TWO NEW SPECIES OF ODONATA FROM JAVA

By M. A. LIEFTINCK

(Buitenzorg Museum.)

IN drawing up a revised Catalogue of the Dragonflies of Java, in which it is proposed to include all those species which I have been able to find recorded as having occurred in the Island, I have come across several species which appear to be new to science. In order not to delay the publication of these striking novelties, it is proposed to offer here descriptions and outline-drawings of structural characters of two of the most remarkable discoveries of recent years.

A complete list of the species of Odonata occurring in Java and adjacent islands will, it is hoped, soon appear elsewhere. A detailed study of the biology of *Anaciaeschna montivagans*, described hereafter, will also be given in a separate memoir.

The types of the new species have been deposited in the Buitenzorg Museum collection.

Fam. LESTIDAE.

Platylestes heterostylus, sp. n. (figs. 1-2).

Material studied:—One ♂, adult, SOUTH W. JAVA; res. Banjoemas, Djeroeklegi, 28.i.1931 (*F. C. Drescher*). “Head and eyes dark brown. Thorax grass-green with black spots. Abdomen grass-green with black rings at articulations. Appendages white.” (Living colours.)

Closely related to *platystylus*, Laidlaw (? *nec* Rambur).

FIG. 1.—*Platylestes heterostylus*, sp. n. Diagram of thoracic colour-pattern.

♂ (colours somewhat faded).—Labium yellowish. Labrum, anteclypeus and genae olive-green; postclypeus also green but with three indistinct brownish spots above. Ground-colour of head a dark olive-green, conspicuously marked with black in the centre and between antennae and the eye-margin. Small greenish spots around each lateral ocellus. Postocular lobes dark olive-green, decorated with cloudy black markings. Occiput clear greenish-yellow.

Pro- and syn-thorax olive-green above, pale greenish to ochreous on side and underneath. Prothorax with a median black spot at base of anterior lobe and a double fascia of the same colour over its middle.

Synthorax with a dark brown, somewhat triangular, spot along dorsal fifth of median carina, and with four series of black dots on either side of it, irregularly spread over the mesepisterna and the thoracic sides, as is shown in fig. 1.

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Legs yellowish-green with two narrow, reddish-brown, stripes along exterior sides of femora, and with a similar brown stripe along inner and outer sides of tibiae. Spines, tarsal articulations and claws black.

Wings hyaline. Neuration in basal part reddish-brown, otherwise black in colour. Pterostigma short, a little inflated at the middle of its length, jet-black, its inner and outer margins narrowly white. The venation is almost wholly identical with that of the wings in a male specimen from Calcutta (India), photographed by Laidlaw (1920, *Rec. Ind. Mus.*, 19: 156, fig. 4), except in a few points that may be tabulated as follows:—

1. The nervures M_s and M_3 are separated at their origin for a distance equal in length to the first cross-vein between them.
2. In hind-wing the nervure M_3 is at first straight, thence, after a distinct costad convexity at the level of the seventh postnodal cross-vein, is shallowly concave, and finally is again somewhat convex just before reaching the wing-margin.
3. The pterostigma of front wing is exactly one and a half times longer than wide, that of hind-wing being a shade longer. Inner and outer margins run parallel to each other in both pairs of wings.

Abdomen grass-green, with the articulations finely-black, and marked with warm dark cinnamon-brown as follows:—Segment 1 has a mid-dorsal marking of that colour and a

FIG. 2.—*Platylestes heterostylus*, sp. n. Male anal appendages, dorsal view and right side.

black point on the middle of the sides, the side-portion of articulation between first and second segment being likewise black. Segm. 2 has a dorsal brown marking, strongly constricted at middle, and an anterior and posterior pair of very small, diffuse, dark brown spots on either of the mid-dorsal carina; sides with a very distinct, oval, black dot situated beyond the middle of segment. Segm. 3-7 have cinnamon-brown markings covering the whole dorsum but strongly tapering in front and, after being gradually narrowed to behind, are suddenly and conspicuously widened before the end; the posterior figures thus formed

enclose a minute, transversely placed, black dorsal stripe, and are narrowly attached to the black articulation. The brown marking on dorsum of segm. 7 deepens gradually in colour to its apex, and 8-10 are dark blackish-brown; 8, 9 and 10 have an ochreous dorso-lateral spot about at their middle, and 8 has a comma-shaped yellow marking along side at base. Lower apical third to half of the tergites of segm. 7-9 black.

