Reprinted from ENTOMOLOGICAL NEWS, Vol. LXIX, No. 9, Nov., 1958
Printed in U. S. A.

Synonymies and Types of Apterostigma (Hym: Formicidae)

By NEAL A. WEBER, Swarthmore College,
Swarthmore, Pennsylvania

The genus *Apterostigma* Mayr is confined to the mainland of Tropical America and most of the species are found in rain forest. The ants depend for food entirely on a basidiomycete fungus that they culture like other members of the tribe Attini. Many of the described forms are still recorded only from the original collections and normal infraspecific variation has been largely unknown. Recent examinations of types in European and American museums [1] and biological studies have for the first time made possible the following synonymies. Hitherto the geographical distribution of the species has appeared limited but the present synonymies reveal a widespread distribution of some like the situation in other attine genera which have recently been re-studied.[2] Little on the habits of the species has been published except for the 1893 studies of Möller and those of myself. Fortunately the changes in names involve only those of the latter. As in other attine genera, color, size, sculpturing and pilosity are bound to vary within members of one colony.

Apterostigma auriculatum Wheeler

1925. *Apterostigma auriculatum* Wheeler, Arkiv f. Zool. 17A: 49–50.
1925. *Apterostigma auriculatum* var. *demerarae* Wheeler, Arkiv f. Zool. 17A: 51. New Synonymy.
1940. *Apterostigma immobile* Weber, Rev. de Ent. 11: 418–419. New Synonymy.
1945. *Apterostigma wasmanni,* Weber, Rev. de Ent. 16: 36–39.

Wheeler described *auriculatum* from Trinidad and the variety *demerarae* from British Guiana. The differences appear insignificant in the light of later studies. The cotypes of *wasmanni*

[1] Supported by a grant from the National Science Foundation. The museums are cited in the publications below and, in addition, types in the Museum of Comparative Zoology, Harvard, have recently been examined.

[2] Weber, N. A. 1958. Ent. News 69: 7–13, 49–55; Proc. Ent. Soc. Washington (in press).

secured in 1957 show this to be an unrelated species. The species *immobile* was described from the Panama Canal Zone and was noted at the time as close to *wasmanni* and *auriculatum* but separated by a median unpaired tooth in the meso-epinotal impression, posterior to the pair of lobes here. While this is a distinctive character in the specimens mounted then for study, not every specimen in the colony shows this and several South American specimens show it feebly. The ants are otherwise unusually and deeply punctate but are probably best considered, as in other attines, members of a variable and wide-ranging species.

Colonies have since been taken on Barro Colorado Island, Canal Zone, and the fungus cultured.

Apterostigma auriculatum subsp. **icta** Weber

1937. *Apterostigma wasmanni* subsp. *icta,* Weber, Rev. de Ent. 7: 393.
1945. *Apterostigma wasmanni icta* Weber, Rev. de Ent. 16: 39.

The exact status of this form, known only from a Trinidad dealate female, must await more comparative material. It differs particularly from Trinidad females of *auriculatum* in lacking the strongly marginate gaster, darker color (possibly unimportant) and less sharply depressed incipient frontal scrobes.

Apterostigma auriculatum subsp. **petiolatum** Weber

1938. *Apterostigma wasmanni* ssp. *petiolatum* Weber, Rev. de Ent. 9: 175–176.

Cotypes are paler and with higher thoracic ridges than Trinidad or British Guiana *auriculatum.* When more material is produced, *petiolatum* may not be sustained.

Apterostigma billi Weber

1938. *Apterostigma billi* Weber, Rev. de Ent. 9: 165–166.

This species is close to *auriculatum* and *petiolatum* above, rather than to *wasmanni.* It has the broad, coarsely sculptured

head with transverse anterior clypeal margin of *auriculatum* but the frontal lobes are distinctly more irregularly convex. The petiole is clearly longer and lower. The thoracic ridges and gastric carinae are comparable.

Apterostigma bolivianum Weber

1938. *Apterostigma bolivianum* Weber, Rev. de Ent. 9: 181–182.

This species is close to *auriculatum, petiolatum* and *billi* but lacks well defined meso-epinotal lobes and is generally less rugose. All may prove to be one variable species complex when more material is available.

Apterostigma calverti Wheeler

1911. *Apterostigma calverti* Wheeler, Psyche 18: 206–207.

