TWO NEW CHALCIDOID PARASITES.

By JAMES WATERSTON, B.D., D.Sc.

The Imperial Bureau of Entomology has recently received from Fiji two examples of a Trichogrammatid bred from eggs of a Hispid, *Promecotheca reichei*, Baly, that mines in leaves of coconuts, and through the kindness of Dr. G. A. K. Marshall this material has been handed to me for examination. As received, the specimens (mounted in glycerine under the same cover glass) were too shrivelled to be studied satisfactorily. After some colour notes had been made, the wings of each specimen were detached and mounted. The bodies were then thoroughly potashed (10 per cent.) and transferred to glacial acetic in which, owing to their original pallor, they practically disappeared. They were accordingly stained for one minute with carbol fuchsin (Grübler), washed again in acetic acid, and gradually brought up to pure clove oil in which the dissection of one example was completed. Although it is unfortunately

Fig. 1. *Chaetostricha cratitia*, Waterst., sp. n.: a, head; b, portion of eye; c, antenna; d, detail of ring joint and first funicular; e, membranous sulcus.

still no easy matter to determine the genera of the TRICHOGRAMMATIDAE, I have no hesitation in assigning the insects under discussion to *Chaetostricha*, Walker, in interpreting which I agree with Dr. Kryger's views in his paper on "The European Trichogramminae" (Entomologiske Meddelelser, xii, pp. 303-305, 1918). The ring joint in this genus is solid, but in both examples examined the funicular joint at the extreme base shows a clear, nearly complete, weakly chitinised ring, which must give additional flexibility to the antenna at this point.

***Chaetostricha cratitia*, sp. n.**

A pale yellow species very faintly infuscated at the bases of the abdominal tergites and below the ovipositor. A slight cloud below stigma. Possibly also the tips of the tarsi and the antennae towards the apex may be slightly darker than the body.

Head, seen from in front (fig. 1, *a*), about one-fifth broader than deep (23:19). Eyes sparsely pilose (fig. 1, *b*), half as long again as the genal keel and separated, at their nearest, by rather less than two-thirds of the breadth of the head. Genae long and considerably swollen behind the keel. Clypeal edge nearly straight, with a slight median notch. Toruli (3:2) well up on the face, their lower edge just on the base line of the eyes; separated by their longer diameter and from the orbit by a diameter and one-third. Chaetotaxy as in fig. 1, *a*. Besides the bristles shown there are, on each side of the vertex near the stout bristle (touching the orbit), which is partly dotted, 2 minute bristles more remote from the orbit on the occipital slope. On each of the swollen genae are some half dozen minute bristles.

Antenna, length, 0.4 mm. (fig. 1, *c*); the scape, pedicel and funicular joint are in ratio 38:28:17, and the club segments 14:18:22. The breadths of the antennal joints vary considerably according to the pressure to which they are subjected; thus on the same scale the breadth of the scape is 12-13; pedicel, 10-12; funicle, 9½-11; club, 11-13:11-12 (at sutures). The first segment of the club bears 7-8 long bristles in all and no sensoria; second segment, 8-9 bristles and 2 sensoria; apical segment, 1 lateral bristle, 4 sensoria, and 1 stout terminal bristle as long as the supporting segment. There are also 3 minute but stout knob-like sensoria set in sockets; 1 at the apical ventral angle of the funicular joint, another (lateral) near the base, and 1 laterally on the second club segment, on the suture between it and the third.

Mandibles (10:7) similar, tridentate, the long bristle on the ventral edge *not* unusually thickened. Stipes with 1 long lateral bristle and 1 median, shorter, opposite the base of the palpus. Galea with 2 stout spinose bristles at side distally and about 24 short fine bristles on inner surface. Mentum with 2 long bristles; 4 setigerous cells on lingua.

Fig. 2. *Chaetostricha cratitia*, Waterst., ♀: from apex of scutellum to hind margin of first abdominal segment; *a*, detail of structure of first tergite towards hind margin.

Thorax. Pronotum collar-like, consisting of 2 triangular tergites, spiracular emargination slight and shallow; pattern fine, long drawn out transversely; each tergite bears 5 bristles; 2 near middle, 2 beside the spiracle and 1 anteriorly. Mesonotum with median weak line, pattern very fine, longitudinally drawn out so that the whole surface appears to be delicately striate; 1 stout bristle at each antero-lateral angle; parapsides with 1 lateral bristle; axillae with 2 minute bristles; scutellum with 2 stout bristles, admedian in position, 1 beside each of the clear sensory pustules (fig. 2). Metanotum very short and broad, the propodeon consists of a median area, which is narrow and riband-like and 2 lateral triangular expansions; spiracle broadly oval, with 2 minute bristles outside and 1 behind (fig. 2). The mesophragma extends almost through three segments and is nearly two-thirds the breadth of the abdomen. Prosternum and propleurae bare. Mesosternopleurae smooth and bare except for 1 minute bristle at the posterior edge of the small and closely united prepectus and another below the forewing on the upper edge of the episternite.