Anal appendages of very characteristic shape. Sup. apps. equal in length to segm. 8; basal fifth deep black, the rest of their length pale yellow; apices rather suddenly and strongly bent inwardly, the points covering one another. On the inner side, at the end of the first third of their length, is a blunt projection, and, slightly beyond this, there is a triangular cone, directed straight downwards; besides, at the end of the second third, the sup. apps. are provided with a sharply pointed tooth directed backwards and inwards. Inferior appendages brown at base, fading to yellow distally; over two-thirds the length of superiors, meeting each other apically but with the points knob-like and only scarcely upturned, not spatulate; each carries at its base on the inner side a tubercular projection for over one-third of its length (fig. 2).

Length: abd. + apps. 36, hind-wing 21.5, pt. $\frac{0.9}{1.0}$ mm.

The specimen is the holotype.

The genus *Platystyles*, Selys, heretofore containing only a single rare species, *platystylus* (Ramb.) in Bengal and Burma, has been thoroughly discussed by Laidlaw (*loc. cit.*, pp. 155-157, figs.), and, more recently, by Fraser (1930, *J. Bombay Nat. Hist. Soc.*, 34 : 92-94, figs.).

To the characters distinguishing the genus from *Lestes*, and enumerated by Laidlaw, I have nothing to add, the species described in this paper from Java agreeing very well in all important generic characters with the Indian species. According to Fraser, who described the supposed second known female of *platystylus* (taken in Bengal), his specimen differs considerably from the original description of the type as given by Rambur, so that it still remains an open question as to whether Laidlaw's and Fraser's insects are identical with the true *platystylus* or not. Only two males are known: one from Calcutta, the supposed allotype, and one from Burma.

The occurrence in Java of a second species may well be regarded as of exceptional interest, as its ranging so far south-eastwards means a welcome addition to our knowledge of the distribution of the genus. In all probability more representatives will be discovered sooner or later in the interjacent regions, although both species seem to be inconspicuous and very rare insects.

The principal differences between the males of *platystylus* and *heterostylus* may be given as follows:—

platystylus.

1. Abdomen 33.5, hind-wing 21 mm.
2. Thorax palest khaki-brown above, milky-white on side. Venter powdered with white. Black spots along ventral margin of metepimerum apparently absent.
3. Pterostigma with costal side decidedly shorter than anal side, inner and outer margins divergent.

heterostylus.

1. Abdomen 36, hind-wing 21.5 mm.
2. Thorax olive-green above, paler along sides (grass-green in living male), not pruinose below. Two additional black spots along ventral margin of metepimerum.
3. Pterostigma with costal side equal in length to anal side: hence inner and outer margins parallel to each other.

platystylus.

4. Sup. anal apps. curling in at apices to meet each other in a gradual and regular curve, but the extreme apices curling a little outwards again. Inf. apps. half as long as upper pair, their distal half after a slight constriction a little widened, and gently curved inwardly towards apices, which are more spatulate at tip.

heterostylus.

4. Sup. anal apps. less slender, with submedian interior acute tooth placed more distad, apical third of each rather abruptly inwardly bent and overlapping each other in a transverse plane, extreme apices thus curled distinctly inwards. Inf. apps. over two-thirds the length of upper pair, straight and slenderer, with tips rather club-shaped and rounded (fig. 2).

Fam. AESCHNIDAE.

Anaciaeschna montivagans, sp. n. (fig. 3).

Material studied :—5 ♂♂ and 8 ♀♀ from West and Mid Java.

Localities (imagines only). WEST JAVA :—1 ♀ (ad.), G. Tangkoeban Prahoe, 1400 m., 24.viii.1929 (*F. C. Drescher*); 2 ♀♀ (ad.), G. Gedeh-complex, Poentjak-pass, Telaga Saät, 1450 m., 15.xii.1929 and 30.iii.1930 (ovipositing) (*M. A. L.*); 4 ♂♂, 3 ♀♀ (reared from larvae), same locality, xi.1929, iii.1930, and viii.1930 (*M. A. L.*). MID JAVA :—1 ♂ (freshly emerged), 2 ♀♀ (ad.), Diëng Plateau, Telaga Balekambang and Pengilon, and Kali Dolog, ca. 2500 m., 6 and 7.viii.1930 (*Miss T. van Benthem Jutting*).

