

SOME NEUROPTERA FROM AUSTRALIA.

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From Professor Perkins of Hawaii, and Mr. Dodd of Kuranda, Queensland, I have received a number of Australian Neuroptera. The Chrysopidæ and a few other forms are described in this article. There are four genera of Chrysopidæ in Australia; *Chrysopa*, *Nothochrysa*, *Ankylopteryx*, and *Apochrysa*. The first two occur in the United States, but *Nothochrysa* only in California. As with us *Chrysopa* is the largest genus, and some of the species are very similar to some of our forms.

Chrysopa.

The Australian forms known to me can be distinguished by the following table:

- | | |
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| 1. Dark marks on the vertex..... | C. ramburi |
| No marks on the vertex..... | 2. |
| 2. Veins all green..... | 6. |
| Veins partly black..... | 3. |
| 3. A black spot on the radial sector, shortly before the stigma | |
| | C. signatipennis |
| No such spot..... | 4. |
| 4. Many veins more or less margined with dark..... | 5. |
| Veins not margined..... | C. innotata |
| 5. A band across the face..... | C. irregularis |
| No band across face..... | C. regularis |
| 6. Basal part of antennæ blackish..... | 7. |
| Antennæ all pale..... | 8. |
| 7. Vertex mostly red, face reddish..... | C. atalotis |
| Vertex yellowish, a transverse red stripe over base of antennæ from eye to eye..... | C. satilota |
| 8. Divisory veinlet commonly ending before the cross vein; wings long, slender, acute..... | C. otalatis |
| Divisory veinlet ending beyond the cross vein..... | 9. |
| 9. Larger species; stigma indistinct, vertex reddish; wings very narrow | |
| | C. italotis |
| Medium species, stigma not very distinct; vertex pale; wings quite broad..... | C. latotalis |
| Smaller species, a reddish spot on vertex, stigma of hind wings very prominent..... | C. olatatis |

Chrysopa signatipennis sp. nov.

Pale yellowish; antennæ slender, pale, basal joint large and long, compared with the size of the head; pronotum longer than broad, narrowed in front, and each side with a dark spot; abdomen dark toward tip. Wings with mostly pale venation, the gradate series slightly darker; there is in each fore wing a very prominent black spot on the radial sector between the sixth and seventh cross-vein from sector to radius; the stigma is scarcely distinct. Wings rather slender, slightly acute at tip, the costal area much broader than the third cubital cell, latter twice as long as broad, the divisory veinlet ends just beyond the cross-vein; about seven veinlets in outer gradate series, six in the inner, the outer series quite remote from the margin. There are four cross-veins between radius and subcosta beneath stigma; hind wings not very much narrower than the fore pair. Expanse 25 mm.

From North Queensland (Perkins).

Chrysopa regularis sp. nov.

Pale yellowish; basal joint of antennæ with two reddish-brown lines on the outer side; pronotum very short, and narrower than the vertex. Wings with longitudinal veins mostly yellowish, transverse veinlets mostly black, and partly bordered with faint brown; the branches of the radial sector are also brown, and margined; stigma short, dark; in hind wings the venation mostly pale, but costals dark. Wings rather short, blunt; costal area plainly broader than third cubital cell, divisory veinlet ending far beyond the cross-vein, four veinlets in each gradate series, only four branches of radial sector, only twelve costals before stigma, between subcosta and radius, below the stigma, are four cross-veins; hind wings narrow, more acute, only four branches to radial sector, latter at base united to median for much more than a cell length. Expanse 18 to 20 mm.

From Middle Queensland (Perkins).

Chrysopa irregularis sp. nov.