Fig. 3. *Chaetostricha cratitia*, Waterst., ♀: a, forewing; b, hindwing.

Wings. Forewing (fig. 3, a) (8 : 3): length, 0.76 mm.; breadth, 0.28 mm.; not including the marginal cilia, of which the longest (0.125 mm.) are at the distal posterior angle. The longest cilia are distinctly not half the greatest breadth of the wing, though they are two-thirds or more as long again as the radius. The neuration reaches to rather more than half the wing length.

Hindwing (fig. 3, b) (about 13 : 1): length, 0.68 mm.; breadth, 0.05 mm. The longest of the marginal cilia are three times the breadth (0.15 mm.). Discal ciliation as in figure, the second row being just in advance of the mid line.

Legs. Forelegs: length, 0.71 mm.; 1 stout apical femoral bristle; dorsal edge of tibia apparently simple, without tooth-like prominences; first tarsal joint with about 6 lateral ventral spines.

Mid legs: length, 0.84 mm.; coxa (6:5) with 3 bristles posteriorly on apex. Trochanter slender, as long as coxa or three-sevenths of the femur (5:1). The latter much shorter (2:3) than the tibia (12:1), with about 10 short bristles along the dorsal edge, 7-8 and an apical spine in a subdorsal posterior row and 5 in an antero-median row; the apical ventral bristle is rather weak. The tibia has 7-8 widely spaced spines dorsally, 2 at the base being stronger; 8-9, minute, anteriorly (one row) and about 18 in all, stronger, posteriorly, arranged in two rows from the middle to apex but in a single row on basal half; 7-8 ventral spines on apical half, apical spine only one-third of the 1st tarsal joint. The tarsal joints bear on the plantar surface a double row of thin hyaline spines, and there are besides the following lateral spines, one apical on 1st and 2nd joints, and one beyond half on the first joint.

Hind legs: length, 0.95 mm.; coxa (2:1) pear-shaped, as long as the femur (11:5), externally bare, and with 2 spinose bristles at apex and 2 more (minute) near base on inner surface. The femur bears a dorsal row of bristles (10), and on upper anterior surface two more rows of 6-7 each. The last unit (distal) of all these is a spine, so that anteriorly at apex the femur has an oblique row of 3 spines; there is besides, anteriorly, a moderately long bristle near base, above ventral edge; the distal spine, long and stout, is placed well before the apex; posteriorly the femur bears 8-10 bristles in two rows. Tibia (10:1) rather more than half as long again as the femur; its dorsal edge denticulate, with about a dozen short spines, of which one or two at the base are stronger; on ventral edge (on apical half) 8-9 spines, on the anterior surface about 12 bristles and one or two fewer posteriorly; apical surface posteriorly much roughened, comb of 5-6 spines; the apical spine equal in length to that of mid tibia, only stouter. Tarsus similar to that of mid leg; proportions of tarsal joints: foreleg, 26:27:26; mid leg, 45:33:25; hind leg, 45:33:27.

Abdomen conic ovate, longer than head and thorax together. The 7th (9th) segment from above triangular. Ovipositor very shortly extruded. The segments (from above) subequal. Tergites peculiarly constructed, a basal band of variable width being chitinised and emitting thin sub-parallel chitinous ribs to the hind edge. Between the ribs the tergite is exceedingly thin, this membranous area being traversed in turn by extremely delicate chitinous rays or wrinkles. The 1st (3rd) tergite (fig. 2) has 50-60 of these major ribs and at each side a group of raised cells.

Chaetotaxy. Each tergite has 1 bristle at the side, accompanied in the case of tergite 1 by a second much smaller. In the middle tergites 1-4 are bare, while tergites 2-6 have 2 bristles (1, 1) about the mid line; tergite 7 has 10 bristles (5, 5). The first sternite is bare; 2-4 bear 2 bristles (1, 1), median in position. The last sternite bears 6 bristles in all, 2 at each side and 2 below the ovipositor. The sting is relatively stout, with 6 teeth at apex.

Length, about 0.9 mm.; expanse, 1.8 mm.

Type ♀ in the British Museum; one of 2 ♀♀ bred from ova of *Promecotheca reichei*, a Hispid beetle injurious to the foliage of coconut (*Cocos nucifera*) Cicia, Fiji, 7.xii.1921 (*H. W. Simmonds*, No. 809), and received from the Imperial Bureau of Entomology.

Chaetostricha cratitia, sp. n., is closely allied to *C. schlickii*, Kryger (*l.c.* p. 307, 1918), from Dyrehaven, Denmark (host unknown). In the Danish species the scape and pedicel are subequal, and the funicular joint a little less than half the club, which again is shorter than the pedicel, ring joint and funicular joint combined.

Genus **Encyrtus**, Dalm.

Encyrtus cotterelli, sp. n.

