

# A REVISION OF THE ANT GENUS *LEPTOGENYS* ROGER (HYMENOPTERA : FORMICIDAE) IN THE ETHIOPIAN REGION

WITH A REVIEW OF THE MALAGASY SPECIES

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## SYNOPSIS

The ant genus *Leptogenys* is revised for the Ethiopian Region and the species of the Malagasy Region are reviewed. Separate species-lists and keys for the two regions are given. Seventy species (56 Ethiopian, 14 Malagasy) are recognized, of which 26 are new. Twenty-five new

synonyms, mostly infraspecific, are established. No subgenera are recognized. The Madagascan species *jonesii* (Forel), known only from the male, is transferred to the genus *Pachycondyla* F. Smith.

## INTRODUCTION

THE genus *Leptogenys* comprises a reasonably compact and large genus within the tribe Ponerini. It was originally placed in a tribe of its own, along with *Prionogenys* Emery but as Brown (1963) pointed out, the traditional characters for separating a tribe Leptogenyini as independent are insufficient. At present there are some 280 named forms within the genus (including synonyms, etc.), which may represent about 175 valid species. Of these the Ethiopian and Malagasy regions have 56 and 14 species respectively, a total of 70 species or about 40 per cent of the world total.

The genus is distributed throughout the world's tropics and a few species occur in the subtropical zones. Wheeler (1922) gave a map of the distribution of the genus which has not radically altered since that time. Previous revisionary studies of the genus do not exist for the species of the Ethiopian and Malagasy regions although Arnold (1915) presented a key to the South African species and later gave additional notes and comments on a number of forms (Arnold, 1926).

Very little is known of the biology of the species. Nest sites are usually in the ground, in rotten wood or in compressed leaf litter (Bolton, 1973) although a few subarborescent species are now known which nest in dead wood at some distance above the ground and forage upon the tree-trunks. In other zoogeographical regions some species are semi-nomadic, without a fixed nest-site, but it is not known if this applies to any species from the regions under consideration at present. Food records are few, the species for which prey has been recorded show that the main diet is either of termites or terrestrial Isopoda. Many species are nocturnal and are only rarely to be found during daylight by normal collecting methods.

In the vast majority of species only the worker caste has been described. Females (queens) of only a few species are known and the males are virtually all unknown as collections of this caste in association with workers are extremely rare. The known males are all normal, winged forms but the females are apterous and in the main very ergatoid.

Most species are more or less restricted in distribution but a number of them, particularly some members of the *maxillosa*-group, are well-known tramp species, having been spread throughout the tropics by human commerce (Wilson & Taylor, 1967).

## ABBREVIATIONS OF MUSEUMS

AMNH, New York	The American Museum of Natural History, New York, U.S.A.
BMNH	British Museum (Natural History), London, U.K.
IE, Naples	Istituto di Entomologia, Naples, Italy.
MCSN, Genoa	Museo Civico di Storia Naturale 'Giacomo Doria', Genoa, Italy.
MCZ, Cambridge	Museum of Comparative Zoology, Cambridge, Mass., U.S.A.
MHN, Geneva	Muséum d'Histoire Naturelle, Geneva, Switzerland.
MNHN, Paris	Muséum National d'Histoire Naturelle, Paris, France.

MNHU, Berlin	Museum für Naturkunde der Humboldt-Universität, Berlin, Germany (D.D.R.).
MRAC, Tervuren	Musée Royal de l'Afrique Centrale, Tervuren, Belgium.
NM, Basle	Naturhistorisches Museum, Basle, Switzerland.
NM, Bulawayo	National Museum, Bulawayo, Rhodesia.
NM, Vienna	Naturhistorisches Museum, Vienna, Austria.
SAM, Cape Town	South African Museum, Cape Town, South Africa.
UFC, Yaounde	Université Fédéral du Cameroun, Yaounde, Cameroun.
UM, Oxford	University Museum, Oxford, U.K.

# MEASUREMENTS AND INDICES

Total Length (TL). The total outstretched length of the individual, from the mandibular apex to the gastral apex.

Head Length (HL). The straight-line length of the head in perfect full-face view, measured from the mid-point of the anterior clypeal margin to the mid-point of the occipital margin.

Head Width (HW). The maximum width of the head measured behind the eyes in full-face view.

Cephalic Index (CI).  $\frac{HW \times 100}{HL}$

Scape Length (SL). The straight-line length of the antennal scape, excluding the basal constriction or neck.

Scape Index (SI).  $\frac{SL \times 100}{HW}$

Pronotal Width (PW). The maximum width of the pronotum measured in dorsal view.

Petiole Height (PH). The height of the petiole measured in profile from the apex of the ventral (subpetiolar) process vertically to a line intersecting the dorsalmost point of the node.

Petiole Length (PL). The length of the petiole from the anterior process to the posteriormost point of the tergite, where it surrounds the gastral articulation.

Lateral Petiole Index (LPI).  $\frac{PH \times 100}{PL}$

Dorsal Petiole Width (DPW). The maximum width of the petiole in dorsal view.

Dorsal Petiole Index (DPI).  $\frac{DPW \times 100}{PL}$

All measurements are expressed in millimetres.

# DEFINITION OF THE GENUS

## *LEPTOGENYS* Roger

*Leptogenys* Roger, 1861 : 41. Type-species: *Leptogenys falcigera* Roger, 1861 : 42; by subsequent designation of Bingham, 1903 : 52.

- Lobopelta* Mayr, 1862 : 733. Type-species: *Ponera diminuta* F. Smith, 1857 : 69; by subsequent designation of Bingham, 1903 : 54. **Syn. n.**
- Lobopelta* Mayr [as subgenus of *Leptogenys*]; Emery, 1911 : 101, et auctt.
- Machaerogenys* Emery, 1911 : 100 [subgenus of *Leptogenys*]. Type-species: *Leptogenys truncatirostris* Forel, 1897 : 195; by original designation. **Syn. n.**
- Dorylozelus* Forel, 1915b : 24. Type-species: *Dorylozelus mjobergi* Forel, 1915b : 25; by monotypy (= *Leptogenys tricola* Taylor, 1969 : 132, substitute name for *D. mjobergi* due to secondary homonymy in *Leptogenys*). [Synonymy by Taylor, 1969 : 132.]
- Microbolbos* Donisthorpe, 1948 : 170. Type-species: *Microbolbos testaceus* Donisthorpe, 1948 : 170; by original designation. [Synonymy by Wilson, 1955 : 136.]

The synonymy of *Lobopelta* and *Machaerogenys* has been derived independently by Prof. W. L. Brown and will be recorded by him in his forthcoming revision of genera of tribe Ponerini.

*Worker.* Minute to large monomorphic ants belonging to the tribe Ponerini.

Mandibles variously shaped, may be subtriangular, short linear, or strongly elongate so that they are incapable of closing against the clypeus, but in all cases they are edentate or nearly so. Maximum number of teeth in species of Ethiopian and Malagasy Regions is three, consisting of apical plus two preapical; more usually only with one preapical or entirely without preapical teeth. Median portion of clypeus usually projecting as a distinct lobe, with a longitudinal median carina (absent only in *truncatirostris*). Palp formula 4,4. Lobes of frontal carinae small, only partially covering the antennal insertions, the major portion of which is visible in dorsal view. Antennae 12-segmented, the antennal scapes usually long, SI > 100, very rarely shorter. Eyes present in all known species, varying from very large to minute. Dorsal alitrunk with promesonotal suture well developed; metanotal groove present, usually distinct, reduced or indistinct only in some minute species. Middle and hind tibiae each with a large pectinate spur and a smaller simple spur. Pretarsal claws distinctly pectinate in most species, the pectination reduced to two, three or four teeth in some, very rarely absent in some minute species. Petiole a node of varying configuration, very rarely a thick, tapering scale (*spandax*). Gaster usually constricted between first and second segments, the constriction very faint or absent in some cases (*stuhlmanni*-group, *guineensis*-group). Sting long and stout.

*Female.* Usually ergatoid and with the same characters as the workers, but with the gaster larger. In one species (*ergatogyna*) the female is apterous but not ergatoid, with a complete set of thoracic sclerites and a full complement of sutures. Ocelli are present in this species but not in the other known females.

*Male.* Known only for a few species. Mandibles reduced, partially or wholly concealed by the broad clypeus when closed. Palp formula 6,4 (apparently 5,4 in some). Antennae 13-segmented, the scape short, at most about as long as the second funicular segment, often shorter. Eyes large, ocelli well developed. Lobes of frontal carinae widely separated, small, not concealing the antennal insertions. Mesoscutum with notauli and parapsidal furrows present; in profile this sclerite usually not swollen, not overhanging the pronotum in front. Hind wings without an anal lobe. Middle and hind tibiae with one large pectinate and one small simple spur. Pretarsal claws pectinate in all known species. Pygidium not projecting into a curved spine posteriorly.

#### NOTES ON THE GENUS

##### THE SYNONYMY OF *Leptogenys*.

Of the four names listed above as synonyms of *Leptogenys* two were previously recorded. The first of these, *Dorylozelus*, need not concern us here as it applies to an Australian species, and is fully documented by Taylor (1969). *Microbolbos* was a name erected by Donisthorpe (1948) to cover a single West African species

now known to be closely related to *guineensis*. Leaning heavily on the traditional characters used to define *Leptogenys*, Donisthorpe noted that in his species the claws were not pectinate and the mandible had three teeth (apical plus two preapical). Other small species are now known in which pectination is lost and a more or less complete series from fully to not pectinate can be constructed. Within the *guineensis*-group itself both *microps* and *testacea* lack pectination whilst *guineensis* has usually two minute teeth at least on the hind claws, and *spandax* has complete pectination. A similar phenomenon may be observed among the smaller species of the *nitida*-group. As pointed out by Wilson (1955), who synonymized *Microbolbos* to *Leptogenys*, the presence of an 'extra' preapical tooth is scarcely a useful character as in a number of species of the Oriental and Indo-Australian regions numerous preapical teeth are developed (*processionalis*-group).

The two names newly synonymized above were originally separated from *Leptogenys* on mandibular structure. *Lobopelta* was erected by Mayr (1862) at a time when only very few species were known of *Leptogenys*, and all placed therein had elongate, linear mandibles. Recognizing that the two were closely related, Mayr defined *Lobopelta* as the short mandibulate forms, *Leptogenys* as the long mandibulate species. The two were retained as separate genera by a number of authors (e.g. Bingham, 1903) but as more species were described it became apparent that the distinction was by no means as sharp as was at first thought, and eventually Emery (1911) reduced *Lobopelta* to subgenus of *Leptogenys*. Since that time other species have been described which cannot easily be placed in either subgenus as their mandibles are intermediate in form, and in the present paper the thirteen species of the *sulcinoda*-group show a series in which the mandibles become more elongate and the median lobe of the clypeus becomes shorter and narrower. The result is that at one end of the group are species in which the mandibles close tightly against the clypeus, and at the other end are forms which have a large gap between clypeus and mandibles when the latter are closed. Thus one has the strange situation of having both subgenera within the same species-group.

That the process of mandibular variation is not necessarily unidirectional is possibly illustrated by *zapyxis* of the *stuhlmanni*-group. In all other species of this group the mandibles are long and quite narrow. In *zapyxis*, however, a convex lamelliform extension has developed which runs most of the length of the inner mandibular margin and is, in effect, on its way back to a secondary short mandibulate condition as, if this lamella becomes much larger, then the mandibles will meet along their length when closed and will close against the clypeus although still projecting far in front of it.

In view of these facts it was decided that *Lobopelta* was not viable even as a subgenus and consequently it has been placed in the synonymy.

In the case of the final name, subgenus *Machaerogenys*, I cannot comprehend why a separate subgenus was ever thought necessary for *truncatirostris* and its allies. Emery's (1911) original description of the subgenus was based only on the mandibular structure of *truncatirostris* itself, which is admittedly very derivative. However, this diagnosis does not apply to the other two species usually placed here, *arcirostris* and *ridens*, which have more normal mandibles and hence must be removed from

*Machaerogenys* although sharing many other characters with *truncatirostris* (and showing a number of resemblances to the *maxillosa*-group). It is my opinion that a separate subgenus is unnecessary to contain a single species merely because its mandibles are more specialized than those of its closest relatives, and *Machaerogenys* has been abandoned.

#### FEMALES OF THE SPECIES.

Of the 56 species presently known from the Ethiopian Region, females are known for only six or seven, and all these except one are extremely ergatoid with the alitrunk and head similar to that of the worker. Ocelli and the thoracic sutures usually associated with this caste are absent. However, the female may be determined as the gaster is considerably more bulky than in the worker and the node of the petiole is usually antero-posteriorly compressed and considerably broader in dorsal view than in workers of the same species.

The queen of *ergatogyna* is the only female yet known from the genus in which flight sclerites and ocelli are distinct and well developed, although the queen of this species appears never to develop wings, and again bears a remarkable similarity to the worker caste.

#### MANDIBULAR STRUCTURES.

Regardless of the shape or length of mandible in individuals, many species of the Ethiopian Region have a mandibular groove which has its origin dorsolaterally at the extreme base of the blade. It runs diagonally to the outer margin of the mandible and continues down the ventral surface. In some species this groove takes the form of a broad channel (*attenuata*) whilst in others it is quite small (*furtiva*). In other species it may be reduced, vestigial or absent (*mactans*, *guineensis*-group), but it is particularly marked in members of the *stuhlmanni*-group.

In species in which this groove is present there is an apparently associated thin-spot or membranous area on the dorsal surface of the mandible, close to the base of the groove and on its inner side (towards the inner margin of the mandible). In the long mandibulate species the thin-spot is usually visible even when the mandibles are closed, but in others the spot is usually concealed by the leading edge of the clypeus unless the mandibles are open.

The function of these structures is not known, nor can any reason be suggested for their absence in some species.

### SPECIES OF THE ETHIOPIAN REGION

#### LIST OF SPECIES

##### *conradti*-group

*conradti* Forel

*crustosa* Santschi

*conradti* var. *rufipes* Santschi **syn. n.**

*africanus* Weber **syn. n.**

**maxillosa-group**

**falcigera** Roger

*insularis* F. Smith

**jeanneli** Santschi

**maxillosa** (F. Smith)

*falcata* Roger

*vinsonnella* (Dufour) **syn. n.**

*cribrata* Emery (provisional synonym)

**pavesii** Emery

*maxillosa* subsp. *sericea* Weber **syn. n.**

**stuhlmanni-group**

**camerunensis** Stitz

*stuhlmanni* race *camerunensis* var. *angusticeps* Forel [unavailable]

*stuhlmanni* subsp. *camerunensis* var. *opalescens* Wheeler [unavailable]

**erythraea** Emery **stat. n.**

**leiothorax** Prins **stat. n.**

**nebra** sp. n.

**regis** sp. n.

**schwabi** Forel

**sterops** sp. n.

**stuhlmanni** Mayr

*comorensis* Forel **syn. n.**

**titan** sp. n.

**vindicis** sp. n.

**zapyxis** sp. n.

**sulcinoda-group**

**bellii** Emery

**elegans** sp. n.

**excellens** sp. n.

**ferrarii** Forel

*ferrarii* st. *dentatula* Santschi **syn. n.**

**longiceps** Santschi

**mastax** sp. n.

**nuserra** sp. n.

**occidentalis** Bernard **stat. n.**

*ferrarii* subsp. *sulcinodis* Bernard **syn. n.**

*ferrarii* subsp. *bernardi* Baroni Urbani **syn. n.**

**princeps** sp. n.

**ravida** sp. n.

**sulcinoda** (André)

**terrioni** sp. n.

**trilobata** Santschi

**attenuata-group**

**attenuata** (F. Smith)

*jaegerskjoeldi* Santschi

**bubastis** sp. n.

**crassinoda** Arnold **stat. n.**

**ergatogyna** Wheeler

*cursor* Arnold **syn. n.**

**guineensis-group**

**guineensis** Santschi

**microps** sp. n.

**spandax** sp. n.

**testacea** (Donisthorpe)

**haviglandi-group****arnoldi** Forel**furtiva** Arnold **stat. n.****haviglandi** Forel**peringueyi** Forel**nitida-group****amon** **sp. n.****ankhesa** **sp. n.****buyssoni** Forel**castanea** (Mayr)*parva* Forel **syn. n.***parva* var. *bellua* Forel **syn. n.***parva* var. *dispar* Santschi **syn. n.***hewitti* Santschi **syn. n.****cryptica** **sp. n.****diatra** **sp. n.****honorio** **sp. n.****khaura** **sp. n.****mactans** **sp. n.****nitida** (F. Smith)*intermedia* Emery **syn. n.***tenuis* Stitz*nitida* var. *adpressa* Forel **syn. n.***nitida* var. *aena* Forel **syn. n.***nitida* var. *gracilis* Santschi **syn. n.***nitida* st. *insinuata* Santschi **syn. n.***nitida* var. *grandior* Forel **syn. n.***nitida* race *brevinodis* Forel **syn. n.***nitida* st. *speculans* Santschi **syn. n.***brevinodis* var. *deflocata* Santschi **syn. n.***nitida* var. *capensis* Baroni Urbani **syn. n.****piroskae** Forel**strator** **sp. n.****striatidens** **sp. n.****stygia** **sp. n.**

Note. A number of the synonyms given above in *nitida* and *maxillosa*-groups have also been determined independently by Prof. W. L. Brown and will be recorded by him in his forthcoming revision of the genera of tribe Ponerini.

## KEY TO SPECIES

## (Workers)

- 1 With petiole in profile the posterodorsal angle projecting as a spine or tooth (Text-fig. 24) . . . . . 2
- With petiole in profile the posterodorsal angle not projecting as a spine or tooth . . . . . 3
- 2 Rugosity of head and alitrunk overlaid by a dense puncturation. Scapes, legs, and at least the first gastral tergite reticulate and dull. (Guinea, Gabon, Cameroun, Zaire, Sudan . . . . . **crustosa** (p. 251)
- Rugosity of head and alitrunk not overlaid by puncturation. Scapes and legs usually shiny, not reticulate; first gastral tergite highly polished. (Ivory Coast, Ghana, Cameroun) . . . . . **conradti** (p. 250)

- 3 Entirety of head, alitrunk and gaster densely shagreened and opaque, with scattered larger punctures and short, dense, greyish, pruinose pubescence . . . . . 4
- Not entirely shagreened, usually not opaque, at least the gaster usually shining. If finely and densely reticulate-punctate everywhere then scattered larger punctures absent and dense pruinose pubescence lacking . . . . . 7
- 4 Dorsum of head, alitrunk and first two gastral tergites with numerous standing hairs. Larger species, HL > 1.75. (Tanzania) . . . . . *jeanneli* (p. 253)
- Dorsum of head, alitrunk and first two gastral tergites without standing hairs. Smaller species, HL < 1.75 . . . . . 5
- 5 Fringing lamella of clypeus broad and broadly rounded. Outer margin of mandible straight or concave in its distal half (Text-fig. 1). Sides of head not strongly divergent anteriorly in full-face view. (Somalia, Sudan, Cameroun, Kenya, Tanzania; tramp species in Old World tropics) . . . . . *pavesii* (p. 255)
- Fringing lamella of clypeus narrow, either narrowly rounded or obtusely angulate medially. Outer margin of mandible convex throughout its length (Text-fig. 2). Sides of head divergent anteriorly in full-face view . . . . . 6
- 6 Node of petiole in dorsal view distinctly broader than long, DPI > 105. (Zaire, Rhodesia, S.W. Africa; pantropical tramp species) . . . . . *maxillosa* (p. 254)
- Node of petiole in dorsal view at least as long as broad, usually distinctly longer than broad, DPI 100 or less (pantropical tramp species) . . . . . *falcigera* (p. 252)
- 7 First and second gastral tergites without hairs, with sparse, strongly adpressed pubescence. Eyes minute, their maximum diameter less than the maximum width of the scape. Gaster very weakly or not constricted between the first and second segments . . . . . 8
- First and second gastral tergites with hairs, often also with pubescence. If gastral hairs sparse then either eyes larger, their maximum diameter greater than the maximum width of the scape, or gaster strongly constricted between first and second segments, or both . . . . . 11
- 8 Pronotal dorsum with a pair of long, erect hairs anteriorly, much longer than the remaining pilosity. Minute species, HL < 0.70, PW < 0.42, with minute eyes, diameter < 0.05. (Ivory Coast) . . . . . *microps* (p. 278)
- Pronotal dorsum without a pair of long, erect hairs anteriorly, pilosity absent or hairs of approximately equal length. Larger species, HL > 0.75, PW > 0.45, with larger eyes, diameter > 0.07 . . . . . 9
- 9 Pronotal dorsum without short, standing hairs. Petiole in profile a thick scale, tapering dorsally (Text-fig. 28). Larger species with relatively longer antennal scapes, HL > 1.25, SI > 140. (Ghana) . . . . . *spandax* (p. 279)
- Pronotal dorsum with numerous short, standing hairs. Petiole in profile not a thick scale but a high, narrow node. Smaller species with relatively shorter scapes, HL < 1.10, SI < 130 . . . . . 10
- 10 Apex of mandible with three teeth, apical plus two preapical (Text-fig. 23). (Ghana) . . . . . *testacea* (p. 280)
- Apex of mandible with two teeth, apical plus one preapical. (Guinea, Ghana) . . . . . *guineensis* (p. 278)
- 11 Petiole in profile or in dorsal view with the upper halves of the sides longitudinally rugose or sulcate . . . . . 12
- Petiole in profile or in dorsal view with the upper halves of the sides not longitudinally rugose or sulcate . . . . . 15
- 12 Pronotal dorsum unsculptured apart from pits from which hairs arise . . . . . 13
- Pronotal dorsum sculptured, at least anteriorly . . . . . 14
- 13 In full-face view the occipital margin of the head feebly convex (Text-fig. 14). Petiole node in profile longer, LPI < 140. (Gabon). . . . . *sulcinoda* (p. 272)
- In full-face view the occipital margin of the head broadly concave (Text-fig. 13). Petiole node in profile shorter, LPI > 145. (Guinea) . . . . . *occidentalis* (p. 270)

- 14 Larger species,  $HL > 1.00$ ,  $PW > 0.58$ , with relatively longer head and scapes,  $CI < 65$ ,  $SI > 140$ . (Ivory Coast, Ghana) . . . . . **mastax** (p. 268)
- Smaller species,  $HL < 1.00$ ,  $PW < 0.58$ , with relatively shorter head and scapes,  $CI > 65$ ,  $SI < 135$ . (Ivory Coast, Ghana) . . . . . **nuserra** (p. 269)
- 15 Mandibles extended into elongate, narrow, linear or sublinear blades, the inner margins of which are often concave. Mandibles not capable of closing tightly against the median lobe of the clypeus, which is often reduced, enclosing a space (sometimes large) between themselves and the clypeus (Text-figs 7–11) . . . . . 16
- Mandibles short and usually quite stout, their inner margins usually distinctly convex. Mandibles capable of closing tightly against the median lobe of the clypeus, never enclosing a space between themselves and the clypeus (Text-figs 13–18) . . . . . 35
- 16 Antennal scapes with  $SL > 1.90$ . Gaster very weakly or not constricted between the first and second segments. Metanotal groove not cross-ribbed or sculptured . . . . . 17
- Antennal scapes with  $SL < 1.70$ . Gaster distinctly constricted between first and second segments. Metanotal groove distinctly cross-ribbed or otherwise sculptured . . . . . 27
- 17 With head in full-face view eyes not breaking the outline of the sides of the head (Text-fig. 8). Antennal scapes with dense pubescence but without erect hairs which are as long as the maximum width of the scape. Large species with relatively short scapes,  $HL > 2.10$ ,  $SI < 170$ . . . . . 18
- With head in full-face view eyes breaking the outline of the sides of the head (Text-figs 4, 7). Antennal scapes with numerous erect hairs which are as long as or longer than the maximum width of the scape; pubescence on scapes usually sparse. Smaller species with relatively long scapes,  $HL < 2.10$ ,  $SI > 180$  . . . . . 19
- 18 Dorsum of pronotum and propodeum unsculptured apart from pits from which hairs arise. Maximum diameter of eye about 0.66. (Cameroun) . . . . . **titan** (p. 263)
- Dorsum of pronotum and propodeum, especially the latter, sculptured. Maximum diameter of eye about 0.50. (Kenya, Tanzania) . . . . . **regis** (p. 259)
- 19 Entire dorsum of alitrunk completely unsculptured. Sides of alitrunk unsculptured apart from cross-ribbing at meso-metapleural suture and a few rugae around the bulla of the metapleural gland. Full adult colour brown or deep red-brown, with bluish or violet opalescence, which may be patchy . . . . . 20
- Propodeal dorsum at least weakly, usually strongly sculptured; pronotum sometimes sculptured, often not. Sides of alitrunk with plurae and propodeum striate or rugose. Full adult colour black or brown but without opalescence . . . . . 21
- 20 Larger species with antennal scapes both absolutely and relatively longer,  $SL > 2.75$ ,  $SI > 230$ . (Cameroun, Zaire) . . . . . **camerunensis** (p. 256)
- Smaller species with antennal scapes both absolutely and relatively shorter,  $SL < 2.60$ ,  $SI < 220$ . (Mozambique) . . . . . **leiothorax** (p. 258)
- 21 Inner margin of mandible with a convex, semi-translucent lamella (Text-fig. 21). (Ghana) . . . . . **zapyxis** (p. 264)
- Inner margin of mandible without a convex, semi-translucent lamella (Text-figs 6, 20) . . . . . 22
- 22 Antennal scapes relatively shorter,  $SI < 200$  . . . . . 23
- Antennal scapes relatively longer,  $SI > 200$  . . . . . 24
- 23 Larger species,  $HL > 1.80$ , with maximum diameter of eye 0.50 or more. Pronotal dorsum weakly sculptured. With mandibular apices overlapping the basal portion of each blade passing through a curve before its junction with the clypeus. (Sudan, Kenya, Mozambique, Comoro Islands) . . . . . **stuhlmanni** (p. 261)
- Smaller species,  $HL < 1.60$ , with maximum diameter of eye  $< 0.45$  (ca 0.40). Pronotal dorsum unsculptured apart from minute hair-pits. With mandibular apices overlapping the basal portion of each blade not passing through a curve before its junction with the clypeus. (Ivory Coast) . . . . . **sterops** (p. 261)
- 24 Dorsum of head unsculptured apart from minute hair-pits: pronotal dorsum usually the same but rarely with some faint sculpturation. . . . . 25