Pale yellowish, a transverse red band across face below antennæ from eye to eye, a red spot on each cheek, and a red stripe above on basal joint of the antennæ; pronotum short and broad, broader than the vertex. Wings with mostly pale venation, very faintly bordered with brown, darker on some dark veins near base of costa, near stigma, at tip of wings, near end of anal vein, and at middle of hind margin, stigma dark; hind wings with pale venation, except at end of anal vein. Fore wings moderately long, almost acute at tip, costal area much broader than the long third cubital cell, the divisory veinlet ends just beyond the cross-vein, about three gradate veins in inner series, and four or five in outer; near tip of wing is a

diamond-shaped cell formed by the last fork of radius bending up near to radius, and connected thereto by a very short cross-vein; five branches of radial sector, about sixteen costals before stigma. Hind wings narrow, and much shorter than fore wings, the radial sector at base connected to median by less than a cell length. Expanse 24 mm.

From North Queensland (Perkins).

Chrysopa olatatis sp. nov.

Pale greenish; antennæ yellowish, a reddish spot behind on the vertex; pronotum green, with a broad pale median stripe, thorax and abdomen also greenish, with median dorsal pale reddish stripe. The abdomen rather short, pronotum much broader than long; wings unmarked, but the stigma of the hind pair very prominent and reddish brown. Wings short, but acute at tip, costal area barely broader than the third cubital cell, latter hardly twice as long as broad, divisory veinlet ending beyond the cross-vein; five veinlets in each gradate series, and four between subcosta and radius beneath the stigma. The hind wings not much narrower than the front pair; venation all pale green. Expanse 21 mm.

From Port Darwin, 4 Sept. (Dodd).

Chrysopa italotis sp. nov.

Pale yellowish, vertex slightly reddish; antennæ wholly pale yellowish; pronotum nearly twice as broad as long, green, with pale median stripe; thorax and abdomen pale. Wings unmarked, stigma indistinct. The wings long and narrow, acute at tip, the costal area barely broader than the third cubital cell, the latter long, with base uneven, divisory veinlet ending beyond cross-vein; eight gradate veinlets in the outer series, five or six in the inner series; about six cross-veins between radius and subcosta beneath stigma; in the hind wings the radial sector unites with the median for about a cell-length; venation all pale yellowish. Expanse 34 mm.

From Port Darwin, 19 March (Dodd).

Chrysopa latotalis sp. nov.

Pale yellowish throughout, unmarked, unless cheeks are rather rufous, and a faint paler stripe on middle of pronotum. Pronotum much broader than long, with transverse groove behind the middle; apex of male abdomen from side obliquely truncate, longer above. Wings of moderate size, broad and blunt at tips; costal area a little broader than the third cubital cell, base of latter not oblique, divisory veinlet ending beyond the cross-vein; about seven gradate veinlets in outer series, and five in inner series; below stigma three or four cross-veins between radius and subcosta; the stigma in both

pairs of wings rather prominent; in hind wings the radial sector is united to the median for much less than a cell-length. Expanse 28 mm.

From Kuranda (Dodd), and North and Middle Queensland (Perkins).

Chrysopa atalotis sp. nov.

Vertex, face and most of basal joints of the antennæ reddish, basal part of antennæ black; pronotum longer than broad, narrowed in front, green, with a pale median stripe; thorax yellowish; abdomen brownish green; legs pale. Wings hyaline; venation greenish, costa, subcosta and the radius more yellowish, stigma moderately prominent, yellowish. Wings rather large, hardly acute at tip; costal area no wider than the third cubital cell, base of this cell very oblique, the divisory veinlet ending beyond the cross-vein, about eight or ten veinlets in the outer gradate series, and four in the inner series; beneath the stigma there are about six cross-veins between radius and subcosta; in the hind wings the radial sector is united to median for the length of a cell. Expanse 32 to 35 mm.

From Port Darwin, January, April (Dodd).

Chrysopa satilota sp. nov.

