropogenic change of landscape in the most densely populated federal state of Germany." (Author)] Address: Conze, K.-J., AK Libellen NRW c/o Listerstr. 13, D-45147 Essen, Germany. E-mail: kjc@loekplan.de

15765. Devai, G.; Miskolczi, M. (2011): Adatok a Báb-tava és a Nyíres-tó szitakötõ-faunájához (Odonata) [Data on the dragonfly (Odonata) fauna from the bogs Báb-tava and Nyíres-tó (NE-Hungary)]. Studia odonatol. hung. 13: 63-70. (in Hungarian, with English summary) ["This is the 21th paper of a series directed at communicating faunistical data of Hungary which had been unpublished until December 31, 1987 (cf. DÉVAI, GY. et al. 1993). The authors present faunistical data from two bogs (Báb-tava and Nyíres-tó) in the geographical microregion Beregi-sík in NE-Hungary, over the administrative area of the settlement Csaroda and Beregdaróc. Collections were made in 4 years between 1983 and 1987, with the participation of 4 specialists on 15 days, in one 10×10 km UTM grid map cell (FU 13). In the report information on 487 adults (339 males and 148 females) is given in detail, representing 110 faunistical data. In this study 26 species (9 Zygoptera and 17 Anisoptera) were found to occur in the area, out of which 1 belongs to the very frequent, 16 to the frequent, 7 to the less frequent, 1 to the rare and 1 to the sporadic class of countrywide occurrence frequency." (Authors)] Address: Devai, G., Debreceni Egyetem, Tudományegyetemi Karok, Természettudományi és Technológiai Kar, Hidrobiológiai Tanszék, 4032 Debrecen, Egyetem tér 1, Hungary

15766. Escola, J.; Müller, P.; Batlle, R.M. (2011): Odonatofauna del nuevo “Estany d'Ivars i Vila-sana” (Pla d'Urgell, Lleida, ne Península Ibérica) (Odonata). Boletín de la S.E.A. 48(1): 329-334. (in Spanish, with English summary) ["Odonata of the new lake “Estany d’Ivars i Vila-sana” (Pla d'Urgell, Lleida, NE Iberian Peninsula). Odonate records from a lake, L'Estany d'Ivars i Vila-sana (Lleida, NE Iberia), whose water levels were restored during the period 2005-2009 after being drained between 1948 and 1951, are given. Records by Ramon Margalef from just before the draining and another present records of near localities are also given." (Authors)] Address: Grup Oxygastra, Institucio Catalana d'Historia Natural, C/del Carme 47, 08001, Barcelona, Spain. E-mail: contacte@oxygastra.org

15767. Gümüsatam, G. (2011): The names given to the Turkish Cypriot people animals for areas of the concept [sic] - Names given to animals by Turkish Cypriots in conception areas. Diyalektolog - Agiz Arastirmalari Dergisi 3: 11-32. (in Turkish, with English summary) [yusufçuk, Nr. 216; = dragonfly "In this study, the names given by the Turkish Cypriot people to animals in natural life were evaluated according to their conceptual fields. In addition, these names were compared with Turkey Turkish and similarities were determined. In addition to all these, the names of the determined words in the standard language and zoology are also referred to. Cattle and small cattle, poultry, birds, reptiles, fresh and salt water creatures, etc. and the ways followed in naming the animals included in them were determined. Thus, the tendency of the Turkish Cypriot people to observe nature and to name the living creatures here has been determined, and an answer has been sought to how much they are affected by the cultures they interact with. [Google translate]." (Author)] Address: Gümüsatam, G., Girne Amerikan Üniversitesi, Eðtim Fakültesi, E-posta: gurkangumusatam@gau.edu.tr.

15768. Hancíková, B. (2011): Migrations of dragonflies and damselflies (Odonata). B.Sc., Faculty of Science, Department of Ecology, Univerzita Karlova, Ústrední knihovna, Ovocný trh 3-5, 116 36 Praha: 37 pp. (in Czech, with English summary) ["This study is aimed at the phenomenon of migration, which is not still fully explored and which, by different circumstances, undergo several species of dragonflies. Only for a few species from several tens of migrants generally, their migration route and strategies are explored. These case studies are described and I am also dealing with those species of dragonflies for which migration is not fully explored, and I am pointing out the other possible fields of research. One of the aims of my work is the comparison of different attributes and strategies of migration in dragonflies with other migrants from insect as well as the migratory birds." (Author)]

15769. Kawakubo, C.; Hoshikawa, K. (2011): A long-term transition in the community of dragonflies and damselflies on Himenoga-Ike Pond in Mt. Sambe. Bulletin of the Shimane Nature Museum of Mt. Sanbe (Sahimel) 9: 25-33. (in Japanese, with English summary) ["Odonata community on Himenoga-Ike Pond was surveyed from May to October 2009. A total of 1208 adults and 919 nymphs belonging to 27 species were recorded. These species could be divided into 9 guild groups according to differences in size of food-capture basket and in mode of pond-space utilization. Bibliographical survey revealed that number of odonata species in the pond has been nearly stable during recent 30 years, 19-22 spp., excluding temporal visitors. However, species composition has changed drastically with turnover rates of 5.5 spp./ 12 years or 7.0 spp./ 18 years. Most of the species-exchanges occurred within guilds, though a guild with much food resources packed 5 species without any extinction events presumably due to seasonal or spatial segregations among them." (Authors)] Address: Kawakubo, Chie; Hoshikawa, Kazuo

15770. Klimsa, E. (2011): Exuvienfunde der Schabrackenlibelle Hemianax ephippiger (BURMEISTER, 1838) in den Jahren 2008 und 2009 in der "Grube Auhofweiher" bei Schwandorf (Odonata). Galathea 27(1): 43-47. (in German, with English summary) ["A compilation of rare dragonflies could be found in 2008 and 2009 in a pond within a clay ditch near the city of Schwandorf, Upper Palatinate, Northern Bavaria. Thorough investigations led to 66 exuvias of H. ephippiger. The natural area of this species expands from Africa to Southern Asia. In Southern Europe it reproduces irregularly and migrates into Bavaria from time to time. This paper deals with precise features to identify exuvias from Hemianax with certainty. Differences to other dragonfly species are shown in pictures. Unsolved questions remain: what caused Hemianax to accept this pond for breeding - despite the high risk that the larvae will not survive our winter temperatures? Is it a certain similarity of our native waterplant Biysmus compressus with the favoured rice plants from the reproducing area in Southern Europe, that let the female imago lay the eggs and that guided later on the grown-up larvae towards their last mould into the air? Is the new generation able to find their way back to the South? - More information is needed." (Author)] Address: Klimsa, K., Zeisigstr. 2, 92421 Schwandorf, Germany. E-mail: eklimsa@t-online

15771. Lenssen, J.P.M.; Klutman, A.G.M.: Nijboer, R.C.; Boedeltje, G. (2011): Changes in stream macro-invertebrate communities due to water quality improvements. Levende Nat. 112(6): 213-218. (in Dutch, with English summary) ["The last decades have shown a tremendous decrease of organic and nutrient load in streams in The Netherlands. During the last 23 years, macro invertebrates have been monitored in a consistent manner in most of the streams in the Dutch region Oost-Gelderland. The data allow us to assess the effect of improved water quality on macro invertebrate communities during the last 23 years. This effect strongly depends on the stream type. In highly regulated streams, i.e. canalized, enlarged in profile and barraged, we noticed a shift from species with high tolerance against low oxygen concentrations in the water towards species with a slightly higher oxygen demand. However, the resulting community was still dominated by limnophilic species. Different shifts were noticed in unregulated streams, where stream velocities tend to be higher and morphological variation offers a wide variety of substrates. Here we noticed a clear shift towards species with high oxygen demand. Moreover, the number of rare spe-

cies (indicative of undisturbed stream environments) also significantly increased in unregulated waters, whereas no increase occurred in regulated waters. These results clearly demonstrate the interaction between water quality and stream morphology and hydrology. Improvement of water quality is not sufficient if stream hydrology and morphology is not restored. On the other hand, natural stream communities are highly susceptible for changes in water quality." (Authors)] Address: Lenssen, J.P.M., Waterschap Rijn en IJssel, Postbus 148, 7000 AC Doetinchem, Netherlands. E-mail: j.lenssen@wrij.nl

15772. Ng, Y.F.; Dow, R.A.; Choong, C.Y. (2011): New records of Odonata (Insecta) from the Cameron Highlands, with first records of two species for Malaysia. Journal of Science and Technology in the Tropics 7: 9-16. (in English) ["Records of Odonata collected in the Cameron Highlands in September 2008 are presented. Fifty five species from 14 families were collected as either adults or larvae. Indolestes anomala and Macromia sp. cf. cupricincta, have not previously been recorded in Malaysia, whilst another 16 species do not appear to have been recorded in the Cameron Highlands or immediate surrounds before now." (Authors)] Address: Ng, Y.F., Centre for insect Systematics, Faculty of Science and Technology, Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor D.E. Malaysia. E-mail: ng_yf@ukm.my

15773. Phommexay, P.; Satasook, C.; Bates, P.; Pearch, M.; Bumrungsri, S. (2011): The impact of rubber plantations on the diversity and activity of understorey insectivorous bats in southern Thailand. Biodivers. Conserv. 20: 1441-1456. (in English) ["Although a large proportion of tropical rain-forest in South-east Asia has been replaced by rubber plantations, there is very little information about the impact of such forest conversion on bat diversity. To address this deficiency, trapping and acoustic monitoring programmes were carried out in Ton Nga Chang and Khao Ban That wildlife sanctuaries in southern Thailand with the purpose of comparing species diversity and activity of understorey insectivorous bats at sites in forest and in nearby monoculture rubber plantations. Insect biomass in both habitats was assessed. Bat species diversity and activity were found to be much lower in rubber plantations than in forested areas and mean insect biomass was determined to be more than twice as high in the latter habitat than in the former. Bats utilising forest were shown to have significantly higher call frequencies but marginally lower wing loadings and aspect ratios than bats found in both habitats. Management strategies to increase biodiversity in rubber plantations are discussed." (Authors)] Address: Bates, P., Harrison Institute, Centre for Systematics and Biodiversity Research, Bowerwood House, St. Botolph's Road, Sevenoaks, Kent TN13 3AQ, UK. E-mail: harrisoninstitute@btopenworld.com

15774. Reiss, M. (2011): Substratpräferenz und Mikrohabitat-Fauna-Beziehung im Eukrenal von Quellgewässern. Dissertation Fachbereich Geographie der Philipps-Universität Marburg: 245 pp, Anhang. (in German) ["The function and the ecological significance of the substratum as a hydromorphological element and as a microhabitat for invertebrates of springs are poorly investigated. In eco-faunistic studies which interpret the fauna-microhabitat-relationship of springheads (eucrenal), quantitative and qualitative investigations and analysis of the substrate preferences of invertebrate taxa regarding the eucrenal as an ecotone are still missing. Thereby faunistic research focuses mostly on the aquatic taxa only, rarely on terrestrial organisms. The main objectives of this study are formulated in three questions: 1. Is there a substrate preference for specific taxa considering the ecotone characteristics of springs? 2. What kind of microhabibiat functions offers the substrate type for the fauna? 3. Is there a faunistic relevance of substrate specific habitat types that can be ascertained? The results of this study show a significant relevance of the substrate as a microhabitat for the aquatic and terrestrial invertebrate fauna in springs. Therefore only forest springs of the low mountain range were investigated in regions of Hesse and Thuringia. For some taxa a specific substrate preference was found. Microhabitat functions are mostly characterized as food basis, refuge, protection and reproduction area. A first quantitative method to identify fauna--microhabitat-relationship is given with a new approach of a multihabitat-sampling as an integrated method for collecting and recording faunistic data. For the most commonly substrate specific microhabitat types the faunistic evidence and relevance was found. Some results are leading to new hypotheses, which show the importance of further research in the topic of substrate preferences of fauna and fauna-microhabitat-relationships of springs." (Author)] Address: not stated

15775. Schmidt, C. (2011): 10 Jahre Libellenmonitoring im FND "Kuhbergbruch". Landschaftspflege und Naturschutz in Thüringen 48(2): 70-81. (in German, with English summary) ["Between 2002 and 2011 a monitoring program of Anisoptera was realized at a complex of small anthropogenous ponds in the administrative district of Greiz, Thüringen, Germany. Based on collecting exuviae on a regular basis, it was possible to provide evidence of reproduction of 16 indigenous species. Due to additional observations of imagines, including Zygoptera, the number of species increased to 32 since 1992. Amongst indigenous Anisoptera Leucorrhinia pectoralis and L. rubicunda are two species of the category 1 in the Red List of Thuringia, furthermore Aeshna juncea and L. dubia are in category 3. This four important species were described in detail in view of nature conservation by means of phenology, colonization and population development." (Author)] Address: Seifert, C., Hafengasse 9, A-1030 Wien, Austria. carlo_seifert@web.de

15776. Walia, G.K.; Chahal, S.S.; Singh, N. (2011): Cytogenetic studies on three species of genus Burmagomphus of family Gomphidae (Odonata: Anisoptera) from India. International Journal of Zoological Investigations 7(1): 272-277. (in English) ["Male germ cell chromosomes of Burmagomphus divaricatus, B. pyramidalis and B. sivalikensis … have been investigated by using conventional staining, C-banding, silver nitrate staining and sequence specific staining. The species were collected from Punjab and Himachal Pradesh, India. All the species possess the chromosome number 2n = 23 which is the type number of

the family. Terminal C bands and NOR's are present at the autosomal bivalents and X chromosome is C positive and NOR rich in all the three species, while m bivalents show variation in distribution of C- heterochromatin and NOR's. In the sequence specific staining, whole complement shows bright DAPI signals in B. divaricatus, bright CMA3 signals in B. pyramidalis and both DAPI and CMA3 signals in B. sivalikensis." (Authors)] Address: Walia Gurinder Kaur, Dept of Zoology & Environmental Sciences, Punjabi University, Patiala, Punjab, India

15777. Zessin, W. (2011): Neue Insekten aus dem Moler (Paläozän/Eozän) von Dänemark Teil 1 (Odonata: Epallagidae, Megapodagrioniidae). Virgo, Mitteilungsblatt des Entomologischen Vereins Mecklenburg 14(1): 62-71. (in German, with English summary) ["Some new fossil damselfly genus and species, Morsagrion ansorgei n. gen. n. sp., Furagrion morsi n. sp., Hanklitia hankliti n. gen. n. sp., (Megapodagrioniidae), Ejerslevia haraldi n. gen. n. sp. and Solveigia wittecki n. gen. n. sp. (Epallagidae) are described from the Paleocene/Eocene Fur Formation (Mo clay) of isle of Fur and Mors, Denmark." (Author)] Address: Zessin, W., Lange Str. 9, 19230 Jasnitz, Germany. E-mail: zessin@-zoo-schwerin.de

2012

15778. Amaya-Perilla, C.; Palacino-Rodriguez, F. (2012): An updated list of the dragonflies (Odonata) of Meta Department, Colombia, with forty-six new department records. Bulletin of American Odonatology 11(2): 29-38. (in English, with Spanish summary) ["As a result of several years of sampling in Meta Department, Colombia, an updated list of dragonflies species is provided, of which 46 are new department records. A total of 12 families, 60 genera, and 144 species are reported, which represents 85% of the families, 68% of the genera, and 44% of the species recorded from Colombia." (Authors)] Address: Amaya-Perilla, Catalina, Grupo de estudios en Biodiversidad y Faunística (Entomología), Programa de Biología Ambiental, Facultad de Ciencias Naturales, Universidad Jorge Tadeo Lozano, Bogotá, Colombia

15779. Batema, D.L.; Bellian, A.; Landowski, L. (2012): A survey of Odonata of the Patoka River National Wildlife Refuge and Management Area. Proceedings of the Indiana Academy of Science 121(1): 54-61. (in English) ["The Patoka River National Wildlife Refuge and Management Area (hereafter Patoka River Refuge or the Refuge) represents one of the largest intact bottomland hardwood forests in southern Indiana, with meandering oxbows, marshes, ponds, managed moist-soil units, and constructed wetlands that provide diverse and suitable habitat for wildlife. Refuge personnel strive to protect, restore, and manage this bottomland hardwood ecosystem and associated habitats for a variety of wildlife. The Patoka River National Wildlife Refuge Comprehensive Conservation Plan (CCP) lists many species of management priority (McCoy 2008), but Odonata are not included, even though they are known to occur on the Refuge. The absence of Odonata from the CCP is the result of lack of information about this ecologically important group of organisms. Therefore, we conducted a survey, from May to October 2009, to document their presence, with special attention being paid to rare, threatened, and endangered species. A total of 43 Odonata species were collected and identified. No threatened or endangered species were found on the Refuge, but three species were found that are considered imperiled in Indiana based on Nature Serve Ranks (Stein 2002). Additionally, 19 new odonate records were documented for Pike County, Indiana. The results of this survey will be used by Refuge personnel to assist in management decisions and to help establish priorities for the Patoka River Refuge activities and land acquisition goals." (Authors)] Address: Batema, D.L., Dept of Chemistry, Environmental Studies, Program, Univ. of Evansville, 1800 Lincoln Avenue, Evansville, IN 47722 USA. E-mail: dh28@evaansville.edu

15780. Bolshakov, L.V. (2012): New species of Odonata for Tula Province. Entomological and parazitological Researches in the Volga: 51-54. (in Russian, with English summary) ["Based on 2011-2012 collections 3 new species of Odonata for Tula Province are presented, including Anax parthenope and Erythromma viridulum being new for the Centre of European Russia." (Author)] Address: not stated

15781. Bratton, J.H. (2012): Miscellaneous invertebrates recorded from the Outer Hebrides, 2010. The Glasgow Naturalist 25(4): 130-132: (in English) [Hermetray, 4 August: Lake, NF988741: Ischnura elegans, Sympetrum nigrescens det. R. Youngmann (Odonata); Ronay, 6 August: Small peaty lake, NF90085566: Sympetrum danae larva (Odonata),] Address: Bratton, J.H., 18 New Street, Menai Bridge, Anglesey, LL59 5HN, UK. E-mail: jhnbratton@yahoo.co.uk

15782. Campos, F.; Velasco, T.; Santos, E. Sanz, G. (2012): Nueva cita de Macromia splendens (Pictet, 1843) (Odonata, Corduliidae) en el oeste de España. Boln. Asoc. esp. Ent. 36(1-2): 233-235. (in Spanish) [Spain, Robleda (UTM 29T 7064474), at 755 m.a.s.l., 22-IX-2011.] Address: Campos, F., Universidad Europea Miguel de Cervantes, Calle Padre Julio Chevalier 2, 47012 Valladolid, Spain. E-mail: fcampos@uemc.es

15783. Chucholl, C. (2012): Understanding invasion success: life-history traits and feeding habits of the alien crayfish Orconectes immunis (Decapoda, Astacida, Cambaridae). Knowledge and Management of Aquatic Ecosystems 404, 04: 22 pp. (in English) ["In the present study, the life history and diet of the highly successful North American invader Orconectes immunis was assessed for the first time in its introduced European range. In 2007, O. immunis population dynamics were monitored in a typical backwater habitat using unbaited funnel traps, and its life history was analysed using Von Bertalanffy's growth function. Juveniles hatched as early as March and may attain sexual maturity at the end of their first summer. The adult population moulted up to four times during the summer months, with the non-breeding form (II) lasting for a remarkably short time period. The high growth rate of O. immunis was combined with a short longevity, which was estimated at 2.5 years. The fecundity ranged from 119 to 495 pleopodal eggs. The stomach contents were dominated by

detritus, followed by macroinvertebrates and macrophytes, and no ontogenetic shift in diet was observed. The ability to prey on a wide array of invertebrate taxa presumably supports the sustained high growth rate of O. immunis. The presented data provide evidence that O. immunis exhibits a strongly r-selected life history and omnivorous feeding habits. These ecological properties have often been linked to successful invaders and enhance the invasiveness of O. immunis." (Author)] Address: Chucholl, C., Dept. Experimental Ecology (Bio 3), Univ. of Ulm, Albert-Einstein-Allee 11, 89069 Ulm, Germany. E-mail: Cchucholl@aol.com

15784. García-Villanueva, V.; Moreno Tamurejo, J.A.; Maldonado, J.J.; García Corraliza, I. (2012): Fauna de odonatos (Insecta: Odonata) del Parque Natural del Tajo Internacional (Cáceres, oeste de España). Boletín de la SEA 51: 197-202. (in Spanish, with English summary) ["On the Odonata (Insecta) of the International Tagus Natural Park (Cáceres, western Spain): Data are provided on the odonate fauna of the International Tagus Natural Park (Cáceres, Spain) based on samples taken during 2010 and 2011. Forty species have been recorded in the study area (45 including bibliographic records)." (Authors)] Address: García-Villanueva, V., c/ Diego de Jara y Torpa, 11. E-06011 Badajoz, Spain. E-mail: vgvillanueva@telefonica.net

15785. Grether, G.F. (2012): The neuroecology of competitor recognition. Integr. Comp. Biol. 51(5): 807-818. (in English) ["Territorial animals can be expected to distinguish among the types of competitors and noncompetitors that they encounter on a regular basis, including prospective mates and rivals of their own species, but they may not correctly classify individuals of other species. Closely related species often have similar phenotypes and this can cause confusion when formerly allopatric populations first come into contact. Errors in recognizing competitors can have important ecological and evolutionary effects. I review what is known about the mechanisms of competitor recognition in animals generally, focusing on cases in which the targets of recognition include other species. Case studies include damselflies, ants, skinks, salamanders, reef fishes, and birds. In general, recognition systems consist of a phenotypic cue (e.g., chemical, colour, song), a neural template against which cues are compared, a motor response (e.g., aggression), and sensory integration circuits for context dependency of the response (if any). Little is known about how competitor recognition systems work at the neural level, but inferences about specificity of cues and about sensory integration can be drawn from the responses of territory residents to simulated intruders. Competitor recognition often involves multiple cues in the same, or different, sensory modalities. The same cues and templates are often, but not always, used for intraspecific and interspecific recognition. Experiments have shown that imprinting on local cues is common, which may enable templates to track evolved changes in cues automatically. The dependence of aggression and tolerance on context is important even in the simplest systems. Species in which mechanisms of competitor recognition are best known offer untapped opportunities to examine how competitor-recognition systems evolve (e.g., by comparing allopatric and sympatric populations). Cues that are gene products (peptides, proteins) may provide insights into rates of evolution. There are many avenues for further research on the important but understudied question of how animals recognize competitors." (Author) Hetaerina occisa, H. americana, H. cruentata, H. titia] Address: Grether, G.F., Dept of Ecology & Evolutionary Biology, University of California, Los Angeles, CA 90095-1606, USA. E-mail: ggrether@ucla.edu

15786. Grözinger, F.; Wertz, A.; Thein, J.; Feldhaar, H.; Rödel, M.O. (2012): Environmental factors fail to explain oviposition site use in the European common frog. Journal of Zoology 288(2): 103-111. (in English) ["A 7-year monitoring of potential oviposition ponds of the European common frog Rana temporaria, in northern Bavaria, Germany, indicated that breeding ponds were not randomly used. Site fidelity could not consistently explain this pattern. Because amphibians are known to select oviposition sites according to certain habitat characteristics, we investigated pond parameters that may drive breeding site selection in that area. We recorded 44 abiotic and biotic parameters, including variables within-ponds, predator presence, as well as habitat characteristics of the terrestrial area surrounding the ponds. However, multifactorial statistics such as non-metric multidimensional scaling, hierarchical clustering and random forest algorithm as well as single-factor comparisons could not highlight common habitat features of chosen ponds. The results of this study indicate that breeding site choice is more than a pure function of habitat characteristics, and that understanding the reproductive biology, even of such a widespread species as R. temporaria, needs more research effort." (Authors)] Address: Rödel, M.O., Museum für Naturkunde, Leibniz Inst. for Research on Evolution & Biodiversity, Invalidenstr. 43, 10115 Berlin, Germany. E-mail: mo.roedel@mfn-berlin.de

15787. Hernandez-Manrique, O.L.; Numa, C.; Verdu, J.R.; Galante, E.; Lobo, J.M. (2012): Current protected sites do not allow the representation of endangered invertebrates: the Spanish case. Insect Conservation and Diversity 5: 414-421. (in English) ["1. Using a recently created database representing the joint effort of around 100 invertebrate taxonomists, this study uses the information on 52 arthropoda and 27 mollusca species that are endangered and critically endangered to examine to what extent invertebrate species are represented in existing Spanish protected areas. 2. As distribution information is available at a 100 km² resolution, we consider different area thresholds to judge cells as being protected. 3. Approximately 19% of the area represented by the grid cells with observed occurrences rates as extant protected reserves, and 36% is included within the Natura 2000 network. 4. If having 50% of the cell area as a Natura 2000 reserve is considered as sufficient to have effective protection, almost 68% of species and 32% of probable populations (contiguous cell groups) would be represented. 5. However, 77% of species and 94% of probable populations are not represented in the current protected reserves if we establish that at least 95% of each cell area should belong to a reserve to provide effective protection. 6. Thus, existing conservation strategies, which are based primarily on the

protection of certain areas and vertebrate species, may be insufficient to ensure the conservation of invertebrate species." (Authors)] Address: Lobo, J.M., Museo Nacional de Ciencias Naturales, CSIC, José Gutiérrez Abascal 2, Madrid 28006, Spain. E-mail: mcnj117@mncn.csic.es

15788. Johnson, J. (2012): Wintertime Sympetrum corruptum in Oregon. Bulletin of the OES, Spring 2012: 6. (in English) [S corruptum ♂, at Waldport, Lincoln Co., Oregon, 9-XII-2011. USA.] Address: jt_johnson@comcast.net

15789. Jones, J.I.; Murphy, J.F.; Collins, A.L.; Sear, D.A.; Naden, P.S.; Armitage, P.D. (2012): The impact of fine sediment on macro-invertebrates. Rivers Research and Applications 28(8): 1055-1071. (in English) ["The sustainable use of water resources requires clear guidelines for the management of diffuse pollution inputs to rivers. Without informed guidelines, management decisions are unlikely to deliver cost-effective improvements in the quality of rivers as required by current water policy. Here, we review the evidence available for deriving improved guidelines on the loading of fine sediment to rivers based on the impact on macro-invertebrates. The relationship between macro-invertebrates and fine sediments is poorly defined. Studies of the impacts of fine sediment on macro-invertebrates have been undertaken at various scales, which has an influence on the range of responses displayed and the reliability of the results obtained; results obtained from investigations at smaller scales may not manifest at the scale required to manage rivers and vice versa. Many of the identified effects of increased loading of fine sediment on macro-invertebrates occur as a consequence of deposition on the river bed, yet many current management guidelines are based on suspended sediment targets. On this basis, existing water quality guidelines for sediment management are unlikely to be appropriate." (Authors)] Address: Jones, J.I., School of Biological & Chemical Sciences, Queen Mary Univ. of London, Mile End Road, London, E1 4NS, UK. E-mail: j.i.jones@qmul.ac.uk

15790. Keppner, E.J. (2012): Odonata records from Bay and Washington counties and the St. Andrew Bay drainage basin, Florida. Bulletin of American Odonatology 11(2): 49-67. (in English) ["An annotated list of the Odonata occurring in Bay and Washington counties and the St. Andrew Bay drainage basin, Florida, is presented based on collections of adults and nymphs from 2003–2012. This survey, combined with reports from the literature, resulted in 114 species of Odonata (36 Zygoptera and 78 Anisoptera) being reported from the survey area with 94 species of odonates reported for Bay County (31 Zygoptera and 63 Anisoptera), 92 for Washington County (28 Zygoptera and 64 Anisoptera), and 99 for the St. Andrew Bay drainage basin (31 Zygoptera and 68 Anisoptera). The Florida Natural Areas Inventory lists 20 of the species reported from the survey area as imperiled and the Florida Fish and Wildlife Conservation Commission lists 13 of those species as Species of Greatest Conservation Need." (Author)] Address: Keppner, E.J., 4406 Garrison Road, Panama City, FL 32404, USA. E-mail: ekeppner@bellsouth.net

15791. Michels, J.; Gorb, S.N. (2012): Detailed three-dimensional visualization of resilin in the exoskeleton of arthropods using confocal laser scanning microscopy. Journal of Microscopy 245(1): 1-16. (in English) ["Resilin is a rubber-like protein found in the exoskeleton of arthropods. It often contributes large proportions to the material of certain structures in movement systems. Accordingly, the knowledge of the presence and distribution of resilin is essential for the understanding of the functional morphology of these systems. Because of its specific autofluorescence, resilin can be effectively visualized using fluorescence microscopy. However, the respective excitation maximum is in the UV range, which is not covered by the lasers available in most of the modern commercial confocal laser scanning microscopes. The goal of this study was to test the potential of confocal laser scanning microscopy (CLSM) in combination with a 405 nm laser to visualize and analyse the presence and distribution of resilin in arthropod exoskeletons. The results clearly show that all resilin-dominated structures, which were visualized successfully using wide-field fluorescence microscopy (WFM) and a'classical' UV excitation, could also be visualized efficiently with the proposed CLSM method. Furthermore, with the application of additional laser lines CLSM turned out to be very appropriate for studying differences in the material composition within arthropod exoskeletons in great detail. As CLSM has several advantages over WFM with respect to detailed morphological imaging, the application of the proposed CLSM method may reveal new information about the micromorphology and material composition of resilin-dominated exoskeleton structures leading to new insights into the functional morphology and biomechanics of arthropods."... CLSM, known resilin-dominated structures including the wing hinge and the prealar arm of the locust Locusta migratoria (Insecta, Caelifera, Acrididae; see Weis-Fogh, 1960), a vein joint in the hind wing of Sympetrum striolatum (Authors)] Address: Gorb, S.N., Functional Morphology & Biomechanics, Zoological Institute, Christian-Albrecht University of Kiel, 24098 Kiel, Germany. E-mail: sgorb@zoologie.uni-kiel.de

15792. Morrill, A.; Forbes, M.R. (2012): Random parasite encounters coupled with condition-linked immunity of hosts generate parasite aggregation. International Journal for Parasitology 42(7): 701-706. (in English) ["Parasite aggregation is viewed as a natural law in parasite-host ecology but is a paradox insofar as parasites should follow the Poisson distribution if hosts are encountered randomly. Much research has focused on whether parasite aggregation in or on hosts is explained by aggregation of infective parasite stages in the environment, or by heterogeneity within host samples in terms of host responses to infection (e.g., through representation of different age classes of hosts). In this paper, we argue that the typically aggregated distributions of parasites may be explained simply. We propose that aggregated distributions can be derived from parasites encountering hosts randomly, but subsequently by parasites being 'lost' from hosts based on condition-linked escape or immunity of hosts. Host condition should be a normally distributed trait even among otherwise homogeneous sets of hosts. Our model shows that mean host condition and variation in host condition have different effects

on the different metrics of parasite aggregation. Our model further predicts that as host condition increases, parasites become more aggregated but numbers of attending parasites are reduced overall and this is important for parasite population dynamics. The effects of deviation from random encounter are discussed with respect to the relationship between host condition and final parasite numbers." (Authors)] Address: Forbes, M.R., Dept Biol., Carleton Univ., 587 Tory Build. 1125 Colonel By Drive, Ottawa, ON K1S 5B6, Canada. E-mail: mforbes@ccs.carleton.ca

15793. Rozner, G.; Ferincz, A.; Miokovics, E. (2012): Data to the distribution of Golden Ringed Dragonfly (Cordulegaster bidentata Selys, 1843) and Large Golden Ringed Dragonfly (Cordulegaster heros Theischinger, 1979) in Bakony Mountains. Természetvédelmi Közlemények 18: 447-455. (in Hungarian, with English summary) ["According to earlier data, C. bidentata occurs in the Koszeg Mountains, the Bakony and the North Central Mountains, while C. heros is found in the Sopron Mountains, the Orség, the Mecsek and, according to more recent data, in the Zselic. Our studies in 2008-2009 confirmed the occurrence of C. heros syntopic C. bidentata in several watercourses of the Koszeg Mountains, which was an important new finding for the occurrence of the species, and also confirmed the occurrence of both species in the same water system. On this basis, it was reasonable to assume that C. heros could occur in other areas previously considered to be the habitat of C. bidentata. In 2010-2011, we extended our studies to the Bakony area and were able to detect C. heros in several watercourses and recorded the occurrence of both species in different sections of the same watercourse. Translated with www.DeepL.com/Translator" (Authors)] Address: Rozner, G., Managership of Balaton-felvideki National Park, 8229 Csopak, Kossuth u. 16., Hungaria. E-mail: roznergyuri@gmail.com

15794. Soldan, T.; Bojková, J.; Vrba, J.; Bitušík, P.; Chvojka, P.; Papáèek, M.; Peltanová, J.; Sychra, J.; Tátosová, J. (2012): Aquatic insects of the Bohemian Forest glacial lakes: Diversity, long-term changes, and influence of acidification. Silva Gabreta 18(3): 123-283. ["Aquatic insects have been studied in five Czech (Èerné, Èertovo, Prášilské, Plešné, and Laka) and three German (Großer Arbersee, Kleiner Arbersee, and Rachelsee) lakes and their inlets and outlets in the Bohemian Forest. All available historical and present records, as well as many unpublished data were summarised. Of nine insect orders, 70 families, 214 genera, and 373 species/taxa were found in total (Ephemeroptera 20, Odonata 22, Plecoptera 37, Heteroptera 35, Megaloptera and aquatic Neuroptera 3, Trichoptera 46, Coleoptera 58, Chironomidae 113, other Diptera 39). All aquatic insect groups are discussed from the point of view of species richness, influence of acidification, ecological requirements, distributional ranges of species, and species protection. Altogether 215 species/ taxa were found in the lakes, where Heteroptera, Coleoptera, and Chironomidae were the most species-rich groups (135 taxa). The lowest number of taxa was recorded in strongly acidified Èertovo Lake and Rachelsee (55 and 56 taxa, respectively); the highest number of species/taxa was recorded in Laka, Plešné and Prášilské lakes (95, 91 and 89 taxa, respectively). Altogether 237 taxa were found in inlets and outlets; Chironomidae, Trichoptera, and Plecoptera prevailed (151 taxa). Based on the cluster analysis of recent species data, the lakes were classified into four groups which primarily reflect characteristics of the lake littoral and water chemistry. Available data on Ephemeroptera, Plecoptera, Trichoptera, and Heteroptera from the past two decades were analysed in order to reveal possible biological recovery from acid stress. A certain degree of recovery has been documented by the increase in species richness of Ephemeroptera and Heteroptera. Yet the lakes have not been colonised by any acid-sensitive species." (Authors)] Address: Soldan, T., Inst. of Entom, Biol. Centre ASCR, Branišovská 31, CZ-37005 Èeské Budìjovice, Czech Republic

15795. Thomas, H.H.; Moosman, P.R.; Veilleux, J.P.; Holt, J. (2012): Foods of bats (Family Vespertilionidae) at five locations in New Hampshire and Massachusetts. Canadian Field-Naturalist 126(2): 117-124. (in English) ["Diet and feeding relations of six species of bats at five locations in New Hampshire and Massachusetts were studied to improve understanding of foraging niche differentiation. Fecal samples were collected from 100 Big Brown Bats (Eptesicus fuscus), 154 Little Brown Myotis (Myotis lucifugus), 49 Northern Myotis (M. septentrionalis), 54 Eastern Small-footed Myotis (M. leibii), 9 Eastern Red Bats (Lasiurus borealis), and 1 Hoary Bat (L. cinereus) netted during non-hibernation periods from 2004 to 2008 at four locations in southern New Hampshire and one in north-central Massachusetts. Beetles (Order Coleoptera) were the major food of E. fuscus (mean percentage volume = 81.6%, 97% occurrence) followed by moths (Order Lepidoptera), with scarabaeid and carabid beetles the most abundant consumed families by volume and frequency. Moths were the most important item by volume and frequency preyed on by the remaining species (M. lucifugus, mean percentage volume 30.7%, 82% occurrence; M. septentrionalis, mean percentage volume 42.7%, 82% occurrence; M. leibii, mean percentage volume 49.4%, 81% occurrence; L. borealis, mean percentage volume 62.8%, 100% occurrence; L. cinereus, mean percentage volume 82%, 100% occurrence). Little Brown Myotis consumed the largest variety of prey (40); Northern Myotis consumed the highest volume of spiders (8.1%). Community similarity index values indicated diets of the three species of Myotis were more similar to each other (similarity = 0.71) than to those of non-Myotis. The diet of E. fuscus was more similar to that of the Myotis cluster (0.58) than to either species of Lasiurus. Results suggest that, despite faunal differences between the U.S. Northeast and other parts of North America, foraging relationships among guild members follows a similar pattern." (Authors)] Address: Thomas, H., Dept of Biol. & Chemistry, Fitchburg State Univ., Fitchburg, Massachusetts 01420 USA