Two pins of cotypes were borrowed from the American Museum of Natural History. One, of three workers, bore the label "Juan Viñas, Costa Rica, in Bromeliads, Calvert" and the other, of three alate females, bore the label "Banana River district, Costa Rica, Early xi, 1909. Calvert." In the original description Wheeler refers to 12 workers, one dealated and five winged females taken by Dr. P. P. Calvert during October and November 1909 as the material seen by him. All were taken between overlapping leaves of bromeliads 12–15 feet above the ground in their fungus gardens.

Cotype workers of *dubium* (= *dentigerum*) differ particularly in having longer necks, more irregularly angulate frontal lobes and sharply carinate gastric margins. The female *dubium* has a longer neck, more rounded frontal lobes and more marginate gaster. Workers of *collare* have similar frontal lobes but still longer necks and gastric carinae. Cotypes of all castes of *branneri* (= *robustum*) are close but have longer necks and smoother pleurae of the prothorax,

Apterostigma collare Emery

1896. *Apterostigma collare* Emery, Bull. Soc. Ent. Ital. 28: 67–68.

The Emery collection has the holotype dealate female with a single, much-folded label: "Coleccion De Anastasio Alfaro, Apterostigma collare Em., Costa Rica, Suerre, Nov. 1895." The thorax length is 1.77 mm., the petiole from above 0.25 mm. wide, the postpetiole from above 0.48 mm. long by 0.51 mm. and there are no gastric carinae. The ant is glued by the side, making head measurements difficult.

The reference to typical *collare* females and workers (Weber 1938, Rev. de Ent. 9: 169) from Hamburg Farm, Sta. Clara Pr., Costa Rica was based upon comparisons with Emery's original description. One of these workers when compared with the female type shows no important differences.

Apterostigma dentigerum Wheeler

1925. *Apterostigma dentigerum* Wheeler, Arkiv f. Zool. 17A: 51–54.
1938. *Apterostigma collare* ssp. *dubium* Weber, Rev. de Ent. 9: 168–169. New Synonymy.
1938. *Apterostigma collare* ssp. *angulatum* Weber, Rev. de Ent. 9: 169–170. New Synonymy.
1941. *Apterostigma dubium* Weber, Rev. de Ent. 12: 110.
1941. *Apterostigma angulatum* Weber, Rev. de Ent. 12: 111–113.

The types ("numerous workers, a single female and two males") were taken "from a small flattened fungus garden under a large stone in the jungle at Zent, Costa Rica, Dec. 1911." The worker was figured as *angulatum* (Rev. de Ent. 9: 163, fig. 4, : 171, fig. 12 and as *dubium* (*loc. cit.*, figs. 6, 14, 19) by the author from Panama Canal Zone specimens. The descriptions allude to the angulate frontal lobes as the outstanding worker character. There are now six pins in the Museum of Comparative Zoology labelled cotypes (No. 23238) that total 14 workers, one female and three males and were taken December 8, 1911, by W. M. Wheeler. The female has the same thorax length as

a Barro Colorado Island, Canal Zone specimen and males from the latter locality are also similar.

The *dubium* description alluded to the marked similarity of the worker of this and *angulatum,* while the female of *dubium* had the rounded frontal lobes characteristic of most other species. The holotype of *dubium* is not conspecific with a cotype female of *calverti* nor with a syntype of *collare.* Whether or not this represents a case of dimorphism in the female caste of *dentigerum* or of an adoption of the female of one by workers of the other (in which case mixed colonies should be found) cannot now be determined.

Apterostigma ierense Weber

1937. *Apterostigma ierense* Weber, Rev. de Ent. 7: 387–388.
1937. *Apterostigma fitzgeraldi* Weber, Rev. de Ent. 7: 393–394. New Synonymy.

This small and striking species and the closely related *gibbum* differ markedly from others known in having a separately raised mesonotum and in having a tubercle or carina (vestigial in *gibbum*) at either side of the smooth meso-epinotal impression. The holotype of *fitzgeraldi* differs distinctly from *ierense* cotypes in darker color, in having reduced meso-epinotal tubercles and in sculpture, but additional collecting in Trinidad, the type locality for both, will probably show that these differences are infraspecific. *A. gibbum* of Bolivia is larger and with the gibbosity of the prothoracic pleurae more prominent.

