

REVISION OF THE *SERRAULAX* QUICKE SPECIES
DESCRIBED BY SZÉPLIGETI IN THE YEARS 1905–1914
WITH DESCRIPTION OF A NEW SPECIES
(HYMENOPTERA: BRACONIDAE: BRACONINAE)

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Eleven species belonging to the genus *Serraulax* QUICKE, 1987 (a member of Braconinae) are revised. Complementary redescrptions are presented of the generic type species *Serraulax lukombensis* (CAMERON, 1912) and nine *Serraulax* species by SZÉPLIGETI described in the years 1905 – 1914 and originally arranged in the genera *Iphiaulax* and *Megagonia*. The new species *Serraulax ater* is described. The nearest ally of each species is indicated. *Serraulax togoensis* (SZÉPLIGETI) is a junior synonym of *S. persimilis* (SZÉPLIGETI) *sen. syn.* A key is given for the eleven *Serraulax* species. With 81 original line-drawn and 14 original photos.

Key words: Braconinae, *Serraulax*, redescription, new species, synonym, key

INTRODUCTION

The braconid genus *Serraulax* was created by QUICKE (1987) designated *Iphiaulax lukombensis* CAMERON, 1912 as the type species of the new genus. The genus *Serraulax* is the member of the subfamily Braconinae and the tribe Braconini. A fairly detailed description of the new genus and a redescription of *S. lukombensis* was presented by QUICKE (1987: 144–147). In addition to the type species, the following five species were assigned by QUICKE (l.c.) to his new genus: *S. calopterus* (SZÉPLIGETI, 1908), *S. dorsalis* (SZÉPLIGETI, 1914), *S. palpator* (SZÉPLIGETI, 1914), *S. tigrinus* (SZÉPLIGETI, 1908) and *S. trifasciatus* (SZÉPLIGETI, 1905). SZÉPLIGETI's five species were originally described in the genus *Iphiaulax* FOERSTER. Nota bene, three of SZÉPLIGETI's species were described prior to 1912, nevertheless CAMERON's species was chosen as the type species.

The following nine *Serraulax* species by SZÉPLIGETI are revised: *S. calopterus*, *S. conradti*, *S. dorsalis*, *S. orientalis*, *S. palpator*, *S. persimilis*, *S. semiluteus*, *S. tigrinus* and *S. trifasciatus*. The species *Serraulax lukombensis* (CAMERON) and the new species, *S. ater*, are added to the revision; i.e. eleven *Serraulax* species are treated in the present survey. Two additional species, *Iphiaulax guineensis* SZÉPLIGETI, 1914 and *Goniobracon denticornis* ENDERLEIN, 1920, belong also to the genus *Serraulax* (QUICKE & KOCH 1990: 223, YU *et al.* 2005), however, the type-series of these two species were not available. A fourteenth species, *Serraulax* (origi-

nally *Ipobracon*) *togoensis* (SZÉPLIGETI, 1914) proved to be a junior synonym of *S.* (originally *Megagonia*) *persimilis* (SZÉPLIGETI, 1906) *sen. syn.* The eleven *Serraulax* species herewith discussed are distributed in the Ethiopian zoogeographic region.

The redescrptions of the ten species and the description of the new species are complemented with an identification key promoting their adequate recognition. The redescrptions of SZÉPLIGETI's species are necessiated by their short to very short original descriptions confined mainly to colour differences and less to morphological or quantitative characterizations.

The present survey is intended to be a further step towards a better knowledge of the species of *Serraulax*. Certainly several (or many?) new species will be discovered in the genus *Serraulax* both by collecting them in tropical Africa and by the elaboration of braconid material housed in museums possessing unsorted afrotropical braconids. Furthermore, in among the species (e.g. in the genus *Iphiaulax*) described by earlier authors a few species will prove undoubtedly to belong to *Serraulax*.

The type material of the *Serraulax* species herewith studied and redescrbed are deposited in five museums: Berlin, Budapest, Müncheberg, Stockholm and Tervuren; for further details see at the respective species treatments and the acknowledgements.

In the key for the Braconinae genera of the Old World the genus *Serraulax* runs to the genera *Tsavobracon* QUICKE, 1985 and *Craspedolcus* ENDERLEIN, 1920 (QUICKE 1987: 97, key couplets 122–123). The genus *Serraulax* is also near *Iphiaulax*, the distinction between the two genera is presented as follows:

- *Iphiaulax* FOERSTER, 1862: (1) Second submarginal cell of fore wing relatively short, i.e. *SR1* clearly, usually 1.5–1.6 times longer (Fig. 1); (2) Scape in outer-lateral view moderately emarginate (Fig. 2); (3) First tergite (usually) striated, however, medially without a carina-form stria (Fig. 3).
- *Serraulax* QUICKE, 1987: (1) Second submarginal cell of fore wing relatively long, i.e. *SR1* and *3–SR* equal in length (minute deviations feasible, Figs 8, 41); (2) Scape in outer-lateral view strongly excised (Figs 4, 12, 19, 25); (3) First tergite striated, medially with a weak carina-form stria (Figs 10, 17, 24).

