

Supplement by R. C. L. Perkins

to

NEUROPTERA

Vide pp. 31—89 hujus tomi.

Fam. HEMEROBIIDAE.

Subfam. *CHRYSOPINAE*.*Anomalochrysa reticulata* P.

At Kilauea, Hawaii, I have taken specimens of an *Anomalochrysa* agreeing well with *A. reticulata*, but they are rather small and, as in many other species, there is some variation in the neuration. The male characters are remarkable. The apical dorsal plate is fringed with hairs and bears a specially developed stout spinose one on each side at the base; the apical ventral valve is hairy beneath, subtriangular, being subacute at the apex, which forms a recurved hook. The abdomen has the clothing normal, the hairs not directed basally, as in *A. frater* P., which it much resembles.

HAB. Hawaii, Kilauea.

Anomalochrysa rufescens McL.

I suspect that my *A. biseriata* is the female of *A. rufescens* McL., the type of which I have not seen.

Subfam. *HEMEROBIINAE*.(1) *Nesomicromus angularis*, sp. nov.

Head pale, yellowish, clothed with pale hairs, the pronotum also pale, but dark-spotted at the sides and thereon with dark hairs, rest of thorax pale but more or less dark in parts, abdomen brownish, with pale hairs. Antennae pale yellowish. Anterior wings light brown mottled with darker and with a large triangular dark brown or blackish fuscous triangular area on the basal half, connected with dark spaces on the costa, apical margin whitish hyaline, this pale area interrupted by a dark space a little above its middle, neuration pink in the pterostigmatic region. Posterior wings hyaline with dark fuscous markings along the outer gradate nervures and beyond these, with a good deal of fuscous strigulation; pterostigmatic nervures and many of the others pink. Front and middle tibiae annulate, the hind ones very long, pale, subfusiform in shape.

F. H. II.

89

Fauna La. m. m. 1912. 2.

Anterior wings with emarginate apical margin, the costa bisinuate, the dorsal margin rounded, seven to nine radial sectors, hind wings with apical margin distinctly concave. Apical dorsal appendages of abdomen long but not extending far beyond the ventral plate, which is triangular, between the appendages two chitinous spines crossing one another. Expanse about 16 mm.

HAB. Molokai, 4500 ft.

(2) *Nesomicromus phaeostictus*, sp. nov.

Brownish (after drying) the head above yellow, clypeus and middle of face brown, antennae pale yellow, the joints fuscous-ringed; front and middle tibiae conspicuously dark-ringed.

Wings hyaline, the front pair with four small but conspicuous dark spots on the basal fourth of the costa, and nearly equidistant one from another, three similar spots below these on the radius, three nearly equidistant dark blotches on the costa beyond the small spots, and with one or two other small spots between each of these blotches, a transversely elongate spot beyond the latter, a spot at the tip of the wing, sometimes connected with the last of the costal blotches, two elongate dark spots on the apical margin. For the rest the wings are strigulated with brown or fuscous with darker spots on the cubitus and the gradate nervules; the nervures bear conspicuous light and dark hairs, the former more numerous. Hind wings with seven or eight dark spots on the costa, a dark suffusion in the costal cells beneath the three or four basal spots, and a second suffusion beneath two of the other spots; a large smoky cloud on the lower part of the apical margin and a small one, distant from this, on the dorsal.

Front wings falcate, the apical margin conspicuously concave, the dorsal margin nearly straight or faintly concave on the basal half; radius with about seven sectors. Hind wings with the apical margin distinctly concave. Female: expanse about 16 mm. Allied to the preceding species.

HAB. Oahu, 1500 ft. Koolau range.

(3) *Nesomicromus ombrias*, sp. nov.

Dark brown or blackish, the lower part of the face testaceous, a pale marking on the head above, some spots on the pronotum, the mesonotum in the middle in front, yellowish. Basal two joints of the antennae brown, the following testaceous. Legs pale, yellowish, the front and middle tibiae with two dark wide rings, the hind pair very long, dilated after the basal third, with a more or less dark cloud near the base and another at the apex; femora also more or less infuscate at apex, apex of abdomen yellowish.