15796. Weipert, J.; Bössneck, U. (2012): Die Schutzgebiete der Landeshauptstadt Erfurt (Thüringen). Teil XX: Flora und Fauna des GLB „Alte Lehmgrube bei Schmira“. Vernate 31: 105-130. (in German) [The nature reserves of the urban area of Erfurt (Thuringia). Part XX: Flora and fauna of the reserve „Alte Lehmgrube bei Schmira“. The paper

presents the results of floristic and faunistic surveys from 1994 to 2009 within the reserve “Alte Lehmgrube bei Schmira” of the Thuringian state capital Erfurt. The following odonate species are listed: Aeshna cyanea, Coenagrion puella, Enallagma cyathigerum, Ischnura elegans, Lestes sponsa, Chalcolestes viridis, Libellula depressa, Orthetrum cancellatum, Pyrrhosoma nymphula, Sympetrum vulgatum] Address: Weipert, J., Institut für biologische Studien, Am Bache 13, 99338 Plaue, Germany. E-mail: info@-bios-jw.com

15797. Zessin, W. (2012): Buchbesprechungen. Virgo, Mitteilungsblatt des Entomologischen Vereins Mecklenburg 15(1): 100-101. (in German) [Hauke Behr: Libellen Einblicke in die biologische Vielfalt der Westmecklenburgischen Seenlandschaft; Dietmar Glitz: Libellen in Norddeutschland. Geländeschlüssel] Address: Zessin, W., Lange Str. 9, D-19230 Jasnitz, Germany. E-mail: zessin@-zoo-schwerin.de

15798. Zhang, H.-J. (2012): A new species of Sympetrum (Odonata, Libellulidae) from China. Acta Zootaxonomica Sinica 37(4): 747-750. (in Chinese, with English summary) ["Sympetrum shaanxiensis sp. nov. (Odonata, Libellulidae) from Shaanxi Province, China is described. The type specimens are deposited at the museum of Zoology and Botany, the Shaanxi Bioresource Key Laboratory, Hanzhong, Shaanxi, China. The new species is similar to S. vulgatum, but differs from the latter in the characters listed in the Table 1. Etymology. The new species is named from the type locality, Shaanxi Province. Female. Unknown. Measurements (mm). abd. + app. 25-26, hw 28-30. Holotype ♂, Zakoushi, Liuba County, Shaanxi Province (33°37'N, 106°20'E; alt. 1 820 m), 15 July 2007, Leg. ZHANG Hong-Jie. Paratypes: 1♂, Baimatan, Huanglong County, Shaanxi Province (35°33'N, 110°10'E; alt. 950 m), 12 Aug. 1987; 1♂, Tongchuan City, Shaanxi Province (35°05'N, 109°05'E; alt. 800 m), 18 Aug. 1985; 1♂, Qingshui, Zhengba County, Shaanxi Province (32°38'N, 107°45'E; alt. 1 300 m), 22 July 1987. Table 1. Comparison of morphological features between Sympetrum shaanxiensis sp. nov. and S. vulgatum. Both labium and labrum cream-coloured Labium citrine, labrum orange with black middle lobe or black spot on middle lobe Rear of eyes with two transverse black stripes Rear of eyes with three transverse black stripes. Dorsal synthorax with pale brown antehumeral stripes Dorsal synthorax without antehumeral stripes. Each distal end of abdominal S2-9 with paired very small red spots on mid-dorsum Each distal end of abdominal S2-9 without paired very small red spots on mid-dorsumInterior branch equal to outer branch in posterior hamule Interior branch shorter than outer branch in posterior hamule. Distal segment of penile organ broad triangle-shaped in lateral view Distal segment of penile organ diamond-shaped when viewed from lateral. Ventral subapex of superior anal appendages blunt and rounded, without any cone-shaped projection in lateral view Ventral subapex of superior anal appendages with ten black cone-shaped projections in lateral view." (Author)] Address: Zhang, H.-J., Shaanxi Bioresource Key Laboratory, Shaanxi Univ. of Technology, Hanzhong 723000, China

15799. Ajiboye, A.O.; Faturoti, E.O.; Owolabi, O.D. (2013): Food and feeding habits of Synodontis nigrita, Valenciennes, 1840 (Pisces: Mochokidae) in Asejire Lake, Nigeria. International Journal of Lakes and Rivers 6(1): 1-8. (in English) ["Food and feeding habits of Synodontis nigrita were examined in Asejire Lake, South-western, Nigeria between January 2002 and December 2003. A total of 517 specimens of S.nigrita were collected bi-monthly from the catches of local fishermen using cast nets, gill nets and bamboo-made traps. The stomach contents were analyzed using frequency of occurrence, numerical and volumetric methods. Two hundred and sixty one (50.48%) had empty stomachs, with the highest recorded in wet season (April-October) and lowest in dry season (November-March). The fish fed mainly on insects from seven taxa. The most frequently consumed insects were the isopterans which occurred in 49.27% of the stomachs, and accounted for 43.85% by number and 37.12% by volume; while dictyopterans were the least consumed insects occurring in 6.86% of stomachs, accounting for 2.84% by number and 8.30% by volume. Feeding habits varied with size, suggesting an age-specific food preference in order to avoid intra-specific competition for available food items in the lake. This coupled with the ability to feed on highly nutritious food probably accounted for the survival of the fish in the lake system." (Authors)] Address: Ajiboye, A.O., Dept of Animal Science & Fisheries Management, Bowen Univ., P.M.B.284, Iwo, Osun State, Nigeria. E-mail: debron2005@yahoo.com

15800. Alvial, I.E.; Orth, K.; Durán, B.C.; Álvarez, E.; Squeo, F.A. (2013): Importance of geochemical factors in determining distribution patterns of aquatic invertebrates in mountain streams south of the Atacama Desert, Chile. Hydrobiologia 709: 11-25. (in English) ["The ecology of macroinvertebrate communities in arid regions is still poorly understood. Here we examined how the community structure varied at spatial and temporal scales in streams and tributaries of the Huasco River in semi-arid region of Northern Chile. We expected that macroinvertebrate distribution may be responding to natural processes of mineralization described for Chilean semiarid basins. The relationships among biotic and abiotic variables were assessed through multivariate techniques (principal component analysis, non-metric multidimensional scaling, canonical correspondence analysis), and a two-way analysis of similarity was used to evaluate differences between basins and years (2007, 2008, and 2009). Significant differences in community structure and physical–chemical variables between basins (Del Carmen and Del Tránsito) were found, but not between years. Altitude, Mn, Al, Ca, Na, HCO3, and dissolved oxygen were the variables that best accounted for the communities distribution. In particular, high metals concentration in El Transito basin should determine low density and diversity of macroinvertebrates. Chironomidae, Ephydridae, and Glossiphoniidae were associated to waters with high metals content and acidic pH, whereas Baetidae, Hydroptilidae, and Blephariceridae were associated to sites with more favorable physical–chemical conditions. These results contribute to under-

stand the ecological patterns of macroinvertebrates in arid regions and should lead to conservation and monitoring plans for this remote place." (Authors)] Address: Alvial, Ingrid, Center for Advanced Studies in Arid Zones (CEAZA), Casilla 599, La Serena, Chile. E-mail: ingrid.alvial@ceaza-.cl

15801. Anjos-Santos, D.; Lozano, F.; Costa, J.M. (2013): Fluminagrion gen. nov. for Acanthagrion taxaense Santos, 1965, from Brazil (Odonata: Coenagrionidae). International Journal of Odonatology 16(2): 145-155. (in English, with Spanish summary) ["A new genus of Coenagrionidae, Fluminagrion, from Rio de Janeiro, Brazil is described, diagnosed, and illustrated, based on examination of the type series and additional specimens of Acanthagrion taxaense Santos, 1965, deposited in the collection of MNRJ/Brazil. This genus is characterized by: posterior lobe of prothorax trilobate, with medial lobe rounded and projected in both sexes; segment 3 of genital ligula C-shaped in lateral view, bifid in ectal view, ending in lobes directed laterally with apexes pyramidal in cross-section; male cercus entire and decumbent from proximal fourth, with brush-like setae at about half its length; female lacking mesepisternal fossa, S8 with vulvar spine." (Authors)] Address: Anjos-Santos, D., Laboratorio de Investigaciones en Sistemática y Ecología Animal (LIESA), Sarmiento 849, 9200, Esquel, Chubut, Argentina. E-mail: danielleanjos2@yahoo.com.br

15802. Arman, N.Z.; Salmiati; Said, M.I.M.; Azman, S. (2013): Anthropogenic influences on aquatic life community and water quality status in Mengkibol River, Kluang, Johor, Malaysia. Journal of Applied Sciences in Environmental Sanitation 8(3): 151-160. (in English) ["Biological monitoring assessing pollution levels and water quality. The objective of this study was to determine the composition and abundance of benthic macroinvertebrate in a tropical urban river over five consecutive months (No communities from three sampling stations located in the middle section of the Mengkibol River, Kluang were monitored. Biotic, water quality, diversity and evenness indices as well as statistical analysis were ap that the river did not support much macroinvertebrate diversity. Moderately intolerant pollution species such as dragonfly (Insecta: Odonata) were observed to be dominant in each site. However, the occurwater quality of the Mengkibol River. Indices such as the Biological Monitoring Working Party (BMWP), Lincoln Quality Index (LQI), and Water Quality Index (WQI) were also used to assess the level of impact on the Mengkibol River. The relationship between the physicochemical and benthic macroinvertebrate data were investigated by one ANOVA and Pearson's correlation of coefficient analysis. These statistical methods indicate that temperature had addition, the LQI value was generally affected by the BMWP score ($P < 0.01$), while the Pielou Evenness Index (J) was strongly correlated with the BMWP, LQI and Shannon Weiner Diversity Index (H') (P uniformly.] Address: Arman, N.Z., Institute of Environmental & Water Resource Management, Univ. Teknologi Malaysia

15803. Blanckenhagen, B. von (2013): Erster gesicherter Nachweis der Östlichen Moosjungfer Leucorrhinia albifrons (Burmeister, 1839) in Hessen. Libellen in Hessen 6(1): 46-49. (in German) [male, 28.05.2012, Lahnberge near Marburg, Hessen, Germany (3485350/5633720)] Address: von Blanckenhagen, B., Kaffweg 8, 35039 Marburg, Germany. E-mail: benno.v.blanckenhagen@web.de

15804. Brinesha, R.; Janardanana, K.P. (2013): The life history of Pleurogenoides malampuzhensis sp. nov. (Digenea: Pleurogenidae) from amphibious and aquatic hosts in Kerala, India. Journal of Helminthology 88(2): 230-236. (in English) ["The life-cycle stages of Pleurogenoides malampuzhensis sp. nov. infecting the Indian bullfrog Hoplobatrachus tigerinus (Daudin) and the skipper frog Euphlyctis cyanophlyctis (Schneider) occurring in irrigation canals and paddy fields in Malampuzha, which forms part of the district of Palakkad, Kerala, are described. The species is described, its systematic position discussed and compared with the related species, P. gastroporus (Luhe, 1901) and P. orientalis (Srivastava, 1934). The life-cycle stages, from cercaria to egg-producing adult, were successfully established in the laboratory. Virgulate xiphidiocercariae emerged from the snail Digoniostoma pulchella (Benson). Metacercariae are found in muscle tissues of dragonfly nymphs and become infective to the frogs within 22 days. The pre-patent period is 20 days. Growth and development of both metacercariae and adults are described."] Address: Brinesha, R., Parasitology laboratory, Dept of Zoology, Univ. of Calicut, Kerala, India

15805. Cannings, R. (2013): Obituary for Gordon Pritchard (1939-2012). Argia 25(2): 25-29. (in English) [Obituary.] Address: Cannings, R.A., Royal British Columbia Museum, 675 Belleville Street Victoria, British Columbia V8W 9W2. Canada. E-mail: rcannings@royalbcmuseum.bc.ca

15806. Carvalho, F.G.; Oliveira Junior, J.M.B.; Justino de Farias, A.P.; Juen, L. (2013): Use of the ABC curve as a method to detect the effect of anthropogenic change on the Odonata (Insecta) assembly. Interciencia 38(7): 516-522. (in Portuguese, with English summary) ["The insects of the order Odonata are organisms commonly used in biomonitoring studies, since they have some species with very specific requirements and high sensitivity to environmental changes. The aim of this study is to evaluate whether the effects of environmental changes lead to a change in patterns of abundance and biomass of the Odonata assembly, testing the hypothesis that, because of the demands ecophysiological order, with the removal of riparian vegetation took place an increase the in abundance of Anisoptera and a decrease in Zygoptera. Ten streams were sampled, five being altered and five preserved. A comparison of biomass and abundance was done using the W statistic. The hypothesis was supported in part since for Zygoptera the biomass curve for both preserved and altered environments was above the abundance curve, despite the fact that difference in altered environments was very small. For Anisoptera in degraded environments there was a predominance of fast growing and larger body size species, and therefore, the biomass curve extents above the abundance curve. This pattern can be explained by the thermoregulation demands of the suborder. Even considering that Zygoptera did not show a re-

versal of the curves, the technique proved effective in assessing environmental impact and can be employed in biomonitoring programs that use this group." (Author)] Address: de Carvalho, F.G., Biólogo, Estudante M.Sc. no Programa de Ecologia Aquáti ca e Pesca, Universidade Fede ral do Pará (UFPA), Brasil. E--mail: fernandogeraldocarva lho@gmail.com

15807. Cebulski, B.C.; O'Brien, M.F. (2013): Observations on egg parasitism of Aeshna tuberculifera (Odonata: Aeshnidae) by Eulophidae, Trichogrammatidae and Mymaridae (Hymenoptera) in Alger county, Michigan. The Great Lakes Entomologist 46: 145-153. (in English) ["Egg parasitoids were reared from a population of Aeshna tuberculifera in the Kingston Lake area of Alger County, Michigan, from 1983-2005. Leaves of Iris versicolor were repeatedly used for oviposition during the period of observation, with the result that just a few leaves were targeted by different females. Seven species of parasitic Hymenoptera were reared from 1688 eggs. The cumulative rate of parasitization over the course of the study was 18.4%. Three species of parasitoids were responsible for approximately 96% of the parasitized eggs: Aprostocetus (Ootetrastichus) mymaridis Girault (Eulophidae) (41%); and the Mymaridae Polynema nr. needhami (34%) and Anagrus subfuscus Förster (21%)." (Authors)] Address: Cebulski, B.C., 122 White Bear Drive, Negaunee, MI 49866, USA

15808. Chakravorty, J.; Ghosh, S.; Meyer-Rochow, V.B. (2013): Comparative survey of entomophagy and entomotherapeutic practices in six tribes of eastern Arunachal Pradesh (India). Journal of Ethnobiology and Ethnomedicine 9:50 doi:10.1186/1746-4269-9-50: 12 pp. (in English) ["A consolidated list of edible insects used in the eastern part of Arunachal Pradesh (N.E. India) by Wangcho (Wancho) and Nocte tribes of the Tirap District and the Shingpo, Tangsa, Deori and Chakma of the Changlang District has been prepared. The list is based on thorough, semi-structured field-interviews with 20 informants of each tribal group. At least 51 insect species, belonging to 9 orders were considered edible. The largest number of the edible species belonged to the Coleoptera (14), followed by 10 each of the Orthoptera and Hymenoptera, 9 of the Hemiptera, 3 Lepidoptera, 2 Isoptera and one each of Ephemeroptera, Odonata and Mantodea. As far as therapeutic uses of insects are concerned, 4 species (Hemiptera) were mentioned by the Wangcho (Wancho). Food insects are chosen by members of the various tribes according to traditional beliefs, taste, regional and seasonal availability of the insects. Depending on the species, only certain, but sometimes all, developmental stages are consumed. Preparation of the food insects for consumption involves mainly roasting or boiling. With the degradation of natural resources, habitat loss, rapid population growth, and increasing 'westernization', the traditional wisdom of North--East Indian tribals related to insect uses is at risk of being lost.] Address: Chakravorty, J., Biochemical Nutrition Laboratory, Dept of Zoology, Rajiv Gandhi Univ., Arunachal Pradesh 791112, India. E-mail: jharnaau@yahoo.com

15809. Chen, Jia-Huei (2013): Comparative food habits of two closely-related insectivorous bats and their eco-morphological correlates. MSc. thesis, Dept of Life Sciences, School of Biological Science & Technology, National Cheng Kung University: 46 pp. (in Chinese, with English summary) ["… The diet of H. terasensis comprised of 9 insect orders, and that of H. turpis additionally included Araneae, Odonata, and Trichoptera and contained a total of 12 orders of arthropods. Both species fed primarily on Coleoptera that accounted for more than 20% in frequency of occurrence and about 40% in volume percentage, while the rest prey orders accounted for different proportions in their respective diets. Hemiptera and Hymenoptera accounted for 53.8% of the total frequency of occurrence and contributed to 50.8% of the volume in the diets of H. terasensis. In contrast, Orthoptera, Hemiptera, and Blattodea were more prevalent in the diet of H. turpis, but Orthoptera and Lepidoptera were more abundant in volumes. Below the level of order, I found 21 and 13 prey taxon, mostly families, in the diets of H. terasensis and H. turpis, respectively. Within hemipterans, H. terasensis consumed higher proportions of cicadas than H. turpis. Overall, H. terasensis displayed a more even and thus a more heterogeneous diet than that of H. turpis, with a medium dietary overlap between the two species at 0.67, based on Horn's index of similarity. Most wing parameters measured were higher in H. terasensis than those of H. turpis. A higher wing loading and aspect ratio indicate a faster but less maneuverable flight for H. terasensis. In contrast, the flight of H. turpis is expected to be more maneuverable and adapted to near vegetation and the ground. In addition, H. turpis with higher call frequency would be more tolerant to cluttered environments. Incorporating the general flight potentials of insects, dietary results showed that H. terasensis, with higher wing loading and aspect ratio, consumed a higher proportion of faster-flying insects, such as Hymenoptera. The larger body and skull size of H. terasensis suggest a more powerful bite force, and the estimated hardness index of prey eaten by H. terasensis (3.75) was slightly higher than that of H. turpis (3.67). The food habits differed between H. terasensis and H. turpis in several aspects, and various factors might have contributed to these differences. The dietary results were consistent with the predictions from eco-morphological traits, including body size, wing parameters, and echolocation. Since H. terasensis ate more evenly among each insect order, it ate less number of insect orders but had a more heterogeneity diet. This study did not measure food availability on site, thus can't rule out the possibility of dietary differences affected by prey availability. The dietary compositions of H. terasensis among sites across Taiwan, however, indicate little dietary variation in space and substantiate our conclusions. Eco-morphological traits constrain animals to explore resources and to a certain extent that have contributed to the different patterns of resource use, thus eco-morphological traits can be a good indicator for resource use patterns of animals with caution." (Author)] Address: Chen, Jia-Huei, National Cheng Kung Univ., No. 1, Daxue Rd, Taiwan 701

15810. Chiandetti, I.; Del Bianci, C.; Fiorenza, T. (2013): Cordulegaster heros Theischinger, 1979, a new species for the fauna of the province of Udine, north-eastern Italy (Odonata, Cordulegastridae). Boll. Mus. St. Nat. Venezia

64: 21-27. (in English, with Italian summary) ["In 2012 and 2013, specimens of C. heros, a new species for the Province of Udine, were observed in three areas of the Julian Prealps within the catchment of the torrent Torre. In this note brief details on the characteristics of the discovery site and its associated odonatofauna are also reported." (Authors)] Address: Chiandetti, I., Via Braide Podé 8, I-33010 Colloredo di Monte Albano (UD), Italia. E-mail: chiandet@gmail.com

15811. Cuello, J.A.G. (2013): Entomofauna bioindicadora del Rió Algodonal, La Ermita, norte de Santander. Revista ingenio 6(1): 112-117. ["The river Algodonal is one of the most important bodies of water in the department of North of Santander, Colombia. Could a study of biodiversity of insects associated to the basin of the River Algodonal to determine the quality of the water that is being you dilute below in the municipality of Ocana? For this study it took three sampling stations in the basin of the River. It took samples in transeptos of 100m x 20m, an area of 2000 m² for station. The collection was carried out with hand net, manual, aquatic net and pitfall traps. It was collected on the average seven orders for station: Hymenoptera, Coleóptera, Hemipterous, Homoptera, Dipteral, Ortoptera and Odonata, with a total abundance of 431 individuals. They were seven famillies bioindicadoras: Curculionidae, Veliidae, Libelulidae, Coenagríonidae, Gelastocoridae, Muscidae and Culicidae whose values of importance inside the methodology BMWP/Col added 40 classifying the water in class IV or of doubtful quality what indicates that it is polluted. Physiochemical parameters were evaluated in situ like oxygenate dissolved 5,23 - 7,57 mg/L, PH 7 - 8 and Conductivity 31,8 - 55,4 µS-cm, those which leaning with tests of total hardness (mg/L), Chlorides (mg/L), total Alkalinity (mg/L) and Turbidity NTU, determined that the quality of the water is doubtful and that it stops its consumption it should be treated." (Authors)] Address: Cuello, J.A.G., Biólogo, Univ. Francisco de Paula Santander Ocana, Investigador Grupo GIADS, Facultad de Ciencias Agrarias y del Ambiente, Colombia. E-mail: jagranadilloc@ufpso.edu.co

15812. Curtis, L.R.; Morgans, D.L.; Thoms, B.; Villenueve, D. (2013): Extreme precipitation appears a key driver of mercury transport from the watershed to Cottage Grove Reservoir, Oregon. Environmental Pollution 176: 178-184. (in English) ["An abandoned cinnabar mining and roasting site is in the major sub-basin of the watershed for Cottage Grove Reservoir, Oregon. Average surface sediment total mercury concentration in the river draining this sub-basin (0.61 ± 0.52 µg/g) was about ten-fold higher than three smaller tributaries to the reservoir. Total mercury in reservoir surface sediments averaged 1.66 ± 0.70 µg/g. Stratigraphy for two sediment cores indicated generally decreased reservoir mercury loading from 1963 to 2002 but two pronounced peaks in mercury deposition. Years of extreme precipitation immediately prior to these peaks at least partially explained them. Epaxial muscle total mercury concentrations of largemouth bass increased with body weight up to 2.5 µg/g. A gradient of mercury concentrations in soils from a 3.3 km diameter grid indicated condensation of mercury vapors from the mine site polluted the sub-basin. Highlights: Pollution of the watershed with mercury yields a highly persistent human health risk. *Watershed level events profoundly influence mercury transport into aquatic ecosystems. *Soil and sediment mercury concentration gradients are a source identification tool." (Authors) Fingerling brown bullhead catfish (Ameiurus nebulosus), snails (Physidae), bullfrog tadpoles (Rana), and Anisoptera and Zygoptera larvae were collected from the reservoir shoreline using a sweepnet. ... (ng/g). Dragonfly a, 0.49 ± 0.03, 35 ± 12. ...] Address: Curtis, L.R., Dept of Environmental & Molecular Toxicology, Oregon State Univ., Corvallis, OR, USA. E-mail: larry.curtis@oregonstate.edu

15813. De Nadaï-Monoury, E.; Lecerf, A.; Canal, J.; Buisson, L.; Laffaille, P.; Gilbert, F. (2013): A cost-effective method to quantify biological surface sediment reworking. Hydrobiologia 713: 115-125. (in English) ["We propose a simple and inexpensive method to determine the rate and pattern of surface sediment reworking by benthic organisms. Unlike many existing methods commonly used in bioturbation studies, which usually require sediment sampling, our approach is fully non-destructive and is well suited for investigating non-cohesive fine sediments in streams and rivers. Optical tracer (e.g. luminophores or coloured sand) disappearance or appearance is assessed through time based on optical quantification of surfaces occupied by tracers. Data are used to calculate surface sediment reworking (SSR) coefficients depicting bioturbation intensities. Using this method, we evaluated reworking activity of stream organisms (three benthic invertebrates and a fish) in laboratory microcosms mimicking pool habitats or directly in the field within arenas set in depositional zones. Our method was sensitive enough to measure SSR as low as 0.2 cm^2 day^{-1}, such as triggered by intermediate density (774 m² of Gammarus fossarum (Amphipoda) in microcosms. In contrast, complex invertebrate community in the field and a fish (Barbatula barabatula) in laboratory microcosms were found to yield to excessively high SSR (>60 cm^2 day^{-1}). Lastly, we suggest that images acquired during experiments can be used for qualitative evaluation of species-specific effects on sediment distribution." (Authors) Cordulegaster boltonii] Address: Gilbert, F., UPS, INP, EcoLab (Laboratoire écologie fonctionnelle et environnement), Univ. Toulouse, 118 route de Narbonne, 31062, Toulouse Cedex 9, France. E-mail: franck.gilbert@univ-tlse3.fr

15814. Debata, S.; Ku, H.; Rout, S.; Ku, R. (2013): An observation on Odonata diversity in Hadgarh Wildlife Sanctuary, Odisha, eastern India. Tigerpaper 40(2): 10-13. (in English) ["The present study recorded 55 species of odonates under 36 genera and 9 families from the area (Table 1). From all the recorded Anisoptera, Family Libelluidae is dominated by 31species followed by Aeshnidae (3) and Gomphidae (3). In case of the sub-order Zygoptera, Coenagrionidae is well represented (7), followed by Calopterygidae (3), Protoneuridae (3), Chlorocyphidae (2), Platycnemididae (2) and Lestidae (1)." (Authors)] Address: Debata, S., Dept of Wildlife & Conservation Biology, North Orissa University, India. Email: subrat.debata007@gmail.com.

15815. di Lascioa, A.; Rossi, L.; Carlino, P.; Calizza, E.; Rossi, D.; Costantini, M.L. (2013): Stable isotope variation in macroinvertebrates indicates anthropogenic disturbance along an urban stretch of the river Tiber (Rome, Italy). Ecological Indicators 28: 107-114. (in English) ["Running waters in urbanized areas are large-scale systems of anthropogenic energy dissipation that receive effluents from point and diffuse sources, potentially inducing changes in organic matter decomposition and deposition and thus modifying river metabolism and the feeding patterns of inhabiting populations. Based on the hypothesis that anthropogenic disturbance provides important trophic constraints that influence the trophic niches of local communities, stable isotopes analysis was used to evaluate possible alterations in resource assimilation by aquatic species in response to diffuse and point sources of pollution from the city of Rome. For this purpose, the isotopic signature d15N and d13C) of detritus-based benthic communities and fish was determined upstream and downstream of two wastewater treatment plants (WWTPs) located before and after the urban stretch of the river Tiber. Community-wide metrics as the carbon range and convex hull area encompassing all taxa in a d15N and d13C bi-plot were used to measure the species' niche width and overlap. Differences were found between the upstream and downstream signatures, regarding the d15N and d13C of both detritivores and predators. The differences were found to be more pronounced at the southern WWTP, located downstream of the city. The lower d15N in macroinvertebrates at the WWTP-impacted sites reflected the lower d15N of suspended particulate organic matter and was associated with higher inorganic and organic loads. The decreasing range of d13C values in macroinvertebrates and fish indicated a narrowing of the niche width downstream of the treatment plants, particularly downstream of the urban area itself. The effects were stronger on detritivores than predators due to direct incorporation of the sewage-derived material that dominated the locally available food sources. These data suggest that isotopic signals coupled with community-wide metrics can be used as functional indicators of treated and untreated seewage impacts on aquatic communities even when the primary targets (species abundance and community structure) appear to be largely unaffected." (Authors) Ischnura sp. Is listed.] Address: Rossi, L., Dept Environmental Biol., Sapienza Univ. of Rome, via dei Sardi 70, 00185 Rome, Italy. E-mail: loreto.rossi@uniroma1.it

15816. Dijkstra, K.-D.B. (2013): Three new genera of damselflies (Odonata: Chlorocyphidae, Platycnemididae). International Journal of Odonatology 16(3): 269-274. (in English) ["The genera Stenocypha [type species: Libellago gracilis], Matticnemis [type species: Platycnemis doi] and Spesbona [type species: Metacnemis angusta], first recognized by molecular analysis, are diagnosed and discussed on morphological grounds." (Author)] Address: Dijkstra, K.D., Netherlands Centre for Biodiversity Naturalis, P.O. Box 9517, 2300 RA, Leiden, The Netherlands. E-mail: dijkstra@nnm.nl

15817. Geipel, I.; Jung, K.; Kalko, E.K.V. (2013): Perception of silent and motionless prey on vegetation by echolocation in the gleaning bat Micronycteris microtis. Proc. R. Soc. B 7 March 2013 vol. 280 no. 1754: 8 pp. (in English) ["Gleaning insectivorous bats that forage by using echolocation within dense forest vegetation face the sensorial challenge of acoustic masking effects. Active perception of silent and motionless prey in acoustically cluttered environments by echolocation alone has thus been regarded impossible. The gleaning insectivorous bat M. microtis however, forages in dense understory vegetation and preys on insects, including dragonflies, which rest silent and motionless on vegetation. From behavioural experiments, we show that M. microtis uses echolocation as the sole sensorial modality for successful prey perception within a complex acoustic environment. All individuals performed a stereotypical three-dimensional hovering flight in front of prey items, while continuously emitting short, multi-harmonic, broadband echolocation calls. We observed a high precision in target localization which suggests that M. microtis perceives a detailed acoustic image of the prey based on shape, surface structure and material. Our experiments provide, to our knowledge, the first evidence that a gleaning bat uses echolocation alone for successful detection, classification and precise localization of silent and motionless prey in acoustic clutter. Overall, we conclude that the three-dimensional hovering flight of M. microtis in combination with a frequent emission of short, high--frequency echolocation calls is the key for active prey perception in acoustically highly cluttered environments." (Authors)] Address: Geipel, Inga, Institute of Experimental Ecology, University of Ulm, Albert-Einstein-Allee 11, 89069 Ulm, Germany. E-mail: inga.geipel@uni-ulm.de

15818. González-Soriano, E.; Novelo-Gutiérrez, R. (2013): Biodiversidad de Odonata en México. Revista Mexicana de Biodiversidad 84: 243-251. (in Spanish, with English summary) ["An up to date chapter on the Odonata of Mexico is presented. Since the last update in 2006, 5 new species were described, 11 new records were added and 14 species have been described in their larval stage. Hence, the Mexican list presented here is constituted by a total of 355 species. Comments on endemism, endangered species and/or at risk are included." (Authors)] Address: González-Soriano, E., Inst. de Biol., Depto de Zoología, Univ. Nacional Autónoma de México, Apartado postal 70-153, 04510 México, D. F., México. E-mail: esoriano@ibiologia.unam.mx

15819. Harris, S.; Karlsson Green, K.; Pettersson, L.B. (2013): Predator faunas past and present: quantifying the influence of waterborne cues in divergent ecotypes of the isopod Asellus aquaticus. Oecologia 173(3): 791-799. (in English) ["Waterborne chemical cues are an important source of information for many aquatic organisms, in particular when assessing the current risk of predation. The ability to use chemical cues to detect and respond to potential predators before an actual encounter can improve prey chances of survival. We investigated predator recognition and the impact of chemical cues on predator avoidance in the freshwater isopod Asellus aquaticus. This isopod has recently colonised a novel habitat and diverged into two distinct ecotypes, which encounter different predator communities. Using laboratory-based choice experiments, we have quantified behavioural responses to chemical cues

from predators typical of the two predator communities (larval dragonflies in the ancestral habitat, perch in the newly colonised habitat) in wild-caught and lab-reared Asellus of the two ecotypes. Individuals with prior experience of predators showed strong predator avoidance to cues from both predator types. Both ecotypes showed similar antipredator responses, but sexes differed in terms of threat-sensitive responses with males avoiding areas containing predator cues to a larger extent than females. Overall, chemical cues from fish elicited stronger predator avoidance than cues from larval dragonflies. Our results indicate that in these isopods, prior exposure to predators is needed to develop antipredator behaviour based on waterborne cues. Furthermore, the results emphasise the need to analyse predator avoidance in relation to waterborne cues in a sex-specific context, because of potential differences between males and females in terms of vulnerability and life history strategies." (Authors)] Address: Karlsson Green, Kristina, Metapopulation Research Group, Dept of Biosciences, Univ. of Helsinki, P.O. Box 65, Helsinki, 00014, Finland. E-mail: kristina.karlsson@biol.lu.se

15820. Hellmund, M.; Hellmund, W. (2013): Fossile Kleinlibellen (Odonata, Zygoptera) und ihr endophytischer Fortpflanzungsmodus - Erfolgreiche Strategie seit mindestens 100 Millionen Jahren. Entomologische Nachrichten und Berichte 57(1/2): 31-44. (in German, with English summary) ["Fossil damselflies (Odonata, Zygoptera) and their endophytic reproductive behaviour -successful strategy since at least 100 Million years. - For 20 years, we have intensely researched the reproductive behaviour of fossil as well as contemporary damselflies (Zygoptera). Meanwhile we are able to distinguish and differentiate four different modes of ovipositing. To simplify and clarify communication, we created new descriptive labels, e. g. „Coenagrioniden-Typ" („Zickzack-Modus" and „Bogen-Modus") respectively Lestiden-Typ („Einzelreihen-Modus" and „Doppelreihen-Modus"), which are now fundamentally accepted and adopted by the current junior authors, searching in this field. Based on numerous Contemporary studies it became clear that the fossil egg-sets amazingly agree, both in size and morphology, with egg-sets of taxa belonging to the extant zygopteran families Coenagrionidae and Lestidae. The above-mentioned actualistic studies and observations are the key for understanding and interpreting the processes of the past Earth history, in particular in paleoethology. Zygoptera (damselflies) other than Anisoptera (dragonflies) practice a „balanced strategy", by producing only a restricted number of eggs each of which is by the female carefully and thoroughly inserted into plant tissue (fresh leaves, leaf litter or small twigs). The egg is this individually protected while developing to a prolarva. This is called „endophytic ovipositioning". In contrast, most Aniso- ptera produce a large number of eggs which are dropped freely into wet substratum like mosses or comparable plant material and onto pond water surfaces, practicing a mode of „opportunistic strategy", despite the drawback that the majority of these eggs may not be able to develop successfully to a prolarva. The latter method is called „Freileger" or random scattering of eggs." (Authors)] Address: Hellmund, M., Zentralmagazin Naturwissen. Sammlungen Martin-Luther-Univ. Halle-Wittenberg Kustos Geiseltalmuseum/Geiseltalsammlung, Domplatz 4, 06108 Halle (Saale), Germany. E-Mail: meinolf.hellmund@zns.uni-halle.de

15821. Jezirorski, P. (2013): First record of Sympecma gobica (Odonata: Lestidae) from Iran. Klapalckiana, 49: 39-42. ["Sympecma gobica Förster, 1900 is recorded for the first time from Iran, collected from Khorasan Razni province. Details of the habitat are provided. All three species of the genus Sympecma are now known from Iran." (Author)] Address: Jezirorski, P., Na Belidle 1, CZ-735 64 Havírov-Suchá, Czech Republic. E-mail: jezirko@post.cz