Serraulax QUICKE, 1987

Serraulax QUICKE, 1987: 95, 97 (in key) and 144 (description), type species: *Iphiaulax lukombensis* CAMERON, 1912 (original designation).

Additional generic features to the original description (cf. QUICKE 1987: 144–145). – Body 10–17, usually 12–14, mm long. Antenna about as long as body

and flagellum with 60–70 flagellomeres. Scape in outer-lateral view 1.6 to 2 times as long as broad apically, and clearly excised laterally (Figs 4, 12, 19, 25, 33, 48, 72). Head in dorsal view subcubic to weakly transverse, i.e. 1.5–1.6(–1.7) times as broad as long, temple rounded to rather receded (Figs 5, 13, 20, 26, 34, 49, 55, 61, 65, 73). Oral opening: its horizontal diameter about equal to shortest distance between opening and eye. Third joint of maxillar palp more or less flattened (Figs 36, 56, 66). Face with coriaceous-(sub)rugulose sculpture, otherwise head polished.

Mesosoma elongate, in lateral view 1.8–1.9(–2) times as long as high, polished. Notaulix posteriorly weakening, smooth. Propodeum also polished, around lunule without striae or rugulae. Inner spur of hind tibia clearly shorter than half length of basitarsus. Claw moderately downcurved, gradually thickening basally (Figs 40, 77).

Fore wing: Pterostigma 3.8–4.3 times as long as wide, *r* issuing more or less proximally from its middle. Second submarginal cell long, 3–*SR* (1.8–)2–2.2 times longer than 2–*SR*, *SR*1 reaching (or approaching) tip of wing and about as long as 3–*SR* (Figs 8, 41, 52, 57, 68, 78). First discal cell low to less high, 1–*SR*–*M* bent or broken at 1–*M* (Figs 9, 23, 30, 42, 69, 79, see arrows). Vein *cu*–*a* just postfurcal. – Hind wing: *cu*–*a* straight and directed clearly inwards (Fig. 43).

First tergite usually as long as broad posteriorly, less commonly somewhat longer or somewhat shorter than broad posteriorly (Figs 10, 24, 31, 53, 58, 63, 70, 71, 80). Scutum of first tergite domed, more or less striated longitudinally, postero-medially with a carina-form stria (Figs 10, 24, 31, 71, 80). Tergites 2–5 variably striated longitudinally (Figs 10, 24, 31, 71, 90–95). Second tergite less, further tergites more transverse, second tergite basally with a pair of lateral and a median fields, lateral fields always polished (Figs 90–95). Ovipositor sheath about as long as hind tibia + tarsus combined. Ovipositor apically with a dorsal node and ventrally finely serrate (Figs 11, 44, 81).

Body testaceous; legs also testaceous, hind tibia and tarsus black(ish), less usually legs blackish to black. Ground colour of wings yellow with three transverse brown streaks (fore wing) and with streak-like pattern (hind wing); less usually wings more or less brown to dark brown. Pterostigma yellow, distally more or less darkening brown to blackish (Figs 82–89).

The following abbreviations are applied in the redescrptions and description (after VAN ACHTERBERG 1993: 4–5):

Eye: OOL = ocellar-ocular line, i.e. shortest distance between hind ocellus and compound eye; POL = postocellar line, i.e. shortest distance between hind two ocelli.

Fore wing: *cu*–*a* = nervulus; *m*–*cu* = transverse medio-cubital vein; *r* = first section of the radial vein; 1–*M* = basal vein; 1–*SR*–*M* = first section of the cubital vein; 1–2*CU*1 = first and second sections of the discoidal vein; 2–*SR* = first transverse cubital vein; 2–*IA* = second section of the

submedian vein; 3-SR = second section of the radial vein; 3-CUI = basal section of the subdiscal vein; CUIb = second short section of the subdiscal vein; SRI = third section of the radial vein.

Hind wing: *cu-a* = nervellus.

Surface sculpture terminologies are applied after EADY (1968) and HARRIS (1979).

CHECKLIST OF THE *SERRAULAX* QUICKE SPECIES (after YU *et al.* 2005)

ater sp. n. – Cameroon

calopterus (SZÉPLIGETI, 1908: 33) (*Iphiaulax*) – Tanzania

conradti (SZÉPLIGETI, 1913: 384) (*Iphiaulax*) – Cameroon

denticornis (ENDERLEIN, 1920: 123) (*Goniobracon*) – Cameroon

dorsalis (SZÉPLIGETI, 1914a: 177) (*Iphiaulax*) – Cameroon, Equatorial Guinea, Gabon, Togo, Zaire

guineensis (SZÉPLIGETI, 1914a: 180) (*Ipobracon*) – Cameroon, Equatorial Guinea

lukombensis (CAMERON, 1912: 363) (*Iphiaulax*) – Cameroon, Equatorial Guinea, Togo, Uganda, Zaire
= *guineensis* SZÉPLIGETI, 1914a: 175 (*Iphiaulax*)

orientalis (SZÉPLIGETI, 1914a: 177) (*Iphiaulax*) – Kenya, Mozambique, Tanzania

palpator (SZÉPLIGETI, 1914a: 176) (*Iphiaulax*) – Ethiopia

persimilis (SZÉPLIGETI, 1906: 582) (*Megagonia*) – Cameroon, Tanzania, Togo

= *togoensis* (SZÉPLIGETI, 1914a: 174) (*Ipobracon*)

semiluteus (SZÉPLIGETI, 1911: 404) (*Iphiaulax*) – Malawi

tigrinus (SZÉPLIGETI, 1908: 33) (*Iphiaulax*) – Eritrea, Mozambique, Tanzania, Zaire

var. *interruptus* (SZÉPLIGETI, 1908: 34) (*Iphiaulax*)

trifasciatus (SZÉPLIGETI, 1905: 31) (*Iphiaulax*) – Cameroon, Equatorial Guinea, Togo