- Dorsum of head and pronotum distinctly sculptured everywhere. (Cameroun) *vindicis* (p. 263)
- 25 Larger species with very large eyes,  $HL > 1.90$ , maximum diameter of eye  $0.54$  or more. Full adult colour brown. (Ethiopia) *erythraea* (p. 257)
- Smaller species with smaller eyes,  $HL < 1.85$ , maximum diameter of eye  $0.48$  or less. Full adult colour black 26
- 26 Eyes larger, maximum diameter in the range  $0.44-0.48$  (in HW range of  $1.08-1.22$ ). Width of head across eyes the same as or only slightly less than the width across the clypeus from corner to corner. (Rhodesia, South Africa) *schwabi* (p. 259)
- Eyes smaller, maximum diameter about  $0.36$  (with HW ca  $1.22$ ). Width of head across eyes much less than width across the clypeus from corner to corner. (Cameroun) *nebra* (p. 258)
- 27 Dorsum of head finely rugose or reticulate-rugose, the interrugal spaces with numerous fine punctures 28
- Dorsum of head not rugose nor reticulate-rugose; either punctate, reticulate-punctate or smooth and shining 29
- 28 Pronotum with a fine and very dense reticulation which covers the entire dorsum, also with scattered hair-pits. Larger species,  $HL > 1.30$ ,  $SL > 1.40$ ,  $SI > 125$ . (Cameroun) *terrioni* (p. 273)
- Pronotum without a fine reticulation, at most with a few weak, rounded rugulae. Smaller species,  $HL < 1.20$ ,  $SL < 1.20$ ,  $SI < 120$ . (Cameroun, Zaire) *trilobata* (p. 273)
- 29 Sides of head below and behind eyes and lateral portions of ventral surface of head strongly sculptured. (Zaire) *excellens* (p. 266)
- Sides of head below and behind eyes and lateral portions of ventral surface of head unsculptured except for hair-pits and very rarely some weak, superficial reticulation 30
- 30 Dorsum of head coarsely and closely reticulate-punctate, the punctures not separated by smooth areas. Larger species,  $HL > 1.20$ ,  $PW > 0.75$ . Node of petiole massive,  $PL > 0.60$ ,  $PH > 0.75$ . *princeps* (p. 271)
- Dorsum of head with scattered punctures which are separated by smooth areas. Smaller species,  $HL < 1.15$ ,  $PW < 0.70$ . Node of petiole smaller,  $PL < 0.55$ ,  $PH < 0.70$  31
- 31 Mesopleuron completely reticulate-punctate, with numerous transverse rugulae. Petiole dorsum and upper halves of sides reticulate-punctate superimposed upon a coarser rugulation. (Senegal, Ghana) *longiceps* (p. 268)
- Mesopleuron not reticulate-punctate; a few punctures and transverse rugulae may be present but there are extensive unsculptured areas. Petiole dorsum and sides not reticulate-punctate 32
- 32 Middle of posterodorsal margin of petiole slightly projecting as an obtuse tubercle. (Ethiopia) *bellii* (p. 265)
- Middle of posterodorsal margin of petiole not projecting as a tubercle 33
- 33 Eyes smaller, their maximum diameter approximately equal to the length of the third funicular segment (Text-fig. 10). Head black, very polished, with only a few scattered, minute punctures. (Zaire) *ravida* (p. 272)
- Eyes larger, their maximum diameter markedly greater than the length of the third funicular segment (Text-fig. 9). Head brown or black, if black then with numerous quite distinct punctures 34
- 34 Larger species,  $HL > 0.95$ ,  $SL > 0.85$ , with longer petiole,  $LPI < 140$ . Full adult colour black. (Ivory Coast, Ghana, Nigeria, Cameroun) *elegans* (p. 265)
- Smaller species,  $HL < 0.90$ ,  $SL < 0.85$ , with shorter petiole,  $LPI > 140$ . Full adult colour brown. (Zaire, Rhodesia) *ferrarii* (p. 267)

- 35 Propodeal dorsum with a longitudinal groove medially, and anteriorly with a broad, transverse impression posterior to the metanotal groove. Mandibles very broad, massively developed (Text-fig. 22). Antennal scapes relatively very long,  $SI > 220$ . (Ghana, Uganda, Cameroun, Zaire) . . . *ergatogyna* (p. 276)
- Propodeal dorsum without a median groove and transverse impression anteriorly. Mandibles not as above. Antennal scapes shorter,  $SI < 200$  . . . 36
- 36 Dorsum of head coarsely reticulate-punctate or very densely punctulate over most or all of its surface . . . 37
- Dorsum of head either smooth and shining, with only scattered punctures from which hairs arise, or rarely superficially finely reticulate . . . 43
- 37 Minute species,  $HL < 0.85$ ,  $PW < 0.50$ . Eyes small or minute, their maximum diameter much less than the maximum width of the scape. Second funicular segment at most as long as third, usually much shorter than third . . . 38
- Larger species,  $HL > 1.10$ ,  $PW > 0.65$ . Eyes large, their maximum diameter greater than the maximum width of the scape. Second funicular segment distinctly longer than the third . . . 40
- 38 Pronotal dorsum unsculptured, smooth and shining. (Nigeria) . . . *khaura* (p. 288)
- Pronotal dorsum strongly sculptured . . . 39
- 39 Antennal scapes longer,  $SI \geq 119$  or more. Eyes larger, with more than 10 facets. Full adult colour black. (Nigeria, Cameroun) . . . *stygia* (p. 292)
- Antennal scapes shorter,  $SI \leq 115$  or less. Eyes smaller, with less than 10 facets. Full adult colour yellow-brown. (Ghana) . . . *cryptica* (p. 286)
- 40 First and second gastral tergites covered with a fine, dense, reticulate-punctuation or granulation, without smooth, shining areas. (Rhodesia) . . . *furtiva* (p. 281)
- First and second gastral tergites unsculptured, smooth and shining apart from pits from which hairs arise . . . 41
- 41 Pronotal dorsum with scattered small pits separated by smooth areas, without a fine blanketing sculpture on any part of the sclerite. (South Africa) *peringueyi* (p. 282)
- Pronotal dorsum with a fine, dense sculpturation, blanketing the sclerite at least in part . . . 42
- 42 Fringing lamella of clypeus narrow and indistinct. Antennal scapes relatively short,  $SI < 140$ . Eyes large, maximum diameter 0.34 or more. (Rhodesia) *arnoldi* (p. 281)
- Fringing lamella of clypeus broad and distinct, usually opaque. Antennal scapes relatively long,  $SI > 140$ . Eyes smaller, maximum diameter 0.30 or less. (South Africa). . . *havilandi* (p. 282)
- 43 Ventral process of petiole complex, double, consisting of a large lobe or tooth antero-ventrally and a smaller lobe or tooth situated more posteriorly, the two separated by a distinct space or indentation (Text-fig. 25) . . . 44
- Ventral process of petiole simple, single, consisting only of a lobe or tooth antero-ventrally, of varying configuration . . . 46
- 44 Sides and ventral surface of head sculptured. Node of petiole in profile decreasing slightly in thickness from base to apex. (Zaire) . . . *strator* (p. 291)
- Sides and ventral surface of head not sculptured. Node of petiole in profile increasing slightly in thickness from base to apex . . . 45
- 45 Pronotal dorsum with numerous shallow, foveolate impressions separated by smooth areas. Smaller species,  $SL < 1.10$ , with relatively shorter antennal scapes,  $SI < 135$ . (Cameroun) . . . *honorio* (p. 287)
- Pronotal dorsum smooth, without foveolate impressions. Larger species,  $SL > 1.10$ , with relatively longer antennal scapes,  $SI > 135$ . (Zaire) *ankhesa* (p. 284)
- 46 Antennal scapes with  $SL > 1.40$  . . . 47
- Antennal scapes with  $SL < 1.30$  . . . 50

- 47 Maximum diameter of eye in full-face view less than maximum width of scape. Ventral process of petiole a broad lobe with a posteroventral tooth. Full adult colour red-brown. (Ethiopia) . . . . . **buyssoni** (p. 285)
- Maximum diameter of eye in full-face view greater than maximum width of scape. Ventral process of petiole a simple or acute lobe. Full adult colour black . . . . . 48
- 48 Larger species with relatively longer head and antennal scapes and larger eyes; HL 1.50 or more, CI < 65, SI > 170, ocular diameter 0.36 or more. Node of petiole in dorsal view very strongly narrowed anteriorly, much broader behind than in front, the sides feebly concave (Text-fig. 29). Head and body usually with bluish opalescence. (South Africa) . . . . . **attenuata** (p. 274)
- Smaller species with relatively shorter head and antennal scapes and smaller eyes; HL < 1.45, CI > 65, SI < 165, ocular diameter 0.32 or less. Node of petiole in dorsal view only slightly narrower in front than behind (Text-fig. 30). Head and body shiny black, without bluish opalescence . . . . . 49
- 49 Mesonotum and propodeum without scattered large pits or punctures. Propodeal dorsum shorter, about 1.10 in profile from metanotal groove to apex of prominence on declivity in workers with HW range 0.96–1.00. (South Africa) **crassinoda** (p. 276)
- Mesonotum and propodeum with numerous scattered large pits or punctures. Propodeal dorsum longer, about 1.30 in profile from metanotal groove to apex of prominence on declivity in workers with HW range 0.96–1.00. (Cameroun) **bubastis** (p. 275)
- 50 Antennal scapes relatively very short, SI < 95. (South Africa) . . . . . **mactans** (p. 288)
- Antennal scapes relatively long, SI 100 or more . . . . . 51
- 51 Mandibles covered with dense, fine, longitudinal striation. Dorsum of head and pronotum with dense but superficial reticulation. (Cameroun) . . . . . **striatidens** (p. 292)
- Mandibles smooth and shining, not striate. Dorsum of head and pronotum smooth, without superficial reticulation . . . . . 52
- 52 Circumocular impression very broad and deep in front of, above and behind eye, so that the eye appears to be sunk in a concavity in the side of the head (Text-fig. 18). Node of petiole in dorsal view much longer than broad, DPI < 70; head long and narrow, CI < 65. (Cameroun) . . . . . **amon** (p. 283)
- Circumocular impression very weak or absent, the eye not sunk into a concavity in the side of the head. Node of petiole much broader, DPI 80 or more; head shorter and broader. CI 69 or more . . . . . 53
- 53 Antennal scapes both relatively and absolutely shorter, SL < 0.75 (range 0.62–0.70), SI < 120 (range 100–117). (Rhodesia, South Africa) . . . . . **castanea** (p. 285)
- Antennal scapes both relatively and absolutely longer, SL > 0.75 (range 0.80–1.08), SI 120 or more (range 120–130) . . . . . 54
- 54 Smaller species, HL ca 0.86, HW ca 0.62, SL ca 0.80. Ventral process of petiole an elongate, recurved tooth. (Cameroun) . . . . . **diatra** (p. 287)
- Larger species, HL > 0.90, HW > 0.65, SL > 0.85. Ventral process of petiole a lobe, the posteroventral angle of which may be dentiform, but not as above . . . . . 55
- 55 Eyes larger, ocular diameter greater than 0.11, the eyes set well forwards on the sides of the head. The maximum diameter of the eye equal to or greater than the maximum width of the scape in full-face view. (Eastern and southern Africa) **nitida** (p. 289)
- Eyes small, ocular diameter ca 0.09, the eyes set well back on the sides of the head (Text-fig. 15). The maximum diameter of the eye much less than the maximum width of the scape in full-face view. (Ethiopia) . . . . . **piroskae** (p. 290)

THE *CONRADTI*-GROUP

Mandibles elongate and linear, curved, not closing tightly against the clypeus. Eyes large, their maximum diameter in full-face view greater than the maximum width of the scape. Second funicular segment elongate, distinctly longer than the third. Head strongly broadened anteriorly, much broader in front than behind. Posterodorsal angle of petiole in profile drawn out into a tooth or spine (Text-fig. 24). Sculpture coarse, rugose upon the head and alitrunk. Gaster constricted between the first and second segments. Clypeus with a prominent median lobe, without a fringing lamella. Standing hairs present on all dorsal surfaces of head and body.

The two species constituting this small group are easily distinguished from their congeners by the characters listed above, the fifth of which is diagnostic. Related species with this character are also known from the Neotropics (*unistimulosa* Roger and its allies). The two species of the Ethiopian Region seem to be confined to forested zones but are widely distributed.

*Leptogenys conradti* Forel

*Leptogenys conradti* Forel, 1913b : 666. Syntype workers, CAMEROUN: (*Conradt*) (MHN, Geneva) [examined].

DIAGNOSIS OF WORKER. Posterodorsal angle of petiole in profile drawn out into a spine or tooth. Head and alitrunk rugose, not overlaid by punctures. First gastral tergite smooth and shining.

FURTHER DESCRIPTION. *Worker*. TL 9.4–10.4, HL 1.66–1.76, HW 1.40–1.48, CI 81–85, SL 1.92–2.20, SI 145–155, PW 1.18–1.24, PH 1.10–1.18, PL 0.90–0.96, LPI 117–125, DPW 0.76–0.84, DPI 83–87 (12 measured).

Head considerably broader in front than behind, the occipital border acutely margined and broadly but shallowly concave. Eyes large, maximum diameter ca 0.40–0.44, their greatest diameter in full-face view greater than the maximum width of the scape. Circumocular impression present on inner and posterior margins of eyes. Clypeus with a rounded prominent median lobe. Mandibles elongate, becoming slightly broader from base to apex, most strongly curved near the base and enclosing a large space between them and the clypeus when their apices are overlapping. Second funicular segment long, the respective lengths of segments 1–3 ca 0.26–0.30, 0.44–0.50, 0.36–0.40. Metanotal groove impressed and cross-ribbed. Petiole in profile massive, the posterodorsal angle produced into a tooth which is variously developed amongst individuals but is usually distinctly dentiform. Head, alitrunk and petiole coarsely rugose, the rugae on the head predominantly longitudinal, more sharply developed in some individuals than in others. Gaster unsculptured, smooth and highly polished. Legs and antennae usually shining, but rarely with some fine punctures. Standing hairs abundant upon all surfaces.

This species and *crustosa* are characterized by the projection of the posterior portion of the petiole node into a spine or tooth. They are separable by the characters given in the key and the diagnoses above and also by the fact that *crustosa* averages smaller than *conradti* although this may be found to be incorrect as the species become better known.

A single specimen in the MCZ, Cambridge collection may represent a third species in this group. It resembles *conradti* closely but is smaller, HL 1.38, HW 1.14, (CI 83), SL 1.38, (SI 121), PW 0.96. Note also that the scapes are relatively much shorter. The posterodorsal prominence of the petiole is short and blunt and the clypeus is less acutely carinate than in *conradti*. The sculpture of the cephalic dorsum in

this specimen consists of numerous fine rugulae, not arranged into any pattern or direction.

This specimen may represent a distinct species or may be an extremely aberrant or first-brood specimen of *conradti*, but as only a single worker is available it is not possible at present to decide upon its status. Accordingly I have labelled it '*conradti?*' in the MCZ, Cambridge collection.

#### MATERIAL EXAMINED.

IVORY COAST: Lamto, Toumodi (*J. Lévi*); O.R.S.T.O.M. Exp. Sta., Abidjan (*W.L. Brown*). GHANA: Tafo (*B. Bolton*); Bosuso (*D. Leston*); Mt Atewa (*D. Leston*); Legon (*D. Leston*); Sajimasi (*D. Leston*); Aburi (*D. Leston*). CAMEROUN: Ototomo (*G. Terron*); Mbale Mejo to Ekingli (*G. Schwab*).

### *Leptogenys crustosa* Santschi

(Text-fig. 24)

*Leptogenys crustosa* Santschi, 1914a : 326, fig. 12. Syntype workers, GUINEA: Conakry, 8.viii.1913 (*F. Silvestri*) (IE, Naples).

*Leptogenys (Leptogenys) conradti* var. *rufipes* Santschi, 1937 : 75. Holotype worker [not female], GABON: Samkita (*F. Faure*) (NM, Basle) [examined]. **Syn. n.**

*Leptogenys (Leptogenys) africanus* Weber, 1942 : 47, fig. 8. Holotype and paratype workers, SUDAN: Lotti Forest, W. slopes of Imatong Mountains, 5.viii.1939 (*N. A. Weber*) (MCZ, Cambridge) [examined]. **Syn. n.**

DIAGNOSIS OF WORKER. Posterodorsal angle of petiole node in profile drawn out into a blunt spine. Sculpturation of head and alitrunk rugose, overlaid by a fine, dense puncturation. First gastral tergite coarsely reticulate.

FURTHER DESCRIPTION. *Worker*. TL 7.3–9.1, HL 1.34–1.64, HW 1.08–1.38, CI 79–84, SL 1.48–1.90, SI 136–137, PW 0.92–1.20, PH 0.86–1.12, PL 0.74–1.00, LPI 112–116, DPW 0.64–0.86, DPI 86–87 (4 measured).

Head markedly broader in front than behind, in the largest specimen examined width of head in front of eyes at maximum was 1.60, and width across occipital margin 0.96. Eyes large, maximum diameter 0.33–0.46, surrounded on their internal margins by a distinct circumocular impression. Maximum diameter of eye much greater than maximum width of scape. Clypeus with a rounded median lobe. Mandibles elongate and narrow, not closing tightly against the clypeus, enclosing a large gap when their apices are in contact. Mandibular blades most strongly curved basally. Second funicular segment elongate, the respective lengths of segments 1–3 ca 0.30–0.40, 0.34–0.44, 0.28–0.30. Petiole in profile with the posterodorsal angle produced into a short spine. Basic sculpturation of head, alitrunk and petiole a coarse rugosity, predominantly longitudinal upon the head, but everywhere the rugosity is overlaid by a dense puncturation, which is more strongly developed in large than in small individuals. First and second gastral tergites, or at least their basal halves, with a relatively coarse superficial reticulation. This is also present upon the legs and scapes, which are consequently dull. Standing hairs numerous upon all surfaces. Colour black, with the mandibles, antennae and legs red-brown or orange-brown.

#### MATERIAL EXAMINED.

CAMEROUN: no loc. (*G. Terron*). ZAIRE: Elisabetha (*Tinant*): Ituri, Okondo (*A. Collart*).

THE *MAXILLOSA*-GROUP

(Text-figs 1, 2, 3, 31)

Mandibles elongate and linear, curved, not closing tightly against the clypeus. Eyes large, their maximum diameter in full-face view greater than the maximum width of the scape. Second funicular segment not, or only very slightly longer than the third. Head slightly or strongly broadened anteriorly, varying among species. Sculpture of a dense shagreening everywhere with scattered larger punctures. Entire body with dense, greyish pruinose pubescence. Gaster constricted between first and second segments. Clypeus without a prominent median lobe; with a fringing lamella.

A further character of value in separating three of the four species of this group (*pavesii*, *maxillosa* and *falcigera*) from all others of the Ethiopian Region except for some members of the *guineensis*-group is that they lack standing hairs on the dorsum of the head, alitrunk, petiole and first two or three gastral tergites. This character also applies to *pruinosa* Forel, an extralimital species of the *maxillosa*-group described from Sri Lanka. Forel (1901b : 81) stated that *pruinosa* was found on wood imported into Hamburg from East Africa and, as I am of the opinion that the *maxillosa*-group is of African origin, I would not be unduly surprised if *pruinosa* were discovered at some time in the future in Kenya or Tanzania.

All species of this group in the Ethiopian region with the exception of the large *jeanneli* are tramp species in the tropical zones of the world and probably rely on human commerce for transportation. To judge from the number of collections examined, *falcigera* has been able to establish itself in some strength in the Hawaiian Islands, whilst *maxillosa* has been recorded from both Cuba and Brazil.

The *maxillosa*-group appears to be related to *truncatirostris* and its allies of the Malagasy Region, but in these species standing hairs are present on the head and body and the mandibles tend to be shorter and broader though linear or sublinear in form.

*Leptogenys falcigera* Roger

(Text-fig. 2)

*Leptogenys falcigera* Roger, 1861 : 42. Holotype worker, SRI LANKA (*H. Nietner*) (location of type not known).

*Leptogenys insularis* F. Smith, 1879 : 675. Syntype workers, HAWAII: Oahu Is. (*T. Blackburn*) (BMNH) [examined]. [Synonymy by Wilson & Taylor, 1967 : 30.]

DIAGNOSIS OF WORKER. Densely shagreened with scattered larger punctures. Without standing hairs. Petiole in dorsal view as long as or longer than broad. Lamelliform margin of clypeus narrow and translucent. Outer margin of mandible convex throughout its length.

FURTHER DESCRIPTION. *Worker*. TL 7.0-7.8, HL 1.40-1.52, HW 1.32-1.46, CI 93-96, SL 1.32-1.48, SI 98-104, PW 0.92-1.02, PH 0.84-0.90, PL 0.66-0.78, LPI 115-127, DPW 0.68-0.70, DPI 90-100 (8 measured).

Head broadened in front of the eyes, the sides weakly convex but diverging anteriorly throughout their length. Eyes large, their maximum diameter ca 0.32-0.38. In full-face view their maximum diameter much greater than the maximum width of the scape. Anterior border of clypeus with a narrow, fringing lamella which is translucent and is narrowly rounded or forms an obtuse angle anteromedially. Mandibles long and linear, their outer margins convex throughout the length of the blade, most strongly convex near the base. Metanotal

groove weak, virtually obliterated. Node of petiole in dorsal view usually longer than broad, more rarely about as long as broad. Entire body densely shagreened and with numerous scattered larger punctures. Pruinose pubescence present everywhere but standing hairs absent except on the clypeus and gastral apex.

Within this species-group *jeanneli* is easily separated by its possession of standing hairs upon the dorsal surfaces of the head and body, but the other three members form a complex of closely related species which in all likelihood arose in the Ethiopian Region although all three are now widely distributed tramp species; and there is at least one other relative (*pruinosa* Forel) at present unknown in the Ethiopian Region.

Both *falcigera* and *maxillosa* have a relatively narrow clypeal lamella which is translucent and is narrowly rounded or forms an obtuse, rounded angle medially. Also in both these species the outer margin of the mandible is convex throughout its length and the mandibles are long and narrow. The head is strongly broadened anteriorly and the sides are not as convex as in *pavesii*. In *pavesii* the clypeal lamella is broad and broadly and evenly rounded, not forming an angle medially, and is usually opaque. The outer margin of the mandible is convex basally but distal to the convexity is usually flat or concave for part of its length. The mandibular blades themselves are shorter and stouter than in *maxillosa* or *falcigera*. The head is not strongly broadened anteriorly and the sides are more convex in *pavesii*. The separation of *falcigera* from *maxillosa* rests most convincingly upon the shape of the petiole node in dorsal view. In *maxillosa* the node is always distinctly broader than long, with  $DPI > 105$ , whilst in *falcigera* the node is at most as broad as long, usually distinctly longer than broad, and with a maximum DPI of 100.

In the present study *falcigera* has not been recorded from the mainland of the Ethiopian Region but its range is expected to extend at least into the eastern parts of the continent. It has been previously recorded from Madagascar, Aldabra, Sri Lanka and the Hawaiian Islands.

#### MATERIAL EXAMINED.

ALDABRA Is.: South Is. (J. G. Frazier). SRI LANKA: Peraden (C. T. Bingham). HAWAII: Wailuku, Maui (R. C. L. Perkins); Hilo (G. Poinar); Honolulu (K. Oshiro).

### *Leptogenys jeanneli* Santschi

(Text-figs 3, 31)

*Leptogenys jeanneli* Santschi, 1914c : 55, fig. 3. Holotype worker, TANZANIA: Grotte B. du Kulumuzi, à Tanga (st. no. 74), iv. 1912 (*Alluaud & Jeannel*) (NM, Basle) [examined].

DIAGNOSIS OF WORKER. Entirety of head and body densely shagreened and opaque, with scattered larger punctures. Numerous standing hairs present on the dorsal surfaces of the head and body.

FURTHER DESCRIPTION. *Worker*. TL 9.6, HL 1.86, HW 1.72, CI 92, SL 1.94, SI 113, PW 1.08, PH 0.98, PL 0.94, LPI 104, DPW 0.72, DPI 76.

Head broader in front than behind, maximum width in front of eyes  $> 1.80$ , width across occipital margin  $< 1.40$ . Eyes large, ocular diameter at maximum 0.42, the maximum diameter much greater than the maximum width of the scape. Eyes with a pronounced

circumocular impression on their inner margins. Clypeus medially with a narrow, translucent fringing lamella. Mandibles long, narrow and curved, leaving a large gap between them at full closure. Outer margins of mandibular blades convex throughout their length, most strongly curved basally; tapering from base to apex and terminating in an acute apical tooth. Preapical teeth absent. Respective lengths of funicular segments 1-3 ca 0.28, 0.40, 0.34. Metanotal groove poorly developed, only weakly impressed and not cross-ribbed. Petiole in profile nodiform. Gaster strongly impressed between first and second segments. All surfaces of head and body are densely shagreened, with scattered larger punctures. Short, standing hairs numerous upon all dorsal surfaces. Short, greyish, dense pruinose pubescence abundant everywhere. Black, dull; the antennae, legs and mandibles brown.

This quite distinctive species is apparently known only from the holotype. It is easily separated from the other members of the group by its possession of standing hairs on the dorsal head and body, and by its large size.

### *Leptogenys maxillosa* (F. Smith)

*Ponera maxillosa* F. Smith, 1858 : 93. Syntype workers, males, MAURITIUS: (*Dr Beke*) (BMNH) [examined].

*Leptogenys maxillosa* (F. Smith); Roger, 1861 : 43.

*Leptogenys falcata* Roger, 1861 : 42. Syntype workers, CUBA & BRAZIL (location of types not known). [Synonymy by Forel, 1901b : 46.]

*Formica vinsonnella* Dufour, 1864 : 210. Holotype ? worker, RÉUNION (location of type not known). **Syn. n.**

*Leptogenys maxillosa* var. *vinsonella* (Dufour); Emery, 1894 : 68; Forel, 1912b : 159 (Seychelles).

*Leptogenys cribrata* Emery, 1895a : 20. Syntype workers, SOUTH AFRICA: Vrijburg (*E. Simon*) (MCSN, Genoa). Provisional synonym.

**DIAGNOSIS OF WORKER.** Densely shagreened with scattered larger punctures. Without standing hairs. Petiole in dorsal view broader than long. Outer margin of mandible convex throughout its length.

**FURTHER DESCRIPTION.** *Worker.* TL 6.8-7.5, HL 1.38-1.48, HW 1.28-1.46, CI 91-98, SL 1.30-1.60, SI 101-110, PW 0.96-1.04, PH 0.84-0.90, PL 0.64-0.68, LPI 126-140, DPW 0.68-0.76, DPI 106-113 (8 measured).