Head pale yellowish, a deep red stripe from eye to eye, just above the antennæ; basal joint of antennæ large, yellowish, beyond the antennæ are brownish, but paler toward tips; pronotum longer than broad, narrowed in front, greenish, with pale median stripe; thorax and abdomen yellowish; legs very pale, darker on tarsi; tip of male abdomen, seen from the side, deeply incised in middle. Wings hyaline, rather large, acute at tips; costal area hardly broader than the third cubital cell, base of this cell scarcely oblique, divisory veinlet ending beyond the cross-vein; about eight veinlets in the outer gradate series, and five in the inner; below the stigma four or five cross-veins between subcosta and radius; all venation very pale greenish, unmarked. Expanse 31 mm.

From Port Darwin, 1 May (Dodd).

Chrysopa otalatis sp. nov.

Pale yellowish or greenish throughout, no markings, but the cheeks are more or less rufous, and there is sometimes on the thorax a trace of a paler median stripe; the venation is all pale yellowish, unmarked. The pronotum is as broad as long, but little narrowed in front, usually with a transverse ridge near the middle; the tip of male abdomen, seen from the side, is deeply incised, but the upper part projects farther than the lower. The wings are very slender, acute at tip, but the costal area is fully as broad as the third cubital cell, the latter is very long, the divisory veinlet

ending before the cross-vein; about seven veinlets in each gradate series; below the stigma about four cross-veins between subcosta and radius; the stigma not especially prominent; in hind wings the radial sector unites to the median for more than a cell-length. Expanse 28 mm.

From Brisbane, and Bundaberg district, Queensland (Perkins).

Nothochrysa.

In all the Australian species the middle veinlet connecting anal to cubitus in the fore wings is much nearer to the outer than to the inner veinlet. The four species known to me are separable as follows:

1. A black spot between bases of antennæ, and two dark spots on vertex
N. tripunctata M'Lach.
 No spot between antennæ.....2.
2. A dark band across face below antennæ, pronotum and thorax marked with black.....*N. facialis* Bks.
 No marks on face.....3.
3. Marks each side on pronotum; divisory veinlet of third cubital cell dark.....*N. insignis* Walk.
 No marks on pronotum; divisory veinlet of third cubital cell pale
N. lata Bks.

Nothochrysa facialis sp. nov.

Pale yellowish; a transverse black band across the face below the antennæ, rest of head unmarked; antennæ brown, except basal and second joints; pronotum with a rather broad, elongate, black spot on each side, two prominent black spots on middle lobe of mesonotum, a spot along anterior border of the lateral lobes, three small dots on lateral lobes of metathorax, and a narrow band across basal segment of abdomen, rest of abdomen with some black spots; a few dark spots on the mesosternum. Wings with pale veins, the cross-veins nearly all black, likewise most of the radial sector, also the divisory veinlet; stigma not very dark. Wings elongate, slender, acute at tip, costal area scarcely as broad as third cubital cell, the divisory veinlet slightly oblique; about eight veinlets in the outer gradate series and seven in the inner; in the hind wings the outer part of radial sector, outer cross-veins, and gradate veinlets are black. Expanse 30 mm.

From Port Darwin, 27 March (Dodd).

Nothochrysa lata sp. nov.

Pale yellowish throughout; pronotum extremely broad, about three times as broad as long; thorax very large. Wings elongate, but not acute at

tip, venation mostly pale, the gradate series black, and many other veins, especially cross-veins, black at base and tip. Costal area not as broad as third cubital cell, the latter rather short, the divisory veinlet slightly oblique; eight gradate veinlets in the inner series, nine in the outer series; in hind wings the venation is almost wholly pale. Expanse 40 mm.

From Port Darwin, 29 August (Dodd).

Ankylopteryx pallida sp. nov.

Pale yellowish throughout, the palpi marked with dark at the tip, and on each anterior corner of pronotum is a dark spot; wings pale, some of the cross-veins and gradate series faintly dark, but a more distinct spot on the radius at the point where it is joined by the first cross-vein from the radial sector; costal area at origin of radial sector is nearly as broad as rest of the wing at that point, the radial sector very sinuous, emitting six or seven branches; the third cubital cell nearly twice as long as broad, the divisory veinlet cutting off a small cell, but ending beyond the cross-vein; near tip of wing the subcosta diverges from the radius, between radial sector and median are four cross-veins; hind wings much narrower, acute venation pale. Pronotum slightly longer than broad, narrowed a little in front. Expanse 24 mm.

