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## ***NIGERIELLA*, A NEW GENUS OF WEST AFRICAN FIG WASPS ALLIED TO *ELISABETHIELLA GRANDI* (HYMENOPTERA CHALCIDOIDEA, AGAONIDAE)**

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With 42 text-figures

Abstract. — Description of *Nigeriella* gen. nov. for *N. fusciceps* spec. nov. (type-species; Nigeria, from *Ficus abutilifolia* Miq.) and *N. letouzeyi* spec. nov. (Cameroons, from *Ficus* cf. *dekdeknena* (Miq.) A. Rich.). Keys to species of *Elisabethiella* Grandi and *Nigeriella*, and to African genera of Agaonidae; differentiation of subfamilies Agaoninae and Blastophaginae.

Two samples of wasps from West African figs, sent by Dr. R. Letouzey (Paris, France) and Dr. J. T. Medler (Ile-Ife, Nigeria), contain new species from the affinity of *Elisabethiella* Grandi. One, described below as *Nigeriella fusciceps* spec. nov., combines features usually considered distinctive between females of different groups of *Elisabethiella*. It has the mandibular appendage with ca. twenty ridges, as in the majority of *Elisabethiella*. The antenna bears sensilla chaetica, but their positions and flexibility differ from those of *Elisabethiella articulata* (Joseph) and *E. pectinata* (Joseph). In a way, it resembles *Paragaon perplexum* Joseph which, however, is dissimilar in characters of the head and the fore wing. Moreover, the pronotum has a fine longitudinal groove in *N. fusciceps*, as in *Elisabethiella*. It is entire in *Paragaon* as well as in *N. letouzeyi* spec. nov., the second species described in the present paper.

Although the females of the two species are distinct by several, apparently important, characters, the morphology of their males suggest a close relationship. Both have the antennae, widely different from those of *Elisabethiella* in shape and number of segments, situated in separate sockets; the fore tarsus is pentamerous; and the thoracical terga are broader, not narrowing behind. Apparently, there is some relationship with *Alfonsiella* Waterston, as witnessed e.g., by the configuration of the antennae and their toruli.

THE GENUS *ELISABETHIELLA* GRANDI (1928a)

The species of fig wasps allocated in the genus *Elisabethiella* Grandi form a rather heterogeneous lot. Of some, notably *E. articulata* (Joseph) and *pectinata* (Joseph), the female mandibular appendage has more than forty rows of denticulations, while in other species this number is lower. The flagellar segments of the antenna may bear short and rod-like (*E. pectinata*), or somewhat longer sensilla chaetica (*E. articulata*), or the sensilla are of a linear shape. In some (*E. enriquesi* Grandi, *stueckenbergi* Grandi), the antennal pedicel is rotundate in out-line; in *E. allotriozoonoides* (Grandi), *dyscritus* (Waterston), and *socotrensis* (Mayr), it is more angular.

The males, known of *E. allotriozoonoides*, *enriquesi*, and *socotrensis* only, have the antennae situated in a common groove in the head capsule. The antenna has two anuliform segments between the pedicel and the oblong, undivided club. The fore tarsus is bimerous, but it has traces of dorsal divisions in the distal segment. The thorax consists of two separate sclerites representing the pronotum, and the combined meso- and metanotum and propodeum, respectively; the posterior sclerite narrows behind.

Of only two species the host *Ficus* are known, viz., *E. socotrensis* was reared from *Ficus salicifolia* Vahl, and *E. stueckenbergi* was recorded from *Ficus petersii* Warburg.

On the morphology of both sexes, I would classify *E. allotriozoonoides* and *socotrensis*, and also *enriquesi* — and, because of their similar females, *E. dyscritus* and *stueckenbergi* too — in one species-group. This group would consist of two subgroups, viz., *E. allotriozoonoides*, *dyscritus* and *socotrensis* (which all may be associated with some *Ficus*-species of the section *Urostigma* ?), and *E. enriquesi* and *stueckenbergi* (the latter from section *Galoglychia*, the former of unknown provenance). I would not, on the entomological evidence, have expected a difference such as suggested by the botanical grouping. A second species-group of *Elisabethiella* consists of *E. articulata* and *pectinata*, known in the female sex only and of somewhat uncertain taxonomic position.

*Nigeriella fusciceps* and *letouzeyi*, in my opinion, form the counterpart of the combined species-groups of *Elisabethiella*. For that reason they are classified in a separate genus *Nigeriella* gen. nov. of which they, probably, represent two species-groups.

Key to the species of *Elisabethiella* and *Nigeriella*

1. Females . . . . .	2
— Males . . . . .	9
2. Mandibular appendage with twenty to thirty rows of denticulations . . . . .	3
— Mandibular appendage with more than forty rows of denticulations (species-group	