Front wings darkish brown or fuscous, mottled over most of their surface with pale spots or strigulations, interrupting the dark nervures with pale spaces, the gradate

nervules dark and with darker suffusion at their sides, especially the outer series. The dilated costal cells form the clearest part of the wing, beyond the outer gradate nervules the mottling is sparse but there is a marginal series of five or six conspicuous pale spots, widely separated from one another, extending from the apical on to the dorsal margins. There is a large basal area between the radius and dorsal margin of a generally darker colour than the rest of the wing, forming a large blotch, angulated below and more or less curved above, where it is broken by pale spaces about the cubital nervures. About its angle it is uniformly dark. Hind wings smoky hyaline, iridescent, with a conspicuously darker smoky area along the dorsal margin, on the basal third or fourth of the wing length.

Front wings rounded at the tips, apical margin not at all excised, costa strongly curved on its basal part, where the costal cells are unusually high. Six sectors to the radius. Apical segment of the abdomen raised or somewhat bent back, angulately emarginate in dorsal aspect, the appendices in side view elongate triangular, bluntly pointed, conspicuously clothed with curved hairs, extending far beyond the apical ventral segment. Male: expanse 15 mm.

HAB. Oahu; mountains near Honolulu, 1500 ft.

ODONATA.

Fam. AGRIONIDAE.

The Hawaiian species referred to the genus *Agrion*, I believe, are none of them really referable to that genus, and the species though apparently all allied to one another, yet themselves form a number of groups. Probably in the hands of a specialist the whole will form a peculiar genus, with several subgenera. I have previously spoken of the great variability exhibited by the various species, and were it not for the characters shown by the terminal appendages of abdomen in the ♂, the difficulty of separating the species would be intense. Having now examined many more specimens from the different islands, I am the more convinced of the extreme importance of these characters. In many species, if one only had the extreme forms, one would certainly consider these to form distinct species, but when one has large series, especially from different localities and different islands, one finds that the apparently strong distinctions between extremes, apart from those afforded by the appendages, all vary and intermediate forms occur. Characters usually considered of specific, or even of more than specific importance, whether of colour, size, neuration, etc. all vary and one is finally driven to the male structures to find constant characters.

The following tabulation is probably a fairly natural grouping of the species that I have examined. It is based on the male characters.

1. Superior appendages of the ♂ abdomen short, the inferior ones extending behind them; most of the abdominal segments dark and metallic, and at most with a pale band at the base; lower appendages bidentate at the apex or obliquely truncate in side view.....*A. xanthomelas, pacificum, nigrohamatum.*
Without some or all of the above characters.....2.
2. Superior appendages generally shorter than the lower and with a black tooth on the inner side towards the base, this tooth being usually directed upwards; abdomen largely red.....*A. oresitrophum, orobates, leptodemas, calliphya.*
Without some or any of these characters3.
3. Legs mostly dark brown or black; abdomen usually black or pitchy and metallic, rarely with red segments behind the two basal ones; insect often with more or less whitish pruinosity; upper appendages in lateral view emarginate at apex so as to form two apical processes or teeth.....
A. koelense, asteliae, amaurodytum, eudytum, adytum.
Without some or all of these characters.....4.
4. Upper appendages extremely long and forcipate, dilated only at the extreme base.....*A. nesiotis.*
Appendages not so formed.....5.
5. Upper appendages turned outwards, their broad surface exposed in dorsal aspect; apical abdominal segment strongly and obliquely raised from base to apex*A. oahuense.*
Without these characters6.
6. Postcostal area of front wings with a single row of cellules, rarely with a few divided, to form a double row; abdomen slender or very slender.....
A. deceptor, vagabundum, kauaiense, molokaiense, jugorum.
Postcostal area of front wings always with a double row of cellules for a considerable part; species of large size and the abdomen relatively stout compared with the above species*A. oceanicum, blackburni, heterogamias.*

The last three species form the genus *Megalagrion* of McLachlan, but individuals of some of the preceding group might be included therein.

(1) *Agrion calverti*, sp. nov.

