

THE GENUS *GOETHEANA* GIRAULT IN SOUTH AFRICA (EULOPHIDAE – HYMENOPTERA)

(Met opsomming in Afrikaans)
(Avec résumé en français)

—◆—
D. P. ANNECKE, Division of Entomology, Pretoria

ABSTRACT

The chalcidoid genus *Goetheana* Girault with two included species, *parvipennis* (Gahan) and *incerta* spec. nov., is recorded from South Africa. Possible hosts of *G. parvipennis* are the cacao thrips, *Selenothrips rubrocinctus* (Giard), and *Thrips tabaci* Lindeman, both of which are known to occur in South Africa.

INTRODUCTION

The genus *Goetheana* was described in the chalcidoid family Mymaridae by Girault (1920). Subsequently that author (Girault, 1930) synonymized *Dasyscapus* Gahan with *Goetheana*, and the latter genus has been taken up in the Eulophidae, tribe Omphalini (Annecke & Doutt, 1961), in which somewhat heterogeneous group Gahan (1927) had apparently correctly placed his genus *Dasyscapus*.

Goetheana parvipennis (Gahan) was described from Java (Gahan, 1927) as a parasite of *Thrips tabaci* Lindeman; subsequently Ferrière (1931) recorded the species from the Gold Coast, West Africa, where it had been reported as an effective controlling agent of the cacao thrips, *Selenothrips rubrocinctus* (Giard). This thrips parasite was used in biological control work in Trinidad and Puerto Rico in an unsuccessful attempt to achieve control of the cacao thrips (Adamson, 1936; Dohanian, 1937; Callan, 1943). In a recent letter (25 January, 1961) Dr. Edward Callan comments as follows: "In 1942 I observed *D. parvipennis* parasitizing cacao thrips on mango in Jamaica and Puerto Rico. On 29 September, 1943, I reared this species from cacao thrips on mango at El Valle, near Caracas, D.F., Venezuela. I sent some of the Venezuela-reared specimens to Gahan, and this is undoubtedly the material you examined in the U.S. National Museum. In 1944 I saw Gahan in Washington and discussed with him the occurrence of *D. parvipennis* in Venezuela. Gahan expressed the opinion that, although this species might possibly have reached Caracas from Trinidad by its own efforts (it was never introduced by Adamson into Venezuela), it was just as likely that it was already in fact present in the New World when introduced into Trinidad by Adamson in 1935. This might perhaps account for the fact that no economic control of cacao thrips by *D. parvipennis* has resulted from its introduction."

The present paper records *Goetheana parvipennis* from South Africa, and also gives the description of an apparently new species. Both these species were caught in a suction trap operating at Skukuza, Kruger National Park, in fairly dense

Received for publication on 26 June, 1961

THE GENUS *GOETHEANA* GIRAULT IN SOUTH AFRICA

riverine forest. The distribution of *G. parvipennis* is thus expanded and now includes Java, South America (including Trinidad, Puerto Rico and Jamaica), West and South Africa.

The hosts of *Goetheana* species in South Africa are not known. Dr. J. C. Faure, Division of Entomology, Pretoria, has informed the writer that *Selenothrips rubrocinctus* (Giard) occurs in South Africa, while *Thrips tabaci* Lindeman, another known host of *Goetheana parvipennis* (Gahan), is common throughout the country.

Until the writer was able to examine authentic (Venezuelan) material of *G. parvipennis* kindly supplied by Dr. E. McC. Callan, Rhodes University, Grahamstown, it was not possible to be sure about the identity of the caught South African material. For this reason the species is here redescribed and figured, the South African material having been used for this purpose.

DESCRIPTION OF *Goetheana* SPECIES

***Goetheana parvipennis* (Gahan), figures 1-8**

Female

Colour: Thorax dark brown, head dorsally brown becoming lighter anteriorly and on the face towards the mouth; abdomen, antennae and legs pale yellowish to colourless, with the last two or three abdominal sclerites dorsally and laterally dusky; wings hyaline, with the stigmal vein dusky.