15822. Keshari, S.; Kumari, J.; Prasad, M. (2013): Diversity, Distribution and Species composition of Odonates in Ranchi, Jharkhand. Biospectra 8(2): 71-76. (in English) ["Biodiversity protection and conservation is on national and international agenda and responsible for sustainable development of a region or a country. Therefore Odonates diversity in Ranchi District was observed during 2011-2012 and 33 species belonging to 8 families were recorded. Altogether randomly collected 24 dragonfly species were sampled and the number of damselflies species samples were 09. Libellulidae was the richest family with 18 species and sub- order Anisoptera. Different habitat types provide good opportunities to these wonderful groups to flourish and survive. Mostly Odonates were aggregated due to habitat specific nature and random distribution indicates availability of resource utilization to survive." (Authors)] Address: Keshari, S., Dept of Zoology, R.L.S.Y.College, Ranchi Univ., Ranchi, Jharkhand, India. E-mail:seemakeshari@gmail.com

15823. Khelifa, R.; Zebsa, R.; Sakrane, N.E.; Youcefi, A.; Bensouilah, S.; Amari, H. (2013): Long-range movements of an endangered endemic damselfly Calopteryx exul Selys, 1853 (Calopterygidae: Odonata). African Journal of Ecology 52: 375-377. (in English) ["The study was carried out in Salah Salah (36°27'41.37"N 7°20'22.07"E located upstream Seybouse River (north-east Algeria). It is a 20-m width watercourse with a mean depth of 70 cm and bank vegetation consisted of dense Typha angustifolia and Nerium oleander. This part of the river was affected by human activities like water pumping and throwing tons of rocks and gravelly soil coming from nearby building constructions into the river bed. We conducted capture-mark-resightings on imagos during five days (20, 22, 25, 28 May and 01 June 2010) in the morning within a stretch of 200 m. The short sampling period was due to conflicts with local people. The current study stretch was isolated from other potential suitable ones by a distance of about 4 km. Adults were individually marked on the left and right wing, thorax and the abdomen using paint spots of different colours. SPSS 17.0 (SPSS Inc, Chicago, IL, USA) was used to perform Mann-Whitney U-test. The species flight period started in early May, and the first reproductive pair was observed on 25 May. A total of 141 imagos (64 males and 77 females) were marked, among which 33 (14 males and 19 females) were subsequently resighted giving a mean resighting rate of 23.40% (21.18% for males and 24.67% for females). All of the latter individuals were resighted only once. Almost all resighted individuals (94%) displayed movements of less than 50 m with a

mean of 9.35± 8.49 m (9.35±8.49 for males and 9.56±10.20 m for females). There was no significant difference in short-scale movements (<50 m) between males and females (U = 94.5, P = 0.35). However, 6% of resighted individuals carried out long-range movements. An individual male marked on 22 May was resighted two days after in a subpopulation 5.3 km downstream in a site where the species reproductive behaviour and biology were daily studied by our colleagues. Similarly, a female marked on 25 May noted dead during the next day in another subpopulation 4.9 km downstream" (Authors)] Address: Khelifa, R., Institute of Evolutionary Biology and Environmental Studies, University of Zürich, Winterthurerstr. 190, CH-8057, Zürich, Switzerland. E-mail: rassimkhelifa@gmail.com

15824. Kim, J.S.; Kwak, J.I.; Noh, T.H. (2013): Characteristics of Odonata communities based on habitat types of superb biotope in Wonju city, Korea. Korea Journal of Environment and Ecology 27(2): 209-218. (in Korean, with English summary) ["This study was conducted to analyze the characteristics of odonata communities as habitat types in Wonju City, Korea. The 33 plots were installed at 4 types of biotope like abandoned paddy fields, natural type reservoir, natural type river and forest valley in Wonju city. From the survey, the 9 family and 38 species were identified. As the result of comparative investigation of the species composition of each habitat through TWINSPAN analyzing, the difference of species composition was definite in abandoned paddy field, natural type reservoir and forest valley, however, it was uncertain in natural type river. The dominant species and the subdominant species of each habitat were mainly Sympetrum frequens and S. infuscatum but the distributions of Paracercion hieroglyphicum, Epophthalmia elegans, and Anax parthenope julius were different as haibtat types. The order of the index of species diversity was not different between abandoned paddy fiedls, natural type reservoir and natural type river, but forest valley was low. The abandoned paddy field was shown the most diverse spawning type of odonata, it is considered that hydrophyten play an important role in the abundant of odonata since the sorts of odonata spawning in plants are majority. As the result of analyzing interspecies relationship, Crocothemis servilia mariannae and Orthetrum albistylum, C. servilia mariannae-Platycnemis phyllopoda, Lyriothemis pachygastra-Sympetrum parvulum are shown the positive correlation, however, they have a difference in preferred habitat between high correlation species." (Authors)] Address: Kwak, J.I., Urban Ecology Research Center, 124-22 Bang-i-dong, Songpa-gu, Seoul(138-830), Korea. E-mail: kkwark@uos.ac.kr

15825. Kubheka, S.P.; Rowe-Rowe, D.T.; Alletson, J.D.; Perrin, M.R. (2013): Possible influence of increased riparian activity (stream modification and agricultural intensification) on abundance of South African otters. African Journal of Ecology 51(2): 288-294. (in English) ["Otters are threatened by habitat loss and the pollution of their riverine habitat. Environmental impacts on top predators are often the first indication of habitat deterioration. It is rare for predator-prey-habitats to be monitored over long time intervals (decades), however necessary that may be. Here, we report on the decline in otter relative abundance in a previously pristine habitat and speculate on its causes. We surveyed sign of coexisting otters (Aonyx capensis and Lutra maculicollis) along a river in Kamberg Nature Reserve in uKhahlamba Drakensberg Park, KwaZulu-Natal, South Africa. The area, Stillerust, lies downstream of a commercial dairy farm and a rural village–subsistence farming area. Data collected recently were compared with two previous surveys, carried out in 1972–1974 and 1993–1994, and were also compared with a pristine section of river in the nature reserve, upstream of the farming areas. At Stillerust, the number of spraint (scat) sites found, for each otter species, approximated only 25% of those recorded in the earlier studies. In the pristine section of the river, the amount of sign and abundance of otters were similar to those recorded in 1993. Assessments of stream biota and water quality analyses revealed negative changes in the river below the pristine area, down to, and including, Stillerust. Visible signs of pollution were evident. Since the 1970s, the rural village population has increased ca eightfold, and the commercial farm has changed from an extensive livestock enterprize to an intensive dairy farm ... Amphibians (including Rana spp., and Xenopus laevis) and dragonflies (Aeshna, Notogomphus, Paragomphus, Ceratogomphus, Anax, Orthetrum, Diplacodes, Crocothemis, Sympetrum, Trithemis, Pantala spp.) larvae occur mainly in backwaters, oxbows, vleis ..." (Authors)] Address: Perrin, M.R., School of Biological & Conservation Sciences, Univ. KwaZulu-Natal, Scottsville, South Africa 297 Frances Staniland Rd, Pietermaritzburg, South Africa. E-mail: Perrin@UKZN.ac.za

15826. Li, J.-m.; Han, D.-m.; Fang, J.; Gu, C.-b. (2013): A study on fauna and diversity of Odonata in Yaoluoping Nature Reserve. Journal of Biology 30(5): 73-76. (in Chinese, with English summary) ["The Odonata in Yaoluoping Nature Reserve was investigated in 2010-2011. According to the collections, productions and identifications of the specimens, it was preliminarily confirmed that from 18941 specimens there were 12 families, 53 species of Odonata in Yaoluoping reserve in which there were 13 genus, 26 species of Libellulidae and Pantala flavescens was the most dominant species. The floristic analysis suggested Yaoluoping reserve is the transition zone between Palaearctic and oriental region. It was found that the distribution of Odonata was influenced by the water and characteristic of vegetations. The species numbers, dominance and evenness index decreased with the altitude." (Authors)] Address: Li, J.-m., School of Life Science, Anhui University, China

15827. Lou, Y.-G.; Zhang, G.-R.; Zhang, W.-Q.; Hu, Y.; Zhang, J. (2013): Biological control of rice insect pests in China. Biological Control 67(1): 8-20. (in English) ["Highlights: •Rice is one of the most important food crops in the world. •Damage by insect pests is a serious challenge to rice production in China. •Biological control is an effective method for pest control but not extensively adopted. •Integration of new strategies in biological control should be explored. Abstract: Rice is one of the most important food crops in the world. China has the second largest area of the rice growing in the world and the highest yield of rice

produced. Infestation by insect pests, especially rice planthoppers, stem borers and leaf folders, is always a serious challenge to rice production in China. Current methods for controlling insect pests in China mainly include good farming practices, biological control, breeding and growing resistant varieties, and the use of chemical insecticides. However, for farmers, the favorite method for insect pest control is still the application of chemical insecticide, which not only causes severe environmental pollution and the resurgence of herbivores but also reduces populations of the natural enemies of herbivores. To control insect pests safely, effectively and sustainably, strategies encouraging biological control are currently demanded. Here we review the progress that has been made in the development and implementation of biological controls for rice in China since the 1970s. Such progress includes the species identification of the natural enemies of rice insect pests, the characterization of their biology, and the integration of biological controls in integrated pest management. To develop effective ecological engineering programs whose aim is to implement conservation biological controls, further research, including the evaluation of the roles of plants in non-crop habitats in conservation biological controls, volatiles in enhancing efficiency of natural enemies and natural enemies in manipulating insect pests, and education to increase farmers' knowledge of biological controls, is proposed." (Authors) Address: Lou, Y.-G., State Key Laboratory of Rice Biology, Institute of Insect Science, Zhejiang University, Hangzhou 310058, China

15828. Md Rawi, C.S.; Al-Shami, S.A.; Madrus, M.R.; Ahmad, A.H. (2013): Biological and ecological diversity of aquatic macroinvertebrates in response to hydrological and physicochemical parameters in tropical forest streams of Gunung Tebu, Malaysia: implications for ecohydrological assessment. Ecohydrology 7(2): 496-507. (in English) ["In this study, we have investigated the effects of some hydrological and physicochemical parameters such as water quality, velocity, water depth, river width, water pH, water temperature, ammonia-N, biochemical oxygen demand (BOD), chemical oxygen demand (COD) and dissolved oxygen (DO) on diversity of aquatic macroinvertebrates in forest streams of Gunung Tebu (GT), Malaysia. The results of canonical correspondence analysis identified three groups of the aquatic macroinvertebrates according to their relationships with hydrological and physicochemical parameters. The stream velocity, water quality (i.e. DO, BOD and ammonia-N) in addition to canopy cover, total habitat score and substrate quality were the determinant factors controlling the diversity pattern of the aquatic macroinvertebrates in GT streams. Alteration in the hydrological and physicochemical parameters showed to influence the ecological diversity of the aquatic macroinvertebrates in GT streams. The predators were found to be highly associated with the elevated concentrations of BOD and COD. Shredders were positively correlated with pH, stream velocity, DO and habitat quality indicators (total habitat score, embeddedness, epifaunal and canopy cover). However, the collector-gatherers correlated negatively with all of these parameters. It was concluded that stream velocity, substrate structure and water quality were strong attributes for variation in aquatic macroinvertebrate assemblage structure in tropical forest streams of GT." (Authors) Address: Salman Abdo Al-Shami, School of Biological Sciences, Universiti Sains Malaysia (USM), 11800 Penang, Malaysia. E-mail: alshami200@gmail.com; salshami@usm.my

15829. Meyer, M.D.; Davis, C.A.; Bidwell, J.R. (2013): Assessment of two methods for sampling invertebrates in shallow vegetated wetlands. Wetlands 33(6): 1063-1073. (in English) ["Invertebrates are often used as indicators of wetland health and habitat quality for species such as waterbirds. However, the sampling method may influence the characterization of wetland invertebrate populations. The objective of this study was to compare the effectiveness of two sampling methods, the aquatic D-frame net and Quadrat-Column-Core (QCC) method, in determining invertebrate population metrics in vegetated depressional wetlands of north central Oklahoma. As compared to the D-frame net, use of the QCC method resulted in higher estimates of both total microcrustacean and nonmicrocrustacean density and biomass. Additionally, the QCC method had higher estimates of density and biomass for seven of the eight functional feeding groups and nearly half of the 49 taxa collected from the wetlands. The D-frame net method produced higher estimates of taxa richness and the Shannon index as well as higher densities and biomasses than the QCC method for five taxa. Overall, invertebrate community structure was different between the two sampling methods. In light of differences in the metrics determined for the two sampling methods, the ultimate choice of a sampling method for wetland invertebrates should be based on study objectives." (Authors) Address: Davis, C.A., Dept of Natural Resource Ecology & Management, Oklahoma State Univ., 008C Agricultural Hall, Stillwater, OK, 74078, USA. E-mail: craig.a.davis@okstate.edu

15830. Morrill, A.; Mlynarek, J.J.; Forbes, M.R. (2013): Explaining covariation between endo- and ecto-parasites in spreadwing damselflies (Zygoptera: Lestidae). Canadian Journal of Zoology 91(10): 761-765.["Host individuals and populations are commonly infected by more than one type of parasite, yet studies examining parasite effects on host fitness often limit observations or experiments to only a single parasite taxon or to a narrow subset of potential parasite taxa. Addressing covariation between parasite taxa is important for determining the potential for misattributing effects caused by one parasite species to another parasite species, and also for testing more broadly whether host attributes relate to exposure or susceptibility to infection. In this study, parasitism by ectoparasitic water mites (Arrenuridae) and endoparasitic gregarines (Eugregarinidae) of two spreadwing damselfly species, Lestes disjunctus Selys, 1862 and Lestes forcipatus Rambur, 1842, was measured and analyzed for covariance. No significant correlations between the intensities of the two types of infecting parasites were found when both live and resisted mites were considered. However, significant negative correlations between live mites and gregarines were consistently found in L. forcipatus host samples, but never in L. disjunctus samples. These results show some species-specific patterns of covariation between mite and gregarine infections in damselflies. We propose potential

underlying causes for this correlation related to parasite–host ecology and to changes in host behaviour resulting from water mite infection of L. forcipatus." (Authors)] Address: Morrill, A., Dept of Biol., Nesbitt Building, Carleton Univ., 1125 Colonel By Drive, Ottawa, ON K1S 5B6, Canada. E-mail: andre_morrill@carleton.ca

15831. Novelo-Gutiérrez, R.; Ramirez, A. (2013): First record of Telebasis filiola Perty (Odonata: Coenagrionidae) preying on small web-building spiders (Arachnida: Tetragnathidae). International Journal of Odonatology 16(4): 289-292. (in English) ["At a wetland in southeastern Mexico a female of T. filiola was observed and photographed preying on a small web-building spider of the genus Leucauge. This is the first record of gleaning by a representative of the genus Telebasis. A brief discussion on this subject in other odonates is provided." (Authors)] Address: Ramírez, A., Department of Environmental Sciences, University of Puerto Rico, Río Piedras campus. PO Box 190341, San Juan PR 00919, Puerto Rico

15832. Nurulain, B.S. (2013): Morphological variation of selected species in the genus Orthetrum (Odonata: Anisoptera) in Sarawak. B.Sc. thesis, Universiti Malaysia Sarawak: VII + ? pp ["Dragonflies are widely distributed in the tropical rainforests of the island of Borneo. Dragonflies can be differentiated morphologically at the species level. Study on the morphological variations of four selected species in the genus Orthetrum (i.e. O. glaucum, O. testaceum, O. chrysis, and Orthetrum sabina) from the suborder Anisoptera in Sarawak was conducted by using voucher specimens deposited in UNIMAS Zoological Museum, Sarawak Forestry Research Centre, and Sarawak Biodiversity Centre. This study was done to determine the morphological variations among dragonflies species based on morphometric characters and to identify the important characters that differentiate the individuals at the species level. A total number of 89 adult individuals were morphologically analysed with 15 morphometric measurements. Cluster Analysis (CA) and Discriminant Function Analysis (DF A) showed that O. sabina can be discriminated from O. glaucum, O. testaceum, and O. chrysis mainly based on four major diagnostic characters; length of abdomen, length of thorax, width of thorax, and length of tarsus (hind leg). However, none of the canonical coefficients estimated from the measured characters are suitable to distinguish O. glaucum, O. testaceum, and O. chrysis from each other. The knowledge from this morphometric analysis will assist researchers to choose the best characters to discriminate between the Orthetrum species for future research." (Author)] Address: not stated

15833. Obregón-Romero, R.; Cano-Villegas, F.J.; Tamajón--Gómez, R.; López Tirado, J. (2013): Primeras citas de Trithemis kirbyi Selys, 1891 (Odonata, Libellulidae) en las provincias de Ciudad Real y Huelva, y nuevas aportaciones para la provincia de Badajoz (España). Boletín de la SAE 22: 88-93. (in Spanish, with English summary) ["T. kirbyi is recorded for the first time, from Ciudad Real (first record from Castilla La Mancha) and Huelva (Andalusia). The presence in the province of Badajoz (Extremadura) is also confirmed. The increment of its distribution range to inland and the Atlantic coast is shown with this new data." (Authors)] Address: Obregón-Romero, R., Dpto. Botánica, Ecología y Fisiología Vegetal. Área de Ecología. Campus de Rabanales. Universidad de Córdoba, Spain. E-mail: rafaobregonr@gmail.com

15834. Oliveira, E.; Takeuchi, S.S.; Cerutti, V.E. (2013): Assembly of Odonata (Insecta) Larvae in limnic environments in the Parque Estadual de Vila Velha, Brazil. Estud. Biol. 35(85): 163-176. (in Portuguese, with English summary) ["To analyze the composition, distribution and ecological indices for the assembly of Odonata larvae in 15 sampling points (six lentic and nine lotic) Parque Estadual de Vila Velha, were executed four sampling programs. At the end of each season, between March and December/ 2011. At each point five samples were extracted, each one obtained at an interval of 15 minutes using sieve (diameter 25 cm, mesh opening of 0,2 mm). A total of 3.061 larvae were collected, these 2.419 recorded in lentic systems and 642 in lotic. Lentic systems in the largest absolute (538) occurs in the Baixio do Coqueiro. In lotic systems (166) occur in Rio Guabiroba. Among the seven families registered Coenagrionidae – 40.48% Te Libellulidae – 39.36% are the most abundant and Megapodagrionidae – 0.52%, the smallest representation. Of the 21 genera occurred: Acanthagrion, Aeshna, Hetaerina, Lestes, Macrothemis and Telebasis represent about 88%. The genus richness was close: lentic (10) and lotic (9). The greatest of richness Margalef (17.4) occurs in Rio Guabiroba, higher values of Shannon diversity (0.83) occur in rivers Barrozinho and Quebra Perna. The Berger Parker dominance was attended by Hetaerina Rio Barrozinho and evenness was more pronounced in Rio Guabiroba. The estimator Jackniffe 2nd order indicated maximum value (23.4) for genera. The results reflect the importance of this conservation unit with respect to the maintenance of wetlands preserved for biodiversity of this assembly of larvae." (Authors)] Address: Oliveira, Edinalva, Núcleo de Ciencias Biológicas e da Saúde da Universidade Positivo (UP), Curitiba, PR - Brasil. E-mail: edinaoli@yahoo.com.br

15835. Patten, M.A.; Smith-Patten, B.D. (2013): Odonata species of special concern for Oklahoma, USA. International Journal of Odonatology 16(4): 327-350. (in English) ["Assessment of conservation status is a necessary step before management plans can be formulated. Historically such assessments have a strong bias toward vertebrates, particularly endothermic terrestrial vertebrates (i.e. birds and mammals). Invertebrates, by contrast, tend to be ignored, and many insect groups, despite being species rich and reasonably well studied, such as the Odonata (damselflies and dragonflies), have not been assessed or have been assessed only at a broad geographic level (e.g. internationally or continentally). Assessment at a state level recognizes that states often are at the front of regional and local conservation and management planning and implementation. On the basis of our extensive surveys across the Great Plains state of Oklahoma in the central USA, as well as our compilation of thousands of museum specimens dating back to 1877, we were able to discern the status and distribution of each of the 161 species of odonates recorded in the state. In doing so we were able to assess a conservation rank, using

NatureServe criteria, for each species. We conclude that nine species are critically imperiled (S1) in the state. These species require immediate conservation attention, initially at the level of intensive surveys to delineate the full extent of the geographic range in the state and to determine the population size and habitat needs. We categorized an additional 13 species as imperiled (S2) and placed 18 species on a “watch list” (S3). Species on these two lists will require field surveys as well, and regions of high occurrence of listed species ought to be targeted for such efforts and considered as set-asides for preservation of key members of the odonate fauna in the state." (Authors)] Address: Patten, M.A., Oklahoma Biol. Survey & Depart. of Biology, Univ. of Oklahoma, Norman, Oklahoma 73019, USA

15836. Petzold, F. (2013): Zwei Einzelfunde der Kleinen Zangenlibelle (Onychogomphus forcipatus) im Landkreis Hildburghausen (Insecta: Odonata). Mitteilungen des Thüringer Entomologenverbandes 20(2): 42-45. (in German) [29.06. 2012, Speicher Roth II east of Römhild / Waldhaus (Lkrs. Hildburghausen; MTBO 5529,4 and 08.08.2013 near Bürden in Hildburghäuser Wald.] Address: Petzold, F., Lutherstr. 130, 07743 Jena, Germany. E-mail: falk_petzold@web.de

15837. Polo-Cavia, N.; Gomez-Mestre, I. (2013): Learned recognition of introduced predators determines survival of tadpole prey. Functional Ecology 28(2): 432-439. ["Alien predators are one of the major causes for rapid decline and extinction of native species, because they often create novel ecological contexts in which the antipredatory responses of native organisms are no longer fit. Although larval amphibians are often capable of innately responding to chemical cues from local predators through changes in morphology and behaviour, naïve tadpoles generally cannot recognise introduced predators with which they have not shared an evolutionary past. However, in a few documented cases, aquatic organisms have been observed to alter morphology or behaviour in response to alien predators. Such a response may have evolved as adaptive recognition, increasing their repertoire of innate responses to include the novel predator, or may have evolved as the prey's ability to learn new threats by association with conspecific alarm cues. The red swamp crayfish, Procambarus clarkii, is a harmful invasive species in aquatic systems worldwide, causing great ecological impact on native amphibian populations during the last decades through intense predation of eggs and tadpoles. We demonstrate that naïve tadpoles of the western spadefoot toad, Pelobates cultripes, are not capable of innately recognising waterborne predator cues from the red swamp crayfish. Nevertheless, we demonstrate that P. cultripes tadpoles can learn to recognise the cues of the invasive predatory crayfish as a threat when they are exposed to predator cues combined with conspecific alarm cues. Finally, we show that tadpoles conditioned by joint exposure to crayfish and alarm cues enjoy higher survival during predation trials with invasive crayfish. Learning to recognise a newly introduced predator through association with conspecific alarm cues may allow successful generalisation of antipredatory responses by tadpoles. This cognitive ability of tadpoles may contribute to reduce their vulnerability to alien predators and soothe the impact of invasions in natural populations … either an invasive predator (P. clarkii) or a native one (nymphs of Anax imperator). ... We also dip-netted ten dragonfly nymphs (A. imperator), and used fyke-nets to ..." (Authors)] Address: Polo-Cavia, Nuria, Dept of Biology, Univ. Autónoma de Madrid, 28049 Madrid, Spain,

15838. Rueda, J.; Mesquita-Joanes, F.; Valentín, A.; Dies, B. (2013): Inventario de los macroinvertebrados acuáticos del “Ullal de Baldoví” (Sueca, Valencia, España) tras un programa de restauración. Check-list of the aquatic macroinvertebrates of “Ullal de Baldoví” spring pond (Sueca, Valencia, Spain) after a restoration program. Bol. R. Soc. Esp. Hist. Nat. Sec. Biol., 107: 57-65. (in Spanish, with English summary) [The water body Ullal de Baldoví (Sueca, Valencia) is a priority habitat (Calcareous fens with Cladium mariscus, code 7210 of EU priority habitats) system located inside the Albufera Natural Park, composed of reduced surface but deep ponds, associated with subterranean springs. Its progressive reduction and degradation forced the regional government (Consellería de Infraestructuras, Territorio y Medio Ambiente) and the local council of the city of Sueca to start a restoration action that lasted until 2008. This restoration plan was concluded in the framework of a LIFE-Nature development project, “Recovering of a priority habitat in the Albufera Natural Park”, known as “Proyecto Ullals” (“Spring pond project”). In the present study we provide a list of the aquatic invertebrates collected in Ullal de Baldoví (Sueca, Valencia) during 2007. This is an emblematic spring system with oligohaline waters, located inside the l’Albufera Natural Park. In total, 81 taxa were found distributed in 6 phyla, 24 orders and 57 families. These results were obtained from six sampling stations accounting for different environments in the Ullal, including a restored area. Three endemisms were found: Melanopsis tricarinata (Bruguière, 1789), an species endemic to the Iberian Peninsula, plus Dugastella valentina (Ferrer Galdiano, 1924) and Palaemonetes zariquieyi Sollaud, 1939 both with even more restricted distributions in the Valencian region. Leptocheirus pilosus Zaddach, 1844, an amphipod species belonging to the family Aoridae is reported for the first time in the region. Fifteen taxa belong to the class Ostracoda, two of which are considered invasive alien species (IAS): Fabaeformiscandona subacuta (Yang, 1982) and Stenocypris major (Baird, 1859). In the study carried out by Poquet et al. (2008) on the ostracods of shallow lakes in the Valencian Community, 6 species were found in the Ullal de Baldoví system during 2000. In comparison, just one of them, Candonopsis scourfieldi Brady, 1910, was not collected during the present survey. The limnological results indicate low variability in conductivity, salinity, chlorides and alkalinity in the Ullal (Tab. I). The recent restorated part of the system has allowed the colonization of several new taxa into Ullal de Baldoví. When aiming at estimating the maximum biodiversity of an ecosystem, it is essential to carefully select a wide array of habitat types to be sampled, in order to maximize the expected number of taxa. In comparison to a previous survey carried out in 2000 (Sahuquillo et al., 2007) in the same system, the present survey is remarkable with regards to the notably higher number of taxa collected in the Ullal de Baldoví wa-

ter body. The importance of seasonal sampling campaigns is made clear to thoroughly characterise epicontinental aquatic systems, even when studying such a stable water body. Indeed, a monthly monitoring survey for one year would most probably uncover a higher faunistic richness of the system and would maximise its environmental value, a reason to remark the necessity for a preservation of this environment for the future generations." (Authors)] Address: Rueda, J., Dept de Microbiologia i Ecologia, Universitat de València. Dr. Moliner, 50. 46100 Burjassot, Valencia, Spain. E-mail: juan.rueda@uv.es

15839. Simon, S.; Hadrys, H. (2013): A comparative analysis of complete mitochondrial genomes among Hexapoda. Molecular Phylogenetics and Evolution 69(2): 393-403. (in English) ["With respect to bauplan radiation, species and taxa richness, hexapods have an unassailable lead. But still, the phylogenetic relationships among the orders and infraorders remain a matter of discussion. The rapidly increasing mitochondrial genome sequences from diverse insect species provide the opportunity to explore miscellaneous evolutionary questions in the superclass Hexapoda. A combined primary sequence analyses of the complete available data set has not yet been performed. Until now phylogenetic analyses of subsets of selected taxa resulted to strong supported topologies showing in some instances discrepancies between morphological and nuclear data. This circumstance started the discussion about the limits of complete mitochondrial genomes for inferring deep hexapod relationships. By using the hitherto densest taxon sampling of Hexapoda our analyses resulted in discrepancies to the current phylogenetic hypotheses based on morphological and nuclear data, e.g. monophyly of hexapods and some hexapods orders, e.g. Diptera, Hemiptera and Orthoptera. Nonetheless, compared to previously published studies that strongly support systematically erroneous groups using a sparse taxon sampling, our analyses had no support for theses discrepancies. Consequently, we highly recommend interpreting mt-genome based phylogenies with reduced datasets particularly for hexapods with cautions although the inferred relationships are highly supported." (Authors)] Address: Hadrys, Heike, ITZ, Ecology & Evolution, TiHo Hannover, Bünteweg 17d, 30559, Hannover, Germany. E-mail: heike.hadrys@ecolevol.de

15840. Torralba Burrial, A.; Nores Quesada, C.I.; Armendariz, C. (2013): Evaluando la situación de la libélula amenazada Oxygastra curtisii (Odonata: Corduliidae) en Navarra (N Península Ibérica). Biodiversidad floristica vegetacion Tamega IV Congreso de Biodiversidad: Pósters: 190. (in Spanish) [Verbatim: About 23% of Iberian dragonflies are regionally threatened in Spain according to the Atlas and Red Book of Threatened Invertebrates in Spain. One of the few dragonflies that, in addition to being threatened, is included in the Habitats Directive and the Spanish Catalogue of Threatened Species is Oxygastra curtisii. Generally associated with rivers with backwater areas and alder groves (although it can be found in certain reservoirs and ponds), it has a fragmented distribution in the Iberian Peninsula. It has recently been found in Navarre, far from its main Iberian population centres. In this work, funded by the Government of Navarra through the public company GANASA, we analyse the biodiversity of the fluvial communities of odonates in the Navarran part of the Bidasoa River, especially the distribution of O. curtisii. During the summer of 2012, three sampling campaigns were carried out, covering 20 stretches (about 200 m long), selected according to vegetation and hydromorphological criteria, in order to be able to extrapolate the situation of their populations to the entire Navarrese part of the river. The samplings also recorded the adult odonates found, but given the influence of the meteorological conditions on their detection, the exuviae samplings (almost 1,700 specimens identified) allowed a more accurate evaluation of the odonate communities. These consisted of Onychogomphus uncatus, O. forcipatus, Cordulegaster boltonii, Boyeria irene and O. curtisii, for which quantitative data on population size and sex ratio were obtained, and ten other species, mostly Zygoptera, for which only qualitative or adult-based data could be obtained. O. curtisii maintains high populations in numerous stretches of the Bidasoa River, having identified the characteristics of the most favourable habitats for the species and those in which it is lacking. Translated with www.DeepL.com/Translator (free version)

15841. Tschiedel, K. (2013): Bericht zum Tag der Artenvielfalt in der Muskauer Heide am 15. Juli 2012, Truppenübungsplatz Oberlausitz. Berichte der Naturforschenden Gesellschaft der Oberlausitz 21: 201-221. (in Geman) [Report about the „Day of Species Diversity“, July 15th 2012 in the army training area “Oberlausitz” on the Muskauer Heide. 7 odonate species, including Lestes dryas and Sympetrum danae, have been recorded.] Address: Tschiedel, Kerstin, Zum Silberberg 10, 02906 Hohendubrau, Germany. E-mail: kerstin@tschiedel.net

15842. Wesner, J.S. (2013): Fish predation alters benthic, but not emerging, insects across whole pools of an intermittent stream. Freshwater Science 32(2): 438-449. (in English) ["Predation effects in streams can cascade to terrestrial food webs through the flux of organisms that develop in the stream and emerge as adults to the terrestrial system. This emergence subsidizes some terrestrial predators, an effect that generally varies based on the magnitude of the subsidy. Factors regulating this magnitude are relatively well known, but factors regulating the trophic structure of the subsidy are not. I tested the hypothesis that predatory fish in natural stream pools alter the biomass and trophic structure (proportion of predatory adults) of emerging aquatic insects. I created a 13× gradient of predatory fish biomass (4 species of Lepomis sunfish and the minnow Notropis boops; within the range of natural variation) across 10 pools in Brier Creek, Oklahoma (USA). Pool area and substrate composition varied naturally, so I also measured their effect on insects. At the end of the experiment after the stream became intermittent, fish reduced benthic insect biomass but not emergence to the terrestrial habitat. The proportion of predatory insects emerging from pools was positively associated with pool area, but was unaffected by fish density. The best predictor of emergence biomass among pools on any date was the standing crop of benthic insects before fish manipulation, a result suggesting a time lag between measured benthic

standing crop in the stream and subsequent emergence. Fish manipulations occurred during the end of peak summer insect emergence, which may have limited my ability to detect fish effects on emergence. My study demonstrates that variation in the timing of predation may constrain the spatial scale of fish effects in aquatic and terrestrial food webs and suggests that pool size can influence the trophic structure of emerging aquatic insects." (Author)] Address: Wesner, J.S., Dept of Fish, Wildlife, & Conservation Biology, Colorado State University, Fort Collins, Colorado 80523 USA. E-mail: jeffwesner@gmail.com

15843. Yu, J.; Wang, T.; Han, S.; Wang, P.; Zhang, Q.; Jiang, G. (2013): Distribution of polychlorinated biphenyls in an urban riparian zone affected by wastewater treatment plant effluent and the transfer to terrestrial compartment by invertebrates. Science of The Total Environment 463–464: 252-257. (in English) ["Highlights: •The distribution of PCBs in an urban riparian zone around a wastewater effluent affected river was investigated. •Relatively high abundances of PCB-11 and PCB-28 were found for most samples. •Mid-chlorinated congeners (PCB-153 and PCB-138) were more accumulated in chironomids and dragonflies as well as soil dwelling invertebrates. •Emerging invertebrates can carry waterborne PCBs to the terrestrial compartment. •The estimated annual flux of PCBs from emerging chironomids ranged from 0.66 to 265 ng m- 2·y- 1. Abstract: In this study, we investigated the distribution of polychlorinated biphenyls (PCBs) in a riparian zone affected by the effluent from a wastewater treatment plant (WWTP). River water, sediment, aquatic invertebrates and samples from the surrounding terrestrial compartment such as soil, reed plants and several land based invertebrates were collected. A relatively narrow range of d13C values was found among most invertebrates (except butterflies, grasshoppers), indicating a similar energy source. The highest concentration of total PCBs was observed in zooplankton (151.1 ng/g lipid weight), and soil dwelling invertebrates showed higher concentrations than phytophagous insects at the riparian zone. The endobenthic oligochaete Tubifex tubifex (54.28 ng/g lw) might be a useful bioindicator of WWTP derived PCBs contamination. High bioaccumulation factors (BAFs) were observed in collected aquatic invertebrates, although the biota-sediment/soil accumulation factors (BSAF) remained relatively low. Emerging aquatic insects such as chironomids could carry waterborne PCBs to the terrestrial compartment via their lifecycles. The estimated annual flux of PCBs for chironomids ranged from 0.66 to 265 ng·m- 2·y- 1. Although a high prevalence of PCB-11 and PCB-28 was found for most aquatic based samples in this riparian zone, the mid-chlorinated congeners (e.g. PCB-153 and PCB-138) became predominant among chironomids and dragonflies as well as soil dwelling invertebrates, which might suggest a selective biodriven transfer of different PCB congeners." (Authors)] Address: Wang, P., State Key Lab. Environ. Chemistry & Ecotoxicology, Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, Beijing, 100085, China. E-mail: bswang@rcees.ac.cn

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15844. Aubin, G.; Gaillard, E. (2014): Première preuve de l'autochtonie de Macromia splendens dans le bassin de l'Eyrieux (Ardèche) (Odonata: Macromiidae). Martinia 30(1): 29-34. (in French, with English summary) ["First evidence of the autochtony of Macromia splendens in the basin of the River Eyrieux (Ardèche department) (Odonata: Macromiidae). Summary: Four exuviae of M. splendens have been discovered in the Eyrieux River. These data allow spreading the distribution of this species about 35km northward, making the corresponding population the northernmost of the Rhone basin. This observation, which was realized within the framework of the Natura 2000 site FR8201658 "Vallée de l'Eyrieux et ses affluents" inventory, reinforces the interest of this singular area." (Authors)] Address: Aubin, G., Naturalia Environnement, site Agroparc, Le Moitessier, rue Lawrence Durrell, F-840911 Avignon, France. E-mail: g.aubin@naturalia-environnement.fr

15845. Battisti, A. (2014): Nuove segnalazioni di Sympecma paedisca (Brauer, 1882) (Odonata, Zygoptera) nel S.I.C. "Baraggia di Candelo - IT1130003" Biella (BI). Rivista Piemontese di Storia Naturale 35: 93-98. (in Italian, with English summary) ["S. paedisca is reported for the first time for the S.C.I. - Baraggia di Candelo, Biella, Italy. In this paper the results of the surveys made in the years 2009, 2010, 2011 and 2012 for this species and for S. fusca are reported." (Author)] Address: Battisti, A., Fraz. Feilley 101, Saint Vincent, 11027, Aosta, Italy. E-mail: andre.battisti@gmail.com