Head broadened in front, the sides feebly convex and diverging anteriorly throughout their length. Eyes large, maximum diameter ca 0.32-0.36, considerably greater than the maximum width of the scape. Anterior clypeal margin with a narrow, translucent fringing lamella. Mandibles long and slender, the outer margins of the blades convex throughout their length. Node of petiole in dorsal view distinctly broader than long. Body and head everywhere densely shagreened with scattered larger punctures. Dense, pruinose pubescence present everywhere but standing hairs restricted to the clypeus and gastral apex.

*L. maxillosa* is a reasonably common tramp species throughout both the Old and New World Tropics, but appears to originate in the central and southern portions of the Ethiopian Region where it is a widely distributed but relatively uncommon species. Its closest relative within the group is *falcigera*, but in this species the petiole node is at least as long as broad, usually distinctly longer than broad, whilst in *maxillosa* the node is always considerably broader than long. In *maxillosa* the scapes are usually somewhat longer, SI 101-110, as opposed to SI 98-104 in *falcigera* and the LPI overlaps slightly, *falcigera* LPI 115-127 (mean 119), *maxillosa* LPI 126-140 (mean 133).

I have not been able to see the types of *vinsonnella* or *cribrata* but in the case of

the former I have examined series from numerous islands and systems near Réunion and all the specimens have been *maxillosa*. Similarly, *maxillosa* is the only species which fits the original description of *cribrata* and to the best of my knowledge is the only species of this group occurring in southern Africa. Consequently I have placed these two names in the synonymy of *maxillosa*, but I place *cribrata* there only provisionally as a future examination of the types may prove the present contention to be incorrect.

#### MATERIAL EXAMINED.

ZAIRE: 13 mi. N. of Kienge (*E. S. Ross & R. E. Leech*). RHODESIA: Bulawayo (*G. Arnold*); Honde Valley, Mtarazi R. (*W. L. Brown*). SOUTH WEST AFRICA: Lontpansberg (*Vernay-Lang*). SOUTH AFRICA: Natal, Dukuduku (*Grobler*). SEYCHELLES: Bird Is. (*V. Fitzgerald*); Dennis Is., Amirante Is., Coetivy Is. (*P. Sladen* expedition). MAURITIUS: (*J. E. M. Brown*). CHAGOS ARCHIPELAGO (*M. J. D. Hirons*). CUBA: Soledad, Cienfuegos (*N. A. Weber*); no loc. (coll. *F. Smith*).

### *Leptogenys pavesii* Emery

(Text-fig. 1)

*Leptogenys pavesii* Emery, 1892 : 111. Syntype workers, SOMALIA (*Robecchi*) (MCSN, Genoa). *Leptogenys* (*Leptogenys*) *maxillosa* subsp. *sericea* Weber, 1942 : 46. Syntype workers, SUDAN: Imatong Mts, E. slope ca 4100 ft, 31.vii.1939 (*N. A. Weber*), (MCZ Cambridge) [examined].

#### Syn. n.

DIAGNOSIS OF WORKER. Densely shagreened with scattered larger punctures. Without standing hairs. Petiole in dorsal view longer than broad. Lamelliform margin of clypeus broad and often opaque. Outer margin of mandible straight or concave in part of its length.

FURTHER DESCRIPTION. *Worker*. TL 6.8–7.6, HL 1.40–1.62, HW 1.24–1.44, CI 88–90, SL 1.36–1.64, SI 107–114, PW 0.92–1.08, PH 0.80–0.92, PL 0.66–0.72, LPI 121–127, DPW 0.60–0.72, DPI 90–97 (6 measured).

Sides of head convex, the head not strongly broadened in front of the eyes, the sides more nearly parallel than in other members of the group. Eyes large, maximum diameter ca 0.32–0.36, greater than the maximum width of the scape. Fringing lamella of anterior clypeal margin broad and broadly and evenly rounded, usually opaque or semi-opaque. Mandibles curved basally, the outer margins convex for some distance beyond the basal curve, but beginning at about the midlength the outer margin becoming flat or more usually concave. Mandibles shorter and stouter than in other members of the group. Node of petiole in dorsal view longer than broad. Body densely shagreened as in the other species but the larger punctures are more sparse and usually less distinct than in *maxillosa* or *falcigera*. Standing hairs present only on the clypeus and gastral apex.

Notes on the separation of this species from its closest relatives are given under *falcigera*.

The range of *pavesii* does not appear to overlap that of *maxillosa* in the Ethiopian Region. All specimens of the former examined have come from the countries of east and north-east Africa whilst those of the latter originated in the central and southern parts of the continent. Like other members of this group *pavesii* is a tramp species and in this study I have examined specimens from Saipan, though whether this is Saipan in the Marianas or Saipan, Palau Is. is not clear.

## MATERIAL EXAMINED.

SOMALIA: Dolo (*Vatova*). KENYA: Miongave, nr Mombasa (*L. F. Brown*); Ngong Forest Reserve (*G. Arnold?*). TANZANIA: Morogoro (*A. Loveridge*). CAMEROUN: no loc. (*G. Terron*). GUAM: Ladrone Is. (?). MARIANA or PALAU Is.?: Saipan (*R. K. Enders*).

THE *STUHLMANNI*-GROUP

(Text-figs 4-8, 19-21, 32)

Mandibles elongate, linear, usually increasing in width from base to apex, not closing against the clypeus. Eyes large or very large, their maximum diameter much greater than the maximum width of the scape. Second funicular segment considerably longer than the third, sometimes twice as long. Head broader in front than behind. Clypeus with a prominent median lobe. General shape of petiole as shown in Text-figs 19, 32. Metanotal groove impressed but without cross-ribs or sculpture. Gaster not or only very weakly constricted between the first and second segments.

Of the eleven species of this group seven are large or very large. Of these, five are distributed throughout eastern and southern Africa, with one also occurring on the Comoro Islands, and two are of central African origin. The four smaller species are known from West and Central Africa, with two in each area.

The group falls into two complexes of species, depending on the shape of the basal portion of the mandible. In *camerunensis* and its allies (*nebra*, *sterops*, *vindicis* and *zapyxis*) the mandible does not pass through a curve basally before its articulation (Text-fig. 5), and the blades of the long mandibles are usually approximately straight, without feebly convex outer margins. These five species are all of West or Central African origin.

The remaining species allied to *stuhlmanni* (*erythraea*, *leiothorax*, *schwabi*, *regis* and *titan*) are all from East or South Africa except the last, which comes from Cameroun. They have the base of the mandible curved before its articulation (Text-fig. 6), although this is indistinct in some populations of *schwabi*. The outer margin of the blade is usually slightly convex throughout its length in full-face view.

*Leptogenys camerunensis* Stitz

(Text-figs 5, 7, 32)

*Leptogenys camerunensis* Stitz, 1910 : 130. Syntype workers, CAMEROUN: Barombistation (*Preuss*) (NM, Basle) [examined].

*Leptogenys stuhlmanni* race *camerunensis* var. *angusticeps* Forel, 1916 : 399. Holotype worker, ZAIRE, St Gabriel (*Kohl*) (MHN, Geneva) [examined]. [Name not available.]

*Leptogenys stuhlmanni* subsp. *camerunensis* var. *opalescens* Wheeler, 1922 : 94. Syntype workers. ZAIRE: Akenge (*Lang & Chapin*) (MCZ, Cambridge) [examined]. [Name not available.]

DIAGNOSIS OF WORKER. Alitrunk without sculpture dorsally and only with cross-ribbing at meso-metapleural suture laterally. With blue or violet opalescence. Large species with very long antennal scapes, HL > 1.80, SI > 230.

FURTHER DESCRIPTION. Worker. TL 11.0-12.0, HL 1.90-2.02, HW 1.24-1.32, CI 65-66,

SL 2.92-3.38, SI 235-256, PW 1.24-1.30, PH 1.12-1.20, PL 1.06-1.12, LPI 105-107, DPW 0.72-0.74, DPI 64-70 (3 measured).

Head markedly broader in front than behind, the maximum width anteriorly in syntypes  $> 1.60$ , width across occipital ridge  $< 0.90$ . Eyes very large, maximum diameter ca 0.60, much greater than the maximum width of the scape. Inner margins of eyes with a circumocular impression. Mandibles long, more or less straight, gradually increasing in width apically and with a single preapical tooth. Mandibular blades not closing tightly against the clypeus, not curved basally before their articulation. Second funicular segment very long, respective lengths of segments 1-3 ca 0.50, 1.10, 0.56. Metanotal groove weakly impressed, not cross-ribbed. Gaster not constricted between first and second segments. Entire body smooth and shining, unsculptured apart from small pits from which hairs arise and some cross-ribs at the meso-metapleural suture. Erect hairs present on all dorsal surfaces. Colour red-brown or brown, the appendages lighter, and the head and alitrunk with weak blue or violet opalescence or reflections, which may be patchy.

One of the larger species of the group, *camerunensis* is distinguished primarily by its size and lack of sculpturation. The mandibles have a virtually straight outer margin and the blades are not curved outwards along their length. In this respect *camerunensis* shows affinities with *zapyxis* and *sterops*.

#### MATERIAL EXAMINED.

ZAIRE: Wombali (*P. Vanderijst*). CAMEROUN: no loc. (*G. Terron*).

### *Leptogenys erythraea* Emery stat. n.

*Leptogenys stuhlmanni* subsp. *erythraea* [sic] Emery, 1902 : 33. Syntype workers, ETHIOPIA: Eritrea (*Belli*) MCSN, Genoa).

*Leptogenys stuhlmanni* subsp. *erythraea* Emery; Forel, 1907a : 131 et auctt. [Justified emendation.]

DIAGNOSIS OF WORKER. Metapleuron sculptured. Eyes large, maximum diameter 0.54 or more. Antennal scapes long, SI  $> 200$ . Full adult colour brown. Large species, HL  $> 1.80$ .

FURTHER DESCRIPTION. *Worker*. TL 9.7-10.8, HL 1.94-2.00, HW 1.28-1.34, CI 65-67, SL 2.72-2.80, SI 209-214, PW 1.20-1.24, PH 1.14, PL 0.94, LPI 121, DPW 0.68-0.70, DPI 73-74 (3 measured).

Head broader in front than behind, broadest across the clypeus. Eyes large, maximum diameter 0.54-0.56, much greater than the maximum width of the scape; the eyes breaking the outline of the sides of the head in full-face view. Clypeus with a prominent median lobe. Mandibles elongate and narrow, slightly curved along their length and passing through a more marked curve basally before their articulation. Funicular segments 1-3 with respective lengths ca 0.42-0.44, 0.84-0.86, 0.52-0.54. Gaster not constricted between first and second segments. Elongate standing hairs present upon all surfaces and on appendages. Head, pronotum and mesonotum unsculptured apart from minute pits from which hairs arise. Propodeal dorsum with feeble, nearly effaced sculpturation, with smooth areas. Meso- and metapleurae striate, strongest on metapleuron and extending onto the lower portions of the sides of the propodeum. Gaster unsculptured, smooth and shining. Full adult colour brown.

I have not seen the types of this species but have examined a series compared with type by Prof. W. L. Brown. These indicate that *erythraea* is a distinct species and not a subspecies of *stuhlmanni*. The male has been described by Forel (1907a).

#### MATERIAL EXAMINED.

ETHIOPIA: Eritrea, Ghinda (*Staudinger*).

*Leptogenys leiothorax* Prins stat. n.

*Leptogenys stuhlmanni* subsp. *leiothorax* Prins, 1965 : 154, fig. 1. Holotype and paratype workers, MOZAMBIQUE: Dondo 10.xii.1960 (G. Arnold) (SAM, Cape Town) [examined].

DIAGNOSIS OF WORKER. Dorsal alitrunk completely unsculptured. With blue or violet opalescence. Smaller species with shorter antennal scapes, HL < 1.75, SI < 220.

FURTHER DESCRIPTION. *Worker*. TL 8.3–9.1, HL 1.62–1.66, HW 1.10–1.14, CI 67–69, SL 2.34–2.42, SI 212–214, PW 1.04–1.08, PH 0.96–0.98, PL 0.88–0.90, LPI 109–111, DPW 0.54–0.58, DPI 61–64 (3 measured).

Head broader in front than behind, broader across the clypeus from corner to corner than across the eyes; sides of head convex. Eyes large, maximum diameter ca 0.44–0.50, breaking the outline of the sides of the head in full-face view. Clypeus with a prominent median lobe. Mandibles elongate, in full-face view weakly curved along their length, slightly more strongly curved basally before their articulations. Respective lengths of funicular segments 1–3 ca 0.32–0.40, 0.74–0.78, 0.42–0.46. Metanotal groove impressed but not cross-ribbed; gaster only extremely weakly constricted between first and second segments. All surfaces of body and appendages with numerous standing hairs. Dorsal surfaces of head and body completely unsculptured, smooth and shining except for small pits from which hairs arise. Propodeal declivity with a few transverse rugae. Sides of alitrunk unsculptured apart from cross-ribbing at the meso-metapleural suture and some rugosity around the area of the metapleural glands. Full adult colour deep red-brown with patchy bluish or violet opalescence.

At first sight this species is reminiscent of a small version of *camerunensis* as it is similarly sculptured and coloured, but its true affinities lie with *schwabi* which, apart from its lack of sculpturation, *leiothorax* closely resembles. In general shape and build and also in dimensions *leiothorax* is very close to *schwabi* but the lack of sculpture on the propodeum in the former will separate them. Also, in *leiothorax* the width of the head across the clypeus is greater than the width across the eyes, whereas in *schwabi* the two widths are approximately equal.

*Leptogenys nebra* sp. n.

DIAGNOSIS OF WORKER. Propodeum sculptured. Antennal scapes relatively long, SI > 200; eyes small, maximum diameter ca 0.36.

FURTHER DESCRIPTION. *Holotype worker*. TL 9.1, HL 1.84, HW 1.20, CI 65, SL 2.60, SI 217, PW 1.06, PH 0.98, PL 0.86, LPI 114, DPW 0.62, DPI 72.

Sides of head convex, broadest in front, distinctly broader across the clypeus from corner to corner than across the eyes. Eyes quite small for a member of this group, maximum diameter ca 0.36, but still distinctly greater than the maximum width of the scape. Clypeus with a prominent median lobe. Mandibles elongate, more or less straight in full-face view, increasing in width from base to apex and not passing through a curve basally before their articulations. Respective lengths of funicular segments 1–3 ca 0.32, 0.70, 0.48. Metanotal groove impressed but without cross-ribs. Gaster not constricted between first and second segments. All surfaces of head, body and appendages with numerous long, standing hairs, the longest of which on the scape are longer than the maximum scapal width. Dorsum of head, pronotum and gaster smooth and shining, unsculptured apart from hair-pits. Mesonotum and propodeal dorsum transversely rugose, the latter more coarsely than the former. Mesopleuron with some rugae above but the median portion tending to be smooth. Metapleuron and sides of propodeum rugose. Colour black, the appendages brown.

Holotype worker, CAMEROUN: Ototomo, 17.vi.1969, JLA (G. Terron) (BMHN).

This relatively small-eyed species is related to *sterops* and *zapyxis* but the combi-

nation of characters noted above, plus the lack of a convex lamella on the inner margin of the mandible will separate *nebra* from all other species of the group.

*Leptogenys regis* sp. n.

(Text-fig. 8)

DIAGNOSIS OF WORKER. Propodeum and pronotum sculptured. Eyes not breaking outline of sides of head in full-face view. Large species with relatively short antennal scapes, HL > 2.00, SI < 170.

FURTHER DESCRIPTION. *Holotype worker*. TL 11.2, HL 2.24, HW 1.66, CI 74, SL 2.54, SI 153, PW 1.28, PH 1.14, PL 1.02, LPI 112, DPW 0.66, DPI 64.

Head much broader in front than behind, the width of the head across the eyes noticeably less than the width across the clypeus from corner to corner. Eyes large, maximum diameter 0.50 but not so strongly convex or prominent as in other members of the group so that the eyes in full-face view fail to break the outline of the sides of the head. Clypeus with a prominent median lobe. Mandibles elongate, feebly curved along their length and passing through a curve basally before their articulations. Lengths of funicular segments 1-3 ca 0.40, 0.76, 0.46. Dorsal surfaces of body with numerous short, standing hairs; hairs on the antennal scapes very short, scarcely longer than the underlying pubescence, without long hairs such as are found in other species of the group which are almost or quite as long as the scape is broad. Pits from which hairs arise conspicuous upon the cephalic dorsum. Pronotum, mesonotum and propodeum sculptured, the last much more strongly than the rest. Sides of alitrunk sculptured, with rugae on the pleurae. Gaster smooth and shining except for pits from which hairs arise.

*Paratype worker*. As holotype but slightly larger, TL 11.4, HL 2.24, HW 1.64, CI 73, SL 2.62, SI 159, PW 1.28, PH 1.24, PL 1.12, LPI 110, DPW 0.68, DPI 61. Eyes ca 0.50 at maximum; funicular segments 1-3 ca 0.42, 0.80, 0.50 respectively.

Holotype worker, KENYA: Shimba Forest Reserve, vi.1957 (N. L. H. Krauss) (BMNH).

Paratype worker, TANZANIA: Dar-es-Salaam, College Campus, 1969 (Ilse Walker) (MCZ, Cambridge).

This large species and the related *titan* are easily differentiated from other members of the group by the failure of the eyes to break the outline of the sides of the head in full-face view and by the lack of long, standing hairs on the antennal scapes. In all other large species of the group the scape is equipped with numerous long hairs, the longest of which are at least equal to or more usually greater than the maximum width of the scape, whereas in *regis* and *titan* the hairs which are present are short, often not much longer than the scapal pubescence. The two species, *regis* and *titan*, are separated by characters of size and differences of sculpturation, as the latter is much larger than the former and has the pronotum unsculptured.

*Leptogenys schwabi* Forel

*Leptogenys schwabi* Forel, 1913c : 208. Holotype worker, RHODESIA: Bulawayo (G. Arnold) (MHN, Geneva) [examined].

**DIAGNOSIS OF WORKER.** Propodeum sculptured. Maximum diameter of eye  $< 0.50$ , the eyes breaking the outline of the sides of the head in full-face view. Antennal scapes long, SI  $> 200$ . Width of head across eyes the same as or only slightly less than the width across the clypeus from corner to corner.

**FURTHER DESCRIPTION.** *Worker.* TL 8.4–9.8, HL 1.60–1.82, HW 1.08–1.22, CI 64–68, SL 2.28–2.54, SI 203–211, PW 1.04–1.14, PH 0.92–1.10, PL 0.88–1.00, LPI 104–113, DPW 0.54–0.64, DPI 62–64 (12 measured).

Head broader in front than behind. In front of the eyes the sides of the head slightly convex so that the width of the head across the clypeus from corner to corner anteriorly is the same as or only slightly more than the width across the centre of the eyes. Eyes large and convex but not very large as in some members of the group, maximum diameter ca 0.44–0.48. Clypeus with a prominent median lobe. Mandibles elongate, in most specimens feebly curved along their length and passing basally through a curve before their articulations. Funicular segments 1–3 ca 0.34–0.40, 0.64–0.76, 0.42–0.46 respectively. All surfaces of body and appendages with numerous standing hairs. Dorsum of head smooth and shining, unsculptured apart from small pits from which hairs arise. Pronotal dorsum similar but very rarely with faint traces of sculpturation on the extreme posterior portion of the sclerite. Propodeal dorsum with transverse rugae. Pleurae and sides of propodeum sculptured. Gaster unsculptured apart from hair-pits.

In the past this species has been confused with *stuhlmanni*. The misidentification of specimens of *schwabi* as *stuhlmanni* and the consequent misapplication of the latter name is common in collections. In the BMNH collection, for example, series which were all *schwabi* had been labelled as such and also as *stuhlmanni*. Prins (1965) reduced *schwabi* to a variety of *stuhlmanni*, basing his argument on specimens collected by Arnold and Grobler in Rhodesia and South Africa respectively. All these specimens were determined by Arnold and were in fact all *schwabi* (*stuhlmanni* remains unknown in Rhodesia and South Africa). Prins's argument that he could find very little difference between the two 'species' in these series was therefore correct as all were *schwabi* but some of them had been misidentified as *stuhlmanni*.

The cause of this confusion appears to stem from Arnold's (1915) record of *stuhlmanni* from Durban. I have examined this series and they are in fact *schwabi*, though slightly larger than is usual in this species. The two are separable on a number of characters, many of which were in fact noted in the original descriptions of Mayr and Forel but subsequently not used.

*L. stuhlmanni* is a larger, more stockily built species than *schwabi*, with relatively shorter antennal scapes (compare measurements). The head is broader in front in *stuhlmanni* and the eyes are less prominent, so that the width of the head across the eyes is noticeably less than the width across the clypeus from corner to corner. The pronotal dorsum is completely sculptured in *stuhlmanni* whereas in *schwabi* it is usually smooth, although in some specimens faint traces of sculpture are present posteromedially. Pits from which hairs arise on the cephalic dorsum are small and inconspicuous in *schwabi* but larger and more distinct in *stuhlmanni*.

#### MATERIAL EXAMINED.

RHODESIA: Bulawayo (G. Arnold); Chirinda Forest (G. Arnold); Umtali (G. Arnold). SOUTH AFRICA: Natal, Umhlanga (G. Arnold?); Natal, Durban (G. Arnold); Durban (C. B. Cooper); Zululand, Eshowe (R. E. Turner).

*Leptogenys sterops* sp. n.

(Text-fig. 20)

DIAGNOSIS OF WORKER. Smaller species, HL < 1.60. Propodeum and metapleurae sculptured. Mandibles without a lamelliform extension of the inner margin.

FURTHER DESCRIPTION. *Holotype worker*. TL 8.2, HL 1.56, HW 1.06, CI 68, SL 1.98 SI 183, PW 0.96, PH 0.86, PL 0.72, LPI 119, DPW 0.52, DPI 72.

Head broader in front than behind but not strongly broadened in front of the eyes; the sides feebly convex, the occipital border marginate. Ocular diameter 0.40 at maximum, greater than the maximum width of the scape. Clypeus with a prominent median lobe. Mandibles elongate but not linear, increasing in width from base to the level of the single preapical tooth then narrowing again to the apex; the inner margin feebly convex basad of the preapical tooth. Mandibular blades not passing through a curve basally before their articulations. Second funicular segment very long, the respective lengths of segments 1-3 ca 0.30, 0.52, 0.36. Alitrunk elongate; metanotal groove not cross-ribbed. Node of petiole in profile high and narrow, the anterior and posterior faces both feebly convex and converging dorsally, the anterior and dorsal faces forming a single convex curve. Gaster very weakly constricted between the first and second segments. Standing hairs numerous on all surfaces. Head, pronotum, petiole and gaster unsculptured apart from minute pits from which hairs arise. Propodeal dorsum rugose, predominantly transversely so. Metapleuron and sides of propodeum regularly rugose. Mesopleuron with rugae developed only in the upper and extreme lower portions, the greater part of the sclerite between these areas with the sculpture wholly or partially effaced and with smooth, shining areas. Colour principally dark brown, the appendages lighter, the head and propodeum darker, black in places.

*Paratype workers*. TL 8.0-8.2, HL 1.54-1.56, HW 1.02-1.06, CI 66-69, SL 1.98-2.00, SI 183-194, PW 0.94-0.98, PH ca 0.86 PL 0.68-0.72, LPI 119-126, DPW 0.52-0.58, DPI 72-85 (5 measured). Ocular diameter ca 0.40; length of funicular segments 1-3 ca 0.28-0.30, 0.48-0.52, 0.34-0.36. As holotype but in one specimen with the mesopleuron almost covered with very fine striation.

Holotype worker, IVORY COAST: Banco Forest, nr Abidjan, 13. i. 1963, no. A72 (*W. L. Brown*) (MCZ, Cambridge).

Paratype workers. IVORY COAST: 5 with same data as holotype; 1 worker, O.R.S.T.O.M. Res. Sta., 17 km W. of Abidjan, 7.i.1963, no. A1 (*W. L. Brown*) (BMNH; MCZ, Cambridge).

This species, the smallest yet discovered in the *stuhlmanni*-group, is most closely related to *zapyxis*, also from West Africa. The two are easily distinguished as in *sterops* the mandible increases in width from the base towards the apex and is widest at the preapical tooth. Also, the inner margin of the blade lacks a lamelliform extension and is only feebly convex at most. In *zapyxis* on the other hand the inner margin of each mandibular blade is equipped with a semi-translucent, lamella-like extension which is convex in outline, and the mandible usually attains its maximum width at a point proximal to the preapical tooth.

*Leptogenys stuhlmanni* Mayr

(Text-fig. 6)

*Leptogenys (Lobopelta) stuhlmanni* Mayr, 1893 : 198. Syntype workers, MOZAMBIQUE: Quilimane (*Stuhlmann*) (location of types not known).

*Leptogenys comorensis* Forel, 1907b : 76. Syntype workers, COMORO ISLANDS: Mohali (Voeltzkow) (NM, Basle; MCZ, Cambridge) [examined]. **Syn. n.**

DIAGNOSIS OF WORKER. Propodeum sculptured. Large species with relatively short antennal scapes,  $HL > 1.75$ ,  $SI < 200$ . Pronotal dorsum feebly sculptured. Eyes breaking outline of sides of head in full-face view.

FURTHER DESCRIPTION. *Worker*. TL 9.6–10.4, HL 1.82–2.00, HW 13.2–14.6, CI 68–74, SL 2.32–2.70, SI 180–194, PW 1.16–1.26, PH 1.10–1.18, PL 1.02–1.06, LPI 104–115, DPW 0.62–0.70, DPI 61–68 (6 measured).

Head broader in front than behind, distinctly broadened in front of the eyes. Eyes large, their maximum diameter 0.50–0.54, much greater than the maximum width of the scape. In full-face view the eyes breaking the outline of the sides of the head. Clypeus with a prominent median lobe. Mandibles long, usually very slightly curved along their length, characteristically passing through a curve basally before their articulations. Respective lengths of funicular segments 1–3 ca 0.40–0.42, 0.74–0.76, 0.46–0.48. Metanotal groove not cross-ribbed. Gaster not constricted between first and second segments. All surfaces of body and appendages with numerous standing hairs. Pits on dorsum of head from which hairs arise usually large and conspicuous. Dorsum of pronotum and sometimes also the sides weakly sculptured. Dorsum and sides of propodeum and the pleurae rugose. Dorsum of petiole usually feebly sculptured. Gaster smooth and shining, unsculptured apart from hair-pits.