DESCRIPTION OF THE NEW SPECIES (*SERRAULAX ATER*) AND REDESCRIPTION OF THE TEN KNOWN *SERRAULAX* SPECIES

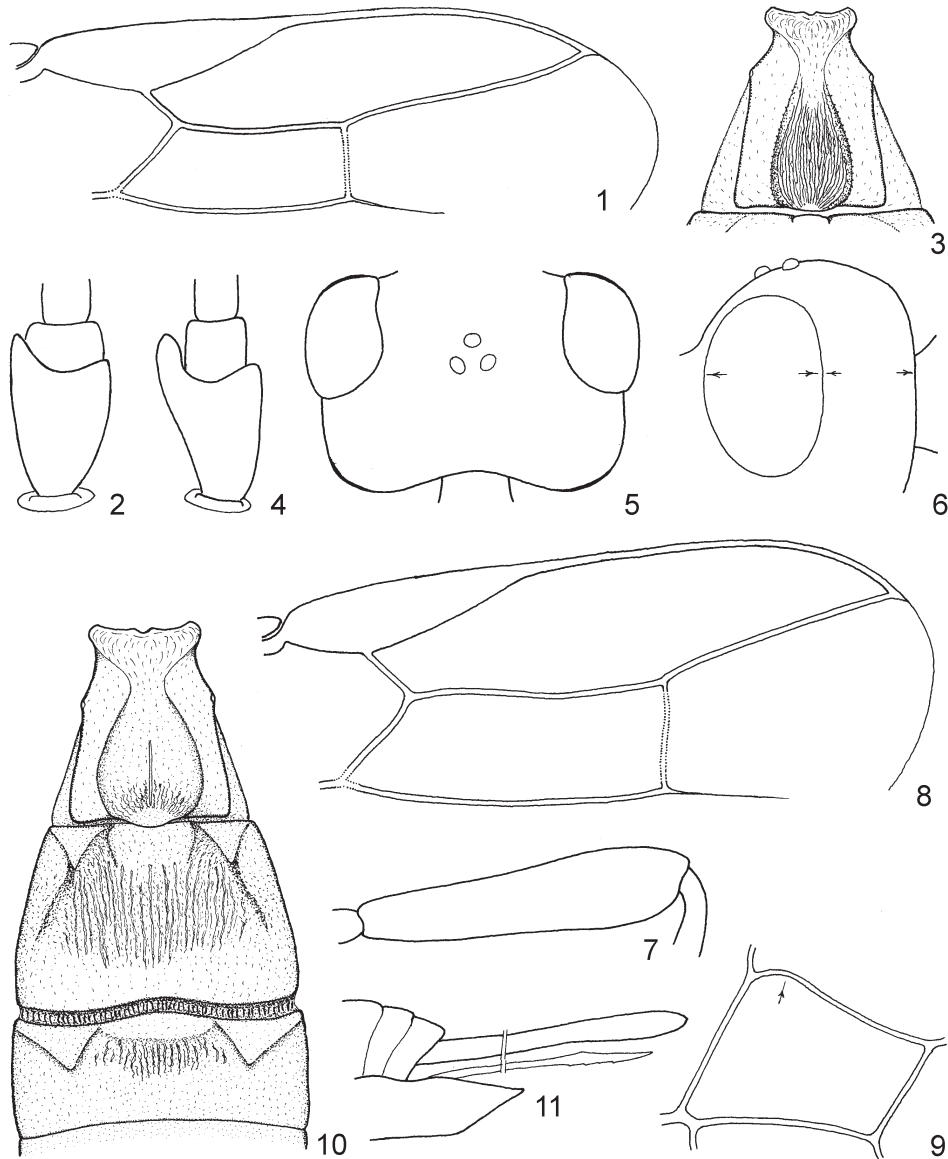
The redescrptions of SZÉPLIGETI's *Serraulax* species are restricted to the specific differences; complementary features pertaining to all species in general are given in the description of the genus *Serraulax* (see before). Detailed redescrptions are presented for the species *S. lukombensis* and *S. trifasciatus*.

