

# THE ANNALS

AND

## MAGAZINE OF NATURAL HISTORY.

[EIGHTH SERIES.]

No. 72. DECEMBER 1913.

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LXIII.—*Descriptions and Records of Bees.*—LV.  
By T. D. A. COCKERELL, University of Colorado.

*Nomia muscosa*, Cockerell.

This was described from the female; the male hardly differs in appearance, and has the hind legs very little modified. The hind tibiæ have white hair on the outer side, and short, shining, purplish-brown hair on the inner, only well seen in an oblique view. The antennæ are dark. Males before me are from Mackay, Queensland, Jan., March, November, 1900 (*Turner*, 618), and New South Wales (*Nat. Mus. Victoria*, 71).

*Nomia hippophila purnongensis*, subsp. n.

♂.—Head and thorax olive-green, with coppery tints; abdomen bright olive-green; tegulæ fulvous (or with a black basal shade), with pallid margins; flagellum black above, fulvous beneath except at apex; hind femora much swollen, metallic green, red at apex; hind tibiæ mainly green.

Length about 7 mm.

*Hab.* Purnong, Australia, two (*Fulton*; *Nat. Mus. Victoria*, 159, 217).

*N. hippophila*, Ckll., is closely allied to *N. flavoviridis*, Ckll., and perhaps to be regarded as a southern subspecies. Males of *N. hippophila* before me are from "Windsor,  
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Victoria" (*French*; Froggatt, 187), and near Melbourne (*F. P. Spry*; Nat. Mus. Vict. 201, 202, 203, 255).

A new locality for *N. flavoviridis* is Wagga, N.S.W. (*Froggatt*, 154).

*Nomia flavoviridis cyanella*, subsp. n.

♂.—Length about  $6\frac{1}{2}$  mm.

Head and thorax dark bluish green; abdomen and area of metathorax dark greenish blue; legs rufo-piceous, with metallic tints, hind femora shining greenish blue; flagellum piceous above, bright ferruginous beneath; tegulæ rufo-piceous; stigma and nervures dull brown; hind border of mesothorax with two spots of white pubescence. Tongue dagger-shaped.

*Hab.* Cooktown, Queensland, October 1902 (*Turner*).

*Nomia flavoviridis phanerura*, subsp. (sp.?) n.

♀.—Length about 7 mm.

Head and thorax dark bluish green, area of metathorax yellowish green; mesothorax dull and granular, the scattered larger punctures hard to observe, its posterior corners with patches of white hair; tegulæ large, bright apricot-colour. Wings with the apical field distinctly dusky; stigma and nervures red-brown. Abdomen with the first segment dark green, the others practically black, but the apical depressed parts of all the segments shining golden green; hair-bands on segments 2 to 4, and patches on sides of first, light fulvous, bands on 3 and 4 very broad; fifth segment and apex ferruginous.

*Hab.* Mackay, Queensland, May 1900 (*Turner*, 1088).

Resembles *N. gracilipes*, Smith, in the red apex of abdomen, but differs in the colour of head and thorax, of abdominal bands, &c.

I formerly held this to be the female of true *N. flavoviridis*, but, although it resembles the male in the colour of the tegulæ, I believe that the different female associated (*Turner*, 434) with *flavoviridis* by the collector really belongs to it. This female is larger than *phanerura*, and has the mesothorax somewhat shining, with the scattered larger punctures quite distinct. The tegulæ, however, are dark brown, with hyaline borders. The abdominal hair-bands are white, as in the male. The wings are as in the male, with broad second s.m.

The female of genuine *flavoviridis*, as here interpreted, is also before me from Brisbane, May 20, 1912 (Queensl. Mus.



62), and Stradbroke Island, Oct. 2, 1911, and Dec. 3, 1912 (*Hacker*; Queensl. Mus. 24 and 78); a male comes from Brisbane, March 25, 1912 (*Hacker*; Queensl. Mus. 61). A smaller, hardly typical female is from "Windsor, Victoria" (*French*; Froggatt, 94), and a series of three still smaller females, with the general coloration of var. *doddii*, Ckll., comes from Brisbane, Sept. 12, 1911, and March 18, 1912 (*Hacker*; Queensl. Mus. 23 and 71), and "Rutherglen, Victoria" (*French*; Froggatt, 171). When a row of the small females, with the apical part of the abdomen golden-green, is contrasted with a row of larger, darker, more blue-green *flavoviridis*, it is difficult not to believe that we have two species. I am, however, at a loss to find any really satisfactory specific characters, and if there are really two distinct things, it must be for the Australian entomologists to demonstrate it.