One of the three large, black species of the group which inhabit eastern and southern Africa and its offshore islands, *stuhlmanni* is distinguished from *regis* by size, the convexity of the eyes, which break the outline of the sides in *stuhlmanni* but not in *regis*, and by the presence of numerous long hairs upon the antennal scapes which are absent in *regis*. The other closely related species, *schwabi*, tends to be smaller and less stockily built than *stuhlmanni*, with relatively longer antennal scapes and finer sculpturation. On the dorsum of the head the pits from which hairs arise are distinct and quite large in *stuhlmanni* and the pronotal dorsum is sculptured, whereas in *schwabi* the hair-pits are small and inconspicuous and the pronotum is usually unsculptured, although some individuals may have slight sculpturation. Finally, in *schwabi* the width of the head across the eyes is the same as or only slightly less than the width across the clypeus from corner to corner, whereas in *stuhlmanni* the corner to corner clypeal width is distinctly greater than the width across the eyes as the head is more strongly broadened in front in this species.

There seems to be little doubt that *stuhlmanni* and *schwabi* were confused by earlier authors (see under *schwabi*) and records of distribution of the species published to the present should be used with some caution.

I have not been able to find the types of *stuhlmanni* but Dr M. Fischer (NM, Vienna) has lent me two workers collected by Stuhlmann in Mozambique and named by Mayr himself, which are taken as the basis for my interpretation of this species.

#### MATERIAL EXAMINED.

SUDAN: Imatong Mts (N. A. Weber). KENYA: Nakuru (E. S. Ross & R. E. Leech); Mombasa (N. A. Weber). MOZAMBIQUE: (Stuhlmann, ex coll. G. Mayr).

*Leptogenys titan* sp. n.

DIAGNOSIS OF WORKER. Propodeum unsculptured. Eyes not breaking outline of sides of head in full-face view. Very large species with relatively short antennal scapes,  $HL > 2.10$ ,  $SI < 170$ .

FURTHER DESCRIPTION. *Holotype worker*. TL 13.6, HL 2.30, HW 2.02, CI 88, SL 3.24, SI 160, PW 1.62, PH 1.36, PL 1.18, LPI 115, DPW 0.76, DPI 64.

Sides of head strongly divergent anteriorly, the head much broader across the clypeus than across the eyes. Eyes large, maximum diameter ca 0.66, distinctly failing to break the outline of the sides of the head in full-face view. Maximum diameter of the eyes considerably greater than the maximum width of the scapes. Clypeus with a prominent median lobe. Mandibles very long, only slightly broadened apically, the blades passing through a distinct curve basally before their articulations. Respective lengths of funicular segments 1–3 ca 0.50, 1.02, 0.66. Metanotal groove without cross-ribs. Gaster weakly impressed between first and second segments. Head, body and appendages with numerous, relatively short, standing hairs. On the antennal scapes in dorsal view no hairs are present which exceed the maximum width of the scape. Dorsum of head, pronotum, propodeum and gaster unsculptured apart from hair-pits. Mesonotum with a number of very faint transverse striae, particularly upon the median portion of the sclerite. Sides of alitrunk unsculptured except for cross-ribbing at the meso-metapleural suture and a few rugae on the bulla of the metapleural glands. Colour black, appendages dark brown.

Holotype worker, CAMEROUN: Ngoa-Ekelé 4.i.1969 (*G. Terron*) (BMNH).

*L. titan* is most closely related to *regis* of east Africa but is larger than that species and lacks propodeal sculpturation. These two species are the only members of the group in which the eyes fail to break the outline of the sides of the head in full-face view.

*Leptogenys vindicis* sp. n.

DIAGNOSIS OF WORKER. Head and dorsal alitrunk sculptured. Antennal scapes relatively long,  $SI > 200$ ; smaller species,  $HL < 1.75$ .

FURTHER DESCRIPTION. *Holotype worker*. TL 9.0, HL 1.64, HW 1.14, CI 69, SL 2.38, SI 209, PW 1.12, PH 0.96, PL 0.80, LPI 120, DPW 0.68, DPI 85.

Head broader in front than behind but the width of the head across the clypeus only very slightly more (ca 0.02) than the width across the eyes in full-face view. Eyes large, maximum diameter ca 0.50, much greater than the maximum width of the scape. Clypeus with a prominent median lobe. Mandibles long, slightly broader apically than basally, passing through a very feeble curve near the base. Funicular segments 1–3 ca 0.34, 0.68, 0.38 respectively. Gaster feebly constricted between first and second segments. All surfaces of head, body and appendages with numerous standing hairs. All dorsal surfaces of head and body finely sculptured except for the gaster, metanotal groove and area immediately behind the pronotal suture, which are smooth and shining. Sculpture takes the form of fine, disorganised rugulation with a few larger rugae, so that the surfaces appear matt or only dully shining. Sides of alitrunk with more distinctly separated rugae and with some shining areas on the pronotum and pleurae. Colour a very deep brown, almost black, the gaster lighter brown, the appendages mid-brown and shining.

Holotype worker, CAMEROUN: Mt Nkolodon, JLA, 19.v.1969, 900–1000 m (*G. Terron*) (BMNH).

*Leptogenys zapyxis* sp. n.

(Text-figs 4, 19, 21)

DIAGNOSIS OF WORKER. Propodeum and metapleuron sculptured. Inner margin of mandible extended by a convex, semi-translucent lamella.

FURTHER DESCRIPTION. *Holotype worker*. TL 9.0, HL 1.78, HW 1.16, CI 65, SL 2.40, SI 207, PW 1.08, PH 0.92, PL 0.82, LPI 112, DPW 0.62, DPI 76.

Head broader in front than behind, the sides weakly convex and diverging anteriorly. Occipital border marginate. Eyes with maximum diameter ca 0.42, much greater than the maximum width of the scape. Clypeus with a prominent, truncated median lobe. Mandibles elongate, their outer margins straight to feebly concave, the inner margins convex, with a semi-translucent, lamellate extension forming the true inner margin and imparting the convexity to the border. Second funicular segment elongate, respective lengths of segments 1-3 ca 0.36, 0.64, 0.42. Metanotal groove not cross-ribbed. Petiole in profile with the anterior and posterior faces convex and sloping towards one another dorsally, the anterior and dorsal faces united in a continuous curve. Gaster very feebly constricted between first and second segments. All surfaces with numerous standing hairs. Head, pronotum, petiole and gaster unsculptured apart from hair-pits. Dorsum and sides of propodeum and metapleuron rugose. Mesopleuron with some effaced sculpturation but with extensive smooth areas. Black, the appendages lighter.

*Paratype workers*. TL 8.1-9.0, HL 1.62-1.80, HW 1.04-1.18, CI 64-66, SL 2.18-2.44, SI 200-209, PW 0.96-1.08, PH 0.88-0.92, PL 0.76-0.84, LPI 109-118, DPW 0.58-0.64, DPI 73-77 (7 measured). Ocular diameter at maximum ca 0.38-0.44; respective lengths of funicular segments 1-3 ca 0.30-0.36, 0.60-0.64, 0.38-0.42. As holotype but colour varying from dark brown to black.

Holotype worker, GHANA: Mt Atewa, 22.x.1968 (C. A. Collingwood) (BMNH).

Paratypes. GHANA: 1 worker, same data as holotype; 6 workers, Tafo, 26.vi.1970, in wet-rotten log (B. Bolton); 3 workers, Tafo 3.viii.1966, ant ecology sample 150C (D. Leston); 2 workers, Tafo 2.viii.1966, ant ecology sample 144A (D. Leston) (BMNH; MCZ, Cambridge; NM, Basle; MNHN, Paris).

THE *SULCINODA*-GROUP

(Text-figs 9-14, 26, 27)

Mandibles variously developed, either short and closing tightly against the clypeus or linear and curved, enclosing a space between themselves and the clypeus when closed. Eyes medium or large, but always with their greatest diameter in full-face view greater than the maximum width of the scape. Second funicular segment equal to or slightly longer than the third. Head usually broader in front than behind; more markedly so in some species than in others. Sculpture variable but never with the entire dorsal head and alitrunk rugose, nor shagreened. Gaster constricted between first and second segments. Metanotal groove cross-ribbed or otherwise sculptured.

The *sulcinoda*-group includes 13 species which fall roughly into two complexes depending upon whether the mandibles are capable of closing tightly against the clypeus or not. In general there are two criteria which determine whether full closure is possible, the first being the length of the mandible itself and the second the size of the median lobe of the clypeus. These seem interdependent and modifications occur simultaneously, for as the mandible lengthens and narrows the clypeal lobe becomes shorter and narrower.

Species with relatively shorter, broader mandibles and longer, broader clypeal lobes are connected to those with longer, narrower mandibles and shorter, narrower clypeal lobes by intermediates such as *princeps*, and illustrate and support the contention that long-mandibulate forms have arisen from short-mandibulate stock several times within the genus.

All members of the group are small to medium-sized species and the majority appear to be confined to rather densely forested areas, especially in West and Central Africa.

### *Leptogenys bellii* Emery

*Leptogenys bellii* Emery, 1901: 59. Syntype workers, ETHIOPIA: Eritrea, Ghinda (*Belli*) (MCSN, Genoa).

I have not been able to examine the types of this species nor have I seen any material which matches the original description, but the description is good enough to recognise *bellii* as a member of the *sulcinoda*-group. The following description is modified from the original.

*Worker.* TL 6.0. Head longer than broad, narrower behind than in front, with the occipital margin straight or feebly concave. Eyes large. Median lobe of clypeus short, blunt (truncated?) apically. Mandibles weakly curved, narrow, slightly broadening apically where they terminate in a point. Scapes surpassing occipital margin by less than twice their diameter. Node of petiole a little longer than broad, almost as high as long; in profile the anterior and posterior faces vertical. Anterodorsal angle rounded, posterodorsal angle acute. In the middle of the dorsum is a narrow, shining zone, a little elevated but not cariniform. Posterior face of petiole bordered by a sharp corner, a little projecting in the middle of the superior margin where it forms an obtuse tubercle. Vertex smooth, with small piligerous punctures which become larger and more numerous towards the sides and may even be confluent behind the eyes. On pro- and mesonotum the punctures are separate on the dorsum, confluent on the sides and larger than those of the head; larger and confluent on sides of propodeum. Meso- and metapleurae partly sculptured. Sides of petiole with confluent punctures. Gaster shining, with minute piligerous punctures. Standing hairs present on dorsal surfaces. Black, shining, the appendages reddish.

The description gives the impression of an average-sized member of the *sulcinoda*-group most probably related to *elegans* and *ferrarii* but separated from them by details of petiolar structure and sculpturation.

### *Leptogenys elegans* sp. n.

(Text-fig. 9)

DIAGNOSIS OF WORKER. Upper halves of sides of petiole not sulcate. Dorsum of head, alitrunk and first gastral tergite unsculptured apart from large hair-pits.

FURTHER DESCRIPTION. *Holotype worker.* TL 4.8, HL 1.00, HW 0.72, CI 72, SL 0.90, SI 125, PW 0.62, PH 0.62, PL 0.46, LPI 135, DPW 0.48, DPI 104.

Head slightly wider in front of the eyes than behind, the sides feebly convex. Eyes with maximum diameter ca 0.24, greater than the maximum width of the scape in full-face view. Median lobe of clypeus prominent, broadest basally, rounded anteriorly and with convex sides. Mandibles elongate and narrow, not closing tightly against the clypeus, enclosing a large space when their apices are overlapping. Lengths of funicular segments 1-3 respectively

ca 0.16, 0.16, 0.14. Gaster strongly constricted between first and second segments. Dorsum of head with numerous shallowly incised punctures separated by smooth, shining interspaces. Sides and ventral surface of head unsculptured apart from scattered hair-pits. Dorsal alitrunk unsculptured apart from crossribbing in the metanotal groove and scattered, large, pit-like punctures from which hairs arise. Sides of alitrunk also with pit-like punctures and the metapleuron and extreme lower region of the mesopleuron with longitudinal rugulae. Upper halves of sides of petiole with some rugulation. First and second gastral tergites with scattered but strongly marked large hair-pits, otherwise unsculptured. All surfaces of body and appendages with standing hairs. Colour black, shining; the legs, antennae and mandibles brown.

*Paratype workers.* As holotype but with size range as follows: TL 4.5–4.9, HL 0.96–1.02, HW 0.68–0.72, CI 70–72, SL 0.86–0.94, SI 125–138, PW 0.58–0.62, PH 0.56–0.62, PL 0.44–0.48, LPI 127–135, DPW 0.42–0.48, DPI 95–105 (8 measured).

Ocular diameter 0.20–0.24, and size range of funicular segments 1–3 ca 0.16–0.18, 0.14–0.16, 0.12–0.14 respectively. Sculpturation of metapleuron and sides of propodeum variable. In most specimens it is as in the holotype but in some the rugulae are reduced or absent in places whilst in others the rugulae are more extensive and also occur on the propodeal sides.

Holotype worker, NIGERIA: Gambari, 10.ix.1969, in rotten stump (*B. Bolton*) (BMNH).

Paratypes. 2 workers with same data as holotype. IVORY COAST: 5 workers, 40 km W. of Abidjan, 14.i.1963, A97, Plantation Niecky (*W. L. Brown*). GHANA: 1 worker, Pankese Cocoa Station, 10.ix.1969 (*C. A. Collingwood*); 4 workers, Bunso, 7.vii.1969, pyrethrum knockdown B2/2 (*D. Leston*); 2 workers, Bunso, 30.vii.1969, pyrethrum knockdown B8/1 (*D. Leston*); 1 worker, Tafo, 8.x.1966, ant ecology sample 318F (*D. Leston*); 1 worker, Asikaisu, 9.ix.1969, ant ecology sample AM70 (*D. Leston*) (BMNH; MCZ, Cambridge; NM, Basle).

The nest from which the holotype was taken was situated in the stump of a rotten tree branch about 2 feet above ground level. This species appears to be subarboreal as a number of specimens were collected by Leston as they were running on tree trunks, and some were acquired by pyrethrum knockdown from cocoa trees.

This species appears to be closely related to *ferrarii*, and notes on their separation are given under the latter.

Dr G. Terron (UFC, Yaounde) has sent me specimens of this species from Byime-Assi, in Cameroun.

### *Leptogenys excellens* sp. n.

DIAGNOSIS OF WORKERS. Sides of head below and behind eyes and lateral portions of ventral surface of head sculptured. Upper halves of sides of petiole not sulcate.

FURTHER DESCRIPTION. *Holotype worker.* TL 5.0, HL 1.00, HW 0.72, CI 72, SL 0.92, SI 128, PW 0.66, PH 0.66, PL 0.44, LPI 150, DPW 0.46, DPI 104.

Head broader in front than behind, the sides feebly convex, the occipital margin in full-face view extremely shallowly concave, almost straight. Eyes large, maximum diameter 0.24, their diameter greater than the maximum width of the scape. Inner and posterior margins of eye with a weak circumocular impression. Median lobe of clypeus short, triangular, narrowly rounded apically. Mandibles long and curved, not closing against the clypeus. Relative lengths of funicular segments 1–3 ca 0.16, 0.18, 0.16. Petiole in profile with the anterior face vertical, the posterior face feebly sinuate and higher than the anterior, so that the dorsum slopes upwards posteriorly. Anterodorsal angle broadly rounded, posterodorsal angle also rounded but noticeably more acute. Petiole in dorsal view slightly broader than long, scarcely narrowing anteriorly. Gaster constricted between first and second segment. All surfaces

of body and appendages with numerous standing hairs. Dorsum of head with numerous coarse punctures, the spaces between them feebly reticulate. Sides of head behind and below the eyes with weak rugosity, the ventral surfaces of the head complexly sculptured on their lateral portions by a number of short, shallow indentations and numerous fine punctures. Dorsum of alitrunk with scattered large punctures, the posterior margins of many of which are indistinct on the pronotum. Meso- and metapleurae reticulate-punctate but each with a shining median area, more extensive on the former. Upper halves of sides of petiole in profile reticulate-rugose with many small punctures. Gaster unsculptured apart from hair-pits. Black, shining, the gaster dark brown and polished, the appendages lighter brown; the antennal funiculae lighter in colour than the scapes.

*Paratype worker.* As holotype, with dimensions as follows; TL 5.0, HL 0.98, HW 0.72, CI 73, SL 0.92, SI 128, PW 0.62, PH 0.64, PL 0.44, LPI 145, DPW 0.44, DPI 100. Diameter of eye 0.24, lengths of funicular segments 1-3 ca 0.16, 0.16, 0.14.

Holotype worker, ZAIRE: Yangambi Reserve, 0949 (*A. Raignier & J. van Boven*) (MCZ, Cambridge).

Paratype. 1 worker, same data as holotype (BMNH).

### *Leptogenys ferrarii* Forel

*Leptogenys ferrarii* Forel, 1913c : 209. Syntype workers, RHODESIA: Bulawayo, 23.ii.1913 (*G. Arnold*) (MHN, Geneva) [examined].

*Leptogenys ferrarii* st. *dentatula* Santschi, 1915 : 246. Holotype worker, ZAIRE: Katanga, Katakai (*Gérard*) (NM, Basle) [examined]. **Syn. n.**

*Leptogenys ferrarii* race *dentulata* Santschi; Bernard, 1952 : 210. [Lapsus.]

DIAGNOSIS OF WORKER. Upper halves of sides of petiole not longitudinally sulcate. Hairs on first gastral tergite not arising from large pits.

FURTHER DESCRIPTION. *Worker.* TL 4.1-4.3, HL 0.84-0.86, HW 0.64-0.66, CI 74-78, SL 0.80-0.82, SI 124-125, PW 0.54-0.60, PH 0.50-0.58, PL 0.36-0.40, LPI 142-147, DPW 0.40-0.46, DPI 105-115 (5 measured).

Head only slightly broader in front of eyes than behind, the sides convex; the occipital margin in full-face view weakly concave. Eyes large, maximum diameter 0.18-0.20, with a weak circumocular impression on the internal and posterior margins. Diameter of eye much greater than maximum width of scape. Median lobe of clypeus triangular, narrowed anteriorly, almost pointed. Mandibles elongate, not closing against the clypeus. Respective lengths of funicular segments 1-3 ca 0.16, 0.14, 0.12. Petiole in dorsal view broader than long, broadest posteriorly. Node narrow and high in profile, the dorsal surface sloping upwards posteriorly but only slightly so. Gaster impressed between first and second segments. Dorsum of head only with small pits from which hairs arise. Dorsal alitrunk with larger shallow punctures which are best defined on the pronotum. In some specimens they are absent from the propodeal dorsum and may be effaced on the pronotum so that the dorsal alitrunk is largely smooth and shining. Meso- and metapleurae with weak rugulation, sometimes also finely punctate, but always with extensive unsculptured areas. Gaster unsculptured, smooth and shining apart from minute hair-pits. Full adult colour dark brown, the appendages lighter.

This species seems most closely related to *elegans* but the two are separated by the construction of the petiole, as reflected by their indices, and also by their sculpturation and colour, as noted in the key. Also, the sides of the head are less convex in *elegans* and the head broadens more markedly anteriorly.

#### MATERIAL EXAMINED.

RHODESIA: Lonely Mine (*H. Swale*); Cecil Kop nr Umtali (*W. L. Brown*).

*Leptogenys longiceps* Santschi

*Leptogenys longiceps* Santschi, 1914a : 328, fig. 13. Holotype worker, SENEGAL: Dakar (F. Silvestri) (IE, Naples).

DIAGNOSIS OF WORKER. Mesopleuron completely sculptured. Median clypeal lobe very short and bluntly rounded.

FURTHER DESCRIPTION. *Worker*. TL 4.2–4.5, HL 0.88–0.96, HW 0.70–0.72, CI 74–80, SL 0.76–0.86, SI 108–120, PW 0.58–0.62, PH 0.54–0.60, PL 0.42–0.46, LPI 128–136, DPW 0.40–0.46, DPI 95–100 (7 measured).

Head slightly broadened in front of eyes. Maximum diameter of eyes 0.18–0.22. Median lobe of clypeus developed as in *trilobata* (Text-fig. 11) but much shorter and narrower. Mandibles elongate, not closing against the clypeus. Length of funicular segments 1–3 ca 0.16, 0.16, 0.14 respectively. Head everywhere with scattered fine punctures dorsally, anteriorly also with a very fine superficial reticulation which extends from the posterior clypeal margin almost to the level of the posterior margin of the eye. Laterally and ventrally the head unsculptured apart from hair-pits. Dorsal alitrunk with numerous low, rounded rugulae overlaid by a dense reticulate-puncturation. Posterior portion of pronotal dorsum unsculptured, smooth and shining. Sides of pronotum very finely rugulose, mesopleuron, metapleuron and sides of propodeum more coarsely rugulose and also covered with a dense reticulate-puncturation. Upper halves of sides of petiole reticulate-punctate, this sculpture superimposed upon a rather coarser rugulation. Gaster smooth and shining apart from hair-pits.

The shape of the median lobe of the clypeus in this species resembles that found in *trilobata* but in a much reduced condition. However, the marked differences in sculpture between the two easily serve to separate them. In terms of sculpturation the species most closely resembling *longiceps* is *excellens*, but in this latter species the sculpture of the cephalic dorsum is continued on the sides and ventre.

## MATERIAL EXAMINED.

GHANA: Legon (*D. Leston*); Legon (*Mkhize*).

*Leptogenys mastax* sp. n.

(Text-figs 12, 27)

DIAGNOSIS OF WORKER. Petiole node with upper halves of sides longitudinally sulcate. Dorsum of head reticulate-punctate. Pronotum strongly sculptured. HL > 1.00, SI > 145.

FURTHER DESCRIPTION. *Holotype worker*. TL 4.9, HL 1.06, HW 0.66, CI 62, SL 1.02, SI 154, PW 0.62, PH 0.66, PL 0.46, LPI 143, DPW 0.44, DPI 95.

Head elongate, narrow, slightly broadened in front, the sides more or less straight and the occipital margin in full-face view weakly concave. Maximum diameter of eyes 0.24, greater than the maximum width of the scape. Inner and posterior borders of eyes with a circumocular impression. Median clypeal lobe long, triangular and quite broad. Mandibles relatively short, capable of closing tightly against the clypeus. Antennal scapes relatively long (SI > 140); lengths of funicular segments 1–3 respectively ca 0.18, 0.20, 0.16. Node of petiole in dorsal view broadest posteriorly, the upper halves of the sides converging strongly dorsally so that the actual dorsal surface of the node is a narrow strip. In profile the posterior face of the node feebly concave, the anterior feebly convex; the posterior face much higher than the anterior so that the dorsal surface slopes upwards posteriorly and is slightly convex. Gaster constricted between first and second segments. All surfaces of body and appendages with standing hairs. Dorsum of head reticulate-punctate, the sides behind the eyes with a fine, superficial reticulation, the ventral surface unsculptured. Pronotal dorsum rough, with dense punctulation. The

extreme posterior portion of the pronotum smooth and shining and with finger-like projections leading anteriorly into the sculptured area. Remainder of dorsum densely punctulate and with a few fine rugulae. Sides of pronotum finely reticulate, the meso- and metapleurae with some fine rugulae and a few punctures but with extensive smooth areas, especially upon the former. Upper halves of sides of petiole strongly longitudinally sulcate, the lower halves shiny and unsculptured. Gaster with only minute hair-pits. Black, the appendages brown.

*Paratype workers.* TL 4.7–5.0, HL 1.04–1.10, HW 0.66–0.70, CI 62–64, SL 0.98–1.08, SI 148–156, PW 0.62–0.64, PH 0.62–0.66, PL 0.42–0.46, LPI 139–147, DPW 0.42–0.44, DPI 92–100 (7 measured). Ocular diameter 0.22–0.26; lengths of funicular segments 1–3 ca 0.16–0.18, 0.20–0.22, 0.16–0.20. Otherwise as holotype.

*Paratype females.* Ergatoid; fitting description of worker but the petiole is modified and the gaster swollen. In the females examined the second gastral segment measured 0.92–0.96 high in profile and 0.86–0.92 wide in dorsal view. This is compared to measurements of 0.76–0.78 and 0.72–0.76 respectively in workers of the same series. Dimensions of the females are: HL 1.06–1.08, HW 0.68–0.70, CI 63–65, SL 0.96–1.02, SI 141–147, PW 0.62–0.64, PH 0.68–0.70, PL 0.40–0.42, LPI 162–171, DPW 0.48–0.50, DPI 119–125, ocular diameter 0.24–0.26 (4 measured). These compare well with the worker except that the scapes are relatively slightly shorter and the petiole is noticeably narrower in profile and broader in dorsal view. Ocelli are absent and the alitrunk is similar to that of the worker as flight sclerites are not developed.

Holotype worker, GHANA: Mt Atewa, 12.vi. 1970, under rotten twig on path (*B. Bolton*) (BMNH).

Paratypes. GHANA: 5 workers, Mt Atewa, ant ecology sample 138E, 29.vii.1966 (2 workers); ant ecology sample 139C, 29.vii.1966 (1 worker); ant ecology sample 161E, 5.viii.1966 (1 worker); ant ecology sample 164C, 5.viii.1966 (1 worker) (*D. Leston*). IVORY COAST: 6 workers, 4 females, Banco Forest, Abidjan, 8.i.1963, no. A6 (*W. L. Brown*) (BMNH; MCZ, Cambridge; NM, Basle).

It is interesting to note the number of females present in the paratype series from Ivory Coast. As this caste is very poorly known in the African species of *Leptogenys* it is impossible to say whether this multigynous condition holds in any other species or is peculiar to members of the *sulcinoda*-group or merely to this one species.

*L. mastax* is a member of a small complex of species within the group centring on *sulcinoda* and including also *nuserra* and *occidentalis*. All share the characters of relatively short mandibles which close tightly against the clypeus and a strong sulcate sculpturation on the upper halves of the sides of the petiole. They are separated by the characters given in the key and their respective diagnoses.

### *Leptogenys nuserra* sp. n.

DIAGNOSIS OF WORKER. Upper halves of sides of petiole sulcate. Dorsum of head densely punctate. Pronotum sculptured. Small species with relatively short scapes, HL < 1.00, SI < 140.

FURTHER DESCRIPTION. *Holotype worker.* TL 4.0, HL 0.90, HW 0.60, CI 67, SL 0.78, SI 130, PW 0.52, PH 0.52, PL 0.34, LPI 150, DPW 0.38, DPI 111.

Head not broadened in front of eyes, the sides feebly convex throughout their length. Maximum diameter of eye 0.20, in full-face view as long as the maximum width of the scape. Median lobe of clypeus triangular, broad and quite long. Mandibles relatively short, capable of closing tightly against the clypeus. Funicular segments 1–3 respectively 0.12, 0.14, 0.12. Petiole in profile high and narrow, the anterior and posterior faces virtually parallel but the

latter longer than the former so that the dorsal surface slopes upwards posteriorly. In dorsal view the node broadest posteriorly, narrowing in front, and the upper halves of the sides strongly convergent dorsally so that the dorsal surface proper is very narrow. Gaster constricted between first and second segments. All surfaces and appendages with numerous standing hairs. Dorsum of head densely but shallowly punctate, the sides and ventral surfaces unsculptured. Pronotal dorsum densely but finely reticulate or shagreened, the extreme posterior portion unsculptured and with finger-like projections radiating forwards. Remainder of dorsal alitrunk with scattered punctures and some very fine shagreening. Metapleuron with some fine striation and punctures, the former extending slightly onto the mesopleuron; otherwise sides of alitrunk unsculptured. Upper halves of sides of petiole longitudinally sulcate. Gaster smooth apart from minute hair-pits. Black, the legs, mandibles and scapes brown, the funiculi yellow-brown.

