

The preapical tibial spur of the fore legs short and weak; the spur of the second tibia long and saltatorial, reaching to the middle of the second tarsal joint; the subapical femoral spurs of the same leg strong; the tibial spur of third leg strong and short, with a comb of seven short spines on inner aspect.

Length, 1.25 mm.; alar expanse, nearly 2.5 mm.

Described from a single female, bred 3., viii., 1914.

Host: the tea fly (*Oscinis theae*).

Genus SYMPIESIS, Först.

The following species is apparently congeneric with *Sympiesis felti*, Crawford, (Proc. U.S. Nat. Mus., xl. p. 448, 1911), described from *Agromyza melanopyga* in fern leaves. In the single ♂ present in the material the frons had been injured and the antennae crushed off at the scape. Two chitinous fragments adhering to the face were detached, and after treating with potash followed by glacial acetic acid, were sufficiently swollen to be identified as the first and second funicular joints; neither was furnished with a branch or unusually long hair. All the generic characters are, I think, distinctly marked, except in the condition of the hind tibia, which unless carefully examined, might be taken as indicating a Hemitarsenine affinity. The second spur, however, though short, is undoubtedly present. *Sympiesis purpureus* is a purplish black form, with duller thorax and entirely dark antennae. The abdomen shows bluer reflections. The legs are pale, with darker tarsal tips and femoral streaks.

Sympiesis purpureus, sp. nov. (fig. 4).

♀.—*Head* much broader than deep (4:3), eyes bare, swollen and prominent. Vertex, frons and clypeus shining, without pattern (except within the ocellar triangle); scrobes roughly circular, or square with rounded angles; a narrow linear ridge between the mouth corner and the lower eye angle; clypeal edge simple, concave. Occiput reticulate, with a few short bristles. At each side of the vertex two bristles; posterior ocelli wide apart near the occipital edge, with four bristles between and one in front of each; along the orbits about 10 minute bristles. Frons remarkably bare. Before the narrow ridge separating the face from the genae are two minute bristles, and four more stand in a square above the middle of the mouth edge. Although the surface of the face is uniformly smooth, there is an internal reticulation of the integument demonstrable by focussing through. Behind the malar keel there is a distinct, curved, elongate reticulation, and the usual row of post-ocular bristles.

Antennae (fig. 4, a) with scape, pedicel, ring joints, four funicular, and two club joints. Scape long and narrow (5:1); pedicel transverse, hardly wider than the scape and extremely short (one-fifth of the scape or one-half the first funicular joint), with a reticulation so coarse that one cell extends almost the length of the joint; ring joints (two) minute, narrow, closely appressed. Joints of funicle equal, the first distinctly, the second almost, cylindrical; joints 3 and 4 appear slightly shorter, as their distal angles are rounded off and the joint produced into a neck. Club not expanded, one-and-a-half times as long as the joint of the funicle; basal joint a little longer than the apical one, which has a short, blunt spur. The whole antennae bristly and the flanges of the sensoria stout. Length of antenna, .65 mm.

Mouth-parts (fig. 4, *b, c*): cardo shaped like a jack-boot, stipes rather narrow; maxillary palpus two-jointed (2:3), the first joint broader and bare, the second slightly tapered, with one bristle near base, three more distally and a long terminal one with a minute bristle at the side. Mentum rather broad, reticulate like the stipes. Labial palpus just exceeding basal joint of maxillary palpus, ending truncately with two long bristles and a minute one between. The lingua with six setigerous marginal cells. Mandibles somewhat oblong, with an outer (ventral) strong tooth separated by a deep incision from an inner one which is somewhat longer. The apical inner (upper) edge of the mandible is serrate with three to four denticles. Posteriorly the inner edge is strongly angled at one-half and swollen again basally. In both ♀♀ examined the denticles on the left mandible are more strongly developed.

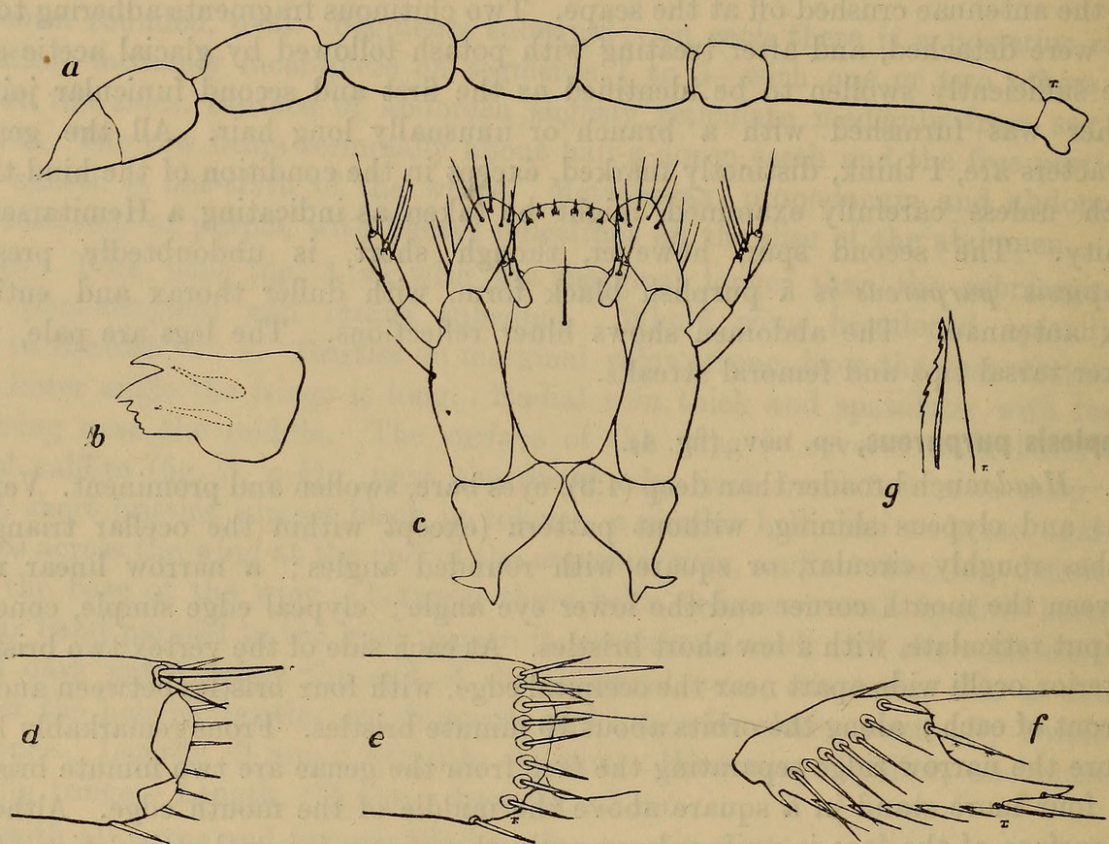


Fig. 4. *Sympiesis purpureus*, sp. n., ♀; *a*, antenna; *b*, mandible; *c*, trophi; *d*, apex of hind tibia (front view); *e*, the same (from behind); *f*, first joint of fore tarsus (front view); *g*, apex of ovipositor.

Thorax: prothorax coarsely reticulate, save for a rather broad median area where the pattern is fine and transversely drawn out. There is a small postero-lateral semi-circular excision for the spiracle. On each side of the bare median area posteriorly are three strong bristles, with three to four weaker ones in front, besides one or two microscopic bristles; on the anterior edge are two median bristles. Mesonotum with generally equal, moderate, clearly raised reticulation, which is just a little coarser posteriorly. Parapsidal furrows merely indicated anteriorly. The bare axillae penetrate deeply and their pattern is rather drawn out and not raised. One bristle opposite the inner anterior angle of the axillae, another in front, between

the apex of the axillae and the end of the furrow, and a third behind the edge of the prothorax near the middle. Scutellum with two bristles on each side, both beyond one-half; pattern finer than on the mesonotum, drawn out and hardly raised. Mesopleurae reticulate; mesoprepectus large, with coarse raised pattern; metanotum medianly reticulate, with smooth side areas; propodaeum smooth, with well-developed keel. Spiracles nearly circular, "metapleurae" with a fringe of six to seven silky hairs on lowest edge above the ridge.

Wings: fore wings having the submarginal cell well developed, with a dozen hairs. Submarginal vein with nine to ten bristles; the portion of the marginal vein which bounds the submarginal cell bears five to six bristles, and on the rest are numerous dense short bristles. The radius is short, with a narrow neck and quadrate end; four cells; post-marginal twice the radius; marginal ciliation short. Submarginal: marginal: radius: post-marginal, as 5:10:1:2. Behind the marginal vein is a narrow clear strip with one row of twelve bristles; from the junction of the marginal and submarginal veins a row of six slopes towards the posterior edge, bounding the clear area referred to. Parallel with the hind margin runs a row of isoclined hairs, from which, above the middle of the frenulum, a double row of similar hairs, bounding a very narrow and not well-defined line, goes to the middle of the distal edge of the wing. The rest of the wing, except the basal triangle, is evenly haired. Length, 1.1 mm.; breadth, .55 mm. Hind wings: length, .9 mm.; breadth, .20 mm.

Legs: all the coxae blackish, all the fourth tarsal joints dusky and blackish at the tips, the remaining joints of the tarsi and the tibiae pale; the femora are mainly pale medianly, with a blackish streak on the upper and lower edges in the fore and hind legs, more extensive in the femur; in the mid legs the black femoral streak is developed almost entirely on the ventral edge. *Fore legs*: coxae coarsely reticulate outside near base, apical bristle rather long, six to eight minute pre-apical hairs. Femur not swollen, somewhat bare, with only three to four hairs in the ventral row, all on basal half; the pre-apical postero-ventral bristle is long; there are five to six hairs on the upper edge, and on the posterior face a median row of eight to ten bristles, and four to five shorter ones below the apical edge; on the anterior face are over a dozen short bristles disposed in two irregular rows along the upper edge, the two subapical and median ones being stronger. Tibiae with eight to nine bristles on the upper edge, and numerous weak short bristles on the ventral aspect, mainly towards the apex; two anterior stouter bristles; the apical ventral bristle is single. First tarsal joint with a distinct comb of six even parallel short spines on the anterior aspect. *Mid legs*: the coxa bears a patch of five clear short spines on the inside. Femur with a submedian posterior row of five bristles, beginning at one-third from the base to near the apex; subapical bristle dark and strong, spine-like. *Hind legs*: femur with eight to nine bristles on anterior aspect ventrally, but some distance above the edge; another row (six to seven) just above the middle line, mainly on the apical half; between this row and the edge there are about half-a-dozen shorter bristles; on the posterior surface are several scattered bristles, of which about six (rather longer) form a median row. Tibia with one long and one short stout apical spine, and besides a transverse comb of about eight spines.

Proportions of Tarsal Joints.

	i.	ii.	iii.	iv.
Fore	15	20	20	40
Mid	20	28	24	36
Hind	20	30	20	40

Abdomen with all segments subequal; 2 and 3 shorter, 4 to 7 a little longer. The middle of the dorsum smooth, while the tergites are reticulate on the overlapping flaps. Spiracle small and round. The eighth tergite is very bristly; the stylet short, conical, with five bristles (one long). Free portion of sheath, which is broad, oval, pointed, with about 20 shorter bristles, one-fifth of the base. The saw is pale, with a black apex and seven distinct teeth; three are at the apex, then after a deep notch follow three more, with a seventh, rather fainter.

Length, over $1\frac{1}{2}$ mm.; alar expanse, about 3 mm.

Host: a microlepidopterous leaf-miner (*Acrocercops ordinatella*, Meyr.) of the camphor plant.

Described from 1 ♂ and 4 ♀♀.

Holotype—a ♀

Genus SYNTOMOSPHYRUM, Förster.

Perhaps the most interesting of Mr. Rutherford's captures is a Tetrastichine species represented by three ♀♀ assignable apparently to the above genus. All three examples were bred from a Coccinellid pupa, two being robust and of equal size, while the third is considerably smaller.

