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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.

♀. 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.

♂. Length about 8½ 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 reddish-amber; wings clear, dusky at apex, stigma and nervures clear amber-colour; 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.

Cœlixys 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.

Cœlioxys 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.

Cœlioxys azteca, Cresson.

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

Cœlioxys texana sonorensis, subsp. nov.

♂. Length about $8\frac{1}{2}$ 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 *Cœlioxys* 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.

Cœlioxys otomita bicarinata, subsp. nov.

♀. 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.

Cœlioxys triodonta, sp. nov.

♂. 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 hair-bands 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.

Cœlioxys costaricensis, sp. nov.

♀. 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