- of *E. articulata*) . . . . . 8
3. Antennal flagellum with long, flexible sensilla chaetica, next to a few sensilla linearia. Nigeria . . . . . *Nigeriella fusciceps*  
 — Antenna with sensilla linearia only . . . . . 4
4. Mandible with ca. twenty ventral ridges; the appendage only distally distinctly denticulate. Cameroons . . . . . *Nigeriella letouzeyi*  
 — Mandible with ca. ten ventral ridges; the appendage with rows of many fine denticulations (genus *Elisabethiella*) . . . . . 5
5. Antennal pedicel rotundate in outline (subgroup of *E. enriquesi*) . . . . . 6  
 — Antennal pedicel longer than wide, and more angular in outline (subgroup of *E. allotriozoonoides*) . . . . . 7
6. Head distinctly shorter than wide across the compound eyes (ca. 6 : 7). Mandibular appendage four times as long as wide, with rows of ca. ten denticulations. Angola . . . . . *E. enriquesi*  
 — Head as long as wide across the compound eyes. Mandibular appendage five times as long as wide, with rows of seven denticulations. South Africa . . . . . *E. stueckenbergi*
7. Head longer than wide across the compound eyes (39 : 34); the longitudinal diameter of the eye as long as the cheek. Socotra . . . . . *E. socotrensis*  
 — Head as long as wide across the compound eyes; the longitudinal diameter of the eye (at least in *allotriozoonoides*) distinctly shorter than the cheek (ca. 5 : 6). Two species, not easily distinguished if at all distinct (Grandi, 1928b: 163):  
   Eritrea . . . . . *E. allotriozoonoides*  
   Uganda . . . . . *E. dyscritus*
8. Antennal scape elongate, far projecting beyond the point of attachment of the pedicel; flagellar segments with short, rod-like sensilla. Guinea . . . . . *E. pectinata*  
 — Antennal scape normal; flagellar segments with the sensilla noticeably longer than the segments. Guinea . . . . . *E. articulata*
9. Antennae situated in separate sockets, with a distinct and wide club. Thorax not narrowing behind. Fore tarsus pentamerous (genus *Nigeriella*) . . . . . 10  
 — Antennae situated in a common groove; the club not wider than the other segments. Thorax narrowing behind. The fore tarsi have two free segments (genus *Elisabethiella*) . . . . . 11
10. Head with dorsal prominences next to the antennal toruli. Antenna with three anuliform funicular segments. Mandible falcate. Nigeria . . . . . *Nigeriella fusciceps*  
 — Head simple. Antenna with two anuliform funicular segments. Mandible short and robust. Cameroons . . . . . *Nigeriella letouzeyi*
11. Head little longer than wide (33 : 31); the pronotum shorter than the combined lengths of the other thoracal sclerites (ca. 7 : 9). Angola (subgroup of *E. enriquesi*) . . . . . *E. enriquesi*  
 — Head distinctly longer than wide (ca. 7 : 6); the pronotum as long as the posterior sclerite of the thorax (subgroup of *E. allotriozoonoides*) . . . . . 12
12. Femur of the mid leg twice as long as the trochanter, and one-and-a-half times as long as wide. Eritrea . . . . . *E. allotriozoonoides*  
 — Femur of the mid leg two-and-a-half times as long as the trochanter, and twice as long as wide. Socotra . . . . . *E. socotrensis*

#### The position of *Nigeriella* among the African Agaonidae

In the following key to the genera of the African Agaonidae, an innovation is introduced, i.e., the division of the fig wasps in two subfamilies. Most of the African genera fall into the nominate subfamily Agaoninae Walker (1846: 23), based on *Agaon paradoxum* Dalman. An available name for the other

group is Blastophaginae Kirchner (1867: 188), used for *Blastophaga psenes* (L.) from Europe. The basic differences here used for the discrimination of the two subfamilies, were noted by Grandi as early as 1916 (p. 125, key; 136, nota). A survey of the world genera and subgenera is given in table 1, with an indication of their host groups. The list is complete as to Agaonid groups, although the records from subgenera *Ficus* and *Sycomorus* are not given in detail.

TABLE I

Host relations of the Agaonidae (genera and subgenera)  
(notes refer to remarks in the text)

Agaonid genera of the subfamily Agaoninae:	genus FICUS, SUBGENERA and sections:	Agaonid genera of the subfamily Blastophaginae:
UROSTIGMA		
<i>Elisabethiella</i> Grandi 1)	<i>Urostigma</i> <i>Leucogyne</i> <i>Conosycea</i>	<i>Blastophaga quadriceps</i> Mayr 1) <i>Maniella</i> Abdurahiman & Joseph <i>Blastophaga</i> Gravenhorst (s.l.), <i>Eupristina</i> Saunders, <i>Parapristina</i> Hill, <i>Waterstoniella</i> Grandi
<i>Pleistodontes</i> Saunders <i>Agaon</i> Dalman, <i>Alfonsiella</i> Waterston, <i>Allotriozoon</i> Grandi, <i>Elisabethiella</i> Grandi, <i>Nigeriella</i> Wiebes, (? <i>Paragaon</i> Joseph)	<i>Stilpnophyllum</i> <i>Malvanthera</i> <i>Galoglychia</i>	<i>Blastophaga</i> Gravenhorst (s.l.) <i>Blast. greenwoodi</i> Grandi 2)
	<i>Americana</i>	<i>Pegoscapus</i> Cameron
PHARMACOSYCEA		
<i>Tetrapus</i> Mayr	<i>Pharmacosycea</i> <i>Oreosycea</i>	<i>Blastophaga</i> Gravenhorst (s.l.), <i>Dolichoris</i> Hill 2)
FICUS		
	various sections	<i>Blastophaga</i> Gravenhorst (s.str.), <i>Ceratosolen</i> Mayr, <i>Liporrhopalum</i> Waterston
SYCOMORUS		
		<i>Ceratosolen</i> Mayr

In general, the hosts of the Agaoninae are found in *Urostigma* sections *Malvanthera*, *Galoglychia*, and in *Pharmacosycea* (subgenus and section). Exceptions are the following records:

(1) *Elisabethiella socotrens* (Mayr) (Agaoninae) from *Ficus salicifolia* Vahl, and *Blastophaga quadriceps* Mayr (Blastophaginae) from *Ficus religiosa* L.: the record last-mentioned was more than once confirmed, but that from *Ficus salicifolia* is based on Mayer's paper only (Mayer, 1882: 570; det. Schweinfurth);

(2) *Blastophaga greenwoodi* Grandi (Blastophaginae) from *Ficus obliqua* Forst. f. (Greenwood, 1929: 347; and see Wiebes, 1963: 309); other *Malvanthera* have *Pleistodontes* (Agaoninae). See Grandi's remarks (Grandi, 1928a: 68) on the similarity of *Blastophaga greenwoodi* and *Elisabethiella*. The same characters involved in this similarity, notably the structure of the mandible and that of the third antennal segment, apply to *Dolichoris* Hill (1967: 38-39<sup>1</sup>). In this genus, however, the morphology of the male leaves no doubt as to its place among the Blastophaginae.

(3) A general remark concerns the genus *Blastophaga* Gravenhorst that should be divided up into many groups and genera, but still stands as a generic name for many species not yet revised.

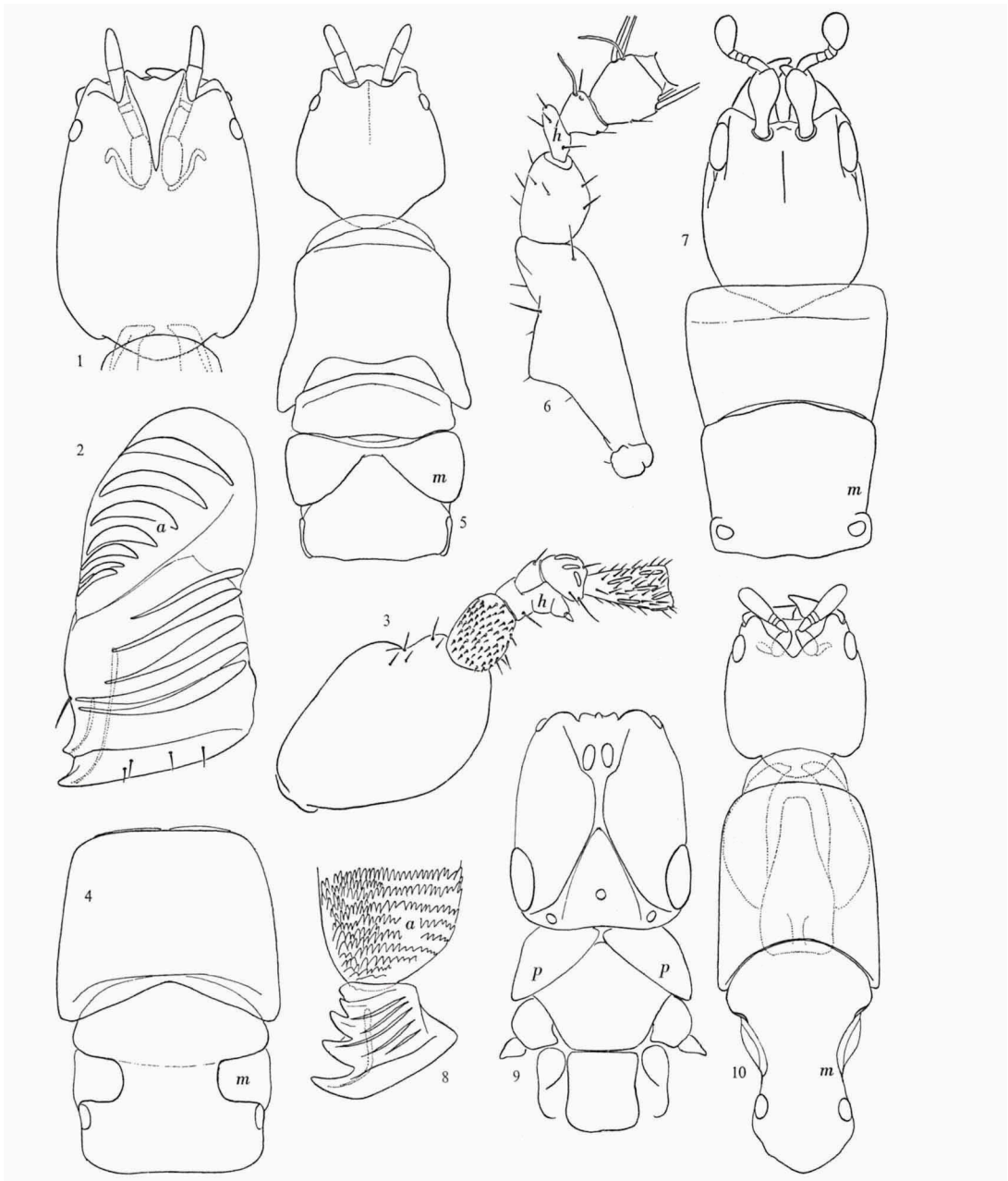
These few exceptions ignored, the division of the Agaonidae is quite obvious and strict. It should be taken as a suggestion for a reappraisal of the gross classification of *Ficus*. There are some botanical parallels of the entomological relationships. These were mentioned by Corner (1960: 374-376), when he hinted at the relationship of sections *Malvanthera* and *Galoglychia*, as against a similar alliance of sections *Urostigma* and *Conosycea* with *Americana*.