*Paratypes workers.* TL 3.5–4.1, HL 0.80–0.90, HW 0.56–0.62, CI 66–72, SL 0.66–0.78, SI 118–130, PW 0.46–0.54, PH 0.46–0.54, PL 0.30–0.36, LPI 150–159, DPW 0.32–0.38, DPI 100–112 (6 measured). Maximum diameter of eye 0.16–0.20; respective lengths of funicular segments 1–3 ca 0.12–0.14, 0.14–0.16, 0.12–0.14.

*Paratype females.* TL 3.6–3.7, HL 0.86–0.88, HW 0.58–0.60, CI 66–70, SL 0.72, SI 120–124, PW 0.51–0.52, PH 0.52, PL 0.26, LPI 200, DPW 0.42, DPI 161 (2 measured). Ocular diameter 0.20. Ergatoid, answering the description of the worker but with the petiole differently constructed as can be seen in the measurements given. The node in profile is strongly compressed antero-posteriorly and in dorsal view is relatively very broad. Gaster swollen; in the two females studied the height of the second segment in profile was 0.72–0.76 whilst its width in dorsal view was 0.74–0.76. In workers the height of this segment is 0.54–0.60 and the width 0.52–0.56.

Holotype worker, GHANA: Mt Atewa, 29.vii.1966, ant ecology sample 141E (*D. Leston*) (BMHN).

Paratypes. GHANA: 2 workers with same data as holotype; 1 female, Tafo, 22.vi.1966, ant ecology sample 45 (*D. Leston*); 1 worker, Tafo, 18.x.1966, ant ecology sample 335F (*D. Leston*); 1 worker, Mt Atewa, 8.viii.1969, pyrethrum knockdown sample A13/6 (*D. Leston*); 1 worker, Sajimasi, 25.vii.1969, on trunk (*D. Leston*). IVORY COAST: 1 worker, 1 female, Banco Forest, nr Abidjan, 8.i.1963, sample A11 (*W. L. Brown*); 5 workers, Banco Forest, nr Abidjan, i.1963, sample A (*W. L. Brown*) (BMNH; MCZ, Cambridge; NM, Basle.)

This species is most closely related to *mastax* but is smaller and the head is less strongly sculptured. It is the smallest of the complex of species immediately related to *sulcinoda* in which the upper halves of the sides of the petiole are longitudinally sulcate.

### *Leptogenys occidentalis* Bernard stat. n.

(Text-fig. 13)

*Leptogenys ferrarii* subsp. *sulcinodis* Bernard, 1952 : 210, fig. 5D. Holotype worker, GUINEA: Ravin 1 du Mont To (st.B1 28) (*Lamotte*) (MNHN, Paris) [examined]. [Junior homonym of *sulcinoda* André, 1892 : 48.]

*Leptogenys (Lobopelta) nitida* subsp. *occidentalis* Bernard, 1952 : 211, fig. 5 F. Syntype workers, GUINEA: To Foret 21–2. B2 41 ravin 1 (*Lamotte*) (MNHN, Paris) [examined]. [Synonym of the above and hence valid name.]

*Letogenys ferrarii* subsp. *bernardi* Baroni Urbani, 1971 : 360. [Replacement name for *sulcinodis* Bernard.] **Syn. n.**

**DIAGNOSIS OF WORKER.** Upper halves of sides of petiole longitudinally sulcate. Pronotum unsculptured apart from hair-pits. Occipital margin in full-face view concave.

**FURTHER DESCRIPTION.** *Worker.* TL 4.5–4.6, HL 1.04–1.06, HW 0.72–0.76, CI 69–72, SL 0.94–0.98, SI 126–130, PW 0.62–0.66, PH 0.60–0.64, PL 0.40–0.42, LPI 150–155, DPW 0.42–0.44, DPI 100–105 (4 measured).

Head slightly broader in front than behind, the occipital margin broadly concave in full-face view. Maximum diameter of eye ca 0.20–0.24. Median lobe of clypeus broad, narrowly rounded anteriorly. Mandibles short, capable of closing against the clypeus. Length of funicular segments 1–3 respectively ca 0.17, 0.18, 0.16. Node of petiole in dorsal view as broad as or slightly broader than long, much broader behind than in front. Sides of petiole converging dorsally so that the dorsal surface is quite narrow. Petiole high and narrow in profile, the anterior and posterior faces vertical and more or less parallel but the former shorter than the latter. Gaster constricted between first and second segments. Dorsum of head with numerous small, shallow punctures, the spaces between them smooth and shining. Sides and ventral surface of head and sides and dorsum of alitrunk unsculptured apart from hair-pits; propodeal declivity with transverse rugae. Upper halves of sides of petiole strongly longitudinally sulcate. Gaster unsculptured apart from minute hair-pits. Black, with appendages brown.

The two Bernard names given above are straight synonyms despite the fact that he related one to *ferrarii*, an elongate-mandible form, and the other to *nitida*, a short-mandible form. The only reason which I can see for this procedure is that in Bernard's *sulcinodis* the mandibles are open, whilst in his *occidentalis* they are closed. Measurement of the mandibles shows that they are of equal dimensions in both but the fact that they are open in one and closed in the other gives the illusion that those of the former are actually longer than those of the latter.

This species is of course related to *ferrarii* and its allies and not to *nitida*. Its closest relative within the group appears to be *sulcinoda* but the two are separable by the shape of the occipital margin and the dimensions of the petiole, as noted in the key.

### *Leptogenys princeps* sp. n.

(Text-fig. 26)

**DIAGNOSIS OF WORKER.** Head reticulate-punctate. Dorsal alitrunk completely sculptured. Node of petiole massive. Large species, HL > 1.20, PW > 0.75.

**FURTHER DESCRIPTION.** *Holotype worker.* TL 5.9, HL 1.26, HW 0.90, CI 71, SL 1.30, SI 144, PW 0.82, PH 0.86, PL 0.62, LPI 138, DPW 0.68, DPI 109.

Head slightly broadened in front of the eyes, the sides of the head feebly convex, the occipital margin in full-face view feebly concave. Maximum diameter of eye 0.32, greater than the maximum width of the scape. Eyes with a weak circumocular impression on their inner and posterior margins. Respective lengths of funicular segments 1–3 ca 0.18, 0.26, 0.24. Node of petiole massively constructed, in profile nearly as large as the first gastral segment. Posterior face of node approximately vertical, meeting the dorsal surface in an acute angle which slightly overhangs the posterior face. In dorsal view the nodes as long as the first gastral tergite, broader behind than in front. Hairs present on all surfaces of head, body and appendages. Dorsum of head coarsely reticulate-punctate, the sides and ventral surface unsculptured apart from a number of hair-pits. Alitrunk everywhere finely rugulose, the dorsal alitrunk and sides of the pronotum also with scattered large punctures. Propodeal declivity only with transverse rugulae. Upper halves of sides of petiole finely punctate with some larger punctures, the lower halves smooth and shiny. Posterior one-quarter of the sides

of the node with a vertical series of short, coarse, longitudinal sulci. Gaster unsculptured apart from small hair-pits, smooth and shining. Colour dark brown, the mandibles, antennae and legs lighter, the node black.

Holotype worker, GHANA: Mt Atewa, 4.viii.1966 (*D. Leston*) (BMNH).

This is one of the larger species of the group and its size and massive petiole node make it easy to identify.

### *Leptogenys ravida* sp. n.

(Text-fig. 10)

DIAGNOSIS OF WORKER. Eyes relatively small, their maximum diameter about equal to the length of the third funicular segment. Median clypeal lobe narrow, short and acute.

FURTHER DESCRIPTION. *Holotype worker*. TL 5.1, HL 1.08, HW 0.78, CI 72, SL 1.02, SI 130, PW 0.66, PH 0.64, PL 0.48, LPI 133, DPW 0.46, DPI 96.

Head broader in front than behind, the sides feebly convex and diverging anteriorly throughout their length. Occipital margin in full-face view broadly and very shallowly concave. Eyes relatively small for a member of this group, maximum diameter ca 0.18, about equal in length to the third funicular segment and only very slightly larger than the maximum width of the scape (ca 0.14). Median lobe of clypeus short, narrow and acute. Mandibles elongate and narrow, not closing tightly against the clypeus. Node of petiole with the anterior and posterior faces approximately vertical in profile, but the former shorter than the latter so that the dorsal surface slopes upwards posteriorly. Dorsum of head smooth and shining, unsculptured apart from a number of minute, widely scattered hair-pits. Dorsal alitrunk similar except that the hair-pits are much larger and the extreme posterior portion of the propodeum has a few faint, transverse striae. Propodeal declivity rugose. Sides of pronotum unsculptured apart from scattered pits. Mesopleuron with a few faint rugulae and extensive smooth, shining areas; metapleuron and sides of propodeum minutely rugulose. Node of petiole with a few faint striae on the upper halves of the sides. Gaster smooth and shiny apart from minute hair-pits. Black, shining, the appendages brown.

Holotype worker, ZAIRE: ('Belg. Congo' on data label) Mulungu Res. Sta., 1650 m, 28.iv.1948 (*A. Emerson*), 'Ants from mound of *Odontotermes patruus* (Sjostedt)' (MCZ, Cambridge).

### *Leptogenys sulcinoda* (André)

(Text-fig. 14)

*Lobopelta sulcinoda* André, 1892 : 48. Holotype worker, GABON (*Mocquerys*) (MNHN, Paris) [examined].

*Leptogenys* (*Lobopelta*) *sulcinoda* (André); Emery, 1911 : 102.

DIAGNOSIS OF WORKER. Upper halves of sides of petiole sulcate. Pronotum unsculptured apart from hair-pits. Occipital margin in full-face view feebly convex.

FURTHER DESCRIPTION. *Worker*. TL 4.6, HL 1.02, HW 0.72, CI 70, SL 0.90, SI 125, PW 0.58, PH 0.64, PL 0.48, LPI 133, DPW 0.46, DPI 96.

Head only slightly broadened anteriorly, the occipital margin feebly convex. Eyes large, maximum diameter 0.24. Median lobe of clypeus broad and broadly rounded anteriorly. Mandibles short, capable of closing tightly against the clypeus. Petiole in profile with the posterior face very weakly sinuate, much longer than the anterior face so that the dorsal surface slopes upwards posteriorly. Anterior face of petiole grades into dorsum through a broad convexity; the angle separating dorsum and posterior face more acute though still

rounded. In dorsal view the node slightly longer than broad, broadest posteriorly. Upper halves of sides of petiole node converge dorsally so that the dorsal surface is very narrow. Gaster strongly constricted between first and second segment. Head with numerous fine, shallow punctures, separated by shining interspaces; sides and ventral surface unsculptured. Alitrunk mostly unsculptured apart from hair-pits but the declivity of the propodeum has a few weak transverse rugae, and a few weak rugae or vestiges of such are present upon the propodeum and metapleuron. Upper halves of sides of petiole strongly longitudinally sulcate. Gaster unsculptured apart from minute hair-pits. Colour black, the appendages brown.

This species is apparently only known from the original collection of a single specimen. It is closest related to *occidentalis* but separated from it by the possession of a feebly convex occipital margin, and by the other characters noted above and in the key. Two other species are known in which the upper halves of the sides of the petiole are longitudinally sulcate, *mastax* and *nuserra*, but in both of these species the pronotal dorsum is strongly sculptured.

### *Leptogenys terroni* sp. n.

DIAGNOSIS OF WORKER. Dorsum of head and alitrunk covered with dense sculpturation. Large species, HL ca 1.48, SL ca 1.62.

FURTHER DESCRIPTION. *Holotype worker*. TL 7.8, HL 1.48, HW 1.18, CI 80, SL 1.62, SI 137, PW 0.98, PH 0.90 PL 0.74, LPI 121, DPW 0.66, DPI 90.

Head much broader in front than behind, the width across the clypeus considerably greater than across the eyes. Sides of head more or less straight, diverging strongly from back to front. Eyes large, maximum diameter 0.42, much greater than the maximum width of the scape and with a distinct circumocular impression above, in front of and behind the eye, but not below. Clypeus with a prominent, truncated median lobe. Mandibular blades very long, only feebly curved along their length, increasing slightly in width from base to apex. Funicular segments 1–3 ca 0.30, 0.32, 0.18 respectively. Metanotal groove impressed and crossribbed. Petiole with the upper halves of the sides converging dorsally so that the true dorsal surface is a narrow, longitudinal strip. Gaster strongly impressed between first and second segments. All surfaces of head, body and appendages with numerous standing hairs. Dorsum of head, especially between the eyes, finely and closely reticulate-rugulose, the spaces between the rugulae with numerous small punctures. Pronotum and mesonotum covered with a dense, fine reticulation and with scattered hair-pits. Propodeum and upper halves of sides of petiole similarly sculptured but also with larger rugae. Sides of pronotum as dorsum, the pleurae rugose. Legs, gaster and lower halves of sides of petiole smooth and shining, with hair-pits but otherwise unsculptured. Colour black, the gaster and appendages brown, the former darker in colour than the latter.

Holotype worker, CAMEROUN: no. 1519 (no further data) (*G. Terron*) (BMNH).

This is the largest and one of the most distinctive species yet known in the *sulcinoda*-group. Its large size and characteristic sculpturation render it easily distinguishable from other members of the group.

### *Leptogenys trilobata* Santschi

(Text-fig. 11)

*Leptogenys trilobatus* Santschi, 1924 : 196, fig. 1. Holotype worker, ZAIRE: Tschela, 2.xi.1920 (*H. Schouteden*) (MRAC, Tervuren) [examined].

DIAGNOSIS OF WORKER. Dorsum of head rugose, dorsum of alitrunk not densely sculptured, mostly shining. Median clypeal lobe truncated apically.

FURTHER DESCRIPTION. *Worker*. TL 5.4–5.6, HL 1.02–1.10, HW 0.76–0.84, CI 75–76, SL 0.86–0.94, SI 112–113, PW 0.62–0.68, PH 0.54–0.60, PL 0.56–0.62, LPI 96–98, DPW 0.50–0.52, DPI 84–89 (2 measured).

Head broader in front than behind. Maximum diameter of eyes 0.22–0.24, greater than the maximum width of the scape. A weak circumocular impression present on inner and posterior margins of eyes. Median lobe of clypeus strongly prominent, with almost parallel sides and a broadly arcuate, truncated apex. Mandibles long and narrow, not closing against the clypeus. Respective lengths of funicular segments 2–3 ca 0.16–0.18, 0.14–0.16. Metanotal groove weakly cross-ribbed. Node of petiole massive; in dorsal view longer than wide, widest posteriorly; in profile very nearly as long as high. Gaster constricted between first and second segments. Dorsum of head rugose, with numerous minute punctures; the median strip of the ventral surface unsculptured. Dorsal alitrunk with scattered foveolate punctures, the pronotum with a few weak, rounded rugae, the propodeum also with a few small punctures. Meso- and metapleurae striate, with punctures between the striae. Gaster smooth and shining. Standing hairs numerous on all surfaces. Black with the appendages light brown.

#### MATERIAL EXAMINED.

CAMEROUN: Yolé Massif, Kala (*G. Terron*)

### THE *ATTENUATA*-GROUP

(Text-figs 22, 29, 30)

Mandibles short, closing tightly against the clypeus. Eyes medium to large, their maximum diameter greater than the maximum width of the antennal scape. Second funicular segment distinctly longer than the third. Head slightly or not broadened anteriorly. Node of petiole in dorsal view much longer than broad. Sculpture only of fine punctures dorsally from which hairs arise, with large shining spaces between the punctures. Gaster constricted between first and second segments. Clypeus without a prominent median lobe, without a fringing lamella.

Of the four species placed in this small group *bubastis* and *crassinoda* are certainly closely related, but the remaining species, *attenuata* and *ergatogyna*, are very different. However, in view of the characters above it is probably best to leave them in one group until the genus as a whole is better understood.

In the four species, *crassinoda* and *attenuata* are known only from South Africa whilst *bubastis* is known only from Cameroun. The last species, *ergatogyna*, is more widely distributed, having been recorded from Ghana, Uganda and Zaire, and appears to be strictly a forest species.

Three other species referable to this group and related either to *attenuata* or *crassinoda* are known from the Malagasy Region.

#### *Leptogenys attenuata* (F. Smith)

(Text-fig. 29)

*Ponera attenuata* F. Smith, 1858 : 91. LECTOTYPE and paralectotype workers, by present designation, SOUTH AFRICA: Cape of Good Hope, no. 1490 (*Drege*) (UM, Oxford; BMNH) [examined].

*Lobopelta attenuata* (F. Smith); Roger, 1863 : 19.

*Leptogenys (Lobopelta) jaegerskjoeldi* Santschi, 1914b : 9. Syntype workers, SOUTH AFRICA : Natal, Richmond, 24.iii.1905 (*I. Trägårdh*) NM, Basle) [examined]. [Synonymy by Arnold, 1926 : 210.]

*Leptogenys jägerskiöldi* Santschi; Santschi, 1917 : 297. [Misspelling.]

DIAGNOSIS OF WORKER. Petiole in dorsal view elongate and strongly compressed from side to side, much narrower anteriorly than posteriorly. Body often with bluish or violet reflections. Antennal scapes moderately long, SI > 175.

FURTHER DESCRIPTION. *Worker*. TL 7.5–7.8, HL 1.50–1.62, HW 0.94–1.02, CI 59–63, SL 1.72–1.98, SI 183–194, PW 0.84–0.94, PH 0.66–0.80, PL 0.76–0.88, LPI 86–91, DPW 0.38–0.46, DPI 50–53 (8 measured).

Head elongate, quite narrow, broadest across the eyes which are situated approximately at the midlength of the sides of the head. Occipital margin concave in full-face view. Eyes large, maximum diameter ca 0.36–0.42, greater than the maximum width of the scape. Clypeus triangular, the mandibles closing tightly against it. Respective lengths of funicular segments 1–3 ca 0.26–0.28, 0.46–0.48, 0.36–0.40. Metanotal groove impressed but not cross-ribbed. Node of petiole in dorsal view elongate, strongly narrowed anteriorly, much broader behind than in front. In profile the anterior and dorsal faces confluent through a broad curve. Gastral constriction between first and second segments distinct. Sculpture lacking except on the mandibles where a few very fine striae are usually present. All surfaces of body with standing hairs. Colour black or blackish brown, usually with bluish or violet reflections. Legs, mandibles and funiculi lighter.

This quite distinctive species, the male of which was described by Arnold (1915), appears to be restricted to South Africa. Some apparently closely related forms are known from the Oriental and Indo-Australian Regions, such as *peuqueti* André and *assamensis* Forel, and these species resemble *attenuata* more closely than any species present in the Ethiopian Region.

#### MATERIAL EXAMINED.

SOUTH AFRICA; E. Cape Prov., Katberg (*R. E. Turner*); Grahamstown (*W. L. Brown*); E. Cape Prov., Alexandria (*W. L. Brown*); Natal, Durban (*G. Arnold*); Durban (*H. B. Marley*); Durban (*C. B. Cooper*); W. Grahamstown (*F. Jacot-Guillarmod*); Cape Prov., Knysna (*B. Malkin*).

#### *Leptogenys bubastis* sp. n.

DIAGNOSIS OF WORKER. Propodeal dorsum without a transverse impression anteriorly but with scattered large pits. Petiole node in dorsal view not strongly compressed from side to side. Scapes relatively short, SI < 165.

FURTHER DESCRIPTION. *Holotype worker*. TL 7.0, HL 1.42, HW 0.98, CI 69, SL 1.50, SI 153, PW 0.86, PH 0.72, PL 0.70, LPI 103, DPW 0.46, DPI 66.

Head broadest across the eyes, not much broader in front than behind, the sides feebly convex. Maximum diameter of eye ca 0.30, greater than the maximum width of the scape. Clypeus broadly triangular, the mandibles closing tightly against it. Funicular segments 1–3 ca 0.26, 0.42, 0.30 respectively. Metanotal groove a narrow, incised line, not cross-ribbed. Propodeal dorsum relatively much longer than in the related *crassinoda* (see key, couplet 49). Node of petiole in dorsal view longer than broad, narrowing anteriorly but the sides not strongly compressed. Gaster constricted strongly between first and second segments. Dorsal surfaces of head and body with short, standing hairs. Head with numerous minute punctures from which hairs arise, the pronotum with very few such pits, but the mesonotum and

propodeum with a number of large pits. First and second gastral tergites abundantly supplied with distinct hair-pits. Propodeal declivity not transversely rugose. Sides of alitrunk with some cross-ribbing or rugosity at the suture lines and on the bulla of the metapleural glands; otherwise the body smooth. Colour black, the appendages brown.

Holotype worker, CAMEROUN: series MZ (*G. Terron*) (BMNH).

Most closely related to *crassinoda*; the differences between the two are given under that species and in the key.

### *Leptogenys crassinoda* Arnold stat. n.

(Text-fig. 30)

*Leptogenys attenuata* var. *crassinoda* Arnold, 1926 : 210. Syntype workers, SOUTH AFRICA: East London (*Rattray*) (BMNH) [examined].

DIAGNOSIS OF WORKER. Propodeal dorsum without a transverse impression anteriorly, with scattered large pits. Petiole node in dorsal view not strongly compressed from side to side. Antennal scapes relatively short, SI < 165.

FURTHER DESCRIPTION. *Worker*. TL 6.2–7.2, HL 1.38–1.42, HW 0.94–1.00, CI 68–70, SL 1.48–1.52, SI 152–157, PW 0.82–0.86, PH 0.70–0.72, PL 0.64–0.66, LPI 109–110, DPW 0.40–0.44, DPI 60–68 (2 measured).

Head broadest across the eyes, not markedly broader in front than behind. Occipital margin broadly but shallowly concave in full-face view. Maximum diameter of eye ca 0.28–0.30, greater than the maximum width of the antennal scape. Clypeus triangular, the mandibles closing tightly against it. Metanotal groove impressed but not cross-ribbed. Node of petiole in dorsal view elongate, broadest behind and narrowing slightly anteriorly. Constriction between first and second gastral segments distinct. Body unsculptured. Standing hairs present upon all surfaces. Colour black, the appendages brown or yellow-brown.

Arnold originally described this species as a variety of *attenuata* but it is smaller, with a broader head, smaller eyes, shorter scapes and a shorter, thicker petiole. As far as can be ascertained *crassinoda* is still only known from the type-collection.

The closest related species to *crassinoda* is *bubastis*, which it closely resembles. However, in *bubastis* the mesonotum and propodeum have numerous scattered, large punctures or pits which are absent from *crassinoda*, and the propodeal dorsum is relatively much longer in *bubastis*, as is noted in the key.

### *Leptogenys ergatogyna* Wheeler

(Text-fig. 22)

*Leptogenys (Lobopelta) ergatogyna* Wheeler, 1922 : 95, fig. 20. Holotype female, ZAIRE: Medje (*Lang & Chapin*) (AMNH, New York) [examined].

*Leptogenys (Lobopelta) cursor* Arnold, 1954 : 293, fig. 4. Holotype worker, UGANDA: Zika Forest, near Entebbe, 18.v.1952 (*G. Arnold*) (NM, Bulawayo) [examined]. **Syn. n.**

DIAGNOSIS OF WORKER. Mandibles massively developed, very broad. Propodeal dorsum with a broad, transverse impression anteriorly and a longitudinal groove which is most distinct posteriorly. Antennal scapes very long, SI > 200.

FURTHER DESCRIPTION. *Worker*. TL 8.0–8.4, HL 1.60–1.62, HW 0.98–1.02, CI 61–62, SL 2.34–2.44, SI 238–244, PW 0.96–1.02, PH 0.76–0.80, PL 0.71–0.72, LPI 106–111, DPW 0.48–0.50, DPI 66–69 (4 measured).

Head elongate and narrow, somewhat broader in front than behind; occipital margin short and only extremely weakly concave. Eyes large, maximum diameter ca 0.40–0.42, the eyes situated just in front of the midlength of the sides of the head. Clypeus triangular. Mandibles massive, broad and heavy, their basal borders closing tightly against the clypeus. Apical (masticatory) margin very long, meeting the basal margin through a broad curve. A single preapical tooth present, close to the apical. Antennal scapes very long; lengths of funicular segments 1–3 respectively ca 0.30–0.34, 0.60–0.64, 0.46–0.50. Metanotal groove present but not cross-ribbed. Propodeal dorsum with a longitudinal groove, most distinct posteriorly, and also with a transverse impression anteriorly, just posterior to the metanotal groove. Node of petiole in dorsal view elongate, broadest behind and narrowing slightly anteriorly. Constriction between first and second gastral segments distinct. Meso-metapleural suture cross-ribbed, otherwise body unsculptured apart from hair-pits, which are abundant on the head. Standing hairs present on all dorsal surfaces; pubescence quite dense on dorsum of head and on legs. Colour black, the appendages brown.

*Female.* TL 8.2, HL 1.62, HW 1.00, CI 62, SL 2.26, SI 226, PW 1.02, PH 0.84, PL 0.72, LPI 116, DPW 0.52, DPI 72.

Head similar to that of worker but with three ocelli, of which the median (anterior) is the best developed. Scapes relatively slightly shorter than in worker but eyes about the same size, maximum diameter ca 0.42. Alitrunk with developed flight sclerites but wings apparently never developed. Parapsidal furrows present; posterior arm of notauli present, the anterior arms absent. Node of petiole slightly higher and broader than in worker, the gaster swollen beyond the size of the worker. In the female the height of the second segment in profile is 1.20 whilst in the worker it is 1.04, and the dorsal width of the second segment is 1.10 in the female, 0.95 in the worker. The female has some fine, transverse striation across the anterior portion or covering all of the propodeal dorsum which is not present in the worker, and lacks the transverse propodeal impression present in the worker, but otherwise the two are similar.

The association of the worker and female castes of this species described respectively as *cursor* and *ergatogyna*, was permitted by a series collected at Tafo, Ghana by D. Leston, which contained a number of workers and a single female. The holotype of *ergatogyna* and the female in the Ghana series are similar in most respects but the former is more strongly sculptured. The fine punctures of the head are rather more dense and are also abundant on the pronotum, which in the case of the Ghana female is mostly smooth and shining. Transverse striae are restricted to the anterior half of the propodeal dorsum in the Ghana specimen whilst in the holotype of *ergatogyna* they occur on the entirety of the segment.