I have elsewhere (p. 364) given my reasons for restricting the name *Syntomosphyrum* to Tetrastichines with an unlined mid lobe on the mesothorax, while the scutellum is furrowed only between the dorsal and lateral aspects. In the present case the apex of the mid lobe shews a minute median excision at the suture, the mid line of the lobe being, if anything, paler, and apparently a little depressed posteriorly, though no real impressed line or furrow can be traced. After potash, the scutellum exhibits two extremely fine and incomplete parallel longitudinal lines inside the lateral sulci. In thoracic characters, then, *S. taprobanes* occupies a transitional position between *Syntomosphyrum*, *Tetrastichodes* and *Tetrastichus*. The concomitant antennal characters are also somewhat variable, e.g., the ring joints and the number of funicular joints. Therefore without questioning their practical utility, I think it likely that the above genera constitute a graded series with no very natural division. I have placed the Ceylonese form in *Syntomosphyrum* mainly because of its evident affinity with the species Silvestri has described under the name *S. indicum* (Boll. Lab. Zool. Agr. Portici, iv, p. 232–344, fig. iii–viii, 1910). The two indeed come close, but there are minute differences all over, which induce me to treat them separately at present. Of these differences, some of which are tabulated below, the most easily recognised lie in the antennae and hind tarsi. The species

also appear to be quite different in habit. The ♀♀ of *S. taprobanes* probably seek and sting their prey in the normal manner. Silvestri (Report of an Expedition to Africa in search of the natural enemies of Fruit Flies (Trypanidae); Territory of Hawaii, Board of Agriculture and Forestry, Bull. No. 3, Div. of Entomology, p. 126, 11th Feb. 1914) describes how the ♀♀ of *S. indicum*, having found a fruit with broken rind, carefully test with their antennae for their prey, in pursuit of which, when located, they plunge into the decaying pulp and entirely disappear from view. Eventually the larva is overtaken in spite of its strenuous efforts to escape, and oviposition takes place.

***Syntomosphyrum taprobanes*, sp. nov. (fig. 5).**

Head broader than deep (4:3), entirely shining black. After potash, the integument shows a finely reticulated pattern, but the space above the mouth is almost smooth. Clypeal edge bilobed; scrobes not far apart, oblong oval, set plainly above the base line of the eyes; a well defined keel from the corner of the mouth to the inner lower angle of the eye; malar space three-quarters the depth of the eye. Three short stiff bristles on orbits at vertex, two between orbits and middle of occiput, six (?) on the ocellar triangle, with a few shorter ones on vertex behind the triangle and on the top of the occiput below. No occipital ridge or sharp edge. At the top of each frontal sclerite, above or near the apex of the scape, about eight minute bristles and nearly a dozen below to the level of the scrobes; also about a dozen between each scrobe and the malar keel, three minute bristles on each clypeal lobe, and one or two more between the mouth edge and the base of the scrobes.

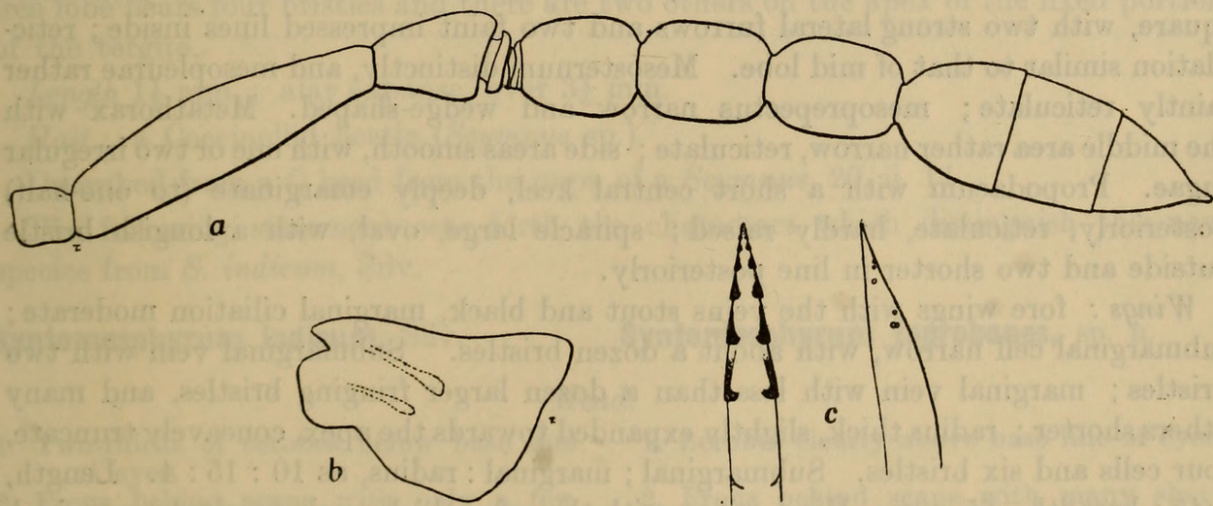


Fig. 5. *Syntomosphyrum taprobanes*, sp. n., ♀; a, antenna; b, mandible; c, apex of ovipositor.

Antennae (fig. 5, a) 10-jointed; scape, pedicel, two ring joints, three funicular, and three in club; entirely dark blackish brown. Scape four times as long as broad; pedicel one-third the length of the scape; the first ring joint more robust and brownish, the second hyaline and bilaminar. Joints of funicle increasing in ratio (C120)

8:9:10, the first as wide as long, the next two longer than wide; the joints bear from six to ten or more sensoria. Club joints practically equal in length (15:15:14), but the second is broadest, while the third is suddenly tapered; terminal hair of spur short and fine, not more than a quarter of the third club joint; club as a whole definitely wider than the funicle. Length of antenna, .75 mm.

Mouth-parts: mandibles (fig. 5, *b*), outer (ventral) edge gently concave towards the base, bidentate; outer tooth smaller, separated by a sharp but not deep notch from the inner, which is broad, with straight, truncated apex projecting a little beyond the outer tooth. Inner edge of the second tooth slightly swollen, as is also the basal two-thirds of the inner edge, which as a whole is concave at the base of the second tooth. Maxillary palpus two and a half times as long as the labial palpus; cardo with two bristles, one larger lateral, the other opposite the base of the palpus. Two (?) short bristles just behind the base of the palpi on the mentum; four short bristles from single cells in the lingua. The labrum bears anteriorly two strong median and two weaker lateral bristles (1, 2. 1.)

Thorax: prothorax semicircularly emarginate at the spiracle, with bare triangular area (whose base occupies the median one-third of the posterior margin) flanked on either side by about ten microscopic bristles; posterior row of bristles 3,3, and one additional, stronger at the spiracle; the whole surface evenly and moderately reticulate. Mesothorax with the parapsidal furrows straight, except for a slight outward bend anteriorly; mid lobe black, gleaming, surface covered by an extremely fine (especially medianly) drawn out reticulation; on the inside of each furrow are three bristles; parapsides invaded very deeply (to beyond one-half anteriorly from the suture), with two bristles; at the middle of the suture the mid lobe is narrowly depressed for a short distance forward, but no definite furrow is formed. Scutellum square, with two strong lateral furrows and two faint impressed lines inside; reticulation similar to that of mid lobe. Mesosternum distinctly, and mesopleurae rather faintly reticulate; mesoprepectus narrow and wedge-shaped. Metathorax with the middle area rather narrow, reticulate; side areas smooth, with one or two irregular rugae. Propodaeum with a short central keel, deeply emarginate (to one-half) posteriorly, reticulate, hardly raised; spiracle large, oval, with a longish bristle outside and two shorter in line posteriorly.

Wings: fore wings with the veins stout and black, marginal ciliation moderate; submarginal cell narrow, with about a dozen bristles. Submarginal vein with two bristles; marginal vein with less than a dozen larger fringing bristles, and many others shorter; radius thick, slightly expanded towards the apex, concavely truncate, four cells and six bristles. Submarginal; marginal: radius, as 10:15:4. Length, 1.45; breadth, .65 mm. Hind wings with the veins thick; submarginal: marginal, as 5:6. Length, 1.1 mm.; breadth, .25 mm.

Legs: not densely clothed; all the coxae, trochanters and femora (except indistinctly near the apex) blackish; the tibiae fuscous, almost black; the tarsal joints concolorous with the tibiae, those of the mid legs somewhat paler. Fore legs with the ventral fringing hairs short and weak, pre-apical bristle inconspicuous; tibia with single short stout apical spine, and a row of about ten short bristles on outer aspect; across the apex a comb of four spines; first tarsal joint with, on the inside, a longitudinal comb of six short stiff bristles. Mid legs with the femora almost

bare ventrally ; tibia with apical comb of four spines and spur as long as first tarsal joint. Hind tibia with apical comb of from seven to eight spines and spur shorter than the first tarsal joint.

Proportions of Tarsal Joints.

	i.	ii.	iii.	iv.
Fore	17	30	30	40
Mid	22	35	32	45
Hind	25	38	35	45

Abdomen rather broad and short, shining black ; the tergites faintly reticulate medianly, but distinctly so at the sides and on the portion underlapping the sternites ; petiole short ; tergites 2 and 5 subequal. Post-median row of bristles interrupted in the middle on tergites 2 and 3. Spiracle small and circular. The stylet on tergite 8 very short, bearing four longish equal bristles ; at least twenty bristles in front and eight to nine behind the stylets ; there are besides six to eight longer bristles on the ventral edge, overlapping the upper sheath of the ovipositor (tergite 9). Ovipositor with the side-pieces (from sternite 8) expanded distally and ending in a somewhat long acute point. They do not share in the serration of the saw proper, which bears three to four extremely minute apical teeth and three much stouter behind ; these serrations extend only over the apical one-eighth of the saw (fig. 5, c) which is .4 mm. long and stout basally. The sheath (ninth tergite) is rather longer than the saw, and the distal articulated portion is two-ninths of the whole ; each free lobe bears four bristles and there are two others on the apex of the fixed portion of the tergite.

Length $1\frac{1}{2}$ mm. ; alar expanse, over $3\frac{1}{4}$ mm.

Host : a Coccinellid beetle (*Scymnus* sp.)

Described from a ♀ bred from the pupa of a *Scymnus*, 20. ii. 14.

The following statement sets forth the characters which distinguish this new species from *S. indicum*, Silv.

***Syntomosphyrum indicum*, Silv.**

***Syntomosphyrum taprobanes*, sp. n.**

Head.

1. Two-thirds of scrobes below base line of eyes.
2. Frons behind scape with only a few bristles (8 to 10).
3. Inner mandibular tooth with apex concave.
4. Median hairs on mentum well behind labial palpi.
5. Antennae castaneous ; pedicel just less than half the scape. Joints of funicle transverse ; third joint distinctly broader than long ; first joint with two sensoria ; bristle to spur of club as long as, or longer than, the last club joint.

1. Scrobes clearly above base line of eyes.
2. Frons behind scape with many short bristles (20 to 24).
3. Inner mandibular tooth with flat, broad apex.
4. Median hairs just behind labial palpi.
5. Antennae black ; pedicel one-third of scape. Joints of funicle never broader than long, gradually increasing ; joints 2 and 3 cylindrical ; first joint with six to seven sensoria ; bristle to spur of club very short, one-quarter of last club joint.

Thorax.

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|-------------------------------------------------------------------|-------------------------------------------------------|
| 6. Two bristles and a clear spot (non-setigerous) inside furrows. | 6. Three bristles along inside of parapsidal furrows. |
| 7. Keel of propodaeum continued through middle of the metathorax. | 7. Metathorax not carinate. |

Abdomen.

- | | |
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| 8. Second segment longer than third. | 8. Second segment subequal to third. |
| 9. Total length of ovipositor, .26 mm.; apical one-third serrate. | 9. Total length of ovipositor, .4 mm.; apical one-sixth serrate. |

Legs.

