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Two new species of damselflies from Halmahera, Indonesia (Zygoptera: Platystictidae, Platycnemididae)

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Abstract

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.

Key words: Damselfly, Zygoptera, Moluccan Islands, *Drepanosticta*, *Nososticta*, new species

Introduction

The Moluccan islands of eastern Indonesia occupy a biogeographically significant position between the Oriental and Australasian regions, and Halmahera is one of the largest islands in the group. The history of odonate collecting in the Moluccas was summarised by Van Tol (2007), who noted that the odonate fauna of the region remained poorly known and described nine new species of the platystictid genus *Drepanosticta* including four from Halmahera. Since this important contribution no new information has been published. Michalski (2012) presented a key to all species presently known from the Moluccas with the number of *Drepanosticta* species known from Halmahera remaining at four while only a single species of the extremely speciose

platycnemidid genus *Nososticta* (see e.g. Theischinger & Richards 2015) has been recorded there to date.

Here we describe and illustrate two new damselflies belonging to the genera *Drepanosticta* and *Nososticta* collected during a recent survey of central Halmahera.

Material and methods

Descriptive terminology largely follows Watson & O'Farrell (1991). Colouration is given as detectable from the preserved material, supplemented with photographs of specimens taken in life. Measurements are given in millimeters (mm). All illustrations were done with the aid of a camera lucida and are not to scale. Coordinates are presented using the GPS datum WGS 84. All material listed is lodged in the collection of Museum Zoologicum Bogoriense (MZB). Abbreviations used: Fw for forewing, Hw for hindwing, pf for pterostigma, S for segment.

Drepanosticta pararudicula **sp. nov.**

Figures 1-10

Material

Holotype ♂ (MZB. ODON. 19257): Indonesia, North Maluku, Central Halmahera, Loy Poloy, 00°31'08.8"N/127°54'00.9"E, 48 m asl, 15-xi-2012, E. Cholik, P. Lupiyaningdyah, I. Millar & F. Thorsen. Paratypes: 1 ♂ (MZB. ODON. 19258), same data as holotype; 1 ♀ (MZB. ODON. 19248), Indonesia, North Maluku, Central Halmahera, Doromesmesan, 00° 29'50.1"N/127°54'35.6"E, 102 m asl, 21-xi-2012, E. Cholik, P. Lupiyaningdyah, I. Millar & F. Thorsen.

Etymology

The specific epithet is a composite of para (Greek for "beside") and rudicula, the specific name of its apparently closest ally.