#### MATERIAL EXAMINED.

GHANA: Tafo (*D. Leston*); Mt Atewa (*D. Leston*); Nkwantanan (*D. Leston*).  
CAMEROUN: Ototomo (*G. Terron*).

#### THE GUINEENSIS-GROUP

(Text-figs 16, 23, 28)

Mandibles short, closing tightly against the clypeus. Eyes small or minute, their maximum diameter always less than the maximum width of the antennal scape. Second funicular segment as long as or shorter than the third. Head only slightly or not broadened anteriorly. Sculpture usually only of fine punctures dorsally. Gaster not or only very feebly constricted between the first and second segments. Standing hairs absent from dorsum of propodeum, petiole and first and second gastral tergites.

The four related species forming this group are presently known only from West Africa; three of the species are forest inhabitants whilst the fourth (*microps*) is a savannah species.

***Leptogenys guineensis* Santschi**

(Text-fig. 16)

*Leptogenys (Lobopelta) guineensis* Santschi, 1914a : 329, fig. 14. Syntype workers, GUINEA: Mamou (*F. Silvestri*) (NM, Basle) [examined].

DIAGNOSIS OF WORKER. Apex of mandible with two teeth. Larger species, HL > 0.88. Petiole in profile not a dorsally tapered, thick scale.

FURTHER DESCRIPTION. *Worker*. TL 4.3–4.5, HL 0.92–0.96, HW 0.68–0.70, CI 73–74, SL 0.80–0.82, SI 117–118, PW 0.54–0.56, PH 0.52, PL 0.32–0.36, LPI 145–160, DPW 0.36–0.38, DPI 105–112 (6 measured).

Head not broadened anteriorly, broadest just behind the eyes, the sides shallowly convex. Eyes small, maximum diameter ca 0.08; in full-face view their maximum diameter less than the greatest width of the scape. Second funicular segment usually slightly shorter than the third, sometimes the same length; the relative lengths of segments 1–3 ca 0.12–0.14, 0.10–0.12, 0.12. Mandibles short, with a single preapical tooth and closing tightly against the clypeus. Metanotal groove impressed and with a very fine cross-ribbing so that the base of the groove appears to be traversed by a row of punctures. Node of petiole high and narrow in profile, with a slightly convex anterior face and a virtually straight, sloping posterior face. Gaster only very weakly impressed between first and second segments. Body unsculptured apart from transverse rugae on propodeal declivity and cross-ribbing on the meso-metapleural suture. Short, standing hairs absent from propodeum and first two gastral tergites. Colour brown, glossy, the appendages lighter.

This species is very closely related to *testacea*, and further collections may prove them to be inseparable. However, in the material examined during the course of this study specimens of *guineensis* have consistently been larger and have lacked the third (middle) tooth on the mandibular apex which is characteristic of *testacea*. Another feature which appears to be typical of *guineensis* is the presence on the anterior portion of the median clypeal lobe of a yellow-coloured patch which is usually about the same colour as the mandibles. Two long setae with distinct black pits project from the upper portion of this area. In *testacea* this area is slightly lighter in colour but does not form a strong contrast with its surroundings as it does in *guineensis*.

**MATERIAL EXAMINED.**

GHANA: Mt Atewa (*C. A. Collingwood*); Mt Atewa (*D. Leston*); Tafo (*D. Leston*).

***Leptogenys microps* sp. n.**

DIAGNOSIS OF WORKER. Apex of mandible with two teeth. Minute species, HL < 0.70; eyes minute, maximum diameter < 0.05.

FURTHER DESCRIPTION. *Holotype worker*. TL 2.7, HL 0.66, HW 0.48, CI 73, SL 0.50, SI 104, PW 0.38, PH 0.34, PL 0.28, LPI 121, DPW 0.22, DPI 78.

Head not broader in front than behind, broadest at about its midlength, the sides feebly convex. Occipital margin very weakly concave medially in full-face view. Clypeus with a

relatively short, bluntly triangular median lobe, the apex of which is rounded. Mandibles short, closing tightly against the clypeus, the inner margins of the blades convex, the outer slightly concave in full-face view. Eyes minute, maximum diameter 0.04, much less than the maximum width of the scape, with very few facets. Funiculus with segments 1-3 ca 0.10, 0.06, 0.07 respectively, the second funicular segment very nearly as broad as long. Petiole in profile with the anterior face slightly convex, rounding into the dorsal surface; the latter meeting the almost straight posterior face in a more acute angle. Body of node inclined forward so that the anterior face is much shorter than the posterior and so that when the ventral surface is horizontal the anterior and posterior faces slope anteriorly. Gaster weakly constricted between first and second segments. Standing hairs absent from dorsum of propodeum, petiole and first two gastral tergites, which do, however, have a strongly adpressed pubescence. Pronotum with a pair of long, erect hairs anteriorly and with shorter standing hairs and pubescence. Dorsum of head with minute, faint superficial punctures. Dorsal alitrunk with scattered punctures, larger than those on the head and more distinct, most obvious on the propodeum. Propodeal declivity with a few fine, transverse striae. Gastral tergites with scattered minute punctures. Colour uniform dull yellow.

*Paratype workers.* TL 2.7-2.9, HL 0.64-0.66, HW 0.48-0.50, CI 73-78, SL 0.50-0.52, SI 104-108, PW 0.38, PH 0.34-0.36, PL 0.28, LPI 121-128, DPW 0.22-0.24, DPI 78-86 (2 measured).

As holotype, with eyes the same size, but in one the occipital margin in full-face view is nearly straight and the punctures of the propodeal dorsum are shallower and less well defined.

Holotype worker, IVORY COAST: Lamto (Toumodi), 15.ix.1965, AA129 (probably collected by *J. Lévioux*) (MCZ, Cambridge).

Paratypes. 1 worker with same data as holotype, and 1 worker from the same locality but dated 10.ix.1965, AA 124 (BMNH; MCZ, Cambridge).

This minute species is the smallest of the *guineensis*-group and one of the smallest species known of the genus. In some ways it is convergent with the very small species of the *nitida*-group (*khaura*, *cryptica*, *stygia*) but these forms have numerous standing hairs on the propodeum, petiole and gaster, absent from *microps*.

### ***Leptogenys spandax* sp. n.**

(Text-fig. 28)

DIAGNOSIS OF WORKER. Apex of mandible with two teeth. Larger species, HL > 1.00. Petiole in profile a thick scale, tapering dorsally.

FURTHER DESCRIPTION. *Holotype.* TL 6.8, HL 1.38, HW 0.98, CI 71, SL 1.46, SI 149, PW 0.82, PH 0.82, PL 0.60, LPI 137, DPW 0.54, DPI 90.

Occipital margin feebly convex, sides of head very weakly convex and slightly diverging anteriorly so that the front of the head is somewhat wider than the back. Eyes small, maximum diameter ca 0.14, failing to break the outline of the sides of the head in full-face view. Maximum diameter of eye distinctly less than maximum width of scape. Clypeus with a broadly triangular median lobe. Mandibles short, closing tightly against the clypeus, their inner margins convex, outer margins slightly concave. Second and third funicular segments of equal length, ca 0.24. Metanotal groove impressed and weakly cross-ribbed. In profile the propodeal declivity with a short tooth on each side, projecting just above the bulla of the metapleural glands. Node of petiole in profile a thick scale, tapering strongly in its upper half. Anterior face almost vertical, posterior face sloping strongly anteriorly, the dorsum very short. In dorsal view the node short and broad, with a narrow, wide dorsal surface, a slightly convex anterior and slightly concave posterior face. Gaster not constricted between first and second segments. Standing hairs absent from dorsal surfaces of head, alitrunk, gaster and appendages, present only around

the mouth and gastral apex. Dorsum of head finely punctate. Pronotum similarly sculptured but the punctures larger and more dispersed, with reticulate sculpture between them. Propodeal dorsum finely rugulose, the declivity very coarsely transversely rugose. Sides of propodeum and metapleuron rugose, mesopleuron with patches of rather effaced sculpture, mostly smooth and shining. First gastral tergite with numerous minute punctures. Brown, the legs, antennae and mandibles yellow-brown.

*Paratype worker.* As holotype but with HL 1.36, HW 0.98, CI 72, SL 1.44, SI 1.47, PW 0.78, PH 0.78, PL 0.58, LPI 134, DPW 0.54, DPI 93.

Holotype worker, GHANA: Tafo, 24.ix.1966, ant ecology sample 282E (*D. Leston*) (BMNH).

Paratype. 1 worker with same data as holotype (MCZ, Cambridge).

### *Leptogenys testacea* (Donisthorpe)

(Text-fig. 23)

*Microbolbos testaceus* Donisthorpe, 1948 : 170. Holotype and paratype workers, GHANA: Eastern Region, New Tafo, vii. 1945, no. F463 (*Strickland*) (BMNH) [examined].

*Leptogenys testacea* (Donisthorpe); Wilson, 1955 : 136.

DIAGNOSIS OF WORKER. Apex of mandible with three teeth. Smaller species, HL <0.88

FURTHER DESCRIPTION. *Worker.* TL 3.5–3.7, HL 0.80–0.84, HW 0.60–0.62, CI 73–76, SL 0.70–0.72, SI 1.16–1.20, PW 0.46–0.48, PH 0.44–0.50, PL 0.30–0.32, LPI 140–156, DPW 0.32–0.36, DPI 100–113 (8 measured).

Maximum width of head at about the midlength of the sides, behind the eyes. Eyes small, maximum diameter ca 0.08; in full-face view the maximum diameter of the eye less than the greatest width of the scape. Relative lengths of funicular segments 1–3 ca 0.12, 0.10, 0.10. Mandibles short, closing tightly against the triangular clypeus. Mandibles with three teeth, the apical and two preapicals. The middle tooth of the three (i.e. first preapical) is the smallest and in some specimens appears to be considerably worn down. Metanotal groove impressed and with very fine cross-ribbing, appearing as a row of punctures traversing the base of the groove. Node of petiole high and narrow in profile; the gaster not constricted between the first and second segments. Unsculptured apart from some transverse rugae on the propodeal declivity and cross-ribbing on the meso-metapleural suture. Short, standing hairs absent from the propodeum and first two gastral tergites. Colour light brown, shining, the legs and antennae lighter.

This small, soil-inhabiting species is known at present only from the type-series. It is very closely related to *guineensis* and a discussion of the two is given under that species.

Wilson (1955 : 136) first pointed out that the mandible was armed with three teeth and stated that the surface of the body was 'heavily shagreened, completely opaque.' This effect was due to a layer of very fine dirt (mud?) on the surface of the specimens. When cleaned they are mostly smooth and shining.

### THE HAVILANDI-GROUP

Mandibles short, closing tightly against the clypeus. Eyes medium, their maximum diameter greater than the maximum width of the scape. Second funicular segment longer than the third. Sculpture of dorsal head and alitrunk of dense rugulation or punctures. Gaster

constricted between first and second segments. Clypeus with a fringing lamella, which may be very narrow.

The four species forming this compact group appear to be restricted to the territories of South Africa and Rhodesia. All are of medium size, are stoutly built and strongly sculptured.

### *Leptogenys arnoldi* Forel

*Leptogenys (Lobopelta) arnoldi* Forel, 1913a : 110. Syntype workers, males, RHODESIA: Plumtree (*Arnold*) (MRAC, Tervuren; MHN, Geneva) [examined].

DIAGNOSIS OF WORKER. First and second gastral tergites unsculptured. Antennal scapes shorter, SI < 140. Fringing lamella of clypeus indistinct. Maximum diameter of eye 0.34 or more.

FURTHER DESCRIPTION. *Worker*. TL 5.9–6.8, HL 1.30–1.44, HW 0.94–1.02, CI 66–72, SL 1.18–1.32, SI 125–133, PW 0.78–0.86, PH 0.70–0.76, PL 0.52–0.54, LPI 135–146, DPW 0.46–0.56, DPI 90–104 (6 measured).

Head slightly broader in front than behind, the occipital margin broad and very weakly convex, the sides convex. Maximum diameter of eyes ca 0.34–0.36, their length in full-face view greater than the maximum diameter of the slightly flattened scapes. Clypeus large, broadly triangular, with a very narrow, indistinct lamelliform anterior margin. Mandibles short and broad, with a single small preapical tooth; closing tightly against the clypeus. Second funicular segment elongate, lengths of segments 1–3 respectively ca 0.20–0.24, 0.30–0.32, 0.20–0.22. Metanotal groove deep but not cross-ribbed. Petiole in profile high and quite narrow, the anterior and posterior faces almost parallel, rounding into the slightly convex dorsum. Gaster strongly constricted between first and second segments. Mandibles smooth and shining. Dorsum of head with small punctures, densest between the eyes, tending to become more sparse medially and also posteriorly. Pronotum merely roughened or finely, densely punctate, but usually with a smooth, shining area posteromedially which often extends anteriorly on the disc and often has a number of finger-like projections radiating from the median area. Mesonotum as pronotum, again with some smooth areas. Propodeum strongly and densely punctate or roughened, the declivity transversely rugose. Gaster smooth and shining. Standing hairs present on all surfaces. Pubescence quite dense on head and alitrunk, sparse on gaster. Colour dark brown or black, the legs, mandibles and antennae light or dark brown.

The characters given in the diagnosis above are sufficient to differentiate *arnoldi* from the remaining species of the group. The female of this species was described by Arnold (1915), but this specimen has not been examined during the course of the present study.

### *Leptogenys furtiva* Arnold stat. n.

*Leptogenys havilandi* race *furtiva* Arnold, 1926 : 209. Syntype workers, RHODESIA: Bulawayo, 2.i.1915 (*G. Arnold*) (BMNH) [examined].

DIAGNOSIS OF WORKER. First and second gastral tergites sculptured, reticulate-punctate or granular. Antennal scapes longer, SI > 140. Fringing lamella of clypeus distinct, broad and often opaque.

FURTHER DESCRIPTION. *Worker*. TL 6.5–6.8, HL 1.30–1.40, HW 0.92–1.00, CI 70–72, SL 1.38–1.48, SI 147–150, PW 0.80–0.86, PH 0.74–0.80, PL 0.56–0.60, LPI 130–133, DPW 0.52–0.58, DPI 92–97 (6 measured).

Head only very slightly broader in front than behind, the sides very feebly convex, almost

straight. Frontal groove short, not extending to level of posterior margins of eyes. Eyes medium, maximum diameter ca 0.28–0.32. Clypeus broad, with a distinct and usually opaque, broad fringing lamella on the anterior margin. Mandibles short, closing tightly against the clypeus. Respective lengths of funicular segments 1–3 ca 0.22–0.24, 0.32–0.36, 0.24–0.26. Metanotal groove deeply impressed; gaster very strongly constricted between first and second segments. All surfaces of body with numerous standing hairs. Dorsum of head, alitrunk and first two gastral tergites very finely and very densely reticulate-punctate or punctulate, the individual punctures so small and closely packed that the surfaces appear coarsely granular. Propodeal dorsum also with a few weak rugulae. Pleurae and sides of propodeum more coarsely sculptured, with distinct rugae.

This species is separated from others of the group by its strongly sculptured gaster, but in all other respects it is very close to *haviglandi*. In the original description Arnold (1926) noted that the workers were carrying termites in their jaws.

### *Leptogenys haviglandi* Forel

*Leptogenys (Lobopelta) haviglandi* Forel, 1901a : 332. Holotype worker, SOUTH AFRICA: Natal (*Havigland*) (MHN, Geneva) [examined].

DIAGNOSIS OF WORKER. First and second gastral tergites unsculptured. Antennal scapes longer, SI > 140. Fringing lamella of clypeus distinct, broad. Maximum diameter of eye < 0.34.

FURTHER DESCRIPTION. *Worker*. TL 6.7–7.2, HL 1.32–1.42, HW 0.96–1.00, CI 70–73, SL 1.40–1.60, SI 146–160, PW 0.80–0.88, PH 0.76–0.80, PL 0.60–0.62, LPI 126–130, DPW 0.50–0.56, DPI 83–91 (3 measured).

Head only very slightly broader in front than behind, the sides feebly convex, almost straight. Frontal groove distinct, extending to the level of the posterior margin of the eyes or further. Maximum diameter of eyes ca 0.26–0.30. Clypeus broadly triangular and rounded, with a distinct fringing lamella on the anterior margin. Mandibles closing tightly against clypeus. Respective lengths of funicular segments 1–3 ca 0.22–0.24, 0.34–0.38, 0.26–0.28. Metanotal groove deeply impressed; gaster strongly constricted between the first and second segments. All surfaces of body with numerous standing hairs. Dorsum of head reticulate-punctate. Pronotum with small, crowded rugulae and some puncturation, similarly the mesonotum and propodeal dorsum but on the latter the rugulae tend to be coarser. Sides of propodeum and pleurae coarsely rugose, the pronotum finely sculptured. First and second gastral tergites unsculptured apart from hair-pits.

Most closely related to *furtiva* and *peringueyi*, from which it is separated by details of sculpturation; *haviglandi* may be found to be inseparable from them when more collections have been made. At present *haviglandi* represents a mid-point between the very heavily sculptured *furtiva* and the lightly sculptured *peringueyi*, but these three forms may well be different expressions of a single variable species.

### *Leptogenys peringueyi* Forel

*Leptogenys (Lobopelta) haviglandi* st. *peringueyi* Forel, 1913c : 210. Holotype worker, SOUTH AFRICA: Cape Prov., Table Mountain (*L. Peringuey*) (MHN, Geneva) [examined].

*Leptogenys (Lobopelta) peringueyi* Forel; Arnold, 1915 : 96. [Raised to species.]

DIAGNOSIS OF WORKER. First and second gastral tergites unsculptured. Pronotal dorsum sculptured with punctures separated by smooth, shining spaces.

FURTHER DESCRIPTION. *Worker*. TL 6.7, HL 1.30, HW 0.90, CI 70, SL 1.22, SI 135, PW 0.74, PH, PL – not measurable, DPW 0.50.

Head not broadened in front of eyes, the sides approximately straight. Maximum diameter of eyes ca 0.26, greater than the maximum width of the scape. Frontal groove extending to level of posterior margins of eyes. Clypeus broadly triangular, with a narrow, fringing lamella. Mandibles short and stout, closing tightly against the clypeus. Metanotal groove deeply impressed; gaster strongly constricted between first and second segments. All surfaces of body with numerous standing hairs. Dorsum of head densely punctate, the pronotal dorsum more sparsely so, with distinct smooth, shining spaces between the individual punctures, broader than those upon the head. Mesonotum similarly sculptured but propodeal dorsum also retaining traces of rugose sculpturation. Sides of pronotum very lightly sculptured; pleurae and sides of propodeum more strongly so, with distinct rugosity. Gaster unsculptured apart from hair-pits.

This species is closely related to *havilandi*, the major differences separating the two belonging to the sculptural patterns of the head and alitrunk. When they are better known *peringueyi* and *havilandi* may be found to be conspecific.

### THE *NITIDA*-GROUP

(Text-figs 15, 17, 18, 25)

Mandibles short, closing tightly against the clypeus. Eyes medium to minute, their maximum diameter in full-face view ranging from just greater than the maximum width of the scape to considerably less than the scape width. Second funicular segment at most about as long as the third, usually shorter than the third. Head not or only slightly broadened anteriorly. Sculpture usually only of scattered fine punctures on the dorsal surfaces; reticulate-punctate in some species, rarely otherwise. Gaster constricted between first and segments segments.

This group of fourteen species divides itself into a number of complexes of more or less closely related forms. The first, including *cryptica*, *khaura* and *stygia*, is West African in distribution and is characterised by strong reticulate-punctate sculpture on the cephalic dorsum and by its small size. The second, including *buyssoni*, *ankhesa*, *honorio* and *strator* are known from Zaire, Cameroun and Ethiopia. They are larger species with relatively blocky petiole nodes and strongly developed subpetiolar processes. They appear to feed on termites. The remaining species are found in central, eastern and southern Africa, are medium-sized, lightly sculptured and with usually a simple lobiform subpetiolar process. One of them (*mactans*) appears to have convergently acquired a number of characters possessed by the *processionalis*-group of the Oriental and Indo-Australian Regions.

### *Leptogenys amon* sp. n.

(Text-fig. 18)

DIAGNOSIS OF WORKER. Head relatively long and narrow, CI ca 62. Circumocular groove very strongly developed. Petiole long and narrow, DPI < 70.

FURTHER DESCRIPTION. *Holotype worker*. TL 5.2, HL 1.12, HW 0.70, CI 62, SL 0.84, SI 120, PW 0.58, PH 0.52, PL 0.54, LPI 97, DPW 0.34, DPI 66.

Head elongate and narrow, increasing slightly in width anteriorly; occipital margin very shallowly concave, the sides of the head more or less straight. Maximum diameter of eyes

ca 0.18, about equal to the maximum width of the strongly dorsoventrally flattened scapes. Circumocular groove strongly developed in front of, above and behind the eye so that the eye appears to be sunk in an impression in the side of the head. Median portion of clypeus a broad, rounded lobe. Mandibles short and stout, closing tightly against the clypeus. Funicular segments 1-3 respectively ca 0.16, 0.18, 0.16. Metanotal groove an incised line; cross-ribbing is present in the groove but the individual ribs are so small that the spaces between them appear as a line of small punctures across the dorsum. Node of petiole in dorsal view longer than broad, broadest behind and narrowing anteriorly. Gaster strongly constricted between first and second segments. Short, standing hairs present on all surfaces. Completely devoid of sculpture except for hair-pits and cross-ribbing on the meso-metapleural suture. A few weak rugulae are present on the bulla of the metapleural glands and the propodeal declivity is transversely rugose, though only 2-3 complete rugae are present. Colour medium brown, the gaster lighter, the appendages a dark yellow-brown.

Holotype worker, CAMEROUN: Ototomo, 20.v.1968, JLA (G. Terron) (BMNH).

This species is easily distinguished from the other members of the *nitida*-group by its possession of marked circumocular grooves, elongate head and long, narrow petiole.

### *Leptogenys ankhesa* sp. n.

(Text-fig. 25)

DIAGNOSIS OF WORKER. Subpetiolar process double, with separate anterior and posterior portions. Propodeal dorsum unsculptured. Scares relatively long, SI > 135.

FURTHER DESCRIPTION. *Holotype worker*. TL 6.1, HL 1.22, HW 0.84, CI 69, SL 1.20, SI 143, PW 0.76, PH 0.78, PL 0.58, LPI 134, DPW 0.62, DPI 107.

Head only very slightly broader in front than behind, the occipital margin straight to feebly concave, the sides more or less straight. Maximum diameter of eye ca 0.20, slightly greater than the maximum width of the scape in full-face view (ca 0.12-0.14). Clypeus broadly triangular, blunt apically. Mandibles short, closing tightly against the clypeus. Respective lengths of funicular segments 1-3 ca 0.20, 0.18, 0.20. Mesonotum distinctly broader than long. Metanotal groove impressed and cross-ribbed. Node of petiole in dorsal view broader than long, the anterior and posterior faces virtually parallel, the sides diverging posteriorly. In profile the node of the petiole broadening slightly from base to apex. Subpetiolar process double, complex, consisting of a lobe situated anteriorly, the posteroventral corner of which projects as a short tooth, and a more posteriorly situated short, blunt tooth, separated from the anterior lobe by a marked gap. Gaster strongly constricted between first and second segment. All dorsal surfaces of head and body with standing hairs, though these are sparse upon the first gastral tergite and propodeal. Unsculptured, smooth and shining except for small hair-pits and transverse rugulation on the propodeal declivity. Some faint rugae also present on the extreme lower portion of the metapleuron. Colour uniform red-brown.

*Paratype worker*. TL 5.9, HL 1.20, HW 0.84, CI 70, SL 1.20, SI 143, PW 0.78, PH 0.80, PL 0.56, LPI 142, DPW 0.62, DPI 111. Maximum diameter of eye 0.18; funicular segments 1-3 ca 0.18, 0.20, 0.20. Otherwise as holotype.

Holotype worker, ZAIRE ('Belg. Congo' on data label), Sona Mpungu, Forest, 21 km N. Lufu, 10.iv. 1948, 'ants collecting termites' (A. Emerson) (MCZ, Cambridge).

Paratype. 1 worker, same data as holotype (BMNH).

Related to *buyssoni* and *strator*, it is separated from the former by size and the more complex development of the subpetiolar process (the second tooth is absent

in *buyssoni*), and from the latter by details of sculpturation and shape of petiole node as given in the key and descriptions.

### *Leptogenys buyssoni* Forel

*Leptogenys (Lobopelta) buyssoni* Forel, 1907a : 131. Holotype worker, ETHIOPIA: Hieka Bourka, 1905 (*Rothschild*) (MHN, Geneva) [examined].

DIAGNOSIS OF WORKER. Larger species,  $HL > 1.45$ ; scapes relatively long,  $SI > 140$ . Eyes small, maximum diameter ca 0.16. Subpetiolar process with a posteroventral tooth.

FURTHER DESCRIPTION. *Worker*. TL 7.4, HL 1.52, HW 1.06, CI 70, SL 1.66, SI 156, PW 0.90, PH 0.84, PL 0.70, LPI 120, DPW 0.60, DPI 87.

Head not broadened anteriorly, broadest at the level of the eyes. Occipital margin straight to feebly convex, the sides of the head straight. Eyes small, only very weakly convex, maximum diameter ca 0.16, less than the maximum width of the scape. Clypeus broadly triangular. Mandibles short, closing tightly against the clypeus. Second funicular segment slightly longer than the third, respective lengths of segments 1-3 ca 0.24, 0.34, 0.30. Metanotal groove impressed and cross-ribbed, the propodeal dorsum with a slight longitudinal impression medially, most distinct at the midlength of the sclerite. Subpetiolar process a broad lobe, developed into a short tooth posteroventrally which projects from the body of the lobe. Gaster strongly constricted between first and second segments. All surfaces of body with short, standing hairs. Dorsal surfaces of head, alitrunk and gaster unsculptured apart from minute hair-pits. Sides of alitrunk with cross-ribbing at meso-metapleural suture and some short rugae near the metapleural gland, but otherwise as dorsum. Full adult colour red-brown.

This species is closest related to *strator* and *ankhesa*, but although the subpetiolar process is strongly developed in *buyssoni* it is not followed by a second lobe or tooth posteriorly as is the case in the other two species. Also *buyssoni* is distinctly larger than either *strator* or *ankhesa*.

### *Leptogenys castanea* (Mayr)

*Lobopelta castanea* Mayr, 1862 : 734. Holotype worker, SOUTH AFRICA: Cape of Good Hope (BMNH) [examined].