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| 10. Hind tarsi with joints 1 and 3 subequal, 2 longer. | 10. Hind tarsi with joint 1 shorter than 2, which is equal to 3. |
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Genus *TETRASTICHODES*, Ashm.

The following species is separated from *Syntomosphyrum*, Först., mainly by the well-marked though fine furrow on the scutellum. The legs of this insect are unusually bristly and the first mid tarsal joint long.

***Tetrastichodes asthenogmus*, sp. nov.** (fig. 6).

Head a little broader than deep. Eyes seen from in front rather narrow and wide apart, the intervening space over twice the visible diameter of the eye. Mouth edge straight, transverse, with two inconspicuous central lobes. Scrobes oval, their lower edge just on the base line of the eyes. Vertex rather narrow, suture high up, so that the anterior ocellus lies within the wide angle formed by the frontal plates; suture between the plates disappearing at the scrobes, between which there is no median plate; a distinct keel from the clypeal corners to the lower edge of the eye. On the occiput are numerous short erect hairs; on the vertex medianly behind the

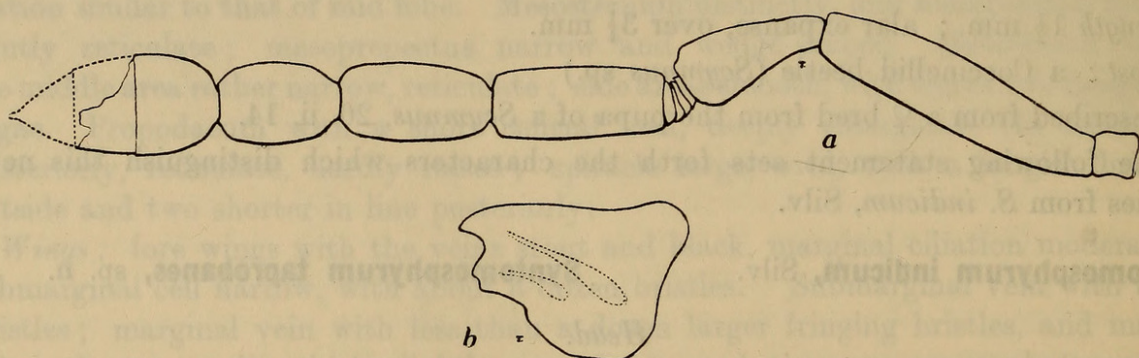


Fig. 6. *Tetrastichodes asthenogmus*, sp. n., ♀; a, antenna; b, mandible.

ocelli two short spinose hairs, and a similar pair on each side near the eye margin; from the anterior ocellus to the scrobes is a rather wide, practically bare median area; half-way to the orbits is an irregular row of minute bristles (8-10), and a similar row on the orbits themselves; between the scrobes is a double row (4, 4) of short stiff bristles, and from this level to the mouth edge are numerous (60-70) minute bristles.

Antennae (fig. 6, a) in both specimens imperfect, but probably with the following joints: scape, pedicel, ring joints, three funicular and three (?) to the club. The scape and pedicel are lemon-yellow in colour, the others fuscous. Scape with

numerous short bristles outside and 10–11 on dorsal and ventral edges; six times as long as broad. Pedicel one-third of the scape, narrow, over twice as long as broad. Four laminae—representing two or possibly three joints—intervene between pedicel and funicle. Funicular joints cylindrical, decreasing in length and almost exactly in the ratio 5:4:3, but of equal breadth, the first joint being about $2\frac{1}{2}$ times as long as broad. Club 3-jointed (?), not expanded; the first joint slightly shorter than the last joint of the funicle; funicle and club very bristly.

Mouth-parts: mandibles (fig. 6, *b*) broad basally, with three teeth, of which the outer is large, separated by a semi-circular sinus from the inner pair, which are minute. Inner edge of mandible at first straight then much swollen towards the base. Cardio produced posteriorly into a hook, stipes with two hairs at side. Maxillary palpus long, with one outer hair at one-half and three at the apex. Labial palpus hardly more than a quarter of the maxillary and with similar hairs, those at the apex very long ($2\frac{1}{2}$ times as long as the palpus itself). The usual bristle on the mentum is placed far back and not nearly between the base of the palpi.

Wings: fore wings over twice as long as broad, long and narrow, evenly ciliated, fringe short. Submarginal:marginal:radius, as 3:5:1; submarginal with 4 bristles, marginal with 13; radius club slender, with 4 cells. Length, 1.3 mm., breadth, .57. Hind wings about three times as long as broad. Submarginal:marginal, as 2:3. Length, 1.1 mm.; breadth, .27 mm.

Thorax: prothorax moderately broad, considerably sinuated above the spiracle on the posterior edge, coarsely reticulate all over, smooth, with many short bristles (40–45) on each side of a narrow smooth depressed area, and a posterior or marginal row of twelve stronger bristles. The prosternum is a truncate square with two short hairs before the posterior edge.

Mesonotum considerably longer than broad. Parapsidal furrows widely apart, deep; parapsides deeply invaded by axillae. Mid lobe with 25–30 short hairs, of which a pair at the sides of the apex are stronger; parapsides with about a dozen hairs; axillae bare. Scutellum oblong quadrate, with two widely separated deep lateral sulci meeting the suture outside the ends of the parapsidal furrows and concurrent with the inner edge of the axillae. There are also two faint impressed lines forming a square with the anterior and posterior edge of the scutellum. The end of the parapsidal furrow bisects the distance between the lateral and the faint inner scutellar furrows; from the middle of the suture two narrow lines go to the posterior ends of the faint lateral furrows. The square mid lobe of the scutellum is bare; on the narrow lateral lobes are, on each side, a strong and a weaker short bristle, and a curious minute knob on the suture. The reticulation of the mesothorax is comparatively even, all the cells being drawn out and pointed; anteriorly the parapsides are coarsest. On the mid lobe the surface *inside* the cells is a little raised. The scutellum, though densely reticulate like the rest of the mesothorax, is comparatively smooth, the pattern on the lateral lobes being extremely finely drawn out. The mesophragma is as long as the scutellum; mesopleurae, with furrow, entirely smooth; mesoprepectus with coarse striate reticulation, except along the anterior edge, with two minute hairs at ventral angle; mesosternum smooth, but with faint reticulation posteriorly, nearly bare, save for one or two minute hairs on each side near hind edge.

Metanotum smooth, side areas each with a short hair; the middle area slightly swollen and (after potash) exhibiting a trace of reticulation at the sides. Propodaeum more than twice as broad as long, sides nearly parallel; edge between pleura and sternum defined, smooth and very flat; central keel short and not distinct. Spiracle oval, as far from the centre as the length of the segment. Below the spiracle are three hairs on the metapleurae. Posterior edge of the propodaeum considerably excavated in the middle to receive the abdomen.

Abdomen sessile, brown, slightly shining, petiole minute, tergites subequal in length, medianly smooth and faintly reticulate on the overlapping sides; spiracles small, nearly circular. Each tergite bears a posterior row of short hairs (incomplete near the sides on tergite 1); in front of the row at the sides are one or two irregular short hairs, and from tergite 2 onwards there is a more or less continuous post-median row; on each side of the mid line on all the tergites one of the hairs is the longest in its row.

Legs conspicuous for their length, the difference being in the posterior pairs of tibiae. All the legs and the posterior coxae pale yellowish; the anterior and mid coxae dark, and the anterior femora a little infuscated. Anterior coxae large, a little swollen. In both fore and mid legs the preapical subventral bristle is long and stronger than the hairs of the ventral row. The tibiae are densely clothed with hairs or short bristles. The hind and mid tibiae are to the corresponding femora as 5:4. First joint of fore tarsi flattened slightly.

Proportions of Tarsal Joints.

	i.	ii.	iii.	iv.
Fore	30	35	28	35
Mid	55	43	28	35
Hind	60	50	30	45

Length, $1\frac{1}{2}$ mm.; alar expanse, 3 mm.

Described from two ♀♀ taken on the egg-capsule of a cockroach, 7.i.14.

NOTES ON AFRICAN CHALCIDOIDEA—II.

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Family EULOPHIDAE.

Genus PLEUROTROPIS, Förster.

In the confusion existing as to the meaning of the various Entedonine genera, I think it best to define the sense in which *Pleurotropis* is employed in the following pages. The essential character of the genus is, I take it, the presence on the smooth propodaeum of two central keels, which diverge apically to meet the raised posterior edge of the segment. There are also present two lateral keels, as a rule strongly developed, running (*inside* the oval raised spiracle) along the edge from which the descent to the pleura begins. The lateral keels join the posterior edge above a generally slightly protruding angle inside the insertion of the metacoxae. The general shape of the propodaeum is transversely quadrate, not truncately triangular as in *Entedon*. The petiole, which joins the propodaeum by a distinct, though often very short, process, is pitted, quadrate or even sub-pentagonal in section. The proportion of the first abdominal tergal surface to the whole visible surface varies sexually and specifically from less than one-third to three-quarters.

The scutellum shows the usual Entedonine bristles. The parapsidal furrows vary in distinctness in different species, but can, I think, always be traced by altering the position and illumination of the specimen under examination. They seem invariably to bend rather abruptly at about the middle of the mid lobe, which bears apically at the sides a distinctive seta. The area round the seta may be depressed or smooth, or different in sculpture from the rest of the mid lobe.

The head is generally broad, and the eyes are bare, pubescent, or completely hairy. The antennae in both sexes have nearly always eight joints: scape, pedicel, ring joint, three in the funicle and two in the club, with the terminal spur not articulated. In the female the funicle and first club joints are generally more cylindrical and increasingly stouter; in the male they are more bead-like and of equal breadth. The ring joint is very small, but highly magnified (600–1,000) shows a complex laminate structure. Proximally there is the usual short stalk of insertion with the pedicel, and the dorsal edge is solid and chitinised. When the antenna bends upwards the ring joint is seen to consist of two to three laminae, which are distinctly separated only ventrally.

Förster (Hym. Stud., ii, p. 78, 1856) includes *Pleurotropis* with *Entedon* amongst the genera with less than twelve joints in the antennae, and further remarks (*op. cit.* p. 82): "Die Fühler sind in beide Gattungen achtgliedrig, oder wenn man den griffel an der spitze des letzten Gliedes mitzählen will, neungliedrig, beim ♀ mit zwei ringeligem, beim ♂, mit nicht geringelten Endglied."

According to Ashmead (Mem. Carn. Mus., i, pp. 341, 342, 1904) there are ten joints in the antennae: "Scape, pedicel, ring joint, four funicular, and three in the club." In this reckoning, the "Endgriffel," or spur, is counted as a joint, but in the African

species I have personally examined, this equivalence cannot be maintained. But even allowing for this, there is still a discrepancy between the number of joints given by Ashmead and Förster respectively. Ashmead was evidently acquainted with species, reckoned by him as *Pleurotropis*, Först., which possess a four-jointed funicle, and Crawford (Bull. U.S. Dept. Agric., Tech. Ser. no. 19, pt. ii, 1910) suggests that one such form, *P. atamiensis*, Ashmead, is probably an undescribed genus. In the paper just quoted Crawford states that in several Japanese species the ♀♀ have a three-jointed funicle, and presumably the American species to which he has supplied a key (Proc. U.S. Nat. Mus., xliii, p. 177, 1913) answer to this description. In any case *P. telenomi*, Crawford (Proc. U.S. Nat. Mus., xl, p. 445, 1911), from Uganda, has three funicular joints and otherwise agrees with the sense in which *Pleurotropis* is here employed.

The fore wing of the genus is remarkable for the great development of the marginal vein which is sometimes over twice as long as the submarginal. The tiny bristles on the clypeus have evidently considerable value for the taxonomist, but they are hard to observe and seldom well preserved. I have discussed them only in describing *P. neavei*, sp. n. Generally the malar space is large and triangular, but it may be much reduced. The mouth-parts of *Pleurotropis* are of great importance. While the trophi are of the usual Entedonine type (see under *P. neavei*), the mandibles exhibit much diversity. They may be bidentate, with equal or unequal teeth, and more or less deeply cleft. The inner apical edge of the inner tooth may be straight, swollen, or minutely serrate. Probably the most natural characters for the separation of the genus into species, or at any rate, groups of closely allied species, are to be found here. Fundamental as these slight differences appear to be, I have not based the following short key on mandibular characters, chiefly because material for dissection has not been available in the case of all the species.