It should be noted that Ramirez (1969, 1970) suggested the presence and structure of the pollen pockets (sternal and/or coxal), to be important characters for the classification of species into genera. One would expect these characters useful for the classification of the genera within the family Agaonidae. As far as known now, however, they are contrary to the classification here proposed. Some Agaoninae would be combined with some Blastophaginae, e.g., *Blastophaga (Pegoscapus) mariae* Ramirez and *carlosi* Ramirez (New World Blastophaginae) both have (reduced) sternal pockets only, while other *Pegoscapus* have coxal and sternal pockets (Ramirez, 1970: 12, 17, 20) as have, e.g., *Elisabethiella stueckenbergi* Grandi (Agaoninae) and *Blastophaga boschmai* Wiebes (Old World Blastophaginae); another Old World Blastophagine, *B. psenes* (L.) has none, and also the species of New World *Tetrapus* (Agaoninae) have none (Ramirez, 1969: 581). While I consider the knowledge of these features of great interest, I am not convinced of their paramount taxonomical importance.

1) The noted affinity of *Dolichoris* and *Tetrapus* (Hill, 1967: 39) is superficial only. The males are widely different, as are, on closer inspection, the females.

The African genera may be distinguished by the characters used in the following key (figs. 1-10). Of some genera, only one African species is known: in these instances the specific name is mentioned in the key.

1. Females . . . . . 2
- Males . . . . . 10
2. Mandibular appendage completely, or largely, fused with the body of the mandible, bearing ventral lamellae (fig. 2). Third antennal segment (fig. 3), in most instances distinctly (not in all extra-limital genera), with a separation between the main part and the produced apex, which may, itself, be subdivided into two parts (Blastophaginae) . . . . . 3
- Mandibular appendage truly appended to the mandible, and bearing ventral rows of denticulations (fig. 8). Third antennal segment (fig. 6) simple, the produced apex, if at all prominent, not separate from the main part of the segment (Agaoninae) . . . . . 5
3. Spiracular peritremata of the eighth urotergite very large and slipper-shaped, with distinct lateral extensions . . . . . *Ceratosolen*
- Spiracular peritremata subcircular, small . . . . . 4
4. Antenna ten-segmented; the funicular segments with one or two rows of sensilla linearia. Mesosternum with pollen pockets . . . . . *Liporrhopalum gestroi*
- Antenna eleven-segmented, the funicular segments with one row of sensilla linearia. Pollen pockets lacking (introduced with the edible fig, *Ficus carica* L.) . . . . . *Blastophaga psenes*
5. Venation of the fore wing incomplete, i.e., the postmarginal vein short and obsolescent, fading out indistinctly, shorter than the stigmal vein . . . . . 6
- Venation complete: the postmarginal vein at least as long as the stigmal, and in most instances distinctly longer . . . . . 7
6. Antennal sensoria: long and flexible sensilla chaetica . . . . . *Alfonsiella*
- Antennal funicle with short and wide sensilla linearia . . . . . *Allotriozoon*
7. Head distinctly longer than wide across the compound eyes; the antennal funicle with sensilla chaetica only (no sensilla linearia) . . . . . 8
- Head not much longer than wide; the antennal funicle with sensilla linearia (and in one instance, also sensilla chaetica) . . . . . 9
8. Mandible unidentate, the rows on the appendage consisting of two teeth. Pronotum entire . . . . . *Paragaon perplexum*
- Mandible with several teeth (aberrant: *Agaon medleri* Wiebes, with a rasp of ca. 75 ventral mandibular ridges); the rows on the appendage consisting of a larger number of denticulations. Pronotum longitudinally divided into two sclerites . . . . . *Agaon*
9. Mandibular appendage with rows of many fine denticulations. Pronotum distinctly divided into two sclerites (fig. 9) . . . . . *Elisabethiella*
- Mandibular appendage with ridges of two teeth, or basally without distinct denticulations. The pronotum not distinctly divided into two sclerites, but it may have a fine longitudinal groove . . . . . *Nigeriella*
10. Metanotum completely separate from the mesonotum, either as two dorsal sclerites, or the metanotal part consisting of two sublateral sclerites; at the same time fore tarsi bimerous (Blastophaginae) . . . . . 11
- Metanotum either not completely separate from the mesonotum and the fore tarsi not bimerous, or if the separation of the terga is more complete, then the fore tarsi trimerous (Agaoninae) . . . . . 13
11. Prosternum for the greater part separate from the prothoracal episterna. Antennae situated in separate sockets on either side of a trilobed process (fig. 1); five-segmented, the third segment often anuliform . . . . . *Ceratosolen*
- Prosternum fused with its episterna, forming a robust ventral sclerite. Antennae



Figs. 1-10. Semidiagrammatical figures illustrating the key to the genera. 1-5, Blastophaginae; 6-10, Agaoninae. 1, *Ceratosolen megacephalus* Grandi, male head; 2, do., female mandible; 3, *Ceratosolen namorokensis* Risbec, proximal part of female antenna; 4, *Blastophaga psenes* (L.), male thorax; 5, *Liporrhopalum gestroi afrum* Wiebes, male head and thorax; 6, *Alfonsiella brongersmai* Wiebes, proximal part of female antenna; 7, do., male head and thorax; 8, *Agaon hamiferum modestum* Wiebes, female mandible; 9, *Elisabethiella* spec., female head, pronotum, and mesonotum; 10, do., male head and thorax (sternal sclerites seen by transparency).