*Nomia gracilipes*, Smith.

A female labelled "Gunbower" (*J. A. Kershaw*; Nat. Mus. Vict. 66) agrees with Smith's description, except that it is about 9 mm. long. The abdomen has the first three segments dark blue, with patches of pure white hair on the lateral apical margins, and the remaining segments very dark red suffused with black. The mesothorax is dull, with scattered large punctures and small ones between them. The species is nearest to *N. australica*, Smith.

*Nomia mærens*, Smith.

This was described from "Australia." Females before me from the National Museum of Victoria (67, 68, 257) are labelled "Wandin" (*Jarvis*) and "Fern Tree Gully," 12. 11. 06 (*F. P. Spry*).

*Nomia ferricauda*, sp. n.

♀.—Length about 8 mm.

Black, with the apical depression of the third abdominal segment, and all the segments beyond, clear ferruginous; head broad, face with thin white hair, vertex with brownish-white hair; mandibles with a ferruginous patch; tongue dagger-like; clypeus irregularly punctured, depressed in middle; flagellum obscure red beneath; mesothorax dull, with scattered large punctures and numerous extremely minute ones; scutellum dull and minutely granular, with very few large punctures; area of metathorax striate; poste-



rior truncation brilliantly shining, with sparse small punctures; sides of thorax with white hair, but dorsum with scanty black hair; tegulæ piceous. Wings faintly dusky, stigma piceous, nervures sepia; second s.m. rather broad. Legs dark, with pale hair, ferruginous on inner side of tarsi; hair of tibiæ partly dark. Abdomen shining, very minutely punctured; first two segments with patches of white hair on lateral hind margins; third and following segments with broad bands of light orange hair, but extreme sides of third with a little white.

*Hab.* Brisbane, Queensland, Sept. 25, 1911, and Sept. 24, 1912 (*H. Hacker*; Queensl. Mus. 80, 59). One is also labelled "Sunnybank."

Easily known from all other Australian species by the black and red abdomen.

*Nomia grisella*, sp. n. (*muscosa*, subsp.?).

♀.—Length about 9 mm.

Black; very closely allied to *N. muscosa*, Ckll., differing as follows:—Third joint of labial palpi longer; mesothorax not so hairy, the dull, very finely punctured surface visible; hind margins of second and following abdominal segments light testaceous. Compared with *N. gilberti*, Ckll., it differs by the strong keel down the middle of upper part of face; reduced metathoracic enclosure, and sides of metathorax densely hairy right up to enclosure; very dark fuscous hair on inner side of hind basitarsi, &c. The abdomen is much less distinctly and strongly punctured than in *muscosa*, especially on the first segment. The second s.m. is narrow, and the tongue is long and filiform.

*Hab.* Cape York, Queensland, April 1902 (*Turner*).

*Nomia brisbanensis*, sp. n.

♀.—Length  $9\frac{1}{2}$  mm.

Black, with greyish-white pubescence, the mesothorax and scutellum with fine grey tomentum, and numerous erect, bristle-like, black hairs; head broad; tongue elongate dagger-shaped; mandibles black, stained with red about middle; clypeus with irregular subconfluent punctures; front dull and granular; flagellum dark red beneath; mesothorax dull and granular; modified basal area of metathorax a narrow transverse band, shining and cross-striated, narrowed in the middle, and bounded posteriorly by a sharp rim; tegulæ of moderate size, ferruginous, with the extreme base fuscous. Wings dusky, nervures and stigma sepia, second



s.m. comparatively broad. Legs dark, with light hair, partly dark on tibiæ; hair on inner side of basitarsi pale orange to yellowish white. Abdomen dullish, the minutely punctured surface appearing granular; a small patch of white hair at each side of first segment, and entire or nearly entire conspicuous white hair-bands on second to fourth; hair at apex dark reddish fuscous.

♂.—Similar in most respects; eyes strongly converging below; broad lower margin of clypeus honey-colour; antennæ very long, the flagellum 5 mm., reddish and strongly crenulate beneath; scape red in front; tongue as in female; hind margins of second and following segments pallid; anterior and middle tibiæ at apex and base, and wholly in front, hind tibiæ except a large patch on outer side, and all the tarsi rather dull ferruginous; hind femora strongly incrassate; hind tibiæ also thick, with an obtusely angular projection on inner side near apex.

I thought at first that this might be a colour-variety of *N. frenchi*, Ckll., but the fourth ventral segment in middle is smooth and shining, with a strong sulcus, which ends a little before the emarginate apex; whereas the fourth ventral in *frenchi* is roughened and slightly ridged in middle, with a rudimentary sulcus at extreme base.

