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New and Little Known Bees

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NEW AND LITTLE KNOWN BEES.

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so much so that when first seen I thought it was some queer Geometer, and was surprised, after I had netted it, to find out what it was. Unfortunately, the photograph is rather blurred, and does not show the markings very clearly. The submarginal rows of black spots on both wings are much larger than usual, and those of the hind wings reach the apex of the marginal black chevrons. The disc is paler and not so heavily marked as in ordinary specimens. The markings on the under side are almost similar.

No. 2 is a beautiful variety of A. villica. The first example of this striking form was taken here more than twenty years ago. It was discovered by Colonel A. J. H. Ward, D.L., V.D., sitting on a bush in his garden; and he was so struck by its beauty that he sent and asked me to come and look at it, as he thought it might be of use to me. Of course I was delighted when I saw it, and boxed it at once! Since then I have bred a few, and nearly always of the same type; as it seems to be peculiar to this neighbourhood, I think it deserves a varietal name, and I have therefore called it wardi in honour of its finder. There is no need to give a description as the figure is so clear. It seems to be a very uncommon variety, for I have not bred many out of the hundreds of larvæ I have reared year after year. In addition to this form, I have bred one or two nice specimens having the basal spots of upper wings united.

No. 3 is an extremely beautiful and asymmetrical variety, and was the only variety bred out of some two hundred larvæ I reared last season.

Lee House, Dovercourt, February 7th, 1914.

NEW AND LITTLE KNOWN BEES.

By T. D. A. COCKERELL.

Anthophorula bruneri (Crawford).

Dallas, Texas, on *Helianthus*, September 22nd, 1905, four males (F. C. Bishopp).

Anthophorula morgani, sp. nov.

 \mathfrak{P} . Length 6 mm. or slightly over; black, closely related to *A. bruneri*, but differing thus: smaller (size of male *bruneri*); wings greyish, nervures and stigma dull dusky reddish (stigma in *bruneri* is clear amber); hair on inner side of hind basitarsus dark fuscous; abdominal hair-bands whiter. The dusky stigma, dark tegulæ and well punctured mesothorax readily separate it from *A. texana* (Friese). The well punctured mesothorax separates it at once from *A. coquilletti* (Ashm.). From *A. compactula* (Ckll.) it is known by the less brightly coloured flagellum, the black or piceous tegulæ, and the broad, shining, hardly punctured hind margin of first abdominal segment. There are three submarginal cells.

Hab. Falfurrias, Texas, on Helianthus, May 18th, 1907 (A. C. Morgan).

Exomalopsis frederici, sp. nov.

J. Length about 81 mm., expanse 16; black, mandibles dark red except at base, tibiæ at apex, and the tarsi ferruginous; hair of head and thorax long and abundant, shining white on face, cheeks and under side of thorax, fulvous on head and thorax above, very bright on anterior half of mesothorax; flagellum obscure brown beneath; vertex shining; ocelli large, in a scarcely curved line: mesothorax closely and distinctly punctured, except on disc posteriorly, where it is shining and sparsely punctured; base of metathorax with strong punctures and small shining spaces; tegulæ bright reddishamber; wings clear, dusky at apex, stigma and nervures clear ambercolour; stigma large; b. n. going far basad of t. m.; second s. m. broad, receiving first r. n. far beyond middle; legs with pale hair, fulvous on inner side of tarsi, middle and hind tibiæ with dark fuscous hair on outer side; hind tibiæ thick, but legs otherwise ordinary; abdomen shining, very finely punctured; hind margins of second and following segments with entire pale fulvous hair-bands, that on second narrow and submarginal; segments before the bands with fine short hair, only clearly seen in side view, that on second ochreous. on the others black; apex of abdomen broadly rounded, ferruginous.

Hab. Mexico (F. Smith coll., 79, 22). British Museum. In Friese's table of *Exomalopsis* this runs to *E. planiceps*, Sm., which differs conspicuously in the colour of the pubescence.

The insect looks rather like a small *Diadasia*. The hind spur is strongly curved at end.

Calioxys ardescens, Cockerell.

Guayaquil, Ecuador, one male, one female (v. Buchwald; Alfken coll. 6). These are quite identical with the Brazilian C. ardescens. The female, not before known, is about 13 mm. long, and resembles the male except in the usual sexual characters. The last dorsal segment of abdomen is keeled. and ends obtusely; the last ventral is rather broad, and is narrowed, but not distinctly notched, before the end. The insect reminds one of C. otomita, Cress., from which it differs especially as follows :---Ridge between antennæ high, extending down to clypeus, which is obtusely elevated in the middle (the lower edge of clypeus is shallowly emarginate); middle of mesothorax with sparser and smaller punctures; middle of apical margin of clypeus much less angulate; last dorsal segment much broader apically; last ventral broader, and rather abruptly narrowed before the end. In Schrottky's table of Brazilian species this female runs to C. pygidialis, Schrottky, but differs from it by the absence of a median tooth on scutellum and a ventral keel on abdomen.

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Cælioxys sanguinosus, Cockerell.

