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The Halictine Bees of the Australian Region.

By T. D. A. COCKERELL.

THE Halictine bees of Australia were studied and described many years ago by Mr. F. Smith: since his death they have received practically no attention; and owing to the brevity of the published descriptions and the complete absence of tables for identification the recognition of the species has seemed difficult. The following tables and notes are based on an examination of Smith's types in the British Museum, and it is hoped that they will make it easier for entomologists to further elucidate the subject. There can be no doubt that any resident of Australia who will collect and study these bees will find many new species.

The following abbreviations are used:—(T.)=type specimen examined; s. m.=submarginal cell; r. n.=recurrent nervure; b. n.=basal nervure; t. c.=transverso-cubital

nervure ; t. m. = transverso-medial nervure ; hind spur = hind spur of hind tibia ; area = basal area of metathorax.

PARASPHECODES, Smith.

Similar to *Halictus*, but with head and thorax black and abdomen red or largely so. Males with clypeus yellow, except at sides above. This genus does not differ from *Halictus* in any good structural character, and its separation is only justified by the fact that it includes a compact and easily recognized group of species. In his generic diagnosis Smith says that the first r. n. always meets the second t. c. ; but this is not invariably the case. So far as I know, the hind spur of the female is always without spines or teeth. The following table separates Smith's species :—

♂.

- | | |
|--|----------------------------|
| First r. n. entering basal corner of third s. m. ; size smaller ; abdomen red, with only the apex slightly blackish ; flagellum entirely black | <i>sulthica</i> , Sm. (T.) |
| First r. n. entering second s. m. not far from its end | 1. |
| 1. Flagellum ferruginous beneath ; size rather large ; a black cloud on third abdominal segment and segments 4 to 6 all black ; area coarsely wrinkled | <i>altichus</i> , Sm. (T.) |
| Flagellum entirely black | 2. |
| 2. Area rugose-granular ; middle femora very dark. Area longitudinally plicate ; middle femora clear red | <i>stuchila</i> , Sm. (T.) |
| | <i>hilactus</i> , Sm. (T.) |

♀.

- | | |
|--|----------------------------|
| First r. n. entering second s. m. near apex ; red of abdomen quite bright ; area often without longitudinal ridges or wrinkles | 1. |
| First r. n. meeting second t. c. ; red of abdomen darker or duller ; area with longitudinal ridges or wrinkles | 3. |
| 1. Abdomen red, only faintly blackened apically ; area dull, without distinct wrinkles or ridges ; hind spur simple ; second s. m. higher than broad | <i>lithusca</i> , Sm. (T.) |
| Abdomen with segments 1 to 3 red, 4 and 5 black. | 2. |
| 2. Smaller ; red of abdomen very bright, hind margins of segments 1 and 2 darker ; clypeus with few large punctures on a shining surface ; mandibles strongly dentate ; hind spur simple ; second s. m. about as high as broad | <i>tuchilas</i> , Sm. (T.) |
| Larger ; red of abdomen darker, chestnut colour, hind margins of segments 1 and 2 not darkened ; area with a delicate raised sculpture ; hind spur simple ; second s. m. very broad, | |

- broader than high, and nearly as large as third *lichatus*, Sm. (T.)
3. Larger; abdomen shining very dark chestnut, blackened apically; ridge behind area very prominent; second r. n. and third t. c. much weakened *tilachus*, Sm. (T.)
- Smaller; abdomen not so dark 4.
4. Area with fine wrinkled ridges; abdomen dull and rather hoary; second s. m. about square. *lathius*, Sm. (T.)
- Area with fine straight ridges 5.
5. Wings strongly yellowish *taluchis*, Sm.
- Wings clear *hiltacus*, Sm.

P. talchius, Sm., I have not seen. It is described from a male, the face thickly covered with yellow pubescence, and the basal margins of the second and third abdominal segments depressed. The following two new species are in the British Museum:—

Parasphcodes melbournensis, sp. n.

♀.—Length about 11 mm.

Wings dusky, stigma dark red-brown; second s. m. higher than broad, first r. n. meeting second t. c.; clypeus shining, with large sparse punctures; antennæ wholly black; pubescence pale fulvous; legs dark; metathorax sharply truncate, the upper lateral corners of the truncation prominent; area broad, without a shining rim, its surface dull and minutely roughened, the basal two fifths covered with little ridges; abdomen rather long, not very shiny, bright red, with extremely minute punctures on segments 1 and 2; first segment largely clouded with blackish; extreme apex blackish; venter lighter and more yellow, the hind margins of the segments darker.

Hab. Melbourne, Australia (collection of F. Smith).

From *P. melbournensis* (1) *P. taluchis* differs by the better defined area, with the wrinkles covering its surface, the lighter stigma, &c.; (2) *P. hiltacus* differs by the smaller, darker, and more shiny abdomen, the upper angles of metathoracic truncation not at all prominent, the striæ practically covering area, &c. The area of *P. melbournensis*, partly striate or ridged and partly not, is especially distinctive.

Parasphcodes Frenchi, sp. n.

♀.—Length about 9 mm.

Clypeus shining, with large close punctures; tegulæ shining piceous, white in front; pubescence white, faintly

tinged with ochreous dorsally; legs black; upper corners of metathoracic truncation not at all prominent; area semilunar, with a shining rim, its surface with nearly straight longitudinal ridges, evanescent posteriorly, but extending over more than half the surface; abdomen broad, very dark chestnut-red, beyond second segment strongly blackened, but not black; *sides of second and third segments each with a triangular basal patch of white tomentum*; venter strongly blackened; wings almost clear, dusky at apex; stigma sepia, nervures dark brown; first r. n. meeting second t. c.; second s. m. a little higher than broad.