The scutellum and propodaeum also afford most important characters. In the former, differences of sculpture and pattern can be easily expressed, but I have found it almost impossible to put into words the moulding of the propodaeum. Mr. Terzi's skilful drawings give an adequate representation of this region in the species now described. In the discussion of various surface levels and light values between author and artist recourse to modelling in plasticine has had satisfactory results. On the notum of the propodaeum the chief points to be attended to are the curvature of the median keels, their distance apart and the nature of the hollows before the stalk, *e.g.*, whether single or multiple, shining or dull; and in the latter case, whether smooth or pitted. On the pleura the position and size of the stigma are of value.

The chief variation of the propodaeum in any species seems to occur inside the central keels, where false or incomplete keels are frequently thrown up. The distal hollows are much more constant.

In the case of the wings, antennae, and leg joints, the measurements have been taken from balsam mounts. Those of the visible segments of the abdomen, the total length of each species, and its alar expanse are more approximate, being taken from card-mounted specimens, by slipping a micrometer on to the diaphragm of the eyepiece (no. iii., with objective a_3) of a binocular dissecting microscope. For detailed descriptions, the same objective, with eyepiece no. v. has been used. The

measurements of tarsal joints have been taken along the dorsal edge, and the fourth joint reckoned as extending to about the middle of the empodium, *i.e.*, to the bend of the claw, as this is the point at which the eye naturally rests in comparing the fourth with the other joints.

In describing *P. neavei*, sp. n., many details of generic value only have been mentioned; in the others, comparative features mainly have been emphasised.

The available evidence suggests very strongly that the species of *Pleurotropis* will prove to be hyperparasites upon other parasitic Hymenoptera; and if this be so, they must be regarded in many cases as noxious insects.

Key to Species of Pleurotropis, Förster, described from Africa and Persia.

1. Wings limpid 2
 Wings distinctly tinged with brown; mandibles large, falcate,
 protruding *clinognathus*, sp. n.
2. Hind tibiae concolorous to apex, metallic or non-metallic 4
 Hind tibiae dark metallic green, with the apical one-fifth or
 one-sixth, or at least the extreme tip, paler, non-metallic 3
3. Entire mesonotum (mid lobe, parapsides, axillae, and scutellum)
 with rather fine reticulation, the pattern strongly raised;
 mid keels of propodaeum basally contiguous; size over
 2 mm. *illustris*, sp. n.
 Mesonotum with coarse raised reticulation on base of mid lobe,
 smoother at sides of apex and base of scutellum in middle,
 keels well apart at base, brilliant green. 1½ mm. *neavei*, sp. n.
 Only the tip of the tibia pale, larger (2 mm.) and slightly
 duller *neavei*, var.
4. Small species; ♀ not more than 1.25 mm. 5
 Larger species; ♀ 1.35–1.75 mm., more stoutly built 6
5. Hind tibiae translucent brown, in some specimens faintly
 metallic; antero-median scutellar surface smooth in both
 sexes *telenomi*, Crawf.
 Hind tibiae darker, with blue reflections; antero-median scutel-
 lar surface smooth in female, raised in male *violacea*, sp. n.
6. Entirely shining black, but not metallic, save occasionally on
 funicle and hind legs; head very broad, malar space reduced,
 truncate; lateral keels delicate *africana*, sp. n.
 More or less extensively metallic on head and thorax; lateral
 keels normal 7
7. Mid region of scutellum gleaming from base to apex 9
 Mid region of scutellum posteriorly with raised pattern 8
8. Pattern of scutellum entirely coarse and raised, outer tooth of
 mandible distinctly smaller than the inner, whose edge is
 simple *mediopunctata*, sp. n.

- Scutellum in the middle anteriorly smooth, reticulate, not raised, pattern finer; mandibular teeth subequal, inner edge apically serrate *homoea*, sp. n.
9. Pre-apical hollows of propodaeal peduncle shining; mesonotal sculpture coarse; vertex reticulate *nigripes*, sp. n.
- Pre-apical hollows dull; mesonotal sculpture fine; vertex smooth *amaurocoela*, sp. n.

Pleurotropis neavei, sp. nov. (figs. 1, 2, 5, 9).

♀.—*Head* broader than thorax (5 : 4), much broader than long (5 : 2), the length being measured across the vertex; occiput very concave, the edge sharp. Eyes large, densely clothed with whitish pubescence; malar space distinct, triangular. Frons slightly prominent at the base line of the eyes, just above which the antennae are set; vertex coarsely reticulate, seen from above shining green. Posterior ocelli about twice as far from one another as from the ocular edge. Behind the posterior ocelli the vertex is a little excavated and smoothed towards the postero-lateral angle of the occiput, but the reticulation reappears just before the occiput is reached. Occiput sharply defined, surface down to the neck (facing the prothorax) dull, reticulate, dark purple. Frons coarsely reticulate to below the anterior ocellus (which divides a line drawn from the apex of either scape to the opposite posterior ocellus), and concolorous with the vertex; its surface up to this point flat or slightly convex, but below the anterior ocellus the face is hollowed, consisting of two inclined finely reticulate plates, which unite rather indistinctly in the middle, but with clear sutures above from the anterior ocellus to the upper margin of the eye; the face here has aeneous reflections, but from in front is dark green; the lower mid line of the frons and the clypeus, which is gently concave on the oral edge, is smooth. Above the middle of the frons the orbits are subparallel, but they diverge both towards the occiput and the genae. All the frons wide, the shortest distance between the eyes being $\frac{1}{3}$ – $\frac{1}{2}$ greater than the width of the eye seen from the same aspect. Genae duller, with short pubescence, at most showing a faint, purplish reflection. On the occipital edge 4 bristles, viz., a median pair with one on each side aligned after an interval with a row of five bristles, which fringe the orbit, the last of this row standing at the level of the apex of the scape; below this on each side a row of 5–6 minute bristles; across the clypeus, above the mouth edge, 6 bristles (3, 3) and a pair below the scrobes; a single hair behind the anterior ocellus and one inside each of the posterior ocelli; between the ocellar triangle and the apices of the scapes two pairs of lateral medianly convergent bristles.

Antennae eight-jointed (fig. 2, b): scape, pedicel, one ring joint, three funicular and two in the club—the last with a terminal spur. Scape slender, five times as long as broad, on ventral edge 6–7 hairs, dorsally about three. Pedicel about twice as long as broad, shorter than first funicular joint. Ring joint very small; under a high power, apparently consisting of at least two laminae, closely appressed. The funicular joints, especially the second and third, pedunculate anteriorly, first longest, second and third decreasing slightly; first joint of club much bigger than the second. Joints 4–8 show three kinds of structure: (a) long scattered hairs, (b) short mushroom-like

hairs, and (c) "sensory" grooves, giving rise to clear narrow blade-like pieces of chitin. Entire antennae dark shining metallic green, hairs whitish. Length, .6 mm.

Mouth-parts: mandibles (fig. 5, b) triangular, bidentate, outer tooth slightly sharper and longer, inner edge of the second serrate near apex, 3-4 hairs on outside. Stipes dense and black; one hair behind the maxillary palpi; galea with about seven hairs, mainly towards the apex. Both palpi one-jointed, the labial long, three-fourths of the maxillary, with the usual long terminal bristle and another median or sub-basal.

Thorax shining green, the sternal area similar, but darker. *Prothorax* entirely shining and smooth, brilliant green, with a suggestion of blue, with six strong pale bristles (3, 3) on the anterior edge, which is sharply defined; these bristles extend to the bend of the parapsidal furrows. *Mesonotum* with the parapsidal furrows distinct; mid lobe coarsely reticulate anteriorly in the centre, the pattern raised and extending to the suture, the sides anteriorly still reticulate but not raised, the

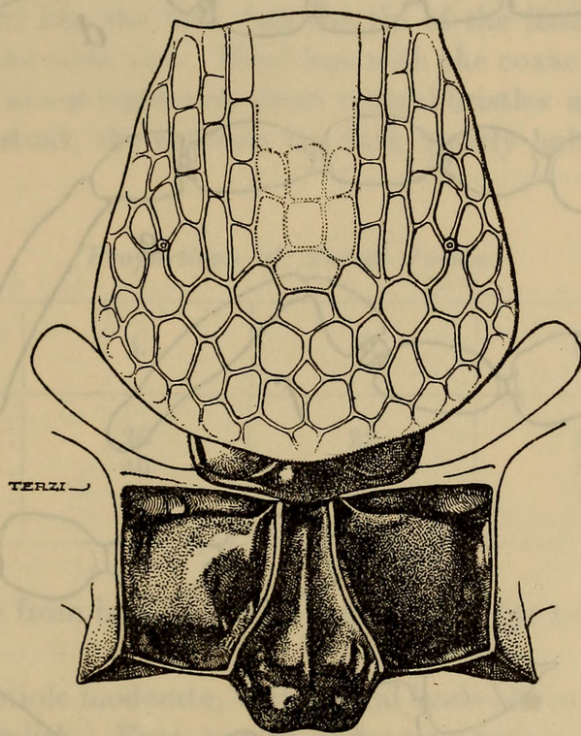


Fig. 1. *Pleurotropis neavei*, sp. n.; scutellum, metanotum and propodeum.

reticulations becoming drawn out towards the apex (*i.e.*, posteriorly). On each side towards the furrows is a dimpled or depressed, smooth, setigerous area; besides these two bristles the mid lobe bears a pair anteriorly. Lateral lobes smooth and shining—in reality finely reticulate, but not with raised pattern—with two bristles, one before the axilla and one at the anterior angle. Axillae with one bristle, invading parapsides somewhat deeply, and with a similar surface. *Scutellum* (fig. 1) with two bristles; anterior median area smooth, with ridges or furrows on each side; posteriorly the furrows are more and more distinctly crossed by transverse ridges, till the whole hind area is reticulate. *Metanotum* narrow, mid portion green, shining, smooth; sides dull purplish and depressed. *Propodeum* (fig. 1) large, entirely smooth

and shining, with two short angular projections and as short neck for the reception of the petiole. Entire posterior edge ridged; two median and two lateral keels, the spiracles outside the latter. At the metanotal suture the median keels are from one another about one-seventh of the distance between the laterals, but posteriorly they diverge considerably, till at the posterior edge they are apart over one-third the

