

# Revisions of the Afrotropical genera of Argidae and species of *Pampsilota* Konow, 1899 (Hymenoptera, Tenthredinoidea)

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<http://zoobank.org/5015C4B5-9331-42DD-9DCE-1EBDB40FF441>

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## Abstract

The Afrotropical fauna contains five genera of Argidae. These are keyed. New subjective synonyms, followed by the valid name in brackets, are *Calarge* Enslin, 1911 [*Arge* Schrank, 1802], *Calarge africana* Enslin, 1911 [*Arge congrua* Konow, 1907], *Clyparge* Pasteels, 1963 [*Scobina* Lepeletier & Serville, 1828], *Clyparge terminalis* Pasteels, 1963 [*Scobina poecila* (Klug, 1834)], and *Sterictophora* [sic] *afra* Pasteels, 1963 [*Sphacophilus afer* **comb. n.**, species inquirenda near *S. monjarasi* Smith & Morales-Reyes, 2015]. The type material of both *C. terminalis* and *S. afra* was probably collected in the New World, but labelled with the wrong locality “Kamerun”. An introduction of both species to Africa, not followed by long-term establishment, seems less likely. The removal of these taxa from the faunal list of the region is recommended. The nine known Afrotropical species of *Pampsilota* are revised, and an illustrated dichotomous identification key presented, with distribution maps for all species. Four species are here described as new to science: *P. dahomeyanus* Goergen, Koch & Liston, **sp. n.**, *P. nigeriae* Liston & Koch, **sp. n.**, *P. tsavoensis* Liston & Koch, **sp. n.**, and *P. zebra* Liston & Koch, **sp. n.** Lectotypes are designated for *Pampsilota afer* Konow, 1899, and *Cipdele africana* Mocsáry, 1909. The immature stages and host plant of only one species are known: *P. dahomeyanus* on *Lannea nigritana* (Anacardiaceae). Its larval morphology strongly resembles that of European and North American species of *Arge*. We provisionally retain *Pampsilota* as a valid genus, although it could justifiably be treated as comprising merely a species group, or groups, within *Arge*.

Received 14 October 2016

Accepted 10 January 2017

Published 19 January 2017

Academic editor:

Ralph Peters

## Key Words

Taxonomic revision

new synonymy

new species

key

distributions

host

*Lannea*

Anacardiaceae

## Introduction

Taeger et al. (2010) catalogued seven valid genera of Argidae as present in the Afrotropical Region. As a result of our studies, we concluded that only five valid genera can be considered to be present there: *Arge* Schrank, 1802, *Cibdela* Konow, 1899, *Pampsilota* Konow, 1899, *Sjoestedtia*, Konow, 1907 (Konow 1907a), and *Triarge* Forsius, 1931. With currently 127 valid species, *Arge* is by far the most species-rich sawfly genus in this biogeographic region (Koch et al. 2015). It is also well repre-

sented in the Holarctic and Oriental Regions, but makes up a much smaller proportion of the total sawfly fauna there. A total of about 350 valid species of *Arge* worldwide were catalogued by Taeger et al. (2010). The other four Afrotropical genera are comparatively small. Nine species of *Triarge* are known, all endemic to the winter rainfall zone of southern Africa (Koch et al. 2015). *Sjoestedtia* is only known from the Afrotropical Region, and contains two valid species (Taeger et al. 2010). *Cibdela*, not mentioned from the Afrotropics by Taeger et al. (2010), is represented there only because of the intro-

duction to Réunion, from Sumatra, of *C. janthina* (Klug, 1834) for control of invasive *Rubus alceifolius* JLM Poiret (Rosaceae) (Mathieu et al. 2014). The following revision of *Pampsilota* treats nine Afrotropical species:

- P. afer* Konow, 1899
- P. africanus* (Mocsáry, 1909)
- P. brandbergensis* Koch, 2006
- P. dahomeyanus* sp. n.
- P. leleupi* Pasteels, 1953
- P. luederitzensis* Koch, 2006
- P. nigeriae* sp. n.
- P. tsavoensis* sp. n.
- P. zebra* sp. n.

Taeger et al. (2010) listed three further *Pampsilota* species from the East Palaearctic and Oriental Regions: *P. cenchrus* Wei, 1997, *P. interstitialis* (Cameron, 1877), and *P. scutellis* Wei, 1997. They were described or re-described by Wei (1997) and Saini (2009), with illustrations of some body parts, and are not considered further here. No information on the hosts and immature stages of these species has been published. Recent combinations of some other species names with *Pampsilota* have been proposed, for example by Saini (2009), for several E. Palaearctic and Oriental species group taxa currently placed otherwise mostly in *Tanyphatnidea* Rohwer, 1912 (e.g. Wei 1997, Taeger et al. 2010).

The Afrotropical species of *Pampsilota* are highly heterogeneous in their appearance and morphology. For example, body length ranges from 5.3 mm to 15.3 mm, and whereas the ovipositor sheath is conspicuously compact in *P. afra* (Fig. 5) and *P. dahomeyanus* (Fig. 16), in *P. africanus* (Fig. 10) and *P. zebra* (Fig. 32) it is distinctly pincer-shaped. In other species the valvulae 3 of the ovipositor sheath more or less diverge towards their apices in dorsal view. This high morphological diversity was discussed by Pasteels (1955), who gave as examples the distally conspicuously laterally compressed metatibia and compact valvulae 3 of *P. afer*, compared to the distally cylindrical metatibia and pincer-shaped valvulae 3 of *P. africanus*. However, he concluded that a similarly wide range of character states also occurs in *Arge*, and that the high degree of heterogeneity in *Pampsilota* was therefore not remarkable. Additionally, we found such large interspecific differences in the morphology of the ovipositor itself, and sometimes of penis valves, that we have considerable doubts as to whether the genus is monophyletic as presently circumscribed. The treatment here of *Pampsilota* as distinct from *Arge* is justified on practical grounds, because it enables the easier identification of a number of species which could otherwise be mixed-up with species of the large and taxonomically difficult genus *Arge*.

Our study aims to render the rich Afrotropical fauna of Argidae more easily identifiable, using purely morphological methods, and thus make it accessible for further research.

## Material and methods

Specimens were studied with Leica MZ12, Olympus SZX12, and Wild M8 binocular microscopes. Lancets and penis valves were examined with a Leitz Laborlux S transmitted-light microscope, and photographed through this with a Leica Wild MPS32 camera. The outlines for the illustrations of the dorsal and ventral parts of the male genital capsule, including the digitus and cuspis, were obtained using a Leo 1450VP scanning electron microscope. Details of the genitalia were filled in by hand while constantly cross-checking specimens through the microscope. Habitus photos of adults, and details of larvae, were mostly taken with a Leica DFC295 camera attached to an Olympus SZX12 microscope. Larvae were photographed immersed in ethanol, sometimes held in place with fine pellets of glass. Composite images with an extended depth of field were created using the software CombineZ5 (<http://hadleyweb.pwp.blueyonder.co.uk>).

Morphological terminology follows Viitasaari (2002).

### Abbreviations used in the text

Material examined is deposited in the following institutions:

HNHM	Hungarian Natural History Museum, Budapest, Hungary.
IITAC	International Institute of Tropical Agriculture, Cotonou, Benin.
MNCN	Museo Nacional de Ciencias Naturales, Madrid, Spain.
MFN	Museum für Naturkunde Berlin, Germany.
MRAC	Musée Royal de l'Afrique Centrale, Tervuren, Belgium.
NHRS	Naturhistoriska Riksmuseet, Stockholm, Sweden.
NMKE	National Museum of Kenya, Nairobi, Kenya.
NNIC	Namibian National Insect Collection, Windhoek, Namibia.
OLML	Oberösterreichisches Landesmuseum, Linz, Austria.
RBINS	Royal Belgian Institute of Natural Sciences, Brussels, Belgium.
SDEI	Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany.
USNM	National Museum of Natural History, Smithsonian Institution, Washington D.C., USA.
UZMT	Zoological Museum, University of Turku, Finland.
ZSM	Zoologische Staatssammlung, Munich, Germany.

### Other abbreviations

HT	Holotype
LT	Lectotype
PT	Paratype

## Results

### The identity and status of *Calarge* Enslin, 1911, and its type species

*Arge* Schrank, 1802: 226–230. Type species: *Tenthredo enodis* Linnaeus, 1767, by subsequent designation of Rohwer (1911).

*Calarge* Enslin, 1911: 664. Type species: *Calarge africana* Enslin, 1911, by original designation. **Syn. n.**

*Arge congrua* Konow, 1907b: 309. Described: female (holotype, MNCN; 1 paratype, NHRM). Type locality: Africa occ., Kamerun [Cameroon]. Images of holotype and labels, by A. Taeger: see <http://dx.doi.org/10.6084/m9.figshare.757716>.

*Calarge africana* Enslin, 1911: 665. Described: female (holotype, MFN). Type locality: Bipindi, Süd-Kamerun [Cameroon]. **Syn. n.**

Enslin (1911) erected *Calarge* for a single female specimen collected in Cameroon. His main reason for considering this different from *Arge*, was the lack of pre-apical spurs on the metatibiae. We examined the holotype of *C. africana*, and found that it has a small pre-apical spur on the right metatibia, and no spur on the left. Pasteels (1953) had already noted this discrepancy, and concluded [translated from French] “It is therefore not possible to characterise this genus, until further specimens should be found”. In fact, apart from the anomalous development of only a single metatibial spur, the specimen is indistinguishable from *Arge congrua*. Notably, the two nominal taxa share the same distinctively shaped valvulae 3: in dorsal view with a conspicuous, subtriangular median depression; in lateral view wedge-shaped (Pasteels 1953; figs 9a, b). We based our opinion on *A. congrua* on the female paratype, which is the same specimen studied by Pasteels (1953), and the images of the holotype by A. Taeger.

### The identity and status of *Clyparge* Pasteels, 1963, and its type species

*Scobina* Lepelletier & Serville, in Latreille et al., 1828: 574. Type species: *Hylotoma melanocephala* Lepelletier, 1823, by monotypy.

*Clyparge* Pasteels, 1963: 541–543. Type species: *Clyparge terminalis* Pasteels, 1963, by original designation. **Syn. n.**

*Scobina poecila* (Klug, 1834)

*Hylotoma poecila* Klug, 1834: 239. Described: male (holotype, MFN). Type locality: Mexiko [Mexico].

*Clyparge terminalis* Pasteels, 1963: 543–545. Described: female (holotype, MNCN; 1 paratype, MRAC), male (1 paratype, MNCN). Type locality: “Cameroun” (Cameroon). Images of holotype and labels, by A. Taeger: <http://dx.doi.org/10.6084/m9.figshare.775321>.

**Syn. n.** *Clyparge terminalis* Pasteels is a junior secondary homonym of *Scobina terminalis* (Klug, 1814).

The only species included in *Clyparge* is *C. terminalis* Pasteels, 1963, known just from the three specimens of the type series. The holotype is labelled “Kamerun 1898. 1899” (Taeger et al. 2014). The photographs made by A. Taeger made it possible to recognise *C. terminalis* as a *Scobina* species. Later, we examined the holotype of *C. terminalis*, which keys without problems in Smith (1992) to *S. poecila* (holotype examined). The sexual dimorphism described by Pasteels (1963) for *C. terminalis* exactly matches that described by Smith (1992) for *S. poecila*. This species is reliably known only from the Neotropical Region: Honduras, north into Mexico (Smith 1992). We suspect that the type material of *C. terminalis* may have been labelled with the wrong locality, as also the single known specimen of *S. afra* Pasteels, 1963, held by the same museum, and labelled in the same handwriting with the same locality name and nearly the same date (see below). We were informed by M. Paris (MNCN) that no details of the acquisition of these particular specimens can be traced in the museum’s records. A connection with the collector Leopold Conradt can be suspected, because he is known to have collected Hymenoptera, including sawflies, in Cameroon (Rohlfien 1975, Horn et al. 1990; but note that the latter work dates the Cameroon expedition to 1896, whereas contemporary publications and the specimen labels consistently give 1898–99), and many such specimens were acquired by the MNCN (M. Paris, personal communication). However, all specimens from Cameroon, leg. Conradt, in MNCN, as well as those in the SDEI, have a standard, printed label: see as an example image by A. Taeger <http://dx.doi.org/10.6084/m9.figshare.757716>. It is not clear who printed these labels. A large amount of material of various insect orders collected by Conradt in Venezuela, Cameroon and Togo was partly sold through the well-known firm of Staudinger (Horn et al. 1990), whereas further parts were received by Gustav Kraatz, founder of what is now the SDEI (Rohlfien 1975), and partly passed on to other individuals and institutions. Although the few characters on the hand-written labels of the type specimens in question do not provide an ideal basis for comparison, they seem not to be in the same hand as a letter in the SDEI archive, written by Conradt to Kraatz. If the four Pasteels’ type specimens really were collected by Conradt, then the complicated subsequent history of the material, which was perhaps at first largely unlabelled, would have increased the risk of a mistake in their labelling. Continuing to speculate that Conradt was the collector, then it is possible that they came from Venezuela, where he collected sometime before 1889 (Horn et al. 1990). Although L. Conradt did collect zoological specimens, including Hymenoptera, in Mexico (e.g. Milliron 1973), this was around 1910 (Beolens et al. 2011), several years after his visit to Cameroon, and as far as is known these specimens remained in collections in the New World. Mexico is therefore a less likely provenance. Of course, it cannot be excluded that both these species were introduced to Africa from the Neotropical Region, but did

not permanently establish themselves. *Sterictiphora afra*, if synonymous with *Sphacophilus monjarasi* (see below), is known to occur together with *Scobina poecila* in Chiapas Province, Mexico (Smith 1992). In view of the very imperfectly known ranges of many Neotropical sawflies, it is however easily possible that the range of *S. monjarasi* is much more extensive, and could extend to Guatemala. That the ranges of the two taxa overlap, offers little help in evaluating whether the Madrid types were obtained during the same collection event in Central America, or were introduced from there to Africa. In either case, because strong corroboratory evidence for their presence in the Afrotropical Region is lacking, we recommend that they should not be considered to currently occur there.

### The identity and status of *Sterictiphora afra*

#### *Sphacophilus afer* (Pasteels, 1963), comb. n.

*Sterictiphora* [sic] *afra* Pasteels, 1963: 540–541. Described: male (holotype, MNCN). Type locality: “Cameroun” (Cameroon). Images of holotype and labels by A. Taeger: <http://dx.doi.org/10.6084/m9.figshare.746940>.

**Notes.** *Sterictiphora afra* Pasteels, 1963 has been regarded as the only Afrotropical species of *Sterictiphora*, an otherwise Holarctic and Oriental genus. The holotype

(examined) is the only known specimen of the species. It is labelled “Kamerun 1898”, in the same handwriting as on the label attached to the type of *Clyparge terminalis* (Taeger et al. 2014): see under that name above. In the keys by Koch (1988) and Smith (1971, 1992), *S. afra* runs without problem to *Sphacophilus* Provancher, 1888. This genus contains about 50 valid species, distributed in the Neotropical and Nearctic Regions. Species taxonomy of *Sphacophilus* is based mainly on females, and males of many species are unknown, or the association of the sexes is problematic (Smith 1992). We were unable to identify the holotype of *S. afra* to species level, using the keys by Smith (1971, 1992) and reference to several original descriptions. However, the colour pattern of the *S. afra* holotype is distinctive within this genus. Apart from the recently described *S. monjarasi* Smith & Morales-Reyes, 2015 (Monjarás-Barrera et al. 2015), no other known species has this combination of completely black head and thorax, including the entire legs, and an almost completely yellow abdomen. *Sphacophilus monjarasi* is unfortunately only known in the female sex. Its type locality is in Chiapas Province, Mexico. In view of the lack of any other evidence for its presence in the Afrotropics, we recommend that *Sphacophilus afer*, simultaneously the only representative of the Sterictiphorinae there, should be removed from the list of Afrotropical sawflies.