Hab. Melbourne, Australia, June 26, 1892 (*French*).

From *P. Frenchi* (1) *P. hiltacus* differs by its lighter abdomen, without the lateral hair-patches, &c.; (2) *P. tilachus* differs by being larger, with the area shorter and the lateral hair-patches of abdomen wanting, &c.

HALICTUS.

The following table is based on the specimens in the British Museum:—

Species large or middle-sized, not minute*	1.
Species minute, about $5\frac{1}{2}$ to $6\frac{1}{2}$ mm. long.	9.
1. Postscutellum with a patch of bright orange tomentum; third abdominal segment with a well-defined large basal patch of bright orange tomentum, ending abruptly on each side in the subdorsal region; legs mainly red; sides of upper border of prothorax covered with bright orange tomentum; marginal cell and beyond and vicinity of basal nervure suffused with fuliginous; area dull, not wrinkled or striate: ♀, length $9\frac{1}{2}$ mm. (S. Australia.)	<i>peraustralis</i> , sp. n.†
Postscutellum without such a patch.	2.
[2. Legs red, or largely so	3.
Legs black, or almost	4.
3. Larger; legs dusky red; bases of second and third abdominal segments with a broad band of orange tomen-	

* In all these the first r. n. meets the second t. c., except that it is just in the apex of second s. m. in *H. conspicuus* and *H. representans*.

† *H. peraustralis* is labelled in the Museum *H. bicingulatus*, var., but it appears to be a valid species.

- tum; upper margin of prothorax with orange tomentum; tegulae fulvous. *bicingulatus*, Sm., ♀ (n. syn.: *rufipes*, Sm., *tertius*, D. T.).
- Smaller; tibiae and tarsi clear red; abdomen without bands, but with conspicuous patches of ochry-tinged white tomentum at lateral bases of segments 2 to 4; tegulae lively fulvous; hind spur simple. *conspicuus*, Sm., ♀. (T.)
4. Larger; abdomen black, punctured, without hair-patches; hind spur simple. *carbonarius*, Sm., ♀. (T.)
- Smaller; abdomen with hair-patches. 5.
5. Stigma black, or practically so; area very finely and minutely wrinkled. *oblitus*, Sm., ♀. (T.)
- Stigma brown or reddish. 6.
6. Clypeus with a yellowish-white band; face with much white hair; whole insect very hairy. *lanuginosus*, Sm. (T.)
- Clypeus all black. 7.
7. Area with strong regular striae. (Tasmania.) *repræsentans*, Sm., ♀. (T.)
- Area more feebly and irregularly sculptured. 8.
8. Larger and more hairy. *lanarius*, Sm., ♀. (T.)
- Smaller and less hairy. *convexus*, Sm., ♀. (T.)
9. Abdomen green; mesothorax with a very bright green colour, but dull surface; scutellum shining. *floralis*, Sm., ♀*. (T.) (n. syn. *vividus*, Sm.)
- Abdomen red, at least in part; mesothorax green, which separates these species from *Parasphcodes*. 10.
- Abdomen black or dark brown. 12.
10. Mesothorax with very large shallow punctures; abdomen very shiny, red at sides. *punctatus*, Sm., ♀. (T.)
- Mesothorax with minute punctures. 11.
11. Mesothorax very shiny; abdomen red, with only first segment darkened. *vitripennis*, Sm., ♀. (T.)
- Mesothorax duller; abdomen with the apical part dark. *sphécodoides*, Sm., ♀. (T.)
12. Mesothorax black; abdomen dark brown, segments 3 to 5 pilose; second r. n. and third t. c. almost obsolete. (Tasmania.) *globosus*, Sm., ♀. (T.)
- Mesothorax green or blue. 13.
13. Mesothorax peacock-green; abdomen shining; hind spur with 3 spines. *urbanus*, Sm., ♀. (T.)
- Mesothorax dark. 14.

* *H. floralis* is from Australia; Dalla Torre erroneously gives the locality as New Zealand.

14. Mesothorax small and shining; abdomen shining black..... *humilis*, Sm., ♀. (T.)
 Mesothorax dull 15.
15. Larger; mesothorax greener; abdomen dark brown, with a sericeous surface..... *inclinans*, Sm., ♀. (T.)
 Smaller; mesothorax bluer; abdomen shining black. (Tasmania.) *limatus*, Sm., ♀. (T.)

There are three Tasmanian species, *H. familiaris* (Erichs.), *H. orbatus*, Sm., and *H. cognatus*, Sm., which I have not examined. The last, according to Smith, is probably the male of *H. globosus*, Sm.

The presence of ordinary-looking small *Halicti* in the most remote regions is rather remarkable. The following are from New Zealand and Christmas Island (Indian Ocean). The latter locality does not belong to the Australian region, but it is so near to it that its species are of interest in the present connexion.

Halictus Smithii, D. T. (*familiaris*, Sm.), ♀ (T.). New Zealand.—Ordinary-looking small black species; hind spur simple; stigma fulvous; first r. n. meets second t. c.; basal nervure very strongly bent.

H. sordidus, Sm., ♀ (T.). New Zealand.—Ordinary small species; head and thorax black, abdomen *very* dark reddish brown; first r. n. joins second s. m. a short distance before its end.

H. Binghami, W. F. Kirby, ♀ (T.). Christmas Island.—Ordinary-looking small black species; hind spur with very few spines; area large, with fine raised lines, like the veining of a fern-leaf; second and third abdominal segments with basal hair-bands; third s. m. rather large, but its outer side with only a single gentle curve.

H. Andrewsii, W. F. Kirby, ♀ (T.). Christmas Island.—Smaller than *Binghami*; yellowish green, with red legs; venation of *Chloralictus*; hind spur with few long saw-like teeth.