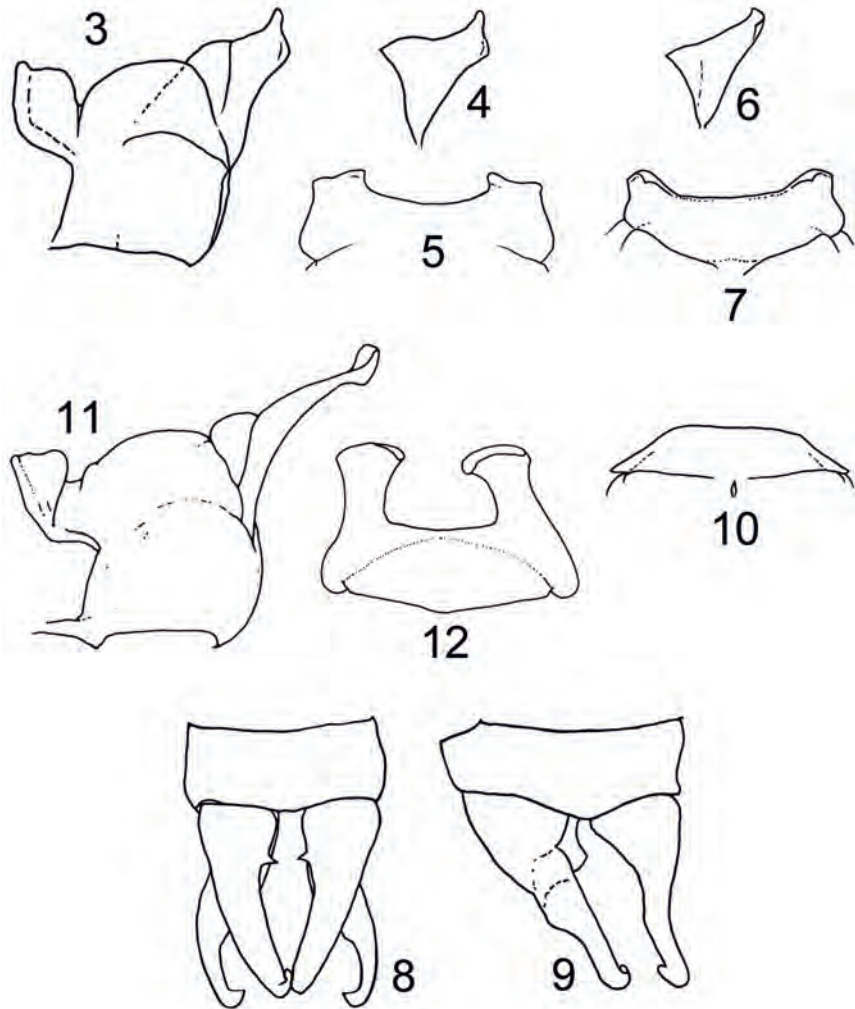
Diagnosis

A medium-sized *Drepanosticta*, general colouration brownish black, the abdomen with base of abdominal segments 3-7 brownish yellow (Figs 1, 2). Separated from most other Moluccan species of *Drepanosticta* by the processes on the posterior lobe of pronotum being very small in males (Figs 3-7) and lacking in females (Fig. 10). Although these processes are also very small in the males of *D. amboinensis*, *D. moluccana* and *D. obiensis*, the small tooth on their superior anal appendages is not as sharp as in *D. pararudicula* and it is situated at approximately ½ length of the appendages vs at 1/3 length.

Holotype. – Male (Figures 3-5, 8, 9)



Figs 1, 2. *Drepanosticta pararudicula* sp. nov., male, habitus: 1) lateral; 2) dorsal; photos in life by S.J. Richards.



Figs 3-10. *Drepanosticta pararudicola* sp. nov.: (3-9) male: (3) prothorax, lateral, holotype; (4, 5) posterior lobe of pronotum, holotype (4) lateral; (5) dorsal; (6, 7) posterior lobe of pronotum, paratype: (6) lateral; (7) dorsal; (8, 9) anal appendages, holotype: (8) dorsal; (9) lateral; (10) female paratype, posterior lobe of pronotum, dorsal. Figs 11-12. *Drepanosticta rudicola* van Tol, male: (11) prothorax, lateral; (12) posterior lobe of pronotum, dorsal.

Head. - Labium black; labrum bluish white with anterior 1/5 black; anteclypeus and mandible base white; rest of head black, postclypeus and anterior frons most iridescent; transverse occipital carina well-developed, lateral extremities angulate; antennae with scape and flagellum black, pedicel dirty yellow.

Thorax. - Pronotum brown, propleura dirty yellow; posterior lobe of pronotum (Figs 3-5) with lateral lobes pale brown, widely apart, narrow but still wider than long, slightly bifid, with distal margin somewhat thickened. Synthorax ground colour black with paler brown or yellowish markings as follows: mesanepisternum except for mid-dorsal carina, most of dorsal half of mesepimeron, metepisternum dorsal to metastigma, a small subtriangular patch in dorsal-most portion of metepimeron. Legs largely dirty yellow with meso- and metacoxa distinctly darkened and some darkening at apex of femora; postcoxae and poststernum brownish black. Wing membrane hyaline, venation brownish grey to black; postnodals 14/13; R4+5 arising at, or very close to, subnodus; IR3 arising approximately halfway along first cell distal to subnodus; Ab vein meeting Ac just before hind margin of wing (Y very short-stalked); pt brownish grey, almost twice as long as wide, with proximal and distal vein almost parallel sided and proximal angle about 75°.