15846. Berquier, C.; Dommanget, J.-L.; Orsini, A.; Andrei-Ruiz, M.-C. (2014): Complément à l'atlas des odonates de Corse: Ischnura pumilio et Aeshna mixta, deux espèces à la phénologie particulière (Odonata: Coenagrionidae, Aeshnidae). Martinia 30(1): 35-39. (in French, with English summary) ["Thanks to the last surveys realized in the frame of the Regional action plan for Odonata which is implemented by the Corsican environmental office (OEC), the knowledge about the regional distribution, ecology and phenology of the Corsican dragonflies has been greatly improved. Several species which were for a long time considered as rare are in reality more common. They however show a shifted phenology which makes them easy to be missed by most of the observers. This is especially the case for I. pumilio and A. mixta." (Authors)] Address: Berquier, C., Office de l'Environnement de la Corse – Observatoire Conservatoire des Insectes de Corse, F-20250 Corte, France. E-mail: berquier@oec.fr

15847. Cássia da Cunha, R.; Fulan, J.A.; Santos, L.R. (2014): Influência das características físicas e químicas da água na distribuição espacial de larvas de Odonata associadas à Eichhornia crassipes (Mart.) Solms no Rio Uruapiara, afluente do Rio Madeira/AM - Influence of physical and chemical characteristics of water on spatial distribution of Odonata larvae associated with Eichhornia crassipes (Mart.) Solms in Uruapiara River, Madeira Basin, State of Amazonas, Brazil. Estud Biol. 36(86): 36-42. (in Portuguese, with English summary) ["The objective of this study was to identify the odonates associated with Eichhornia crassipes (Mart.) Solms, as well as investigate the main environmental variables that affect its spatial distribution in Uruapi-

ara River, Amazonas, Brazil. The macrophytes were sampled in a hollow square with total area of 0.120m². The removal of the larvae was performed with washing plant with carbonated water. We evaluated the following variables: temperatures of the air and water, dissolved oxygen, pH, turbidity, total phosphorus and total nitrogen. We identified total of 73 larvae distributed in the families Libellulidae (64) and Coenagrionidae (9).Libellulidae was represented by Erythemis, Micrathyria, Tauriphila and Nephepeltia and Coenagrionidae by Acanthagrion and Oxyagrion. A canonical correspondence analysis (CCA) showed that Tauriphila and Coenagrionidae were positively affected by the concentration of dissolved oxygen. Nephepeltia and Oxyagrion were negatively affected by increasing the dissolved oxygen. The study revealed that dissolved oxygen was the most significant factor in the distribution of larvae of Odonata in Uruapiara River."] Address: Cássia da Cunha, Rita, Especialista em Biologia da Conservação, Univde Federal do Amazonas (UFAM), Manaus, AM - Brasil. E-mail: cassiafloresta@hotmail.com

15848. Chovanec, A. (2014): Coenagrion ornatum (Selys, 1850) und Ophiogomphus cecilia (Fourcroy, 1785) (Insecta: Odonata) – Nachweis von zwei FFH-Arten an der Zaya (Niederösterreich). Beiträge zur Entomofaunistik 14: 1-11. (in German, with English summary) ["Coenagrion ornatum and Ophiogomphus cecilia, dragonflies listed in the Habitats Directive, were recorded at the river Zaya, a lowland river in the north-eastern Lower Austria. The two species occurred in a regulated stretch, characterised by low flow velocity and heterogeneous riparian structures. The results of the investigation of a restructured stretch situated upstream are also presented." (Author)] Address: Chovanec, A., Krotenbachgasse 68, 2345 Brunn am Gebirge, Austria. E-mail: a.chovanec@kabsi.at

15849. Clarke, D. (2014): The White-faced Darter (Leucorrhinia dubia Vander Linden) re-introduction project in Cumbria. Journal of the British Dragonfly Society 30(2): 54-78. (in English) ["L. dubia is a small dragonfly especially associated with bog-pools in peatlands. In England, there are only three areas (including one in Cumbria) where it has strong populations, most of its former sites having been lost due to habitat changes, mainly human-induced. A project in Cumbria aims to restore a population that once existed and was lost through afforestation in the mid 20th century. Approved by landowners and conservation bodies in 2008, an annual programme based on IUCN guidelines has been implemented from 2010 onwards to restore a colony at Cumbria Wildlife Trust's Foulshaw Moss Reserve near Morecambe Bay. The donor population, Scaleby Moss, is in north Cumbria. Translocation of larvae has been the main methodology, though experimentation with obtaining eggs began in 2013. Monitoring the populations at both sites, mainly by collecting exuviae at the breeding pools, has been the main measure for ensuring that the population at Scaleby Moss has not been adversely affected and for judging the efficacy of the translocations to Foulshaw Moss. Early years of the project were marred by poor summers but good numbers emerged at Foulshaw Moss in both 2013 and 2014, with clear evidence of on-site breeding. Flowever, it is too soon to say whether a sustainable colony has been established. The genetic diversity of the new population has yet to be assessed and a current University-based research study on the genetics of the species in the UK may prove helpful in this regard. The long-term management of the donor site remains a concern and reinforces the need for the current project, which will continue for several more seasons. A parallel re-introduction project in Cheshire commenced translocations in 2013." (Author)] Address: Clarke, D., Burnfoot, Cumwhitton, Brampton, Cumbria CA8 9EX, UK

15850. Compte-Sart, A., (2014): Nueva especie del género Lestes Leach, 1815 (Insecta, Odonata) del Mioceno de Bellver de Cerdanya (Lérida). Graellsia 70(1): e001. http://dx.doi.org/10.3989/graellsia.2014.v70.097: 10 pp. (in Spanish, with English summary) ["A new fossil species of insect, Lestes dianacompteae, n. sp. of the order Odonata, belonging to the genus Lestes Leach, 1815, is described based on wing from the Vallesian (Miocene), of Coll de Saig, in Bellver de Cerdanya (Lérida, Spain). It is compared with all fossil species of the genus and with the nearest extant species, from the Paleartic and Ethiopian regions." (Author)] Address: Compte-Sart, A., Museo Nacional de Ciencias Naturales. Departamento de Biodiversidad y Biología Evolutiva. Madrid, Spain.

15851. Curk, F.; Alcocer, A.; Bischoping, I. (2014): Primera cita de la libélula Aeshna juncea (Linnaeus, 1758) (Odonata: Aeshnidae) en la provincia de Teruel (España oriental). Boletín de la Sociedad Entomológica Aragonesa 55: 246. (in Spanish, with English summary) [An adult male of A. juncea was photographed at Toba dam, Orihuela del Tremedal (Teruel), 13-IX-2013.] Address: Curk, F., Lieu dit San Giustu 20215 Vescovato, Corsica, France. E-mail: franckoundara.curk@laposte.net

15852. Delphon, G.; Costes, A.; Alquiers, D.; Haber, E.; Polisset, P.; Pelozuelo, L. (2014): Nouvelles observations de Macromia splendens en région Midi-Pyrénées (Odonata: Macromiidae). Martinia 30(2): 47-58. (in French, with English summary) ["M. splendens is an iconic dragonfly species of the European fauna. Endemic to South-West of the continent and recognized as vulnerable in its range, it is one of the species taken into account by the French national action plan for Odonata. In the Midi-Pyrénées administrative region (South-Western France), this species was known to reproduce on several rivers: Tarn, Aveyron, Lot and Célé. To improve knowledge of the geographical distribution of this species, targeted surveys were conducted by the Office pour les insectes et leur environnement de Midi-Pyrénées (Opie-MP) in 2012 and 2013, in partnership with the Ligue pour la protection des oiseaux du Tarn (LPO81). 140 exuviae and at least 15 adults were observed during these two years, which demonstrates the presence of the species on several portions of the Lot and Célé rivers and on a significant part of the Aveyron River and its main tributary, the Viaur. The species was found in its classical substitution habitats (dams, including those linked to old mills), but also in a surprising anthropogenic habitat (fishing pond). However, M. splendens could not be found on the Tarn River, between Saint-Rome-de-Tarn and Ambialet, where it was known until 2009." (Author)] Address: Delphon,

Gaël, 17 route de Foix, F-09400 Amplaing, France. E-mail: gael.delpon@yahoo.fr

15853. Delpon, G.; Belenguier, L.; Krieg-Jacquier, R., Boeglin, Y.; Blanc, C. (2014): Comportement adaptatif de Leucorrhinia pectoralis lors de l'émergence en conditions de hautes eaux: conséquences pour la gestion conservatoire des populations (Odonata: Libellulidae). Martinia 30(1): 1-6. (in French, with English summary) ["Some surveys were conducted on the 9 June 2013 in the forest pond of Pizay (Ain department, France), looking for L. pectoralis. They led to the observation of unusual emergence conditions for this species, as exuviae were found in shaded riparian woods, on willow branches and trunks emerging from flooded areas up to more than 2 m high above the water level. These observations are detailed and connected with the particular weather conditions of this year." (Authors)] Address: Delpon, G., 17 route de Foix 09400 Amplaing, France. E-mail: gael.delpon@yahoo.fr

15854. Döler, H.-P.; Ehret, S. (2014): Zur Verbreitung der Speer-Azurjungfer (Coenagrion hastulatum) auf der östlichen Schwäbischen Alb (Odonata: Coenagrionidae). Mercuriale 14: 13-26. (in German, with English summary) ["In contrast to the negative population trend on the national scale records of C. hastulatum on the Eastern Swabian Alb (Germany) have increased since 1986. In the investigation area, in 27 sites records of C. hastulatum have currently been confirmed (evidence 2010 to 2014). The standing waters in this area are so-called Hülben (pools of anthropogenic origin) and smaller ponds. Most have an acidic and dystrophic character on account of the specific soil conditions (decalcified loam). The accompanying odonate fauna shows 31 species. Among them are 9 species, which are on the Red List of Baden-Württemberg. The significant increase of records of C. hastulatum at waters that are monitored since 1986 suggests a possible link between this trend and both the creation of new small ponds (regionally specific waters called 'Hülben') and periodic maintenance measures for existing waters already begun in the early 1980s and still continued so far. In addition, it is very likely that the increase in search intensity since 2010 has contributed to this positive result." (Authors)] Address: Ehret, S., Seligerstr. 45, 89537 Giengen/ Brenz, Germany. E-mail: Sven-ehret@web.de

15855. Dorji, T.; Thinley, K.; Jamstsho, S. (2014): Macroinvertebrate diversity in Threlpangand Kawajangsa freshwater streams in Bhutan. BeBIO 5(1): 1-5. ["… Despite the importance of freshwater biodiversity and macroinvertebrates as natural resources, the conservation threat assessment for macroinvertebrate in particular is limited throughout the world, and its study is at early stage in Bhutan. The current study describes the macroinvertebrate composition and diversity in two freshwater streams, viz., Threlpang and Kawajangsa streams located respectively in Trongsa and Thimphu districts of Bhutan. Macroinvertebrates were sampled in December 2011 (Threlpang) and 2012 (Kawajangsa) at two sampling reaches, upper less impaired and lower more impaired by human activities in both the streams. The study revealed total of 9 taxa within the study streams with 8 in Threlpang and 7 in Kawajangsa stream. Threlpang stream was dominated by Ephemeroptera (22.1%, n=19), followed by Plecoptera (20.9%, n=18), while Kawajangsa stream was dominated by Trichoptera (57.8%, n=122) followed by Diptera (15.6%, n=33). In both the streams macroinvertebrate composition changed from that of more pollution sensitive taxa in upper reaches to that of less pollution sensitive taxa in lower reaches." (Authors)] Address: E-mail: tdorji1.cnr@rub.edu.bt

15856. Eslami, Z.; Pashaei Rad, S.; Dumont, H.J. (2014): Sympetrum flaveolum (Odonata: Libellulidae) a new species record for Iran. Journal of Entomological Society of Iran 34(2): 71-74. (in English, with Persian summary) [1 ♀, Iran: Isfahan province, Chadegan suburb, 18.vii.2012, N 50°30' E 32°53, irrigation reservoir with poor vegetation.] Address: Eslami, Zohre, Dept Zool., Faculty Biol. Science, Shahid Beheshti Univ., Tehran, Iran. E-mail: eslmi.zohre86@yahoo.com

15857. Evangelio Pinach, J.M.; Díaz Martínez, C.; Sendra Pérez, I. (2014): Contribución al conocimiento de la odonatofauna (Odonata) en la serranía baja, el complejo lagunar de Ballesteros y el río Moscas (serranía media) de Cuenca (este de España). Boletín de la Sociedad Entomológica Aragonesa 55: 169-184. (in Spanish, with English summary) ["This work reports on the distribution of dragonflies in Cuenca (eastern Spain), specifically in the Serranía baja and in the lagoon complex of Ballesteros and river Moscas (Serranía media). We provide information for 45 species. Eight have been found for the first time in this area: Lestes virens, Coenagrion puella, Ischnura elegans, Ceriagrion tenellum, Aeshna mixta, Gomphus graslinii, Crocothemis erythraea and Sympetrum sanguineum. Four species (Lestes viridis, Gomphus simillimus, Onychogomphus forcipatus and S. striolatum) are included that have not been found in this area since the 1950s (Benitez, 1950, quoted by Anselin & Martin, 1986). A new record for S. meridionale is provided, this specie is not cited in this area since the early twentieth century (McLachlan, 1902b)." (Authors)] Address: Evangelio Pinach, J.M., Agente Medioambiental. Servicios Periféricos de la Consejería de Agricultura en Cuenca. Junta de Comunidades de Castilla-La Mancha, Spain. E-mail: jjevanach@hotmail.com

15858. Gauci, C. (2014): A review of the Odonata of the Maltese Islands. Journal of the British Dragonfly Society 30(2): 79-109. (in English) ["This paper is the result of five years of detailed observations of Odonata at several sites in the Maltese Islands. It updates the status and relative abundance of the various species. There is currently only one zygopteran Ischnura genei established on the Islands. Calopteryx virgo is considered a vagrant, while the occurrence of C. haemorroidalis, is considered to be highly doubtful. There are nine species of anisopterans which are established in the Islands, these being Anax imperator, A. parthenope, Orthetrum cancellatum, O. coerulescens, O. trinacria, Sympetrum fonscolombii, Crocothemis erythraea, Trithemis annulata and Selysiothemis nigra. Three more: O. nitidinerve, O. chrysostigma and Pantala flavescens, have recently been added to the Islands' list, while two – O. brunneum and S. striolatum - which were formerly considered common, are now very rare. A. ephipigger is a fairly regular migrant, appearing in considerable numbers in some

years. Aeshna mixta is rare but might be on the verge of establishing itself on the Islands, following a recent spate of records, including ovipositing females. Various inaccuracies and conflicting statements appearing in previous contributions are corrected. Observations on behaviour are included where these are of special interest as well as where they are in contradiction of what has been stated in the literature." (Author)] Address: Gauci, C., 28, Triq il-Kissier, Mosta, Malta

15859. Gerecke, R.; Marrone, F.; sorgi, G.; Dossena, M.; Stoch, F. (2014): The water mites (Acari: Hydrachnidia) of the standing waters of Corsica, Sardinia and Sicily: review and new data. Italian Journal of Zoology 81(3): 389-408. (in English) ["A compilation of our present knowledge of the water mites (Acari: Hydrachnidia) adapted to life in standing waters on the three large islands in the western Mediterranean (Corsica, Sardinia and Sicily) is provided. In addition to published data, this study deals with a rich volume of new material from recent field work, mostly deriving from intermittent ponds and pools, an extremely poorly investigated yet peculiar habitat type in the Mediterranean area. Species richness of water mites reported for the standing waters of the three islands amounts to 91 species. Out of the 47 species for which we present new distributional data, Hydrachna incisa Halbert, 1903, Hydrachna leegei Koenike, 1895, Piersigia limophila Protz, 1896, Hydryphantes crassipalpis Koenike, 1914 and Piona laminata (Thor, 1900) have not been recorded previously from the Mediterranean area. Most of these species were believed to have typical North European distributions. In addition to these, a further 13 species are recorded for the first time from the area covered. In total, 11 species are new for Italy, seven more are new for Sicily, three for Sardinia and seven for Corsica. Redescriptions are given of Axonopsis complanata (Müller, 1776) (A. graeca, nov. syn), Brachypoda baderi (reported for the first time after the original description from Abruzzo, Italy, synonymization with B. mutila rejected) and B. mutila (recorded for the first time outside Algeria with certainty). For each species, information is given on habitat preference and geographical distribution; the significance of the data is discussed under perspectives of zoogeography and nature protection. The completeness of our knowledge for the three investigated island is assessed using rarefaction curves and non-parametric estimators of species richness; while Sicily can be considered fairly well known, Corsica and Sardinia require further sampling to assess their water mite diversity." (Authors)] Address: Gerecke, R., Institut für Evolution und Ökologie, Abteilung Evolutionsbiologie der Invertebraten, Universität Tübingen, Germany, Biesingerstr. 11, 72070 Tübingen, Germany. E-mail: reinhard.gerecke@uni-tuebingen.de

15860. González-Soriano, E.; Novelo-Gutiérrez; R. (2014): Biodiversidad de Odonata en México. Revista Mexicana de Biodiversidad, Supl. 85: S243-S251. (in Spanish, with English summary) ["An up to date chapter on the Odonata of Mexico is presented. Since the last update in 2006, 5 new species were described, 11 new records were added and 14 species have been described in their larval stage. Hence, the Mexican list presented here is constituted by a total of 355 species. Comments on endemism, endangered species and/or at risk are included." (Authors)] Address: Gonzalez-Soriano, E., Depto Zoologia, Inst. Biol., Univ. Autonoma, Apartado Postal 70-153, 04510 Mexico, D.F., Mexico. E-mail: esoriano@mail.ibiologia.unam.mx

15861. Gremillion, G.; Humbert, J.S.; Krapp, H.G. (2014): Bio-inspired modeling and implementation of the ocelli visual system of flying insects. Biological Cybernetics 108(6): 735-746. (in English) ["Two visual sensing modalities in insects, the ocelli and compound eyes, provide signals used for flight stabilization and navigation. In this article, a generalized model of the ocellar visual system is developed for a 3-D visual simulation environment based on behavioral, anatomical, and electrophysiological data from several species. A linear measurement model is estimated from Monte Carlo simulation in a cluttered urban environment relating state changes of the vehicle to the outputs of the ocellar model. A fully analog-printed circuit board sensor based on this model is designed and fabricated. Open-loop characterization of the sensor to visual stimuli induced by self motion is performed. Closed-loop stabilizing feedback of the sensor in combination with optic flow sensors is implemented onboard a quadrotor micro-air vehicle and its impulse response is characterized.] Address: Gremillion, G., Dept of Aerospace Engineering, University of Maryland, College Park, MD 20742, USA. E-mail: gmgrem@umd.edu

15862. Haro, R.J. (2014): All along the watchtower: Larval dragonflies are promising biological sentinels for monitoring methylmercury contamination. Park Science 31(1): 70-73. (in English) ["Humans have used other organisms to detect environmental danger for centuries (e.g., the canary in the coal mine). The use of “biosentinels” has developed and expanded to become a mainstay for monitoring environmental contaminants like methylmercury, a pervasive and largely anthropogenic neurotoxin. Biosentinels provide insights on how and where contaminants are entering and moving through aquatic food webs. Many water bodies in the Great Lakes region, including those in national park units, have fish-consumption advisories because of the atmospheric deposition of mercury and its conversion into methylmercury, which can biomagnify. For many years young yellow perch served as the principal biosentinel for monitoring methylmercury. Resent research shows that the diverse assemblage of dragonflies in this region can provide an additional suite of biosentinels, complementing the use of perch among water bodies with fish and expanding the reach of methylmercury monitoring to include fishless ecosystems (e.g., small ponds and wetlands)." (Authors)] Address: Haro, R.J.; E-mail: rharo@uwlax.edu

15863. Kirby, D.; Kirby, M. (2014): Mixed pairing between Emerald Damselfly Lestes sponsa and Small Red Damselfly Ceriagrion tenellum. Atropos 52: 75. (in English) [Verbatim: Further to the observations of mixed pairings in L. sponsa reported by Pickess (2012) we wish to report another unusual pairing of damselflies. On 11-VII- 2014 we visited Cors Caron, Ceredigion, on a sunny and warm day with a moderate breeze. At around 13.00hrs we noticed a

female C. tenellum f. typica paired with a male L. sponsa. We watched them for a few minutes as they remained in tandem but stayed low in the vegetation without any attempt to fly off or L. sponsa (♂) paired with C. tenellum (♀). I do not get the chance to see C. tenellum very often and had been hoping to see the species as Cors Caron is a known breeding site. To see one in these circumstances was particularly memorable, however. Reference: Pickess, B.P., 2012. Mixed pairings: are male Emerald Damselfly Lestes sponsa short-sighted or desperate? Atropos 12: 76-77.] Address: David & Meg Kirby, Hafodwen, Cae Melyn, Aberystwyth, Ceredigion, SY23 2HA, UK

15864. Klecka, J. (2014): The role of a water bug, Sigara striata, in freshwater food webs. PeerJ 2:e389; DOI 10.7717/peerj.389: 16 pp. (in English) ["Freshwater food webs are dominated by aquatic invertebrates whose trophic relationships are often poorly known. Here, I used laboratory experiments to study the role of a water bug, Sigara striata, as a potential predator and prey in food webs of stagnant waters.Multiple-choice predation experiment revealed that Sigara, which had been considered mostly herbivorous, also consumed larvae of Chironomus midges. Because they often occur in high densities and are among the most ubiquitous aquatic insects, Sigara water bugs may be important predators in fresh waters. A second experiment tested the role of Sigara as a potential prey for 13 common invertebrate predators.Mortality of Sigara inflicted by different predators varied widely, especially depending on body mass, foraging mode (ambush/searching) and feeding mode (chewing/suctorial) of the predators. Sigara was highly vulnerable to ambush predators, while searching predators caused on average 8.1 times lower mortality of Sigara. Additionally, suctorial predators consumed on average 6.6 times more Sigara individuals than chewing predators, which supports previous results hinting on potentially different predation pressures of these two types of predators on prey populations. The importance of these two foraging-related traits demonstrates the need to move from body mass based to multiple trait based descriptions of food web structure. Overall, the results suggests that detailed experimental studies of common but insufficiently known species can significantly enhance our understanding of food web structure." (Authors)] Address: Klecka, J., Laboratory of Theoretical Ecology, Biology Centre of the Academy of Sciences of the Czech Republic, Institute of Entomology, Ceské Budjejovice, Czech Republic. E-mail: jan.klecka@entu.cas.cz

15865. Kok, J.M.; Chahl, J.S. (2014): Optimisation of a dragonfly-inspired flapping wing-actuation system. International Journal of Mechanical, Aerospace, Industrial and Mechatronics Engineering 8(9): 1459-1466. (in English) ["An optimisation method using both global and local optimisation is implemented to determine the flapping profile which will produce the most lift for an experimental wing-actuation system. The optimisation method is tested using a numerical quasi-steady analysis. Results of an optimised flapping profile show a 20% increase in lift generated as compared to flapping profiles obtained by high speed cinematography of a Sympetrum frequens dragonfly. Initial optimisation procedures showed 3166 objective function evaluations. The global optimisation parameters - initial sample size and stage one sample size, were altered to reduce the number of function evaluations. Altering the stage one sample size had no significant effect. It was found that reducing the initial sample size to 400 would allow a reduction in computational effort to approximately 1500 function evaluations without compromising the global solvers ability to locate potential minima. To further reduce the optimisation effort required, we increase the local solver's convergence tolerance criterion. An increase in the tolerance from 0.02N to 0.05N decreased the number of function evaluations by another 20%. However, this potentially reduces the maximum obtainable lift by up to 0.025N." (Authors)] Address: Kok, J.M., School Engineering, Univ. South Australia, Mawson Lakes, South Australia, 5095, Australia

15866. Korkeamäki, E. (2014): Newly formed wetland pools for Leucorrhinia pectoralis: Monitoring results 2013. 13 pp. (in Finnish, with English summary) ["This article examines the factors that affect the colonization of Odonata in new habitats, especially newly formed wetland pools. Wetland pools were dug in Lintulahdet Life project to the shore areas to provide a suitable living environment for odonates. The special target species was L. pectoralis. The persistence of Odonata populations was studied by the monitoring with exuviae and adults. The monitoring in the years 2005-2008 and 2013 showed that L. pectoralis and many other dragonfly species inhabited the newly formed pools. Potential restoration managements are briefly discussed." (Author)] Address: Korkeamäki, E., Karkunkatu 18 a 4 b, 48600 Karhula, Finland.

15867. Kottawa-Arachchi, J.D.; Gamage, R.N.; Jayathilake, G.G. (2014): The role of different ecosystems to maintain odonate and butterfly diversity in Mattakelle Tea Estate, Sri Lanka. Proceedings of the International Forestry and Environment Symposium 2014 of the Department of Forestry and Environmental Science, University of Sri Jayawardenepura, Sri Lanka: 133-134. (in English) [Verbatim: A survey on dragonfly and butterfly was conducted at Mattakelle Tea Estate with the objective of assessing the significance of a given tea plantation ecosystem in maintaining dragonfly and butterfly diversity. Odonate and butterfly communities of selected different habitats (seasonal stream, home gardens, small reservoir, Eucalyptus plantation, tea field, marshy land and secondary forest) assessed using line transect method. Dragonfly and butterfly counts were made along two 100 m x 10 m line transects and 30 minutes were spent at each habitat starting from 6.30 – 7.00 am in the morning and same methodology was repeated in all habitats. Other ecological parameters such as air and water temperatures, %RH, pH and EC were also recorded. The intensity of observations was 8 days per month. During two months sampling, 13 species of Odonata and 46 species of butterflies were recorded. Interestingly, 7 dragonfly and 8 butterfly species are in the national threatened category. Present study indicated that small scale reservoir and marshy land habitats maintain the highest dragonfly diversity recording 10 and 8 species where Shannon index (H) = 2.17 and 2.01, respectively. Conversely, home garden and secondary forest habitats recorded significant butterfly diversity with 33 and 32 species

where (H) = 3.31 and 3.28, respectively. This can be explain, as the home garden and secondary forest habitats are well-structured with more plant species that provide feeding and nectarine plants for butterflies. Continuous water supply and water quality may support to maintain highest dragonfly diversity in small reservoir and marshy land habitats. Water sources in home garden and secondary forest have been dried in study period therefore dragonfly diversity was relatively low. Some of the recorded odonate taxa can be used as reliable indicators of ecosystem health. Vegetation structure and the complexity of the ecosystem in tea plantations play a vital role in sustaining odonate and butterfly fauna. Several conservation measures such as increasing plant diversity, introduction of shade trees, feeding and nectarine plants and conduct of good agricultural practices are recommended to protect and conserve odonate and butterfly diversity.] Address: Kottawa-Arachchi, J.D., Hill-Country Environment Association, Tea Research Institute, Talawakelle, Sri Lanka. E-mail: jeevan1188@yahoo.com

15868. Krieg-Jacquier, R.; Deliry, C., Bricault, B.; Jacquiera, C. (2014): Autochtonie d'Oxygastra curtisii au lac d'Aiguebelette (Odonata: Corduliidae). Martinia 30(1): 23-28. (in French, with English summary) ["Autochthony of O. curtisii at the lake of Aiguebelette). From 2008, odonatological surveys allowed the discovery of several populations of O. curtisii in the Ain department, where only two observations of presumed erratic specimens were previously made. Investigations were then widened out of this department to the closest parts of the south of the Jura Mountains and led to the discovery of the species at the lake of Aiguebelette." (Author)] Address: Krieg-Jacquier, R., 18, rue de la Maconne, F-73000 Barberaz, France. E-mail: regis.krieg.jacquier@gmail.com

15869. Liu, B.-p. (2014): Research on Technique of Still-hunt for Catching Anax parthenope julius Brauer. Journal of Anhui Agricultural Sciences 41(28): 11383-11385. (in Chinese, with English summary) ["Anax parthenope julius Brauer has a nice invigorant effect to kidney. A village called Fangliutian which located in central China was selected as the trial venue for research on technique of still-hunt for catching A. parthenope and other big dragonflies. First of all, resources of dragonflies in the venue were investigated, then the catching web was made and improved, catching time and place was selected, finally, technique of still-hunt for catching big dragonflies was explored and improved. As a result, 60 A. parthenope and 32 big dragonflies which coded OA-1 were caught. Gist of the technique of still-hunt for catching big dragonflies as! the web should be green and bolted on the stiff loop which fixed with a bamboo pole, catcher should wear in red clothes or green camouflage uniform, a gentle line should be tied from the end of the web to the bamboo pole that easy to pull, the catching time should be sunny afternoon in summer, catching place should be a place convenient for the procedure and near a point that the dragon always flied by and little or no float grass in the water lest the head of the dragon maybe apart on the tangle catching procedure among the web and float grass. The technique of still-hunt for catching big dragonflies could be used to catch A. parthenope and other big dragonflies." (Authors)] Address: Liu, B.p., College of Life Science, Northeast Agricultural Univ., China. E-mail: liubaoping323@ 126. com

15870. Liu, Y.; Gao, X. (2014): Overview of Odonata insect resources in Luoyang area. Shandong Agricultural Sciences 46(5): 109-112. (in Chinese, with English summary) ["To realize the diversity of Odonata insects in Luoyang area, the samples were collected and investigated in 9 counties and 2 districts of Luoyang area from 2010 to 2013. Finally, more than 700 samples were gathered. They belonged to 57 species, 37 genera, 15 families and 6 superfamilies. According to this survey, the directory of Odonata insects in Luoyang area was listed, and the numbers of genera and species in each family were analyzed." (Authors)] Address: Liu, Y., Henan Forestry Vocational College,Luoyang 471002,China

15871. Luglia, M.; Luglia, T.; Delasalle, J.-F. (2014): Bilan des prospections 2003-2009 en Guyane française avec Acanthagrion minutum nouveau pour le département (Odonata: Conagrionidae). Martinia 30(2): 75-83. (in French, with English summary) ["The authors present the results and the outlooks of their odonate survey carried out in the French Guiana from 2003 to 2009. 369 specimens involving 12 families, 49 genera and 81 species have been captured, with A. minutum being new for the country. A quick compilation of our knowledge on this species is done, followed by an overall description of the habitat where it was observed." (Authors)] Address: Luglia, M., 23 avenue Victor Hugo, 13170 Les Pennes-Mirabeau, France. E-mail: mathieu.luglia@gmail.com

15872. Malikova, E.I.; Haritonov, A.Yu. (2014): On the fauna of Odonata of Orenburgskaya Oblast. Eurasian Entomological Journal 13(4): 329-333. (in Russian, with English summary) ["49 species of Odonata are listed for Orenburgskaya Oblast by recent materials and literature data. 3 species, Ischnura pumilio, Aeshna serrata, Anax p. parthenope, are reported for the first time from the territory." (Authors)] Address: Malikova, Elena, Blagoveshchensk State Pedagogical University, Lenina str., 104, Blagoveshchensk, 675004, Russia. E-mail: e_malikova@inbox.ru

15873. Nicolai, B.; Mammen, K. (2014): Zum Vorkommen der Libellen bei Halberstadt (Nordharzvorland) und die Phänologie von Coenagrion mercuriale und Orthetrum coerulescens (Odonata). Abhandlungen und Berichte aus dem Museum Heineanum 10: 93-112. (in German, with English summary) ["From 2008 to 2014, the dragonfly fauna was observed in a small area near Halberstadt (Sauteichsgraben/ Goldbach/retention basins). A total of 35 species were recorded, with 21 species can be considered as indigenous (at least once mating flights, egg oviposition or newly emerged odonates were found). For the species C. mercuriale, O. coerulescensand O. brunneum data for phenology and biology are given. The presence was noted in detail in C. mercuriale (19.05.-10.08.), O. coerulescens ([27.05.]02.06.-28.08.) and O. brunneum (02.06.-10.08.). Species richness, occurrence of some species mentioned in the Red List of endangered odonates and the outstanding occurence of the FFH-spe-

cies C. mercuriale show the large nature conservation importance of the area. Measures for protection and management of the area were already proposed by NICOLAI & MAMMEN (2009). On their necessity and consistent implementation are explicitly stated." (Authors)] Address: Nicolai, B., Museum Heineanum, Domplatz 36, 38820 Halberstadt, Germany. E-mail: nicolai@halberstadt.de

15874. Nieoczym, M.; Kloskowski, J. (2014): Responses of epibenthic and nektonic macroinvertebrate communities to a gradient of fish size in ponds. Journal of limnology 74(1): 50-62. (in English) ["Size relationships between fish and organisms from adjacent trophic levels are crucial for predicting the structure and dynamics of aquatic ecosystems. We compared macroinvertebrate communities along a fish-size gradient created by separate stocking of three age cohorts of common carp Cyprinus carpio in semi-natural ponds. The specific size range of fish (small, medium and large) corresponding to fish age in ponds was the factor most strongly associated with macroinvertebrate composition. The other significant habitat variables were dissolved oxygen concentration in the water and submerged vegetation abundance in the open-water zone. Among the most numerous taxa in the ponds, relative abundances of Hirudinea, Gastropoda, Odonata and Coleoptera were larger in the presence of small-sized than of larger-sized carp. However, fish size effect was not linear, in that macroinvertebrate assemblages were less similar between ponds containing medium- vs large-sized fish than between ponds with small- vs. large-sized fish. The dissimilarity patterns were mainly determined by disparities in abundance of Corixidae, which unlike other taxa common in the ponds occurred in the greatest numbers in the presence of large-sized carp. Macroinvertebrate diversity was greatest in ponds with small-sized fish and was positively related to emergent macrophyte cover. Enhancement of emergent vegetation is recommended as the most effective management strategy to buffer adverse impacts of fish on macroinvertebrates. If fish are present in the system, assessment of the size structure of fish populations can be advantageous in unravelling the essential processes driving the variation in pond communities." (Authors)] Address: Nieoczym, M., Dept Zoology, Animal Ecology & Hunting, Univ. Life Sciences, Akademicka 13, 20-033 Lublin, Poland. E-mail: mnieoczy@wp.pl

15875. Ohtaka, A.; Uenishi, M.; Wulandari, L.; Liwat, Y.; Ardianor; Gumiri, S.; Nagasaka, M.; Fukuhara, H. (2014): Structure and abundance of “interrhizon” invertebrates in an oxbow lake in the peat swamp area of Central Kalimantan, Indonesia. Limnology 15(2): 191-197. (in English) ["The faunal composition of “interrhizon” invertebrate communities associated with submerged parts of three kinds of macrophytes, Eichhornia crassipes, Gramineae spp. and Polygonum tomentosum, were studied in an oxbow lake, Lake Tundai, with acidic water (pH 3.9–4.4) in the peat swamp area of Central Kalimantan. The pH, turbidity, and chlorophyll-a concentration in the surface waters tended to be higher in macrophyte stands than in open waters near the stands. Thirty-one taxa belonging to three groups of invertebrates, Arachnida, Insecta, especially chironomids, and Isopoda, were found from the root systems, of which insects were the most abundant in every macrophyte stand. The interrhizon invertebrates accounted for 0.16–8.7 g wet wt m-2 among three vegetational stands. The diversity and abundance of interrhizon invertebrates are low in Lake Tundai; this could be due to low pH and/or low productivity in the lake water ... Odonata. Coenagrionidae gen. sp. – … Libellulidae gen. sp.]” (Authors): Address: Ohtaka, A., Faculty of Education, Hirosaki University, Hirosaki, Aomori, 036-8560, Japan. E-mail: ohtaka@cc.hirosaki-u.ac.jp