*Hab.* Brisbane, Queensland (type-locality), females, Sept. 18, 1911, and Oct. 3, 1912 (*H. Hacker*; Queensl. Mus. 42, 79); Stradbroke Island, male, Dec. 3, 1912 (*H. Hacker*; Queensl. Mus. 85). A female with darker tegulæ and ochraceous-tinged abdominal bands is labelled "Oakleigh, Victoria" (*French*; Froggatt, 183).

Closely related to *N. mærens*, Smith, but less robust and with much lighter tegulæ. In *N. mærens* the basal area of metathorax is not narrowed in the middle. *N. generosa*, which is supposed to be the male of *mærens*, has not enlarged hind femora and tibiæ.

*Euryglossa aurescens*, sp. n.

♀.—Length a little over 7 mm.

Similar to *E. ephippiata*, Smith, but smaller, with the red thoracic colour much lighter, inclining to orange; post-scutellum black; wings hyaline; mesothorax less strongly punctured.

*Hab.* Mackay, Queensland, Nov. 1891 (*Turner*, 701).

I had determined this as *E. ephippiata*, but the real species of that name is now before me (Healsville, Victoria; Nat. Mus. Victoria, 184), and is clearly distinct.



*Euryglossa tridentifrons*, sp. n.

♂.—Length nearly 5 mm.

Head and thorax black and chrome-yellow, with a little pale hair; labrum, mandibles (except reddish tips), whole of face below antennæ, very broad lateral face-marks (ending above middle of front), a large frontal patch (continuous with the supraclypeal area, sending a narrow pointed process upward, and having large lateral processes curving over the antennæ), and the cheeks all bright yellow; antennæ relatively short, like those of a female; scape yellow; flagellum light ferruginous, a little dusky above; front dullish, vertex more shining; mesothorax black, not evidently punctured, the margin and two longitudinal stripes yellow; scutellum black, with the posterior margin and sides, also the axillæ, yellow; postscutellum black anteriorly, yellow posteriorly; metathorax black, reddish at sides, its base dullish, the truncation shining; prothorax and pleura yellow, marked with black; tegulæ pale reddish testaceous. Wings hyaline, stigma and nervures pale reddish; second s.m. longer than high, receiving the second r.n. nearer its apex than the first to its base. Legs yellow, the femora with dark streaks and the hind tibiæ somewhat dusky on outer side. Abdomen dark reddish, the bases of the segments abruptly and broadly pale red (only at sides on fourth), these basal bands possibly yellow in life.

*Hab.* "Nagambie, Victoria" (*French*; Froggatt, 194).

A distinct little species, peculiar for the combination of yellow markings on head and thorax and reddish abdomen. The trifold or tridentate frontal mark is also distinctive.

*Euryglossa albocuneata*, sp. n.

♀.—Length a little over 5 mm.

Very robust and compact; head, thorax, and legs black, with white markings; abdomen with the hind margins of the segments pallid; head large and broad; middle of face and clypeus depressed, concave; clypeus very delicately longitudinally striate, with a median impressed line; lateral face-marks present, consisting of large white triangles, filling space between clypeus and eye, and extending above to level of antennæ, the upper outer corner with a very small projection along the orbit; flagellum short and stout, obscure reddish beneath; upper edge of prothorax narrowly (interrupted in middle), tubercles (except a small spot), and a spot on the reddish tegulæ white; mesothorax broad, dull, so



minutely punctured as to appear granular; metathorax feebly shining. Wings hyaline, with sepia nervures and stigma; b. n. not much bent, falling a little short of t.-m.; second s.m. broad, receiving first r. n. very near its base and the second not so near its apex. Knees and bases of tibiae more or less white.

*Hab.* "Windsor, Victoria" (*French*; Froggatt, 192).

A very distinct species, not a typical *Euryglossa*. The third discoidal cell is not produced apically, as it is in *E. geminata*.

*Euryglossa cincticornis*, sp. n.

♂.—Length nearly 7 mm.

Black, with long pale hair on face, cheeks, and anterior femora, but hardly any hair on the dorsal surface; head broad; clypeus closely punctured, but shining; suture bounding clypeus above strongly impressed; front and vertex dull and granular; scape black; flagellum very long, black, with a red band covering two and a half joints above (more below) beyond the middle; last joint broad, compressed, shining on one side; mesothorax and scutellum very densely punctured, but shining between the punctures; area of metathorax shining; tegulae piceous. Wings strongly dusky, stigma and nervures dark reddish brown; b. n. moderately bent, falling far short of t.-m.; second s.m. very much broader than high, receiving first r. n. very near base and second not quite so near apex; the outer side of third discoidal cell, if produced upwards, would be parallel with outer side of second s.m. Legs black, with white hair, intermediate tarsal joints broad and short, with a cup-like outline. Abdomen broad, black, with a dullish surface; seventh segment triangular, pointed, with a large, brilliantly shining, triangular space.