*Leptogenys (Lobopelta) parva* Forel, 1901a : 330. Syntype workers, male, SOUTH AFRICA: Natal (*Haviland*) (MHN, Geneva) [examined]. **Syn. n.**

*Leptogenys (Lobopelta) parva* var. *bellua* Forel, 1914 : 214. Syntype workers, SOUTH AFRICA: Natal, Durban (*G. Arnold*) (MHN, Geneva) [examined]. **Syn. n.**

*Leptogenys (Lobopelta) parva* var. *dispar* Santschi, 1914b : 10. Syntype workers, SOUTH AFRICA: Natal, Zululand (*I. Trägårdh*) (NM, Basle; MRAC, Tervuren) [examined]. **Syn. n.**

*Leptogenys hewitti* Santschi, 1923 : 381, fig. 1. Syntype workers, SOUTH AFRICA: C.P., Grahamstown, 1920 (*J. Hewitt*) (BMNH) [examined]. **Syn. n.**

DIAGNOSIS OF WORKER. Small species with relatively short antennal scapes,  $HL < 0.90$ ,  $SL < 0.75$ ,  $SI < 120$ . Dorsal surfaces of body unsculptured.

FURTHER DESCRIPTION. *Worker*. TL 3.5-4.1, HL 0.74-0.88, HW 0.54-0.68, CI 70-79, SL 0.62-0.70, SI 100-117, PW 0.44-0.52, PH 0.40-0.44, PL 0.28-0.32, LPI 131-143, DPW 0.28-0.34, DPI 93-104 (12 measured).

Head not broader in front than behind, broadest behind the eyes. Occipital margin straight to feebly concave, the sides of the head shallowly convex. Eyes small, maximum diameter ca 0.08-0.12, equal to or slightly less than the maximum width of the scape in full-face view. Clypeus narrowly triangular medially. Mandibles short, closing tightly against the clypeus. Lengths of funicular segments 1-3 respectively ca 0.10-0.12, 0.08-0.10, 0.08-0.10. Subpetiolar

process a broad and strongly developed simple lobe. Gaster strongly constricted between first and second segments. All surfaces of body with numerous short, standing hairs. Unsculptured apart from transverse rugae on propodeal dorsum. Colour light yellow-brown to light brown.

This small species may be confused with the smaller, light-coloured workers of some populations of *nitida* but *castanea* may be distinguished by its scapes, which are consistently shorter, both relatively and absolutely, than those of *nitida*. Also, in the smallest *nitida* workers the eyes are about 0.12 in maximum diameter, whereas the eyes of only the largest examples of *castanea* approach this size. Finally, the HL of the largest *castanea* worker examined in this survey was 0.88, whereas that of the smallest *nitida* worker which could be found was 0.92.

#### MATERIAL EXAMINED.

RHODESIA: Bulawayo (*G. Arnold*). SOUTH AFRICA: Natal, Durban (*C. B. Cooper*); Durban (*I. Bevis*); Krantz Kloof (*H. B. Marley*); Zululand, Mfongosi (*G. Arnold*), E. Cape Prov., Beggar's Bush nr Grahamstown (*W. L. Brown*); Grahamstown, Fern Kloof (*W. L. Brown*); Alexandria Forest Reserve (*W. L. Brown*); Grahamstown (*F. Jacot-Guillarmod*).

### *Leptogenys cryptica* sp. n.

DIAGNOSIS OF WORKER. Small species, HL < 0.75. Head densely reticulate-punctate; pronotum sculptured. Eyes very small, < 0.07; SI in the range 113–115.

FURTHER DESCRIPTION. *Holotype worker*. TL 2.8, HL 0.66, HW 0.46, CI 70, SL 0.52, SI 113, PW 0.38, PH 0.36, PL 0.24, LPI 150, DPW 0.24, DPI 100.

Head not broader in front than behind, broadest across the eyes. Sides of head shallowly convex, occipital margin straight to feebly concave medially. Eyes very small, maximum diameter ca 0.05, less than the maximum width of the scape in full-face view and with less than 10 facets. Clypeus narrowly triangular medially. Mandibles relatively short, closing tightly against the clypeus. Funicular segments 1–3 respectively ca 0.10, 0.08, 0.08. Metanotal groove reduced to a weak transverse impression, in profile scarcely more marked than the promesonotal suture; metanotal groove not cross-ribbed, in dorsal view less distinct than the promesonotal suture. Subpetiolar process a large subrectangular lobe without prominences or teeth. Gaster strongly constricted between first and second segments. All surfaces of body with numerous standing hairs. Dorsum of head coarsely and closely reticulate-punctate, the ventral surface with a number of foveolate punctures which are separated by smooth interspaces. Dorsal alitrunk strongly sculptured with a mixture of punctures and scattered rugulae, the latter most distinct upon the pronotum but not forming a pattern. Propodeal declivity transversely rugose. Sides of alitrunk as dorsum but more weakly so. Gaster smooth and shining, unsculptured. Colour uniform yellow-brown to mid-brown.

*Paratype workers*. TL 2.6–3.1, HL 0.64–0.68, HW 0.44–0.46, CI 67–70, SL 0.50–0.52, SI 113–115, PW 0.36–0.38, PH ca 0.36, PL 0.22–0.24, LPI 150–163, DPW 0.20–0.24, DPI 100–109 (4 measured). Diameter of eye 0.04–0.06; respective lengths of funicular segments 1–3 ca 0.10–0.12, 0.06–0.08, 0.06–0.08. Otherwise as holotype.

Holotype worker, GHANA: Tafo, 1.x.1970, 'rotten log' (*B. Bolton*) (BMNH).

Paratypes. 4 workers, same data as holotype (BMNH; MCZ, Cambridge; NM, Basle).

The combination of light colour, small size, strong sculpture and very small eyes should render this species easily recognizable. It is most closely related to

*stygia* which it resembles in many ways, but this latter species is larger, black, with larger eyes and with longer antennal scapes.

### *Leptogenys diatra* sp. n.

DIAGNOSIS OF WORKER. Subpetiolar process a recurved tooth. Sides of head in front of eyes feebly concave. Small species, HL < 1.00.

FURTHER DESCRIPTION. *Holotype worker*. TL 3.9, HL 0.86, HW 0.62, CI 72, SL 0.80, SI 129, PW 0.48, PH 0.44, PL 0.34, LPI 129, DPW 0.30, DPI 88.

Head not broadened in front, broadest just behind the eyes. Sides of head behind eyes weakly convex, in front of eyes feebly concave. Occipital margin transverse, almost straight, with an extremely feeble convexity. Eyes with maximum diameter ca 0.10, equal to or very slightly less than the maximum width of the scape. Clypeus with an apically truncated, narrow, median triangular lobe, the anterior and lateral portions of which are translucent and lamellate. Mandibles short, closing tightly against the clypeus. Funicular segments 1-3 ca 0.14, 0.12, 0.12 respectively. Metanotal groove impressed and cross-ribbed. Subpetiolar process a broad-based, back-curved tooth or short spine. Gaster strongly constricted between the first and second segments. Standing hairs present upon all dorsal surfaces and on appendages. Unsculptured except for some fine punctures on the head anteriorly, between eye and frontal carinae, cross-ribbing in metanotal groove and transverse rugae on the propodeal declivity. Colour a uniform deep brown, shining.

Holotype worker, CAMEROUN: no. 1726 (no further data) (*G. Terron*) (BMNH).

This small species is closest related to *strator* and its allies but is separated from them by its lack of a second subpetiolar process. Because of this *diatra* runs out in the key with *nitida* and its immediate relatives but the characters given there will serve to separate the species.

### *Leptogenys honoria* sp. n.

DIAGNOSIS OF WORKER. Subpetiolar process double. Ventral surface of head not sculptured. Pronotal dorsum with shallow foveolate impressions.

FURTHER DESCRIPTION. *Holotype worker*. TL 5.4, HL 1.08, HW 0.76, CI 70, SL 0.96, SI 126, PW 0.66, PH 0.64, PL 0.50, LPI 128, DPW 0.56, DPI 112.

Head not broader in front than behind, the sides more or less straight in full-face view, the occipital margin very feebly concave, almost straight. Maximum diameter of eye ca 0.16, equal to or slightly greater than the maximum width of the scape. Median lobe of clypeus triangular and prominent. Mandibles short, closing tightly against the clypeus. Funicular segments 1-3 ca 0.16, 0.14, 0.12 respectively. Metanotal groove impressed and cross-ribbed. Subpetiolar process double, consisting of an anterior lobe, the ventral angle of which is acute, and a posterior tooth, the two separated by a distinct semicircular notch or impression. Node of petiole in profile increasing slightly in thickness from base to apex, noticeably higher than long; in dorsal view the node is much broader than long. Gaster strongly constricted between first and second segments. Standing hairs present on all dorsal surfaces but very short and sparse on the first and second gastral tergites, reduced to a row across the posterior margin of each segment. Mostly smooth and unsculptured but with the following: pronotal dorsum with a number of broad, shallow impressions; meso-metapleural suture cross-ribbed; lower portion of metapleuron and bulla of metapleural glands finely rugose; propodeal declivity transversely rugose. Colour uniform red-brown, the appendages lighter.

Holotype worker, CAMEROUN: no. 1222 (no further data) (*G. Terron*) (BMNH).

The form of the petiole and particularly its ventral process allies this species

closely to *strator* and *ankhesa*, more distantly to *diatra* and *buyssoni*. The characters given in the key and diagnoses will separate these related species.

### *Leptogenys khaura* sp. n.

DIAGNOSIS OF WORKER. Dorsum of head finely and densely punctulate, pronotal dorsum unsculptured. Eyes minute, diameter  $< 0.04$ . Minute species, HL  $< 0.60$ , PW  $< 0.35$ .

FURTHER DESCRIPTION. *Holotype worker*. TL 2.1, HL 0.52, HW 0.38, CI 73, SL 0.42, SI 110, PW 0.30, PH 0.28, PL 0.16, LPI 175, DPW 0.22, DPI 137.

Head not broadened in front, broadest behind eyes. Occipital margin feebly concave, sides of head shallowly convex. Eyes minute, with less than 10 facets, their maximum diameter 0.04, considerably less than the maximum width of the scape. Clypeus narrowly triangular medially. Mandibles short, closing tightly against the clypeus. Funicular segments 1-3 ca 0.08, 0.04, 0.05 respectively; the third, fourth and fifth segments as broad as or broader than long. Metanotal groove impressed and cross-ribbed but the ribs so short that the groove appears to have a series of punctures traversing the alitrunk. Node of petiole in dorsal view much broader than long, anteroposteriorly compressed, the anterior face slightly convex, the posterior slightly concave. Subpetiolar process broad and subrectangular in shape, without projections or teeth. Node in profile somewhat inclined forwards. Gaster strongly impressed between first and second segments. All surfaces of body with numerous standing hairs. Dorsum of head shallowly, finely and densely punctulate, the ventral surface unsculptured. Pronotal dorsum unsculptured, smooth and shining, as are the sides of the pronotum, mesonotum, mesopleuron and gaster. Propodeal dorsum and sides and metapleuron mostly unsculptured but with some very fine, superficial regulation and a few punctures; propodeal declivity transversely rugose. Colour yellow-brown.

*Paratype worker*. TL 2.3, HL 0.54, HW 0.40, CI 74, SL 0.42, SI 105, PW 0.30, PH 0.30, PL 0.18, LPI 166, DPW 0.22, DPI 123. As holotype but propodeal sculpture much more reduced, the surface only superficially marked and with extensive smooth areas.

Holotype worker, NIGERIA: Ile-Ife, 5.viii.1971 (*J. T. Medler*) (BMNH).

Paratype. 1 worker as holotype but dated 21.vii.1971 (MCZ, Cambridge).

This species is the smallest member of the genus yet known from the Ethiopian Region. The combination of characters given in the diagnosis above will distinguish it from all other small or minute species of the region. In size it is approached only by *microps* of the *guineensis*-group but the differences between their respective groups separate them. Other small species such as *cryptica* and *stygia* are strongly sculptured and easily separable.

### *Leptogenys mactans* sp. n.

(Text-fig. 17)

DIAGNOSIS OF WORKER. Antennal scapes relatively very short, SI  $< 95$ . External margins of mandibles convex. Subpetiolar process with a posteroventral blunt tooth.

FURTHER DESCRIPTION. *Holotype worker*. TL 4.5, HL 0.94, HW 0.76, CI 81, SL 0.68, SI 90, PW 0.58, PH 0.48, PL 0.42, LPI 114, DPW 0.34, DPI 81.

Head not broader in front than behind, broadest just behind the eyes. Occipital margin shallowly concave, sides of head feebly convex. Eyes moderate, maximum diameter 0.16, slightly greater than the maximum width of the scape in full-face view. Eyes just failing to break the outline of the sides of the head in full-face view. Median lobe of clypeus short and broad, broadly truncated apically. Mandibles short and stout, their external margins

markedly convex, closing tightly against the clypeus. Antennal scapes very short, scarcely surpassing the midpoint of the occipital margin. Funicular segments 1-3 ca 0.12, 0.10, 0.10 respectively. Metanotal groove weakly impressed. Subpetiolar process a broad lobe with a short, rounded, posteroventral tooth. Gaster strongly constricted between first and second segments. All surfaces of head and body with numerous standing hairs. Unsculptured, completely smooth and shining apart from small hair-pits and a few faint transverse rugulae on the propodeal declivity. Colour red-brown.

*Paratype worker.* TL 4.8, HL 0.98, HW 0.78, CI 80, SL 0.72, SI 92, PW 0.60, PH 0.46, PL 0.40, LPI 115, DPW 0.34, DPI 85. Maximum diameter of eye 0.16. Otherwise as holotype.

Holotype worker, SOUTH AFRICA: Cape Province, Somerset East, x.1930 (*R. E. Turner*) (BMNH).

Paratype. 1 worker with same data as holotype (MCZ, Cambridge).

The short scapes, broad head, strongly curved short mandibles and the shape of the subpetiolar process serve to separate this species from its relatives. In some respects *mactans* appears to be convergent upon the species of the *processionalis*-group of the Oriental and Indo-Australian regions but in these species the mandibles have numerous teeth and the petiole tends to be anteroposteriorly compressed to form a thick scale. In *mactans* the mandibles have only two teeth (apical and preapical) and the petiole and its ventral process suggest that the species is related to *buyssoni* and its allies *ankhesa* and *strator*.

### *Leptogenys nitida* (F. Smith)

*Ponera nitida* F. Smith, 1858 : 92. Syntype workers, SOUTH AFRICA: 'Port Natal' (= Durban) (BMNH) [examined].

*Lobopelta nitida* (F. Smith); Mayr, 1866 : 358.

*Leptogenys intermedia* Emery, 1902 : 32. Syntype workers, SOUTH AFRICA: Cape, Willowmore (*Brauns*) (MCSN, Genoa). **Syn. n.**

*Leptogenys tenuis* Stitz, 1911 : 376, fig. 1. Syntype workers, ZAIRE: Lake Kivu (*Mecklenburg*) (probably in MNHU, Berlin). [Synonymy by Forel, 1912a : 52.]

*Leptogenys (Lobopelta) nitida* var. *adpressa* Forel, 1914 : 214. Syntype workers, SOUTH AFRICA: Grahamstown (*Hewitt*) (MHN, Geneva) [examined]. **Syn. n.**

*Leptogenys (Lobopelta) nitida* var. *aena* Forel, 1914 : 215. Syntype workers, SOUTH AFRICA: Willowmore (*Brauns*) (MHN, Geneva) [examined]. **Syn. n.**

*Leptogenys (Lobopelta) nitida* var. *gracilis* Santschi, 1914b : 11. Holotype worker, ZAIRE: Lake Kivu (*Mecklenburg*) [attributed to Stitz] (NM, Basle) [examined]. [Junior homonym of *gracilis* Emery, 1899 : 271.] **Syn. n.**

*Leptogenys (Lobopelta) nitida* st. *insinuata* Santschi, 1914b : 11. Holotype worker, SOUTH AFRICA: Natal, Richmond, 24.iii.1905 (*I. Trägårdh*) (location of types not known). **Syn. n.**

*Leptogenys (Lobopelta) nitida* var. *grandior* Forel, 1915a : 335. Syntype workers, SOUTH AFRICA: Natal, Krantz Kloof (*H. B. Marley*) (MHN, Geneva) [examined]. **Syn. n.**

*Leptogenys (Lobopelta) nitida* race *brevinodis* Forel, 1915a : 335. Syntype workers, SOUTH AFRICA: Cape Province (*Brauns*) (MHN, Geneva; MRAC, Tervuren) [examined]. [Junior homonym of *brevinoda* Emery, 1914.] **Syn. n.**

*Leptogenys (Lobopelta) nitida* st. *speculans* Santschi, 1926a : 209. Syntype workers, LUGUMBE (*Gérard*) (NM, Basle) [examined]. **Syn. n.**

*Leptogenys (Lobopelta) brevinodis* var. *deflocata* Santschi, 1926a : 209. Syntype workers, MOZAMBIQUE: Forêt d'Amatonga, ii. 1917 (*G. Arnold*) (NM, Basle) [examined]. **Syn. n.**

*Leptogenys nitida* subsp. *capensis* Baroni Urbani, 1971 : 360. [Replacement name for *brevinodis* Forel, 1915.] **Syn. n.**

Note. Many of the above synonyms have been determined independently by Professor W. L. Brown and will be recorded by him in his forthcoming revision of the genera of tribe Ponerini.

DIAGNOSIS OF WORKER. Large species,  $HL > 0.90$ , with  $SI > 120$ . Eyes  $> 0.11$  maximum diameter. Dorsal surfaces unsculptured except for hair-pits.

FURTHER DESCRIPTION. *Worker*. TL 4.6–5.7, HL 0.92–1.20, HW 0.66–0.88, CI 69–75, SL 0.86–1.08, SI 120–130, PW 0.52–0.70, PH 0.44–0.60, PL 0.40–0.48, LPI 110–125, DPW 0.32–0.40, DPI 80–95 (12 measured).

Head not broader in front than behind, broadest at about the level of the eyes. Occipital margin straight to feebly convex, sides of head shallowly convex. Maximum diameter of eyes ca 0.12–0.22, usually equal to or slightly greater than the maximum width of the scape in full-face view, rarely otherwise. Median lobe of clypeus triangular, blunt apically. Mandibles closing tightly against the clypeus, their outer margins somewhat concave. Funicular segments 1–3 ca 0.12–0.20, 0.10–0.18, 0.10–0.16 respectively. Subpetiolar process a simple lobe or with a small posteroventral tooth, very variable in size. Gaster strongly constricted between first and second segments. Short, standing hairs numerous upon all dorsal surfaces of head and body. Unsculptured, smooth and shining except for minute hair-pits and usually with a few transverse rugae on the propodeal declivity. Colour very variable, ranging from jet-black to light brown with all intermediate shades.

In terms of colour and size *nitida* is probably the most variable species of the genus in the Ethiopian Region; no two series examined in the course of this survey were exactly alike in all respects.

The larger or more darkly coloured individuals of *nitida* are unlikely to be confused with any other species but the smaller, more lightly coloured specimens may be mistaken for *castanea*. The characters given in the key and the notes under *castanea* will serve to distinguish the two species.

#### MATERIAL EXAMINED.

KENYA: (no data). ZAMBIA: Kipushi (*H. S. Evans*). BOTSWANA: Malepi Stream (*G. Arnold*); Mamathes (*C. Jacot-Guillarmod*). RHODESIA: Chirinda Forest (*G. Arnold*); Salisbury (*G. H. Bunzli*); Vumba Mts (*G. Arnold*); Umtali (*G. Arnold*). SOUTH AFRICA: Orange Free State (*Wroughton*); Transvaal, Piet Retief (*H. Brauns*); Ladismith (*H. Brauns*); Cape Prov., Oudtshoorn (*B. Malkin*); George (*H. Brauns*); Cape Prov., Montagu Pass (*A. Mackie*); Katberg (*R. E. Turner*); Grahamstown (*J. Hewitt*); Mossel Bay (*R. E. Turner*); Natal (*G. B. King*); Durban (*G. Arnold*), (*C. B. Cooper*), (*H. B. Marley*); Krantz Kloof (*H. B. Marley*); Natal, Slievyre (*Haviland*); Natal, Estcourt (*G. Arnold*); Natal, Eshowe (*H. B. Marley*).

### *Leptogenys piroskae* Forel

(Text-fig. 15)

*Leptogenys (Lobopelta) piroskae* Forel, 1910a: 247. Syntype workers, ETHIOPIA: Eritrea, Ghinda (*Escherich*) (NM, Basle) [examined].

DIAGNOSIS OF WORKER. Larger species,  $HL > 0.90$ , with  $SI > 120$ . Maximum diameter of eye  $< 0.10$ . Dorsal surfaces unsculptured.

**FURTHER DESCRIPTION.** *Worker.* TL 4.7, HL 0.94, HW 0.70, CI 74, SL 0.86, SI 123, PW 0.56, PH 0.50, PL 0.42, LPI 119, DPW 0.38, DPI 91.

Sides of head slightly convex. Head broadest at, or just posterior to, the level of the eyes, not markedly broadened in front. Eyes small, maximum diameter 0.09, in full-face view situated just in front of the midlength of the sides of the head. In full-face view maximum diameter of eye less than maximum width of scape. Lengths of funicular segments 1-3 ca 0.18, 0.12, 0.12 respectively. Anterior margin of clypeus with a projecting median lobe which has a narrow fringing translucent lamella. Mandibles relatively short and quite stout, with a single preapical tooth and closing tightly against the clypeus. Metanotal groove impressed and cross-ribbed. Node of petiole blocky in profile, slightly higher than long (LPI > 100), the anterior and posterior faces almost parallel, the dorsum weakly convex. In dorsal view the node slightly broader behind than in front, with a convex anterior face and almost straight posterior face. Gaster strongly constricted between first and second segments. Head and body everywhere smooth and shining, unsculptured apart from hair-pits and except for the propodeal declivity which is transversely rugose and the metanotal groove and meso-metanotal suture, which are cross-ribbed. Standing hairs present on all dorsal surfaces. Colour uniform orange-brown or light brown.

### *Leptogenys strator* sp. n.

**DIAGNOSIS OF WORKER.** Subpetiolar process double, with separate anterior and posterior portions. Propodeal dorsum rugose.

**FURTHER DESCRIPTION.** *Holotype worker.* TL 5.8, HL 1.22, HW 0.86, CI 70, SL not measurable, PW 0.72, PH 0.77, PL 0.54, LPI 133, DPW 0.52, DPI 96.

Head not broader in front than behind, broadest behind the eyes. Occipital margin shallowly concave, sides of head feebly convex. Eyes with maximum diameter ca 0.16 (antennae missing from all members of type-series). Median lobe of clypeus bluntly triangular. Mandibles short, closing tightly against the clypeus. Mesonotum broader than long; metanotal groove deeply impressed and cross-ribbed. Node of petiole in dorsal view about as broad as long, with the anterior and posterior faces almost parallel and the sides diverging posteriorly. In profile the node is broadest basally and tapers slightly above. Subpetiolar process double, complex, consisting of a broad lobe anteriorly, the posteroventral corner of which is acute, and a secondary blunt, short tooth, situated behind the lobe and separated from it by a distinct notch. Gaster strongly constricted between first and second segments. Standing hairs present on all dorsal surfaces, sparse (some may have been lost by abrasion). Dorsum of head finely and quite densely punctured in the space between the eye and frontal carinae, the remainder unsculptured apart from hair-pits. Ventral surface of head with large, shallow, poorly defined punctures, giving the surface an undulate appearance. Pronotal and propodeal dorsa rugose, the rugae broad, shallow and rounded, the propodeum more strongly sculptured than the pronotum. Meso-metapleural suture strongly cross-ribbed, the metapleuron and sides of the propodeum with some rugulation. Gaster smooth. Colour red-brown.

*Paratype workers.* TL 5.8-5.9, HL 1.24, HW 0.88, CI 71, (antennae missing), PW 0.70-0.74, PH 0.70-0.72, PL 0.54, LPI 129-130, DPW 0.54, DPI 100 (2 measured). Diameter of eye ca 0.14-0.16.

Holotype worker, ZAIRE: ('Belg. Congo' on specimen) Mikenno, 24.vii.1938 (*C. P. Haskins*) (MCZ, Cambridge).

Paratypes. 2 workers, same data as holotype (BMNH; MCZ, Cambridge).

Closest related to *ankhesa*, *strator* is distinguished by its sculpturation, which is absent from the former, and by the shape of the node which, in profile, is broader basally whereas in *ankhesa* the node is slightly narrower basally than it is above.

*Leptogenys striatidens* sp. n.

DIAGNOSIS OF WORKER. Mandibles densely striate. Head and pronotum covered with dense superficial reticulation.

FURTHER DESCRIPTION. *Holotype worker*. TL 5.6, HL 1.36, HW 0.92, CI 68, SL 1.14, SI 124, PW 0.76, PH 0.66, PL 0.54, LPI 122, DPW 0.52, DPI 96.

Head broadest in front, increasing slightly in width from back to front, the sides very weakly convex, the occipital margin feebly concave. Eyes small, their maximum diameter ca 0.14, less than the maximum width of the antennal scape. Median lobe of clypeus long, blunt apically and with weakly convex sides. Mandibles closing tightly against the clypeus, the angle at the junction of the inner and apical margins concealed by the lobe of the clypeus. Funicular segments 1-3 ca 0.16, 0.18, 0.18 respectively. Metanotal groove broad and shallow, very finely cross-ribbed. Gaster strongly constricted between first and second segments. Dorsal surfaces of head, body and appendages with numerous standing hairs. Mandibles finely and densely but very distinctly longitudinally striate. Dorsal surfaces of head and alitrunk covered by a fine, superficial reticulation. Sides of head below level of eyes similarly sculptured but also with elongate, shallow impressions. Pronotum with the reticulation petering out on the sides so that the lower halves are smooth. Lower halves of meso- and metapleurae rugose; propodeal declivity transversely rugose. Sides of petiole superficially reticulate but the posterior half of the dorsum smooth. Gaster smooth and shining. Colour black with faint traces of bluish opalescence; the appendages brown.

Holotype worker, CAMEROUN: Mt Kala, 820 m, 22.ii.1973 (G. Terron) (BMNH).

This species is unique amongst the members of the *nitida*-group known at present as it is the only one with strong sculpturation over the entire head and alitrunk, and possesses distinctly striate mandibles.

*Leptogenys stygia* sp. n.

DIAGNOSIS OF WORKER. Smaller species, HL < 0.80. Head densely reticulate-punctate. Pronotum sculptured. Diameter of eye 0.08-0.09; SI in the range 119-122.