Abdomen. - Largely greyish to blackish brown; S2 with small middorsal spot at base; S3-7 with ill-defined dull yellow portion covering approximately anterior 1/10 of S3, anterior 1/6 of S4-6, anterior 1/5 of S7; a better defined small mediodorsal mark within the ill-defined dull yellow basal portion of S3-7. Anal appendages (Figs 8, 9) brownish grey, superiors in dorsal view stout in basal third, more slender and flattened in apical two thirds, a short subtriangular tooth directed ventromedially at 1/3 length; inferiors with approximately basal half moderately slender and parallel sided, apical half very slender, bent outward, then inward again with tips rather obtusely pointed and bent dorsad.

Measurements. - Hw 20.4 mm; abdomen including anal appendages 31.5 mm.

Variation in male paratype. - The male paratype is similar to the holotype in almost all characters. Slight differences are in the postnodals which are 14-15/14 in the paratype (vs 14/13 in the holotype) and in measurements which are: Hw 20.5 mm; abdomen including anal appendages 32.2 mm in the paratype (vs 20.4 and 31.5 respectively in the holotype). Slight differences in the shape of the pronotum can be seen between the holotype (Figs 4-5) and the paratype (Figs 6-7).

Female - The female is similar to the male with the following exceptions: thorax much as in male but pronotum with posterior lobe (Fig. 10) widely trapezoid and without any indication of lateral processes; postnodals 17/16; abdomen much as in male, with valvae, terebra and styli brownish black; anal appendages dull yellowish grey.

Measurements. - Hw 18.5 mm; abdomen 27.0 mm.

Habitat

All specimens were found along small (< 5 m wide), heavily shaded and shallow streams and seepages in lowland rainforest where they perched on very low twigs and leaves, often less than 10 cm above the ground or water surface. They were never found along large streams or in open, sunny habitats.

Affinities

Based on the shape and size of the processes on the posterior lobe of the pronotum in the male (Figs 3-7), the new species fails to key out to either of the two species groups of *Drepanosticta* from the Moluccas. However its overall similarity to *D. rudicula* van Tol, 2007 suggests that it is most closely related to that species and should be included in the *D. megameffa* group of van Tol (2007). Body colouration and structure of male anal appendages of the new species are extremely similar to *D. rudicula* but the processes of the posterior lobe of the pronotum are extremely short and somewhat bilobed (Figs 3-7). This contrasts with the conspicuous processes of *D. rudicula* which are much longer, and wider distally than basally with the apex club-shaped or bifid (Figs 11, 12). The complete absence of pronotal processes on the posterior lobe of the pronotum in the female of *D. pararudicula* (Fig. 10) also differs significantly from the females of *D. rudicula* which generally have processes similar to the male. The absence of processes in one of the females mentioned by van Tol (2007), without specific locality data provided, may well mean that this female actually belongs in *D. pararudicula* or that the posterior lobe of the female pronotum is variable in *D. rudicula* and possibly also in *D. pararudicula*.

Nososticta halmahera **sp. nov.**

Figures 13-20

Material

Holotype ♂ (MZB. ODON. 19265): Indonesia, North Maluku, Central Halmahera, Doromesmesan, 00°29'50.1"N/127°54'35.6"E, 102 m asl, 21-xi-2012, E. Cholik, P. Lupiyaningdyah, I. Millar & F. Thorsen. Paratypes: 1 ♂ (MZB. ODON. 19266), 1 ♀ (MZB. ODON. 19267), same data as holotype.

Etymology

The specific epithet refers to the type locality, Halmahera Island, and is a noun in apposition to the generic name.

Diagnosis

Male (Fig. 13) black with bright blue markings on head, prothorax, dorsum and sides of synthorax, dorsum and sides of abdomen and on the superior anal appendages; antehumeral patch large, mesepimeral patch not reaching across the whole length of pleuron and metepisternal patch reaching across the whole length; wings slightly suffused with amber. Female with whitish to dull pale blue and brownish yellow markings on head, prothorax, sides of synthorax and abdomen, anal appendages and ovipositor; wings hyaline.