*Hab.* Warburton, Victoria (*F. P. Spry*; Nat. Mus. Victoria, 250).

Evidently related to *E. nigra*, Smith, but conspicuously differing in the colour of the legs and venation. These insects belong to the subgenus *Euryglossimorpha*, Strand, which should, perhaps, be regarded as a distinct genus.

*Euryglossa apicalis*, sp. n.

♂.—Length about 7 mm.

Rather slender, black, with scanty white hair, that on cheeks only about half as long as in *E. cincticornis*; facial quadrangle much longer than broad; mandibles with a red



subapical band ; clypeus shining, well punctured ; front and vertex dull ; antennæ slender, black, the flagellum light fulvous beneath except apically ; last joint not modified ; mesothorax and scutellum shining, very distinctly and quite closely punctured ; base of metathorax shining ; pleura dull and granular ; tegulæ dark brown. Wings strongly dusky, stigma and nervures dark reddish ; b.n. falling far short of t.-m. ; first r.n. meeting first t.-c. ; second r.n. meeting second t.-c. ; second s.m. broad, but not nearly so broad as that of *E. cincticornis*. Legs black, with the knees and anterior tibiæ in front ferruginous ; tarsi dark reddish brown. Abdomen with surface and colour as in *E. cincticornis*, but narrower ; apex pointed.

*Hab.* Croydon, Australia (*S. W. Fulton* ; Nat. Mus. Victoria, 166).

Compared with *E. tenuicornis*, Ckll., this differs by being less robust, with shorter antennæ and different venation.

*Euryglossa inconspicua*, sp. n.

♀.—Length about 5 mm.

Black, robust, with scanty pale hair ; head and thorax with very faint and obscure dark greenish tints ; head broad ; clypeus shining, punctured, pure black, contrasting with the greenish sides of face ; front dull ; flagellum rather obscurely fulvous beneath ; mesothorax obscurely greenish, purplish black posteriorly, with a sericeous surface and very sparse feeble punctures ; scutellum shining, very sparsely punctured ; metathorax granular, dullish ; tegulæ testaceous. Wings hyaline, nervures and stigma reddish brown, some of the outer nervures pale ; stigma very large ; b.n. falling short of t.-m. ; second s.m. broad, but its lower side little longer than its outer, the recurrent nervures joining it near base and apex ; the outer side of third discoidal cell, if produced upward, would be practically parallel with outer side of second submarginal. Femora black, with red knees ; tibiæ and tarsi bright ferruginous. Abdomen broad, black, shining, the hind margins of the segments obscurely reddish.

*Hab.* Purnong, Australia (*S. W. Fulton* ; Nat. Mus. Victoria, 222).

Curiously like *Pachyprosopis atromicans*, Ckll., also found at Purnong, but differing in sculpture as well as venation.

*Euryglossa fasciatella*, Cockerell.

I have before me both sexes labelled "Cheltenham, Victoria" (*French* ; Froggatt, 189, 185). The male, not



previously known, is about  $6\frac{1}{2}$  mm. long, black, with much loose long hair, which is faintly ochreous above; antennæ dark, the flagellum very faintly reddish beneath; all the tarsi light reddish; anterior tibiæ ferruginous basally and in front; hind tibiæ chestnut-red, with glittering white hairs; all the knees red.

*Pachyprosopis aurantipes*, sp. n.

♂.—Black, with bright orange-yellow legs and scape; flagellum pale fulvous, dusky above; labrum and mandibles yellow; eyes converging below and face densely covered with appressed, shining, light brownish-golden hair. Except for the sexual differences, this looks exactly like *P. angophoræ*, Ckll., but it seems to be a distinct species, having the mesothorax and scutellum sparsely and feebly punctured, whereas they are closely punctured in *angophoræ*.

*Hab.* "Windsor, Victoria" (*French*; Froggatt, 197).