*a*, mandibular appendage, with lamellae in fig. 2, denticulate in fig. 8; *h*, hook-like third antennal segment, subdivided in fig. 3, simple in fig. 6; *m*, metanotal sclerites, free in figs. 4 and 5, not separately indicated in figs. 7 and 10; *p*, pronotal sclerites, separated in the mid-line (fig. 9).

Figs. 1, 4-7, 9, 10,  $\times 65$ ; 2,  $\times 250$ ; 3, 8,  $\times 105$ .

- as if originating from a common epistomal groove; with four free segments (not counting the subdivisions of the club) . . . . . 12
12. Metanotum occupying the whole width of the dorsal surface, completely separating the mesonotum from the propodeum (fig. 5). Antennal club not divided . . . . . *Liporrhopalum gestroi*
- The visible parts of the metanotum situated at the lateral edges of the dorsal surface; the mesonotum fused with the propodeum (fig. 4). Antennal club three-segmented . . . . . *Blastophaga psenes*
13. Antenna without distinct ring-segments. Thoracical terga more distinctly separate. Fore tarsi consisting of three segments . . . . . *Allotriozone*
- Antenna with two or three of the segments anuliform, or at least shorter than the pedicel. Thoracical terga fused to some extent. Fore tarsi either two-segmented, or (in some instances incompletely) five-segmented . . . . . 14
14. Fore tarsi bimerous . . . . . *Agaon*
- Fore tarsi basically pentamerous . . . . . 15
15. Antennae situated in a common groove; the club slender, not much wider than the funicle; two ring-segments. Thorax narrowing behind (fig. 10) . . . *Elisabethiella*
- Antennae situated in separate sockets; the club much wider than the two- or three-segmented funicle. Thorax not narrowing behind (fig. 7) . . . . . 16
16. Antennal club two-segmented. Fore tarsi oligomeric . . . . . *Alfonsiella*
- Antennal club three-segmented. Fore tarsi distinctly pentamerous . . . *Nigeriella*

#### DESCRIPTIONS

##### **Nigeriella** gen. nov.

Agaoninae with a complete venation in the female fore wing; with pollen pockets on mesosternum and fore coxae. The female head is about as long as wide across the compound eyes, or slightly longer; there are three ocelli; the scape has a slight ventral projection; the pedicel is subcircular or ovoid in outline, and has the axial surface a little expanded; the funicle may bear sensilla linearia and/or sensilla chaetica.

The male head is as long as wide; it has two compound eyes. The antennae are situated in separate sockets; they have two or three anuli, and the club has three segments. The mesonotum and metanotum are fused as is, incompletely, also the propodeum. All tarsi are pentamerous. The genitalia have no claspers or parameres.

Type species, *Nigeriella fusciceps* spec. nov.

Additional species, *Nigeriella letouzeyi* spec. nov.

##### **Nigeriella fusciceps** spec. nov. (figs. 11-27)

Material. — 18 ♀, 11 ♂, Nigeria, W-state: Igbetti, leg. J. T. Medler, 7.ii.1971, ex *Ficus abutilifolia* Miq. (no. 578); Leiden Museum no. 1713, ♀ holotype slide 1713a, ♀♂ paratypes slides 1713b-d. Three ♀♂ are donated to the Snow Entomological Museum, Lawrence, Kansas, U.S.A.



Female. — Head (fig. 14) as long as wide across the compound eyes; the longitudinal diameter of the eye three-quarters of the cheek. Three ocelli, the lateral of which are situated on separate sclerites. Antenna (figs. 12, 13) eleven-segmented; the scape half as wide as long, the ventral projection not very prominent; the pedicel subcircular, the axial surface expanded, with ca. ten slender spines; the third segment with a long slender appendage; the fourth segment short, the fifth to eleventh twice as long as wide (the distal segments shorter), each with three sensilla linearia and many long, flexible sensilla chaetica. Mandible (fig. 17) with ca. ten ventral ridges; the appendage with ca. twenty ridges, each consisting of two teeth. Labium with two apical setae, the maxilla with two subapical setae.