Guacimo, Costa Rica, June 21st, 1903, one female (J. C. Crawford). U.S. National Museum. The last ventral segment has a well-defined tooth-like apex, whereas the type has only a nodule, but the specimens are evidently conspecific.

Cælioxys azteca, Cresson.

San José, Costa Rica, May 31st, 1903, "on orquetilla," one female (J. C. Crawford). U.S. National Museum.

Cælioxys texana sonorensis, subsp. nov.

3. Length about 81 mm.; face densely covered with white hair; first two joints of antennæ dark red, the others black; hair on eyes shorter than in male texana from Wisconsin; region surrounding middle ocellus strongly elevated ; mandibles with a red subapical spot; cheeks thinly covered with white hair, more densely below (texana from Wisconsin has a large bare space, wholly wanting in sonorensis); mesothorax closely and very coarsely punctured; two conspicuous spots of creamy hair on anterior margin, and a thinly hairy triangle between; scutellum densely punctured, the hind margin with pale hair, and not tuberculate or angular; tegulæ clear bright ferruginous; first r. n. joining second s. m. at extreme base; legs bright clear ferruginous, the tarsi strongly dusky; spurs clear red; abdomen clouded with red at sides and beneath; apical segment deeply excavated, with three teeth on each side, but one of them more or less bifid, no median tooth; fourth ventral segment with two red teeth on apical margin, not extending beyond the fringe of white hair.

Hab. San José de Guaymas, Mexico, April 10th (L. O. Howard). This insect has caused me some perplexity, because, except for the smaller size, it agrees fairly well with Cresson's brief account of male *texana*. It is certainly quite distinct from the Wisconsin insect which Dr. Graenicher has sent me as *texana*; but Dr. Graenicher's female, which certainly seems to belong with the male, appears to be veritable *texana* as described by Cresson. Dr. Howard's bee has the appearance of a desert insect, and should be distinct from the Texan species, which may well range into Wisconsin. Very possibly the new form represents a distinct species, C. sonorensis, but until it is compared with the type of *texana* it may be given only subspecific rank.

In my table of male $C \alpha lioxys$ in Canadian 'Entomologist,' C. sonorensis runs to C. quercina, Ckll., differing by the absence of a median process at end of abdomen, the rounded (instead of squarely truncate) hind margin of scutellum, the red colour at sides of abdomen beneath, and the smaller size. It is allied, however.

Cælioxys otomita bicarinata, subsp. nov.

 \mathfrak{P} . Exactly like *C. otomita*, Cresson, except that the clypeus has on its lower two-fifths a pair of parallel longitudinal ridges, with a depression between.

Hab. Guayaquil, Ecuador (v. Buchwald; Alfken coll. 7). C. leporina, Sky., has a deeply sulcate clypeus, but is very different from bicarinata. Our insect is in many respects similar to C. tumorifera, Ckll., based on a male from Peru. There are, however, many differences; thus in tumorifera the occipital margin is a long way from the ocelli, in bicarinata it is close to them.

Cælioxys triodonta, sp. nov.

3. Length about 10 mm.; black, with the tegulæ, legs, under side of abdomen (except bases of segments) and extreme sides of abdomen more or less, all dark ferruginous; antennæ black, the last two joints ferruginous basally; mandibles dark red; face narrow, densely covered with pale golden hair; hair on eyes short; cheeks with a smooth bevelled space below; hair of thorax yellowish, no distinct spots on mesothorax anteriorly; mesothorax with very large punctures, well separated on disc posteriorly; scutellum short, strongly punctured, but smooth on each side of the delicate median keel, which leads to a prominent marginal tooth; axillar spines long, and nearly straight seen from above; wings dilute fuscous; anterior coxæ with large red spines; spurs red; abdomen shining, the hairbands as usual, but weak; fifth segment with a red spine on each side; sixth with six large spines, and a very short and small, but distinct, median one; fourth ventral segment with two short dark spines close together; fifth with a deep oval depression.

Hab. Guayaquil, Ecuador (v. Buchwald; Alfken coll. 8). Very similar to C. leucochrysea, Ckll., also from Guayaquil, but leucochrysea has the face broader below, hair on eyes shorter and white (yellow in triodonta), last two antennal joints wholly black, median tooth of scutellum much less prominent, and axillar teeth shorter and more curved, no median apical tooth on abdomen, lower apical spines longer and more parallel. By the structure of the scutellum, C. triodonta is related to C. beroni, Sky., but the latter is much larger, and has no median apical tooth on abdomen.

Cælioxys costaricensis, sp. nov.