### Key to genera of Afrotropical Argidae

- 1 Mesotibia and metatibia with preapical spine ..... 2
- Meta- and mesotibia without preapical spine ..... 3
- 2 Fore wing without crossvein 2r-m, and cells 1Rs and 2Rs fused, thus only three submarginal cells present, with the second very large; body usually entirely black..... *Triarge*
- Fore wing with crossvein 2r-m, and cells 1Rs and 2Rs present, thus four submarginal cells present, with the second not conspicuously larger; body usually bicoloured ..... *Arge*
- 3 Body and legs entirely black, with blue metallic lustre .. *Cibdela* [only *C. janthina* (Klug, 1834) is present in the Afrotropics, by deliberate introduction to Réunion]
- Body extensively pale, with or without blue metallic lustre on black parts, or if entirely black at least tibiae pale marked ..... 4
- 4 Interantennal area concave or plane, without interantennal carinae; fore wing with basal anal cell (1A) absent; especially in female head in dorsal view conspicuously narrow, about half as broad as thorax maximum width..... *Sjoestedtia*
- Interantennal area with two more or less conspicuously ridged interantennal carinae; fore wing with basal anal cell (1A) present; head in dorsal view not conspicuously narrow, about two thirds as broad as thorax maximum width... *Pampsilota*

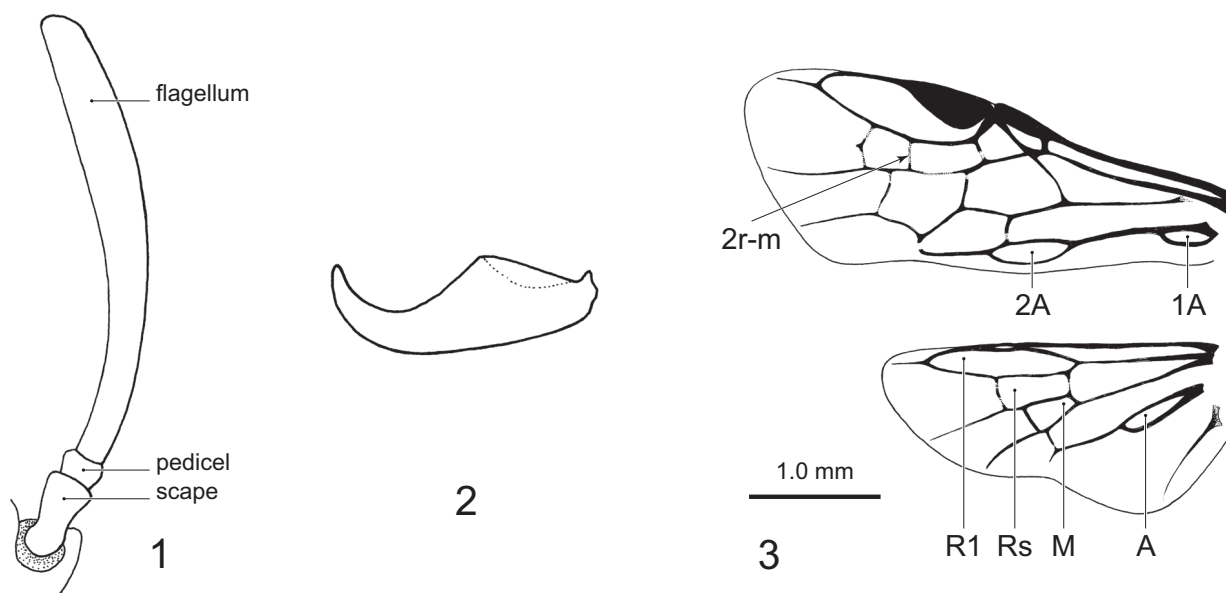
### Revision of Afrotropical *Pampsilota* Konow, 1899

*Pampsilota* Konow, 1899: 76. Type species: *Pampsilota afer* Konow, 1899, designated by Rohwer, 1911. Additional images: <http://www.waspweb.org/Tenthredinoidea/Argidae/Athermantinae/Pampsilota/index.htm>

**Description.** Antenna has three articles (Fig. 1); scape and pedicel short, flagellum very long and undivided. Clypeus not clearly separated by an epistomal suture from the supraclipeal area, malar space conspicuously

present. Meso- and metatibia without preapical spine; tarsal claws simple (Fig. 2). Fore wing with radial crossvein (2r) absent and crossvein 2r-m present, with basal anal cell (1A) closed, and anal cell (2A) long petiolate (Fig. 3); radial cell of hind wing (R1) closed, with anal cell (A) and two middle cells (Rs and M) present (Fig. 3). Tergum 1 with a more or less narrow and deep median split.

Coloration black with more or less blue metallic lustre, and yellowish or yellow-orange markings. Body length from 5.3 to 15.3 mm.



**Figures 1–3.** *Pampsilota* sp.: **1.** Antenna; **2.** tarsal claw; **3.** Fore wing (above), hind wing (below).

**Host plants.** *Lannea nigritana* (Anacardiaceae): only known for *P. dahomeyanus*.

**Remarks.** Taeger et al. (2010) catalogued three species of *Pampsilota* from the East Palaearctic and Oriental

Regions, as well as five valid species from the Afrotropical Region. Only the absence of the preapical spines on the meso- and metatibia distinguishes adults of *Pampsilota* from those of *Arge*.

**Key to Afrotropical *Pampsilota* species**

- 1 Abdomen entirely yellow or light brown (Figs 47–50, 64–67)..... 2
- Abdomen more or less bicoloured; yellow, orange and black, mostly with blue metallic lustre (Figs 38–46, 60–61, 68–71), or nearly entirely black (Figs 62–63)..... 4
- 2 Mesopleuron entirely yellow (Figs 48, 50, 65)..... 3
- Mesopleuron dorsally blackish (Fig. 67)..... *P. tsavoensis* sp. n.
- 3 Antenna partly yellow (Fig. 64); propleuron entirely yellow (Fig. 65), stigma conspicuously bicoloured, with basal half and anterior margin whitish, apical half blackish (Figs 64, 65)..... *P. nigeriae* sp. n.
- Antenna entirely black, propleuron dorsally and ventrally blackish margined, stigma unicoloured, black (Figs 47–50)..... *P. dahomeyanus* sp. n.
- 4 Fore legs black with at most small areas of tibia dark brown (Fig. 40); very large species, body length usually more than 10.0 mm..... *P. afer* Konow
- At least protibia light brown (Figs 42, 44, 46, 61, 63, 65); smaller species, body length rarely more than 10.0 mm ... 5
- 5 Thorax entirely black (Figs 60–63)..... 6
- At least lateral parts of pronotum pale (Figs 42–46, 64, 65)..... 7
- 6 All femora mostly black (Fig. 63)..... *P. luederitzensis* Koch
- Meso- and metafemur yellow (Fig. 61)..... *P. leleupi* Pasteels
- 7 Legs black without blue metallic lustre, only protibia light brown (Fig. 46)..... *P. brandbergensis* Koch
- Femora black with blue metallic lustre, tibiae predominantly yellow (Figs 44, 68) ..... 8
- 8 Costa and subcosta blackish (Figs 68–71); metatarsus entirely black (Figs 69, 71); serrulae (Figs 33, 34); penis valve (Fig. 35)..... *P. zebra* sp. n.
- Costa and anterior of subcosta yellow (Figs 41–44); at least basitarsomere of metatarsus yellow (Figs 42, 44); serrulae (Figs 11, 12); penis valve (Fig. 13)..... *P. africanus* (Mocsáry)

***Pampsilota afer* Konow, 1899**

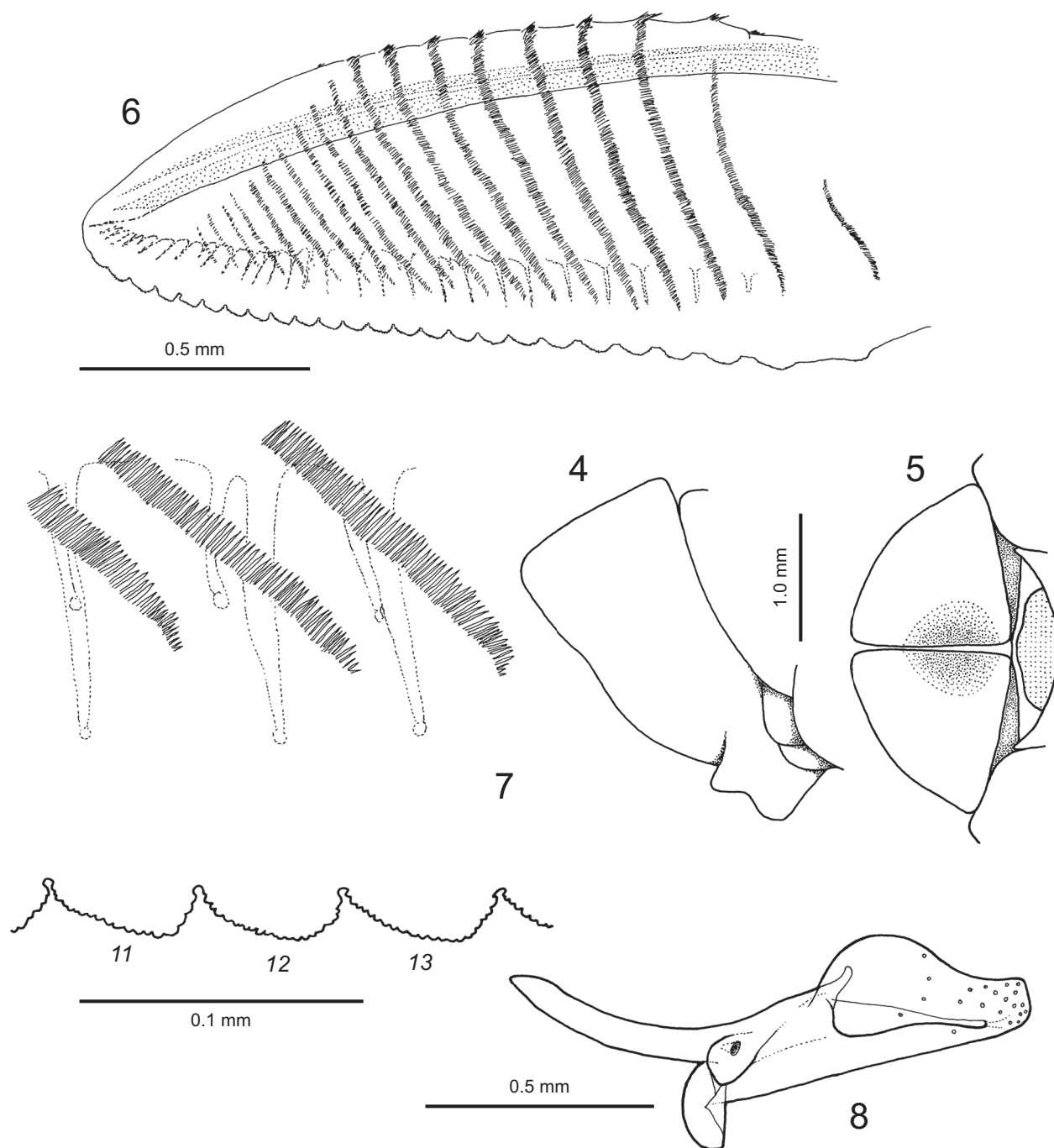
*Pampsilota afer* Konow, 1899: 76–77. Described: female [syntype females; lectotype designated below]. Type locality: Kamerun [Cameroon].

*Pampsilota afer* var. *maynéi* Forsius, 1928: 234. Described:

Female [holotype and paratype]. Type locality: Congo Belge [Democratic Republic of the Congo], Bena Bedi. Synonymy with *P. afer* by Pasteels (1953: 115–116).

**Female.** Figures 4–7, 38–40

Head, thorax and legs black with blue metallic lustre. Wings strongly infusate, intercostal area fuscous;



**Figures 4–8.** *Pampsilota afer*: **4.** Valvulae 3 (lateral aspect); **5.** Valvulae 3 (dorsal aspect); **6.** Lancelet; **7.** Serrulae 11–13; **8.** Penis valve (left, lateral aspect).

substigmal spot inconspicuous; stigma, costa, subcosta and rest of venation black. Abdomen black with blue metallic lustre; at least terga 9/10 and ovipositor sheath yellow-orange.

Head enlarged behind eyes. Antenna 1.6× as long as maximum head width; flagellum enlarged towards apex, quadrangular in cross section, interior surface with sharply compressed longitudinal carina, other longitudinal carinae conspicuously more weakly compressed. Interior margins of eyes parallel-sided. Anterior margin of the clypeus circularly emarginate, supraclypeal

area gently rounded and protruding up to ventral limit of interantennal carinae. Interantennal carinae obtusely ridged, strongly converging below, extending to the level of ventral margin of torulus. Frons, supraclypeal area and clypeus rugosely sculptured or densely punctate, weakly shiny, vertex and gena sparsely micropunctate, shiny; pubescence light brown. Metatibia distally conspicuously laterally compressed. Mesoscutum nearly impunctate, shiny; pubescence similar to that on head. Abdomen smooth and shiny. Valvulae 3: Figs 4, 5. Lancelet with about 24–25 serrulae: Figs 6, 7.

Length: 10.5–15.3 mm.

**Male.** Figure 8

Similarly coloured to female, only tergum 8 and sternum 6–9 yellow-orange. Head very slightly narrowed behind eyes. Antenna 1.8× as long as maximum head width; flagellum not enlarged towards apex, quadrangular in cross section, flattened apically, interior surface with sharply compressed longitudinal carina, other longitudinal carinae more weakly compressed. Supraclypeal area scarcely protruding up to base of interantennal carinae. Interantennal carinae extending about one quarter of way to clypeus. Other characters as for female. Penis valve: Fig. 8.

Length: 10.3 mm.

**Type material examined.** *Pampsilota afer*: Lectotype, hereby designated: ♀. Labels: “Type” (red); “Kamerun”; “Coll. Konow”; “Coll. DEI, Eberswalde”, “*Pampsilota afer* Knw., Kamerun”; “GBIF-GISHym, 2869”; “Lectotypus, *Pampsilota afer* Konow ♀, des.: F. Koch, 2016” (red) (SDEI). Paralectotype: 1 ♀. “Sierra Leone”, “Coll. Konow”, “Coll. DEI, Eberswalde”, “GBIF –GISHym, 2870” (SDEI).

*Pampsilota afer* var. *maynéi*: Paratype: 1 ♀. Democratic Republic of the Congo: Bena Bedi, V.[19]15, R. Mayné (UZMT).