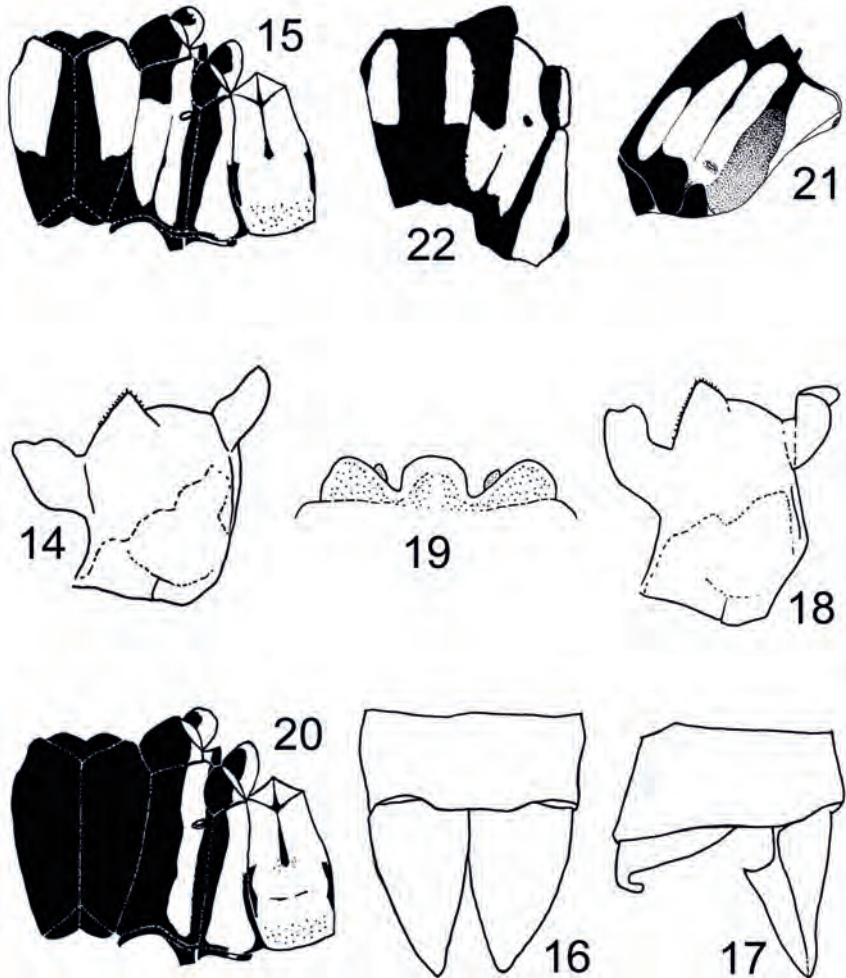
Fig. 13. *Nososticta halmahera* sp. nov., male, in life; photo S. J. Richards.

Holotype. – Male (Figs 14-17)

Head. – Largely black; only base of labium bluish grey, tips of mandibles reddish to blackish brown and a bright blue bar across anterior frons from eye to eye.

Thorax. – Pronotum (Fig. 14) black, median lobe on each side raised into a somewhat rugose cone; pleura largely bright blue. Synthoracic pleura (Fig. 15) largely black with bright blue markings as follows: approximately lateral/ventral 2/3 of mesanepisternum, dorsal 2/3 of mesepimeron and anterior 2/3 of metanepisternum, all of them broadly connected; approximately posterior 2/3 of metepimeron; posterior tip of katepisterna. Postcoxae black and blue, poststernum pale blue except for narrowly black along midline and along part of black metapostepimeron. Legs largely black, all of outer face of procoxa and posterior and apical area of meso- and metacoxa blue, trochanters and a tiny basal portion of femora very pale blue. Wing membrane slightly suffused with amber, venation black; pt almost black, approximately twice as long as wide; postnodals 16-17/14-16; no transverse crossvein descending from distal margin of discoidal cell to wing margin.