Apterostigma luederwaldti Santschi

1923. *Apterostigma luederwaldti* Santschi, Ann. Soc. Ent. Belg. 63: 66–67.

The Santschi collection contains two pins of types (No. xxi.v.d. 3383) labelled: "Brésil, São Paulo, Luederwaldt." The thorax of a worker was 1.32 mm. long. It is close to *manni* but compared with *manni* cotypes the latter has a more convex dorsal surface of the epinotum, lacks the distinct though small tubercle on the declivous surface of the mesonotum and is a smaller ant.

Luederwaldti has large, angular frontal lobes; these are smaller and convex in *manni*.

Apterostigma mayri Forel

1893. *Apterostigma mayri* Forel, Ann. Soc. Ent. Belg. 37: 604.
1912. *Apterostigma Mayri* var. *discrepans* Forel, Mem. Soc. Ent. Belg. 19: 190. New Synonymy.
1922. *Apterostigma abdita* Mann, Proc. U. S. Nat. Mus. 61 (Art. 13): 50–51. New Synonymy.
1937. *Apterostigma mayri* var. *pallidum* Weber, Rev. de Ent. 7: 388–389. New Synonymy.
1938. *Apterostigma mayri* ssp. *zip* Weber, Rev. de Ent. 9: 166–168. New Synonymy.

The Forel collection has four pins marked "Typus." One with two workers has the label "A. Mayri Forel ☿ Trinidad (Urich) 47." These were compared with my Nariva Swamp, Trinidad (No. 140.1) workers and found to be identical as were my British Guiana (No. 326) and Barro Colorado Island, Canal Zone (No. 3437) workers. The color differences of the female and worker of *pallidum* are no longer considered significant and the characters of *zip* are believed to fall within the infraspecific range. The variety *discrepans* was compared by Forel with *pilosum* and *mayri;* its description makes it unclear how best to treat it but there is no evidence to retain it as a form of *mayri*. Cotypes of *abdita* show characters identical with *mayri,* including the terminal antennal segment.

Specimens taken by the author at Rio Porce (Lat. 6°40′ N., Long. 75°10′ W., 3,300 feet) and above Medellín at 5,700 feet, Colombia in 1938 are of *mayri*.

Apterostigma pilosum Mayr

1864. *Apterostigma pilosum* Mayr, Novara Riese, Zool. Thiel, Formicid. 2: 113.

Of the six pins in the Emery collection under this species, the first bore only the label "Apterost. pilosum Bras M" and appears to mean "Brasil, Mayr." It may well be a cotype worker received from Mayr. The second pin was not of the same species and is from Matto Grosso (Germain). Mayr described the spe-

cies from Rio de Janeiro, Brazil, although in 1887 he listed the worker and female from St. Catharina, Brazil. Forel listed the female and male in 1912 from Rio de Janeiro (Göldi).

The above possible worker cotype is a typical member of the genus with a long neck, small and evenly convex frontal lobes, no meso-epinotal tubercles and no gastric carinae. The post-petiolar node from above was 0.35 mm. long × 0.45 mm. wide and the thorax length was 1.62 mm. It differed distinctly when compared with types of *amiae* (= *robustum*), *bolivianum, dorotheae, gibbum, ierense, immobile* (= *auriculatum*), *manni* and *tramitis.*

Apterostigma tramitis Weber

1940. *Apterostigma tramitis* Weber, Rev. de Ent. 11: 417–418.

As noted in the original description, this species is close to *mayri,* differing in the shorter and stouter terminal antennal segment. This, in cotypes of *tramitis,* is 0.35–0.36 mm. × 0.17 mm. while in Trinidad *mayri* it is 0.40 × 0.16 mm. It is temporarily retained as a separate species although it may fall as a synonym.

Apterostigma dorotheae Weber

1937. *Apterostigma dorotheae* Weber, Rev. de Ent. 7: 389–390.

As noted in the original description, this species is close to *mayri* but differs particularly in coarser sculpturing. The carinae of the mesonotum are well defined and in most cotypes are produced as lobes.