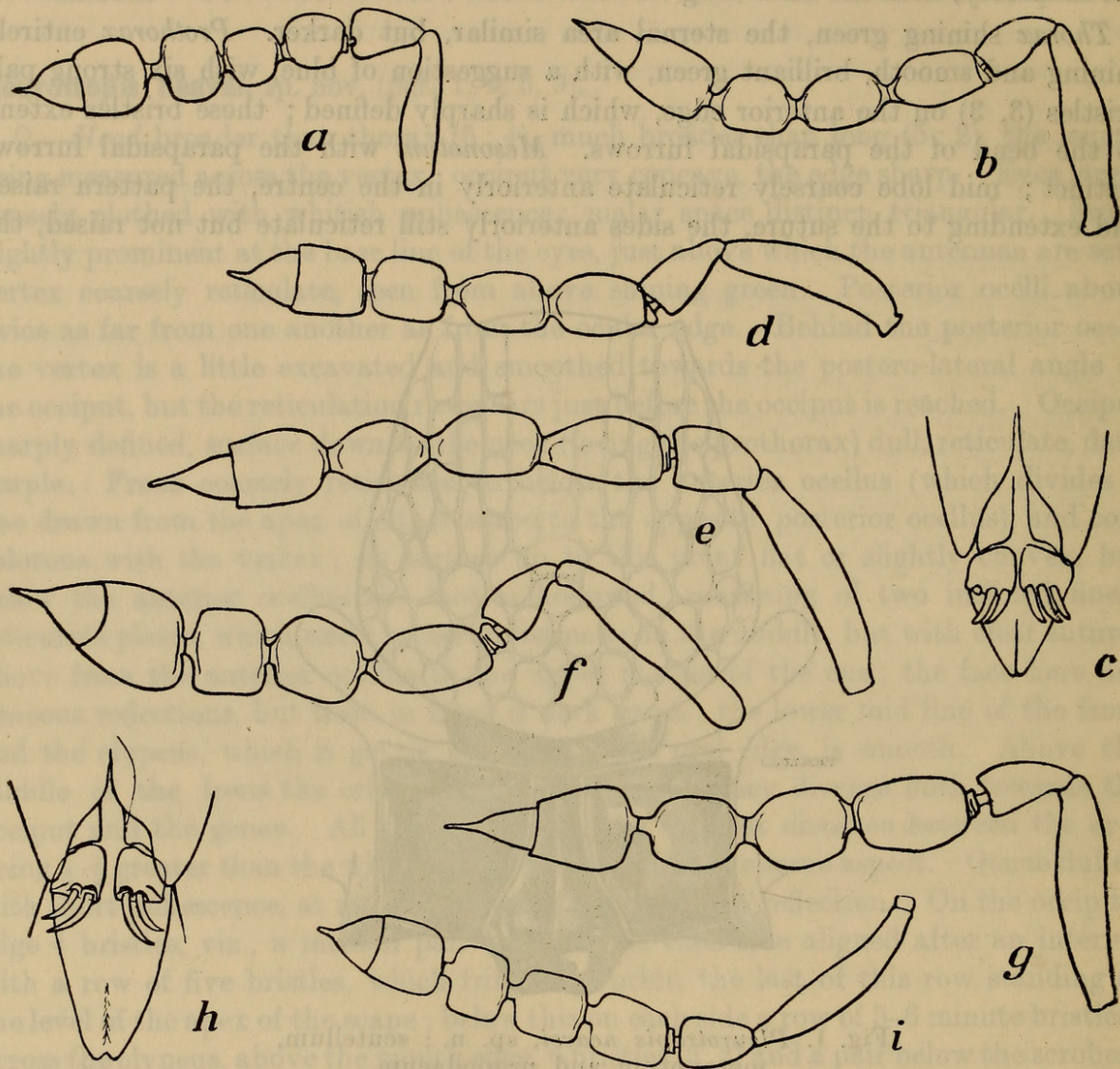


Fig. 2. *a*, antenna of *Pleurotropis africana*, ♀; *b*, antenna of *P. neavei*, ♀; *c*, genitalia of *P. neavei*, ♂; *d*, antenna of *P. clinognathus*, ♀; *e*, antenna of *P. mediopunctata*, ♀; *f*, antenna of *P. homoea*, ♀; *g*, antenna of *P. nigripes*, ♀; *h*, genitalia of *P. nigripes*, ♂; *i*, antenna of *P. amaurocoela*, ♀.

distance between the lateral keels. An area is thus enclosed in which there rises a slight median keel, flanked by two hollows separated slightly from one another. The short stalk of the propodaeum is at first a little depressed, then raised. Thus, the keel or ridge separating the hollows fails before the extreme apex of the propodaeum. Stigma oval, rimmed (fig. 9, *a*); pleurae shining green, reticulate.

Wings: fore wings with the marginal long, more than twice the length of the submarginal; radius nearly sessile, with four cells, shorter than the post-marginal. Length, 1.2 mm.; breadth, .6 mm. Hind wings with cilia rather long. Length, 1 mm.; breadth, 2.5 mm.

Legs: fore legs with the coxae triangular, moderately swollen, reflexed apically on outside; femur slightly swollen, with 10–12 ventral bristles, of which the last (subapical) is longest; tibia as long as the femur, with two apical ventral spurs; the first three joints of the tarsus subequal, the last to tip of claw double its predecessors (see table below). Entire leg to near the tip of tibia black, with metallic green reflections, apex paler, non-metallic; in cleared preparations the knees are also narrowly pale, but this cannot be seen in carded examples; first three tarsal joints pale, fourth darker, especially towards the tip. Mid legs slender, coxae with no apical reflection; femur with three basal ventral bristles, bare thence till near the apex, where there is a single long bristle above the ventral edge; tibia longer than femur, with a strong apical ventral flat spine, which is as long as the first tarsal joint. Mid leg coloured like the first, but the tip of the femur is more extensively pale, and the apex of the tibia also. Hind legs with the coxae large, swollen; femur equal to the tibia, with about eight very short ventral bristles and one long subapical; apical bristle of tibia stout, the extreme tip dark, nearly half as long again as first tarsal joint.

Proportions of Tarsal Joints.

	i.	ii.	iii.	iv.
Fore	20	22	22	44
Mid	40	30	25	45
Hind	30	30	30	50

Measurements made from base of joint along dorsal edge to the base of succeeding joint.

Abdomen with the petiole moderate, with lateral keels above and below, the surface punctate and dull purplish. First tergite occupying rather more than half of the visible surface of the abdomen, shining blue green on the posterior edge and elsewhere, except on the postero-median half, which is dull purple and coarsely reticulate. The remaining tergites have the same dull purple lustre except before the suture, where they are shining blue green. Abdomen generally depressed above slightly carinate below, basally ovate and terminally pointed. Ovipositor not projecting; free portion of sheath one-tenth of the base. The first tergite is practically bare, but behind it the segments are clothed with soft whitish hairs, set mainly at the sides, there being a median posteriorly contracting glabrous area.

Length, 1.62 mm.; alar expanse, nearly 3 mm.

♂.—I am not able to describe this sex in detail, as only fragments of one specimen are available. It appears to be smaller and stouter in build, with a bronzy tint over the prevailing metallic green. Antennae barely .6 mm.; scape shorter and more

expanded than in the ♀; sensory channels less elongate, almost rounded; pedicel longer than first funicular joint; joints of the funicle subequal, decreasing slightly, bead-like, with longer stalks. No subapical ventral bristle on hind tibia.

Proportions of Tarsal Joints.

	i.	ii.	iii.	iv.
Fore	15	25	20	30
Mid	35	25	20	45
Hind	25	30	30	45

NYASALAND: Mt. Mlanje, 3. vii. 13 (*S. A. Neave*).

Holotype—a ♀.

A series of eight females was bred by Mr. Neave from the pupa of a butterfly (*Charaxes* sp.). The insect is not improbably a hyperparasite on some species of *Chalcis*.

P. neavei is apparently a close ally of *P. howardi*, Crawford (Bull. U.S. Dept. Agric., Tech. Ser. no. 19, pt. ii, p. 23), but differs in the smaller size (less than $1\frac{3}{4}$ to 2 mm.) and the apically pale posterior tibiae.

***Pleurotropis neavei*, var.**

♀.—The mandibles are essentially as in the type, and the differences in sculpture (slightly coarser) are such as might be expected with the greater size. *Length*, 2 mm.; alar expanse, over 3 mm.

GERMAN EAST AFRICA: Bukoba, 2 ♀ ♀ from cocoons of *Apanteles* sp., 10. vi. 12 (*C. C. Gowdey*).

***Pleurotropis clinognathus*, sp. nov. (figs. 2, 3, 4, 5, 9).**

A purplish black species, with blue-black or purple reflections.

♀.—*Head*: eyes rather sparsely haired; vertex and frons indistinctly reticulate except on the ocellar triangle; from the ocelli to the suture the frons is shining blue-black, while below, on the area subtended by the scapes, the surface is distinctly though finely reticulate and dull purple in colour. Clypeus shining. Mandibles relatively large (fig. 5, *e*), protruding from the mouth and easily visible, bidentate, falcate, the outer edge long and curved, the outer tooth long and sharp, the inner small.

Antennae (fig. 2, *d*) hardly anywhere metallic; in transmitted light, the scape, pedicel and eighth joint, even when unmounted, are translucent; the other joints are dark, with blue reflections. Pedicel equal to the first funicular joint. *Length*, .55 mm.

Thorax: mid lobe of *mesonotum* with a very coarse raised reticulation. Parapsidal furrows after the bend exceedingly hard to see, but from the bend there is a prominent ridge on each side of the apex of the mid lobe running *inside* the depressed setigerous area and making a narrow abscissa on the scutellar suture. These ridges, however, are not true parapsides, but rise as the meeting lines between

the dissimilar sculpturing of the depressed area and the mid apex of the mid lobe. The depressed area is thus dull (smooth and shining in *neavei*) and the bristle rises from a raised base. *Scutellum* (fig. 3) nowhere smooth, but more shining than the mid lobe; pattern slightly raised and longitudinally drawn out. *Axillae* dull, finely reticulate. *Propodaeum* (fig. 3) with the median keels nearer one another than in *neavei*, one-eighth the distance between the lateral keels, no raised portion or ridge enclosed; near the short neck the central keels diverge slightly, enclosing two hollows. Lateral keels subparallel and short, the short projection behind each being rounded, not pointed. Spiracular area outside the keels narrowed (fig. 9, b).

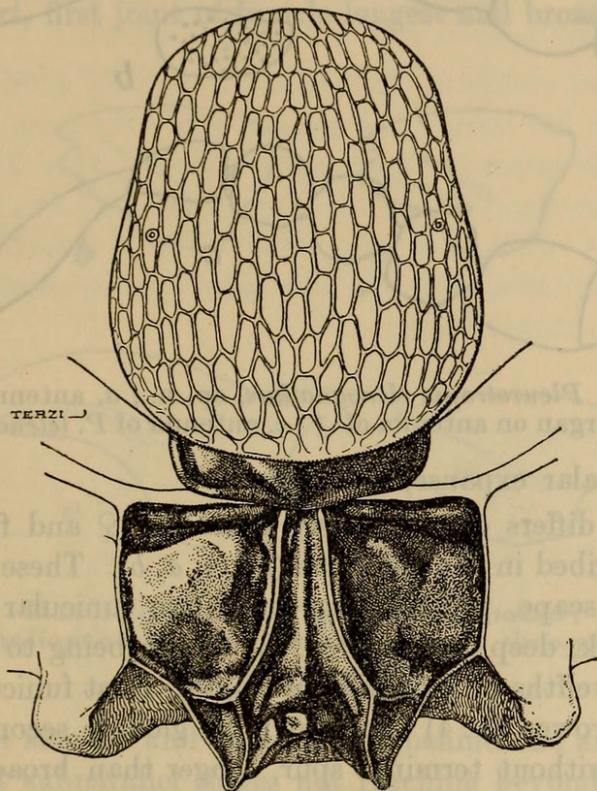


Fig. 3. *Pleurotropis clinognathus*, sp. n. ;
scutellum, metasternum and propodaeum.

Wings tinged with clear brown.
Legs : all the coxae and femora, except the tips of the posterior pairs, dark, but almost without reflections; all the tarsi pale translucent, fuscous or brown, the last joint neither wholly nor partly black; fore and mid tibiae dark to beyond the basal half, paler thereafter; hind tibiae nearly uniformly pale. Spur longer than the first tarsal joint.

Proportions of Tarsal Joints.

	i.	ii.	iii.	iv.
Fore	15	25	20	40
Mid	35	35	20	40
Hind	25	40	30	40

Abdomen: first tergite covering half the visible surface, entirely shining, dark bluish green; tergites 2-4 subequal, 5 twice as long as 4, 6 a little longer than 4. All these tergites purplish and shining, being so little striate or punctate that there is no interference with the light reflection. Free portion of sheath one-sixth of the base.