Numerous larvae and exuviae from the above-mentioned localities and from G. Panggerango, 1200 m., G. Gegerbintang, 1800 m., and G. Papandajan, 1800–2400 m., in West Java.

A very darkly coloured species, stouter and larger than *jaspidea*, with head more projecting in front, thorax more robust, with male abdomen decidedly spindle-shaped, with male anal appendages quite different in shape, and with wings comparatively broader and more abruptly narrowed towards apices.

♂ (juv., bred).—Head very large, with eyes more globular and a little more flattened above than in *jaspidea*, and with the frons much more projecting, rather triangularly pointed in front. Labium, genae and mandible-bases dark brown. Labrum light to dark brown, narrowly bordered with black in the centre. Entire anterior surface of head pale brownish-olive (very probably vivid blue or green in the adult stage!) with the sutures unmarked. Fronto-clypeal suture with a very fine pale line. Frons in dorsal view with anterior edge obtuse-angulate, forming a very sharp ridge; dorsal surface concave, shining, transparent pale brownish-olive, with a very narrow and diffuse blackish shade along its base and with rather narrow, well delimited but isolated, somewhat crescent-shaped, antero-dorsal black border. Vertex and occipital triangle dark brown, the former very low, rounded, and with a very shallow incision at middle. Eyes cinnamon- to sepia-brown above (very likely also deep blue or green in adult male!).

Pro- and syn-thorax unicolorous pale purplish-brown, without any indication of dark sutures or pale coloured areas.

Legs black, all femora as far as the knees similar in colour to the thorax, almost identical in shape to *jaspidea*, tibial spines perhaps a shade shorter.

Wings broader and shorter than in *jaspidea*, apices more abruptly narrowed; hyaline. Neuration very dark brown with a vestige of a yellowish line along interior margin of costa. Pterostigma pale, shorter than in *jaspidea*. Membranula shaped exactly like *jaspidea*, but almost black instead of grey; only the extreme base of it is a little paler. Anal triangle three-celled. Anal loop a little longer in transverse direction but consisting of the ordinary number of cells (7–9). Neuration scarcely different from *jaspidea*; the distal course of the veins *Rspl* and *Mspl* decidedly more outcurved, *M*₃ distinctly more strongly curved to the

wing border and only two or three marginal cells between M_3 and M_{3+4} in hind-wing (almost always four in *jaspidea*). The first and sixth—rarely the seventh—cross-vein in the antenodal space thickened. Antenodal cross-veins $\frac{16-18}{11-12}$, postnodals $\frac{9-10}{12-14}$.

Abdomen with basal segments more swollen in both dimensions, more abruptly narrowed towards end of segm. 2, and decidedly more strongly constricted before the middle of segm. 3 than in *jaspidea*. Instead of being gradually and very little widened from base of segm. 4 to end of 10, the intermediate segments in *montivagans* are more markedly enlarged from middle of segm. 3 to caudad, reaching its greatest width at the end of segm. 9, the sides of the tenth segment and the appendages being a little convergent, giving the abdomen its spindle-shaped appearance.

FIG. 3.—*Anaciaeschna montivagans*, sp. n. Male anal appendages, dorsal view and right side.

Coloration throughout dark reddish-brown, the tenth segment being a little paler and—in living adult examples—possibly at least partly greenish in colour. Auricles slightly longer and a little more prominent but similar in shape to *jaspidea*. All articulations broadly black, the supplementary transverse carinae, as also very short, paired, transverse lines behind the middle of segm. 3–8, finely lined with black. Distal border of segm. 10 black. Tergal margins unmarked. Sternites brown. Base of segm. 10 with a strong, tooth-like tubercle on the middle. Traces of supplementary longitudinal carinae along sides of segm. 6–8 only.

Anal appendages long and slender. Superior pair 6 mm. long, equal in length to half that of segm. 8 and segm. 9 + 10 taken together, shaped as is shown in fig. 3. Inferior appendage elongately triangular, concave and shining interiorly, reaching half the length of superiors. Coloration of both appendages pale reddish-brown, with apices and outer margins darkened.