Apterostigma robustum Emery

1896. *Apterostigma robustum* Emery, Bull. Soc. Ent. Ital. 28: 66–67.
1916. *Apterostigma branneri* Mann, Bull. Mus. Comp. Zool. Harvard 60: 456–457. New Synonymy.
1925. *Apterostigma jubatum* Wheeler, Arkiv f. Zool. 17A: 47–49. New Synonymy.
1937. *Apterostigma amiae* Weber, Rev. de Ent. 7: 391–392. New Synonymy.

1938. *Apterostigma robustum* ssp. *constrictum* Weber, Rev. de Ent. 9: 173–175. New Synonymy.
1938. *Apterostigma robustum* ssp. *tic* Weber, Rev. de Ent. 9: 170. New Synonymy.

The holotype in the Emery collection is a worker with the labels: "Jiménez" and "robustum n. sp." The thorax is 2.08 mm. long, the postpetiolar node 0.54 mm. long by 0.63 mm. wide, the neck is broad and there are no gastric carinae. The differences with the subspecies *tic* of Costa Rica, based on Emery's description, do not exist and the two forms are the same when directly compared. Types of the other listed synonyms show minor infraspecific differences.

The gynetype female of *jubatum* from British Guiana in the Museum of Comparative Zoology was compared with females of *constrictum* from Bolivia and is conspecific. The feeble gastric marginations or carinae appear to be variable in development as are the anterior pronotal lateral gibbosities and neck dimensions. The neck is best developed in the *branneri* cotypes and the worker pair of anterior pronotal lobes the least separated.

The types of *branneri* were taken in Brazil (a colony each at Abuna and Madeira-Mamoré R.R. Camp 39) and were likened to *calverti* of Costa Rica. The British Guiana cotypes of *amiae* are slightly smaller, less rugose on the thorax and somewhat intermediate but clearly conspecific with *branneri* when compared with Abuna cotypes of the U.S.N.M. The *amiae* may have come from a younger colony. The *branneri,* compared with *calverti* cotypes, show the two species indeed to be closely related and separated most distinctly by the larger frontal lobes in worker and female castes of *branneri* (and *robustum*). *Jubatum* was compared originally only with *branneri.*

It is clear that *robustum* is a widespread species that has been redescribed under different names because the holotype and only known specimen has not been used directly for comparisons.

Apterostigma urichi Forel

1893. *Apterostigma urichi* Forel, Ann. Soc. Ent. Belg. 37: 603.
1937. *Apterostigma urichi* var. *nitidum* Weber, Rev. de Ent. 7: 392. New Synonymy.

1937. *Apterostigma urichi* var. *guianense* Weber, Rev. de Ent. 7: 393. New Synonymy.

The Trinidad and British Guiana distribution and habits of this species have been described (Weber, 1945, Rev. de Ent. 16: 29–34 and 1946, *loc. cit.,* 17: 138–140). Since 1937, additional collecting and study have shown that *nitidum* and *guianense* are probably infraspecific variants of doubtful taxonomic value. This species has seldom been collected but must have a wider distribution.

Apterostigma wasmanni Forel

1892. *Apterostigma wasmanni* Forel, Mitt. Schweiz. Ent. Ges. 8: 345.

There were four pins in the Forel collection marked "typus." One, with three workers, bore the labels "A. Wasmanii Forel, ☿, Blumenau, Möller 39a." Another with two workers was labelled "A. Wasmanii Forel, ☿, Möller F, Blumenau, Sur Brésil." A pin of two workers was secured in an exchange with Dr. Ferrière. It bears the labels "Cotypus" and "A. Wasmanii Forel, ☿, Blumenau, Möller 39a." The Emery collection has two pins of ants under *wasmanni,* one a worker from Rio Grande (Ihering), the other being a male with the single pencilled label: "Wasmannia, Blumenau." Forel's original descriptions were drawn from workers and males of Blumenau, Santa Catharina, South Brazil.

The cotypes of the author have total extended lengths of 4.1 and thorax lengths of 1.59 mm. and include the following characters: clypeus produced as a broadly convex apron covering the mandibular bases, frontal lobes angulate, neck short and broad, thorax with a longitudinal median pair of carinae of irregular form which disappear in the meso-epinotal region and are feebly developed on the epinotum. Lateral to the carinae on the mesonotum is an angular tubercle on either side; the petiolar node is angulate above and the sides of the gaster are carinate. A closely related species is *A. manni* Weber, which has the frontal lobes less angulate and the body in general less rugulose; the types are distinctly smaller.