FURTHER DESCRIPTION. *Holotype worker*. TL 3.2, HL 0.70, HW 0.48, CI 68, SL 0.58, SI 121, PW 0.38, PH 0.38, PL 0.26, LPI 146, DPW 0.22, DPI 85.

Head not broader in front than behind, broadest behind the eyes. In full-face view the occipital margin straight to feebly concave; sides of head weakly convex. Maximum diameter of eye ca 0.08, in full-face view less than the maximum width of the scape. Median lobe of clypeus narrowly triangular. Mandibles short, closing tightly against the clypeus. Funicular segments 1-3 ca 0.10, 0.08, 0.08 respectively. Metanotal groove shallow, only weakly impressed, less distinct than the promesonotal suture. Subpetiolar process a broad, rounded lobe, without projections or teeth. Gaster strongly constricted between first and second segments. Standing hairs numerous upon all surfaces of head and body. Dorsum of head densely and quite coarsely reticulate-punctate, the ventral surface with scattered foveolate punctures separated by smooth, shining interspaces. Dorsal alitrunk with scattered punctures and fine rugulae, densest on the propodeum. Propodeal declivity transversely rugose. Sides of alitrunk sculptured as dorsum. Gaster shining, unsculptured apart from hair-pits. Black, the legs and scapes brown, the funicular segments yellow-brown.

*Paratype workers*. TL 3.0-3.2, HL 0.68-0.74, HW 0.48-0.52, CI 68-71, SI 119-122, PW 0.38-0.42, PH 0.36-0.40, PL 0.24-0.28, LPI 143-153, DPW 0.20-0.24, DPI 83-92 (7 measured). Maximum diameter of eye ca 0.08-0.09. Otherwise as holotype.

Holotype worker, NIGERIA: Gambari, 3.xi.1969, 'under fallen banana stem' (B. Bolton) (BMNH).

Paratypes. 7 workers, with same data as holotype (BMNH; MCZ, Cambridge; NM, Basle).

Most closely related to *cryptica*, from which it differs in size and colour, *cryptica* being smaller and yellow-brown with relatively shorter antennal scapes and smaller eyes. The specimens of *stygia* described above were discovered in a small piece of wet-rotten wood under a fallen and rotting banana stem. The species is also present in Cameroun as G. Terron (UFC, Yaounde) has sent me a specimen recently.

#### REVIEW OF SPECIES OF MALAGASY REGION

As the Malagasy fauna is so poorly known and collections of the genus from this region are virtually non-existent, a formal revision of the species has not been undertaken. Instead a list and provisional key are presented together with notes on the groups and types of species which I have examined, in the hope that the review will be of some benefit to further studies of the regional fauna.

#### LIST OF SPECIES

Species shared with the Ethiopian Region (*falcigera*, *maxillosa*, *stuhlmanni*) are not included.

##### *truncatirostris*-group

*arcistrostris* Santschi

*ridens* Forel

*truncatirostris* Forel

##### *attenuata*-group

*angusta* (Forel)

*coerulescens* Emery

*grandidieri* Forel

##### *saussurei*-group

*acutirostris* Santschi **stat. n.**

*oswaldi* Forel

*saussurei* (Forel)

##### *incisa*-group

*alluaudi* Emery

*antogilensis* Emery

*gracilis* Emery

*incisa* Forel

*incisa* var. *imerinensis* Forel **syn. n.**

*incisa* subsp. *suarensis* Emery **syn. n.**

*voeltzkowi* Forel

#### PROVISIONAL KEY TO SPECIES

##### (Workers)

The key is based for the greater part on type-specimens and original descriptions only and consequently should be used with some care as no indication of degree of

variability of the species is known. All species are from Madagascar except where otherwise stated.

- 1 Standing hairs absent from dorsum of head, alitrunk and first two gastral tergites.  
Cuticle densely shagreened, with dense, pruinose pubescence . . . . . 2
  - Standing hairs present on some or all dorsal surfaces. Cuticle not densely shagreened, without pruinose pubescence . . . . . 3
  - 2 Node of petiole in dorsal view distinctly broader than long, DPW > 105 (pantropical tramp species) . . . . . *maxillosa*
  - Node of petiole in dorsal view at least as long as broad, usually distinctly longer than broad, DPW 100 or less (pantropical tramp species). . . . . *falcigera*
  - 3 Anterior clypeal margin broadly rounded or transverse, not projecting into a triangular lobe medially. Mandibles elongate, narrow, but capable of closing against the clypeus. Head strongly broadened in front, the eyes not breaking the outline of the sides of the head in full-face view . . . . . 4
  - Anterior clypeal margin projecting into a triangular lobe medially. Mandibles short or elongate, but if elongate then not capable of closing against the clypeus. Head usually not broadened anteriorly, the eyes usually breaking the outline of the sides of the head in full-face view . . . . . 6
  - 4 Clypeus without a median, longitudinal carina . . . . . *truncatirostris*
  - Clypeus with a median, longitudinal carina . . . . . 5
  - 5 Antennal scapes both relatively and absolutely shorter, SL < 1.75, SI < 125  
 . . . . . *arcirostris*
  - Antennal scapes both relatively and absolutely longer, SL > 1.75, SI > 135 . . . . . *ridens*
  - 6 Mandibles short, not linear, capable of closing tightly against the clypeus; without a gap between themselves and the clypeus when closed . . . . . 7
  - Mandibles elongate and linear, not capable of closing against the clypeus; with a large gap between themselves and the clypeus when closed . . . . . 12
  - 7 Dorsum of head and alitrunk unsculptured apart from minute pits from which hairs arise . . . . . 8
  - Dorsum of head, alitrunk, or both, distinctly sculptured . . . . . 10
  - 8 Propodeal declivity smooth and shining, not transversely rugose . . . . . *angusta*
  - Propodeal declivity transversely rugose . . . . . 9
  - 9 Smaller species, HL ca 1.40; black, without bluish reflections or opalescence.  
Median lobe of clypeus not distinctly longitudinally striate . . . . . *grandidieri*
  - Larger species, HL > 1.50; black with bluish reflections or opalescence. Median lobe of clypeus longitudinally striate . . . . . *coerulescens*
  - 10 Dorsum of head very densely and very finely reticulate-rugose, the interspaces minutely punctulate, without smooth shining areas. Small species, HL < 2.20, diameter of eye ca 0.44 . . . . . *oswaldi*
  - Dorsum of head with scattered large punctures or foveolae, the spaces between which may have some faint striae but are mostly smooth and shining. Larger species, HL > 2.50, diameter of eye > 0.50 . . . . . 11
  - 11 Posterior border of petiole strongly emarginate in dorsal view. Larger species, HL > 2.85, with larger eyes, maximum diameter > 0.70. . . . . *saussurei*
  - Posterior border of petiole not emarginate in dorsal view. Smaller species, HL < 2.80, with smaller eyes, maximum diameter < 0.65 . . . . . *acutirostris*
  - 12 Dorsum of head and first gastral tergite unsculptured apart from pits from which hairs arise. Gaster not constricted between first and second segments. (East Africa, Comoro Islands) . . . . . *stuhlmanni*
  - Dorsum of head sculptured, first gastral tergite usually with at least a fine, superficial reticulation. Gaster constricted between first and second segments  
 . . . . . *incisa*-group
- [including *incisa*, *alluaudi*, *voeltzkowi*, *gracilis*, *antongilensis*]

THE *TRUNCATIROSTRIS*-GROUP

Mandibles elongate but closing tightly against the clypeus, with considerable overlap. Clypeus with a fringing lamella on the anterior margin, not projecting into a triangular lobe medially, either broadly rounded or transverse. Eyes large, their maximum diameter greater than the maximum width of the scape. Second funicular segment slightly longer than the third. Head broadened in front; the eyes not breaking the outline of the sides of the head in full-face view. Entirety of head and body sculptured, either reticulate-punctate, densely rugulose or densely but irregularly punctulate. Standing hairs present on all dorsal surfaces. Gaster strongly constricted between first and second segments.

The three species of this small group formerly constituted the subgenus *Machaerogenys*, now placed in the synonymy of *Leptogenys* (see p. 240).

## Species included

*Leptogenys arcistrotris* Santschi

*Leptogenys* (*Machaerogenys*) *arcistrotris* Santschi, 1926b : 25. Holotype worker, MADAGASCAR: Moramanga (*Descarpentries*) (NM, Basle) [examined].

*Leptogenys ridens* Forel

*Leptogenys ridens* Forel, 1910b : 16. Holotype worker, MADAGASCAR: Fort Dauphin (*Sikora*) (MHN, Geneva) [examined].

*Leptogenys truncatirostris* Forel

*Leptogenys truncatirostris* Forel, 1897 : 195, fig. 2. Syntype workers, MADAGASCAR: Nossi Bé (*Voeltzkow*) (MHN, Geneva; NM, Basle) [examined].

Of the three species included in the group, *truncatirostris* is easily distinguished as it is larger (HL 1.88, HW 1.66, CI 88, SL 1.86, SI 112, PW 1.10) and lacks a median, longitudinal clypeal carina, which is present in all other species of both the Malagasy and Ethiopian regions. Also in *truncatirostris* the anterior margin of the clypeus is transverse, not convexly arched, and the mandibles are elongate and strongly curved basally. Each blade is broadened in the distal half of its length and then tapers to a long acute apex. A single, strongly developed preapical tooth is present which is curved in the direction of the mandibular apex.

The two remaining species, *arcistrotris* and *ridens*, are smaller (*ridens*: HL 1.70, HW 1.36, CI 80, SL 1.98, SI 145, PW 1.08; *arcistrotris*: HL 1.48, HW 1.28, CI 86, SL 1.50, SI 117, PW 0.96) with a median clypeal carina and a convex anterior clypeal margin. The mandibles in both species are elongate, curved slightly along their length, increasing slightly in thickness from base to apex and terminating in an abrupt apical surface. Preapical teeth are not present, the apical surface joins the inner margin through a curve. The two are easily separated as *ridens* is a larger species with relatively much longer scapes, as indicated in the measurements above.

THE *ATTENUATA*-GROUP

Characteristics of the group given on p. 274.

## Species included

*Leptogenys angusta* (Forel)

*Lobopelta angusta* Forel, 1892 : 519. Syntype workers, MADAGASCAR: Imerina, Andrangoloaka Forest (*Sikora*) (MHN, Geneva) [examined].

*Leptogenys coerulescens* Emery

*Leptogenys coerulescens* Emery, 1895b : 339. Syntype workers, MADAGASCAR: Diego Suarez, 1893 (*Ch. Alluaud*) (probably in MCSN, Genoa).

*Leptogenys grandidieri* Forel

*Leptogenys* (*Lobopelta*) *grandidieri* Forel, 1910b : 17. Holotype worker, MADAGASCAR: Fort Dauphin (*Sikora*) (MHN, Geneva) [examined].

*L. angusta* is a large species, with CI and SI within the range of *attenuata*, which it resembles (*angusta*: HL 2.24, HW 1.34, CI 60, SL 2.56, SI 191). As in *attenuata* the petiole in dorsal view is much longer than broad, strongly narrowed in its anterior half. The smooth integument has a scattered, bluish opalescence and the propodeal declivity is smooth, without transverse rugae. The median lobe of the clypeus is not longitudinally striate.

*L. coerulescens* appears to be related to *angusta* and also has bluish opalescence, but in this species the propodeal declivity is transversely rugose and the median clypeal lobe is longitudinally striate.

The last known species of the group, *grandidieri*, is smaller (HL 1.40, HW 0.92, CI 66, SL 1.30, SI 141) and on the whole appears to be more closely related to *crassinoda* than to any of the above. The petiole in dorsal view is longer than broad, but is only slightly broader behind than in front. The propodeal declivity is transversely rugose but the median lobe of the clypeus lacks striae, apart from a few on the extreme lateral portions.

THE *SAUSSUREI*-GROUP

Mandibles short, closing tightly against the clypeus. Eyes large, their maximum diameter greater than the maximum scape width. Second funicular segment only slightly longer than the third. Head not or only slightly broadened anteriorly. Dorsum of head and alitrunk sculptured.

Of the three species in the group two are closely related whilst the third, *oswaldi*, may not actually belong to the group as the gaster is constricted between the first and second segments, a feature much reduced in *saussurei* and *acutirostris*. All three species are large.

## Species included

***Leptogenys acutirostris* Santschi stat. n.**

*Leptogenys saussurei* st. *acutirostris* Santschi, 1912 : 150. Holotype worker, MADAGASCAR (*Le Moult*) (NM, Basle) [examined].

***Leptogenys oswaldi* Forel**

*Leptogenys o'swaldi* Forel, 1891a : 119, pl. 4, fig. 2. Holotype worker, MADAGASCAR: 30 milles au Nord-Ouest de Tamatave (*O'Swald*) (MHN, Geneva) [examined].

***Leptogenys saussurei* (Forel)**

*Lobopelta saussurei* Forel, 1891a : 121. Holotype worker, MADAGASCAR: Mahanoro, côte Est de Madagascar (*Saussure*) (MHN, Geneva) [examined].

*L. oswaldi* is the smallest species of this group (HL 2.08, HW 1.68, CI 80, SL 2.06, SI 124, PW 1.32) and the head is relatively broad. The gaster is strongly constricted between the first and second segments and the eyes have a maximum diameter ca 0.44. Dorsum of head densely sculptured with a fine rugoreticulum, the interspaces of which are minutely punctulate. The remaining two species are larger and less strongly sculptured, with narrower heads and the gastral constriction very weak indeed. The larger of the two, *saussurei* (HL 2.94, HW 1.98, CI 67, PW 1.84; (antennae missing from holotype) has an ocular diameter of 0.80 at maximum. The clypeus and gena to the level of the eye is longitudinally rugose but the dorsum of the head is coarsely punctured, the punctures becoming larger, shallower and more widely spaced posteriorly, separated by smooth interspaces. Petiole in dorsal view has the posterior margin strongly concave, the posterolateral angles prominent. *L. acutirostris* is similarly sculptured but is smaller (HL 2.76, HW 1.84, CI 63, SL 2.34, SI 127, PW 1.60) with smaller eyes, maximum diameter ca 0.58. The posterior margin of the petiole in dorsal view is not excised as in *saussurei*.

THE *INCISA*-GROUP

Mandibles elongate, curved, not capable of closing against the clypeus. Eyes medium to large; maximum diameter greater than maximum width of scape, if only slightly so. Second funicular segment longer than third. Head usually broadest at about the level of the eyes, the sides convex. Gaster constricted between first and second segments. Dorsum of head densely sculptured, either reticulate-punctate or with a fine, dense rugoreticulum with punctulate interspaces. First gastral tergite usually sculptured, at least with a superficial reticulation. Dorsal alitrunk sculptured.

## Species included

***Leptogenys alluaudi* Emery**

*Leptogenys alluaudi* Emery, 1895b : 338. Holotype worker, MADAGASCAR: Diego Suarez, iv-viii. 1893 (*Alluaud*) (probably in MCSN, Genoa).

*Leptogenys antongilensis* Emery

*Leptogenys incisa* var. *antongilensis* Emery, 1899 : 272, fig. Holotype worker, MADAGASCAR: Baia di Antongil, 1897-98 (*A. Mocquerys*) (probably in MCSN, Genoa).

*Leptogenys antongilensis* Emery; Emery, 1911 : 100. [Raised to species.]

*Leptogenys gracilis* Emery

*Leptogenys gracilis* Emery, 1899 : 271. Syntype workers, MADAGASCAR: Bia di Antongil, 1897-98 (*A. Mocquerys*) (probably in MCSN, Genoa).

*Leptogenys incisa* Forel

*Leptogenys incisa* Forel, 1891a : 113, pl. 4, figs 1, 1a. Syntype workers, MADAGASCAR: Montagne de Lokobé, a Nosibé (*O'Swald*) (location of types not known).

*Leptogenys incisa* var. *imerinensis* Forel, 1891b : 242. Syntype workers male, MADAGASCAR: Forêt d'Andrangoloaka (*Sikora*) (MHN, Geneva) [examined]. **Syn. n.**

*Leptogenys incisa* subsp. *suarensis* Emery, 1895b : 338. Syntype workers, MADAGASCAR: Diege Suarez, 1893 (*Alluaud*) (probably in MCSN, Genoa). **Syn. n.**

*Leptogenys voeltzkowi* Forel

*Leptogenys voeltzkowi* Forel, 1897 : 194. Syntype workers, MADAGASCAR: Nossi Bé (*Voeltzkow*) (MHN, Geneva; MCZ, Cambridge) [examined].

The few specimens and types of this group which I have been able to examine show that the species are closely related. It will not be possible to sort the species accurately until all the types can be examined and compared, and until some other collections have been made.

A SPECIES EXCLUDED FROM *LEPTOGENYS**Pachycondyla jonesii* (Forel) **comb. n.**

*Lobopelta jonesii* Forel, 1891a : 219. Syntype males, MADAGASCAR: Forêt d'Andrangoloaka (*Sikora*) (MHN, Geneva) [examined].

This species, known from two males, was originally placed by Forel in *Lobopelta* even though the pretarsal claws were not pectinate, as he pointed out in the original description. In fact, each claw has a single small tooth at about the midlength. Other definitive characters besides this, leading to the exclusion of *jonesii* from *Leptogenys* and its placement in *Pachycondyla*, include the curved, spiniform extension of the pygidium (absent from *Leptogenys*), the absence of notauli (usually present in *Leptogenys*), and the presence of an anal lobe on the hind wing (absent from *Leptogenys*).

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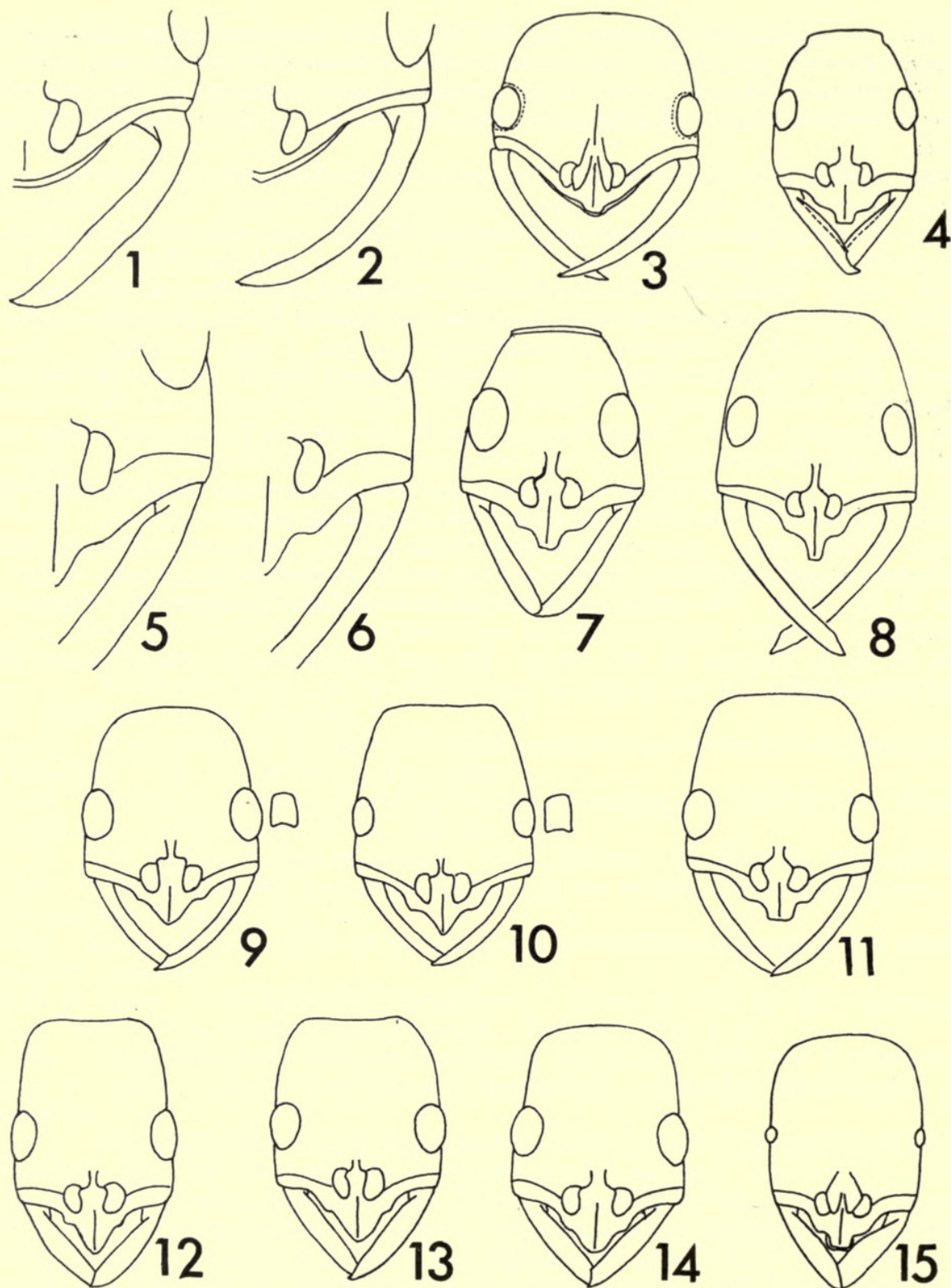
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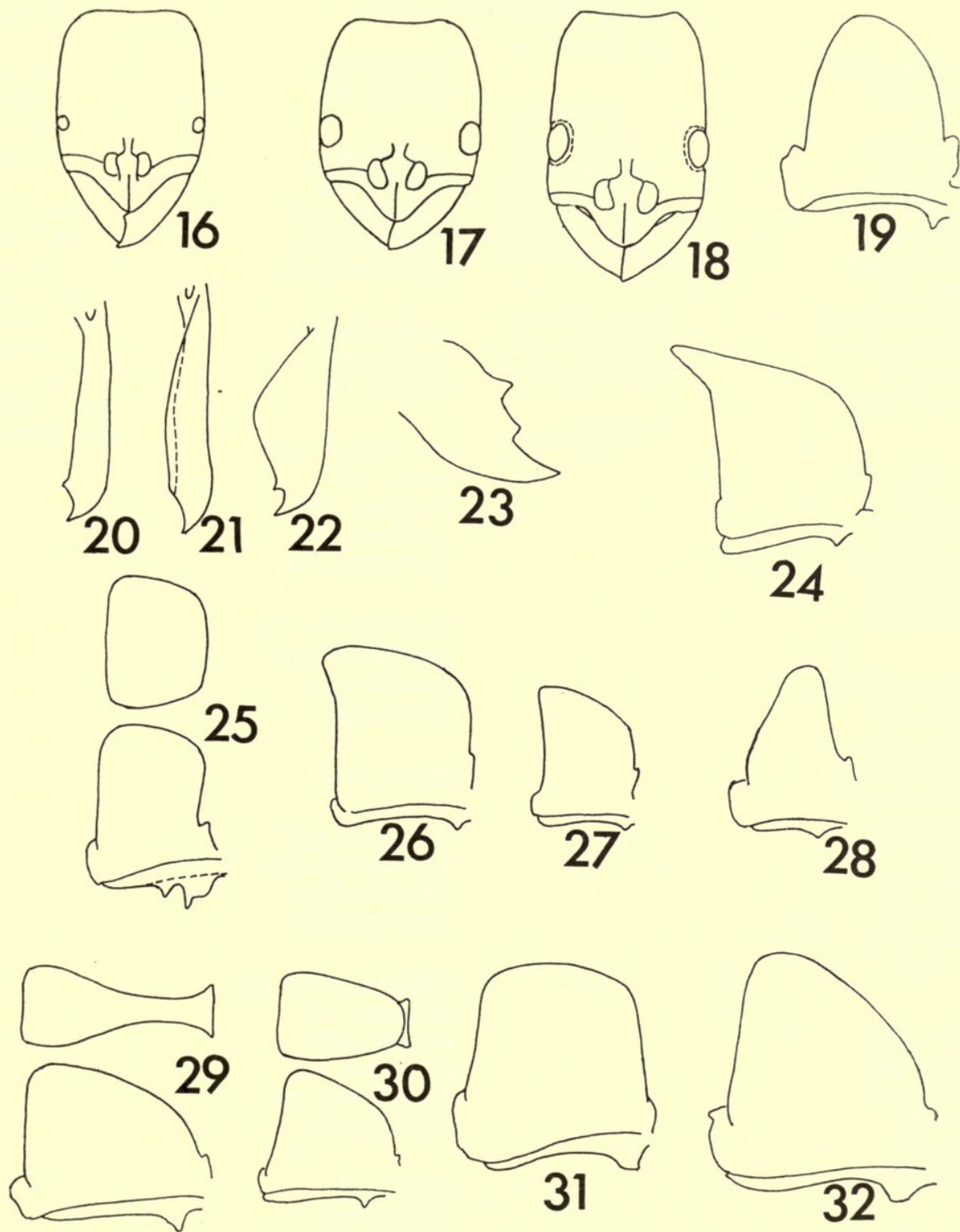
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FIGS 1-15. 1. Anterior portion of head and left mandible of *Leptogenys pavesii*. 2. Anterior portion of head and left mandible of *L. falcigera*. 3. Outline of head of *L. jeanneli*, pilosity and antennae omitted. 4. Outline of head of *L. zapyxis*, pilosity and antennae omitted. 5. Base of left mandible in *L. camerunensis* and allies. 6. Base of left mandible in *L. stuhlmanni* and allies. 7-15. Outlines of heads of (7) *L. camerunensis*; (8) *L. regis*; (9) *L. elegans* (offset shows size of 3rd funicular segment); (10) *L. ravidia* (offset shows size of 3rd funicular segment); (11) *L. tribolata*; (12) *L. mastax*; (13) *L. occidentalis*; (14) *L. sulcinoda*; (15) *L. pirooskae*; pilosity and antennae omitted, mandibles of 12-15 slightly opened.



FIGS 16-32. 16-18. Outlines of heads of (16) *Leptogenys guineensis*; (17) *L. mactans*; (18) *L. amon*; pilosity and antennae omitted. 19. Lateral petiole node shape of *L. zapyxis*, anterior face to right. 20-22. Mandibular shape in (20) *L. sterops*; (21) *L. zapyxis*; (22) *L. ergatogyna*. 23. Apex of mandible of *L. testacea*. 24-32. Lateral petiole node shape of (24) *L. crustosa*; (25) *L. ankhesa*, dorsal view above; (26) *L. princeps*; (27) *L. mastax*; (28) *L. spandax*; (29) *L. attenuata*, dorsal view above; (30) *L. crassinoda*, dorsal view above; (31) *L. jeanneli*; (32) *L. camerunensis*; anterior face of petiole to the right in all cases.

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