***Serraulax ater* sp. n.**

(Figs 4–11)

Material examined (1 ♀) – Female holotype: Cameroon, IX, leg. CONRADT (first label, printed); Coll. KRAATZ (second label, printed); *Serraulax* / Braconinae / det. D. QUICKE 1988 (third label, partly with QUICKE's manuscript); fourth label is the holotype card. – Holotype is in fairly good condition: (1) pinned by mesosoma; (2) right flagellum damaged, only the first four flagellomeres

present; (3) fore right leg and the distal-anterior piece of right fore wing glued on a separate card; (4) fore left wing at first submarginal cell and right hind wing damaged antero-distally; (5) tarsomeres 2–5 of right hind leg missing.



Figs 1–11. 1–3. *Iphiaulax impostor* (SCOPOLI): 1 = distal part of right fore wing, 2 = scape + pedicel in outer-lateral view, 3 = first tergite. – 4–11. *Serraulax ater* sp. n.: 4 = scape and pedicel in outer-lateral view, 5 = head in dorsal view, 6 = head in lateral view, 7 = hind femur, 8 = distal part of right fore wing, 9 = first discal cell, 10 = tergites 1–3, 11 = hind end of female metasoma

Holotype is deposited in Senckenberg Deutsches Entomologisches Institute, Müncheberg (Germany).

Etymology – The new species received the name “ater” owing to the black body and legs.

Description of the female holotype – Body 14 mm long. Antenna as long as body and with 68 flagellomeres. Scape in outer-lateral view 1.8 times as long as broad apically and here deeply excised (Fig. 4). – Head in dorsal view subcubic (Fig. 5), 1.5 times as broad as long, eye somewhat protruding and 1.2 times longer than temple, temple rounded. Eye in lateral view 1.5 times as high as wide and 1.2 times wider than temple, latter evenly wide beyond eye (Fig. 6). Horizontal diameter of oral opening a bit shorter than shortest distance between opening and eye. Face and cheek coriaceous, otherwise head polished.

Mesosoma in lateral view 1.8 times as long as high, polished. Notaulix distinct, shallow, smooth. Hind femur 4.3 times as long as broad distally (Fig. 7). Hind basitarsus as long as hind tarsomeres 2–3 combined. Claw moderately curved, without basal lobe (cf. Fig. 40).

Fore wing somewhat longer than body. Pterostigma (Fig. 8) 3.9 times as long as wide and issuing *r* clearly proximally from its middle, *r* 0.9 times as long as width of pterostigma. Second submarginal cell long, 3–*SR* 2.5 times longer than 2–*SR*, *SRI* straight, reaching tip of wing and 0.9 times as long as 3–*SR*. First discal cell: *I–M* 1.3 times as long as *m–cu*, these two veins parallel, *I–SR–M* S-form and at *I–M* bent (Fig. 9, see arrow).

First tergite (Fig. 10) 1.25 times as long as broad posteriorly, evenly broadening posteriorly, hind mid-longitudinal carina distinct, scutum rugulo-striate behind, otherwise polished. Second tergite 1.6 times broader posteriorly than long medially, median and pair of lateral fields basally distinct and polished, otherwise tergite striated. Suture between tergites 2–3 bisinuate, crenulated. Third tergite medially striated, otherwise together with further tergites polished. Ovipositor sheath as long as hind wing, hypopygium pointed and posterior end of ovipositor sheath weakly serrate (Fig. 11).

Antenna black, distal third of flagellum yellowish to yellow. Head, palpi and prosternum yellow, meso- and metasoma black. Fore leg yellow, middle and hind legs black. Wings evenly blackish, pterostigma and veins black.

Male and host unknown.

Affinity – Within the *Serraulax* species *S. ater* sp. n. stands quite alone with its black corporal colour except yellow head and fore leg; nearest to *S. lukombensis* and *S. trifasciatus*, their distinction see in key-couplets 4 (5) – 7 (6).

Taxonomic remark – Assigning the species *S. ater* sp. n. to the genus *Serraulax* was not problematic since it readily fit the original description by QUICKE (1987).

Serraulax calopterus (SZÉPLIGETI, 1908)
(Figs 12–18, 82, 90)

Iphiaulax calopterus SZÉPLIGETI, 1908: 33 ♀ (one female), type locality: “Kilimandjaro: Kibonoto-Niederung” (Tanzania), female holotype (“1 Exemplar”, present designation) in Naturhistoriska Riksmuseet, Stockholm; examined. – QUICKE 1984: 345 (“Type designation”).

Gonioabracon calopterus (SZÉPLIGETI): ROMAN 1910: 128 (comb. n.). SHENEFELT 1978: 1684 (literature up to 1941).

Designation of the female holotype of *Iphiaulax calopterus*: (first label, printed) “Kilimandjaro / Sjöstedt. 1905–6”; (second label) “30” (handscript) “okt.” (printed); (third label, printed) “Kibonoto / Nieder.”; (fourth label, printed) “Tanzania”; fifth label is the holotype card. – Holotype is in good condition: (1) pinned by mesosoma; (2) distal half of right flagellum missing; (3) one ovipositor sheath damaged.