**Other material examined.** 1 ♂, 7 ♀♀. Democratic Republic of the Congo: Luluabourg, P. Janssens (1 ♀) (RBINS); Sankuru, Komi, III.1930, J. Ghesquière (1 ♀); Eala, III.1936, J. Ghesquière (1 ♀) (MRAC); Kabwe, Luluabourg, 1937, R. R. Soeurs du Carmel (1 ♂) (MRAC); Fulubwe, sur herbes viv., E[ilisebeth]’ Ville, 27.XII.[19]55 (1 ♀) (MRAC). Equatorial Guinea: Fernando-Po, 1901, L. Conradt (1 ♀) (MNCN); Makom, Alcu., Benitogbt., 16.–31.XII.[19]06, G. Tessmann (1 ♀) (MFN); Uelleburg, VI.–VIII.1908, G. Tessmann (1 ♀) (ZSM).

**Distribution.** Cameroon, Equatorial Guinea, Democratic Republic of the Congo, Sierra Leone (Fig. 36).

**Diagnosis.** By its large size and distinctive coloration (infusate wings; black body and legs, with only abdomen apically pale), *P. afer* is easily distinguished from all other *Pampsilota* species.

**Remarks.** The coloration of the abdomen varies from the described typical (darker) form to the apical half of the abdomen yellow-orange with terga 5/6 medially more or less black. In these pale specimens sternum 2–4 are basally yellow-orange. This form with a more or less entirely yellow-orange apical half of abdomen was described under the name *Pampsilota afer* var. *maynéi* Forsius, 1928. Other morphological differences to the nominate form are not detectable. The holotype (MRAC) of *Pampsilota afer* var. *maynéi* was not examined, but the paratype seems to have been collected on the same date and at the same place as the holotype, and there is no reason to doubt that the specimens are conspecific.

Pasteels (1953) first described the male of *P. afer* and misleadingly referred to the specimen as the allotype (MRAC).

***Pampsilota africanus* (Mocsáry, 1909)**

*Cipdele* [sic!] *africana* Mocsáry, 1909: 6. Described: female [unknown number of syntypes]. Type locality: Kilima-Ndjaru [Kilimanjaro, Tanzania].

*Pampsilota africanus*: Enslin 1913: 322–323.

*Pampsilota africanus* var. *interruptus* Forsius, 1928: 234–235. Described: female [holotype]. Type locality: Tanganyika [Tanzania], Tabora-Kigoma. Synonymy with *C. africana* by Pasteels 1955: 340.

*Cipdele africana* var. *interrupta*: Pasteels 1953: 119–120.

**Female.** Figures 9–12, 41–42

Head and thorax black with metallic lustre. Pronotum yellow with anterior margin and medial area black. Legs black with blue metallic lustre; pro- and mesotibiae entirely yellow, metatibia yellow with narrow blackish apex, basitarsomeres yellow with apex of meso- and metabasitarsomere blackish. Wings including intercostal area flavescent-hyaline; substigmal spot small and fuscous; stigma black; costa and subcosta yellowish; rest of venation blackish. Abdomen yellow-orange; terga 1–6(7) broadly black with blue metallic lustre; terga 8/9 entirely black, sternum 5–7 more or less black; valvifers 2 of ovipositor sheath black.

Head very slightly enlarged behind eyes. Antenna 1.4× as long as maximum head width; flagellum enlarged towards apex, quadrangular in cross section, interior surface with sharply compressed longitudinal carina, other longitudinal carinae conspicuously weaker compressed. Eyes slightly converging towards clypeus. Anterior margin of the clypeus broadly, shallowly, circularly emarginate. Supraclypeal area gently rounded, protruding up to ventral limit of interantennal carinae. Interantennal carinae obtusely ridged, converging below, extending to about the level of ventral margin of torulus. Frons, vertex, supraclypeal area and clypeus densely punctate, dull. Postocellar area and gena moderately densely micropunctate, shiny; pubescence whitish. Metatibia not distally laterally compressed (nearly circular in cross section). Mesoscutum punctation similar to gena, shiny; pubescence similar to that on head. Abdomen smooth and shiny. Valvulae 3: Figs 9, 10. Lancet with about 17–18 serrulae: Figs 11, 12.

Length: 8.0–8.7 mm.

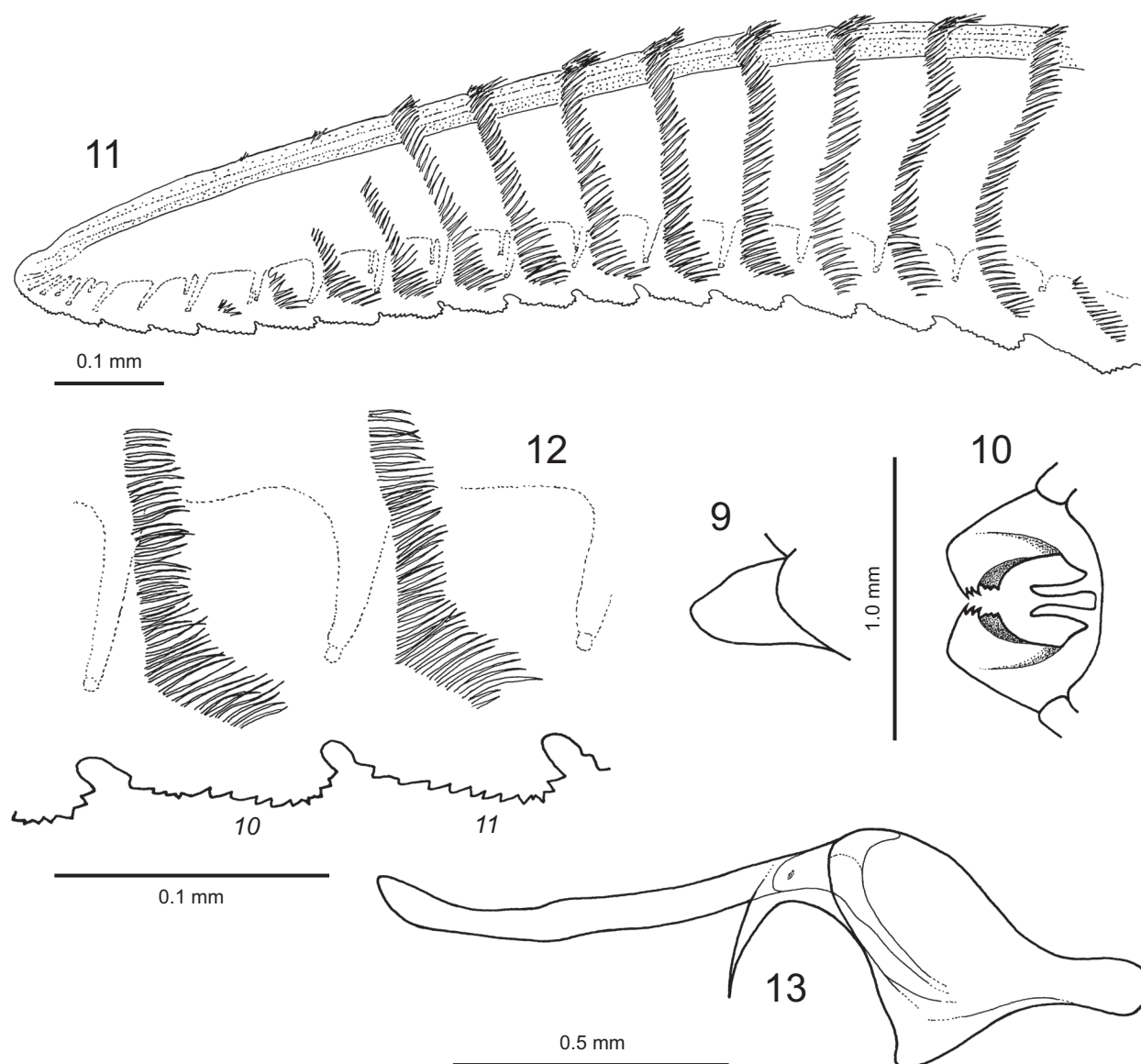
**Male.** Figures 13, 43–44

Similarly coloured to female, except narrow posterior margin of tergum 9 yellow, and tibiae entirely yellow.

Antenna 1.7× as long as maximum head width; flagellum not enlarged towards apex, about oval in cross section, interior surface with sharply compressed longitudinal carina, outer carina conspicuously more weakly compressed, other carinae negligible. Supraclypeal area gently rising up to ventral limit of interantennal carinae. Other characters as for female. Penis valve: Fig. 13.

Length: 7.3–8.3 mm.

**Type material examined.** *Cipdele africana*: Lectotype, hereby designated: ♀. Labels: “Kilimandjaro [Kilimanjaro], Bornemissza [Tanzania]”; “Africa, or.,



**Figures 9–13.** *Pampsilota africanus*: **9.** Valvulae 3 (lateral aspect); **10.** Valvulae 3 (dorsal aspect); **11.** Lancet; **12.** Serrulae 10–11; **13.** Penis valve (left, lateral aspect).

Arusha-Ju, 1906, Katona”; “Lectotype *Cipdele africana* Mocsáry, 1909 designated A. Liston 2015” (red); “GBIF GISHym 21276” (HNHM). Paralectotype: 1 ♀. Tanzania: same data as lectotype (HNHM).

*Pampsilota africanus* var. *interruptus*: Holotype: ♀. Labels: “E[ast] Tanganyika: Tabora-Kigoma, Lt. Stampfer”; “*Pampsilota africanus* Mocs. var. *interruptus* n. ♀, type, R. Forsius det.”; “R. Dét. M, 1477”; “Type ♀” (red); “*Pampsilota africana* Mocs. (= *P. africana* M. var. *interrupta* Fors.)”; “DEI-GISHym. 21245”; “Holotypus, *Pampsilota africanus* var. *interruptus* Forsius ♀, teste: F. Koch, 2016” (red); “*Pampsilota africanus* (Mocsáry) ♀, det.: F. Koch, 2016” (MRAC).

**Other material examined.** 13 ♂♂, 17 ♀♀. Kenya: Stony Athi, Biol[ogical] Survey 5-40 (1♀) (NMKE); Eastern Katutu, Kihtioko, 27.XI.1999, M. Snižek

(5♂♂, 2♀♀); Taita, Mwatate, 30.XI.1997, M. Snižek (3♂♂, 8♀♀); 50km Namanga, Ilbibil env., 18.XI.1997, M. Snižek (1♀). Tanzania: (NE), W of Kiberashi, Kitwei plain, 16.III.2002, M. Snižek (5♂♂, 5♀♀) (MFN, OLML, SDEI, USNM).

**Distribution.** Tanzania, Kenya (Fig. 36).

**Diagnosis.** *Pampsilota africanus* resembles *P. zebra* in having pincer-shaped valvulae 3 (compact or diverging in all other species), metatibia distally nearly circular in cross section, and in the main colour characters (thorax black except for pronotum and sometimes tegulae, legs partly pale, and abdomen at least ventrally partly pale). *P. africanus* has a yellow costa and anterior of subcosta, whereas in *P. zebra* costa and subcosta are black. The tegulae of *P. africanus* are sometimes bicoloured, but in *P. zebra* always black. The hind tibia of *P. africanus* is nearly unicolorous



pale, and in *P. zebra* broadly ringed apically with blackish. The serrulae of these species are very differently shaped (Figs 12, 34), but their penis valves are quite similar (Figs 13, 35).

**Remarks.** *Pampsilota africanus* varies especially in the coloration of the abdomen. Sometimes the black on terga 2/3 is reduced to a small median spot, or as in *P. africanus* var. *interruptus* terga 2–4 are entirely yellow. No other morphological differences exist between the nominate form and var. *interruptus*, and their synonymy by Pasteels (1955) was justified.

### *Pampsilota brandbergensis* Koch, 2006

*Pampsilota brandbergensis* Koch, 2006a: 120. Described: male [holotype and paratype]. Type locality: Brandberg Massif, Namibia.

**Male.** Figures 14, 45–46

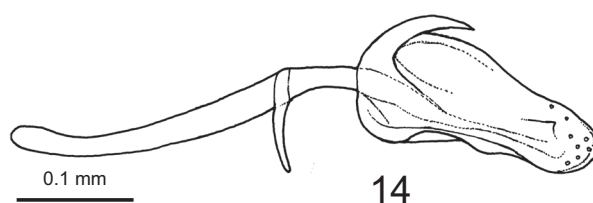
Head black; flagellum dark brown. Thorax black; pronotum and tegula yellow. Legs black; anterior surface of protibia brownish yellow, posterior surface brown. Wings subhyaline including intercostal area; substigmal spot very small and slightly infuscate, costa and stigma light brown, subcosta and rest of venation brown. Dorsal surface of abdomen black with very slight metallic lustre; terga 3–5 yellow, tergum 5 medio-apically blackish spotted, terga 2/6 yellow laterally, sterna 3–6 yellow, sometimes with blackish markings medio-apically, sternum 9 with yellow apical half.

Head narrowed behind eyes. Antenna 2.0× as long as maximum head width; flagellum scarcely enlarged towards apex, triangular in cross section, somewhat flattened apically, interior surface with sharply compressed longitudinal carina, other longitudinal carinae more weakly compressed. Eyes slightly converging towards clypeus. Anterior margin of the clypeus shallowly circularly emarginate, supraclypeal area flatly rising up to base of interantennal carinae, interantennal carinae sharply ridged, scarcely converging below, extending about one third of way to clypeus. Vertex, frons and clypeus impunctate, shiny; gena with micropunctures, shiny; pubescence whitish. Mesoscutum nearly impunctate, shiny; pubescence similar to that on head. Abdomen shiny; terga 1–3 with irregular microsculpture, posterior margin of tergum 8 with large triangular membranous median depression. Penis valve: Fig. 14.

Length: 5.5–6.0 mm.

**Female.** Unknown.

**Type material examined.** Holotype: ♂. Labels: “Namibia, Brandberg, Mason Shelter, 21°04'39''S/14°05'43''E, 05.–14.III.2002, Malaise trap, river bed, A. H. Kirk-Spriggs & E. Marais”; “Holotypus, *Pampsilota brandbergensis* sp. n. ♂, det.: F. Koch, 2005” [red] (NNIC). Paratype: ♂: same data as holotype, except: below Wasserfläche, 21°10'43''S/14°32'51''E,



**Figure 14.** *Pampsilota brandbergensis*: Penis valve (left, lateral aspect).

18.–22.III.2001, Malaise trap, A. H. Kirk-Spriggs & E. Marais (MFN).

**Distribution.** Namibia (Fig. 36).

**Diagnosis.** Together with *P. luederitzensis*, also from southwest Africa, *P. brandbergensis* differs from other *Pampsilota* in its body length of maximally 6.0 mm (other species at least 7.0 mm long). The yellow pronotum and entirely black legs of *P. brandbergensis* distinguish it immediately from *P. luederitzensis*, with dark pronotum and largely pale tibia.

**Remarks.** Variability in colour pattern is scarcely noticeable in the two known specimens, except that tergum 5 as well as sterna 3–5 may be entirely yellow, and the pronotum may have a small ventro-lateral blackish spot.