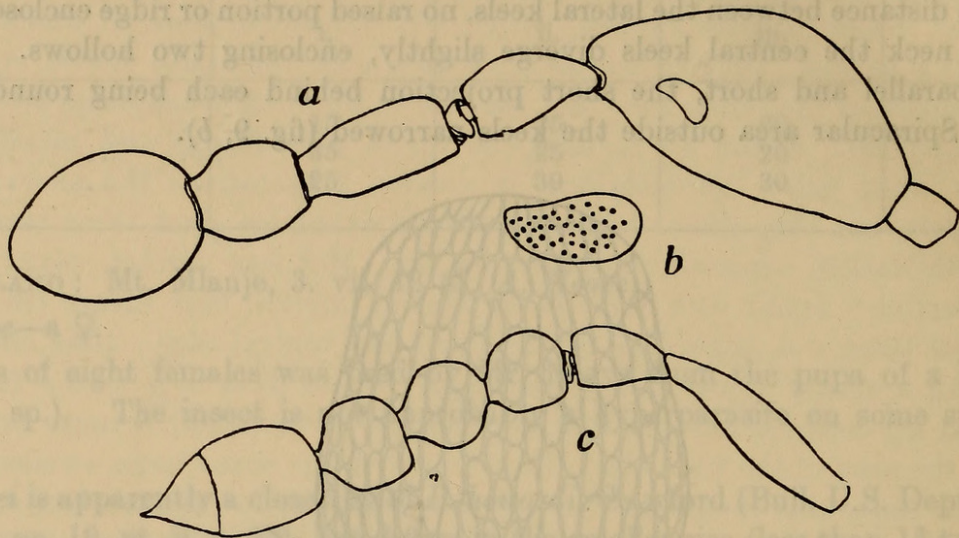


Fig. 4. *Pleurotropis clinognathus*, sp. n.; a, antenna of ♂; b, sense-organ on antenna of ♂; c, antenna of *P. telenomi*, Crwf.

Length, 1.37 mm.; alar expanse, 2.75 mm.

♂.—*Head*: The ♂ differs conspicuously from the ♀ and from the ♂♂ of the other species now described in the antennae (fig. 4, a, b). These are apparently composed of six joints; scape, pedicel, ring joint, two funicular and one club. The scape is extremely thick, deep and swollen, the length being to the breadth as 8:5. Pedicel normal, five-twelfths of the scape in length. First funicular joint cylindrical, longer (7:5) and narrower (3:4) than the more globose second joint. Club joint single, swollen, oval, without terminal spur, longer than broad (4:3) and shorter than the sum of the funicular joints (2:3). The whole antenna is bristly (except the sparsely clad pedicel), and the scape, besides being covered dorsally with a coarse raised reticulation, bears near the apex a perforated oval plate. Length of antenna, .48 mm. The eyes are distinctly hairy.

Wings: the forewings, as compared with those of the ♀, are much less robust and shorter.

Legs rather stronger and possibly more metallic on the femora.

Thorax: in the mid lobe of the mesothorax the ridge inside the parapsidal furrows is fainter posteriorly. The cells on the scutellum a trifle wider, especially posteriorly.

Abdomen: the first visible tergite covers one-half of the whole surface.

Length, 1.37 mm.; alar expanse, 1.8 mm.

SOUTHERN NIGERIA: Ibadan, 50 ♀♀, bred from unrecorded host, emerged 2. ii. 14 (Dr. W. A. Lamborn).

GOLD COAST: Aburi, 7 ♂♂ and 37 ♀♀ bred from horned wasp (*Synagris cornuta*, F.), and 1 ♂ and 43 ♀♀, presumably from the same host, 1912-13 (W. A. Patterson).

Holotype—a ♀ from Ibadan.

Pleurotropis nigripes, sp. nov. (figs. 2, 5, 6, 7, 9).

Dark shining green on head, thorax and base of first abdominal segment, remainder of abdomen and pleurae blue or purplish.

♀.—*Head* (fig. 7, b): sculpture of the vertex distinct, though not so pronounced or raised as on the thorax, agreeing in this respect with *P. clinognathus*. The hollows behind the posterior ocelli distinct, smooth extensively towards the eye margins; reticulation most distinct within the ocellar triangle. Eyes almost bare, the pubescence short and sparse. Mandibles not deeply bidentate (fig. 5, f), inner tooth broader, with its inner edge shortly serrate at the apex. *Antennae* entirely dark and metallic, pedicel short, first joint of funicle longest and broadest. Length, .68 mm.

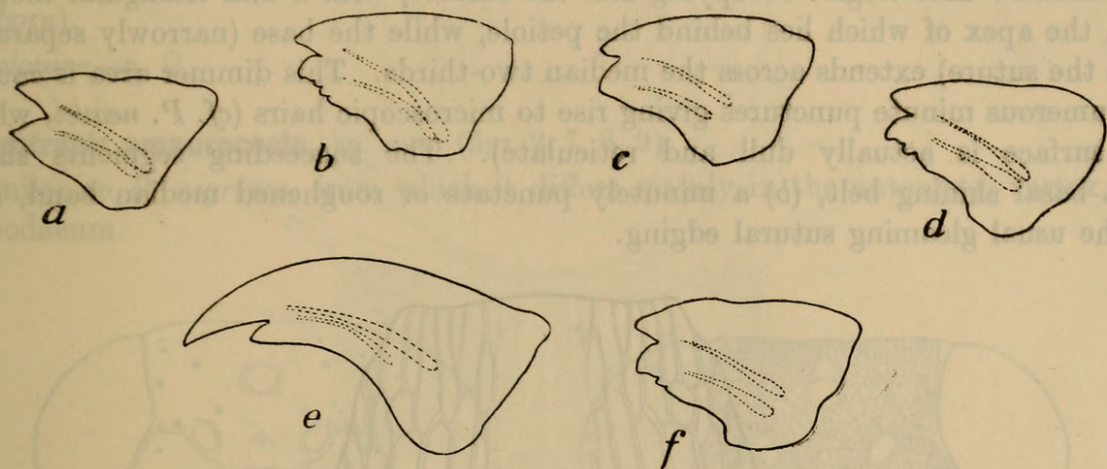


Fig. 5. Mandibles of :—a, *Pleurotropis africana*; b, *P. neavei*; c, *P. mediopunctata*; d, *P. homoea*; e, *P. clinognathus*; f, *P. nigripes*, spp. n.

Thorax: *pronotum* smooth and shining, but behind the anterior ridged edge are numerous very short subparallel ridges not reaching beyond one-third backwards; they are imperceptible separately save in a good light, but their effect is to make the anterior edge duller. *Mesonotum* with the mid lobe rather coarsely reticulate to the level of the posterior (apical) pair of bristles, the pattern being raised. From the bristles to the scutellum the apex of the mid lobe is striate, only the longitudinal lines of the reticulate pattern being raised. Before the scutellum the furrows are rather deeply marked for a short distance. Lateral lobes and axillae mainly striate-reticulate. *Scutellum* antero-medianly smooth, shining and impunctate, as in *P. neavei*, but less broadly so ($\frac{1}{3}$ as opposed to $\frac{1}{2}$) with about five ridges on each side. The smooth median area continues to the metanotum, before which there is at most a weak striation with feeble reticulation. The posterior third is not, as in *P. neavei*, raised again into a bold pattern. *Propodaeum* narrower than in *P. neavei*, the posterior knob broad; within the median keels is a secondary central keel running the whole length of the enclosed space; distally on both sides the preapical hollows are shining.

Wings: fore wings apically rounded; length 1.2 mm.; breadth, .55 mm. hind wings, length, .95 mm.; breadth, .25 mm.

Legs: from the coxae to the tip of the tibiae all three pairs black and metallic; the last joint of all the tarsi wholly black, the other three clear white. The apical spur of the mid tibia is hardly as long as the first tarsal joint.

Proportions of Tarsal Joints.

	i.	ii.	iii.	iv.
Fore	24	25	20	45
Mid	50	30	30	45
Hind	40	40	30	50

Abdomen: first tergite occupying half the surface, with a dim triangular median area, the apex of which lies behind the petiole, while the base (narrowly separated from the suture) extends across the median two-thirds. This dimmer area is caused by numerous minute punctures giving rise to microscopic hairs (*cf.* *P. neavei*, where the surface is actually dull and reticulate). The succeeding segments show, (a) a basal shining belt, (b) a minutely punctate or roughened median band, and (c) the usual gleaming sutural edging.

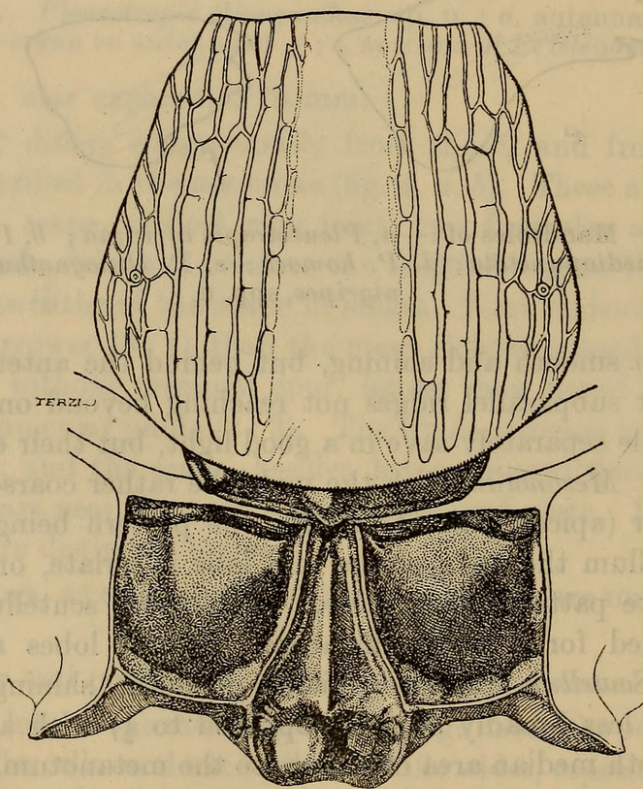


Fig. 5. *Pleurotropis nigripes*, sp. n.; scutellum, metanotum and propodeum.

Length, 1.5 mm.; *alar* expanse, 3 mm.

♂.—*Antennae* with the pedicel less than two-thirds of the first funicular joint. Joints of funicle decreasing; club long, with equal joints. *Length*, .7 mm.

Wings: fore wings very truncate at apex; *length*, .97 mm.; *breadth*, .48 mm. Hind wings, *length*, .88 mm.; *breadth*, .20 mm.

Proportions of Tarsal Joints.

	i.	ii.	iii.	iv.
Fore	20	25	20	40
Mid	40	30	25	40
Hind	35	35	25	40

The apical hind tibial spine distinctly longer than the first tarsal joint.

SOUTHERN NIGERIA: Ibadan, 2 ♂♂ and 8 ♀♀, bred, along with an undetermined *Eurytoma* sp., from cocoons of an undetermined Braconid, vii. 1913 (*Dr. W. A. Lamborn*).

Holotype—a ♀.

Pleurotropis amaurocoela, sp. nov. (figs. 2, 7, 8, 9).

Similar to *P. nigripes*, from which it differs mainly in the antennae, vertex and propodaeum.

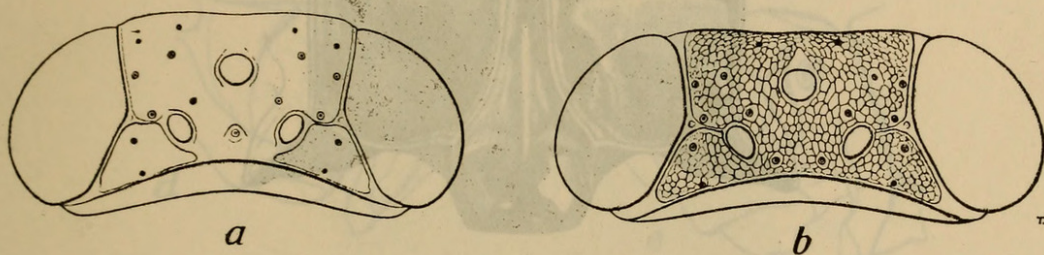


Fig. 7. Heads of:—*a*, *Pleurotropis amaurocoela*, sp. n.;
b, *P. nigripes*, sp. n.