Redescription of *Iphiaulax calopterus* – Body 11 mm long. Antenna somewhat longer than body (13 mm) and with 78 flagellomeres. Scape in frontal view 1.6 times as long as broad apically, in outer-lateral view excised (Fig. 12). Head in dorsal view transverse (Fig. 13), 1.6 times as broad as long, eye 1.4 times longer than temple, temple somewhat receded. Hind femur 4.6 times as long as broad distally (Fig. 14). Pterostigma almost 3.9 times as long as wide, *r* issuing less proximally from its middle, *r* 0.7 times as long as width of pterostigma (Fig. 15). First discal cell high, *I–M* 1.3 times longer than *m–cu*, *I–SR–M* broken at *I–M* (Fig. 16, see arrow). First tergite somewhat longer than broad posteriorly and somewhat more narrowed basally, i.e. half as broad basally as broad behind; its scutum also more narrowing anteriorly (Fig. 17). Tergites 3–4 with weak sculpture (Fig. 18, 90). Ovipositor sheath almost as long as hind tibia + tarsus combined. Head yellowish, antenna black, palpi blackish brown. Meso- and metasoma testaceous, legs black. Fore wing (Fig. 82): proximal half brown, distal half yellow with brown margin, pterostigma yellow, apically brown. Hind wing (Fig. 82) brown, distally with a yellow macula.

Male and host unknown.

Distribution – Tanzania.

Affinity – The colour pattern of the wings (Fig. 82), the black legs and the weak sculpture of tergites 3–4 (Fig. 18) of this species distinguish it from all other *Serraulax* species; see key-couplets 2 (3) and 10 (11).

Serraulax conradti (SZÉPLIGETI, 1913)

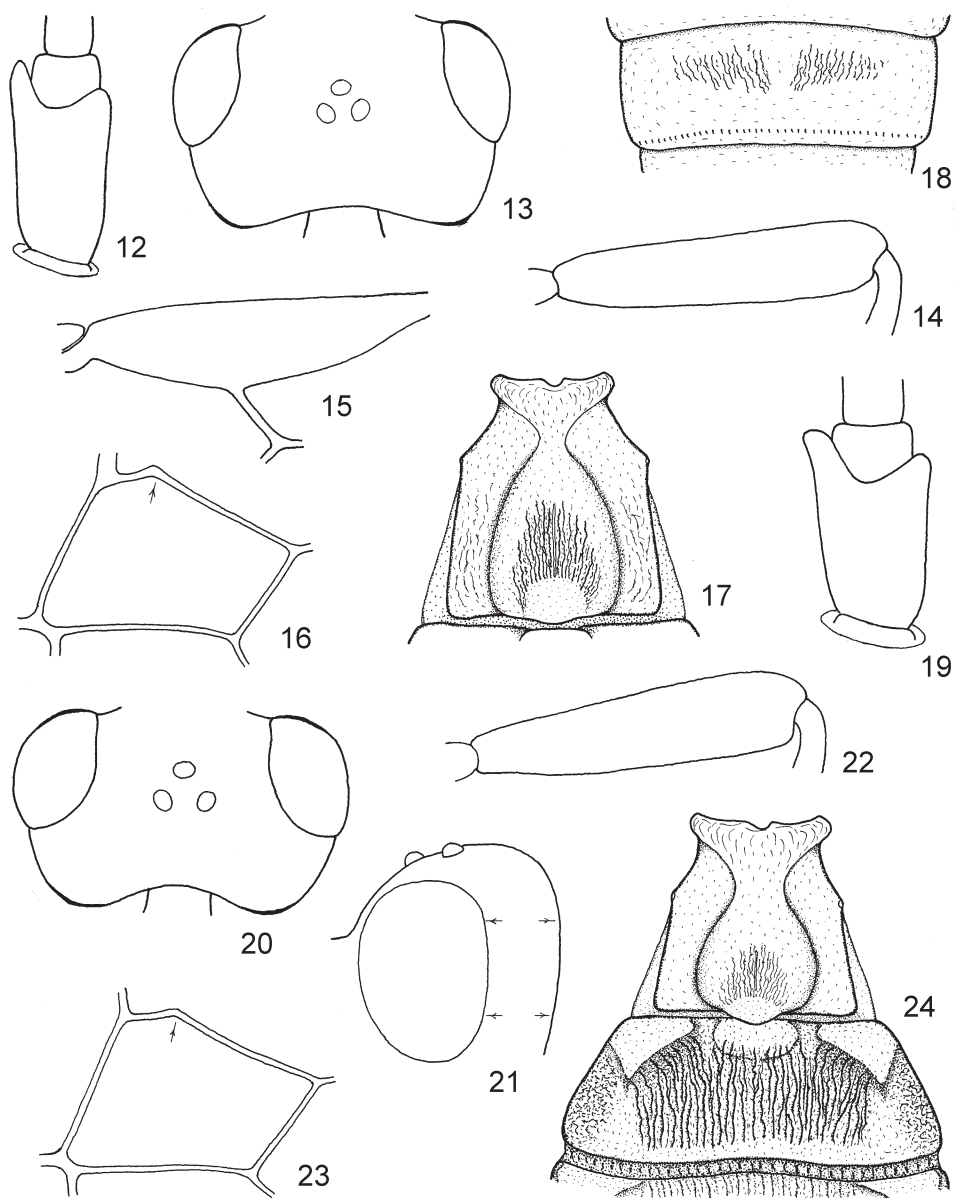
(Figs 19–24)

Iphiaulax conradti SZÉPLIGETI, 1913: 384 ♀ (one female), type locality: “Kamerun”, female holotype (designated by QUICKE & KOCH l.c., labelled by PAPP 2010) in Senckenberg Deutsches Entomologisches Institut, Müncheberg; examined. – FAHRINGER 1935: 525 (in key) and 557 (redescription). SHENEFELT 1978: 1757 (literature up to 1935).