Length of body about 0.6 mm (all other measurements in microns). Head, dorsally (Fig. 1) measuring 110-114 in length and 164-195 in width; eyes anterolateral, bare; ocelli in an obtuse-angled triangle on the caudal part of the vertex, the lateral ocellar interval about 76; vertex with 4 and 4 setae placed as in Fig. 1; occiput gently and broadly concave, with fairly sharp angles laterally, with an incompletely developed suture medially showing as a pale line running from the hind margin of the vertex down towards the foramen but not reaching the latter; antennae arising on a noticeable shelf-like projection (Fig. 5) at about the lower level of the eyes, their insertions separated by a little less than the lateral ocellar interval and by a gently convex protuberance of the face; in lateral view (Fig. 5), the eyes truncate posteriorly; mandibles not visible even under high magnification; sculpture of head very faint, a few transverse striae visible on the vertex, occiput more strongly striate, the lines tending to encircle the foramen and meeting

FIG. 1-8.—*Goetheana parvipennis* (Gahan). 1. Head, dorsal (female T14-1); 2. Thorax, dorsal (female T14-2); 3. Left forewing (female T14-3); 4. Left hind wing (female T14-3); 5. Head, lateral, setae omitted (female T14-4); 6. Ovipositor and associated parts (T14-2); 7. Right antenna of female, inner lateral view (T14-4); 8. Male antenna.

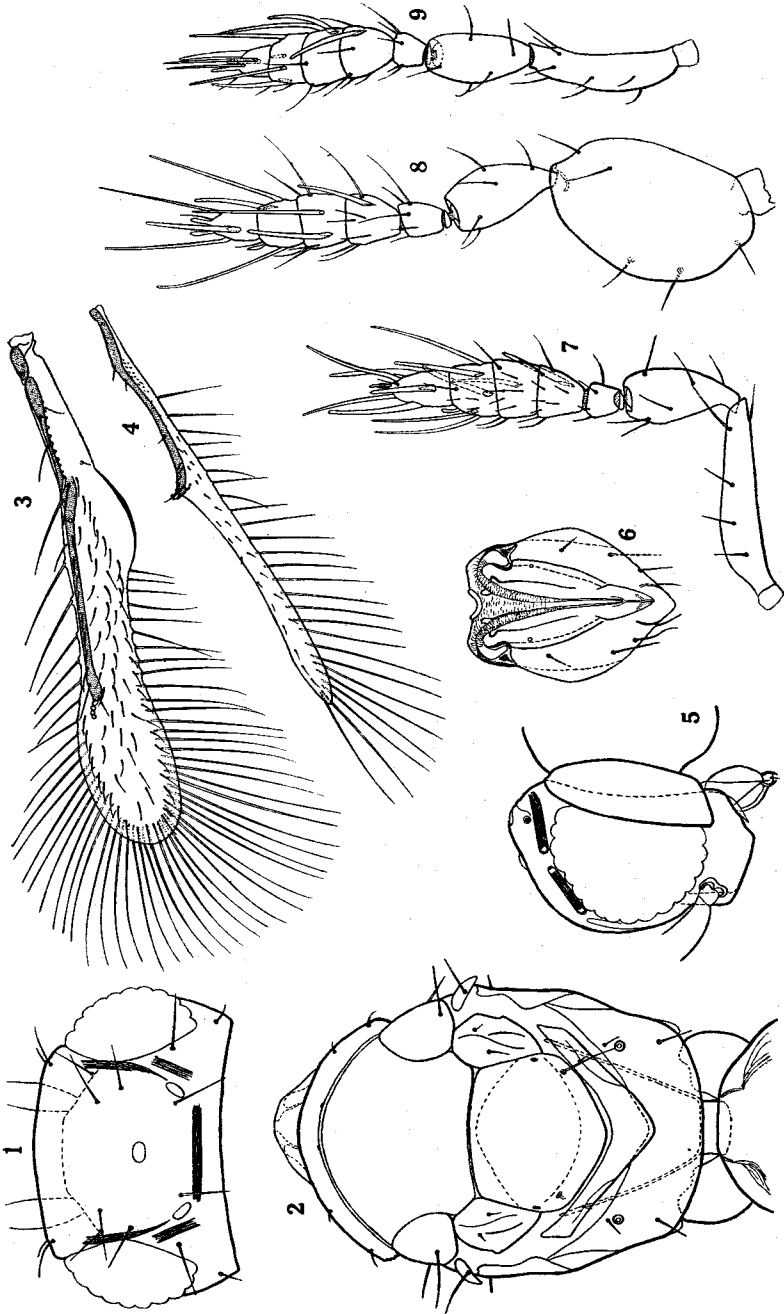
FIG. 9.—*Goetheana incerta* new species, male antenna (allotype).