♀.—*Head* (fig. 7, *a*): eyes distinctly but not densely hairy (almost bare in *P. nigripes* and *homoea*). Vertex and frons to the suture smooth and gleaming, the surface hardly disturbed, except along the edge of the occiput, in the middle, behind the ocellar triangle. The space between the anterior ocellus and the apices of the scapes is shining dark blue green. In *nigripes* the corresponding area is furrowed or raised reticulate, dark green, and only a little less rough in *homoea*.

Antennae short, compact, shining dark blue; funicular joints thick, the first slightly longest (fig. 2, *i*). Length, .55 mm.

Thorax: *mesonotum* green, with purple reflections near the suture. Mid lobe with moderately fine reticulation, hardly at all raised (coarse and raised in *nigripes*), and drawn out towards the apex, at the side of which are two setigerous foveolae, the setae being on a slightly raised base. Over these hollows is a dull purplish tinge. *Scutellum* (fig. 8) with the median area (over one-third) bright shining green throughout; at the sides the reticulate pattern long drawn out. *Propodaeum* (fig. 8) with the central keels widely apart at base and a weak median keel within, preapical hollows dull purplish in contrast to the brilliant green of the rest of the surface.

Abdomen with the first abdominal tergite rather more extensive than in *nigripes*, shining green at the sides and base; the rest purple, equally smooth. With eyepiece v. and objective *a* no hairs can be differentiated on the purple surface, whereas in *nigripes* with the same power they are apparent.

Length, 1.5 mm.; alar expanse, over 3 mm.

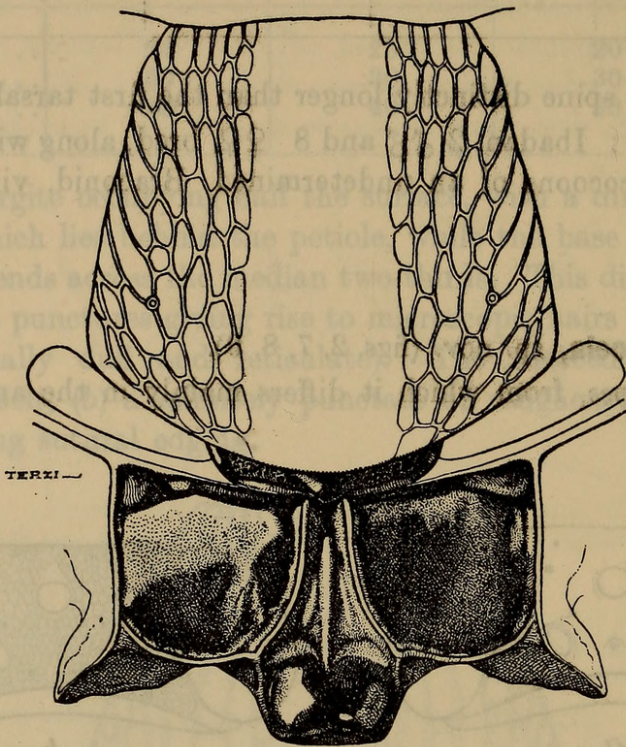


Fig. 8. *Pleurotropis amaurocoela*, sp. n.; scutellum, metanotum and propodeum.

EGYPT: Cairo, 1 ♀, bred (along with a Pteromalid) from a microlepidopterous larva (*Pyroderces simplex*, Wlsm.) in cotton bolls (W. Draper—Brit. Mus.).

NORTHERN NIGERIA: Aguji, Ilorin Province, 3 ♂♂ and 6 ♀♀, bred from cocoons of a Braconid (*Apanteles* sp.) parasitic on the cotton leaf-roller (*Sylepta derogata*, F.), 18.ix.13 (Thos. Thornton).

NYASALAND: Dedza, 2 ♀♀, bred with *Tetrastrichus* sp., from *Sylepta derogata* (E. Ballard).

Holotype—a ♀ from Dedza.

***Pleurotropis homoea*, sp. nov. (figs. 2, 5, 9, 10).**

Closest to *P. nigripes*, but separated from it by size, colour, sculpture of thorax, etc. A larger duller insect; the metallic reflections on the head and thorax very dark green; abdomen practically black, with blue and purple reflections.

♀.—*Head* smoother on the vertex, eyes bare. *Antennae* (fig. 2, f) with the joints of the funicle increasing in width abruptly (hardly at all in *nigripes*). *Length*, .67 mm.

Wings : fore wings, length, 1.15 mm. ; breadth, .55 mm. Hind wings, length, 1 mm.; breadth, .25 mm.

Thorax : mid lobe of *mesonotum* more finely reticulate, with foveolae before the suture, the reticulation at the apex not drawn out into ridges. Mid anterior area of *scutellum* (fig. 10) finely reticulate, but hardly at all raised ; at the sides anteriorly the cells of the network are longer than broad, but the ridges are neither so continuous nor so raised as in *nigripes*. Posteriorly the scutellum is reticulate, while in *nigripes* the smooth area extends to the metanotum. *Propodaeum* (fig. 10) with the median keels

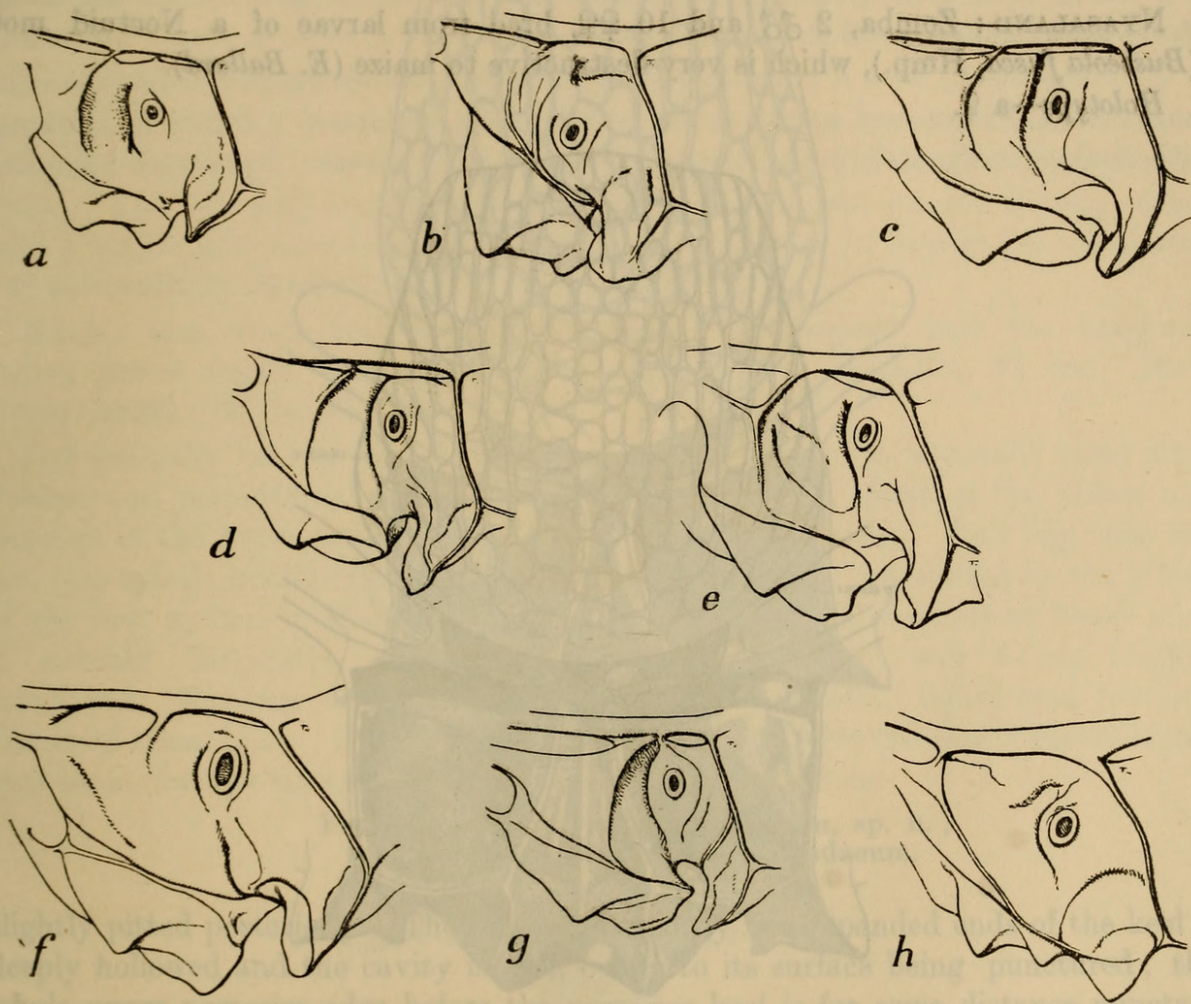


Fig. 9. Pleurae of the propodaeum of:—a, *Pleurotropis neavei*; b, *P. clinognathus*; c, *P. nigripes*; d, *P. amaurocoela*; e, *P. homoea*; f, *P. mediopunctata*; g, *P. africana*; h, *P. illustris*.

closer and the excavation before the insertion of the petiole pitted and dull, not smooth and shining as in *nigripes*. In *nigripes* the areas enclosed between the lateral and the median keels are smooth, shining metallic green ; in *homoea* the corresponding areas are much darker, gleaming, obscurely reticulate (though not raised), and next the posterior margin are a number of irregular foveolae which further darken the edge.

Proportions of Tarsal Joints.

	i.	ii.	iii.	iv.
Fore	20	25	20	40
Mid	40	30	30	40
Hind	40	40	30	—

Abdomen : the first segment occupies at least five-eighths of the exposed surface.

Length, 1.75 mm. ; alar expanse, 3 mm.

NYASALAND : Zomba, 2 ♂♂ and 10 ♀♀, bred from larvae of a Noctuid moth (*Busseola fusca*, Hmp.), which is very destructive to maize (E. Ballard).

Holotype—a ♀.

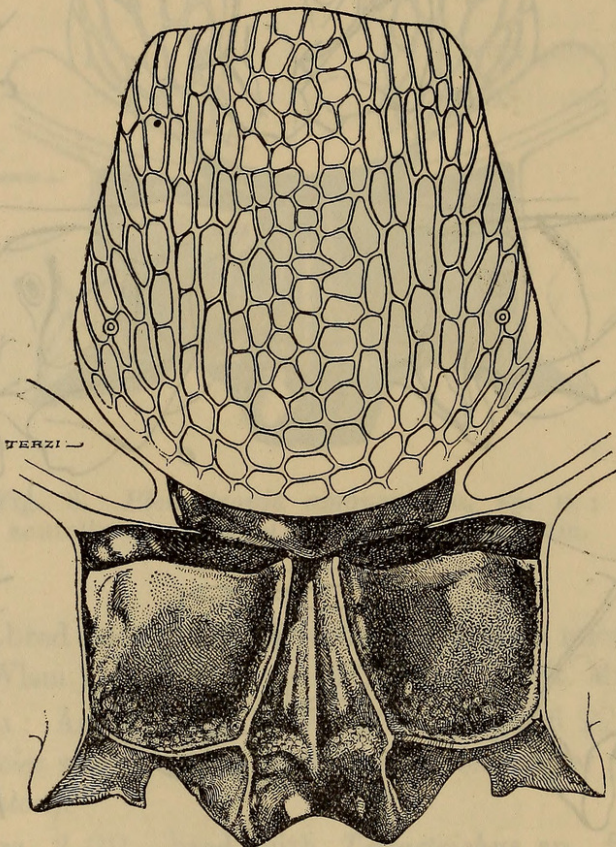


Fig. 10. *Pleurotropis homoea*, sp. n. ; scutellum, metanotum and propodeum.

***Pleurotropis mediopunctata*, sp. nov.** (figs. 2, 5, 9, 11).

Blue-black with metallic reflections, and little green anywhere.