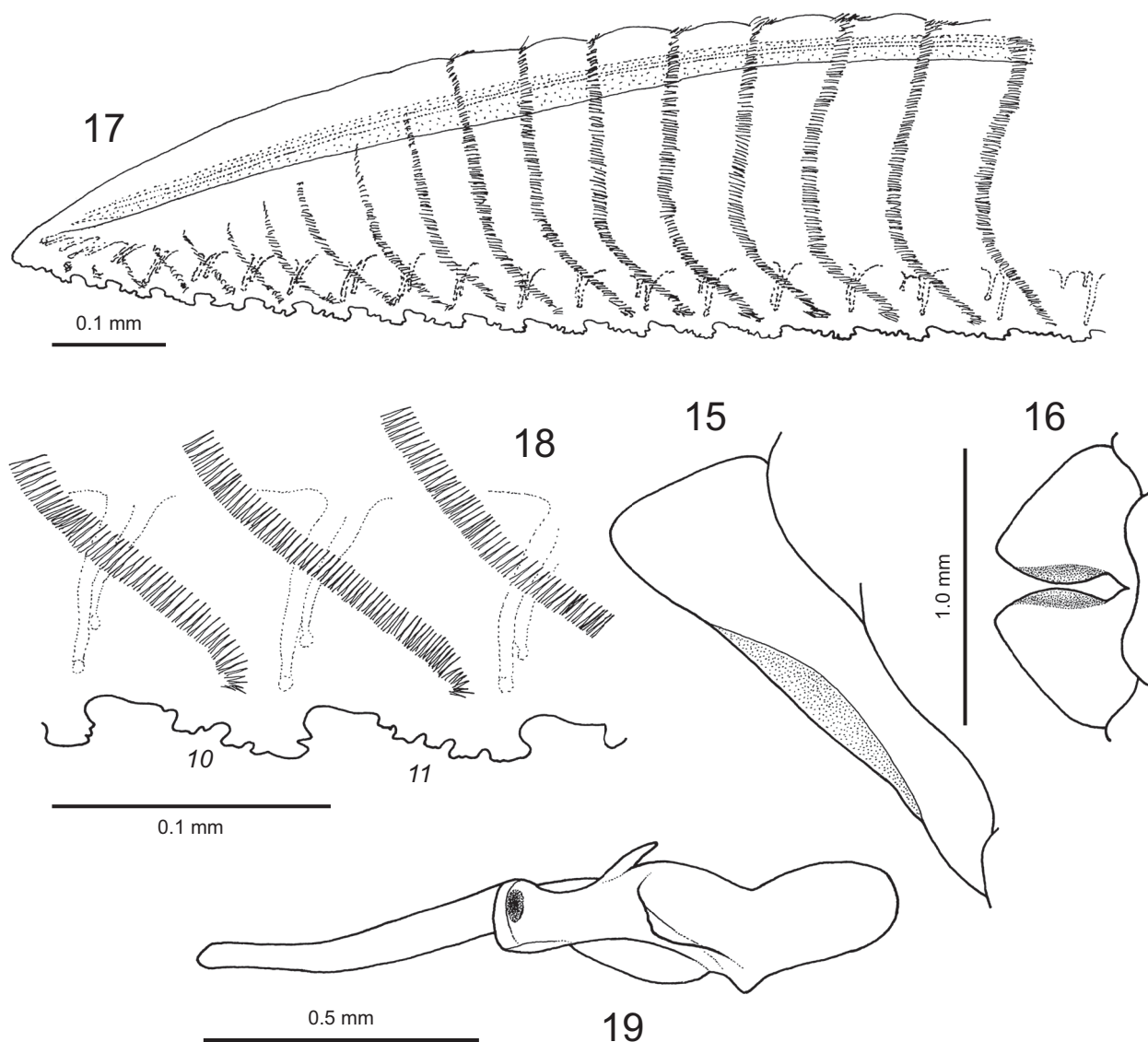
### *Pampsilota dahomeyanus* Goergen, Koch & Liston, sp. n.

<http://zoobank.org/74BDE11B-8CA9-4566-8E73-9FEE395BD4BA>

**Female.** Figures 15–18, 47–48

Head black; labrum yellow. Thorax yellow with following black: mesoscutum except for a small lateral spot on lateral lobe adjacent to tegula; mesoscutellum and metanotum; dorsal and ventral margin of propleuron. Legs yellow; mesotibia very narrowly and metatibia broadly ringed blackish apically; mesotarsomeres with black apex, metatarsomeres black, with basal half of metabasitarsomere yellow. Wings bicoloured: basal half flavescent, apical half and intercostal area infuscate; substigmal spot fuscous and small; stigma, subcosta and venation in apical half black; costa and venation in basal half yellowish. Abdomen yellow.

Head parallel-sided behind eyes. Antenna 1.4× as long as maximum head width; flagellum enlarged towards apex, quadrangular in cross section, interior surface with sharply compressed longitudinal carina, other longitudinal carinae more weakly compressed. Eyes slightly converging towards clypeus. Anterior margin of the clypeus with shallow circular emargination, supraclypeal area slightly rounded, protruding up to base of interantennal carinae, interantennal carinae obtusely ridged, very slightly converging below, extending about to the level of ventral margin of torulus. Frons, supraclypeal area and clypeus moderately densely punctate, shiny; vertex and gena scattered micropunctate, shiny; pubescence yellowish. Anterior half of mesoscutum densely punctate, weakly shiny; posterior half nearly impunctate, shiny; pubescence similar to that



**Figures 15–19.** *Pampsilota dahomeyanus*: **15.** Valvulae 3 (lateral aspect); **16.** Valvulae 3 (dorsal aspect); **17.** Lancelet; **18.** Serrulae 10–11; **19.** Penis valve (left, lateral aspect).

on head. Abdomen smooth and shiny. Valvulae 3: Figs 15, 16. Lancelet with about 19–20 serrulae: Figs 17, 18.

Length: 7.8–9.0 mm.

**Male.** Figures 19, 49–50

Coloration similar to female except for a more or less large yellowish patch on clypeus and supraclypeal area. Sometimes mesoscutellum yellow only medially and on posterior half. Mesotibia entirely, mesotarsus nearly entirely yellow; metatarsomeres black ringed apically. Wings slightly infuscate throughout; stigma, subcosta and venation blackish, only costa yellowish.

Head slightly narrowed behind eyes. Antenna 1.9× as long as maximum head width; flagellum scarcely enlarged towards apex, scarcely flattened apically, slightly triangular in cross section; interior surface with sharply compressed longitudinal carina, other longitudinal carinae much more weakly compressed. Other characters as for female. Penis valve: Fig. 19.

Length: 7.3–7.7 mm.

**Type material.** Holotype: ♀. Labels: “Benin, Cotonou, on *Lannea nigritana*, 3.X.2014, leg.: G. Goergen”; “Holotype, *Pampsilota dahomeyanus* n. sp. ♀, det.: F. Koch, 2016” [red] (MFN). Paratypes [all from Benin, leg. G. Goergen]: 20 ♂♂; 4 ♀♀: same data as holotype (MFN, SDEI, USNM). 2 ♂♂; 1 ♀♀: Pobè-Forest, 6°57′46.7″N 2°40′26.7″E, on *Lannea nigritana*, 26.08.2016 (MFN). 2 ♀♀: Bohicon, 7°11′29.7″N 2°04′08.3″E, on *L. nigritana*, 07.2014 (MFN, SDEI). 2 ♂♂: Pahou, forest area, 05.07.2010 (MFN). 3 ♂♂, data as preceding, except 11.2014, on *L. nigritana* (MFN). 1 ♂ Womè, 11.2014 (MFN). 11 ♂♂; 9 ♀♀: Calavi IITA, ex larvae collected from and reared on *Lannea nigritana*, 11.2014, (IITAC). 14 ♂♂: Cotonou, 6°22′59.4″N 2°13′32.0″E, on *Lannea nigritana*, 05.10.2010 (IITAC). 3 ♂♂; 3 ♀♀: Cotonou, on *Lannea nigritana*, 05.10.2014 (IITAC).

**Larva.** Figures 51–55.

Individuals of two instars were examined in detail: GBIF GISHym 21229, total length 13mm, head capsule width 1.4mm; GBIF GISHym 21236, total length 6mm, head capsule width 0.9mm. Mature larvae reach a length of about 25 mm. All examined instars extremely similar in coloration except that the abdominal prolegs are pale in later instars (Fig. 51), and blackish in younger larvae (Fig. 52). The trunk is mainly green (Fig. 53). They possess the ground-plan characters of Argidae as given by Lorenz and Kraus (1957): one antennomere, abdominal segments 2–9 with 3 dorsal annulets, and tarsus of thoracic legs (Fig. 54) with large empodium.

Head with frons mainly dark, and extensive partly confluent black patches on parietal region and vertex (Figs 51, 55). Mandible with 2 setae. Maxillary palp with 6 setae on outer surface. Clypeus with 2 setae. Anterior edge of labrum with fringe of about 12 setae directed in same plane as labrum; two longer setae arise near the centre and are directed outwards. Frons with about 35 short setae, mostly shorter than diameter of antennomere. Rest of upper head moderately setose; setae mostly shorter than diameter of antennomere. All setae fine and pale. Labrum without central groove.

Thoracic legs with six articles (Fig. 54). Claw with strongly developed basal lobe. Coxa and trochanter black; distal articles brown. Cervical sclerite black. Thoracic subspiracular and surpedal lobes strongly projecting; black, including setae. Spiracular area of prothorax with three black markings.

Entire surface of trunk with numerous very short, fine, pale setae. On dark-pigmented areas of thorax and abdominal segments 1, 2 and 10, setae are darker and longer. All three dorsal annulets of meso- and metathorax and abdominal segments 1–2 with row of small, dark-pigmented glandubae (Fig. 52). Prothorax with fewer small glandubae, but paired medial black markings larger than on other segments (Fig. 52). Pigmentation of glandubae on abdominal segment 2 paler than on more anterior parts of dorsum. Pigmentation, size of glandubae on the abdominal dorsum and length of their setae diminish progressively towards the posterior (Fig. 52). Subspiracular lobe on abdominal segments 1–3(4) more or less marked with black, extent of black decreasing from segment to segment towards posterior.

Abdomen strongly tapering caudally, ventral surface appearing flat in live specimens. Prolegs very small; developed on abdominal segments 2–6 and 10 (Figs 51, 52), with numerous setae on exterior and interior surfaces; on segments 7–9 a minute scar-like vestige probably homologous with a proleg. Suranal lobe, dorsal and ventral surfaces of subanal lobe extensively black (Fig. 52). Posterior surface of anal prolegs dark-marked. Caudal edge of suranal lobe rounded (Fig. 51). Subanal lobe projecting beyond suranal lobe (Fig. 52). Setae on dorsal surface of subanal lobe particularly long and dense.

**Prepupa and pupa.** The trunk of the prepupa (Fig. 58) is darker than the larva, the head paler (mostly brown). The pattern of dark thoracic markings is retained. The

pupa (Fig. 59) is at first pale, darkening progressively as it nears eclosion.

**Host plant.** Larvae were found and reared by G. Goergen at the IITAC on *Lannea nigritana* (Scott-Elliot) Keay (Anacardiaceae), a small (height 3–6 m), deciduous, heliophilous tree species occurring from Senegal to Gabon, West and Central Africa.

**Natural history.** Flight period: June to December, peaking in July and October especially shortly after the annual flushing of individual trees of *Lannea nigritana*. During peak periods numerous adult sawflies were observed on the host plant. In early October 2014 host trees at the type locality were severely defoliated by *P. dahomeyanus*, and large numbers of larvae of all instars were found together with adults. Oviposition is generally on older leaves, with 1–3 eggs laid singly in slits cut into the leaf-blade, next to the midrib, at the base of a leaflet (Fig. 56). The female sits on the upperside of the leaf during oviposition. Larvae are gregarious (Fig. 53): a group of larvae occupies a whole compound leaf and feeds on plant tissues of all ages. As they mature, larvae turn from dull green to pale yellow. In the laboratory, maturation of the 33 larvae reared from field-collected eggs took about 12 days. When fully grown, the larvae drop onto the soil to spin cocoons. About half of the cohort reared in October 2014 made cocoons, sometimes stuck together, in the leaf litter near the soil surface. Cocoons of the remaining larvae were found at about 5 cm below the soil surface. The cocoon is elongate-oval, about 9 mm long, double-walled, with sand grains attached to the outside (Fig. 57). The outer wall is irregularly netted, the inner wall parchment-like separated from the first by a loose layer of silk strands. Whereas eclosion of the individuals which made cocoons above ground occurred already between 20–27 October 2014, i.e. 7–14 days after making their cocoons, adults emerged from cocoons made in the ground in the period 8–25 June of the following year, i.e. 207–224 days after entering the ground. In both instances, there was no obvious pattern in the emergence of male and female sawflies. It is concluded that *P. dahomeyanus* has a multivoltine life cycle with polymodal adult emergence. Parasitism: during larval peak periods imagines of an unidentified *Boethus* species (Hymenoptera, Ichneumonidae, Tryphoninae) were observed attaching eggs externally to the surface of the larvae. Members of the genus are known as koinobiont parasitoids of Argidae larvae. This is the first record of *Boethus* from West Africa.

**Etymology.** The new species name, a Latinised adjective, refers to the historical West African kingdom of Dahomey, the later Republic of Benin, in which the type locality is situated.

**Distribution.** Benin (Fig. 36).

**Diagnosis.** *Pampsilota dahomeyanus* adults resemble those of *P. nigeriae* and *P. tsavoensis* in the nearly entirely yellow colour of the abdomen and thorax underside. *Pampsilota nigeriae* is separated from *P. dahomeyanus* by its predominantly light brown to yellow antenna, entirely yellow propleuron, bicoloured stigma, and very

different penis valve (Fig. 26). *Pampsilota tsavoensis* differs from *P. dahomeyanus* in the blackish dorsal part of its mesepisternum, the shape of the serrulae (Figs 29, 30), and in the shape of the valvulae 3: conspicuously divergent in dorsal view, with distinct denticles on the interior surface (Fig. 28), whereas in *P. dahomeyanus* the ovipositor sheath is more compact, with the valvulae 3 not diverging distally, and without denticles (Fig. 16). The similarly coloured *P. nigeriae*, of which only a single male is known, differs from both species in the predominantly yellow antenna and the bicoloured stigma, and from *P. dahomeyanus* especially in the shape of the penis valve (Fig. 26).

**Remarks.** Especially males of *P. dahomeyanus* are highly variable in coloration. Four specimens have an entirely black mesonotum, metascutellum, black tegula, blackish markings on the pronotum and tergum 1, and terga (5)6–8 nearly entirely black. However, no accompanying differences in the shape of the penis valve were detected. Sometimes, in both sexes, the clypeus and the supraclypeal area are marked with dirty yellow. In the material studied, one male was found to have a very small subapical spine on one metatibia. We interpret this as a rare reversion to what may be the plesiomorphic character state.

General morphology of the larva is very similar to the Arginae species described by Lorenz and Kraus (1957; in that work represented only by larvae of *Arge*), and Smith (1989). Compared to Sterictiphorinae, *P. dahomeyanus* larvae share characters of *Arge*: thoracic leg with six articles (at most 5 in Sterictiphorinae), abdominal postspiracular lobes without raised or subcutaneous glands (present in Sterictiphorinae), subanal lobe without pseudocerci (present in Sterictiphorinae). There is no detailed published description of an Afrotropical argid larva with which to compare *P. dahomeyanus*.

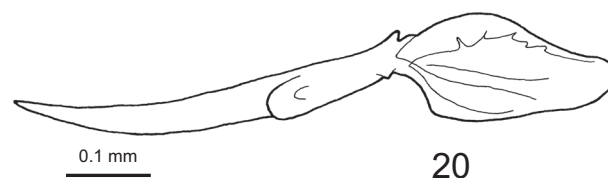
### *Pampsilota leleupi* Pasteels, 1953

*Pampsilota leleupi* Pasteels, 1953: 116–117. Described: male [holotype]. Type locality: Territoire de Sandoa, Kawanga, Congo belge [Democratic Republic of the Congo].