♀.—Head, legs entirely (except empodia and last joint of hind tarsus), prothorax, mesoscutum, axillae, mesosternopleurae, and propodeon (except on mid-third dorsally) clear cinnamon (a little paler on legs); scutellum, metanotum, middle of propodeon and abdomen dark brown with metallic reflections, which on the abdomen

are purplish and more violet on the scutellum. Fifth hind tarsal joint and all empodia infuscated. Eyes chocolate (after spirit). Forewings slightly tinted throughout, clearer on proximal third and with a large median cinnamon-brown cloud; nervures brown. Hind wings nearly hyaline.

Except for the duller metanotum, the whole dorsal surface is remarkably smooth and shining.

Fig. 4. *Encyrtus cotterelli*, Waterst., sp. n.: a, head from above; b, head from in front; c, mandible; d, basal half of antenna; e, ring joint of antenna; f, mid tarsus.

Head from in front wider (12 : 11) than deep (fig. 4, b), clypeal edge straight. Eyes with very short scattered pubescence, in profile occupying two-thirds of the depth of the head and so large that at the level of the anterior ocellus they are separated by only one-sixth and at the base line by about two-thirds of the width. Toruli (12 : 7) set low down, not half their length from the clypeal edge, and separated by one and a half lengths from one another. The frons is practically smooth and bare, save for the usual row of orbital bristles, but the inflexed face is finely striate-reticulate, becoming more normally reticulate towards the genal keel. About 20 bristles between the toruli. The narrow vertex (fig. 4, a) is smooth, with the ocelli in an isosceles triangle. Antenna (fig. 4, d, e) with scape (7 : 2) not greatly flattened, three and a half times as long as the pedicel (7 : 4), which is as long as the first two funicular joints. Ring joint minute. Funicle joints (first three) equal, and if the length is taken as 15 the breadths are 18, 24, 28. The second funicular joint bears six sensoria.

Labrum narrow, slightly concave, with eight bristles. Mandibles (see fig. 4, c). Stipes with one bristle. Palpus slender, the lengths of the joints as 17 : 14 : 11 : 23; joints 1, 3 and 4 of equal breadth (6), the second a trifle wider (7); a dozen stouter bristles at edge of galea, the upper surface of which is densely set with fine bristles. Joints of labial palpus as 15 : 5 : 10. Lingua with 10 setigerous cells.

Thorax.—Mesoscutum about one-sixth longer than the scutellum; the latter, flat, somewhat conic, and very smooth posteriorly. Metanotum strongly rugulose, especially at the sides. Propodeon broadly smooth medianly and faintly reticulate

on each side towards the broadly oval spiracle, which is set at its own length from the anterior edge. Round the spiracle (exteriorly) and towards the hind edge the surface is striate; on the mesopleurae the pattern is drawn out finely anteriorly, but becomes more regular posteriorly.

Wings.—Forewings (12 : 5), length 1.3 mm., breadth 0.56 mm. (fig. 5). Hindwings (18 : 5), length 0.9 mm., breadth 0.25.

Fig. 5. *Encyrtus cotterelli*, Waterst., ♀, forewing.

Legs.—Fore femur (4 : 1) knife-like, retaining its maximum breadth for about three-fourths of its length. Mid femur and tibia of equal length, the latter with four peg-like spines at apex posteriorly; spur three-fourths as long as the 1st tarsal joint. Tarsus (fig. 4, f). Hind tibial comb with about 18 spines.

Tarsus.				Fore Leg.	Mid Leg.	Hind Leg.
1st joint	..	..	..	40	85	80
2nd joint	..	..	..	27	28	40

Abdomen, though smooth and shining, with the mid dorsal surface finely and regularly reticulate. Medianly tergites 1–5 are bare, with a few bristles at the sides. Ventrally the abdomen is covered rather closely with minute bristles. The ovipositor tip is barely visible from above and the free portion of the sheath is one-fifth the base.

Length, 3.2 mm.

Alar expanse, 1.6 mm.

Type ♀ in British Museum.

Three examples were bred from a third instar nymph of the Capsid bug, *Sahlbergella theobromae*, Dist., which is injurious to cacao (*Theobroma cacao*), at Mampong, Ashanti, Gold Coast, West Africa, by Mr. G. S. Cotterell, January 1922, and two of these were received by the Imperial Bureau of Entomology from Mr. W. H. Patterson, Government Entomologist, Aburi, Gold Coast.

In neither specimen is there a complete antenna and the general condition of both is poor, so that their placing has been a matter of difficulty. I have assigned them provisionally to the genus *Encyrtus*, Dalm., to which they run down, but with which, however, they do not quite agree, partly because of their mandibles, but chiefly from the smooth thoracic notum and flat scutellum. My friend, Dr. R. G. Mercet, Madrid, considers that, while showing certain of the characters of *Encyrtus*, these *Sahlbergella* parasites should be regarded as constituting a distinct genus.

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