♀ (adult, living colours, Telaga Saät).—Head shaped as in the male. Labium and genae dirty olive-brown. Labrum pale olive-green with a dark brown margin at middle of

anterior border. Clypeus dirty greenish-white, somewhat olivish intermingled with pale blue. Suture between clypeus and frons indicated by a fine pale brown line. Anterior surface of frons similar in colour, gradually passing to transparent brown along sides. Upper surface of frons concave, shining, transparent reddish-brown, darker especially along its base, but without indication of dark borders. Coloration at transition of vertical and dorsal portion of frons sharply limited and different. Eyes pearl-grey with deep blue gloom above, pearl-grey with a few darkly reflecting spots on side and underneath. Vertex dark reddish-brown in colour, as is also the occipital triangle. Occiput a little paler. Prothorax brown. Synthorax very dark velvet reddish-brown, tinted with olive-green on meso- and met-epimerum. Dorsum with two very large, broadly oval antehumeral bands of a fine, dark green colour, running almost parallel to one another, very gradually merging along their entire outline into the reddish-brown ground-colour, but distinctly separated from each other by the dorsal carina. Laterally, these bands are separated from the humeral suture by a distance of about 1 mm. and, dorsally, terminate at about 0.5 mm. before the antealar ridge, the N_2 , the entire PN_2 and N_3 , as also the spaces at extreme base of the wings, being clear grass-green in colour. There are, besides, three grass-green spots placed upon the under surfaces just before the wing-bases. Legs black, all femora, with the exception of the knees, very dark reddish-brown. Wings heavily and darkly tinged with deep golden brown, except in the costal space between base and first antenodal cross-vein, and in the cubital spaces. Pterostigma from light sepia-brown to dark reddish-brown, paler below. Neuration very similar to the male. Membranula unicolorous dark greyish-black. Nodal indices of five examples:

$\frac{10. 19. 16. 10}{12. 13. 12. 12'}$ $\frac{10. 15. 16. 10}{13. 10. 11. 11'}$ $\frac{10. 17. 17. 9}{13. 11. 13. 13'}$
 $\frac{9. 17. 17. 10}{13. 11. 13. 12'}$ $\frac{9. 17. 16. 10}{13. 11. 11. 12'}$

Abdomen short and thick, cylindrical, widened at base, from base of segm. 3 to end of segm. 8 parallel-sided, constriction on middle of segm. 3 thus scarcely noticeable. Terminal segments a little widened in lateral, rather more in dorso-ventral dimension. Only the dorsal surfaces of first two segments marked with green, as follows:—posterior half of segm. 1 with ill-defined, transverse, grass-green bar; base of segm. 2 likewise and, added to this, with a single small, very badly delimited, triangular spot behind the transverse carina. Entire abdomen otherwise dark, warm reddish-brown, unicolorous, excepting the transverse carinae and the articulations of all segments, which are deep black. Traces of supplementary longitudinal carinae on segments 6 and 7. The abdomen is thus very similar in colouring to the thorax, though rather more reddish- than dark-brown, and not velvety in appearance.

Valves not different in shape from *jaspidea*, but anal appendages only 3 mm. long, much shorter and decidedly narrower than in that species; only a third longer than tenth abdominal segment, lanceolate, straight and flattened, slightly oblique with apices rounded and with a small tuft of dark brown hairs at tips.

Length: ♂ (raised) abd. + apps. 53, hind-wing 44–45, pt. 3.0–3.3 mm. ♀ (adult specimens only) 47–51, 44–45, 3 mm.

Type male and *allotype* female from Telaga Saät, iii.1930 (male bred), and 15.xii.1929 (female adult).

Unlike *A. jaspidea* (Burm.), which is a common plain species breeding in rice-fields and marshes, *A. montivagans* is restricted to the montane regions of Java, where it appears to be widely distributed. The larvae were found in weedy mountain-bogs and swampy lakes, the dull-coloured females being observed ovipositing in the soft stems of all kinds of semi-aquatic plants, such as *Polygonum javanicum* in Telaga Saät, Commelinaceae and Araceae in forest-pools.

The adult male has not yet been discovered, which lends some countenance to the idea that it may have crepuscular or nocturnal habits.