**Male.** Figures 20, 60–61

Head black with blue metallic lustre; antenna black. Thorax black with blue metallic lustre, except for yellow metapleuron. Legs dirty yellow to light brown with following black with more or less blue metallic lustre: coxae, trochanters, profemur, extreme apex of meso- and metatibia, protarsus, more or less distal tarsomeres of meso- and metatarsus. Wings strongly infuscate; intercostal area and small substigmal spot fuscous, stigma, costa, subcosta and rest of venation black. Abdomen yellow; terga 1/2 nearly entirely black, tergum 3 broadly black, tergum 4 blackish spotted medially.

Head very slightly enlarged behind eyes. Antenna 1.6× as long as maximum head width; flagellum not enlarged



**Figure 20.** *Pampsilota leleupi*: Penis valve (left, lateral aspect).

towards apex, triangular in cross section, scarcely flattened apically, interior surface with sharply compressed longitudinal carina, other longitudinal carinae weakly compressed. Eyes slightly converging towards clypeus. Anterior margin of the clypeus shallowly circularly emarginate, supraclypeal area scarcely protruding up to ventral limit of interantennal carinae, interantennal carinae sharply ridged, conspicuously converging below, extending about one quarter of way to clypeus. Frons, supraclypeal area and clypeus moderately densely micropunctate, shiny, vertex and gena sparsely micropunctate, shiny; pubescence brownish. Mesoscutum sparsely micropunctate, shiny; pubescence similar to that on head. Abdomen irregularly microsculptured, with conspicuous dense pubescence. Penis valve: Fig. 20.

Length: 9.7 mm.

**Female.** Unknown.

**Type material examined.** Holotype: ♂. Labels: “Coll. Mus. Congo., Territ[oire] de Sandoa, Gal[erie] forest[ière] Kawanga, 20.XI.1948, N. Leleup”; “*Cipdela Leleupi* n. sp. ♂, J. Pasteels det. 1952”; “Holotype” (red); “Genit. ♂, H4-47”; “R. Det., 5967”; “DEI-GISHym 21244”; “Holotypus” (red); “Holotypus, *Pampsilota leleupi* Pasteels ♂, teste: F. Koch, 2016” (red); “*Pampsilota leleupi* Pasteels ♂, det.: F. Koch, 2016” (MRAC).

**Distribution.** Democratic Republic of the Congo (Fig. 37).

**Diagnosis.** *P. leleupi* resembles *P. afer* in its large body size, thorax without pale markings, and abdomen at least partly pale, but *P. leleupi* is easily recognised by its extensively pale legs (largely black in *P. afer*).

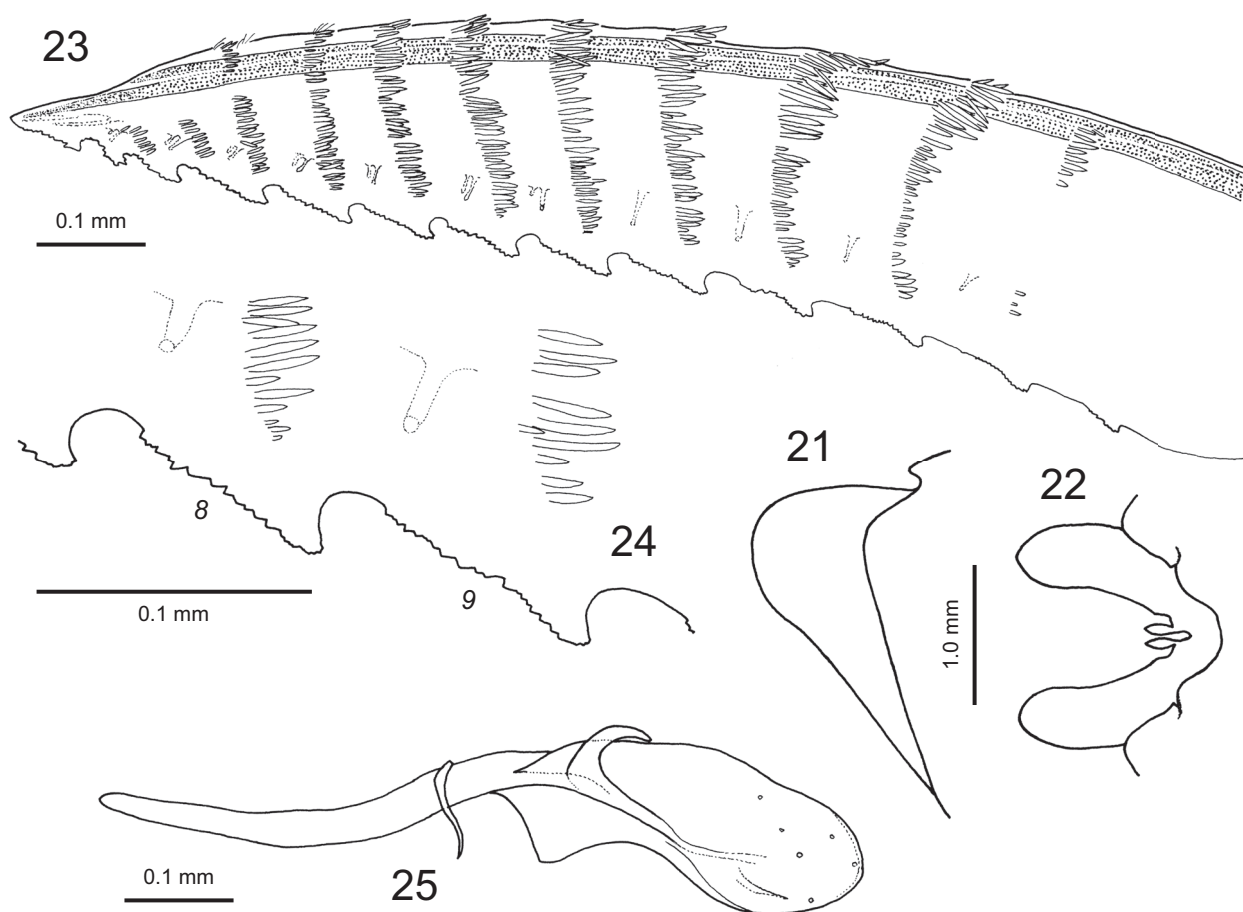
**Remarks.** The genitalia preparation mentioned above (“Genit. ♂, H4-47”) was not available (personal communication from Stephane Hanot, collection manager at MRAC, 26.02.2015). The illustration of the penis valve is therefore taken from Pasteels (1953).

### *Pampsilota luederitzensis* Koch, 2006

*Pampsilota luederitzensis* Koch, 2006b: 224. Described: female [holotype], male [1 paratype]. Type locality: Namibia, Lüderitz, Scorpion Hill.

**Female.** Figures 21–24

Head black, including antenna. Thorax black. Legs black; tibiae whitish, apically slightly brownish, tarsi brownish. Wings hyaline with intercostal area slightly flavescens-hyaline; substigmal spot very small and slightly



**Figures 21–25.** *Pampsilota luederitzensis*: 21. Valvulae 3 (lateral aspect); 22. Valvulae 3 (dorsal aspect); 23. Lancet; 24. Serrulae 8–9; 25. Penis valve (left, lateral aspect).

infusate; costa light brown with basal half white, stigma, subcosta and rest of venation light brown. Abdomen yellowish brown; terga 1,2 black, terga 3–5 with small light brown median spot, tergum 5 additionally with light brown posterior margin, terga 6/7 brown; ventral surface of abdomen brown with yellow longitudinal median stripe.

Head parallel-sided behind eyes. Antenna 1.6× as long as maximum head width; flagellum scarcely enlarged towards apex, quadrangular in cross section, somewhat flattened towards apex, ventral surface with moderately compressed longitudinal carina, other longitudinal carinae more weakly compressed. Eyes slightly converging towards clypeus. Anterior margin of clypeus shallowly, circularly emarginated; supraclypeal area roundly protruding up to ventral limit of interantennal carinae; interantennal carinae sharply ridged between antennae, converging below, extending about one third of way to clypeus. Vertex, frons, gena, clypeus and supraclypeal area sparsely micropunctate, shiny; pubescence whitish. Mesoscutum nearly impunctate, shiny; pubescence similar to that on head; lateral lobe of mesoscutum with narrow glabrous stripe. Valvulae 3: Figs 21, 22. Lancet with about 13 serrulae: Figs 23, 24.

Length: 6.0 mm.

**Male.** Figures 25, 62–63

General coloration similar to that of female. Head and mesoscutum with slight metallic lustre; anterior margin of labrum brownish. Tarsi light brown. Costa almost entirely whitish. Abdomen blackish, tergum 3 yellowish with light brown median spot, terga 4/7 light brown, distal terga yellow; sterna 7/9 yellow.

Antenna 1.7× as long as maximum head width; apex of flagellum flattened, interior surface with sharply compressed longitudinal carina. Other characters as for female. Penis valve: Fig. 25.

Length: 5.3 mm.

**Type material examined.** Holotype: ♀. Labels: “Namibia, Lüderitz, Scorpion Hill, 27°49’S/16°36’E, 09.–12. VIII.1997, Malaise trap, Marais’s & Kirk-Spriggs”; “Holotypus, *Pampsilota luederitzensis* sp. n. ♀, det.: F. Koch, 2005” (red) (NNIC).

Paratype: 1 ♂: Namibia: Lüderitz Distr[ict], 10 km NW Rosh Pinah, 27°54’S/16°42’E, 13.VIII.1990, C. Roberts & E. Marais (MFN).

**Distribution.** Namibia (Fig. 37).

**Diagnosis.** *Pampsilota luederitzensis* resembles *P. brandbergensis* in the body length not exceeding 6.0 mm (in other species at least 7.0 mm). The yellow pronotum and entirely black legs of the latter distinguish it immediately from *P. luederitzensis* with dark pronotum and largely pale tibia.

***Pampsilota nigeriae* Liston & Koch, sp. n.**

<http://zoobank.org/5C0DDF6E-9F09-4DD8-B683-308A3ACFBEE7>

**Male.** Figures 26, 64–65

Head black; labrum yellow; antenna light brown with blackish apex and sharply compressed longitudinal carina. Thorax yellow with following black: mesoscutum except for a small median spot between lateral lobes on posterior margin, mesoscutellum and metascutellum. Legs yellow; metatibia and metatarsomeres moderately broadly blackish-ringed apically, tarsomeres 3/4 nearly entirely black. Wings including intercostal area slightly infuscate; substigmal spot weakly developed, stigma bicoloured with dirty whitish base and blackish apical half, costa whitish, subcosta except for apex adjacent to stigma and rest of venation blackish. Abdomen yellow.

Head slightly narrowed behind eyes. Antenna 1.6× as long as maximum head width; flagellum very slightly enlarged towards apex, triangular in cross section, scarcely flattened apically, interior surface with sharply compressed longitudinal carina, other longitudinal carinae weakly compressed. Eyes very slightly converging towards clypeus. Anterior margin of clypeus semi-circularly emarginate over its entire width; supraclypeal area very slightly rounded, protruding up to ventral limit of interantennal carinae, interantennal carinae obtusely ridged, converging below, extending to a little below ventral margin of torulus. Frons, supraclypeal area and clypeus densely punctate, weakly shiny, vertex and gena scattered micropunctate, shiny; pubescence whitish. Mesoscutum moderately densely punctate, shiny; pubescence similar to that on head. Abdomen smooth and shiny. Penis valve: Fig. 26.

Length: 7.3 mm.

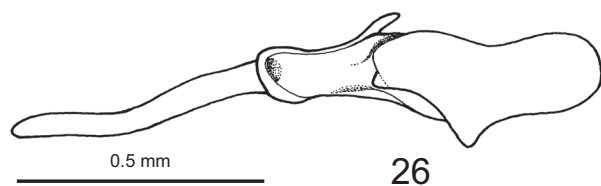
**Female.** Unknown.

**Type material.** Holotype: ♂. Labels: “Nigeria, 14.V.2011, 26 km SEE Abuja, N 09°06′/E07°45′, 400 m, J. Halada leg.”; “DEI-GISHym 21248”; “Holotype, *Pampsilota nigeriae* n. sp. ♂, det.: F. Koch, 2016” [red] (OLML).

**Etymology.** The new species is named after Nigeria, the country in which the holotype was collected.

**Distribution.** Nigeria (Fig. 37).

**Diagnosis.** *Pampsilota nigeriae* adults resemble those of *P. dahomeyanus* and *P. tsavoensis* in the mostly yellow colour of the abdomen and thorax underside, but differs from both in its predominantly yellow antenna and the bicoloured stigma. The penis valves of *P. dahomey-*



**Figure 26.** *Pampsilota nigeriae*: Penis valve (left, lateral aspect).

*anus* (Fig. 19) and *P. nigeriae* (Fig. 26) show differences. Additionally, the dorsal part of mesepisternum is blackish in *P. tsavoensis*, but yellow in *P. nigeriae*.

***Pampsilota tsavoensis* Liston & Koch, sp. n.**

<http://zoobank.org/F7FF2570-36FB-4A86-A8C1-F6D844104E9E>

**Female.** Figures 27–30, 66–67

Head black with following yellow: labrum, clypeus, supraclypeal area. Interantennal area light brown; antenna black with ventral surface brownish, base of scape yellow. Thorax yellow with following black: mesoscutum, metascutum, dorsal half of mesepisternum blackish. Legs yellow with following black: narrow apex of mesotibia, broad apex of metatibia, pro- and mesotarsomeres more or less blackish ringed apically, metabasitarsomere black ringed apically with following tarsomeres black. Wings slightly infuscate; intercostal area and very small substigmal spot infuscate; stigma, costa, subcosta and rest of venation blackish. Abdomen yellow.

Head parallel-sided behind eyes. Antenna 1.3× as long as maximum head width; flagellum conspicuously enlarged towards apex, quadrangular in cross section, interior surface with sharply compressed longitudinal carina, other longitudinal carinae conspicuously weakly compressed. Eyes very slightly converging towards clypeus. Anterior margin of the clypeus shallowly, circularly emarginated; supraclypeal area scarcely protruding up to ventral limit of interantennal carinae, interantennal carinae obtusely ridged, not converging below, extending about to level of ventral margin of torulus. Frons, supraclypeal area and clypeus sparsely micropunctate, shiny, vertex and gena densely micropunctate, subshiny; pubescence whitish. Mesoscutum irregularly microsculptured, subshiny; pubescence similar to that on head. Abdomen smooth and shiny. Valvulae 3: Figs 27–28. Lancet with about 16 serrulae: Figs 29–30.

Length: 7.0 mm.