From North Queensland (Perkins). *A. immaculata*, described from Tasmania, has a spot over antennæ, distinct stigma, etc.

Myiodactylus pubescens sp. nov.

Pale yellowish; sides of pronotum faintly greenish, a black dot on each anterior lobe of the mesothorax; antennæ near middle barely darker; wings with only a few cross-veins in middle area black and black at forkings of some of the costals, and those along apical margin. Antennæ barely more than one third the length of the wings; pronotum slender, narrowed in front, a furrow before the middle, and a swollen ring at the posterior margin. Wings extremely broad, not two and a half times as long as broad, a few of costals forked near middle, all near tip, as likewise all around apical and outer margin; radial sector with nine branches, the connecting veinlets numerous, about one in every three or four black, the cells mostly broader than long; entire surface of fore wings and also the costa densely hairy, mostly erect, especially prominent near anterior base; hind wings much less hairy, one half narrower, the radial sector with eight branches, and nearly all veins unmarked. Expanse 40 to 44 mm.

From Port Darwin, 18 March, 14 April (Dodd).

Mantispa pullula sp. nov.

Pale yellowish; a median brown stripe on the face; antennæ dark; pronotum slender, on enlarged part in front with brown sides and two submedian brown stripes; thorax pale, dark on lateral lobes; femur of leg I dark brown on inner side, middle and hind coxæ obliquely barred with

brown. Wings hyaline, with red-brown stigma. In general similar to *M. imbecilla*, but much smaller, only 7 to 9 millimeters to tip of wings, and the stigma of wings is still shorter than in that species, and more swollen on the costal side.

From Port Darwin, 10 Sept. (Dodd), apparently common.

WET WEATHER COLLECTING.

Until June 23, 1906, collecting lepidoptera had been associated in my mind with fairly pleasant days or nights, but on that date I started out on a misty forenoon with a beating net intending to look only for coleoptera. Promising logs and fungi led me into a thick growth of large hemlocks, pines, and firs, with scattered hard woods of several species, where several moths brought to mind the request of a friend for Geometridæ. After four hours work, the last of which was in a pouring rain, I retreated with eighty-five specimens representing the genera *Heterophleps*, *Tephroclystis* (*Eupithecia*), *Mesoleuca*, *Hydriomena*, *Euchæca*, *Sciagraphia*, *Macaria*, *Homochlodes*, *Melanolophia*, *Æthaloptera*, *Anagoga*, *Gonodontis*, *Caberodes*, *Sabulodes*, and *Xanthotype* of the Geometridæ; *Pyrophila*, *Homoptera*, and some of the so-called Deltoids, besides some genera of the families of the Platypterygidæ, Pyralididæ, Tortricidæ, and Ecophoridæ.

Many of the specimens were taken on the sheltered side of the tree trunks, on the under side of lodged dead ones, and on the sides of old logs. They were flushed from the tops of live evergreens, from thickets of dead tops and brush, by throwing clubs and stones into them, from whence they would flutter away to the ground or to some nearby tree, where they were sometimes easily bottled. Again, some exciting net and foot work would be necessary, and I found that a heavy beating net — soaking wet, too, — is not the best thing for flying moths. I also discovered that thumps and kicks against the smaller trees would often bring down, besides the water, a number of species not otherwise seen. About 2.30 p. m., my clothing became so thoroughly soaked and the net had to be wrung out so often that it became too disagreeable even for an entomologist. I have never seen the Geometridæ so plentiful as they were during that season at Monmouth, and Wales, Maine, which may, in a measure, account for my success on such a day.

C. A. Frost.



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