15876. Parr, A.J. (2014): Migrant and dispersive dragonflies in Britain during 2012 and 2013. Journal of the British Dragonfly Society 30(2): 110-124. (in English) ["The years 2012 and 2013 were quite eventful for migrant and dispersive species in Britain. Sympetrum fonscolombii in particular appeared in good numbers during both years, though local breeding was more noticeable during 2012. After record-breaking appearances of Anax ephippiger during 2011, another major influx was also noted during autumn 2013. A. parthenope, by contrast, had a poor year in 2013, though appearances in the preceding year had been at above-average levels. Species such as S. danae and Ischnura pumilio showed some notable migratory movements during the period, and rarer migrants similarly produced a number of highlights. The second and third British records of Leucorrhinia pectoralis were, for instance, made in coastal Suffolk during late spring 2012, whilst a single Sympetrum vulgatum was noted in Kent during autumn 2013. Recent colonist species also fared well during the reporting period, with Lestes barbarus, Coenagrion scitulum and Aeshna affinis all holding their own. Populations of Chalcolestes viridis continued to strengthen, and some range expansion was noted, particularly in East Anglia. In addition to these newcomers, regular records of Anaciaeshna isoceles from the Westbere region of East Kent hint at the presence of a newly-established population of the species that might well be of immigrant origin (another, confirmed, new population at Paxton Pits, Cambridgeshire, is more likely to be of local derivation)." (Author)] Address: Parr, A.J., 10 Orchard Way, Barrow, Bury St Edmunds, Suffolk, IP29 5BX, UK

15877. Rafay, M.; Hussain, T.; Ruby, T.; Rehman, F.; Ahmad, I.; Abdullah, M. (2014): Role of weeds in creating Agro Ecological stability. Pak. J. Agri. Sci. 51(3): 531-538. (in English) ["We devised a study to ascertain the role of weeds in agro-ecosystem. Therefore, we made seasonal cataloguing of the line data on multiple crops i.e., sugarcane, fodder, wheat and mustard to see crops’ viability and role of weeds’ diversity in preventing insect outbreaks by reducing crop productivity losses. We found that out of fifteen weed species, 11 weed species were of broad-leaved category while four were of pointed-leaves. The arthropodfauna included insect pest-species from Orthoptera, Hemiptera and Lepidoptera that used weeds as priority food. Besides that, some specific zoophagous insect-predators belonging to orders Odonata (Lestes sp.), Coleoptera, Hymenoptera and Araneae were documented on similar weeds, for food, shelter and egg-laying. In the light of our observations, we concluded that there is a significant role of weeds in a crop-system that may support other essential life forms in creating ecological balance." (Authors)] Ad-

dress: Rafay, M., Dept of Forestry, Range & Wildlife Management, The Islamia University of Bahawalpur, Pakistan. E-mail: rafay@iub.edu.pk

15878. Rees, H.C.; Maddisonm, B.C.; Middleditch, D.J.; Patmore, J.R.M.; Gough, K.C. (2014): The detection of aquatic animal species using environmental DNA – a review of eDNA as a survey tool in ecology. Journal of Applied Ecology 51(5): 1450-1459. (in English) ["(1) Knowledge of species distribution is critical to ecological management and conservation biology. Effective management requires the detection of populations, which can sometimes be at low densities and is usually based on visual detection and counting. Recently, there has been considerable interest in the detection of short species-specific environmental DNA (eDNA) fragments to allow aquatic species monitoring within different environments due to the potential of greater sensitivity over traditional survey methods which can be time-consuming and costly. (2) Environmental DNA analysis is increasingly being used in the detection of rare or invasive species and has also been applied to eDNA persistence studies and estimations of species biomass and distribution. When combined with next-generation sequencing methods, it has been demonstrated that entire faunas can be identified. (3) Different environments require different sampling methodologies, but there remain areas where laboratory methodologies could be standardized to allow results to be compared across studies. (4) Synthesis and applications. We review recently published studies that use eDNA to monitor aquatic populations, discuss the methodologies used and the application of eDNA analysis as a survey tool in ecology. We include innovative ideas for how eDNA can be used for conservation and management citing test cases, for instance, the potential for on-site analyses, including the application of eDNA analysis to carbon nanotube platforms or laser transmission spectroscopy to facilitate rapid on-site detections. The use of eDNA monitoring is already being adopted in the UK for ecological surveys." (Authors)] Address: Rees, Helen, ADAS UK Ltd, School of Veterinary Medicine & Science, Univ. Nottingham, Sutton Bonington Campus, Loughborough, Leicestershire, UK. E-mail: helen.rees@adas.co.uk

15879. Ruffoni, A.; Itrac-Bruneau, R.; Varanguin, N. (2014): Première observation d'Onychogomphus uncatus avec indice d'autochtonie dans le département de l'Yonne (Odonata: Gomphidae). Martinia 30(2): 62-63. (in French) [26-VII- 2014, O. uncatus at Charny along the Ouanne river (Yonne department), France] Address: Ruffoni, A., Société d'histoire naturelle d'Autun, Maison du Parc, F-58230 Saint-Brisson, France. E-mail: shna.ruffoni@orange.fr

15880. Ruffoni, A. (2014): Un mâle d'Erythromma viridulum prisonnier temporaire d'une ponte de Libellula depressa (Odonata: Coenagrionidae, Libellulidae). Martinia 30(1): 7-9. (in French, with English summary) ["A male of E. viridulum temporally trapped by a batch of eggs of L. depressa: Numerous and various cases of odonate adults being trapped by living organisms have been reported. Most of the cases which concern an accidental capture refer to plants. Here, we are dealing with a male of E. viridulum who had a leg accidentally trapped by a sticky batch of eggs of L. depressa. The male finally got free and flew off. To our knowledge, this kind of capture is published for the first time.] Address: Ruffoni, A., Maison du Parc, 58230 Saint-Brisson, France. E-mail: shna.ruffoni@orange.fr

15881. Saha, N.; Aditya, G.; Saha, G.K. (2014): Prey preferences of aquatic insects: potential implications for the regulation of wetland mosquitoes. Medical and Veterinary Entomology 28(1): 1-9. (in English) ["Wetlands are potential sites for mosquito breeding and are thus important in the context of public health. The use of chemical and microbial controls is constrained in wetlands in view of their potential impact on the diverse biota. Biological control using generalist aquatic insects can be effective, provided a preference for mosquito larvae is exhibited. The mosquito prey preferences of water bugs and larvae of odonate species were evaluated using chironomid larvae, fish fingerlings and tadpoles as alternative prey. Manly's selectivity (ai) values with 95% confidence intervals (CIs) were estimated to judge prey preference patterns. Multivariate analysis of variance (manova) and standardized canonical coefficients were used to test the effects of density on prey selectivity. The ai values indicated a significant preference ($P < 0.05$) in all of the insect predators tested for mosquito larvae over the alternative prey as a density-dependent function. On a comparative scale, chironomid larvae had the highest impact as alternative prey. In a multiple-prey experiment, predators showed a similar pattern of preference for mosquito larvae over alternative prey, reflecting a significant ($P < 0.05$) niche overlap. The results suggest that, in a laboratory setting, these insect predators can effectively reduce mosquito density in the presence of multiple alternative prey... and the larvae of the odonate species Brachydiplax chalybea chalybea...]" (Authors) Address: Saha, Nabaneeta, Dept of Zoology, University of Calcutta, 35 Ballygunge Circular Road, Kolkata 700019, India. E-mail: nabaneetasaha@gmail.com

15882. Singh, M.K. (2014): Studies on the experimental control of dragonfly larvae Brachythemis contaminata (Fabr.) (Anisoptera: Libellulidae) with insecticides and bio-insecticides in the laboratory. International journal of scientific research 3(10): 45-47. (in English) ["The studies on the control of Odonata larvae B. contaminata by insecticides and bioinsecticides were carried out in the laboratory. The results suggest that insecticide and bioinsecticide of different concentrations of Endosulfan, Nuvan, Malathion, Indoneem and a combination of Endosulfan+Indoneem are very effective to eradicate the larvae B. contaminata from fishponds. The present study will be useful for proper preparation of the fish nursery ponds of stocking spawn of carp for better management of fish production practices." (Author)] Address: Singh, M.K., Dept of Biotechnology, AVS Presidency International College, Mana, Raipur-492001(C.G) India

15883. Swoszowski, F. (2014): Découverte de Lestes dryas dans le Val-d'Oise suite à la mise en oeuvre de travaux de restauration d'une mare (Odonata: Lestidae). Martinia 30(2): 41-45. (in French) ["L. dryas new species to Val-d'Oise department occurring after a pond restoration

(Odonata: Lestidae): The first record of L. dryas in the Val-d'Oise department in 2012 is related. Autochthony was confirmed in 2013. This discovery occurs after the implementation of the restoration of a pond in an alluvial sector."] Address: Swoszowski, Florie, Parc naturel régional du Vexin français, Maison du parc, F-95450 Théméricourt, France. E-mail: f.swoszowski@pnr-vexin-francais.fr

15884. Tornero, I.; Sala, J.; Gascón, S.; Àvila, N.; Quintana, X.D.; Boix, D. (2014): Aquatic macrofauna of Vila Nova de Milfontes temporary ponds, with the first record of Cyphon hilaris Nyholm, 1944 (Coleoptera: Scirtidae) from Portugal. Boletín de la Sociedad Entomológica Aragonesa 55: 326-330. (in English, with Spanish summary) ["The aquatic community of 12 temporary ponds located in Vila Nova de Milfontes (south-western Portugal) was sampled in April 2013. We identified a total of 78 taxa, of which insects were the best represented group (59 taxa), with 29 coleopterous taxa, 11 heteropterous taxa and 5 odonate taxa, among others. ..." (Authors) Aeshna mixta, Coenagrionidae indet., Lestes sp., Sympetrum fonscolombii, S. striolatum] Address: Tornero, Irene, Institut d'Ecologia Aquàtica, Universitat de Girona, Facultat de Ciències, Campus Montilivi, E-17071 Girona, Catalonia, Spain. E-mail: irene.tornero1987@gmail.com

15885. Tsubaki, Y. (2014): Forest light environment as the cradle or forest biodiversity: thermal ecology of Mnais damselflies. Tombo 56: 49-56. (in Japanese, with English summary) ["Forests have a complex mosaic of light environments that differ in color and brightness as well as a mosaic of thermal environments that differ between shade and light. In this paper, I review studies on habitat selection and reproductive behavior of forest-dwelling damselflies (Mnais costalis and M. pruinosa) in response to forest light environments. Measurement of canopy openness in a forest habitat in Kinki district, where two species coexist, revealed that M. costalis preferred sunny habitats while M. pruinosa preferred shady habitats. Species-specific differences in physiological responses to abiotic factors of habitats have been suggested to cause habitat segregation. Our observations on reproductive behavior suggests that habitat thermal condition is an important factor for habitat selection in Mnais damselflies, because thermal conditions strongly influence the degree to which Mnais can perform physiological and behavioral activities, and this will therefore influence fitness. Copulation success of males in relation to insolation conditions of territorial sites was shown that M. costalis males were successful at sunny territorial sites. This was partly because males at sunny sites have higher body temperatures and are able to perform intensive courtship displays toward females. In contrast, mating success of M. pruinosa males was not influenced by the insolation condition at territorial sites, probably because males of this species do not show any courtship display. Human-induced forest disturbance alters the geometry of forests, and will significantly affect all the components of fitness that depend on light for both animals and plants. We need detailed knowledge of forest-dwelling species in its natural light environment in order to understand what goes wrong when its habitat is disturbed." (Author)] Address: E-mail: mnais.pruinosa@me.com

15886. Van Buskirk, J. (2014): Incipient habitat race formation in an amphibian. Journal of Evolutionary Biology 27(3): 585-592. (in English) ["Theory defines conditions under which sympatric speciation may occur, and several possible examples of the process in action have been identified. In most cases, organisms specialize onto habitats that fall into discrete categories, such as host species used by herbivores and parasites. Ecological specialization within a continuous habitat gradient is theoretically possible, but becomes less likely with increasing gene flow among clinal habitat types. Here, I show that habitat race formation is underway in a frog, Rana temporaria, along a continuous and spatially mosaic habitat gradient. Tadpoles from 23 populations raised in an outdoor mesocosm experiment showed adaptive phenotypic variation correlated with the predator density in their pond of origin. A survey of microsatellite markers in 48 populations found that neutral genetic divergence was enhanced between ponds with very different densities of predators. This represents a new example of habitat specialization along a continuous habitat gradient with no spatial autocorrelation in habitat." (Author) larval libellulid and corduliid dragonflies] Address: Buskirk, J. van, Inst. Zoology, Univ. of Zürich, CH-8057 Zürich, Switzerland. E-mail: jvb@zool.unizh.ch

15887. Villanueva, R.J.T.; Dow, R.A. (2014): Review of the Philippine taxa formerly assigned to the genus Amphicnemis Selys, II. Genus Sangabasis with descriptions of eight new species (Odonata: Coenagrionidae). Zootaxa 3815(1): 1-28. (in English) ["The Philippine genus Sangabasis Villanueva is reviewed. Eight new species are described: S. bukid sp. nov., S. bulba sp. nov., S. cahilogi sp. nov., S. carmelae sp. nov., S. feliculoi sp. nov., S. hamis sp. nov., S. janvantoli sp. nov., and S. zamboanga sp. nov." (Authors)] Address: Villanueva, R.J.T., D3C Gahol Apartment, Lopez Jaena St., PH-8000 Davao, Philippines. E-mail: rjtvillanueva@gmail.com

15888. Vince, A.; Bodor, T.; Jakab, T.; Miskolczi, M.; Devai, G. (2014): Data on the dragonfly (Odonata) fauna of the small water courses in the landscape Dél-Nyirség (NE-Hungary). Studia odonatol. hung. 16: 67-79. (in Hungarian, with English summary) ["The authors present faunistical data on dragonflies collected (larvae, exuviae and adults) and observed (adults) from the small water courses in the lowland area of the geographical region Dél-Nyírség (NE-Hungary). Firstly the authors offer a brief survey of the faunistical results of the odonatological researches carried out up till now in the ET 56 UTM grid map cell. Secondly they present the methods employed in the collection of specimens and in data processing, and introduce the literature they have considered in the identification of species and in reporting faunistical data. Finally they provide a detailed survey of the collection and observation results from the area and summarize and evaluate the data on the dragonfly fauna. Collections were made in one year (2013), with the participation of four specialists on 25 days and six localities altogether, in one cell (ET 56) of the 10×10 km UTM grid map. In the report, information on 336 specimens (220 males, 112 females, 4 specimens with undecided sex) are given in detail [19 larvae (8 males, 9 females, 2 with undecided sex), 103 exuviae (61 males, 40

females, 2 with undecided sex), 214 adults (151 males, 63 females)], with the observed adults representing altogether 224 faunistical data (16 larvae, 30 exuviae, 171 collected and 7 observed adults). In this study 29 species (14 Zygoptera and 15 Anisoptera) were found to occur in the area, out of which 1 belongs to the very frequent, 14 to the frequent, 9 to the less frequent, 3 to the rare and 2 to the sporadic class of country-wide occurrence frequency." (Authors)] Address: Jalab, T., Kossuth Lajos Secondary Grammar School, Baross Gábor út 36, H-5350 Tiszafüred, Hungary

15889. Wittmann, H. (2014): Über einige Libellennachweise aus dem Bundesland Kärnten. Salzburger Entomologische Arbeitsgemeinschaft - Haus der Natur 2/2014: 2-10. (in German) [Austria, Carintha; records of the following species are documented: Aeshna caerulea, A. cyanea, A. juncea, Coenagrion hastulatum, Cordulegaster bidentata, Enallagma cyathigerum, Libellula depressa, L. quadrimaculata, Pyrrhosoma nymphula, Somatochlora alpestris, Sympecma fusca, Sympetrum striolatum] Address: Wittmann, H., Haus der Natur – Museum für Natur und Technik, Museumsplatz 5, 5020 Salzburg, Austria. E-Mail: helmut.wittmann@hausdernatur.at

15890. Wong, W.H.; Tay, Y.C.; Puniamoorthy, J.; Balke, M.; Cranston, P.S.; Meier, R. (2014): "Direct PCR" optimization yields a rapid, cost-effective, non-destructive, and efficient method for obtaining DNA barcodes without DNA extraction. Molecular Ecology Resources 14(6): 1271-1280. (in English) ["Macroinvertebrates that are collected in large numbers pose major problems in basic and applied biodiversity research: identification to species via morphology is often difficult, slow and/or expensive. DNA barcodes are an attractive alternative or complementary source of information. Unfortunately, obtaining DNA barcodes from specimens requires many steps and thus time and money. Here, we promote a short cut to DNA barcoding, that is, a nondestructive PCR method that skips DNA extraction ('direct PCR') and that can be used for a broad range of invertebrate taxa. We demonstrate how direct PCR can be optimized for the larvae and adults of nonbiting midges (Diptera: Chironomidae), a typical invertebrate group that is abundant, contains important bioindicator species, but is difficult to identify based on morphological features. After optimization, direct PCR yields high PCR success rates (>90%), preserves delicate morphological features (e.g. details of genitalia, and larval head capsules) while allowing for the recovery of genomic DNA. We also document that direct PCR can be successfully optimized for a wide range of other invertebrate taxa that need routine barcoding (flies: Culicidae, Drosophilidae, Dolichopodidae, Sepsidae; sea stars: Oreasteridae). Key for obtaining high PCR success rates is optimizing (i) tissue quantity, (ii) body part, (iii) primer pair and (iv) type of Taq polymerase. Unfortunately, not all invertebrates appear suitable because direct PCR has low success rates for other taxa that were tested (e.g. Coleoptera: Dytiscidae, Copepoda, Hymenoptera: Formicidae and Odonata). It appears that the technique is less successful for heavily sclerotized insects and/or those with many exocrine glands." (Authors)] Address: Wong, W.H., Dept of Biological Sciences, National Univ. of Singapore, 14 Science Drive 4, Singapore, 117543, Singapore

15891. Xu, M.; Wang, Z.; Pan, B.; Yu, G. (2014): The assemblage characteristics of benthic macroinvertebrates in the Yalutsangpo River, the highest major river in the world. Frontiers of Earth Science 8(3): 351-361. (in English) ["Aquatic ecosystems of highland rivers are different from those of low altitude rivers because of the specific topography and environmental parameters associated with high altitudes. Yalutsangpo, the upper course of the Brahmaputra River, is the highest major river in the world, flowing from west to east across Tibet, China and pouring into India. Macroinvertebrates were sampled from Yalutsangpo and its tributaries, the Lhasa, Niyang, and Parlong Tsangpo Rivers, from October 2009 to June 2010, to study characters of the highland aquatic ecosystem. Altogether, 110 macroinvertebrate taxa belonging to 57 families and 102 genera were identified from the basin. The biodiversity and composition of macroinvertebrate assemblages were strongly affected by altitude gradients. Local diversity represented by taxa richness and the improved Shannon-Wiener index were high at altitudes of 3,300–3,700 m, among which suitability of habitat was higher due to the better integrated environmental conditions of water temperature, dissolved oxygen, and aquatic vegetation, etc.

Macroinvertebrates were grouped into shredders, scrapers, predators, collector-filterers, and collector-gatherers according to their feeding behaviors. It was found that the distributions of the functional feeding groups varied with habitat altitudes. Shredders were present at altitudes of 2,900–4,400 m, while scrapers mainly inhabited altitudes of 3,500–4,500 m, and collector-filterers preferred 3,500–4,000 m. Even though the local taxa richness was not high at each site, the taxonomic composition and density of the assemblages varied greatly among the different sites, resulting in much higher regional diversity compared to the lowland river with similar flow and substrate conditions. The regional cumulative taxa richness of Yalutsangpo decreased and more families were lost as the altitude increased. However, some families that were newly present as the altitude increased were essential for sustaining the high regional biodiversity. The ordination diagram obtained from Detrended Correspondence Analysis indicated that altitude, river pattern, riverbed structures, bank structures, and flow conditions were the main factors that influenced the macroinvertebrate assemblages in the Yalutsangpo basin." (Authors)] Address: Xu, Mengzhen, State Key Lab. Hydroscience & Engineering, Tsinghua Univ., Beijing 100084, China. E-mail: xumz07@gmail.com

15892. Zhao, H.; Meng, Q.; Li, Y. (2014): On diversity of Odonata in the West of Jilin province. Journal of Beihua University (Natural Science) 15(6): 821-825. (in Chinese, with English summary) ["The resources of Odonata in the west of Jilin Province (China) were invested randomly from May 2011 to September 2013. There were 47 species of dragonfly, which belong to 9 families and 28 genera, among which, Gomphidae, Libellulidae, Coenagrionidae and Lestidae were dominant species in west of Jilin. The individuals and species number of Sympetrum were the most abundant in Libellulidae, Trigomphus are the most in Gomphidae, Ischnura is the most in Coenagrionidae, but the individuals and species number had no significant difference among genera in Lestidae. Diversity index of dragonfly showed an obvious rising trend with temperature rising and richness of nutrition levels in Spring, and reached the peak in July, and then diversity index decreased. Evenness index wasn't changed greatly, the dominant concentration index was appeared in May and had a slight fluctuation later." (Authors)] Address: Zhao, H., College of Forest, Beihua University, Jilin 132013, China

15893. Zhao, Y.; Wang, D.; Tong, J..; Sun, Ji Y.; Zhang, J. (2014): Statics analysis of dragonfly wing based on finite element model. Journal of Agricultural Engineering 30(15): 33-38. (in Chinese, with English summary) ["A dragonfly can hover, flap its wings for flight and fly vertically for a short distance. The membranous wings of a dragonfly have a high load-bearing capacity for static and dynamic load during flight. The mass of the wings of a dragonfly is only 1%-2% of its whole body but the wings can stabilize its body. The statics properties of biomimetic models were researched. The finite element software ANSYS was used to simulate the dragonfly wing. The veins were simulated by pipe20 with two nodes and the membranes by shell43 with four nodes. The influence of geometrical nonlinearity was taken into account but material nonlinearity. The models were assumed in the elastic range. The three-dimensional model of the dragonfly wing was reconstructed using reverse engineering software Imageware. The veins of dragonfly wing were drawn with AutoCAD and the membranes were added with ANSYS. The finite element models imitating the dragonfly wing were established by using free meshing. The finite element models of the dragonfly wing were simulated with structural statics. The deformation, the stress and the strain of the models under loads were analyzed respectively. The loads include the uniform load, the bending moment and the torque. Under the uniform load, the deformation of the finite element model imitating a dragonfly wing is very small, and increases gradually from the base to the wing tip. The base of the model bears heavy stress, the middle parts smaller, and the wing tip the least. The strain shows a radial pattern along the longitudinal veins, and reduces gradually from the base to the wing tip of the model. Under the bending moment, the deformation and the rotation angle around y axis increase gradually from the base to the wing tip of the model. The heavy stress and strain are mainly concentrated on the base of the model. The small stress and strain are acted on the middle parts and the wing tip. The distribution trend of the stress and strain is in substantial agreement. Under the torque, the finite element model imitating a dragonfly wing deforms only a little as a whole. The heavy deformation is mainly concentrated on the leading edges and the rear edges of the model. The smaller deformation is acted on the middle parts and the least deformation on the base. The maximum stress and strain occur at the middle parts of the model. The minimum stress and strain occur at the base of the model. The dragonfly wing is a two-dimensional truss structure with excellent rigidity. The dragonfly wing deforms only a little under loads. It is shown that the grid structures of the dragonfly wing deforming together at the boundaries of veins and membranes have excellent integrity. The understanding of dragonfly wings' characteristics provides some reference for improving the properties of two-dimensional composite materials through biomimetic designs." (Authors)] Address: Zhao, Y., School of Mechanical & Power Engineering, Henan Polytechnic Univ., Jiaozuo 454000, China

15894. Zhu, J.Y.; Zhou, C.Y. (2014): Aerodynamic performance of a two-dimensional flapping wing in asymmetric stroke. Proceedings of the Institution of Mechanical Engineers, Part G: Journal of Aerospace Engineering 228(5): 641-651. (in English) ["A numerical study on the aerodynamic performance of a two-dimensional flapping wing in asymmetric stroke in hovering and forward flight is carried out. The effect of the asymmetry of the stroke on aerodynamic forces and flow structures of the wing is analyzed. It is found that for hovering flight appropriate asymmetric stroke can enhance the aerodynamic performance of the wing at low Reynolds number, but it may not be functioning at moderate and high Reynolds numbers. For forward flight the asymmetric stroke does not increase the lifting efficiency and propulsive efficiency of the wing simultaneously. However, it influences the time history of the aerodynamic force significantly, which may enhance the flight maneuverability of the wing. The present results provide physical insight into the understanding of aerodynamics

and flow structures of insect flight with asymmetric stroke." (Authors)] Address: Zhou, C.Y., Dept Mechanical Engineering & Automation, Harbin Institute of Technology Shenzhen Graduate School, Shenzhen, People's Republic of China. E-mail: cyzhou@hit.edu.cn

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15895. Aoki, T. (2015): Mnais sp. having wings with partly opaque white area. Tombo 57: 38-["I found a female individual of Mnais sp. of which wings had partly opaque white area, on May 24, 2014, at Muraoka-ku, Kami-cho, Mikata-gun, Hyogo Pref." (Author)]

15896. Azam, I.; Afsheen, S.; Zia, A.; Javed, M.; Saeed, R.; Sarwar, M.K.; Munir, B. (2015): Evaluating insects as bioindicators of heavy metal contamination and accumulation near industrial area of Gujrat, Pakistan. BioMed Research International Volume 2015, Article ID 94275: 11 pp. (in English) ["To study the accumulation and contamination of heavy metals (i.e., Cd, Cr, Cu, Ni, and Zn) in soil, air, and water, few insect species were assayed as ecological indicators. Study area comes under industrial zone of district Gujrat of Punjab, Pakistan. Insects used as bioindicators included a libellulid dragonfly (Crocothemis servilia), an acridid grasshopper (Oxya hyla hyla), and a nymphalid butterfly (Danaus chrysippus) near industrial zone of Gujrat. Accumulation of Cd was highest in insect species followed by Cu, Cr, Zn, and Ni. Hierarchical cluster analysis (HACA) was carried out to study metal accumulation level in all insects. Correlation and regression analysis confirmed HACA observations and declared concentration of heavy metals above permissible limits. Metal concentrations in insects were significantly higher near industries and nallahs in Gujrat and relatively higher concentrations of metals were found in Orthoptera than Odonata and Lepidoptera. The total metal concentrations in insects were pointed significantly higher at sites S3 (Mid of HalsiNala), S9 (End of HalsiNala), and S1 (Start of HalsiNala), whereas lowest value was detected at site S6 (Kalra Khasa) located far from industrial area. HACA indicates that these insect groups are potential indicators of metal contamination and can be used in biomonitoring." (Authors)] Address: Azam, Iqra, Dept of Zoology, Institute of Life Sciences, Univ. of Gujrat, Punjab 50700, Pakistan

15897. Bailowitz, R.; Danforth, D.; Upson, S. (2015): A Field Guide to the Damselflies and Dragonflies of Arizona & Sonora. Nova Granada Publications: 459 pp. (in English) ["An identification guide for all 167 known species of Odonata of the states of Arizona (USA) and Sonora (Mexico). ... Species accounts begin with the common name approved by the Checklist Committee of the Dragonfly Society of the Americas. Species accounts are organized alphabetically by the scientific (Latin) species name which follows the common name. Each family is divided into genera listed alphabetically. An entry for each genus presents pertinent information concerning important characteristics, distribution, and genera and species numbers. General information includes the habits and habitats of the species, noteworthy or singular behaviors, and selected information of historical or biological import. Field marks are indicated in bulleted, telegraphic style. For every species, information is presented in a set sequence beginning with the insect's total body length in millimeters. Next, characteristics are cited for the male, from the front of the insect progressing to the abdomen and appendages. Female characters follow. The most important characteristics are in bold print. Descriptions of species in this book are based on populations found in the region covered by this book. The information may or may not apply in other areas of the species' range.]

15898. Baltus, H. (2015): Le project LIFE Lomme contribue au developpement des populations de libellules en Haute-Lesse et Haute-Lomme. Les Naturalistes beiges 96(3-4): 37-56. (in French, with English summary) ["From 2010 to 2014, the LIFE Lomme Project has made major restorations of peatlands, meadows and forests. Among these habitats, many ponds have been created and many rivers have become favourable for dragonflies. Standardized surveys based on reliable bioindicators such as dragonflies have been started at the implementation of the project. The number of dragonfly species in the restored sites increased from 21 species in 2009 before the project to 33 species in 2014. Several common dragonflies have already significantly expanded their range and new species appeared. Some specialist species have also shown a rapid growth but others have not yet responded. This clear positive response of dragonflies is clearly due to restorations but also increasing sampling effort as a result of the project implementation." (Author)] Address: Baltus, H., rue Maugere, 1b ä 5150 Floriffoux, Belgium. E-mail: hubert.baltus@gmail.com

15899. Benetti, F.; Dioli, P. (2015): Contributo alla conoscenza della Odonatofauna della provincia di Sondrio (Lombardia, Italia). II. Segnalazioni faunistiche nel "Parco Adda-Mallero - Renato Bartesaghi" di Sondrio. Atti Museo civ. Storia naturale Morbegno 26: 5-12. (in Italian, with English summary) ["Contribution to the knowledge of the Odonata of the Province of Sondrio (Lombardy, Italy). II. Faunistic records of the "Adda-Mallero – Renato Bartesaghi Park" in Sondrio. The odonate fauna of the Province of Sondrio has been greatly reduced by pollution and the disappearance of many wetlands. During years 2011-2015, a park near Sondrio with small 'biolakes' was surveyed to collect new and reliable photographic data on Odonata. As result, 14 species have been recorded." (Authors)] Address: Benetti, F., Via Lusardi 11, I- 23100 Sondrio. Italy. E-mail: benetti.franco@alice.it

15900. Bhandari, R.; Choubey, V.; Shukla, A, (2015): Diversity and abundance of Odonata in catchments of Bansagar dam, Shahdol (M.P). International Journal of Current Research 7(12): 24034-24037. (in English) ["An Odonata survey on downstream of Sone River was conducted in the surrounding of Bansagar dam in Madhya Pradesh from December, 2014 to November, 2015. The purpose of this one year investigation was to provide information on the diversity and abundance of Odonata. The study revealed that in catchments of river Sone, 22 species of 6 families under 2 sub orders of Odonata were encountered where family Libellulidae was the most diverse with 10 species in contrast to local reference sites of river. The increase of

Odonata in the surrounding of river throughout the study period was best highlighted by the presence of biological pollution indicator species." (Authors)] Address: Bhandari, R., Dept of Zool., Govt. O.F.K. College, Jabalpur (M.P), India

15901. Bichuette, M.E.; Gallao, J.E.; von Schimonsky, D.M.; Trajano, E. (2015): Subterrane aquatic fauna of Tapagem Cave, a study in the touristic strech. ANAIS do 33º Congresso Brasileiro de Espeleologia: 103-108. (in Portuguese, with English summary) ["Studies conducted since the 1970s in Brazil, involving cave fauna until some recent studies, contributed to knowledge manly to the inventory and ecological-evolutionary categorization. However, the development of Speleological Management Plans of the Vale do Ribeira, which includes the Parque Estadual da Caverna do Diabo (PECD), it achieved a more precise level regarding the location of fauna inside the cave, including the aquatic cave fauna. During an annual cycle, a touristic stretch of Rio das Ostras was sampled inside the cave, which is extremely altered. The aquatic fauna was sampled using Surber traps. The collected fauna was analyzed in the Subterranean Studies Laboratory and 24 species was recorded in the cave, some of which are water quality indicator, exceeding the number of species in previous works (16). Using this data, we conducted and ecosystem analyses to detect weaknesses related to aquatic habitat. Therefore, this study was the basis to the Speleological Management Plan of Tapagem cave and we propose the water monitoring of this cave to asses and minimize the impacts." (Authors)] Address: Bichuette, Maria Elina, Laboratório de Estudos Subterrâneos – LES, Depto de Ecologia e Biologia Evolutiva – DEBE, Centro de Ciências Biológicas e da Saúde – CCBS, Univ. Federal de São Carlos – UFSCar, São Carlos SP, Brasil. E-mail: bichuette@uol.com.br

15902. Boruah, B.; Payra, A.; Das, G.N.; Misra, R.K.; Rout, S.D., Sahu, H.K. (2015): Diversity of Odonata (Insecta) in Padmatola wetland, Balasore, Odisha, India. Asian Journal of Conservation Biology 4(1): 92-97. (in English) ["The present study has been carried out in the Padmatola wetland of Balasore district of Odisha, India during December 2013 and May 2014. This study emphasises a checklist of total 51 species of Odonata. Among this the Anisoptera represented by 33 species with 22 genera from 4 families and Zygoptera represented by 18 species with 9 genera from 3 families. Family Libellulidae is dominant with 28 species and Coenagrionidae is richest with 15 species. But the rapid degradation of the wetland by human activities are the main threat to the odonates along with the biodiversity." (Authors)] Address: Boruah, B., Dept of Wildlife and Biodiversity Conservation. North Orissa University, Odisha- 757003, India

15903. Casanueva, P.; Campos, F.; Velasco, T.; Sanz, G.; Nunes, L.F. (2015): Selección de sustrato de emergencia por Cordulegaster boltonii (Donovan, 1807) (Odonata: Cordulegastridae) en un río del centro de la Península Ibérica. Boletín de la Sociedad Entomológica Aragonesa 56: 349-350. (in Spanish, with English summary) ["Emergence site selection by C. boltonii in a river in the centre of the Iberian Peninsula: The main emergence substrates of C. boltonii in an Iberian river were analyzed. A total of 50 exuviae were collected from a stretch of river (60m) located in the center of the Iberian Peninsula. Plants were used by larvae as an emergence platform in 86% of cases, and rocks in the remaining cases. The most commonly used plants were Cyperaceae species (Carex and Eleocharis), and no exuviae were found on trees or tree roots (alder, Alnus glutinosa was the only tree species available)." (Authors)] Address: Casanueva, Patricia, Universidad Europea Miguel de Cervantes, Calle Padre Julio Chevalier 2, E-47012 Valladolid, Spain. E-mail: pcasanueva@uemc.es

15904. Chelmick, D. (2015): Species Review 9: Macromia splendens (Pictet 1843) (The Splendid Cruiser). Journal of the British Dragonfly Society 31(2): 89-118. ["M. splendens is the only Western Palearctic representative of an essentially tropical family, the Macromiidae. This European endemic is one of our largest dragonflies and yet, until recent years, hardly anything was known about its life history or distribution. This essentially riparian species favours man-adapted habitats and particularly hydroelectric barrages. It is classified as vulnerable in the European Red List of dragonflies but its populations are stable… (Author)] Address: Chelmick, D., Macromia Scientific, 31 High Beech Lane, Haywards Heath, West Sussex, RH16 1SQ. UK

15905. Chovanec, A.; Waringer, J. (2015): Colonization of a 3rd order stream by dragonflies (Insecta: Odonata) – a best practice example of river restoration evaluated by the Dragonfly Association Index (lower Weidenbach, eastern Austria). Acta Zoo. Bot. Austria 152: 89-105. (in English, with German summary) ["Restoration measures implemented on the lower section of a third order stream (Weidenbach, eastern lowlands of Austria) were assessed by carrying out a dragonfly survey. As required under the European Water Framework Directive the assessment was based on a comparison between a river type-specific, near-pristine reference situation and the actual status quo. As a result of large-scale river regulation, there were no natural sections of the river left. Therefore, the ecological requirements of dragonfly associations were correlated with river type-specific features for deriving type-specific communities. Twenty-six breeding species belonging to all six type-specific dragonfly associations were recorded. Applying the Dragonfly Association Index, the restored river section was allocated to class I (“high ecological status”), which corresponds to the reference situation and underlines the success of the implemented restoration measures. These measures were focused on increasing the sinuosity of the river and the in-stream habitat heterogeneity (e.g. by river widening and by creating meanders) and on improving the lateral connectivity in the river system (e.g. by creating backwaters). The results of the study emphasize the necessity of implementing type-specific restoration as a basis for the colonization by a dragonfly fauna characteristic for the river." (Authors) Address: Chovanec, A., Krotenbachgasse 68, A-2345 Brunn am Gebirge, Austria. E-mail: andreas.chovanec@bmlrt.gv.at