Serraulax conradti (SZÉPLIGETI): QUICKE & KOCH 1990: 223 (comb. n., holotype designation).

Designation of the female holotype of *Iphiaulax conradti*: (first label) “Kamerun / Conradt” (printed) “IX” (handscript); (second label, printed) “Szépligeti det.”; (third label with SZÉPLIGETI’s handscript) “Iphiaulax / Conradt / n. sp.”; (fourth label is with QUICKE’s handscript) “Serraulax conradti n. comb.” (det. QUICKE 1988); fifth label is the holotype card attached by PAPP. – Holotype is in good condition: (1) pinned by mesosoma; (2) both flagelli apically deficient; (3) tarsomeres 2–5 of right hind and tarsus of left hind legs missing; (4) right fore wing distally damaged, a piece of it glued on a separate card.

Redescription of the female holotype of *Iphiaulax conradti* – Body 13 mm long. Right flagellum with 58 and left flagellum with 55 flagellomeres (both flagelli apically deficient). Scape in outer-lateral view excised (Fig. 19). Head in dorsal view transverse (Fig. 20), 1.6 times as broad as



Figs 12–24. 12–18. *Serraulax calopterus* (SZÉPLIGETI) (female holotype): 12 = scape + pedicel in outer-lateral view, 13 = head in dorsal view, 14 = hind femur, 15 = pterostigma + r of right fore wing, 16 = first discal cell, 17 = first tergite, 18 = fourth tergite. – 19–24. *Serraulax conradti* (SZÉPLIGETI) (female holotype): 19 = scape + pedicel in outer-lateral view, 20 = head in dorsal view, 21 = head in lateral view, 22 = hind femur, 23 = first discal cell of right fore wing, 24 = tergites 1–2

long, eye almost 1.6 times longer than temple, temple receded. Temple in lateral view narrowing ventrally and 0.6 times as wide as eye (Fig. 21, see arrows). Hind femur 4.1 times as long as broad distally (Fig. 22). Pterostigma 3.5 times as long as wide and *r* nearly as long as width of pterostigma (cf. Fig. 29). First discal cell: *I-SR-M* weakly bent and less broken at *I-M* as in Fig. 23, see arrow. First tergite slightly broader posteriorly than long laterally, its scutum weakly striate. Second tergite more transverse, 2.6 times as broad posteriorly as long laterally (Fig. 24). Tergites 2–4 striated, fourth tergite on its anterior two-thirds, suture between tergites 2–3 faintly bisinuate. Hind tibia testaceous. Fore wing yellow, transverse three brown streaks wide.

Male and host unknown.

Distribution – Cameroon.

Affinity – *Serraulax conradti* stands nearest to *S. dorsalis* and *S. tigrinus*, their distinction is given in key-couplets 11 (10) – 15 (14).

Serraulax dorsalis (SZÉPLIGETI, 1914)
(Figs 25–32)

Iphiaulax dorsalis SZÉPLIGETI, 1914a: 177 ♀ (five females), type locality: “Togo / Bismarckburg”, female lectotype (designated by QUICKE 1988 in litt.; and four female paralectotypes: present designations) in Zoologisches Museum, Berlin (lectotype + three paralectotypes) and in Magyar Természettudományi Múzeum, Budapest (one paralectotype); examined. QUICKE 1983: 82.

Bathyaulax dorsalis (SZÉPLIGETI): FAHRINGER 1935: 371, 523 (in key) and 387 (redescription). SHENEFELT 1978: 1454 (literature up to 1935).

Serraulax dorsalis (SZÉPLIGETI): QUICKE 1987: 145 (comb. n.).

Designation of the female lectotype of *Iphiaulax dorsalis*: (first blue label) “Togo / Bismarckburg / 15.–17. IV. [18]93 / L. Conradt S.”; (second label with SZÉPLIGETI’s handscript) “Iphiaulax / 6. dorsalis / m.”; fourth label is QUICKE’s and fifth label (reverse the fourth label) is PAPP’s lectotype cards; sixth label is with the actual name *Serraulax dorsalis* (SZÉPL.) given by PAPP. – Lectotype is in good condition: (1) pinned by mesosoma; (2) right flagellum apically and left flagellum proximally deficient; (3) pair of ovipositor sheaths proximally broken, distally adhered to ovipositor.