The following key separates the species of *Euryglossa* and *Pachyprosopis* described above from each other and from several other species:—

- |   |    |  |
|---|----|--|
| Mesothorax red .....  | 1. |  |
| Mesothorax not red .....  | 2. |  |
| 1. Postscutellum red; wings dusky .....   |    | <i>E. ephippiata</i> , Sm.                           |
| Postscutellum black; wings clear .....  |    | <i>E. aurescens</i> , Ckll.                          |
| 2. Mesothorax blue. (Croydon; <i>Fulton</i> ,<br>Nat. Mus. Vict. 198.) .....  |    | <i>Pach. hæmatostoma</i> , Ckll.                     |
| Mesothorax black (very faintly greenish<br>in <i>E. inconspicua</i> ) .....   | 3. |  |
| 3. Mesothorax with yellow stripes and<br>margin .....   |    | <i>E. tridentifrons</i> , Ckll.                      |
| Mesothorax without yellow stripes and<br>margin (rudiments of these in <i>E. calli-</i><br><i>opsiformis</i> , var. <i>a</i> ) .....                                      | 4. |  |
| 4. Face with light markings .....   | 5. |  |
| Face all dark .....   | 6. |  |
| 5. Light markings two large creamy-white<br>lateral marks .....   |    | <i>E. albocuneata</i> , Ckll.                        |
| Light markings yellow, and not confined<br>to lateral marks; faint traces of yellow<br>mesothoracic bands. ("Rutherglen,<br>Victoria"; <i>French</i> , Froggatt, 170.) .. |    | <i>E. calliopsiformis</i> , Ckll., [var. <i>a</i> .] |
| 6. Legs entirely bright orange .....  |    | <i>Pach. aurantipes</i> , Ckll.                      |
| Legs not so .....   | 7. |  |
| 7. Male flagellum black, with a red ring on<br>two and a half joints .....  |    | <i>E. cincticornis</i> , Ckll.                       |
| Male flagellum beneath light fulvous,<br>with the apex broadly black, con-<br>trasting; hind tibiæ black .....  |    | <i>E. apicalis</i> , Ckll.                           |
| Flagellum otherwise .....   | 8. |  |



8. Upper outer angle of second s.m. not greater than a right angle; tibiae and tarsi red ..... 9.  
 Upper outer angle of second s.m. greater than a right angle ..... 10.  
 9. Stigma pallid. (Purnong; *Fulton*, Nat. Mus. Vict. 219.) ..... [var. *a.* *Pach. atromicans*, Ckll.,  
 Stigma dark sepia. (Croydon; *Fulton*, Nat. Mus. Vict. 190, 162: also Windsor; *French*, Froggatt, 190.) .. *Pach. atromicans*, Ckll.  
 10. Larger species, with black hind tibiae .. 11.  
 Smaller species, with red hind tibiae .... 14.  
 11. Mesothorax dullish, without strong punctures ..... *E. fasciatella*, Ckll.  
 Mesothorax with strong punctures; abdomen metallic or submetallic .... 12.  
 12. Disc of mesothorax with strong punctures. (Croydon; *Fulton*, Nat. Mus. Vict. 93.) ..... *E. nigrocerulea*, Ckll.  
 Disc of mesothorax with sparse feeble punctures ..... 13.  
 13. Larger; sides of mesothorax more finely punctured; flagellum dark. (Croydon; *Fulton*, Nat. Mus. Vict. 237: also Dandenong, Nov. 1902; *T. Kershaw*, Nat. Mus. Vict. 164.) ..... *E. depressa*, Sm.  
 Smaller; sides of mesothorax more coarsely punctured; flagellum fulvous beneath. (New South Wales; Nat. Mus. Vict. 165.) ..... *E. jucunda*, Sm.  
 14. Mesothorax not evidently punctured .. 15.  
 Mesothorax closely punctured; males .. 16.  
 15. Middle tibiae clear red ..... *E. inconspicua*, Ckll.  
 Middle tibiae dark except at base; male. *E. fasciatella*, Ckll.  
 16. Flagellum apricot-colour above and beneath. (National Park; *Lea*, 10711; Froggatt, 137.) ..... *E. chrysoceras*, Ckll.  
 Flagellum dark, at least above. (National Park; *Lea*, 10717; Froggatt, 142: also variety with flagellum light red beneath; "Nagambie, Victoria"; *French*; Froggatt, 195.) ..... *E. reginae*, Ckll.

LXIV.—*New Anthracotheres and allied Forms from Baluchistan.—Preliminary Notice.* By C. FORSTER-COOPER, M.A., University Demonstrator in Comparative Morphology, Cambridge.

THE following forms are part of a large collection from the Upper Oligocene deposits of Dera Bugti in Baluchistan. With the exception of fig. 1 all the figures are of natural size.





Cockerell, Theodore D. A. 1913. "Descriptions and records of bees. LV." *The Annals and magazine of natural history; zoology, botany, and geology* 12, 505–514.

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