15906. Coulter, J.P.; Gennard, D.E.; Mill, P.J. (2015): Ultrastructural evidence for antennal chemoreceptors in Aeshna grandis L. (Brown Hawker). Journal of the British Dragonfly Society 31(2): 119-129. (in English) ["The results

of an SEM investigation of the antennae of larval and adult A. grandis have revealed that both larva and adult possess a range of sensilla and that the morphological structures present are similar to those found in investigations carried out on other odonate species. While a chemoreceptive ability cannot be concluded categorically, from a structural view point both the larvae and adults of A. grandis possess sensilla coeloconica, which have often been associated with chemoreception. From the existing body of work it is likely that odonate larvae and adults use a more diverse range of cues than previously thought during searching, feeding and habitat choice, one of which is chemoreception." (Authors)] Address: Coulter, J.P., School of Life Sciences, Joseph Banks Lab., Green Lane, Lincoln, LN6 7DL 2 School of Biol., Univ. of Leeds, LS2 9JT, UK

15907. Díaz Martínez, C.; Evangelio Pinach, J.M. (2015): Aeshna juncea (Linnaeus, 1758) (Odonata: Aeshnidae) y Sympetrum vulgatum ibericum Ocharan, 1985 (Odonata: Libellulidae): primeras citas de Castilla-La Mancha (centro-este de España) y actualización de su distribución ibérica. Boletín de la Sociedad Entomológica Aragonesa 56: 439-444. (in Spanish, with English summary) ["The finding of the threatened dragonflies A. juncea and S. vulgatum ibericum in the province of Cuenca (Serranía alta) provides the first record of both species in the Castilla-La Mancha administrative region (Spain). Eleven new localities are given for A. juncea in the Sistema Ibérico mountain range, at the southern limit of the species' European distribution. In six of them it occurs together with S. vulgatum ibericum. The Iberian distribution maps of both dragonflies are updated after a literature, unpublished data and entomological collections review; as result several localities for S. v. ibericum are discarded and this subspecies is first recorded for the province of Guadalajara." (Authors)] Address: Díaz Martínez, Cecilia, Dirección Provincial de la Consejería de Agricultura, Medio Ambiente y Desarrollo Rural en Cuenca. Junta de Comunidades de Castilla-La Mancha, Spain. E-mail: ceciliad@jccm.es

15908. Dow, R.A.; Hämäläinen, M.; Stokvis, F.R. (2015): Revision of the genus Devadatta Kirby, 1890 in Borneo based on molecular and morphological methods, with descriptions of four new species (Odonata: Zygoptera: Devadattidae). Zootaxa 4033(3): 301-349. (in English) ["Species of Devadatta from Borneo are studied using both morphological and molecular methods. As well as D. podolestoides Laidlaw, four new species are recognised from the island: D. aran spec. nov. (holotype ♂, from Pulong Tau National Park, Miri division, Sarawak, Malaysia, deposited in RMNH), D. clavicauda spec. nov. (holotype ♂, from Bukit Mina, Bukit Mina Wildlife Corridor, Sarawak Planted Forest Project, Bintulu division, Sarawak, Malaysia, deposited in RMNH), D. somoh spec. nov. (holotype ♂, from the Sungai Kahei area, Ulu Balui, Kapit division, Sarawak, Malaysia, deposited in RMNH) and D. tanduk spec. nov. (holotype ♂, from Poring Hot Springs, Kinabalu National Park, West Coast division, Sabah, Malaysia, deposited in RMNH). The Philippine taxon D. basilanensis Laidlaw is considered a good species rather than a subspecies of D. podolestoides. The Bornean species plus D. basilanensis are provisionally considered to form a species group, the podolestoides-group, within Devadatta. The species of the podolestoides-group are so similar in morphology and colouration that they are close to truly cryptic species. Two species appear to exhibit character displacement where their ranges overlap with other Devadatta species. A molecular analysis using four markers (COI, 16S, ITS and 28S) is presented. This analysis includes specimens of all species from the podolestoides-group and two Devadatta species from mainland Asia." (Authors)] Address: Dow, R.A., 6 Bramley Avenue, Coulsdon, Surrey, CR5 2DP, UK. E-mail: rory.dow@virgin.net

15909. Eda, S. (2015): A male of Nannophya pygmaea with black dorsal stripes on the abdomen. Tombo 57: 51. (in Japanese, with English summary) ["On June 20, 2014, two photos of a mature male of Nannophya pygmaea with black dorsal stripes on the abdomen were taken at "the dragonfly paradise" Niiyama in Ina city, Nagano prefecture." (Author)] Address: not stated

15910. El Joubari, M.; Hajji, K; Himmi, O.; El Alami, M.; El Agbani, M.A.; Louah, A. (2015): Etude des Macroinvertébrés (Gastéropodes, Diptères et Odonates) des marais de Smir-Restinga (Nord-Ouest du Maroc). Entomologie Faunistique – Faunistic Entomology 68: 17-31. (in French, with English summary) ["The present study treats the biological and ecological aspects of the Odonata, Gastropoda and Diptera of the marshes of Smir-Restinga; it highlights the important qualitative and quantitative taxonomic richness of the latter. Seasonal samplings on the level of eight stations spread out over the whole site, gave a total of twenty families of macroinvertebrates consisted of … four families of odonates ...] (Authors) Address: El Joubari, Mariam, Laboratoire d'Ecologie, Biodiversité et Environnement, Fac. des Sciences, Université Abdelmalek Esaadi, Avenue de Sebta, Mhanech II 93002. B.P. 212, Tétouan, Maroc. E-mail: eljoubari_mariam@yahoo.fr

15911. Evangelio Pinach, J.M.; Díaz Martínez, C. (2015): Primera cita de Oxygastra curtisii (Dale, 1834) (Odonata: Corduliidae) en la región de Castilla-La Mancha (centro-este de España) y confirmación de su reproducción. Boletín de la Sociedad Entomológica Aragonesa 56: 379-380. (in Spanish, with English summary) [22-V-2015, Lagunillo del Tejo, Cañada del Hoyo, Cuenca, Spain] Address: Evangelio Pinach, J.M., Agente Medioambiental. Servicios Periféricos de la Consejería de Agricultura en Cuenca. Junta de Comunidades de Castilla-La Mancha (España). jjevanach@hotmail.com

15912. Gallesi, M.M.; Sacchia, R.; Hardersen, S. (2015): Does wing shape of andromorph females of Calopteryx splendens (Harris, 1780) resemble that of males? International Journal of Odonatology 18(4): 305-315. (in English) ["Female limited polymorphism consists in the coexistence of two or more female morphs in the same population and is widespread among odonates. Generally, one female morph, the andromorph, resembles males in colour or, sometimes, also in morphology and behaviour, while one or more other morphs, gynomorphs, differ from males. This phenomenon is probably promoted by advantages to females which arise from reduced sexual harassment. Andromorph

females of C. splendens keep wing spots, like males (although these ornaments do not match exactly male wing spot colour), while gynomorphs have hyaline wings. Males and gynomorphs show a marked sexual dimorphism in wing shape, and this determines flight patterns which differ between sexes. If andromorphs mimic male wing spots to avoid harassment, they may also benefit from mimicking the male flight morphology, and consequently the male flight pattern. In this case wing shape of andromorph and gynomorph females would differ, as the wing shape of andromorphs resembles that of males. In this study we compared the wing morphology of males and of the two female morphs of C. splendens using geometric morphometrics. Our results revealed that andromorphs and gynomorphs of this species share the same wing shape, size, and static allometry, and this suggests that flight patterns should also be shared by the two morphs. Thus, females might avoid male harassment by mimicking exclusively male wing pigmentation (male mimicry hypothesis), or confound males through an uncommon appearance (learned mate recognition hypothesis)." (Authors)] Address: Gallesi, M.M., Dipto di Scienze della Terra e dell'Ambiente, Università di Pavia, Pavia, Italy

15913. Gaona, J.M.; Enrique, F. (2015): Nueva cita para la provincia de Cádiz (Sur de España) de la especie Orthetrum nitidinerve (Selys 1841) (Odonata, Libellulidae). Boletín de la SAE No 25: 13-15. (in Spanish, with English summary) ["New records for the species O. nitidinerve in the province of Cadiz (southern España) (Odonata, Libellulidae). [“O. nitidinerve is recorded in a new locality in the province of Cadiz, specifically within Los Alcornocales Natural Park (Los Barrios). Monitoring of the new population was carried out, confirming reproduction of the species. In addition, target species of Odonata are listed in the same habitat." (Authors)] Address: Gaona, J.M., C/Alhóndiga 5-1ºB 11370, Los Barrios, Cádiz, Spain. E-mail: ergaona1@hotmail.com

15914. Gaona, J.M.; Enrique, F. (2015): Nueva cita de Selysiothemis nigra (Van der Linden, 1825) (Odonata, Libellulidae) en la provincia de Cádiz (S. España). Boletín de la SAE 25: 16-17. (in Spanish, with English summary) ["New record of S. nigra in Cadiz province (Southern Spain) is provided." (Authors)] Address: Gaona, J.M., C/Alhóndiga 5-1ºB 11370, Los Barrios, Cádiz, Spain. E-mail: ergaona1@hotmail.com

15915. Gattolliat, J.-L.; Pasche, A.; Pellet, J.; Salamin Hofmann, C. (2015): L’entomofaune de la réserve naturelle des Grangettes (VD): suivi de trois groupes indicateurs. Entomo Helvetica 8: 13-27. (in French, with English and German summaries) ["The present study describes the results of an entomological survey that was carried out between 2013 and 2014 in the marsh landscape of federal importance of Les Grangettes. It focuses on butterflies and day-flying moths (Rhopalocera), grasshoppers (Orthoptera) and dragonflies (Odonata). Butterfly communities seemed particularly degraded in grasslands while grasshoppers exhibited relatively dense and diversified communities in similar habitats. Dragonflies are another diversified group whose populations are more closely linked to the presence of various types of ponds, both permanent and temporary. Both grasshoppers and dragonflies proved to be efficient biological indicators, just like flora or amphibians, for measuring habitat creation and management success." (Authors)] Address: Gattolliat, J.-L., Musée cantonal de zoologie, Palais de Rumine, Place de la Riponne 6, CH-1014 Lausanne, Switzerland. E-mail: Jean-Luc.Gattolliat@vd.ch

15916. Gwardjan, M.; Przybylska, J.; Maniarski (2015): Dragonflies (Odonata) of Kielce. Naturalia 4: 90-107. (in Polish, with English summary) ["The paper presents the results of research conducted on water bodies within the city limits of Kielce (Swietokrzyskie Province) in 2008-2015. In 14 sites 46 dragonfly species were recorded, out of 72 species present in Poland. The total number, including species reported in previous publications, amounts to 50. Today 47 species occur which is 65.3% of the Polish dragonfly fauna. Reproduction was confirmed for 31 species, for further 9 it was probable. The highest number of species was found in “Wietrznia” site and other water bodies in sandpits (20-27 species). Good conditions for dragonflies were found on the ash sedimentation lagoons of Kielce Heating Plant, where 8 species created very numerous or numerous populations." (Author)] Address: Gwardjan, M., Towarzystwo Badañ i Ochrony Przyrody, 25-501 Kielce, ul. Sienkiewicza 68, Poland. E-mail: mariusz@tbop.org.pl

15917. Hämäläinen, M. (2015): From Echo maxima to Archineura maxima - a slow taxonomic process (Odonata: Calopterygidae). Notulae odonatologicae 8(6): 157-168. (in English) ["The treatment of Echo maxima Martin, 1904 in the taxonomic literature, a species known only from a single female specimen from northern Vietnam, is briefly reported. Photographs of the holotype are provided and the species’ morphological characters are compared with those of the two known Archineura species: incarnata and hetaerinoides. A new generic combination Archineura maxima is introduced." (Author)] Address: Hämäläinen, M., Netherlands Centre for Biodiversity Naturalis, P.O. Box 9517, 2300 RA, Leiden, The Netherlands. E-mail: libellago@gmail.com

15918. Hamidan, N.; Jackson, M.C.; Britton, J.R. (2015): Diet and trophic niche of the endangered fish Garra ghorensis in three Jordanian populations. Ecology of Freshwater Fish 25(3): 455-464. (in English) ["G. ghorensis is a small riverine cyprinid fish endemic to the southern Dead Sea that is endangered through habitat loss and invasive species. Here, their diet and trophic niche were assessed in three Jordanian populations: an allopatric population, a population sympatric with native Capoeta damascina and a population sympatric with invasive Oreochromis aureus. Stomach content analyses of samples collected between February 2011 and January 2012 revealed that detritus and algae were prominent food items in their diets, with low dietary contributions of animal material. The most frequent and abundant macro-invertebrates in intestines were Odonata nymphs and gastropod species. The calculation of trophic niche size from the stomach content data revealed that the niche of G. ghorensis (0.10) was gener-

ally smaller than sympatric C. damascina (0.24), with an overlap of 72%, whereas they had a larger trophic niche than sympatric O. aureus (0.20–0.13), with a niche overlap of 54%. These outputs were generally supported by stable isotope analyses of d13C and d15N completed on samples collected at the end of the 2011 growth season, although these indicated a greater contribution of animal material to assimilated diet. They also indicated that the trophic niche breadth [as standard ellipse area (SEA)] of C. damascina (4.18‰²) was higher than G. ghorensis (2.48‰²) and overlapped by 26%. For G. ghorensis, their SEA was slightly larger than O. aureus (4.33–4.00‰²), with an overlap of 27%. Although both methods indicated some sharing of food resources between sympatric fishes, there was no evidence suggesting detrimental outcomes for G. ghorensis and thus was not considered as a constraint on the status of their populations." (Authors)] Address: Hamidan, N., Dept Life & Environmental Sci., Fac. Science & Technology, Bournemouth Univ., Poole BH12 5BB, UK. E-mail: nashat.hamidan@gmail.com

15919. Hasan, J.; Raj, S.; Yadav, L.; Chatterjee, K. (2015): Engineering a nanostructured “super surface” with superhydrophobic and superkilling properties. RSC Adv., 2015, 5: 44953-44959. (in English) ["We present a nanostructured “super surface” fabricated using a simple recipe based on deep reactive ion etching of a silicon wafer. The topography of the surface is inspired by the surface topographical features of dragonfly wings. The super surface is comprised of nanopillars 4 μm in height and 220 nm in diameter with random inter-pillar spacing. The surface exhibited superhydrophobicity with a static water contact angle of 154.0° and contact angle hysteresis of 8.3°. Bacterial studies revealed the bactericidal property of the surface against both gram negative (Escherichia coli) and gram positive (Staphylococcus aureus) strains through mechanical rupture of the cells by the sharp nanopillars. The cell viability on these nanostructured surfaces was nearly six-fold lower than on the unmodified silicon wafer. The nanostructured surface also killed mammalian cells (mouse osteoblasts) through mechanical rupture of the cell membrane. Thus, such nanostructured super surfaces could find applications for designing self-cleaning and anti-bacterial surfaces in diverse applications such as microfluidics, surgical instruments, pipelines and food packaging." (Authors)] Address: Hasan, J., Dept of Materials Engineering, Indian Inst. of Science, Bangalore, Karnataka, India 560012. E-mail: kchatterjee@materials.iisc.ernet.in;

15920. Hayashi, F. (2015): Mechanisms of sperm displacement in Calopteryx cornelia: effects of sexual conflict. Tombo 57: 1-7. (in Japanese, with English summary) ["In this short review, the shape and function of female sperm-storage organs and male sperm-removal organs in C. cornelia are discussed from the viewpoint of sexual conflict. Females have two sperm-storage organs, a spherical bursa copulatrix (be) and a tubular Y-shaped spermatheca (sp), both of which function equally in sperm storage because the survival rates of stored sperm for 5 days do not differ between be and sp. Males possess a peculiar aedeagus with a recurved head to remove bursal sperm and spiny lateral processes to remove spermathecal sperm as known generally in other calopterygid damselfly species. However, the male genitalia of C. cornelia are morphologically asymmetric after sexual maturation. The left lateral process is well developed (projected outsides) but the right one is positioned along the edge of the recurved head. Experiments by surgical cutting of each lateral process demonstrate that only the left process functions in removal of left spermathecal sperm. Such asymmetric male genitalia may be caused by sexual conflict in sperm displacement processes." (Author)] Address: E-mail: fhayashi@tmu.ac.jp

15921. Hefler, C.; Qiu, H. (2015): Visualization and aerodynamic analysis of an escaping dragonfly. The 13th Asian Symposium on Visualization, Novosibirsk, Russia, 2015: 10 pp. (in English) ["An unsteady flow visualization and force measurement were carried out in order to investigate the effects of the reduced frequency of a dragonfly-type model. The flow visualization of the wing wake region was conducted by using a smoke-wire technique. An electronic device was mounted below the test section in order to find the exact position angle of the wing for the visualization. A load-cell was employed in measuring aerodynamic forces generated by a plunging motion of the experimental model. To find the period of the flapping motion in real time, trigger signals were also collected by passing laser beam signals through the gear hole. Experimental conditions were as follows: the incidence angles of the fore and hind-wing were 0° and 10°, respectively, and the reduced frequencies were 0.150 and 0.225. The free stream velocities of the flow visualization and force measurement were 1.0 and 1.6m/sec, respectively, which correspond to Reynolds numbers of 3.4 × 103 and 2.9 × 103. The variations of the flow patterns and phase-averaged lift and the thrust coefficients during one cycle of the wing motion were presented. Results showed that the reduced frequency was closely related to the flow pattern that determined flight efficiency, and the maximum lift coefficient and lift coefficient per unit of time increased with reduced frequency." (Authors)] Address: Hefler, C., Dept of Mechanical & Aerospace Engineering, Hong Kong University of Science and Technology, Hong Kong SAR, China. E-mail: meqiu@ust.hk

15922. Hunt, S.K. (2015): Climate- and habitat-mediation of predator-prey interactions in an invasion context. Master of Science thesis, University of Canterbury. 82 pp. (in English) ["Ecosystems across the globe are facing a range of anthropogenically-driven changes, including biotic invasions, urbanisation and land-use alterations, which can affect ecosystem structure and stability. To manage both native species decline and invasive species spread it is imperative that we can accurately predict how current global environmental change will affect biotic communities. I examined effects of different land uses at both landscape- and habitat-scales on native (Culex pervigilans) and exotic (Aedes notoscriptus) mosquito distributions in lentic (standing water) freshwater habitats. Because of the importance of land use on habitat characteristics, I expected different land uses would contain different biotic communities, and that mosquitoes would more likely be present in simple communities with fewer predators. Moreover, because habitat disturbance and modification can signific-

antly influence community structure, I expected less diverse pond communities in habitats within highly modified urban and pasture land uses would also be more likely to contain mosquitoes. I found land use affects mosquito presence, and was likely strongly linked with land-use effects on predator presence and taxon richness. Predators were more common in habitats within native forest and tussock grassland, and mosquitoes were almost entirely restricted to urban and pasture habitats. Moreover, local habitat characteristics had a strong influence on both mosquito and predator presence, with deeper and more open habitats supporting greater predator abundance, thereby excluding mosquito larvae. To further investigate the global of climate change on predator-prey interactions involving Ae. notoscriptus and Cx. pervigilans, I conducted two experiments. Firstly, I measured effects of habitat warming and short- and long-term habitat drying on interactions between the two mosquito species and three predatory invertebrates, Anisops wakefieldi backswimmers, Austrolestes colensonis damselflies, and Procordulia smithii dragonflies, which represented predators characteristic of different habitat drying regimes. A second experiment further tested interactions between A. wakefieldi and the two mosquito species in a wider range of temperatures. There was little evidence that short-term habitat drying affected interaction strengths of any of the predator-prey combinations, but strong evidence for the importance of temperature-mediated predation rates which depended on both predator and prey identities. Here, predators characteristic of more temporary hydroperiods showed temperature-mediated predation responses on the two mosquito species: increasing temperature resulted in greater predation on native Cx. pervigilans but not effect on predation on exotic Ae. notoscriptus. The second experiment revealed, again, that predation depended on both temperature and mosquito species with higher predation occurring at increased temperature, but also indicated life history traits could mediate the overall effect of temperature-mediated predation. Overall, I have shown that interactions between temperature, predator identity and mosquito species will be very important in determining the potential for mosquitoes to invade under a changing climate. Considering effects of both climate change and land-use-driven habitat modification on the invasion potential of mosquitoes in freshwater communities will therefore be important for managing both native species decline and spread of invaders. Moreover, research and management decisions on critical species like mosquitoes will need to encompass multiple drivers of climate change at both global and local scales." (Author)] Address: not stated

15923. Johnson, J. (2015): Tramea onusta (Red Saddlebags) new to Oregon. Argia 27(4): 14-16. (in English) [Tramea onusta, Curry County, Oregon, USA, 29July 2015.] Address: jt_johnson@comcast.net

15924. Kalita, G.J.; Ray, S.D. (2015): Studies on the diversity and habitat preference of odonates in Deepor Beel Bird Sanctuary, Kamrup, Assam. Journal of Entomology and Zoology Studies 3(2): 278-285. (in English) [Deepor beel bird sanctuary, during December 2013 to September 2014. “Deepor beel bird sanctuary lies between 26° 7' 52" N; 91° 38' 70" E in Kamrup district. A total of 39 species belonging to 5 families and 22 genera were recorded from Deepor beel bird sanctuary. We also recorded Ceriagrion rubiae and Agriocnemis kalinga, which is the first formal record from Assam. Rhyothemis variegata was the most abundant anisopteran species and Pseudagrion microcephalum the most abundant zygopteran species in Deepor beel bird sanctuary." (Authors)] Address: Gaurab Jyoti Kalita, Dept of Wildlife & Biodiversity Conservation, North Orissa Univ., Odisha, India

15925. Karube, H. (2015): Additional records of Vietnamese Odonata I, with descriptions of two new gomphid species. Tombo 57: 27-35. (in English, with Japanese summary) ["Two new gomphid species from Vietnam, Trigomphus kompieri sp. nov. and Lamelligomphus vietnamensis sp. nov. are described and illustrated. Leptogomphus uenoi, originally described by only female, are re-described together with first male. Records of a few other anisopteran species are presented, including novelties to the Vietnamese fauna." (Author)] Address: Karube, H.; Kanagawa Prefectural Museum of Natural History, 499 Iryuda, Odawara, Kanagawa, 250-0031 Japan. E-mail: paruki@nh.kanagawa-museum.jp

15926. Karube, H.; Machida, M. (2015): Record of a gynandromorphic individual of Lyriothemis pachygastra (Selys, 1878) (Anisoptera: Libellulidae). Tombo 57: 43-45. (in Japanese, with English summary) ["A gynandromorphic individual of L. pachygastra was captured at Minamiashigara, Kanagawa Pref., Japan, which is the second record for this species. This individual roughly bears male characteristics on the left side and female characteristics on the right side." (Author)] Address: Karube, H., Kanagawa Prefect. Mus. Nat. Hist., 499 Iryuda, Odawara, Kanagawa, 250, Japan. E-mail: paruki@nh-kanagawa-museum.jp

15927. Karube, H. (2015): True identity of Phaenandrogomphus dingavani (Fraser, 1924) (Odonata: Gomphidae), a new status as Scalmogomphus dingavani comb. nov.. Tombo 57: 36-37. ["'Onychogomhus dingavani' was long placed in the genus Phaenandrogomphus. It is shown that the species clearly belongs to the genus Scalmogomphus." (Author)] Address: Karube, H., Kanagawa Prefectural Museum of Natural History, 499 Iryuda, Odawara, Kanagawa, 250-0031 Japan. E-mail: paruki@nh.kanagawa-museum.jp

15928. Kasuya, M. (2015): Observation of sitting-oviposition into water of Stylogomphus suzukii. Tombo 57: 46-47. (in Japanese, with English summary) ["A female of S. suzukii oviposited into water in a sitting position at Fukazawa River in Izunokuni City, Shizuoka Prefecture. Previously this species has been known to release egg masses by flying and striking the water surface." (Author)] Address: not stated

15929. Katatani, N.; Kitagawa, K. (2015): Notes on the Odonate fauna of Southeast Asia Part 5. Libellulidae 2 (Genus Indothemis, Pseudothemis & Trithemis). Aeschna 51: 33-47. (in Japanese, with English summary) ["This is the fifth report of Southeast Asian Odonata of the genus In-

dothemis, Pseudothemis and Trithemis… The genus Indothemis includes I. carnatica and I. limbata. The genus Pseudothemis; P. jorina and P. zonata. The genus Trithemis includes; T. aurora, T. festiva and T. pallidinervis. The feature of the color pattern of the body of the above seven species are shown by photographs and figures. The observations 'on these species and their distribution are also reported. Genus of Indothemis closely resembles that of Trithemis. The authors show the differences between Indothemis and Trithemis. Two species of Pseudothemis are considered to have habitat segregation. However, a place has been found where both species are living together in northern mountain of Laos. The distribution map of two species of Pseudothemis is shown." (Authors)] Address: Kitagawa, K., Imaiti 1-11-6, Asahi-ku, Osaka C., Osaka, 535-0011, Japan

15930. Kaur, M.; Ware, J.L.; Bechly, G. (2015): How to date a dragonfly: Fossil calibration of dragonfly phylogeny (Odonata: Anisoptera). Palaeontologia Electronica 19.1.1FC: 14 pp. (in English) [Molecular data along with fossils are being used increasingly to recover time-calibrated phylogenetic trees. Recently there have been manuscripts that have used divergence dating to understand evolutionary history of certain clades within Odonata (dragonflies and damselflies), yet the number of such articles is still low. We examined the Odonata fossil record and made a list of fossils that can be used for divergence time analysis. In this manuscript we provide a detailed review of the known crown group fossils for the order Odonata and nine nodes within this clade: Zygoptera, Epiprocta, Anisoptera, Aeshnidae, Gomphidae, Cavilabiata, Macromiidae, Corduliidae, and Libellulidae." (Authors)] Address: Bechly, G., Staatliches Museum für Naturkunde, Abt. Paläontologie, Rosenstein 1, 70191 Stuttgart, Germany. E-mail: guenter.bechly@smns-bw.de

15931. Kirpik, M.A.; Iskender, A. (2015): Kars Platosu Odonata (Insecta) Faunasinin Belirlenmesi. Kafkas Üniversitesi Fen Bilimleri Enstitüsü Dergisi 8(2): 54-65. (in Turkish, with English summary) ["Determination of Kars Plateau Odonata (Insecta) Fauna: Odonata in various puddles, marshy places and various areas have been collected from Kars Center and Administrative district throught June 2005 and August 2009. 13 species have been proved: Calopteryx splendens, Lestes sponsa, L. barbarus, Enallagma cyathigerum, Aeshna affinis, A. juncea, Libellula depressa, L. quadrimaculata, Leucorrhinia pectoralis, Sympetrum pedemontanum, S. sanguineum, S. flaveolum, S. striolatum. …." (Authors)] Address: Kirpik, M.A., Kafkas Üniversitesi Fen Edebiyat Fakültesi Biyoloji Böliimü, 36100-Kars, Turkey. E-mail: kirpik80@gmail.com

15932. Kobayashi, J. (2015): Morphological characteristics of female genitalia in Anotogaster sieboldii (Selys) (Anisoptera: Cordulegastridae). Tombo 57: 9-13. (in English) ["The structures of the female genitalia, particularly the ectodermal components, in A. sieboldii are described and compared with other Odonata. The female genitalia of A. sieboldii resemble those of other taxa, with the following exceptions:(1) spermathecae are composed of a double membrane, (2) medial cuticular plate is situated inside the bursa copulatrix, (3) ventromedial tendon is extraordinarily elongate, and (4) paired vaginal plates on each side of the vagina are absent. Homology of the common spermathecal duct in phylogenetically unrelated Odonata is currently unexplained." (Author)] Address: Kobayashi, J., Laboratory of Entomology, Tokyo Univ. of Agriculture 1737 Funako, Atsugi-shi, Kanagawa 243-0034, Japan E-mail: 43313002@nodai.ac.jp

15933. Komposch, B.; Holzinger, W.E. (2015): Wiederfund der Vogel-Azurjungfer [Coenagrion ornatum (Selys, 1850)] in Kärnten (Insecta: Odonata). Carinthia II 205/125: 639-642. (in German, with English summary) ["A small population of C. ornatum was discovered in June 2015 in a small drainage rivulet in Krottendorf/Eppendorf north of Lavamünd in southeastern Carinthia. It is the only assured population in Carinthia, existing quite isolated from next habitats in Slovenia and Styria. We recommend to enlarge the adjacenting Natura 2000 site „Untere Lavant“ (AT2124000) a little bit to include this population and ensure its further survival.] Address: Komposch, Brigitte, Ökoteam, Bergmanngasse 22, A-8010 Graz, Austria. E-mail: b.komposch@oekoteam.at

15934. Kosterin, O.E. (2015): Taxonomic and faunal notes on Macromia Rambur, 1842 from Cambodia (Odonata: Macromiidae). Odonatologica 44(1/2): 117-151. (in English) ["Five species of Macromia were recently collected in Cambodia. For Macromia aculeata, this is the second finding of the species since its description in 1927. This species is very close to M. arachnomima, described from Borneo, but comparison of the respective holotypes proved them as different species. Records of M. arachnomima from Thailand, Laos, and the Malay Peninsula need to be reconsidered. The closely related species M. cincta and M. cupricincta have both been found in Cambodia; their diagnostic characters are discussed. M. berlandi is supposed to be a northern subspecies of M. cupricincta. Variation in M. chaiyaphumensis and M. septima is considered, and a female of the former is described. Controversies in grouping of Asian Macromia species are discussed. Notes on habitats and behaviour of the species considered are briefly provided." (Author)] Address: Kosterin, O.E., Inst. Cytology & Genetics, Siberian Branch, Russian Acad. Sciences, Lavrentiev Ave 10, RUS-630090 Novosibirsk, Russia. E-mail: kosterin@bionet.nsc.ru

15935. Kovacs, T.; Theischinger, G.; Juhasz, P.; Danyik, T. (2015): Odonata from Batanta (Indonesia, West Papua) with description of three new species. Folia historico-naturalia Musei Matraensis 39: 17-29. (in English) ["Thirty-eight taxa of Odonata are reported from Batanta Island (including Arefi and Birie Islands). Three new species are described: Drepanosticta batanta sp. n., Palaiargia susannae sp. n. and Diplacina olahi sp. n.. Hydrobasileus vittatus is new to New Guinea. The following 15 species are new to the Raja Ampat Islands: Drepanosticta auriculata, Metagrion postnodale, Selysioneura cf. cervicornu, Nososticta cf. finisterrae, Idiocnemis bidentata, I. inornata, Agriocnemis femina, Ceriagrion aeruginosum, Ischnura senegalensis, Pseudagrion cf. civicum, Xiphiagrion cyanomelas, Diplacodes trivialis, Huonia epinephela, Neurothemis ramburii, Orthetrum ser-

apia, Rhyothemis phyllis." (Authors)] Address: Theischinger G., 2A Hammerley Road, Grays Point, NSW 2232, Australia. E-mail: Gunther.Theischinger@environment.nsw.gov.au

15936. Krech, M.; Hampel, J. (2015): Untersuchungen zur Libellenfauna der Tongruben bei Mittelhausen (Landeshauptstadt Erfurt/Thüringen). Thüringer Faunistische Abhandlungen 20: 63-70. (in German, with English summary) ["A survey on the dragonfly fauna of the clay pits close to Mittelhausen (state Capital Erfurt/Thuringia). From 1998 to 2015 a total of 40 dragonfly species has been recorded. Moreover, the clay pit has been used by 37 species for reproduction. The species has been changed over the past decade for the benefit of thermophile, highly expansive dragonfly species. However, the large number of occurring species as well as the presence of several vulnerable species emphasises the importance of the investigated clay pits as a unique breeding habitat for dragonflies in an extensively urbanshaped environment." (Authors)] Address: Krech, M., Auf der Großen Mühle 7, 99098 Erfurt, Germany

15937. Kunz, B. (2015): Status and distribution of Sympetrum sanguineum in Sardinia (Odonata: Libellulidae). Libellula 34(3/4): 161-173. (in German, with English and Italian summaries) ["S. sanguineum was recorded in Sardinia in 1990, 2011, and 2013 at 13 locations between 15 and 1,005 m a.s.l. Exuviae or larvae were found at ten locations. Some of these are among the highest reproduction sites for this species in Europe. With records from six of eight provinces, S. sanguineum is a native member of the Sardinian dragonfly fauna." (Author)] Address: Kunz, B., Hauptstr. 111, 74595 Langenburg, Germany. E-mail: libellenbernd@gmail.com

15938. Li, C.-C.; Lin, S.-C., Hsiao, W.-F. (2015): Morphology and life history of Ischnura senegalensis (Odonata: Coenagrionidae). Formosan Entomol. 35: 185-193. (in Chinese, with English summary) ["This paper describes the basic biology of I. senegalensis, including its life history under laboratory conditions, body colour pattern, behaviour observations, and the ratio of female colour types in the field. In the laboratory rearing of Ischnura senegalensis, the egg stage was 6.0 ± 2.5 days, egg and larval stage were 44.4 ± 10.5 days, male adult longevity was 15.6 ± 6.9 days, female adult longevity was 15.9 ± 7.0 days, and the life cycle was 66.0 ± 19.9 days, all at room temperature. The newly emerged male adults were all of a blue turquoise to green turquoise. On the other hand, the newly emerged female adults showed four colour types: orange, green, green turquoise and blue turquoise. The above female colour types were in an approx. ratio of 9 : 3 : 3 : 1 using the chi-square goodness-of-fit test for both the lab. raised (÷2 = 6.51, p > 0.05, df = 3) and field populations (÷2 = 4.55, p > 0.05, df = 3). In other words, the orange female was the most abundant, followed by the green and green turquoise females, while the blue turquoise female was uncommon.] Address: Li, C.-C., Dept of Bioresources, National Chiayi University, Chiayi, Taiwan

15939. Li, Qiu-j.; Huang, Hai-t.; Lei, Chi-i.; Kan, Hon-p.; Wong, Kai-c.; Hu, Shao-f.; Zeng, Wen-h. (2015): Study on diversity and fauna of Odonata in Macao. Guangdong Agricultural Sciences 42(24): 157-161. (in Chinese, with English summary) ["An investigation of Odonata in 2014 showed that there were 35 species, belonging to 26 genera, 6 families, in Macao. Among them, Pantala flavesens, Ceriagrion aeruginosum, and Ischnura senegalensis were dominant species. Faunal characteristics of Odonata in Macao showed that 27 oriental species and 8 cosmopolitan species, occupied 77.14% and 22.86% in total, respectively. The diversity index, evenness index, dominance index, and superiority centrality index of Odonata in Macao were 2.8084, 0.7899, 0.1981 and 0.0910, respectively. Similarity index of Odonata in Macau Peninsula, Taipa Island and Coloane Island was 47%-77%. Richness and diversity of Odonata in Coloane Island was the highest, Taipa Island followed, and Macau Peninsula was the lowest." (Authors)] Address: Li, Q.-j., Guangdong Entomological Inst. / Key Lab. of Integrated Management of agricultural pests, Guangdong Province / Guangdong wildlife protection and utilization of public laboratory, Guangzhou, Macao Special Administrative Region 510 260 IACM, Macau

15940. Liebel, H.T.; Segreto, R. (2015): Erweiterung der Höhenverbreitung von Gomphus vulgatissimus in Bayern (Odonata: Gomphidae). Libellula 34(3/4): 195-201. (in German, with English summary) ["Altitudinal range expansion of G. vulgatissimus in Bavaria (Odonata: Gomphidae) – At lake Lautersee (county of Garmisch-Partenkirchen, district Upper Bavaria) an emerging individual of G. vulgatissimus was observed on the 16th of May 2015 at an altitude of 1,014 m asl. This is the uppermost evidence of reproduction for this species in Germany. Data of G. vulgatissimus from a central Bavarian database of observations was analyzed for altitudinal range shifts of this species. The result indicates a clear range expansion towards higher altitudes and an increase in observations of exuviae at higher altitudes than before." (Authors)] Address: Liebel, H.T., Arzgrubenweg 7, 82481 Mittenwald, Germany. E-mail: heiko.liebel@gmail.com