Designations of the four female paralectotypes (three females in Berlin, one female in Budapest) of *Iphiaulax dorsalis*: 1 ♀ (in Berlin): (first blue label) “Togo / Bismarckburg / 9.–11. V. [18]93 / L. Conradt S.”. 1 ♀ (in Berlin): (first blue label) “Span.[isch] Guinea / Nkolentangan” (printed) / “XI. [19]07–V. [19]08” (handscript) / “G. Teßmann S.G.” (printed) (second label, printed) “Equatorial Guinea”. 1 ♀ (in Berlin): (first blue label, handscript) “S.[üd] Kamerun / Joko / Schröder S. / Stidrel V.”. 1 ♀ (in Budapest): (first blue label) “Togo / Bismarckburg / 20.7 – 20.9.[19]90 / R. Büttner S.” All four female with paralectotype cards (second labels) and third labels are with the actual name *Serraulax dorsalis* (SZÉPL.) given by me. – Four female paralectotypes in more or less good condition: (1) pinned by mesosoma; (2) flagelli either missing or partly damaged; (3) fore right leg (except coxa and trochanter) missing (1 ♀).

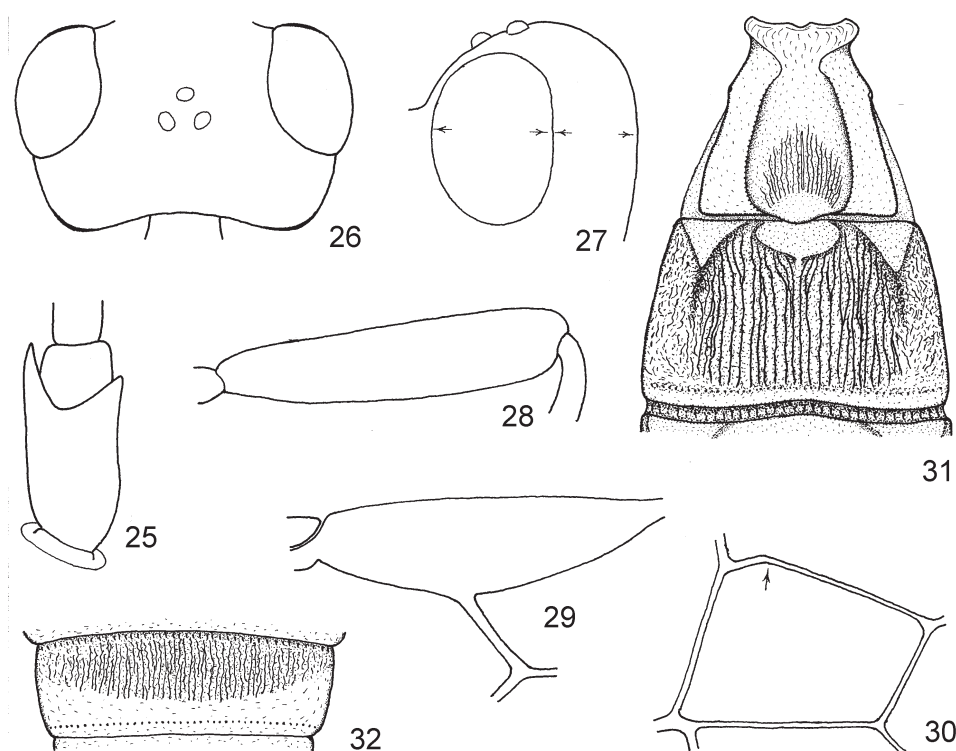
Redescription of the female lectotype of *Iphiaulax dorsalis* – Body 13 mm long. Right flagellum with 60 and left flagellum with 19 flagellomeres (i.e. both flagelli damaged). Scape in outer-lateral view twice as long as broad apically and here deeply excised (Fig. 25). Head in dorsal view transverse (Fig. 26), 1.6 times as broad as long, eye 1.8 times longer than temple, temple rather receded. Temple in lateral view evenly wide beyond eye and 0.7 times as wide as eye (Fig. 27, see ar-

rows). Hind femur 4.3 times as long as broad distally (Fig. 28). Pterostigma 3.5 times as long as wide and *r* nearly, i.e. 0.85 times, as long as width of pterostigma (Fig. 29). First discal cell high, *I-M* 1.4 times as long as *m-cu*, *I-SR-M* and *I-2CU1* not parallel, *I-SR-M* weakly broken at *I-M* (Fig. 30, see arrow). First tergite evenly broadening posteriorly and as long as broad behind, scutum striated and anteriorly less narrowing. Second tergite transverse, 1.75 times as broad posteriorly as long medially, its three anterior fields small and polished, together with tergites 3–4 striated (Figs 31–32). Body and legs testaceous, antenna and hind tibia + tarsus black, face and cheek yellowish, palpi testaceous. Wings yellow with three transverse brown streaks.

Deviating features of the four female paralectotypes of *Iphiaulax dorsalis* – Similar to the female lectotype. Body 10–13 mm long (10: 1 ♀, 12: 2 ♀♀, 13: 1 ♀). Antenna somewhat longer than body and flagellum with 66 flagellomeres (1 ♀ from Togo with not damaged flagellum). Head in dorsal view somewhat less to somewhat more than 1.6 times as broad as long (1 ♀: 1.57, 1 ♀: 1.6, 2 ♀♀: 1.62 times). Eye in dorsal view almost 1.4 times longer than temple (1 ♀). Scutum of first tergite with somewhat weaker striation.

Male and host unknown.