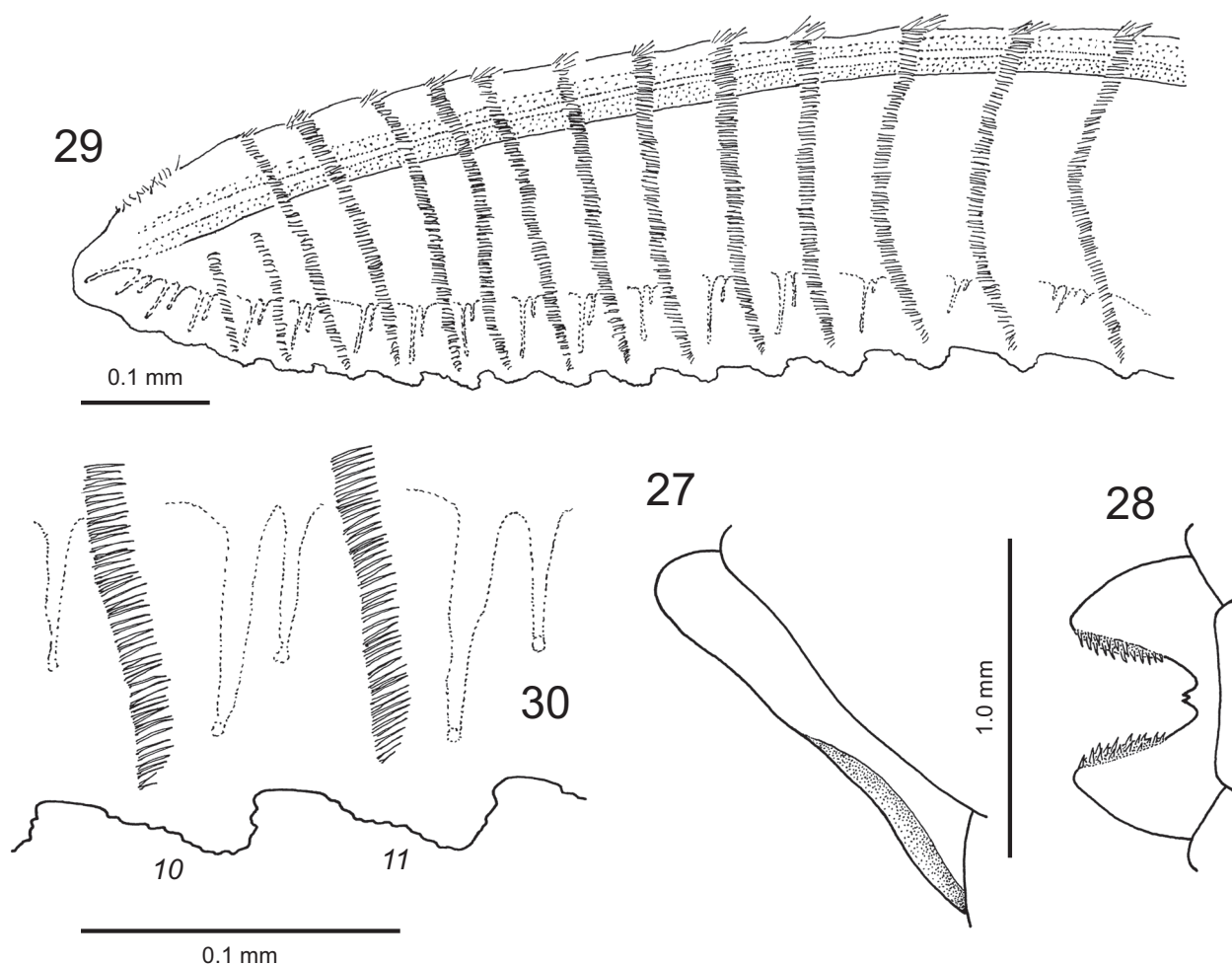
**Male.** Unknown.

**Type material.** Holotype: ♀. Labels: “Kenya S. E., Tsavo, Voi env[ironment], 15.IV.2004, M. Snižek leg.”; “DEI-GISHym 21247”; “Holotype, *Pampsilota tsavoensis* n. sp. ♀, det.: F. Koch, 2016” [red] (OLML).

**Etymology.** The species is named after its collection locality, Tsavo National Park in Kenya.

**Distribution.** Kenya (Fig. 37).

**Diagnosis.** *Pampsilota tsavoensis* adults resemble those of *P. dahomeyanus* and *P. nigeriae* in the mostly yellow colour of the abdomen and thorax underside, but differ from *P. dahomeyanus* in the blackish dorsal part of mesepisternum, shape of the serrulae (Figs 29, 30), and in the morphology of the valvulae 3, which in *P. tsavoensis* are conspicuously divergent in dorsal view, with distinct denticles on the interior surface (Fig. 28), whereas in *P. dahomeyanus* the valvulae 3 do not diverge distally, and are without denticles (Fig. 16). *P. nigeriae*, of which only a single male is known, differs from *P. tsavoensis* in its predominantly yellow antenna and the bicoloured stigma.



**Figures 27–30.** *Pampsilota tsavoensis*: 27. Valvulae 3 (lateral aspect); 28. Valvulae 3 (dorsal aspect); 29. Lancet; 30. Serrulae 10–11.

***Pampsilota zebra* Liston & Koch, sp. n.**

<http://zoobank.org/D56CC835-6389-4FFB-91D5-8E4FB47936BE>

**Female.** Figures 31–34, 68–69

Head black with blue metallic lustre. Thorax black with metallic lustre; pronotum yellow with anterior margin and medially black. Legs black with blue metallic lustre; pro- and mesotibia entirely yellow, metatibia yellow with moderately broad blackish apex, probasitarsomere sometimes with yellow base. Wings including intercostal area subhyaline; substigmal spot strongly infuscate but small; stigma, costa, subcosta and rest of venation black. Abdomen yellow-orange; terga 1–6 broadly black with blue metallic lustre; terga 7–9 entirely black, sternum 5 with broad black posterior margin, sternum 6/7 entirely black; ovipositor sheath with black valvifers 2.

Head very slightly enlarged behind eyes. Antenna 1.4× as long as maximum head width; flagellum enlarged towards apex, quadrangular in cross section, interior surface with sharply compressed longitudinal carina, other longitudinal carinae conspicuously more weakly compressed. Eyes slightly converging towards clypeus. Anterior margin of the clypeus broadly, shallowly, tri-

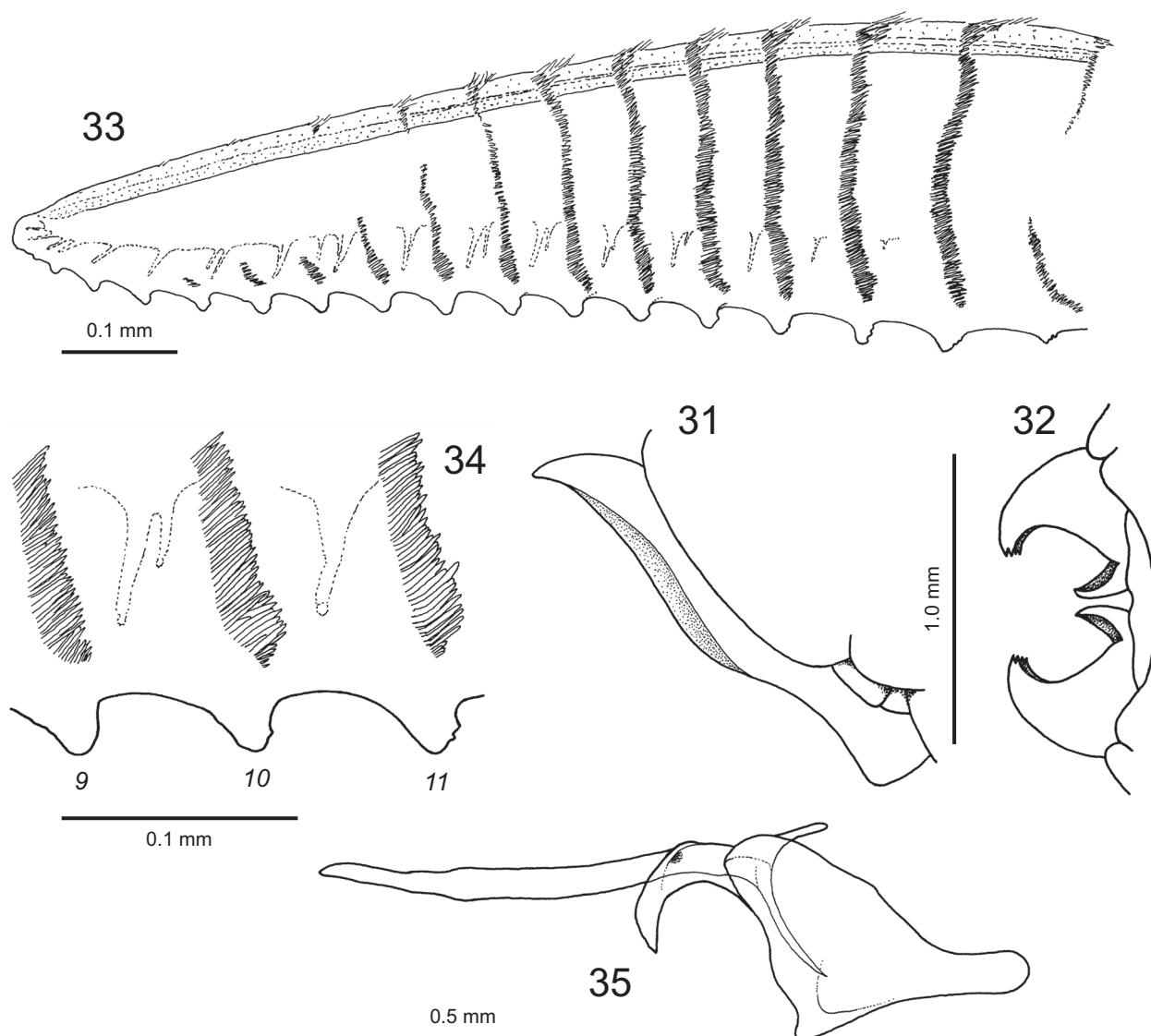
angularly emarginate; supraclypeal area nearly evenly rising up to base of interantennal carinae, interantennal carinae obtusely ridged, converging below, extending to about level of ventral margin of torulus. Frons, supraclypeal area and clypeus rugosely sculptured, dull, vertex densely punctate, dull, postocellar area and gena densely micropunctate, shiny; pubescence whitish. Mesoscutum moderately densely micropunctate, shiny; pubescence similar to that on head. Abdomen smooth and shiny. Valvulae 3: Figs 31, 32. Lancet with about 16 serrulae: Figs 33, 34.

Length: 9.5 mm.

**Male.** Figures 35, 70–71.

General coloration similar to that of female. Metatibia entirely yellow, sometimes interior surface of apex slightly blackish, basal tarsomeres of fore and mid legs extensively yellow. Sternum 5–9 black with blue metallic lustre, sternum 9 broadly yellow apically.

Antenna 1.8× as long as maximum head width; flagellum slightly enlarged medially, scarcely flattened apically, approximately oval in cross section, interior surface with sharply compressed longitudinal carina, outer carina conspicuously more weakly compressed, other carinae not



**Figures 31–35.** *Pampsilota zebra*: 31. Valvulae 3 (lateral aspect); 32. Valvulae 3 (dorsal aspect); 33. Lancet; 34. Serrulae 9–11; 35. Penis valve (left, lateral aspect).

developed. Other characters as for female. Penis valve: Fig. 35.

Length: 7.2–7.8 mm.

**Type material.** Holotype: ♀. Labels: “Tanzania CE, SE Nbuyuni Baobab vall[ey]. [ca. 7.54°S 36.62°E], NE Iringa [Iringa] 9.III.2002, M. Snižek”; “Holotype, *Pampsilota zebra* n. sp. ♀, det.: F. Koch, 2016” [red] (OLML). Paratypes: same data as holotype (5♂♂, 9♀♀) (MFN, OLML, SDEI, USNM).

**Etymology.** The new species name, a noun in apposition, refers to the well-known and widely distributed African ungulate, so named in several European languages.

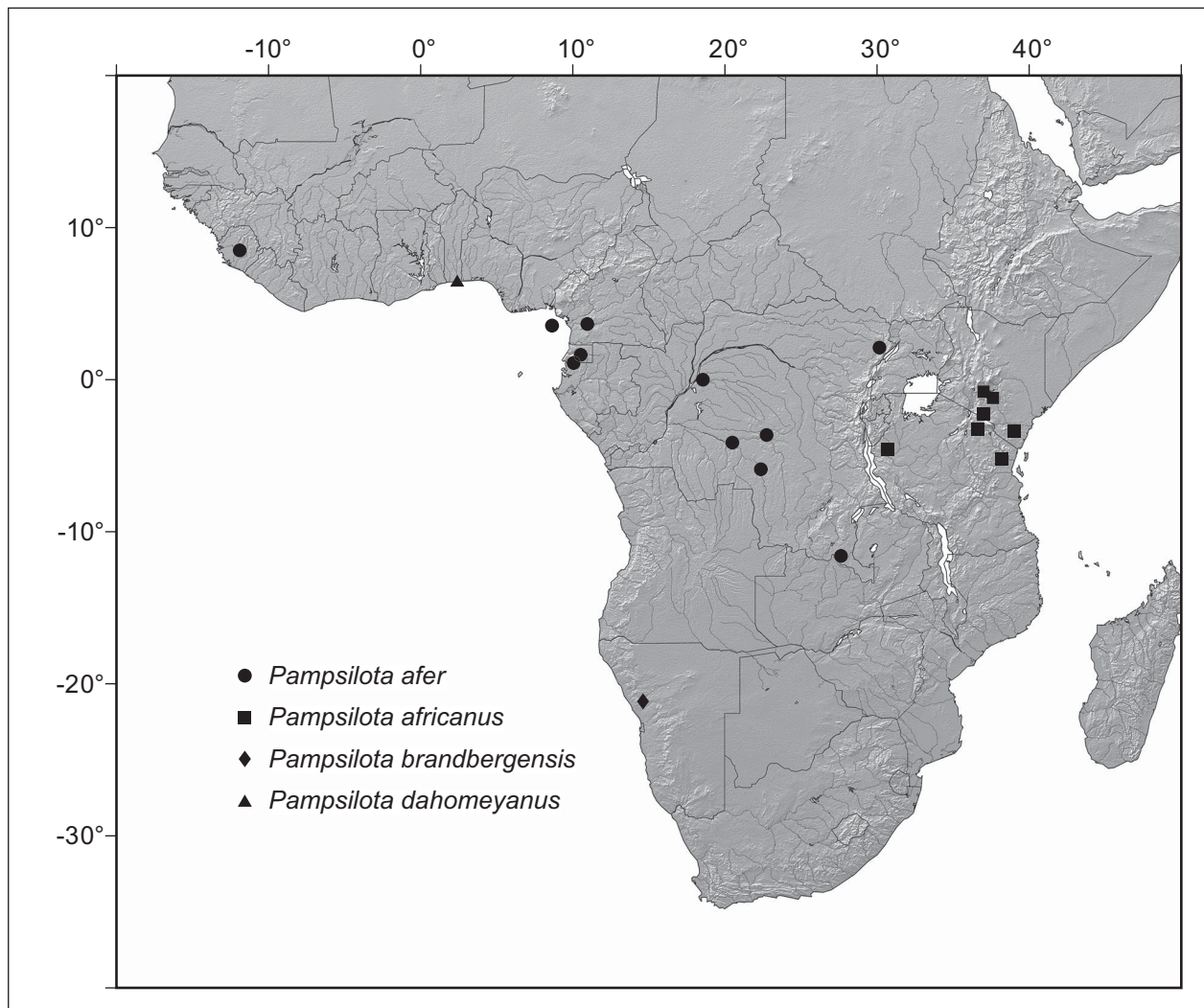
**Distribution.** Tanzania. The only known locality lies on the edge of the Udzungwa Mountains National Park (Fig. 37).