15941. Louboutin, B.; Blanchon, Y.; Gaymard, M.; Houard, X.; Jaulin, S.; Monchaux, G.; Petitot, M.; Rondeau, A.; Ronne, C. (2015): Détection des populations de Gomphidae sur le Rhône méridional. Les invertébrés dans la conservation et la gestion des espaces naturels. Actes du colloque de Toulouse du 13 au 16 mai 2015: 71-76. (in French, with English summary) ["Regional declensions of the objectives of the National Action Plan (PNA) for the threatened dragonflies require appropriation of conservation issues by the different actors. The National Company of the Rhône (CNR), which manages the Rhône River and its annexes environment wished to get involved in improving knowledge on the distribution and ecology of the Rhône river species to integrate them at best in its management. The Rhône is a river relatively difficult to prospect whose odonatological knowledge remains fragmentary. An inventory program to detect the presence, estimate and locate the emergence of the species concerned by the PNA on the southern Rhône sectors has been established for 3 years from 2014 to 2016. This communication presents

the methodology and results for the first year of inventory." (Authors)] Address: not stated

15942. Lowdon, J. (2015): The habitat requirements and changing distribution of Calopteryx splendens (Harris) (Banded Demoiselle) in Northumberland. Journal of the British Dragonfly Society 31(1): 1-13. (in English) ["C. splendens is one of many Odonata species expanding their range northwards in Great Britain. This study investigates this shift within the county of Northumberland, alongside an analysis of habitat characteristics (using River Habitat Surveys) and their influence on site selection. The availability of further habitat in the county was also examined, with many currently unoccupied but suitable sites found." (Author)] Address: Lowdon, Jennie, 8 Fell Terrace, Burnopfield, Newcastle upon Tyne, NE16 6DW, UK

15943. Machado, A.B.M.; Bedê, L.C. (2015): Two new genera and nine new species of damselflies from a localized area in Minas Gerais, Brazil (Odonata: Zygoptera), International Journal of Odonatology 18(4): 269-296. (in English) ["Two new genera, Franciscobasis and Franciscagrion, and seven new species, i.e. Acanthagrion franciscoi, Franciscobasis franciscoi, Franciscobasis sonia, Franciscagrion franciscoi, Franciscagrion longispinum, Minagrion franciscoi and Oxyagrion franciscoi, are described and illustrated. In addition, two new species of Peristicta are reported and will be described elsewhere. All these species have been collected along a 600 m stretch of the headwaters of the São Francisco River, within the Serra da Canastra National Park, in the state of Minas Gerais, Brazil. The significance of this finding in such a small area is discussed." (Authors)] Address: Machado, A.B.M., Depto de Zoologia, Inst. Cienc, Biol., Univ. Federale de Minas Gerais, Caixa Postal 486, 31270-901 Belo Horizonte, Minais Gerais, Brazil. E-mail: angelo@icb.ufmg.br

15944. Magalhaes, E.R.S.; Yamamoto, K.C.; Anjos, H.D.; Loebens, S.; Soares, M.G.M. (2015): Banks of aquatic macrophytes of floodplain lake: sites of alimentation of two species of the fish in the region of Manaus, Amazon, Brazil. Actapesca 3(1): 25-40. (in Portuguese, with English summary) ["The aquatic macrophytes banks in the floodplain lakes of the Amazon river constitute a major environments inhabited by fish. The abundance of aquatics macrophytes suggests that there is a high availability of food, autochthones and allochthones, to fish species. The diet composition of S. marmoratus and C. amazonarum was evaluated by the analysis of stomach contents of 201 specimens, by frequency of occurrence and gravimetric methods. The results of both methods were combined in the food index (IAi). In the high and low water periods, the food items most eaten by S. marmoratus and C. amazonarum were insects (Hemiptera and Odonata) and the fish (muscle and scales). The analysis of variance (one-way ANOVA) shows there are significant differences in the food types according length classes. In S. marmoratus differences occurring between high and low water periods. But to C. amazonarum was different only in high water periods. In conclusion, the aquatic macrophytes banks serve as an important feeding place for S. marmoratus and C. amazonarum in Amazon floodplain lakes." (Authors)] Address: Magalhaes, E., Depto de Ciências Pesqueiras, Universidade Federal do Amazonas - UFAM, Brazil. E-mail: esnermagalhaes@gmail.com

15945. Maingeot, M.; Motte, G.; Goffart, P. (2015): Première étude de l'émergence de la Cordulie à corps fin (Oxygastra curtisii) le long de l'Ourthe. Les Naturalistes beiges 96(3-4): 57-83. (in French, with English summary) ["Emergence is an important and highly vulnerable step in the dragonfly life. This process seemed not to have been directly observed on O. curtisii, a remarkable species of West-European fauna, protected by the “Natura 2000” Habitat Directive, while several studies have provided information on its larval and adult life. A preliminary study has therefore been carried out in June 2014 and 2015 on a little section of the river Ourthe (a tributary of the Meuse river), to document this step. Observations of emergence sequences occurred only at night time, between 22h00 and 5h00 in the morning, for a duration of 4 hours to 6 hours, the maiden flight taking place before dawn. This particular mode of emergence, described in some Anisoptera of our regions and more frequently in the tropics, likely allows to escape predation by birds. Given the aggregative character of this species’ emergences on trees above larval breeding sites (among immersed roots), this nocturnal tempo presents an obvious selective advantage. The phenomenon of “divided” emergence, consisting of shifting the period of emergence during the day when the nocturnal temperatures are too cool, known from other European species with nocturnal emergence, has not been observed. The temporal and spatial distribution of the emergences, the sex ratio, the supports and positions chosen at the emergence are also presented and discussed." (Authors)] Address: Goffart, P., Observatoire de la Faune, de la Flore et des Habitats, Centre de Recherche de la Nature, des Forets et du Bois, Avenue de la Faculte d'Agronomic, 22, 5030 Gembloux, Belgium. E-mail: p.goffart@mrw.wallonie.be

15946. Malikova, E.I.; Streltzov, A.N. (2015): Artificial water bodies as a base in the dispersal of dragonflies (on the sample of the Kivdinskoe reservoir, Amurskaya oblast). A.I. Kurentsov's Annual Memorial Meetings 26: 76-87. (in Russian, with English summary) ["The list of 44 species of dragonflies collected in Amurskaya oblast from Kivdinskoe reservoir (a technological water reservoir to the Raichikhinsk GRES) is given. A number of rare in the Amur region oriental species were abundant there. Paracercion hieroglyphicum and Deielia phaon are reported for Amurskaya oblast for the first time. Number of species of the studied reservoir is richer by 10-15 species than that of the neighbouring natural water bodies (lakes, oxbows, creeks etc.), probably due to better temperature conditions. The high abundance of the mentioned species suggests that the Kivdinskoe reservoir can serve as a base in the dispersal of southern migrants to the north and west." (Author)] Address: Malikova, Elena, Blagoveshchensk State Pedagogical University, Blagoveshchensk, Russia. E-mail: e_malikova@inbox.ru

15947. Massard, J.A.; Geimer, G.; (2015): Le professeur Jos Hoffmann (1911-2000), pédagogue, zoologue et

défenseur de la nature, membre méritant de la Société des naturalistes luxembourgeois. Bulletin de la Société des naturalistes luxembourgeois 116: 321-345. (in French, with English summary) ["Jos Hoffmann was born in Reckange (commune of Mersch) on 11-XII-1911 and died in Luxembourg-City on 16-XII-2000. He was a natural sciences teacher, first at the 'gymnase d'Echternach' (grammar school), then at the 'Lycée de garçons de Luxembourg' and the 'Cours supérieurs/Cours universitaires de Luxembourg'. The author of numerous faunistical studies of invertebrate groups such as Ephemeroptera, Hirudinea, Myriapoda, Odonata, Plecoptera, Neuropteroidea, Amphipoda, Orthoptera, Mecoptera, Dermaptera, Trichoptera, Oligochaeta and others, he was the outstanding zoologist of the second half of the 20th century in Luxembourg. Jos Hoffmann was an active member of the 'Société des naturalistes luxembourgeois' (Society of Luxembourg naturalists) and above all of the science section of the grand-ducal Institute. He was a keen angler, and a member of the executive board of the 'Fédération luxembourgeoise des pêcheurs sportifs' (Luxembourg federation of sport anglers) as well as the editorial director of 'De Lëtzeburger Sportfëscher', the federation's bulletin, from 1956 to 1959. In 1948, he had distinguished himself by his resolute intervention during the accidental pollution of the river Eisch by the phenol factory of Steinfort. Just like so many young Luxembourgers two of his brothers had been illegally forced into the German Wehrmacht during World War II by the Nazis occupying Luxembourg, and they had been made prisoners of war on the Eastern Front. This explains why Jos Hoffmann had been a founding member and a member of the executive board of the Luxembourg association of parents of prisoners of war in 1945. In the following years he developed a short-time public activity in the Christian Social Party (Parti chrétien-social). Jos Hoffmann is the father of Jules A. Hoffmann, winner of the Nobel prize for physiology or medicine in 2011." (Author)] Address: Geimer, Gaby, 1a, rue des Romains, 6478 Echternach, Luxembourg. E-mail: gabrielle.geimer@education.lu

15948. Maton, P. (2015): Photospot: Norfolk Hawker Aeshna isosceles. Atropos 55: 72. (in English) [05-VI-2014, Kent Wildlife Trust Reserve, East Blean Woods, UK,] Address: not stated

15949. Medina, M.N.D.; Cabras, A.A.; Villanueva, R.J.T. (2015): Description of male Risiocnemis moroensis Hämäläinen 1991 (Odonata: Platycnemididae) from Davao City, Mindanao Island, Philippines. Journal of Advances in Biology 8(3): 1636-1640. (in English) ["Description of the male Risiocnemis moroensis (Hämäläinen, 1991) is provided with confirmation of the taxon into appendiculata group is presented." (Authors)] Address: Dejadena Medina, M.N.D., Research and Publication Center, University of Mindanao, Davao City Philippines. E-mail: mnd_medina@umindanao.edu.ph

15950. Medina, M.N.D.; Cabras, A.A.; Villanueva, R.J.T. (2015): Odonata of Island Garden City of Samal and is relation to other small islands in The Philippines. Proceedings of International Conference on Life Sciences and Biotechnology (ICOLIB). Exploration and Conservation of Biodiversity, Jember. ISBN: 978-602-9030-98-3: 93-97. (in English) ["The first record of Odonata fauna in the Island Garden City of Samal is presented with comparison to other small islands in the Philippines. Opportunistic and photo documentation were employed in all fluvial systems surveyed between April 2014 to April 2015. 31 species belonging to 7 families and 22 genera was recorded. 12 species or 39% are zygopterans and 19 species or 61% are anisopterans. A relatively low level of endemism (35%) is recorded which is attributed to the different habitat modifications of its fluvial systems. Kroeber's percentage of similarity revealed Island Garden City of Samal shares similar Odonata species with Siargao and Saranggani Islands characterized by karst ecosystem with low lying topography. Creation of local policy to protect the head waters where most of the endemic species found is urgently needed" (Authors)] Address: Villanueva, R.J.T., D3C Gahol Apartment, Lopez Jaena St., PH-8000 Davao, Philippines. E-mail: rjtvillanueva@gmail.com

15951. Medina, M.N.D.; Cabras, A.A.; Villanueva, R.J.T. (2015): Odonata fauna of Compostela, Valley Province, Mindanao Island, Philippines. International Journal of Current Research in Biosciences and Plant Biology 2(10): 104-109. (in English) ["The first provincial-wide survey of Odonata was conducted in Compostela Valley Province (Comval). Opportunistic and segmented line transect method was employed in all fluvial systems visited between March and September 2014. A total of 2,883 individuals belonging to 12 families 24 genera and 32 species were recorded. 17 out of 32 species or 53% belongs to suborder Anisoptera while 15 species or 47% are Zygopterans. Compostela Valley province exhibits 56% endemism, one of the highest endemism records in Mindanao. An immediate conservation effort to fluvial systems containing high endemism and species quality is recommended." (Authors)] Address: Villanueva, R.J.T., D3C Gahol Apartment, Lopez Jaena St., PH-8000 Davao, Philippines. E-mail: rjtvillanueva@gmail.com

15952. Michalski, J.; Abbott, J.C. (2015): The Dragonflies & Damselflies of Trinidad & Tobago. Kanduanum Books, Morristown NJ. 270 pp. (in English) ["Located at the extreme southern tip of the Lesser Antilles, Trinidad and Tobago's biological affinities are with the South American mainland, rather than the Caribbean islands to the north. Together, these two islands are home to over 120 species of Odonata - all covered in this field guide - and provide a perfect introduction to the flora and fauna of the Neotropics." (Publisher)]

15953. Miyazaki, T. (2015): On a specimen of Aeshna mixta collected by Mr. Syujiro Hirayama (1889~1954) in Chiba Prefecture, Central Japan, with a review on records of the species before 1950. Tombo 57: 39-42. (in Japanese, with English summary) ["S. Hirayama (1889-1954)'s report of A. mixta from Chiba Prefecture in 1935 was treated as doubtful in the Red Data Book of the Prefecture (2011), because of poor and inadequate knowledge for identification between A. mixta and related species, especially Anaciaeschna martini at that time. The author examined Hirayama's collection housed in the Museum of Nature and

Human Activities, Hyogo and verified that the specimen of his report was true 'Aeshna mixta'. In addition, a specimen of the same species from Inokashira, Tokyo, was kept in the same collection. The author also reviewed old records of A. mixta with drawings and/or photos of specimens and showed that A. mixta also occurred in Katsushika, lowland of Tokyo, more than 70 years ago." (Author)] Address: E-mail: t-miyaza@juno.ocn.ne.jp

15954. Moali, A.; Durand, E. (2015): Découverte de Selysiothemis nigra (Vander Linden, 1825) (Odonata, Anisoptera: Libellulidae) au Lac Mezaïa à Béjaïa, Algérie. Poiretia 7: 1-5. (in French, with English summary) ["During a visit to at Bejaïa (NE Algeria) in summer 2013, a population of S. nigra has been identified in Mezaïa lake. Several specimens with breeding behaviours were noticed. These observations represent the first documented mention of this species on the Mediterranean coast of Algeria."] Address: Moali, Aïssa, Laboratoire d'Ecologie et Environnement, Université de Béjaïa, 06000, Béjaïa, Algeria. E-mail: aissa.moali@gmail.com

15955. Munoz, P.; Torres, F.; Megias, A. (2015): Effects of roads on insects: a review. Biodivers. Conserv. 24: 659-682. (in English) ["In the last few decades, mounting evidence points to a negative impact of roads on several groups of animals. Most studies on the effects of roads on animal populations concentrate on vertebrates, and only a few on insects. It is difficult to determine the real effects of roads on insects due to the variety of methods used. We review recent literature examining the ecological impact of roads on insects. The objectives of our synthesis are to gain insight into the effects of the construction and operation of a road on insect groups, and to determine the gaps of knowledge. We found that roads negatively affect the abundance and diversity of insects due to two main factors: (1) the high mortality of some groups when crossing the road, with more impact at higher traffic volumes. (2) The unwillingness of many species to cross a road or live close to it. Roads are major barriers for small or flightless species, although the response varied for flying species. Finally, both experimental and observational evidence support the idea that air pollutants and de-icing salt used for the road maintenance negatively affect insects." (Authors)] Address: Megías, A.G., Depto de Zool., Facultad de Ciencias, Univ. de Granada, Avda Fuentenueva s/n, Granada, Spain. E-mail: adelagm@ugr.es

15956. Møller, A.P.; Mousseau, T.A. (2015): Biological indicators of ionizing radiation in n ature. In: Armon, R.H. & O. Hänninen (eds.): Environmental Indicators: 871-881. (in English) ["Ionizing radiation that consists of a, ß and γ rays can directly damage DNA and other molecules and as such result in somatic or germline mutations. The consequences of ionizing radiation for living beings cannot be measured with a Geiger counter because it will depend on external dose, internal dose, and the extent of DNA repair. In addition it will depend on the environmental conditions under which living organisms exist. We list environmental indicators of ionizing condition that reveal immediate and long-term consequences ranging from changes in DNA, over damaged cells and organs to altered gene function and development, reduced fecundity and survival, and hence to negative population trends, and altered communities and ecosystems and perturbed ecosystem functioning. We test for consistency in biological indicator ability across spatial and temporal scales relying on long-term field data collected at Chernobyl and Fukushima, and we test for consistency in indicator ability among indicators. Finally, we address the direct and indirect effects of ionizing radiation and we discuss the species or taxa most susceptible to the effects of radiation ... Indeed, species richness and abundance of birds (Møller & Mousseau 2007a, b, 2009), but also spiders, dragonflies, grasshoppers, bumblebees, butterflies, amphibians, ... In contrast, there were significant interactions for butterflies, dragonflies, ...]. (Authors) Address: Mousseau, T.A., Dept of Biol. Sciences, Univ. South Carolina, Columbia, SC, 29208, USA. E-mail: mousseau@sc.edu

15957. Nakanishi, H.; Mori, A.; Takeda, K.; Tanaka, H.; Kobayashi, N.; Tanoi, K.; Yamakawa, T.; Mori, S. (2015): Discovery of radioactive silver (110mAg) in spiders and other fauna in the terrestrial environment after the meltdown of Fukushima Dai-ichi nuclear power plant. Proc. Jpn. Acad., Ser. B 91 (2015): 160-174. (in English) ["Six months after the explosion of TEPCO's Fukushima Dai-ichi nuclear power plant, radioactive silver (110mAg), was detected in concentrations of 3754 Bq/kg in Nephila clavata (the orb-web spider; Joro-gumo in Japanese) collected at Nimaibashi, Iitate village in Fukushima Prefecture, whereas 110mAg in the soil was 43.1 Bq/kg. A survey of 35 faunal species in the terrestrial environment during the 3.5 years after the accident showed that most of Anthropoda had two orders higher 110mAg in their tissues than soils, although silver is not an essential element for their life. However, tracing of the activity of 110mAg detected in spider Atypus karschi collected regularly at a fixed location showed that it declined much faster than the physical half-life. These results suggest that 110mAg was at once biologically concentrated by faunal species, especially Arthropoda, through food chain. The factors affecting the subsequent rapid decline of 110mAg concentration in faunal species are discussed." (Authors) Sampling includes Sympetrum croceolum, S. frequens and Anotogaster sieboldii.] Address: Mori, S., Graduate School of Agricultural and Life Sciences, The University of Tokyo, 1-1-1 Yayoi, Bunkyo-ku, Tokyo 113-8657, Japan. E-mail: winep@bird.ocn.ne.jp

15958. Naraoka, H. (2015): Predation of a lepidopteran larva by Aeschnophlebia longistigma (Odonata: Aeshnidae). Tombo 57: 49-50. (in Japanese, with English summary) ["A female adult of A. longistigma Selys, 1883 preying on a mature larva of Malacosoma neustria testacea (Motschulsky, 1861) (Lasiocampidae, Lepidoptera) from a leaf of reed was observed at a pond Hiyamizu-numa, Koshimizu, Tsugaru city, Aomori prefecture on June 21, 2014. The lepidopteran larvae were abundant those days on the shore of the pond." (Author)] Address: Naraoka, H., 36-22, Motoizumi, Fukunoda, Itayanagi-cho, Kita-gun, Aomori Prefecture, 038-3661, Japan. E-mail: sbnkq127@ybb.ne.jp

15959. Nor Zaiha, A.; Mohd Ismid, M.S.; Salmiati; Shahrul Azri, M.S. (2015): Effects of logging activities on ecological

water quality indicators in the Berasau River, Johor, Malaysia. Environmental Monitoring and Assessment 187: 493-501. (in English) ["Influence of deforestation on biodiversity of aquatic organisms was investigated in a stream in the Ulu Sedili Forest Reserve. The stream was monitored five times from December 2011 until December 2012 with 2-month intervals. Sampling of benthic communities was carried out using rectangular dip net while water quality study using a YSI ProPlus meter and the rest were done in the laboratory. Physicochemical parameters and water quality index (WQI) calculation showed no significant difference among the investigated events. WQI classified the Berasau River between Class II (good) to III (moderate) of river water quality. In total, 603 individuals representing 25 taxa that were recorded with Decapods from genus Macrobrabchium were widely distributed. Several intolerant taxa, especially Ephemeroptera and Odonata, were also observed in this river. According to Pearson's correlation analysis, the richness and diversity indices were generally influenced by water quality parameters represented by WQI ($P < 0.01$). In conclusion, logging activities have strong attributes for variation in benthic macroinvertebrate assemblage." (Authors) To determine the Odonata, a key from North America was used.] Address: Salmiati, Centre for Environmental Sustainability and Water Security (IPASA), Research Institute for Sustainable Environment (RISE), Universiti Teknologi Malaysia, 81310, Johor Bahru, Malaysia. E-mail: salmiati@utm.my

15960. Nuñeza, K.J.M.; Nuñeza, O.M.; Villanueva, R.J.T. (2015): Species diversity of Odonata in Bega watershed, Agusan del Sur, Philippines. Journal of Biodiversity and Environmental Sciences 7(5): 69-82. (in English) ["Odonata is dependent upon habitats with standing or flowing water. Its sensitivity to changes in water ecosystems makes it a good biological indicator. This study aimed to determine the species richness of Odonata in Bega Watershed, Prosperidad, Agusan del Sur, Philippines. A survey was conducted in 12 sites on May 8-14, 2014 using sweep netting and hand catching methods. 27 species consisting of 11 species of dragonflies and 16 species of damselflies under 10 families and 20 genera were recorded. Of the 27 species, 17 are endemic with 62.96% endemism. Bega Watershed had high species diversity with an uneven distribution of species. Among the sampled sites, sites 2 and 4 had the highest species richness (S=14) while highest species diversity (H'=2.47) was recorded in site 4 which is a relatively undisturbed and intact ecosystem. Highest abundance of Odonata was recorded in Site 1, the first level of Bega falls. Rhinocypha colorata, an endemic species, was found to be the most abundant and widespread, being found in seven out of 12 sites. Detrended correspondence analysis showed that Odonata prefers semi-forested riparian areas while Bray-Curtis cluster analysis showed that sites 2 and 4 are the most similar sites. The high level of endemism and moderate to high diversity in most of the sites indicate that Bega watershed is a relatively healthy ecosystem and is of high conservation importance." (Authors); Mindanao] Address: Nuñeza, Olga, Dept of Biological Sciences, College of Science and Mathematics, MSU-Iligan Institute of Technology, A. Bonifacio Ave., Tibanga, Iligan City, Philippines. E-mail: olgamnuneza@yahoo.com

15961. Olomukoro O. J.; Osuinde, G.A. (2015): Benthic macroinvertebrate in relation to pollution tolerance index of a creek flowing through an urban area in southern Nigeria. Egerton J. Sci. & Technol. 15: 141-156. (in English) ["Assessment of the pollution tolerance index (PTI) of Ekpan creek Delta state, Southern Nigeria was studied fortnightly from January to June, 2007. Macrobenthic invertebrates were collected from floating macrophytes (Eichhornia crassipes) using the quadrant sampling method and dusted in formalin solution. Physico-chemical parameters were analyzed using test methods according to APHA, 1998 while heavy metals were analyzed with an atomic absorption spectrometer (PYE unicam SP2900) after digestion. Eleven (11) major groups were recorded comprising of 45 species that were sorted, identified and counted. Station one had a relative abundance of 41.1%, station two had 30.7% and station three had 28.2 % respectively of the total population. The dominant groups were Gastropoda (69.9%) and Crustacea (22.0%) while others were rare groups. Polychaete, Crustacea, Coleoptera, Odonata, Gastropoda, Arachnida, occurred both in the rainy and dry season with the exceptions of Collembola and Ephemeroptera which occurred only in the rainy season. Diversity of the benthos showed no significant variation between the stations. There also existed a significant correlation ($p>0.05$) between most of the groups. The PTI values ranged between 11-14 in the study stations and were less than 10 in most months indicating a

compromised water quality." (Authors)] Address: Osuinde, Gloria, Dept of Animal and Environmental Biology, Faculty of Life Sciences, Univ. Benin, P.M.B 1154, Benin City, Edo State, Nigeria. E-mail: gloriaonde@gmail.com

15962. Orr, A.; Kalkman, V. (2015): Field guide to the dragonflies of New Guinea. Brachytron 17 Supplement 3: 3-156. (in Bilingual in English and Bahasa Indonesia) ["Enables identification of the approximately 175 species presently known from New Guinea, its satellite islands and the Bismark Archipelago. Illustrated by nearly 250 colour drawings and over 300 line drawings by Albert Orr and 36 colour photographs taken in the field. Many species included have never been depicted in colour before." (Publisher)] Address: Orr, A.G., Cooperative Research Centre for Tropical Rainforest Ecology & Management, Environmental Sciences, Griffith University, Nathan, Q 4111, Australia. E-mail: agorr@universal.net.au

15963. Parr, A.J.; Long, R. (2015): A Review of the Odonata of the Channel Islands. Journal of the British Dragonfly Society 31(1): 30-48. (in English) ["In all, some 37 species of Odonata - comprising 12 zygopterans and 25 anisopterans - have been recorded from the Channel Islands, and records of these species are reviewed. A number of species formerly considered to be resident are now known to be locally extinct, largely as the result of the loss of suitable habitat. A number of species have, by contrast, only started to appear in the Islands within the last twenty years, probably part of the pan-European range changes resulting from climate change." (Authors)] Address: Parr, A.J., 10 Orchard Way, Barrow, Bury St. Edmunds, Suffolk IP29 5BX, UK. E-mail: Adrian.parr@bbsrc.ac.uk

15964. Parr, A.J. (2015): Migrant and dispersive dragonflies in Britain during 2014. Journal of the British Dragonfly Society 31(2): 64-73. (in English) ["In Britain, the year 2014 was rather a mixed one as far as migrant and dispersive dragonflies were concerned. The period mid-May to mid-July saw significant immigrations of Anax parthenope and, in particular, Sympetrum fonscolombii. Slightly later, during late July/early August, large numbers of Aeshna mixta were also noted in parts of south-east England and a migratory event was probably involved in at least part of this. Events later in the season were, by contrast, very much more low-key, though small numbers of second generation S. fonscolombii were noted. Events relating to our new colonist species were similarly mixed. Chalcolestes viridis had a good season with significant range expansion being noted. Lestes barbarus also seemed to fair well. Coenagrion scitulum and Aeshna affinis however did less well, with fewer than normal sightings and no sign of any continued immigration. Hopefully, the next few years will see a recovery in the fortunes of these last two species" (Author)] Address: Parr, A.J., 10 Orchard Way, Barrow, Bury St. Edmunds, Suffolk IP29 5BX, UK. E-mail: Adrian.parr@bbsrc.ac.uk

15965. Petrulevieius, J.F. (2015): A new Synlestidae damselfly (Insecta: Odonata: Zygoptera) from the early Eocene of Nahuel Huapi Este, Patagonia, Argentina. Arquivos Entomolóxicos 14: 287-294. ["A new lestoid genus, Inacayalestes gen. nov., based on Inacayalestes aikunhuapi sp. nov. is described from Nahuel Huapi Este locality (Ypresian), Neuquén province, Patagonia, Argentina. The new genus is assigned to Synlestidae and seems to be related to Ecchlorolestes Barnard, 1937 and Synlestes Selys, 1868, both genera from Southern Hemisphere, from South Africa and Australia, respectively. The new genus enlarges the record of Lestomorpha in Argentina to three fossil genera: Promegalestes Petrulevièius & Nel, 2004, Austroperilestes Petrulevièius & Nel, 2005, and Inacayalestes gen. nov., whereas two extant genera are present: Lestes Leach, 1815 and Archilestes Selys, 1862." (Authors)] Address: Petrulevièius, J.F., División Paleozoología Invertebrados, Facultad de Ciencias Naturales y Museo, Univ. Nacional de La Plata, and Consejo Nacional de Investigaciones Científicas y Técnicas - CONICET Paseo del Bosque, s/n. La Plata (1900), Buenos Aires, Argentina. E-mail: levicius@fcnym.unlp.edu.ar

15966. Petzold, F. (2015): Zur aktuellen Verbreitung der Westlichen Keiljungfer Gomphus pulchellus, Selys 1840 in Thüringen (Insecta: Odonata). Thüringer Faunistische Abhandlungen 20: 71-82. (in German, with English summary) ["After the very first findings of G. pulchellus in Thuringia from the early 1990s especially after 2009 many new records were obtained. Currently a total of 39 localities is known, 22 of them with successful reproduction recorded. Nowadays the species occurs throughout Thuringia. The species prefers mesotrophic to eutrophic lentic waters with a sandy-loamy Substrate and a certain maturity. Larvae live in shallows that warm up quickly in spring. All known habitats are anthropogenic in origin, like gravel pits, sand pits or small reservoirs, and are mostly situated at lower elevations." (Author)] Address: Petzold, F., Pappelallee 73, 10437 Berlin, Germany

15967. Poschmann, M.; Wedmann, S.; Schindler, T.; Uhl, D.; Wuttke, W. (2015): Eine Arthropoden/Pflanzen-Taphozönose aus einem pliozänen Kratersee bei Ruppach-Goldhausen, Westerwald (Rheinland-Pfalz, SW-Deutschland). Mainzer naturwissenschaftliches Archiv 52: 103-117. (in German, with English summary) ["An arthropod/plant-taphocoenosis from a Pliocene crater lakeat Ruppach-Goldhausen, Westerwald (Rhineland-Palatinate, SW Germany). Some plants and insects are reported from laminated sediments of an ancient lake at Ruppach-Goldhausen in the Westerwald area. This taphocoenosis is briefly discussed in terms of age, climate and palaeoecology. Preliminary results suggest that these laminites were deposited in a hydrologically isolated, probably not very large and not par ticularly deep crater lake. The plant association suggests an Upper Pliocene age and a Cfa-like palaeoclimate. Besides common beetles, there is a notably high share of (semi-)aquatic insects (e. g. Notonectidae, chaoborid pupae) and cladoceran ephippia, which indicate the prolonged existence of an autochthonous aquatic ecosystem within the lake. The fossil preservation hints at quiet conditions at the site of burial. Abundant pyrite framboids suggest anoxic conditions at least below the sediment/water interface." (Authors)] Address: Poschmann, M., Generaldirektion Kulturelles Erbe RLP, Direktion Landesarchäologie, Referat Erdgeschichte, Große

Langgasse 29, 55116 Mainz, Germany. E-Mail: markus.-poschmann@gdke.rlp.de

15968. Priyadarshana, T.M.T.S.; Wijewardana, G.V.I.H.; van der Poorten, N.; Jayasooriya, A.L.A.C. (2015): First record of Gynacantha millardi (Odonata: Aeshnidae) from Sri Lanka. Taprobanica 7(4): 266-267. (in English) ["Dry zone of Sri Lanka, in Bodigama, Uva province/Kuda Oya in Monaragala District (06°32'15.6"N, 081°07' 18.3"E; alt. 188 m a.s.l.) on 5 January 2015 at 06:33 PM." (Authors)] Address: Priyadarshana, T.M.T.S., Dept Natural Resources, Fac. Appl. Sciences, Sabaragamuwa Univ. of Sri Lanka, Belihuloya, 70140, Sri Lanka. E-mail: tharakas.priyadarshana@gmail.com

15969. Quignot, N.; Grech, A.; Amzal, B. (2015): Data collection on combined toxicity of multiple chemicals for animal health and ecological risk assessment. EFSA Supporting Publications 12(7): 1-112. ["There is an increasing need to develop harmonised frameworks and methods for the risk assessment of combined exposure to multiple chemicals. A number of activities have already been undertaken by EFSA, notably in the fields of pesticides and contaminants. This project aims at searching for, reviewing, collecting and synthesizing the published data on combined effects of multiple chemicals in more than 50 species of veterinary and ecological relevance, using extensive literature searches. The taxonomical hierarchy for the literature searches was very wide ranging from bacteria, fungi, invertebrates and vertebrates (amphibians, … Odonata, …). In vivo toxicity data were extracted from 199 publications representing 3,074 individual studies on pesticides, environmental contaminants, food-related products, hormones, metals, mycotoxins and pharmaceuticals. The magnitudes of interaction following acute and chronic exposure to multiple chemicals were consolidated via meta-analysis and expressed as mean effect ratios between single and multiple chemicals. Overall, this report illustrates how systematic published data collection and synthesis can support hazard characterisation of combined toxicity of multiple chemicals. Further work is proposed to compare the toxicity datasets for which statically significant interactions have been reported with chemical-specific reference points from EFSA's chemical hazards database. These analyses will allow testing the sensitivity of the toxicological endpoints (e.g. acute versus chronic effects, mortality versus biochemical parameters etc…), the dose dependency of the toxicological interactions and the potential use of the methodology in ecological risk assessment of multiple chemicals." (Authors)] Address: scer@efsa.europa.eu

15970. Rault, P.A.; Gourdain, P.; Guicheteau, D.; George, G.; Braud, Y. (2015): Découverte de nouvelles stations de Cordulie méridionale Somatochlora meridionalis Nielsen, 1935 dans le Var et les Alpes-Maritimes. Nature de Provence - Revue du CEN PACA, publication web, octobre 2015: 1-4. (in French, with English summary) ["Discovery of new S. meridionalis locations in Var and Alpes-Maritimes. Since 1970, the first presence data of this species in France, S. meridionalis has only been reported twenty times, always from the area of Estérel (Var). In 2013, three new locations were discovered, two in the Plaine des Maures (Var) and one other in the hinterland of Cannes (Alpes-Maritimes). An assessment of the species' conservation status in the PACA region is proposed." (Authors)] Address: Rault, P.A., Service du patrimoine naturel, Muséum national d'Histoire naturelle, Laboratoire d'Écologie Générale, 4, avenue du Petit Château 91800 Brunoy, France. E-mail: parault@mnhn.fr

15971. Sakai, S.; Eda, S. (2015): A case of trans-subordinal tandem trials between a male Mnais pruinosa and a female Davidius fujiama. Tombo 57: 13-14. (in Japanese, with English summary) ["A male M. pruinosa (Calopterygidae) tried 3 times to form tandem position with a female D. fujiama (Gomphidae) at Matsukura river in Ina city, Nagano prefecture on July 15, 2014. This female looked weaken because it kept wings half open and could not fly away on this harassment, which would cause the zygopteran's misconception. This paper is thought to be the first in Japan to report a case of transsubordinal tandem trial." (Authors)] Address: Sakai, M., Fac. Science & Engineering, Chuo Uni., 1-13-27 Kasuga, Bunkyo-ku, Tokyo 112-8551, Japan. Email: boundary.0008@gmail.com

15972. Sakurai, S.; Sakurai, D.; Seki, N.; Natsume, H. (2015): An adult female of Trigomphus melampus (Selys, 1869) was captured on October 4th, 2014 at Nagatoromachi, Saitama Prefecture, Japan. Tombo 57: 47-48. (in Japanese, with English summary) ["An adult female of T. melampus was captured at Nagatoromachi, Saitama Prefecture, Japan on October 4th, 2014. This record is unusually late, because the main flight season of this species is from May to July. Past late record of adult of this species in Saitama Prefecture was only in July recorded in 1973 and 1995." (Authors)] Address: not stated

15973. Sharma, S.; Shukla, A. (2015): Preliminary study of Odonates in southeast region of Narmada Valley, Jabalpur (M.P.). International Journal of Recent Scientific Research 6(10): 7038-7040. (in English) ["… odonates are potential bio control agents of many invertebrates. Odonate assemblage from Narmada Valley in Jabalpur has been investigated. A total of 25 species of Odonata have been distributed in 7 families were sampled. Libellulidae is most dominating family, with 10 species followed by Coenagrionoidae with 7 species […]. Mostly odonates were aggregated due to habitat specific nature and random distribution indicates availability of resource utilization to survive but, in the urban forest area high anthropogenic disturbances were observed which creates high biotic pressure on forest. A detailed list of odonates recorded from urban forest area is presented." (Authors)] Address: Sharma, S., Dept Zool., Government. Model Science College, Jabalpur (M.P.)