Abdomen. – S1 dorsally black, laterally black with blue posterior and smaller blue ventral patch; S2 black, yellowish grey adjacent to genitalia; S3-6 black with tiny pale



Figs 14-20. *Nososticta halmahera* sp. nov.: (14-17) male holotype: (14) prothorax, lateral; (15) composite synthorax, dorsal, lateral, ventral; (16, 17) anal appendages: (16) dorsal; (17) lateral; (18-20) female paratype: (18) prothorax, lateral; (19) posterior lobe of pronotum, dorsal; (20) composite synthorax, dorsal, lateral, ventral. Fig. 21. *Nososticta conifera* Theischinger & Richards, male synthorax, lateral [from Theischinger & Richards (2006)]. Fig. 22. *Nososticta moluccensis* (Selys), male synthorax composite dorsal, lateral [modified from Michalski (2012)].

blue basal mid-dorsal spot generally very narrowly subdivided by dark midline, S7-10 black. Anal appendages (Figs 16, 17): superiors blue, with short, wide, rather forward directed tooth; inferiors brownish black.

Measurements. – Hw 20.0 mm; abdomen including anal appendages 35.5 mm.

Variation in male paratype. – The male paratype agrees with the holotype in almost all characters. Differences are: postnodals 17/15-16 (vs 16-17/14-15 in the holotype), Hw length 20.2 mm, and abdomen including anal appendages 36.0 mm (vs 20.0 and 35.5 respectively).

Female - The female paratype (Figs 18-20) differs from the males in the following characters: Head much as in male, but the mandible tips black and the frontal bar from eye to eye whitish yellow; prothorax (Fig. 18) much as in male but the pleura largely whitish yellow; posterior lobe of pronotum (Fig. 19) with a large rather upright flap, bearing a tiny posterior process on each side and a rounded backward-directed median lobe. Synthorax (Fig. 20) very similar to male but all of mesanepisternum and mesepimeron black, and pale areas largely bluish white. Legs much as in male, but pale areas on coxae, trochanters and femora very pale and on femora also markedly more extensive. Wings much as in male, but membrane hyaline and pt somewhat paler and at least twice as long as wide; postnodals 15-16/13. Abdomen much as in male but pale markings whitish to brownish blue and reduced to lateral patch in S1, ventral edges of S2, 8S and S9 and extreme ventral margin in S3-7. Anal appendages dull yellow. Ovipositor reaching beyond end of S10 by at least the length of S10; valves largely brownish yellow to yellowish brown and dorsally in apical half almost black, with approximately 15 sharply pointed teeth along apical third of ventral edge; terebra brownish yellow.

Measurements. - Hw 20.2 mm; abdomen 33.1 mm.

Habitat

This species was found along small, clear streams in lowland rainforest where they perched on twigs and leaves in sunny patches. A number of individuals were observed in disturbed, roadside drainages suggesting that the species can persist in modified forest habitats.

Affinities

Nososticta halmahera sp. nov. belongs in group C of Theischinger & Richards (2015) which includes species having the front of the synthorax with patches of blue and the tip of the abdomen blue. Within this group the new species' two conical halves of the median lobe of the pronotum and the thoracic colour pattern appear most similar to *N. conifera* Theischinger & Richards (Fig. 21) from Gulf Province in Papua New Guinea. The two species can be distinguished by the antehumeral patch being at least 2/3 as long and wide as the mesanepisternum, the metepisternal patch extending from the subalar ridge to the ventral edge of the pleuron and the metapostepimeron being black in the male of *N. halmahera* sp. nov. (Figs 13, 15) vs the antehumeral patch being

much smaller, the metepisternal patch extending from the subalar ridge to only slightly ventral of the metastigma and the metapostepimeron being blue in *N. conifera*. *Nososticta moluccensis* (Selys, 1886) (Fig. 22), the only other species of *Nososticta* known from the Moluccas (Buru), is also very similar to *N. halmahera*. However in male *N. moluccensis* the blue antehumeral, mesepimeral and metepisternal patches are markedly smaller, the antehumerals more widely and the metepisternal and metepimeral patch less widely separated than in *N. halmahera*, and a transverse crossvein descending from distal margin of discoidal cell to wing margin is present in *N. moluccensis* but is absent in *N. halmahera* (Ris 1929; Michalski 2012).

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