FIG. 1-9.—Del.—Mrs. M. J. Meyer.

FIG. 1-8.—*Goetheana parvipennis* (Gahan). 1. Kop, dorsaal (wyfie T14-1); 2. Bors, dorsaal (wyfie T14-2); 3. Linker voorvlerk (wyfie T14-3); 4. Linker agtervlerk (wyfie T14-3); 5. Kop, lateraal, setae weggelaat (wyfie T14-4); 6. Eierboor en geassosieerde dele (T14-2); 7. Regter antenna van wyfie, van linkerkant gesien (T14-4); 8. Antenna van mannetjie.

FIG. 9.—*Goetheana incerta* n. sp. antenna van mannetjie (allotype).

FIG. 1-9.—Del.—Mevr. M. J. Meyer.



THE GENUS *GOETHEANA* GIRAULT IN SOUTH AFRICA

occasionally to form a few large cells. Antennae (Fig. 7) with a ring segment between the pedicel and the single funicle segment, with scape not always clearly separated from the radicle, narrow basally, becoming wider on the basal one-third, tapering gradually apically; scape + radicle 103-120 (20-22); pedicel 56-69 (23-28); ring-segment minute; funicle 15-22 (15-20); club I 21-32 (24-28); II 18-20 (28-32); III 14-20 (26-30); IV 24-33 (15-22); each club segment usually with one or more long and strong sense cones in addition to several short and long, slender setae; last segment usually with five or six such sense cones and with a short, blunt apical one. Thorax, dorsally (Fig. 2) measuring 231-272 (166-195), with prothorax always visible dorsally as a narrow band around the anterior mesonotal margin, with 1 and 1 small pori on either side of the midline near the mesonotal margin and with 2 and 2 setae placed as in Fig. 2; mesonotum with complete, strongly curved parapsidal sutures ending caudally at the anteromesal angles of the axillae; parapsides with 2 and 2 strong setae, one pair dorsally and the other pair laterally placed; tegulae each with a strong seta; mesoscutum devoid of setae; axillae advanced, with 2 and 2 small setae comprising an outer anterior pair on a line with the scutoscuteellar suture, and a more mesal pair slightly caudad of that line; scutellum wider than long, measuring 71-93 (89-105), with placoid sensilla at about the middle of the sclerite on the extreme lateral margins, and with 1 and 1 strong setae placed behind and slightly mesad of the sensilla; metanotum well-developed, its hind margin forming a blunt, rounded median protuberance which projects over the anterior margin of the propodeum, with 1 and 1 minute setae on a line between the scutellar setae and the propodeal spiracles; propodeum without keels, with 2 and 2 small setae cephalad and caudad of the spiracles (Fig. 2); the latter placed in shallow longitudinal lateral impressions; mesophragma reaching the petiolar insertion, truncate apically; in other views the thorax is seen to have an undivided prepectus separated transversely from the mesosternum by a distinct suture, and subtriangular metapleura distinctly separated from the propodeum at the hind coxal insertion. Sculpture of thorax not strong, consisting of fine longitudinal lines, subparallel and close together on the mesoscutum, parapsides and scutellum; the lateral parts of the prothorax and the lateral arms of the prepectus with fairly strong, more or less reticulate sculpture; medial part of the propodeum with a few subparallel striae. Legs with four-segmented tarsi; foreleg with tibial spur bifid, and with the first tarsal segment short and thick, lacking a tarsal comb of setae. Fore wings (Fig. 3) measuring 432-503 in length, 70-92 in greatest subapical width; venation including the four distal placoid sensilla reaching 319-386 from the wing-base; the latter sensilla in a curved row as in Fig. 3, commencing at the tip of the weakly developed stigmal vein; marginal cilia numbering 47-55, usually more than 50, the longest on the caudal margin near the apex, measuring 150-175; discal setae sparse, commencing near the level of the base of the marginal vein, scattered in two or three broken rows toward the apex of the wing. Hind wing (Fig. 4) slender, measuring 368-432 (21-24), the blade commencing at the base beneath the venation; hamuli reaching 166-198 into the wing; discal setae sparse, small; marginal cilia numbering 20-27, usually 21 or more, the longest measuring 106-134.