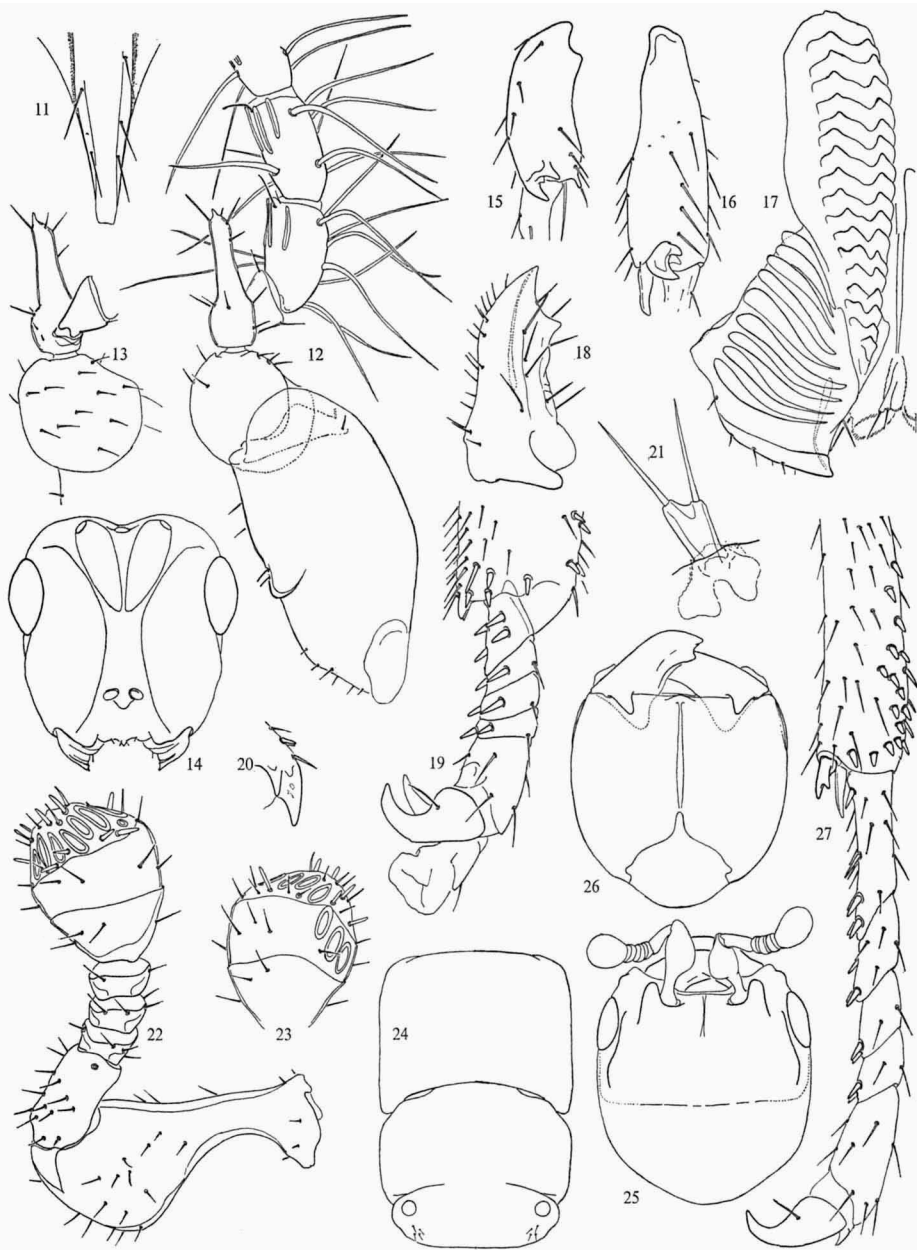
Thorax with sternal pollen pockets. Pronotum with a narrow, superficial longitudinal groove in the mid-line. Fore wing (2 : 1), 1.3 mm long; the submarginal, marginal, stigmal, and postmarginal veins approximately in ratio 28 : 11 : 8 : 13; the hind wing (5 : 1), 0.9 mm long. Fore leg (fig. 15): the coxa with a pollen pocket; the tibia with two dorso-apical teeth and a smaller one in between, one ventral tooth, and a long axial spur; the tarsal segments in ratio 6 : 3 : 3 : 3 : 7, with some axial spines. Hind leg (fig. 16): the tibia with two teeth, the antiaxial one of which is tricuspidate; the tarsal segments approximately in ratio 14 : 7 : 6 : 4 : 9, with a plantar fringe and some axial spines.

Gaster: the hypopygium (fig. 11) blunt at the apex; the ovipositor as long as the gaster, i.e., 0.8 mm.

Length (head, thorax, and gaster), 1.7 mm.

Male. — Head (figs. 25, 26) as long as wide, with stout dorsal prominences next to the antennal toruli, and dark ridges along the eyes and beyond; a dark line running from the eyes backwards and across the vertex. Eyes one-quarter of the length of the head. Antennae (figs. 22, 23) situated in separate sockets; the scape large, narrowly stalked; the pedicel one-third of the length of the scape; the three funicular segments subequal, anuliform; the club consisting of three segments: the ultimate and penultimate bear sensilla. Mandible (fig. 18) long, falcate, bidentate, with one gland; the maxillo-labial complex (fig. 21) with a short dorsal lobe, and a longer ventral, which bears two long setae.

Thorax (fig. 24). Pronotum one-and-a-half times as wide as long; the mesonotum and metanotum combined, twice as wide as long, incompletely separate from the propodeum; the propodeum almost three times as wide as long, with circular peritremata of the stigmata, and a few setae. Fore leg (figs. 19, 20): the tibia with two dorsal teeth, three ventrals (one small in



Figs. 11-27. *Nigriella fusciceps* spec. nov. 11-17, female; 18-27, male. 11, hypopygium; 12, antenna, proximal segments in anti-axial view; 13, do., detail in axial view; 14, head; 15, fore tibia, anti-axial aspect; 16, hind tibia, anti-axial aspect; 17, trophi; 18, mandible, ventral aspect; 19, apex of fore tibia, and tarsus, axial aspect; 20, do., detail in anti-axial view; 21, maxillo-labial complex; 22, antenna, anti-axial aspect; 23, do., detail in axial aspect; 24, thorax; 25, head, dorsal aspect; 26, do., ventral aspect; 27, apex of hind tibia, and tarsus, anti-axial aspect.

Figs. 11-13, 17, 19, 20, 22, 23, 27,  $\times 210$ ; 14, 24-26,  $\times 65$ ; 15, 16, 18,  $\times 105$ ; 21,  $\times 415$ .

between two larger), and some stout spines along the dorsal margin and on the axial apex; the tarsal segments approximately in ratio 10 : 4 : 5 : 3 : 12, with pairs of ventral spines. Mid leg slender, the tibial apex with two stout ventral spines; the tarsal ratio 7 : 4 : 4 : 3 : 9. Hind leg (fig. 27): the tibia with two ventral spurs, the axial one of which is simple and slender, the other bicuspidate, the disc with several, mainly antiaxial, conical spines; the tarsal segments approximately in ratio 11 : 6 : 4 : 3 : 10, with pairs of spines.