♀.—*Head* with slight greenish reflections on the face, mingled with blue. Reticulation of the head somewhat coarse and raised especially between the ocelli and the apex of the scapes. *Antennae* strongly metallic (fig. 2, e). Length, .68 mm.

Thorax : *pronotum* with the shining surface on the anterior half considerably disturbed by hollows and short rugae, so as to appear dim ; the six bristles are darker than usual. *Mesonotum* with the reticulations of the mid lobe much raised, but

the depressed triangular setigerous areas lying one on each side of the apex of the lobe are smooth ; the parapsidal furrows (whose abrupt bending is plainly visible in this species) bounding this smooth spot on the outside, are deepened. *Scutellum* (fig. 11) entirely covered by a raised pattern which anteriorly tends to form ridges, and posteriorly consists of a very coarse reticulation (cf. the same region in *P. neavei*). *Propodaeum* (fig. 11) with the median keels very close together basally, rather more than one-tenth the distance between the laterals ; the enclosed space not carinate, but

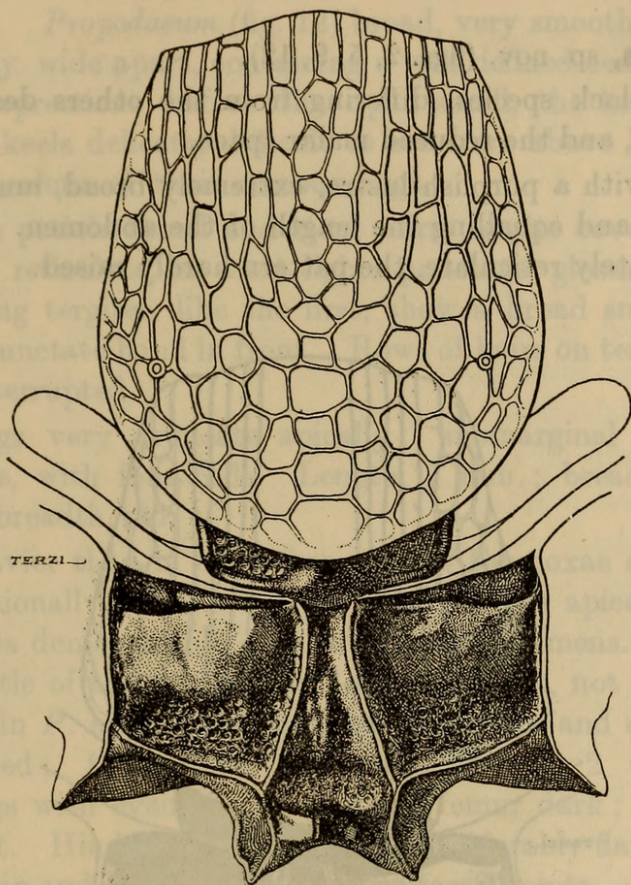


Fig. 11. *Pleurotropis mediopunctata*, sp. n. ;
scutellum, metanotum and propodaeum.

slightly pitted posteriorly. The area contained by the expanded ends of the keel is deeply hollowed and the cavity is dull, owing to its surface being punctured ; the whole upper posterior edge before the posterior keel is for some distance punctate and dull.

Wings : fore wings, length, 1·3 mm. ; breadth, ·6 mm. Hind wings, length, 1 mm. ; breadth, ·25 mm.

Proportions of Tarsal Joints.

	i.	ii.	iii.	iv.
Fore	25	25	20	40
Mid	30	35	25	50
Hind	—	—	—	—

Abdomen with the first segment occupying three-fourths of the exposed surface, with a broad, dim, minutely punctate region bearing microscopic hairs; the base of this dim area extends practically across the suture. Anteriorly and at the sides, gleaming metallic blue-green; the remaining segments considerably telescoped, shining black.

Length, 1.6 mm. ; alar expanse, 3 mm.

SOUTHERN NIGERIA : Ibadan, 4 ♀♀, bred from pupa of a Coccinellid beetle, vii. 1913 (Dr. W. A. Lamborn).

***Pleurotropis africana*, sp. nov.** (figs. 2, 5, 9, 12).

A broad-headed black species, differing from the others described in the weak lateral keels of the ♀, and the reduced malar space.

♀.—*Head* black, with a purplish lustre, extremely broad, much broader than the thorax at its widest and equalling the length of the abdomen. Vertex rather long, with the face moderately reticulate, the pattern hardly raised. Eye large, extending

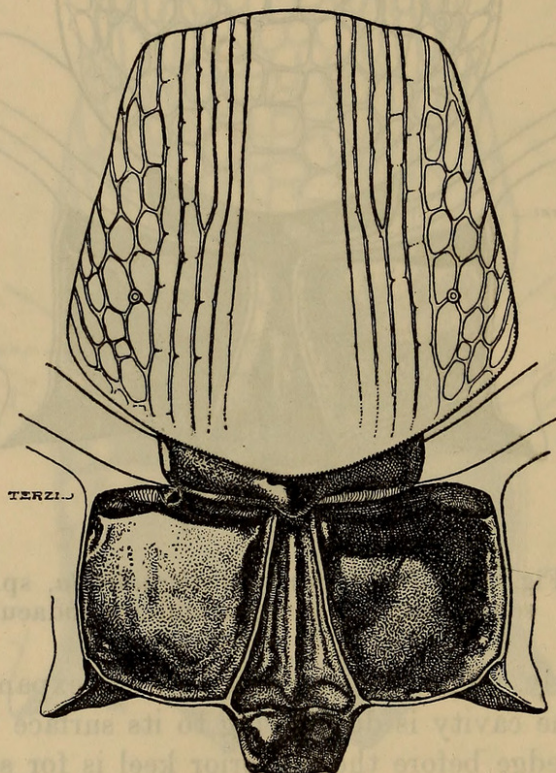


Fig. 12. *Pleurotropis africana*, sp. n. ; scutellum, metanotum and propodeum.

almost to the mandibles and narrowed ventrally; thus the malar space is practically absent, but the genae are correspondingly increased. Mandibles (fig. 5, *a*) deeply cleft into two equal teeth, the edge of the inner of which is not serrate.

Antennae (fig. 2, *a*) with the joints of the funicle remarkably bead-like, subequal—the middle one, if any, the shortest—broadening distinctly towards the club, joint six being broader than long; all joints strongly shining, dark metallic green. Length, barely .5 mm.

Thorax with the *pronotum* gleaming posteriorly, anterior half reticulated and dull, hairs dark. *Mesonotum* with the mid lobe reticulate, the pattern being drawn out towards the apex; parapsidal furrows rather deep, no depressed differently sculptured side areas at the apex of the lobe, but in their place, almost on the furrows, a rather deep, elongate fovea; apex distinctly emarginate; parapsides striate, reticulate. Axillae and side of scutellum not dull, but reticulate and gleaming like the rest of the thoracic surface. *Scutellum* (fig. 12) smooth on the median third from the base to the apex, with about four longitudinal ridges on each side, between which there are practically no transverse striae. *Propodaeum* (fig. 12) broad, very smooth and shining black. Central keels distally wide apart, containing a well defined central ridge and traces of two others. Depressions before the apex small, the knob itself broad and gleaming. Lateral keels delicate, difficult to see from above because of their fine edge and the black colour of their surroundings.

Abdomen with the petiole broad and stout; first tergite covering more than one-half, the disc finely reticulate, in most lights punctate, gleaming, sutural margin broad. The following tergites, like the first, show a broad smooth shining suture with a narrow dull punctate band in front. Rows of hairs on tergites 2-5 continuous and not medianly interrupted.

Wings: fore wings very truncate apically; submarginal half the marginal, radius almost sessile, with four cells. Length, 1 mm.; breadth, .52 mm. Hind wings, length, .85; breadth, .25.

Legs generally heavier than in the other species, the coxae especially being more swollen and proportionally larger. All are black to the apices of the tibiae, any paleness of the knees demonstrable only in cleared specimens. Fore legs with the last (pre-apical) bristle of the ventral row long and stout, not similar to the others of the row, as it is in *P. neavei*; fourth tarsal joint two and one-third times joint 3, entirely darkened; the others are pale, though 2 and 3 are slightly infuscated. Mid legs with even the head of the femur dark; apical spur reaching middle of tarsal joint. Hind legs with the tibia considerably flattened; apical bristle very stout, dark at tip and equal to the first two tarsal joints.

Proportions of Tarsal Joints.

	i.	ii.	iii.	iv.
Fore	15	15	15	35
Mid	24	20	20	40
Hind	25	25	20	45

Length, 1.27 mm.; alar expanse, 2.5 mm.

♂.—Very different in colour from the ♀, being bright cupreous or bronzy all over. The metallic green on the antennae is thus masked, but it reappears on the hind femora.

Antennae with the funicular joints not broadened towards the apex; all practically of the same diameter. *Scutellum* with a reticulate pattern on the median area and

the longitudinal ridges bolder than in the ♀. *Propodaeum* with the lateral keels distinct; spiracle large. *Abdomen* with the petiole longer than in the ♀ and very stout; first tergite more extensive.

Length, 1.25 mm.; alar expanse, barely 2.5 mm.

NYASALAND: Zomba, 2 ♂♂ and 12 ♀♀, bred, along with ♂♂ of a Eupelmine and a ♀ Scelionid from eggs of a Hemipteron (?) (*E. Ballard*).

Holotype—a ♀.

***Pleurotropis violaceus*, sp. nov.**

A small deep blue species nearest to *P. telenomi*, Crawf. (1911), from Uganda, but slightly larger, darker and more metallic.

♀.—*Head* with the vertex and frons shining blue-black, obscurely reticulate. *Thorax* coloured like the vertex. Mesonotum evenly reticulate, the furrows not distinctly marked; apex of mid lobe not so deeply emarginate as in *P. telenomi*. Axillae further apart. Scutellum medianly almost smooth, but even in the centre a masked reticulation can be detected. *Abdomen* violet or blue-black, shining; the first tergite rather more extensive than in *telenomi*. *Legs* blackish brown with blue-black metallic reflections, especially on the hind tibiae.

Length, over 1.25 mm.; alar expanse, 2½ mm.

♂.—Bronzy all over. *Head* broad; vertex and frons to suture, metallic blue, entirely raised reticulate. *Antennae* shining metallic blue; funicle joints bead-like, stout, subequal; pedicel about equal to the first funicular joint. *Thorax* with the mesonotum entirely reticulate; the pattern on the scutellum slightly coarser. *Abdomen* blue-green; the first tergite occupying about five-eighths of the surface; smooth, shining, the other segments telescoped. *Legs* stronger than in *telenomi*, dark, shining, metallic blue-black; those of the latter more or less transparent brown with indefinite reflections.

Length, nearly 1 mm.; alar expanse, over 2 mm.

NYASALAND: Zomba, 1 ♂ and 1 ♀, bred, with *Tetrastichus* sp., from eggs of a Lymantriid moth (*Heteronygmia leucogyna*, Hmp.), which is very destructive to leaves of mahogany trees, 29. v. 13 (*E. Ballard*).

Holotype—a ♂.

***Pleurotropis illustris*, sp. nov. (figs. 9, 13).**

A large brilliant green form, with the median keels basally contiguous.

♀.—*Head* broader than thorax; vertex and frons to the scrobes, raised, reticulate, purple and violaceous green; depressed area behind posterior ocelli likewise reticulate. Eye orbit gleaming near the occipital ridge; eyes sparsely haired, their inner frontal edge decidedly concave. Malar space rather short; lower face reticulate and with hardly any metallic reflections.

Antennae rather widely separated; the joints cylindrical rather than bead-like, brown, with a greenish metallic gleam up to the end of the funicle.

Thorax: mesonotum evenly and rather finely (as regards the mesh) reticulate, the whole pattern boldly raised, brilliant metallic green. Parapsidal furrows distinct anteriorly, and traceable to the suture by varying the position of the insect,



1915. "Notes on african Chalcidoidea. ii." *Bulletin of entomological research* 5, 343–372. <https://doi.org/10.1017/S0007485300030352>.

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