15974. Siukeviciiis, S.; Barekute, D.; Ivtnskis, P.; Rlinsaite, J. (2015): Diversity and distribution of glacial origin forest lakes of Grazute regional park. 8th International Conference on Biodiversity Research. 28.-30.04.2015, Daugavpils, Latvia: 139. (in English) [Verbatim: The investigation on Odonata diversity and distribution of glacial origin forest lakes has been carried out in Grazute regional park (Ignalina. Zarasai districts. Lithuania). The material was collected in 25 lakes, two times during the third decade of

May - first decade of June and second decade of July in 2008-2009. The selected lakes were located in four groups, distance in each group apart from one another about 10-20 km. The sampling sites were divided into two groups by lakes surface and water level fluctuations: lakes with small surface area (0.5-5 ha), without discharge, situated in potholes, surrounded with forest and lakes with surface area 3-20 ha without discharge or partly drained, with marshy shore of the lake. Nestedness temperature calculator (NTC) has been used for measurement of species distribution in lakes of two types. The lower temperature level shows that system operating in some rules, when temperature are higher (close 100°) the system are more chaotic. 25 species of dragonflies (Odonata) have been registering during the research period in lakes of first group. The lowest species diversity was establish in small dystrophic lakes, there were registered 4 ordinary. 9 indicatory, 8 accidentally species. Epitheca bimaculata and Aeshna juncea have been found only in small dystrophic lakes. 32 species of Odonata were found in lakes of second group: 9 ordinary species. 11 indicator species and 8 accidental species. The highest number of species was established near lake Palsinis, random distribution of different Odonata species was established in lake Berzinis. Highest species diversity and individual abundance were in lakes of second group, here was established statistical significant higher temperature of matrix T = 31.75° (p = 0.06). The matrix temperature of first group lakes was lowest (T = 21.62°), it shown higher stability of species composition.] Address: Siukeviciiis, S., Univ. Vilnius. Faculty of Natural Sciences. Centre of Ecological & Environmental Science. M.K. Ciurlionio Str. 21/27. Vilnius. Lithuania, e-mail: stanislovas.sinkeviciiis@gf.vu.lt

15975. Stih, A, Koren, T.; Bobinec, A.; Matejcic, M.; Frankovic, M. (2015): The River Zrmanja - another hotspot of dragonfly diversity in the Dinaric karst, Croatia. Entomologia Croatica 19(1-2): 43-57. (in English, with Croatian summary) ["The Zrmanja is one of the largest rivers in Dalmatia, along with the rivers Krka and Cetina. At the same time it is one of the least surveyed larger rivers in the region, with only a few published records about its dragonfly fauna so far. Between 1984 and 2010 the authors collected data about the dragonflies around the river Zrmanja and its surroundings. Altogether 29 species were recorded at 17 localities. Of those, 12 species were recorded for the first time for the region. The most valuable record is that of Coenagrion ornatum, a local and rare Natura 2000 species. With the overview of the data from museum collections, private field data, published data and data collected during this survey the number of species known from the Zrmanja river increases to 31, making this river one of the best studied areas in Croatia. However, this is probably not the final number of species and new records are to be expected with further research." (Authors)] Address: Štih, Ana, Croatian Herpetological Society – Hyla, Lipovac I n. 7, 10 000 Zagreb, Croatia. E-mail: ana.stih2@gmail.com

15976. Takizawa, K.; Tezduyar, T.E.; Buscher, A. (2015): Space–time computational analysis of MAV flapping-wing aerodynamics with wing clapping. Computational Mechanics 55(6): 1131-1141. (in English) ["Computational analysis of flapping-wing aerodynamics with wing clapping was one of the classes of computations targeted in introducing the space–time (ST) interface-tracking method with topology change (ST-TC). The ST-TC method is a new version of the deforming-spatial-domain/stabilized ST (DSD/SST) method, enhanced with a master–slave system that maintains the connectivity of the “parent” fluid mechanics mesh when there is contact between the moving interfaces. With that enhancement and because of its ST nature, the ST-TC method can deal with an actual contact between solid surfaces in flow problems with moving interfaces. It accomplishes that while still possessing the desirable features of interface-tracking (moving-mesh) methods, such as better resolution of the boundary layers. Earlier versions of the DSD/SST method, with effective mesh update, were already able to handle moving-interface problems when the solid surfaces are in near contact or create near TC. Flapping-wing aerodynamics of an actual locust, with the forewings and hindwings crossing each other very close and creating near TC, is an example of successfully computed problems. Flapping-wing aerodynamics of a micro aerial vehicle (MAV) with the wings of an actual locust is another example. Here we show how the ST-TC method enables 3D computational analysis of flapping-wing aerodynamics of an MAV with wing clapping. In the analysis, the wings are brought into an actual contact when they clap. We present results for a model dragonfly MAV." (Authors)] Address: Takizawa, K., Dept of Modern Mechanical Engineering & Waseda Inst. for Advanced Study, Waseda Univ., 1-6-1 Nishi-Waseda, Shinjuku-ku, Tokyo, 169-8050, Japan. E-mail: kenji.takizawa@tafsm.org

15977. Tamm J.; Seehausen, M.; Pix, A. (2015): Interspezifische Paarungsversuche von Cordulegaster bidentata mit Aeshna cyanea und A. juncea (Odonata: Cordulegastridae, Aeshnidae). Libellula 34(3/4): 175-180. (in German, with English summary) ["Interspecific attempt of copulation by C.bidentata with A. cyanea and A. juncea […]) – Three observations of attempted interspecific pairings by males of C. bidentata with females of A. cyanea and A. juncea in Hessian hill forests are described. These are the first reports on crosspairing attempts of C. bidentata" (Authors)] Address: Tamm, J., Elgershäuser Straße 12, 34131 Kassel, Germany. E-mail: jochen.tamm@t-online.de

15978. Tatarinov, A.G.; Kulakova, O.I.; Loskutova, O.A. (2015): The structure of the fauna, ecological and geographical feature of dragonflies (Insecta, Odonata) of the East European Hypoarctic. Eurasian entomological journal 14(6): 505-510. (in Russian, with English summary) ["On the territory of East European Hypoarctic identified 28 species of dragonflies of the six families. The basis of taxonomic diversity consists of four families: Libellulidae, Coenagrionidae, Corduliidae and Aeschnidae. Species richness of local faunas gradually decreases towards the North. The nature of the longitudinal distribution is dominated by representatives of transpalearctic and Holarctic groups. In two species: Coenagrion hylas and Leucorrhinia orientalis in the region has the Western boundary of the distribution. The type of landscape-zonal distribution of East European Hypoarctic prevail temperate species. Hypoarctic species of dragonflies are only two: Somatochlora sahlbergi and

Aeshna subarctica." (Authors)] Address: Tatarinov, A.G., Inst. of Biology, Komi Scientific Centre, Ural Branch, Russian Academy of Sciences, ul. Kommunisticheskaya 28, Syktyvkar, Komi Republic, 167982, Russia. E-mail: andrei_tatarinov@mail.ru

15979. Theischinger, G.; Lupiyaningdyah, P.; Richards, S.J. (2015): Two new species of damselflies from Halmahera, Indonesia (Zygoptera: Platystictidae, Platycnemididae). IDF-Report 90: 1-10. (in English) ["Two new species of damselflies are described from central Halmahera in North Maluku Province, Indonesia. They are Drepanosticta pararudicula sp. nov. (Holotype MZB. ODON. 19257) and Nososticta halmahera sp. nov. (Holotype MZB. ODON. 19265). The two species are most similar to the Moluccan taxa D. rudicula and N. moluccensis respectively and their descriptions bring the total number of Drepanosticta species known from Halmahera to five and of Nososticta to two." (Authors)] Address: Theischinger G., 2A Hammerley Road, Grays Point, NSW 2232, Australia. E-mail: Gunther.Theischinger@environment.nsw.gov.au

15980. Theischinger, G.; Richards, S.J. (2015): New species of damselflies from the Hindenburg Wall region of western Papua New Guinea (Odonata: Coenagrionidae, Platycnemididae). Odonatologica 44(3): 431-446. (in English) ["Two new species of Teinobasis and one new species of Nososticta from the Hindenburg Wall region of western Papua New Guinea are described and illustrated. They are Teinobasis cuneata sp. nov. (Holotype SAMA 07-001421), Teinobasis flavolineata sp. nov. (Holotype SAMA07-001422), and Nososticta oculata sp. nov. (Holotype SAMA 07-001424). The new Teinobasis species are both moderately large, slender species with predominantly yellow/ orange faces and black abdomens and they are most similar to T. angusticlavia Ris from the Aru Islands and T. albula Ris from the Lorentz River. The new Nososticta species is most similar to N. finisterrae Förster, a species that is widespread in south-eastern New Guinea, but differs from it in having the blue inter-ocular bar that is typical of finisterrae reduced to two widely separated pale blue spots on the anterior frons." (Authors)] Address: Theischinger G., 2A Hammerley Road, Grays Point, NSW 2232, Australia. E-mail: Gunther.Theischinger@environment.nsw.gov.au

15981. Thompson, D.J.; Kerry, L.; Gotham, P.; Sims, A.M.; Watts, P.C. (2015): Rapid cohort splitting in Coenagrion mercuriale (Charpentier) (Southern Damselfly) following its re-introduction to Venn Ottery Common, Devon. Journal of the British Dragonfly Society 31(1): 24-29. (in English) ["The rapid occurrence of cohort splitting in a population of C. mercuriale, recently re-introduced to Venn Ottery Common, an East Devon Pebblebed site, is described. Evidence of cohort splitting, rather than immigration from one of the other East Devon Pebblebed sites, was confirmed by analysis of 14 microsatellite loci from DNA extracted from a leg of one of the 'odd-year' cohort. This individual carried alleles not previously recorded in any Devon population." (Authors)] Address: Thompson, D.J., Dept of Evolution, Ecology & Behaviour, Inst. Integrative Biology, Univ. Liverpool, Liverpool, L69 7ZB, UK

15982. Thompson, D.J.; Thompson, A.L.; Kerry, L.; Gotham, P. (2015): Reintroduction and establishment of Coenagrion mercuriale (Charpentier) (Southern Damselfly) on Venn Ottery Common, Devon. Journal of the British Dragonfly Society 31(1): 14-23. (in English) ["The rationale and mechanics of a programme to re-introduce C. mercuriale to Venn Ottery Common, a Devon Wildlife Trust reserve, is described. The donor sites were in the most genetically diverse area in the UK, Beaulieu Heath in the New Forest. Five hundred animals (100 males and 400 females) were collected and transported over the course of eight days in June 2009 (following a preliminary attempt in 2007). The recipient site was monitored regularly from May 2009 and numbers recorded in regular transect counts rose to 98 in July 2013. The key to the success of the re-introduction was prior knowledge of the habitat requirements of the study species and sustained preparation and maintenance of the recipient site." (Authors)] Address: Thompson, D.J., Dept of Evolution, Ecology & Behaviour, Institute of Integrative Biology, University of Liverpool, Liverpool, L69 7ZB, UK

15983. Trippier, R.; Brooks, S.; Isaac, N. (2015): Spatial distribution modelling of the colonisation of Erythromma viridulum (Charpentier) (Small Red-eyed Damselfly) in the UK. Journal of the British Dragonfly Society 31(1): 49-63. (in English) ["Northward shifts of many UK Odonata and increased occurrences of migrants have been well documented over the last few decades. E. viridulum has greatly expanded its European range and is the first damselfly to have colonised the UK since records began. Since its arrival in 1999, the species has spread rapidly in a north westerly direction by approximately 36.5km per year as it has occupied climatically suitable space. In recent years the rate of northward expansion has decreased, however western expansion and range infilling has continued." (Authors)] Address: Trippier, Rebecca, Department of Geography, University College London, London, WC1E 6BT, UK

15984. Trippier, R.; Brooks, S. (2015): Voltinism in Erythromma viridulum (Charpentier) (Small Red-eyed Damselfly): a newly colonised damselfly species in the UK. Journal of the British Dragonfly Society 31(2): 74-88. (in English) ["Odonates have displayed strong responses to changing climate through shifting range margins and changes in phenology and voltinism. Newly colonising species may also be competing with previously established species. This study analysed voltinism and feeding behaviour of a recent coloniser, E. viridulum. The results indicate that the populations sampled were likely to be semivoltine, and growth rates suggest that early instar larvae present in July would overwinter in that stage and emerge the following year. This implies that voltinism has not changed in British populations since the species colonised this country. Gut content analysis of larvae found that larval prey items changed through progressive instars but indicated that E. viridulum is unlikely to feed upon other odonate species in the UK." (Authors)] Address: Trippier, Rebecca, Dept Geogr., Univ. College London, London, WC1E 6BT 2Life Sciences, Natural History Museum, London SW7 5BD. UK

15985. ShafiqueUrRehman; Khatri, I.; Rustamani, M.A.; Bukero, A.; Pirzado, B.A.; Rajpar, A.R. (2015): Taxonomic studies of dragonflies from Hyderabad, Sindh. Int. J. Biol. Biotech. 12(1): 75-79. (in English) ["For present studies dragonflies were collected from various localities of district Hyderabad. Examination and identification of dragonflies revealed the occurrence of nine species among three families; six species of Libellulidae, two of Gomphidae and one of Aeshnidae." (Authors)] Address: Khatri, I., Dept Entomology, Sindh Agriculture Univ., Tandojam, Pakistan. E-mail: imrankhatri.agri@gmail.com

15986. Westermann, K. (2015): Bestände und Bestandsveränderungen der Schwarzen Heidelibelle (Sympetrum danae) an künstlichen Moorteichen im Oberen Hotzenwald (Hochschwarzwald). Naturschutz südl. Oberrhein 8: 119-126. (in German, with English summary) ["When blocking wide moor ditches during reconstitution measurements of moors, transient artificial moor ponds were created in which habitats for dragonflies of extraordinary conservational importance developed rapidly. The water plants colonizing these ponds were dominated by sphagnum mosses which covered almost the entire surface of some ponds within a few years. At first, S. danae built up huge populations, but these decreased and collapsed when sphagnum mosses covered a high proportion of the surface of the water. Stopping the silting up process of the ponds is incompatible with the reconstitution goals. Therefore, suggestions for the construction of substitutional habitats were discussed." (Author)] Address: Westermann, K., Buchenweg 2, 79365 Rheinhausen., Germany

15987. Westermann, K. (2015): Eine Erfassungsmethode frisch geschlüpfter Schwarzer Heidelibellen (Sympetrum danae) an künstlichen Moorteichen im Oberen Hotzenwald (Hochschwarzwald). Naturschutz südl. Oberrhein 8: 127-134. (in German, with English summary) ["Freshly emerged S. danae whose wings had dried sufficiently to be able to fly, for a long time stayed close to their place of emergence at artificial moor ponds in the upper Hotzenwald (southern Black Forest), even during sunny and warm weather conditions. During noon and in the early afternoon, they could be counted quickly and easily, so it was possible to obtain precise daily numbers. This method was clearly superior to the previously used method of counting exuviae." (Author)] Address: Westermann, K., Buchenweg 2, 79365 Rheinhausen, Germany

15988. Wijeyeratne, G. (2015): A Naturalist's Guide to the Butterflies & Dragonflies of Sri Lanka. John Beaufoy Publishing Ltd: 176 pp. (in English) ["Increasingly the segmentation between birders, butterfly watchers, dragonfly watchers and photographers is reducing as interests overlap and there is a demand for books that cover the three popular groups of birds, butterflies and dragonflies. Having written and photographed the guide to the birds of Sri Lanka in the series, Gehan de Silva Wijeyeratne has produced a single, compact and portable photographic guide to the butterflies and dragonflies of the country. The emphasis in the 280 species featured is on the commoner species, covering around 90 per cent of the species that a visitor is likely to see. It is also an excellent book for residents to learn about the commoner butterflies and dragonflies before progressing to more advanced technical books.The guide is focused on field use to help beginners and experts identify species and provides information on their distribution and habitats. As identification of butterflies and dragonflies require a different approach, the two sections are done as two mini photographic field guides with common introductory sections to wildlife watching in Sri Lanka. The book includes information on the key wildlife sites, general introductions to the biology of dragonflies and butterflies, up-to-date checklists with local status and useful references for people who wish to progress further with their study of these charismatic and photogenic animals." (Publisher)]

15989. Wittenberg, M.; Kastner, F.; Buchwald, R. (2015): Die Larvenentwicklung von Aeshna viridis im NSG Westliches Hollerland, Bremen (Odonata: Aeshnidae). Libellula 34(3/4): 127-141. (in German, with English summary) ["Development of the larvae of Aeshna viridis in the Westliches Hollerland nature reserve in Bremen) – A. viridis is an endangered species in Germany, while in Bremen and Lower Saxony it is even on the brink of extinction. There is little known about the larval development of A. viridis, the descriptions by Wesenberg-Lund (1913) and Münchberg (1930) from the first half of the 20th century being the most detailed publications. They showed that the development from egg to imago normally takes two years, in rare cases even three years. A large population exists in the north west of Germany in the Westliches Hollerland nature reserve in Bremen. A quantitative cycle of the larval development could be analyzed in this population. A. viridis larvae were collected and measured from three ditches on a monthly basis from April to September 2012. We hypothesized that two cohorts would have to be found at the same time in the case of a two year development. For A. viridis a two year development was verified in 2012." (Authors)] Address: Wittenberg, Melanie, Haarenfeld 37, 26129 Oldenburg, Germany. E-mail: wittenberg.melanie@googlemail.com

15990. Zebsa, R.; Khelifa, R.; Kahalerras, A.; Djalal, H.; Houhamdi, M. (2015): Emergence pattern, site selection, and seasonal regulation of Onychogomphus costae Selys, 1885 (Odonata: Gomphidae) innortheastern Algeria. Aquatic Insects 36 (3-4)(2014): 257-265. (in English) ["Emergence and seasonal regulation of the dragonfly O. costae, were surveyed thoroughly during two consecutive years from two nearby stretches upstream the Seybouse River, northeastern Algeria. The emergence season started in mid-May and lasted 68 and 58 days showing a peak in late May and early June in 2011 and 2012, respectively. During the two years 2011 and 2012, 50% of annual emergence occurred after 25 and 22 days, respectively. Sex ratio was slightly but not significantly male biased. Female exuviae were recorded at higher height than males. Height of the exuviae fixation was positively correlated to support height and head width. Percentage mortality at emergence was mainly due to deformity and predation counting from 7.9% to 9.15% of the total emergent population. The species seasonal regulation is inferred and discussed based on the emergence temporal pattern and larval development." (Au-

thors)] Address: Zebsa, R., Département d'écologie et du génie de l'environnement, Faculte des Sciences de la Nature et de la Vie et des Sciences de la Terre et de l'Univers, Guelma, Algeria

15991. Zheng, D.; Zhang, H.; Zhang, Q.; Li, S.; Wang, H.; Fang, Y.; Liu, Q.; Jarzembowski, E.A.; Yan, E.; Wang, B. (2015): The discovery of an Early Cretaceous dragonfly Hemeroscopus baissicus Pritykina, 1977 (Hemeroscopidae) in Jiuquan, Northwest China, and its stratigraphic implications. Cretaceous Research Cretaceous Research 52: 316-322. (in English) ["The Early Cretaceous dragonfly Hemeroscopus baissicus Pritykina is reported for the first time from the Jiuquan Basin, Gansu Province, Northwest China based on adult wings. These wings are different from those from other localities in two aspects: the oblique crossvein 'O' is 3 or 4 cells distal of the subnodus; the wing size is much smaller (30e42 mm in length for forewings). These differences are considered to be intraspecific variations, based on which diagnoses of the genus Hemeroscopus and the family Hemeroscopidae are revised. The discovery of H. baissicus in Jiuquan suggests that the Zhonggou Formation may be correlated with the Fuxin Formation in Liaoning Province, the Lushangfen Formation in western Beijing, and the Dongmyeong Formation in southern Korea. A possible migration path of the dragonfly is indicated that it initially appeared in Transbaikalia in the Aptian, migrated southwestwards to Mongolia in the Aptian or early Albian, and then southwestwards to northwest China, southeastwards to northeast China, and southern Korea in the early Albian." (Authors)] Address: Zhang, H., State Key Lab. Palaeobiology & Stratigraphy, Nanjing inst. Geology & Palaeontology, Chinese Acad. Sciences, 39 East Beijing Rd, Nanjing 210008, China. E-mail: hczhang@nigpas.ac.cn

15992. Zheng, D.; Wang, H.; Jarzembowski, E.A.; Wang, B.; Chang, S.-C.; Zhang, H. (2015): New data on Early Cretaceous odonatans (Stenophlebiidae, Aeschnidiidae) from northern China. Cretaceous Research 67: 59-65. (in English) ["Liaostenophlebia yixianensis gen. et sp. nov., a new stenophlebiid damsel-dragonfly, is described from the Lower Cretaceous Yixian Formation of western Liaoning, northern China. It is the third Chinese damsel-dragonfly belonging to the family Stenophlebiidae to be described. Liaostenophlebia gen. nov. differs from the other genera of Stenophlebiidae in having Ax2 shifted just above MAb, a transverse and narrow Hal, a more curved anterior side of the hypertriangle, and a broader cubital-anal area. Sinostenophlebia zhanjiakouensis Hong, 1984 was previously attributed to Stenophlebiidae and hardly compares with other genera within this family. A check of the plates of the type species (Sinostenophlebia zhanjiakouensis Hong, 1984) suggests that Sinostenophlebia Hong, 1984 should be a member of the family Aeschnidiidae and it is very likely that this genus is a junior synonym of Leptaeschnidium Pritykina, 1977. The new data increases the diversity of both Stenophlebiidae and Aeschnidiidae in the Lower Cretaceous of China." (Authors)] Address: Zheng, D., Dept Earth Sciences, Univ. Hong Kong, Hong Kong Special Administrative Region, China. E-mail: dranzheng@gmail.com

15993. Zhou, J.Z.; Liang, Z. (2015): Redescription of a rare entomogenous fungus Hymenostilbe odonatae. Journal of Mountain Agriculture and Biology 34(6): 50-52. (in Chinese, with English summary) ["Methods Comparative morphology, molecular phylogeny and resolving network analysis, the host for the dragonfly insect fungi were classified and identified. The results show: The fungus is Hymenostilbe odonatae Kobayasi, the main morphological characteristics of orange spore stalk bundles grow from between the film and the festival hosts the whole body back, long 0.4-0.5 cm, width 179-333μm; cylindrical bottle Terrier, 9.7-14 × 3.2 μm, tightly arranged seeds layered, then top with a small sterile stems; conidia solitary columnar, 6.5-9.7 × 1.1-2.2μm. Phylogenetic analysis and network analysis also proved that the evolutionary species of dragonflies layer spore stalk bundles, known for our species but not described in detail." (Authors)] Address: Fungus Resources Institute, Guizhou University, Guiyang, Guizhou, 550025, China

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15994. Abreu, F.; De la Fuente, M.F.; Schiel, N.; Souto, A. (2016): Feeding ecology and behavioral adjustments: flexibility of a small neotropical primate (Callithrix jacchus) to survive in a semiarid environment. Mammal Research 61(3): 221-229. (in English) ["Semiarid environments are known for climate extremes such as high temperatures, low humidity, irregular precipitations, and apparent resource scarcity. We aimed to investigate how a small neotropical primate (C. jacchus; the common marmoset) manages to survive under the harsh conditions that a semiarid environment imposes. The study was carried out in a 400-ha area of Caatinga in the northeast of Brazil. During a 6-month period (3 months of dry season and 3 months of wet season), we collected data on the diet of 19 common marmosets (distributed in five groups) and estimated their behavioral time budget during both the dry and rainy seasons. Resting significantly increased during the dry season, while playing was more frequent during the wet season. No significant differences were detected regarding other behaviors. In relation to the diet, we recorded the consumption of prey items such as insects, spiders, and small vertebrates. We also observed the consumption of plant items, including prickly cladodes, which represents a previously undescribed food item for this species. Cladode exploitation required perceptual and motor skills to safely access the food resource, which is protected by sharp spines. Our findings show that common marmosets can survive under challenging conditions in part because of adjustments in their behavior and in part because of changes in their diet." (Authors)] Address: Souto, A., Dept Zoology, Federal University of Pernambuco, Avenida Professor Morais Rego, 1235, Cidade Universitária, CEP: 50670-901, Recife, Pernambuco, Brazil. E-mail: asouto.labet@gmail.com

15995. Acevedo, V.; Amador, M.; Félix, G.; Barrera, R. (2016): Operational aspects of the centers for disease control and prevention autocidal gravid ovitrap. Journal of the American Mosquito Control Association 32(3): 254-257. (in English) ["Dengue viruses cause hundreds of millions of in-

fections every year in tropical and subtropical countries. Unfortunately, there is not a single universal vector control method capable of suppressing Aedes aegypti (L.) populations. Amongst novel control tools or approaches are various types of traps targeting gravid females or their eggs. Here, we provide details of the operational use of the Centers for Disease Control and Prevention autocidal gravid ovitrap (CDC-AGO trap) for the surveillance and control of Ae. aegypti. Adult mosquitoes were monitored every week in 2 isolated neighborhoods treated with 3 AGO traps per house in 85% of houses and in 2 reference neighborhoods without control traps. Between March 2013 and April 2015 we serviced the AGO traps 14 times in each community (every 2 months). Common trap problems were absent or broken trap tops (1–1.5%), flooded (0.1–0.7%) or dry (0.5–1.3%) traps, and missing (0.3–0.8%) or vandalized (0.5–1.4%) traps. Most traps kept a volume of infusion between 45% and 97% of their original volume (10 liters). Nontarget organisms captured in AGO traps were mostly small flies, and to a lesser extent ants, cockroaches, grasshoppers, butterflies, dragonflies, and lizards. Trap coverage ranged between 83% and 87% of houses in both communities throughout the study. We interpret such high levels of trap retention over time as an expression of acceptance by the community." (Authors)] Address: Acevedo, Verónica, Entomology & Ecology Activity, Dengue Branch, Centers for Disease Control & Prevention, 1324 Calle Cañada, San Juan, PR 00920, Puerto Rico

15996. Acharjee, B.K.; Karzee, L. (2016): A checklist of dragonfly (Odonata: Anisoptera) diversity in the campus of University Of Science And Technology, Meghalaya (USTM), Ri Bhoi district, Meghalaya, India. Journal of Entomology and Zoology Studies 4(3): 124-127. (in English) ["Northeastern India has been marked by its unique species richness and diversity. Like lepidopteron diversity, distribution and diversity of odonata in this region has been well studied. However no concrete study has been done in Ri-Bhoi district of Meghalaya where the university campus is situated. USTM, a nascent university, is built up in a nice landscape documented by marshy areas and hill sides with good vegetation that harbors good dragonfly diversity. In the present study, a survey has been carried out to ascertain dragonfly diversity and 36 species of dragonflies were recorded. This study is first of its kind and has taxonomic importance as it adds few more species to the list of dragonflies from Ri-Bhoi District of Meghalaya." (Authors)] Address: Acharjee, B.K., Dept of Zoology, University of Science and Technology (USTM), Techno City, Kiling Road, Baridua, 9th Mile, Ri-Bhoi, Meghalaya-793101., India

15997. Aidenia, N.I.; Borisov, S.N. (2016): Dragonflies (Odonata) of the Barguzinskaya depression and of the Svyatoi Nos Peninsula (North-Eastern Baikal region, Russia). Eurasian Entomological Journal 15(4): 339-348. (in Russian, with English summary) ["29 dragonfly species are recorded in the Bargusinskaya Depression and Svyatoi Nos Peninsula. The development of 13 species at eight thermal springs is noted, and details of dragonfly distribution and taxonomic problems are discussed. In East Siberia Orthetrum albistylum inhabits only thermal springs, and in the Bargusinskaya Depression it occurs together with Sympetrum pedemontanum." (Authors)] Address: Borisov, S.N., Institute of Systematics and Ecology of Animals, SB RAS, Frunze Str. 11, Novosibirsk 630091 Russia. E-mail: borisov-sn@yandex.ru

15998. Alberts, J.M.; Sullivan, S.M.P. (2016): Factors influencing aquatic-to-terrestrial contaminant transport to terrestrial arthropod consumers in a multiuse river system? Environmental Pollution 213: 53-62. (in English) ["Highlights: •River contamination decreased with downstream longitudinal distance from a large urban center. •Recipient consumer dynamics were influenced by riparian habitat complexity. •Contaminant flux via emergent insects was not a strong predictor of terrestrial arthropod body burdens. •Terrestrial consumer body burdens were best predicted by riparian land cover. •Riparian land cover regulated aquatic-to-terrestrial contaminant transport. Abstract: Emerging aquatic insects are important vectors of contaminant transfer from aquatic to terrestrial food webs. However, the environmental factors that regulate contaminant body burdens in nearshore terrestrial consumers remain largely unexplored. We investigated the relative influences of riparian landscape composition (i.e., land use and nearshore vegetation structure) and contaminant flux via the emergent aquatic insect subsidy on selenium (Se) and mercury (Hg) body burdens of riparian ants (Formica subsericea) and spiders of the family Tetragnathidae along 11 river reaches spanning an urban-rural land-use gradient in Ohio, USA. Model-selection results indicated that fine-scale land cover (e.g., riparian zone width, shrub cover) in the riparian zone was positively associated with reach-wide body burdens of Se and Hg in both riparian F. subsericea and tetragnathid spiders (i.e., total magnitude of Hg and Se concentrations in ant and spider populations, respectively, for each reach). River distance downstream of Columbus, Ohio – where study reaches were impounded and flow through a large urban center – was also implicated as an important factor. Although stable-isotope analysis suggested that emergent aquatic insects were likely vectors of Se and Hg to tetragnathid spiders (but not to F. subsericea), emergent insect contaminant flux did not emerge as a significant predictor for either reach-wide body burdens of spider Hg or Se. Improved understanding of the pathways and influences that control aquatic-to-terrestrial contaminant transport will be critical for effective risk management and remediation." (Authors)] Address: Alberts, J.M., Dept Biol. Sciences, 614 Rieveschl Hall, University of Cincinnati, Cincinnati, OH, 45221, USA. E-mail: albertjy@mail.uc.edu

15999. Al-Obaid, S.; Samraoui, B.; Thomas, J.; El-Serehy, H.A.; Alfarhan, A.H.; Schneider, W.; O'Connell, M. (2016): An overview of wetlands of Saudi Arabia: Values, threats, and perspectives. Ambio 46: 98-108. (in English) ["The wetlands of Saudi Arabia are located in a water-stressed region that is highly vulnerable to climate and other global changes. Sebkhas, mudflats, mangroves, and wadis are the dominant wetlands in the arid regions of North Africa and the Arabian Peninsula. These unique wetlands are recognized as a sanctuary for biodiversity and for their economic services generated from mineral extraction, agriculture, and grazing. Despite their ecological values and societal services, the long-term permanence of Saudi Arabia's wet-

lands faces strong challenges resulting from human activities associated with sustained population growth, habitat degradation, and coastal development. This paper consolidates a literature review of Saudi Arabia's wetlands from local to global importance, highlights their biodiversity, and identifies threats and evolution of these vulnerable ecosystems in the arid Arabian Peninsula by focusing on the status of key freshwater taxa (Odonata, freshwater fishes, amphibians, and waterbirds) and documenting changes affecting important wetlands." (Authors)] Address: Samraoui, B., Dept Biology, University of Annaba and Laboratoire de Conservation des Zones Humides, University of Guelma, Algeria. E-mail: bsamraoui@yahoo.fr

16000. Anderson, T.L. (2016): Predation risk between cannibalistic aeshnid dragonflies influences their functional response on a larval salamander prey. Journal of Zoology 300(3): 221-227. (in English) ["In size-structured populations of predators, the threat of cannibalism can influence behavior of prey that are attempting to avoid predation by larger conspecifics, including reducing their foraging rates. Such behavioral responses subsequently release basal prey of both cannibal and non-cannibal predators from predation risk. However, whether the non-consumptive effects of cannibalism on conspecific predators varies with basal heterospecific prey density is relatively unexplored. I conducted a laboratory study in plastic containers to test whether cannibalism risk influenced the functional response of dragonflies while foraging on three different densities of larval salamander prey. Dragonfly predators foraged with a Type II functional response, and when exposed to cannibalism cues, per capita feeding rates were lower at high prey densities. Salamander prey mortality rates declined with increasing prey densities, but the presence of cannibalism risk did not influence this pattern. Overall, this study shows that functional response curves of predators can vary in response to whether cannibalism risk is present in their environment across a small range of prey densities. Incorporating synergistic effects of multiple processes, such as non-consumptive risk factors and prey density, may help further elucidate the processes that structure both predator and prey population dynamics." (Author)] Address: Anderson, T.L., Division Biological Sciences, University of Missouri, 116 Tucker Hall, Columbia, MO 65211-7400, USA. E-mail: anderstl@gmail.com

16001. Antony, J.M.; Sebastian, A.P. (2016): Comparative study on nocturnal insects attracted to various light sources. Imperial Journal of Interdisciplinary Research 2(7): 1559-1561. (in English) [India; "This study investigated the influence of different sources of light such as such as CFL bulb, Incandescent bulb, and LED bulb on nocturnal insects. Insect collections were found to be higher in the rainy day than the normal dry day. Light attracted insect includes Kissing bug, Moth, Grasshopper, Cricket, Dragonfly, Bugs, Butterflies, Lantern fly. Six orders of insects were found to be attracted to the light source with a significant dominance for incandescent bulb followed by CFL bulb and least towards LED bulb. Among the insects order Dipterans are the dominant group that attracted to the light sources. Hemipteran were found to attracted secondly towards all the light source." (Authors)] Address: Antony, J.M., Dept Zool., Assumption College Changanacherry, Changanassery, Kerala 686101, Indien, India

16002. Araujo, J.P.M.; Hughes, D.P. (2016): Diversity of entomopathogenic fungi: Which groups conquered the insect body? Advances in Genetics 94: 1-39. (in English) ["The entomopathogenic fungi are organisms that evolved to exploit insects. They comprise a wide range of morphologically, phylogenetically, and ecologically diverse fungal species. Entomopathogenic fungi can be found distributed among five of the eight fungal phyla. Entomopathogens are also present among the ecologically similar but phylogenetically distinct Oomycota or water molds, which belong to a different kingdom, the Stramenopila. As a group of parasites, the entomopathogenic fungi and water molds infect a wide range of insect hosts, from aquatic larvae to adult insects from high canopies in tropical forests or even deserts. Their hosts are spread among 20 of the 31 orders of insects, in all developmental stages: eggs, larvae, pupae, nymphs, and adults. Such assortment of niches has resulted in these parasites evolving a considerable morphological diversity, resulting in enormous biodiversity, the majority of which remains unknown. Here we undertake a comprehensive survey of records of these entomopathogens in order to compare and contrast both their morphologies and their ecological traits. Our findings highlight a wide range of adaptations that evolved following the evolutionary transition by the fungi and water molds to infect the most diverse and widespread animals on Earth, the insects.] Address: Araujo, J.P.M., Penn State Univ., University Park, PA, USA. E-mail: joaofungo@gmail.com

16003. Augul, R.S.; Al-Hashmi, A.H.; Al-Saffar, H.H. (2016): New record of the Epaulet Skimmer: Orthetrum chrysostigma (Burmeister) (Odonata: Libellulidae) from Iraq. Journal of Biodiversity and Environmental Sciences 8(5): 233-238. (in English) ["In this study, O. chrysostigma […] is described as a first time to fauna of Iraq; the specimens were collected from Maysan province, south of Iraq, is described as a first time to fauna. The diagnostic characters and main morphological features were figured." (Authors)] Address: Augul, R.S., Iraq Natural History Research Center & Museum, Univ. of Baghdad, Iraq. E-mail: razzaqshalan@gmail.com