Gaster: the genitalia without claspers or parameres.

Length (head and thorax), 1.2 mm. Colour yellowish brown, the head much darker.

***Nigeriella letouzeyi* spec. nov. (figs. 28-42)**

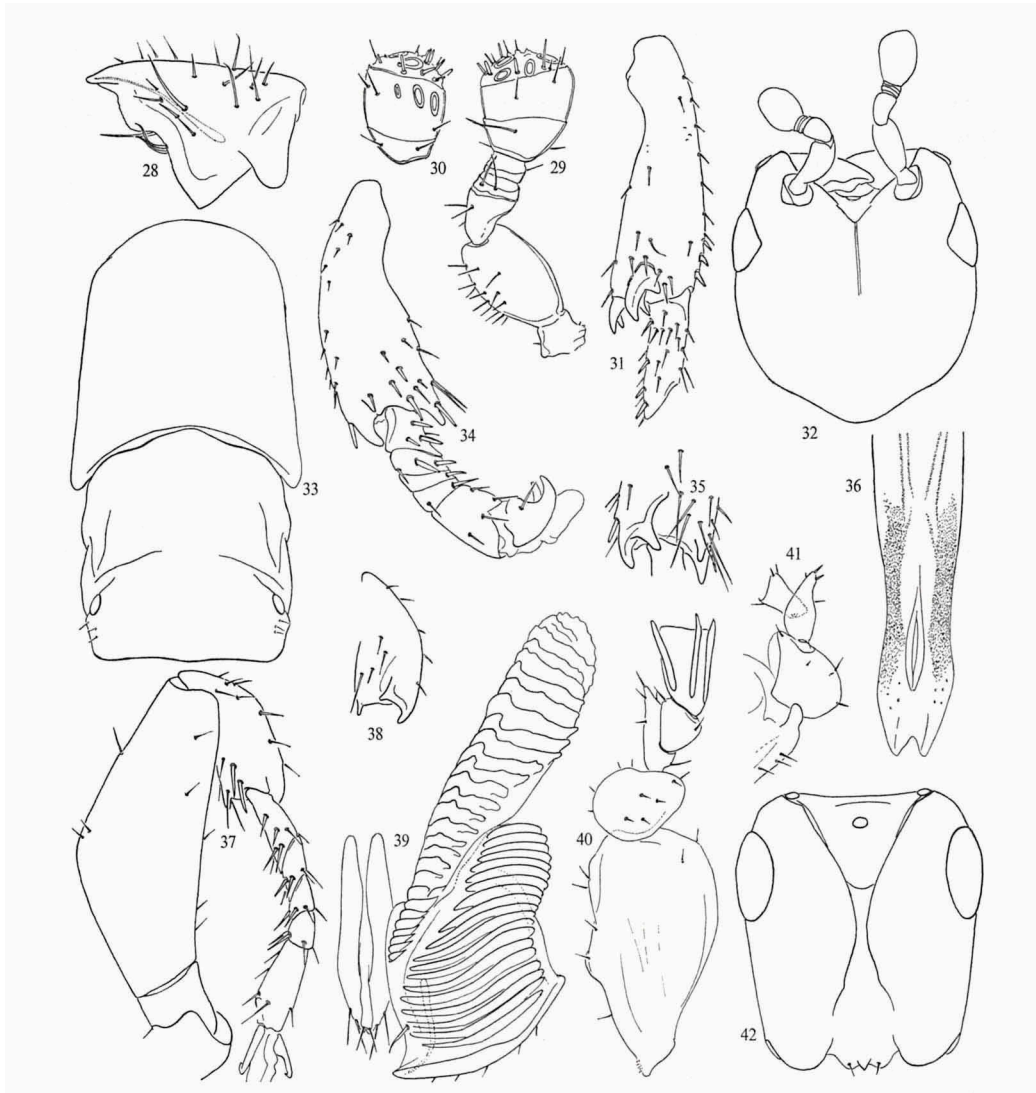
Material. — 90 ♀, 48 ♂, Cameroons: near Obala, leg. R. Letouzey, xii.1969, ex *Ficus* cf. *dekdekkena* (Miq.) A. Rich. (plant no. 9785, Herbarium Mus. Paris); Leiden Museum no. 1342, ♀ holotype slide 1342a, ♀♂ paratypes slides 1342b-d. Five ♀♂ are donated to the Muséum National d'Histoire naturelle, Paris, France.

Female. — Head (fig. 42) longer than wide across the compound eyes (11 : 10); the longitudinal diameter of the eye distinctly shorter than the cheek (7 : 10). Three ocelli, situated on a common, frontal sclerite. Antenna (figs. 40, 41) eleven-segmented; the scape half as wide as long, with the ventral projection not very prominent; the pedicel ovoid in outline, with five axial spines; the third segment shortly produced; the fourth short; the fifth to eleventh segments with ca. five to twelve sensilla linearia. Mandible (fig. 39) with ca. twenty ventral lamellae; the appendage with twenty-five ridges that, distally, become distinctly denticulate. Labium with two apical setae, the maxilla with two subapical setae.