Gaster including petiole measuring 231-294 (140-166), with petiole wider than long, not quite as wide as the caudal width of the mesophragma; ovipositor (Fig 6) diminutive, 93-122 in length, with gonostyli short and fairly broad; ovipositor not exerted; gaster with faint, irregular, parallel, longitudinal lines of sculpture, very indistinct, usually visible only on the lateral slopes of the segments.

Male

Similar to the female except that the apex of the abdomen is more conspicuously brownish, and that the antennal scape is enormously swollen (Fig. 8); measurements of antennal segments as follows: Scape 97 (63); pedicel 53 (26); ring segment minute; funicle 18 (16); club I 25 (24); II 22 (26); III 20 (22); IV 21 (14); abdomen measuring 205 (130), the genitalia 85 in length. In other respects the sexes are alike.

Described from 7 female specimens and 1 male specimen collected in a suction trap at Skukuza, Kruger National Park, by D. P. Annecke during the period December, 1959, to March, 1960; this material has been cleared in caustic soda after dissection of the wings, and mounted on slides in Canada Balsam.

The foregoing description differs from that of Gahan (1927) in certain small features. None of the South African specimens have the head strongly transverse as described and illustrated by Gahan; in this respect the South African specimens agree with the Venezuelan material which is available for study. The South African material has a slightly smaller scape in the male relative to the remaining antennal segments, than do the Venezuelan specimens, but the difference cannot be regarded as specific, since there is some variation among the males of the Venezuelan material.

Gahan (1927) indicated that the description of *Goetheana shakespearei* Girault, the type of *Goetheana*, fitted his specimens of *parvipennis* almost exactly. Girault's description is so poor, however, that it is not possible to determine whether these two species are distinct or not. It may or may not be significant that Girault (1930) only synonymized the two genera and not the species upon which they were based.

***Goetheana incerta* spec. nov., figure 9**

The habitus of the males and females of this species is so like that of females of the foregoing species that at first they were thought to be a series of slightly smaller females of that species. Subsequent examination of the series after treatment of some specimens in caustic soda has shown that two males are present, these with minute genitalia and without the typically swollen antennal scape of *parvipennis*. This last character is used as a generic character by Gahan (1927) in his description of *Dasyscapus*. In spite of the slender male scape in the males of *incerta* new species, the writer is unwilling, on the grounds of their great overall structural similarity to the foregoing species, to assign the series in question to a genus apart from *parvipennis* and, presumably, *shakespearei*. A curious question now arises, however, in that it is not known on which sex Girault's *shakespearei* was based. If the swollen male scape is held to be a valid generic character then the synonymy of *Dasyscapus* with *Goetheana* could be held to be incorrect unless it is assumed that Girault had reference to a female and that his unknown male has a swollen scape. The truth of this matter may well be that Girault was unable to sex his material with the equipment available to him, and for the purposes of this paper it seems satisfactory to rely on characters other than the male scape for the separation of this genus from others in the tribe. These characters have been given by Gahan (1927).

A full description and additional illustrations of *G. incerta* new species, would be largely repetitive of those given for *parvipennis* above. Attention is therefore drawn to such points of difference as are observable in the series studied.

THE GENUS *GOETHEANA* GIRAULT IN SOUTH AFRICA

Female

Colour as in *parvipennis* except the abdomen which is uniformly pale.