**Diagnosis.** *Pampsilota zebra* resembles *P. africanus* in having pincer-shaped valvulae 3 (compact or diverging

in all other species), metatibia distally nearly circular in cross section, and in the main colour characters (thorax black except for pronotum and sometimes tegulae, legs partly pale, and abdomen at least ventrally partly pale). *Pampsilota zebra* differs from *P. africanus* especially in its black costa and subcosta (in the latter costa and anterior of subcosta bright yellow). The tegulae of *P. zebra* are always black, whereas in *P. africanus* they are sometimes bicoloured. Furthermore, the hind tibia of *P. zebra* is in contrast to *P. africanus* broadly ringed apically with blackish. The serrulae of these species are very differently shaped (Figs 12, 34), but their penis valves are quite similar (Figs 13, 35).

**Remarks.** Intraspecific variability is apparent in the coloration of the dorsum of the abdomen, where the black markings are medially more or less extensive, and the more or less extensively yellow coloured pro- and mesotarsi.



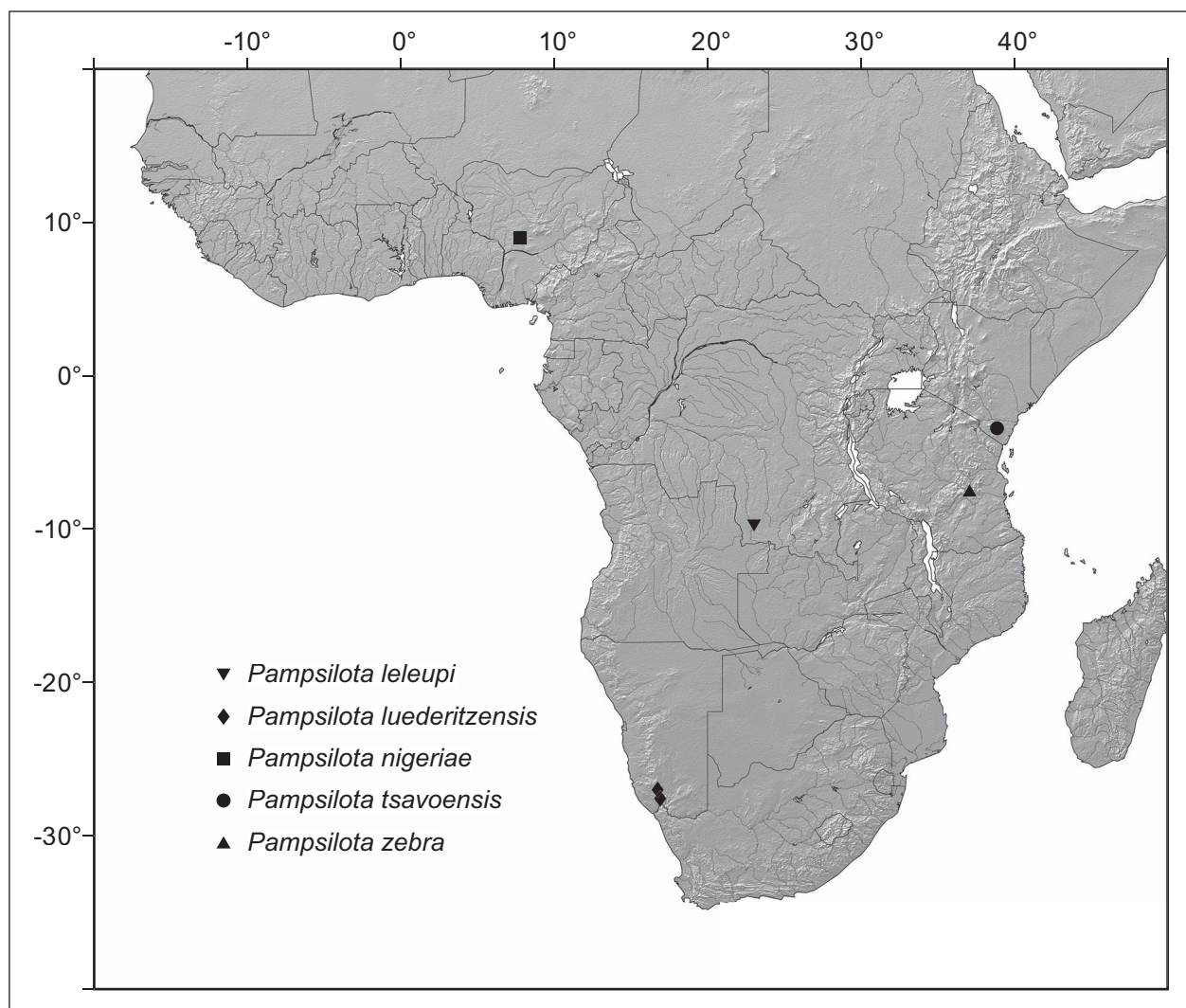


**Figure 36.** Distribution map for *Pampsilota afer*, *P. africanus*, *P. brandbergensis*, and *P. dahomeyanus*.

## Discussion

The regrettable current lack of knowledge on the host plant associations of the majority of Afrotropical Tenthredinoidea, compared for example to the relatively large and partly corroborated data sets available for many regions in the Palaearctic and Nearctic, has recently been highlighted by, for example, Koch et al. (2015) and Liston et al. (2015). This deficit makes it impossible to judge within a wider perspective the significance of the host plant record for the single *Pampsilota* species for which such data exists: *P. dahomeyanus* on *Lannea nigriflora* (Anacardiaceae). This is currently one of very few records of an Afrotropical sawfly species using a native, woody host. We are not aware of other published records of leaf-eating African tenthredinoids reared, or otherwise unequivocally associated, with Anacardiaceae, although a few records associate Neotropical Pergidae and Nearctic Argidae with this plant family (e.g. McKay et al. 2009, Regas-Williams

and Habeck 1979). Among the other Afrotropical symphytan lineages, only Goulet (2014) recorded an association with a species of Anacardiaceae: *Afrotremex xylophagus* Goulet, 2014 (Siricidae) reared from wood of *Antrocaryon klaineianum* Pierre. The few host plants hitherto recorded for native Afrotropical tenthredinoids are, conspicuously, nearly all non-woody species, and very often those which are cultivated (Koch et al. 2015). By contrast, in the Holarctic many tenthredinoids, including most *Arge* species (Smith 1989, Liston 1995), use woody plants as hosts. Possibly the lack of data on sawflies of sub-Saharan Africa using native tree species as larval hosts might largely have been caused by various sampling biases, such as failure to employ effective collecting methods on trees at the right season, or perhaps even a widespread relative lack of interest in studying the insect fauna of native trees, compared to that of the crop plant species which are of more obvious importance to humans. Because the host of *P. dahomeyanus* is valued by humans for its fruit, and has a variety



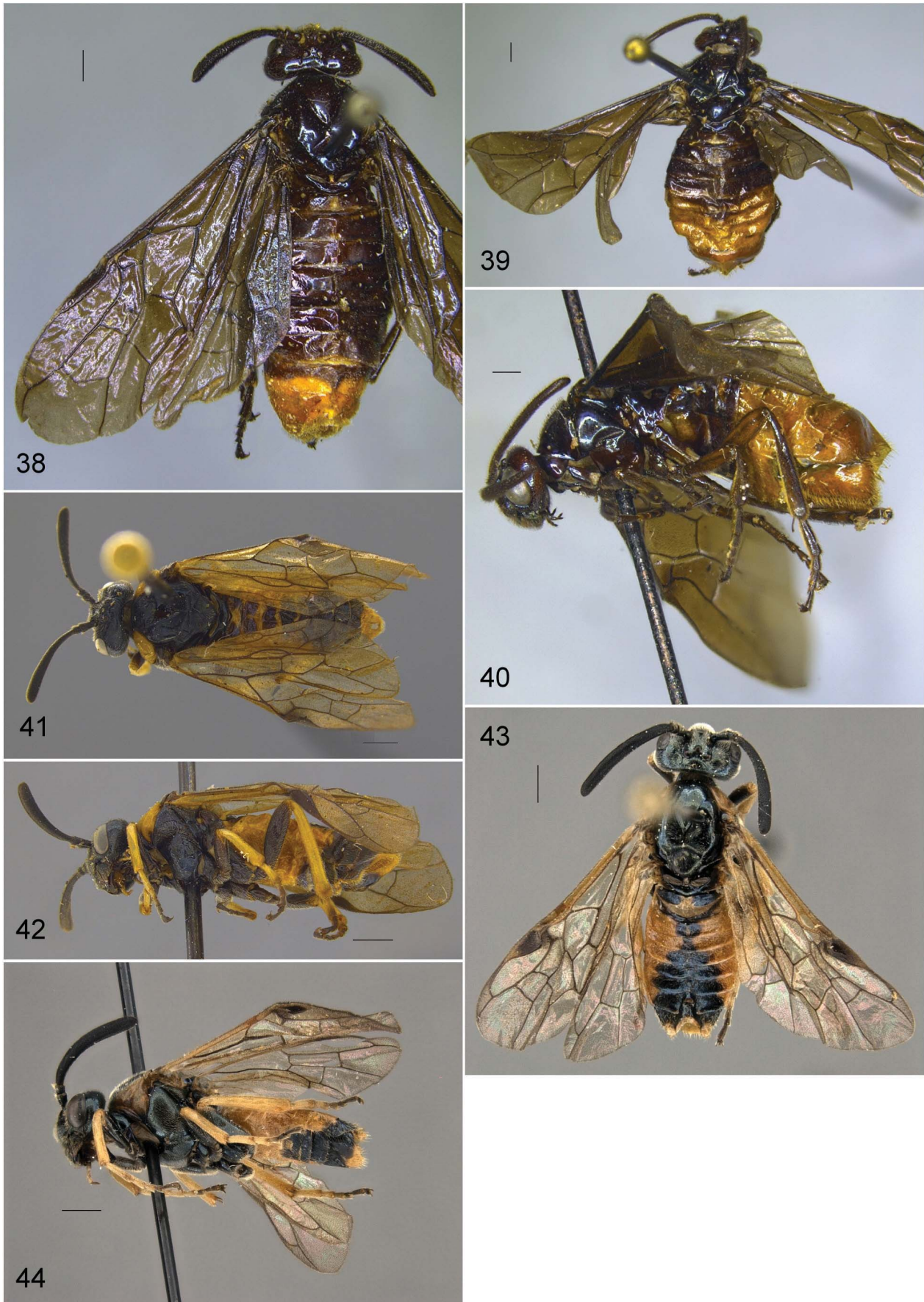
**Figure 37.** Distribution map for *Pampsilota leleupi*, *P. luederitzensis*, *P. nigeriae*, *P. tsavoensis*, and *P. zebra*.

of other uses, including medicinal, it is often planted in or near settlements (Burkhill 1985), and is thus a more conspicuous host than the many Afrotropical tree species found only in the rapidly diminishing areas of semi-natural forest.

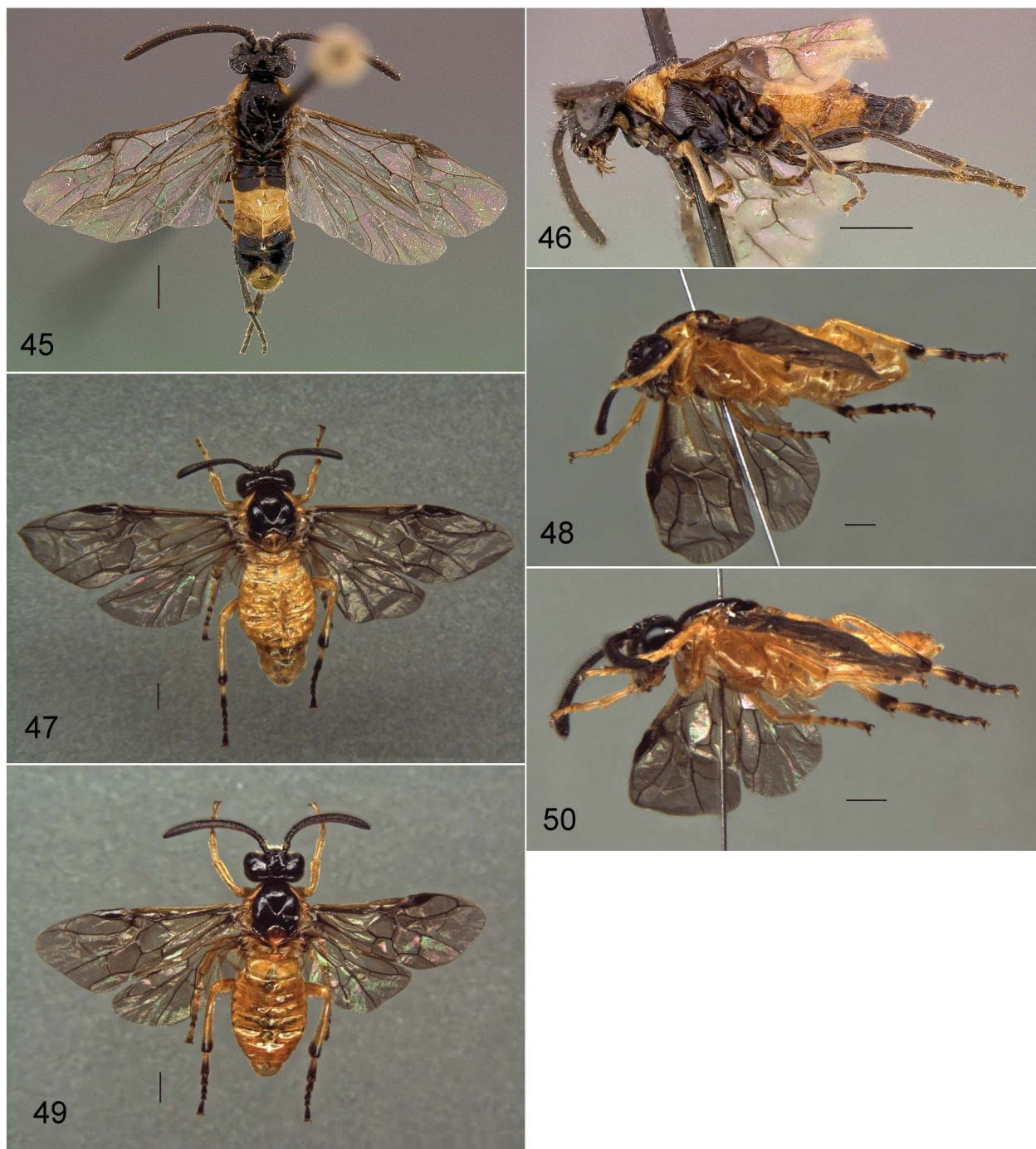
Our study aims to make possible the identification of part of the species-rich Afrotropical fauna of Argidae, and thus prepare the way for further research. The current lack of genetic data forced us to rely on morphological methods, but real progress in understanding the phylogeny of the twenty nominal argid genera worldwide that are currently placed in the Arginae (14) and Athermantinae (6) (Taeger et al. 2010), will probably only be possible when sufficient genetic data become available for a representative spectrum of these taxa. We are, however, a very long way from achieving this. The lack of fresh material of several Afrotropical taxa is a problem, well illustrated by the type species of *Pampsilota*, *P. afer*: at least six of the eleven specimens (one is without a date) which we were able to

examine were collected over one hundred years ago, with the most recent from 1955. The acquisition of gene sequence data for as many Afrotropical sawfly taxa as possible should nevertheless remain an objective, because, apart from its usefulness in phylogenetic analyses, it could also be used to accelerate the task of identifying larvae and host plants, by avoiding the need to rear the immature stages to adults. The latter technique, which is time-consuming and not always successful, will of course remain essential in the long term, if we desire to know more about the natural history of individual taxa.