2. Length about $10\frac{1}{2}$ mm.; black, with the mandibles, apex of labrum, tegulæ, mesothorax (except a large posterior triangular area), outer face of axillæ, tubercles, mesopleura, under side of abdomen and marks on lateral margins (large areas on first segment), all red; hair of eyes very short; mandibles strongly tridentate; labrum nearly twice as long as wide, with a deep basal pit; clypeus convex, densely rugosopunctate; no prominent keel between antennæ; antennæ wholly black; the large punctures of mesothorax well separated on disc posteriorly; scutellum strongly punctured, with a smooth median keel, the hind margin conspicuously angulate, the end of the keel projecting as a small tooth; axillar teeth only moderately long, distinctly curved; wings dilute fuscous, the apical margin darker; anterior coxæ with short spines, densely covered with white hair beneath; anterior margin of mesothorax with a narrow band of yellowish hair, but no patches; hind tarsi with

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orange hair on inner side; spurs red; middle of abdomen with the punctures sparse and small, on the fifth segment minute but close, in abrupt contrast; hind margins of segments, and edge of basin of first, with conspicuous but very narrow white hair-bands, but no other hair-bands or markings; sixth dorsal segment delicately keeled, gradually narrowed apically, and turned up at extreme tip; last ventral rather narrow, with a very apical part, not extending far beyond dorsal; sides of last ventral with long but not dense hairs; ventral segments with strong white marginal hair-bands; last ventral black or nearly, contrasting with the bright red segment before it.

Hab. Guapiles, Costa Rica, June 18th, 1903 (J. C. Crawford). U.S. National Museum. This species may be compared with some of those described by Cresson from Mexico, from which it is readily separable as follows :—

Last dorsal segment abruptly contracted on each side, the

apical part much narrower than the basal ... chichimeca, Cress. Last dorsal gradually tapering to apex..... 1. 1. Last dorsal turned upward at tip; last ventral straight

costaricensis, Ckll.

Last dorsal not turned upward at tip; last ventral strongly

curved downward totonaca, Cress.

C. costaricensis is in many ways similar to the South American C. quærens, Holmbg., to which it runs in Holmberg's table.

Cælioxys luzonicus, sp. nov.

J. Length about 7 mm.; black, head and thorax above very densely punctured; head broader than thorax; mandibles entirely black; hair on eyes short; face and front with pale golden hair, and scape beneath with long hair of the same colour; antennæ entirely black; mesothorax with even posterior middle excessively densely punctured; cheeks covered with white hair, no hairless area below; occiput with white hair; mesothorax with very thin golden-brown hair, only distinct anteriorly; pleura, tubercles and sides of metathorax densely covered with pure white hair; scutellum dull, very densely rugosopunctate, short, the margin simple, except when looked at from in front, when two very small obscure nodules appear; axillar teeth short; tegulæ black; wings dilute fuscous throughout; b. n. meeting t. m., first r. n. joining second s. m. very near base; legs entirely black, with white hair; hair on inner side of hind tarsi orange-fulvous; spurs fuscous; abdomen shining, strongly but not densely punctured, the hair-bands pure white; marginal hair-bands confined to sides, where they form broad patches, on first segment sending a very large lobe basad, and a thin line mesad to near the middle; subbasal bands developed as small stripes on sides of third segment, but nearly meeting in middle on fourth and fifth; sixth segment very short and broad, with very small lateral basal teeth (minute ones also on fifth), and six (three pairs) at apex, four above, and two (longer) below; ventral segments with broad white hairbands, the first with a median patch of hair extending from base to hind margin, but the margin otherwise bare.

Hab. Los Banos, Luzon, Philippine Islands (Baker, 1800). Closely related to C. capitatus, Sm., from India, and C. sumatrana, Enderl., from Sumatra. It is known from capitatus by the absence of spots on the mesothorax anteriorly and the interrupted abdominal bands; from sumatrana by the clear white hair of sides of thorax, and other details of coloration. The male of C. philippensis, Bingh., is much larger, and has the sixth segment of abdomen elongated, with the upper apical teeth (two pairs) very short. It is related to the Indian C. basalis, Sm.

Ceratina tropica, Crawford.

Los Banos, Philippine Islands (Baker, 1787).

Allodape cupulifera, Vachal.

Los Banos, Philippine Islands (Baker, 1788). The female is only 5 mm. long, with the base of the mandibles dark, and no lateral face-marks. It can be distinguished from A. marginata, Sm., by its smaller size.

Megachile aurantipennis, Cockerell. Cacao, Trece Aguas, Alta Vera Par, Guatemala, March 24th, two males (Schwarz & Barber). U.S. National Museum.

CONTRIBUTIONS TO OUR KNOWLEDGE OF THE BRITISH BRACONIDÆ. No. I. METEORIDÆ.

BY G. T LYLE, F.E.S.

(Concluded from p. 77.)

Meteorus pulchricornis (Wesm.) .- Probably the commonest species we have; it is easily recognized by the pale anterior margin of the otherwise fuscous stigma, and by the invariably black first abdominal segment. The metathorax is also generally black, though I possess a specimen in which it is entirely testaceous. A most variable species in size and colour; quite half my females may be referred to Marshall's var. α ; and although I have seen no males of this form, I have several approaching vars. β & γ . My largest specimen, a female, bred from a larva of Agrotis (Lycophotia) strigula, measures 11 mm. in expanse, while the smallest, also a female, bred from a larva of Cerostoma radiatella, expands only 6 mm. Marshall describes the second cubital areolet as "slightly narrowed towards the radius," but in several of my specimens it is considerably so. The larva is pale green, with the parts of the mouth black and the spiracles on segments one and two also outlined in black.

A solitary parasite of larvæ of Lepidoptera. There are

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