Length of body usually smaller than in *parvipennis*, about 0.55 mm. Antenna with scape, pedicel and funicle usually shorter than in *parvipennis*: scape + radicle 89-95 (18-20); pedicel 49-53 (24-29); funicle 14-19 (15-17); ring segment and club segments of the same order of size as *parvipennis*; club with sense cones and setae as in the former species except that these are less stout and well developed (see Fig. 9, male antenna which is indistinguishable from the female in this respect). Forewings generally shorter and smaller than in *parvipennis*, measuring 397-420 (76-85); venation reaching 283-319 into the wing; marginal cilia 154-158 in length, numbering 44-49; hind wing 347-361 (17-19), the hamuli 154-156 from the wing-base, and the marginal cilia numbering 19-23, the longest about 118. Ovipositor 83-91 in length. Sculpture as in *parvipennis*, except that the gaster has the lines of sculpture very regular, fine, parallel and readily discernible under high power, especially laterally.

Male

Similar to the female in colour; immediately distinguishable from the male of *parvipennis* by its slender scape (Fig. 9) which is shorter than that of the female, measuring 77-80 (18).

Described from 5 females (holotype and paratypes) and 2 males (allotype and paratype) collected at Skukuza, Kruger National Park, in a suction trap by D. P. Annecke during the period December, 1959, to March, 1960.

In the females *G. incerta* new species may be distinguished from *parvipennis* only with difficulty: The smaller wings and basal antennal segments, the pale abdomen, as well as the less strongly developed sense cones and setae of the club, provide the best distinguishing characters. The males of *incerta* differ from both the other known species in having a slender antennal scape.

Opsomming

DIE GENUS *GOETHEANA* GIRAULT IN SUID-AFRIKA (*EULOPHIDAE-HYMENOPTERA*)

Die chalcidoïede geslag Goetheana Girault is vir die eerste maal in Suid-Afrika versamel, en twee spesies hiervan word in hierdie bydrae beskryf nl. G. parvipennis (Gahan) en G. incerta spec. nov. Die kakao-blaaspootjie, Selenothrips rubrocinctus (Giard), is 'n moontlike gasheer van G. parvipennis. Hierdie blaaspootjie kom volgens dr. J. C. Faure in Suid-Afrika voor. Thrips tabaci Lindeman wat baie algemeen in Suid-Afrika voorkom, is 'n tweede moontlike gasheer van G. parvipennis.

Résumé

LE GENRE *GOETHEANA* GIRAULT EN AFRIQUE DU SUD (*EULOPHIDAE-HYMENOPTERA*)

Le genre chalcidoïde Goetheana Girault a été recueilli pour la première fois en Afrique du Sud, et cette article en décrit deux espèces, à savoir: G. parvipennis (Gahan) et G. incerta spec. nov.

Le thrips du cacao Selenothrips rubrocinctus (Giard) est un des hôtes possibles de G. parvipennis. Selon le Dr. J. C. Faure ce thrips se trouve en Afrique du Sud. Thrips tabaci Lindeman, qui est très commun en Afrique du Sud, est un autre hôte pouvant accueillir G. parvipennis.

REFERENCES

- ADAMSON, A. M., 1936. Progress report on the introduction of a parasite of the cacao thrips from the Gold Coast to Trinidad, B.W.I. Trop Agric. 13, 62-63.
- ANNECKE, D. P. & DOUTT, R. L., 1961. The genera of the Mymaridae. Ent. Mem. Dep. Agric. S. Afr. 5, 1-71.
- CALLAN, E. McC., 1943. Natural enemies of the cacao thrips. Bull. Ent. Res. 34, 313-321.
- DOHANIAN, S. M., 1937. Life history of the thrips parasite *Dasyscapus parvipennis* Gahan and the technic for breeding it. J. Econ. Ent. 30, 78-80.
- FERRIERE, Ch., 1931. Notes on African Chalcidoidea. Bull. Ent. Res. 22, 127-135.
- GAHAN, A. B., 1927. Miscellaneous descriptions of new parasitic Hymenoptera with some synonymical notes. Proc. U.S. Nat Mus. 71, 1-39.
- GIRAULT, A. A., 1920. New genera and species of Australian Mymaridae. Insec. Inscit. Menstr. 8, 96-100.
- GIRAULT, A. A., 1930. New pests from Australia, VIII. Privately published, Aug. 16, Brisbane.