Head dull black, apex of clypeus and labrum, orbits to the height of the antennae, mouth-parts and a spot on the basal joint of the antennae yellow or cream-coloured. Postocular spots orange, not connected. Prothorax yellow in front and at the sides. Dorsum of mesothorax black with purplish metallic lustre, a spot on each side in front connected with a sutural line not reaching the hind margin, a spot on each side near this margin, a band on the sides of the mesothorax extending back from the middle coxae for less than half its length, but represented by a detached spot near the hind margin, the whole lower part of the mesopleura extending back from the posterior coxae to the hind margin, except a spot posteriorly, yellow. Median longitudinal ridge of mesonotum reddish. Legs with the femora and tibiae sordid brownish or fuscous above, beneath and the trochanters yellow, the coxae infuscate in part. Abdomen black or pitchy, with a green metallic lustre, basal segment yellow at the sides and with very narrowly pale apical margin, third to the seventh with narrow yellow basal band, terminal segment reddish, but sordid in parts.

Front wings with about 18 postcubitals, the stigma fuscous, its lower side covering one cellule; three cellules between the quadrilateral and the nodus. Postpterostigmatic cellules forming a single row.

Apical abdominal segment broadly emarginate; the superior appendages about as long as this, dilated on more than their basal half, the dilated part reddish and without a distinct tooth on its lower margin apically, at most with a very minute notch in the margin just before its apical angle. Seen from above the upper appendages are slightly curved inwardly at the tips, the lower ones are red, black at the acute tips, and more strongly curved inwards.

Length of abdomen 35 mm., expanse about 45 mm. Female not known. Colour variation not known.

HAB. Oahu, near Honolulu, 1200 ft. Named after Prof. P. Calvert.

Agrion adytum var. *tillyardi* nov.

Very slender and elongate, head and thorax dull black, the latter with slight metallic reflection. Face black, apex of clypeus and labrum and the orbits to about the height of the insertion of the antennae white or pale-coloured. Occipital margin of the vertex red; postocular spots wanting. Prothorax with the front margin yellow, as also the whole underside; dorsum of mesothorax with a yellow spot on each side at the base, sometimes continued back as a fine sutural line to or nearly to the wings; sides of thorax yellowish, sometimes with a black spot in front of the insertion of the hind wings, or with a continuous black longitudinal band in place of this spot. Thorax posteriorly reddish. Legs for the most part blackish or brown above, yellow beneath, as also are the tarsi for the most part above; spines long slender and black. Basal two abdominal segments black, the first yellowish or red at the base, sides, and along the apical margin, the second with red apical margin and yellow on the sides, third segment reddish pitchy or pitchy black and this like the preceding sometimes submetallic, the apex still darker, fourth, fifth and base of sixth segments either quite red or else pitchy, the apices darker, seventh with the extreme base red, eighth entirely red, or only its extreme base red, two last segments red, sometimes more or less sordid or infuscate. Appendages red, the tips black. Beneath the abdomen is yellow or reddish.

Front wings with 16—20 postcubital cellules before the stigma, the latter wine-red, overlying one and part of a second cell, three cellules between the quadrilateral and the nodus. Superior appendages ♂ as long as the terminal segment, much dilated basally, when viewed inwardly; in external profile view emarginate at apex to form a large superior and small inferior process or tooth, both of which are black, the upper ones seen from above a little bent inwardly at the tip; lower appendages acute at tips, which reach back to the small tooth of the upper ones.

The postpterostigmatic cellules do not form a double series as is usual in *A. eudytum* P., though sometimes one or more of them is petiolate. Length of abdomen 35 mm.; expanse about 50 mm. I do not know the female.

HAB. Kauai; near Lihue on a mountain stream. Named for Mr R. J. Tillyard, who has done so much work on Australian Odonata.

(2) *Agrion williamsoni*, sp. nov.

Agrees generally in size and appearance with the darker example of *A. tillyardi*, but the prothorax is black or dark above anteriorly, and the middle and hind tibiae are less dark or embrowned; the second abdominal segment is dark at the sides, unicolorous with the dorsal surface; antepenultimate segment with only its extreme apical margin red, the terminal segment, with an apical red band, occupying about half its whole surface. Pterostigma fuscous, only a little red-tinged.

Superior appendages of the male strongly curved inwards, minutely tuberculate at the tip, strongly dilated beneath on the basal two-thirds or more of their length, the dilatation forming a great prominent angle, but bearing no spine or tooth. Lower appendages pale and dilated at the base, black on the apical portion and acute at the tips, about as long as the superior appendages. Female not known.

HAB. Kauai; in the same locality as *A. adytum* var. *tillyardi*. Named for Mr E. B. Williamson of Indiana.