Thorax: pronotum entire; mesosternum with pollen pockets. Fore wing (2 : 1), 1.0 mm long; the submarginal, marginal, stigmal, and postmarginal veins approximately in ratio 26 : 19 : 11 : 14; the hind wing (5 : 1), 0.6 mm long. Fore leg (figs. 37, 38): the coxa with a pollen pocket; the tibia with two dorsal teeth and one ventral; the tarsal segments approximately in ratio 10 : 6 : 5 : 5 : 12, with ventral spines. Hind leg: the tibia with two spurs much as in fig. 16; the tarsal ratio approximately 11 : 4 : 5 : 4 : 5, with a fringe and axial spines.

Gaster: the hypopygium blunt at the apex, as in fig. 11; the ovipositor a little longer than the gaster.

Length (head, thorax, and gaster), 1.2 mm; ovipositor, 0.8 mm.



Figs. 28-42. *Nigriella letouzeyi* spec. nov. 28-36, male; 37-42, female. 28, mandible, ventral aspect; 29, antenna, anti-axial aspect; 30, do., detail in axial view; 31, hind tibia and metatarsus, anti-axial aspect; 32, head; 33, thorax; 34, fore tibia and tarsus, axial aspect; 35, detail of fore tibia in anti-axial view; 36, apex of aedeagus; 37, fore leg, axial aspect; 38, detail of fore tibia in anti-axial view; 39, trophi; 40, antenna, proximal segments in axial view; 41, do., detail in anti-axial view; 42, head.

Figs. 28-31, 34-41,  $\times 210$ ; 32, 33, 42,  $\times 105$ .

Male. — Head (fig. 32) as long as wide. Eyes one-quarter of the length of the head. Antennae (figs. 29, 30) in separate sockets; the scape twice as long as its maximum width, with dorsal setae; the pedicel one-third of the length of the scape; two anuliform, funicular segments; the club consisting of three segments, with sensilla as in the figures. Mandible (fig. 28) short and rather robust, with long setae; one gland. Labium and maxillae atrophied; astomous.

Thorax (fig. 33). Pronotum about as wide as long, narrowing frontad; the mesonotum and metanotum fused, separation indicated laterally; the propodeum twice as wide as long, with large sublateral, spiracular peritremata. Fore leg (figs. 34, 35): the tibia with two dorsal teeth, two ventrals, and with an axial prominence at the apex; the antiaxial setae long, most axial spines stout, especially the dorsal and ventral spines accompanying the teeth; the tarsal segments approximately in ratio 7 : 5 : 2 : 3 : 11, with pairs of ventral spines and with some axials. Mid leg more robust than in *N. fusciceps*; tarsal ratio 10 : 6 : 7 : 6 : 14. Hind leg (fig. 31): the tibial armature consisting of two ventral teeth, the antiaxial one with three cusps, the other longer, bicuspidate; moreover, some short spines present at the dorsal angle; the tarsal segments approximately in ratio 14 : 10 : 7 : 7 : 12, with ventral spines.

Gaster: the genitalia without claspers or parameres; aedeagus, fig. 36.

Length (head and thorax), ca. 0.9 mm. Colour yellowish, the head brown.

#### REFERENCES

- CORNER, E. J. H., 1960. Taxonomic notes on *Ficus* Linn., Asia and Australasia i. Subgen. *Urostigma* (Gasp.) Miq. — Gardens' Bull. Singapore, 17: 368-404.
- GRANDI, G., 1916. Gli Agaonini (Hymenoptera Chalcididae) raccolti nell'Africa occidentale dal Prof. F. Silvestri. — Boll. Lab. Zool. Portici, 10: 121-286, figs. 1-52.
- , 1928a. Due specie di *Blastophaga* delle isole Figi ed istituzione di un nuovo sottogenere. — Boll. Lab. Ent. Bologna, 1: 65-70, fig. 1.
- , 1928b. Revisione critica degli Agaonidi descritti da Gustavo Mayr e catalogo ragionato delle specie fino ad oggi descritte di tutto il mondo. — Boll. Lab. Ent. Bologna, 1: 107-235, figs. 1-44.
- GREENWOOD, W., 1929. The food plants or hosts of some Fijian insects iii. — Proc. Linn. Soc. New Sl. Wales, 54: 344-354.
- HILL, D. S., 1967. Fig-wasps (Chalcidoidea) of Hong Kong i. Agaonidae. — Zool. Verh., 89: 1-55, figs. 1-159.
- KIRCHNER, L., 1867. Catalogus Hymenopterorum Europae: 1-285. Zool.-bot. Ges. Wien.
- MAYER, P., 1882. Zur Naturgeschichte der Feigeninsecten. — Mitt. zool. Sta. Neapel, 4: 551-590, figs. 1, 2, pls. 25, 26.
- RAMIREZ B., W., 1969. Fig wasps: mechanism of pollen transfer. — Science, 163: 580-581, figs. 1-3.
- , 1970. Taxonomic and biological studies of neotropical fig wasps (Hymenoptera: Agaonidae). — Univ. Kansas Sci. Bull., 49: 1-44, figs. 1-121.

- WALKER, F., 1846. List of the Hymenopterous insects in the collections of the British Museum, part 1: 1-100. London.
- WIEBES, J. T., 1963. Indo-Malayan and Papuan fig wasps (Hymenoptera, Chalcidoidea).  
2. The genus *Pleistodontes* Saunders (Agaonidae). — Zool. Meded., 38: 302-321, figs. 1-50.