The separation of the Arginae from the Athermantinae was first proposed by Benson (1938). He ascribed great importance to the character states “pre-apical spurs on meso- and metatibia present [Arginae] or absent [Athermantinae]”. This has become the only character used in more recent works, e.g. Koch et al. (2015), to distinguish members of the putative lineages. One might well question whether this single character of re-



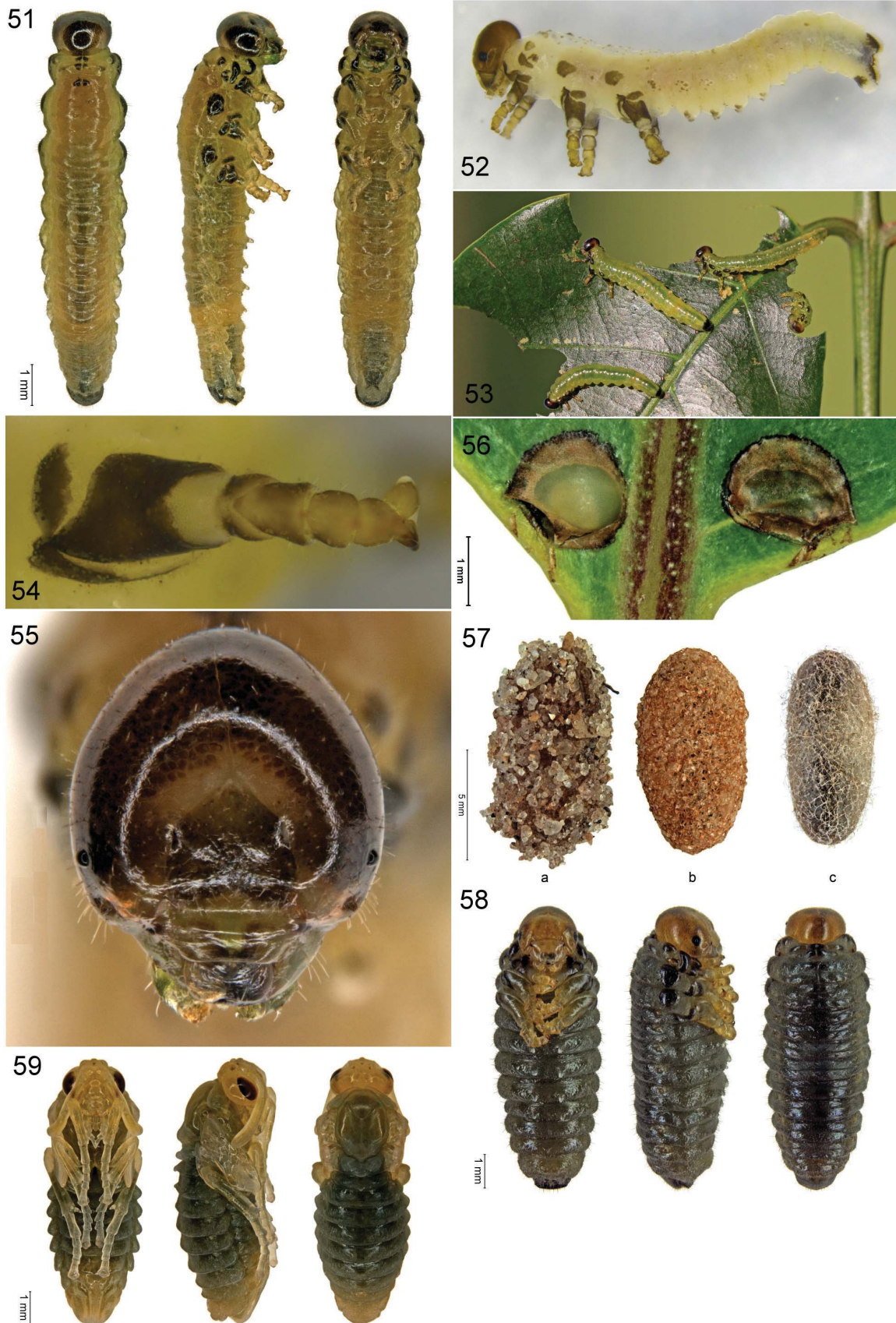
**Figures 38–44.** *Pampsilota afer* ♀: 38. Dark form, dorsal; 39–40. Pale form, dorsal / lateral. 41–44. *P. africanus*. 41–42. ♀ (LT), dorsal / lateral; 43–44. ♂, dorsal / lateral. Scale bars = 1 mm.



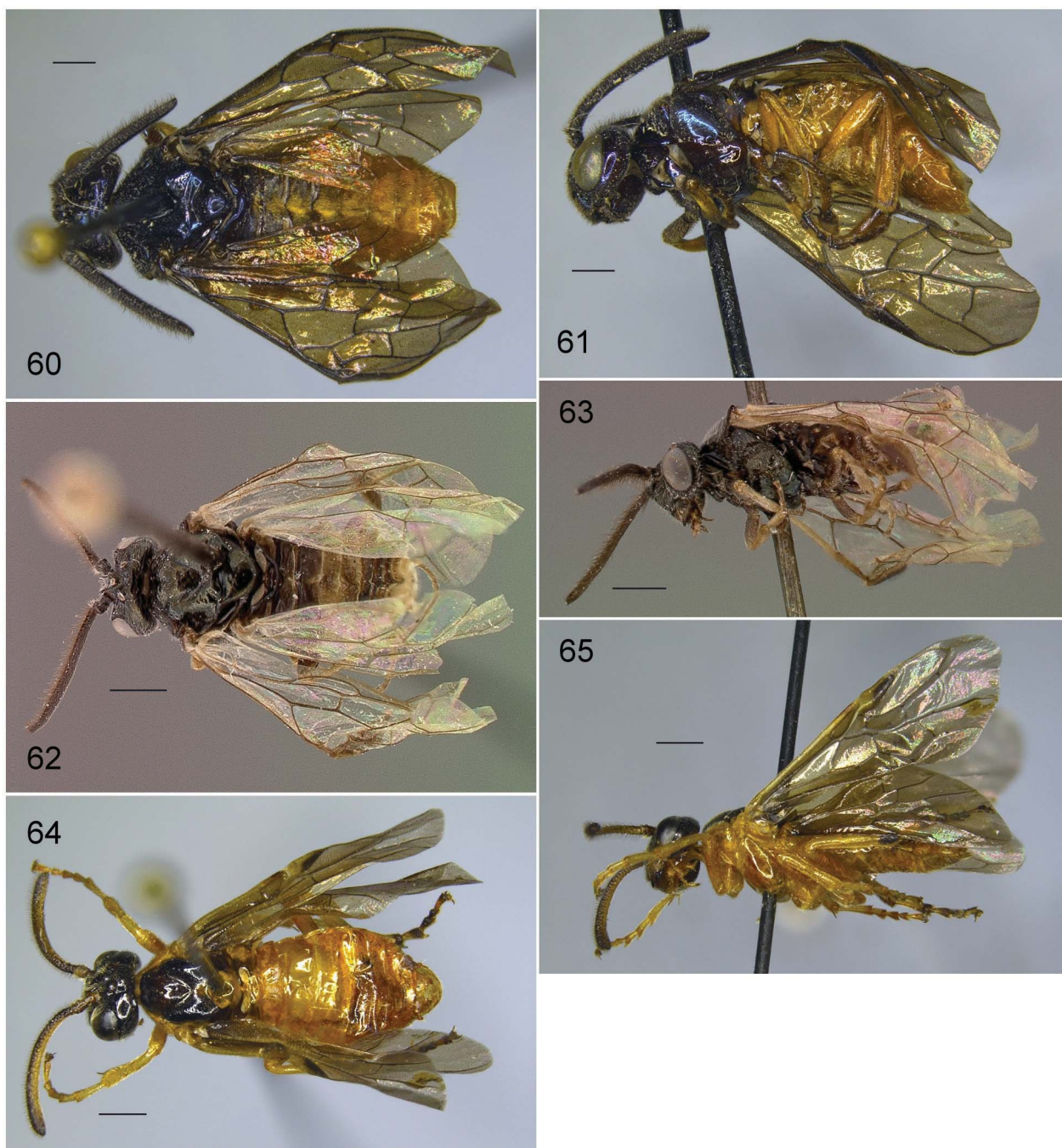
**Figures 45–50.** *P. brandbergensis* ♂ (PT), dorsal / lateral. 47–48. ♀, dorsal / lateral; 49–50. ♂, dorsal / lateral. Scale bars = 1 mm.

duction, which might have occurred or been reversed independently more than once within the Argidae, is really of such phylogenetic significance. On the other hand, of the very many Afrotropical argid specimens examined by the authors, only two specimens were found in which this character state was equivocal (the holotype of *Calarge africana*, and a single *Pampsilota dahomeyanus*). Therefore, we are of the opinion that the character is sufficiently stable at species level to be useful at least for identification.

The morphology of the larva of *P. dahomeyanus* does not differ in any notable way from known larvae of *Arge* species, as described for example by Lorenz and Kraus (1957), and Smith (1989). Given that at suprageneric level the larvae of exophytic sawfly taxa generally exhibit some clear apomorphies (Lorenz and Kraus 1957), this similarity supports the inclusion of *P. dahomeyanus* in the Arginae, rather than the Athermantinae, in which *Pampsilota*, *Sjoestedtia* and *Cipdela* have mostly been placed following Benson (1938) (e.g. Taeger et al. 2010).



**Figures 51–59.** *P. dahomeyanus*, immature stages: **51.** Mature larva, from L to R dorsal, lateral, ventral; **52.** Young larva, lateral (preserved in ethanol); **53.** Larvae on *Lannea nigritana*; **54.** Metathoracic leg; **55.** Head, frontal; **56.** Eggs in base of leaflet. **57.** Cocoons, from L to R with covering of sand, outer layer, inner layer; **58.** Prepupa, from L to R ventral, lateral, dorsal; **59.** Pupa, from L to R ventral, lateral, dorsal.

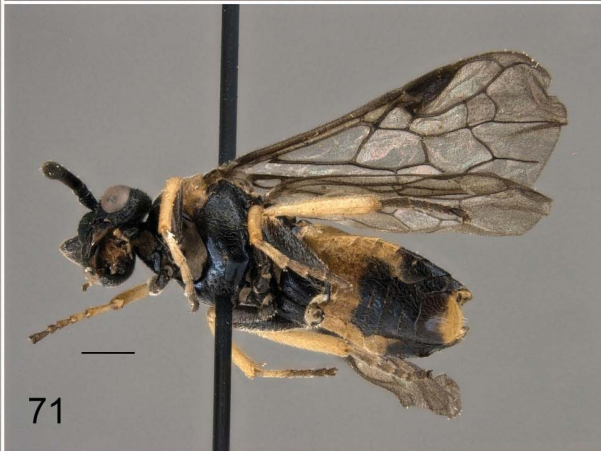
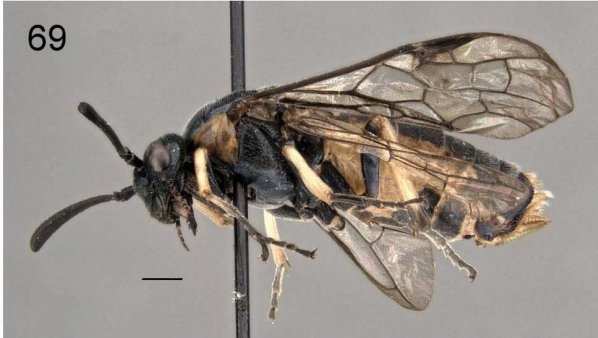
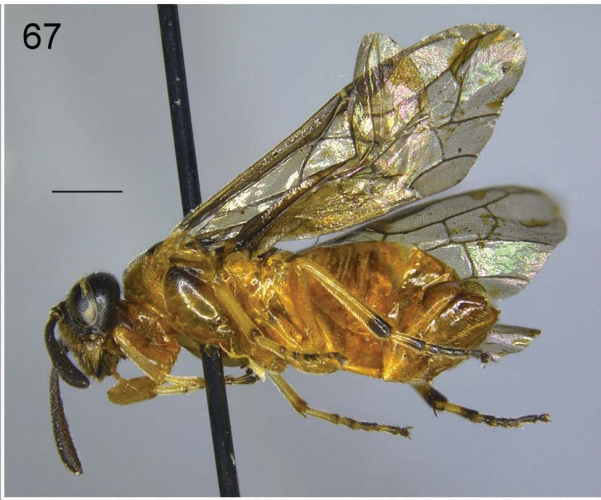


**Figures 60–65.** *P. leleupi* ♂ (HT), dorsal / lateral. **62–63.** *P. luederitzensis* ♂ (PT), dorsal / lateral. **64–65.** *P. nigeriae* ♂ (HT), dorsal / lateral. Scale bars = 1 mm.

However, it would be unwise to draw any conclusions from this assessment before gene sequences are acquired and larval morphology elucidated for the type species of *Pampsilota*, and as many other argine and athermantine species as possible worldwide. What is clear, is that after the exclusion of *Sphacophilus afer* and *Scobina poecila* from the Afrotropical fauna, and the synonymy of *Calarge* with *Arge*, the argid fauna of the sub-Saharan continent is by no means as diverse at higher taxonomic levels as previously believed.

## Acknowledgements

We are most grateful to S. M. Blank (SDEI), E. De Coninck and S. Hanot (MRAC), F. Gusenleitner (OLML), E. Marais (NNIC), M. Paris (MNCN), A. Taeger (SDEI), A. Teräs (UZMT), H. Vårdal (NHRS), S. Csösz, S. Vas, and L. Zombori (HNHM) for allowing us to examine the specimens in their care. Without their help, this study could not have been undertaken. M. Paris also sought information about the history of the *C. terminalis* and *S. afra* specimens. E. Schubert (SDEI) made available handwriting



**Figures 66–71.** *P. tsavoensis* ♀ (HT), dorsal / lateral. **68–71.** *P. zebra*. **68–69** ♀ (HT), dorsal / lateral; **70–71.** ♂ (PT), dorsal / lateral. Scale bars = 1 mm.

samples of L. Conradt, and D. R. Smith (USNM) kindly gave his opinion on our assessment of the status of *S. afra* and *C. terminalis*. Images for Figs 70–71 were kindly provided by B. Schurian (MFN). We thank the graphic designer E. Siebert (MFN) for her help with arranging and lettering the line drawings. The staff of the SDEI library have, over many years, made a great effort in obtaining and archiving potentially relevant literature. Particularly thanked for this by AL are K. Elgner, H. Framke, U. Kaczinski, and R. Riedelsheimer. We are also grateful to Aristide Adomou (Jardin Botanique et Herbar National du Bénin, Université d'Abomey Calavi, Abomey-Calavi, Benin) for identifying the host plant of *P. dahomeyanus* and Hervé Houngoué, IITA Benin, for technical assistance in collecting and rearing the species. FK would like to express his gratitude to the International Bureau of the Federal Ministry of Education and Research (BMBF) at the Project Management Agency c/o German Aerospace Center (DLR) and the National Research Foundation (NRF), South Africa for a research grant. S. Monckton and S. van Noort reviewed the manuscript and suggested important improvements. Finally, the Museum für Naturkunde defrayed the cost of open access publication.

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