Distribution – Cameroon, Equatorial Guinea, Gabon, Togo, Zaire.



Figs 25–32. *Serraulax dorsalis* (SZÉPLIGETI) (female lectotype): 25 = scape + pedicel in outer-lateral view, 26 = head in dorsal view, 27 = head in lateral view, 28 = hind femur, 29 = pterostigma and *r* of right fore wing, 30 = first discal cell of right fore wing, 31 = tergites 1–2, 32 = fourth tergite

Affinity – In the subsequent key the species *Serraulax dorsalis* runs to *S. tigrinus* (SZÉPLIGETI): see key-couplets 14 (15) – 17 (16), however, it is nearest to *S. conradti* (SZÉPLIGETI), their distinction is as follows:

- 1 (2) Eye in dorsal view (1.4–)1.8 times longer than temple, temple less receded (Fig. 26). Hind femur 4.1 times as long as broad distally (Fig. 28). Second tergite less transverse, 1.75 times as broad posteriorly as long medially (Fig. 31). Hind tibia black. ♀: 10–13 mm *S. dorsalis* (SZÉPLIGETI, 1914)
- 2 (1) Eye in dorsal view almost 1.6 times longer than temple, temple slightly more receded (Fig. 20). Hind femur 3.9 times as long as broad distally (Fig. 22). Second tergite more transverse, 2.6 times as broad posteriorly as long medially (Fig. 24). Hind tibia testaceous. ♀: 13 mm
S. conradti (SZÉPLIGETI, 1913)

Serraulax lukombensis (CAMERON, 1912)
(Figs 33–47, 71, 83, 91)

Iphiaulax lukombensis CAMERON, 1912: 363 ♀, type locality: “Lukombe” (former Belgian Congo, currently Democratic Republic of Congo or Zaire), “Type” (or holotype) in Musée Royal de l’Afrique Centrale, Tervuren; examined. – QUICKE 1984: 345 (“Type” designation).

Megagonia lukombensis (CAMERON): FAHRINGER 1935: 486 (in key) and 490 (comb. n., redescription). SHENEFELT 1978: 1697 (“*Megagonia lukombensis*: SZÉPLIGETI 1914b: 166...and 1915: 144” error, literature up to 1935).

Serraulax lukombensis (CAMERON): QUICKE 1987: 146 (comb. n., redescription, type species of *Serraulax*).

Ipoibracon guineensis SZÉPLIGETI, 1914: 175 ♀ (syntype series: three females), type locality: Alen (on label “Alcu”) Benitogebiet (lectotype, Equatorial Guinea), female lectotype (and two female paralectotypes, designated by QUICKE & KOCH l.c.) in Museum für Naturkunde, Berlin; examined, **syn. n.** – SHENEFELT 1978: 1820 (literature up to 1929).

Serraulax guineensis (SZÉPLIGETI): QUICKE & KOCH 1990: 223 (lectotype and paralectotypes designations).

Designation of the female “Type” or holotype of *Iphiaulax lukombensis* (after QUICKE l.c.): (first brownish red label) “Type” (=holotype, printed) / “lukombensis Cam.” (handscript); (second label, printed) “Musée du Congo / Lukombe 12.X.[19]08 / A. Koller”; (third label with CAMERON’s handscript) “Iphiaulax / lukombensis / Cam. type”; (fourth label, DE SAEGER’s handscript) “Megagonia / lukombensis Cam. / (Iphiaulax) / det. De Saeger 1942.” – Holotype is in good condition: (1) pinned by mesosoma, somewhat deformed; (2) antennae deficient, left one glued (in two pieces) on a separate card; (3) missing: tarsomeres 3–5 of right fore tarsus, tarsus of left fore leg, fifth tarsomere of right middle and hind tarsi; (4) fore wing distally somewhat torn, left hind wing apically deficient; left pair of wings glued to mesosoma and insect pin itself.

Designation of the female lectotype of *Ipoibracon guineensis*: (first label, printed) “Sp.[anisch] Guinea / Alcu Benitogbt. / 16–31. VIII. [19]06”; (second label close below first label, printed) “Equa-

torial Guinea”; (third label with SZÉPLIGETI’s handscript) “*Ipobracon* / 32. *guineensis* / Sz.”; fourth label is the lectotype card; fifth label is with the actual name *Serraulax lukombensis* (CAM.) det. PAPP J. 2010 (labels 4–5 attached by me). – Lectotype is in goond condition: (1) pinned by mesosoma; (2) right flagellum missing, left flagellum distally deficient; (3) tarsomeres 4–5 of right hind and left middle legs missing; (4) both ovipositor sheaths broken basally (and adheres to the ovipositor).

Designation of the first female paralectotype of *Ipobracon guineensis*: (first label, printed) “Sp.[anisch] Guinea HIntl. / Nkolentangan / Tessmann S.G. / (handscript) “16.11.[19]08”; (second label, close below first label, printed) “Equatorial Guinea”; third label is the paralectotype card; fourth label is with the actual name *Serraulax lukombensis* (CAM.) det. PAPP J. 2010 (labels 3–4 attached by me). – Paralectotype is in good condition: (1) right flagellum apically deficient; (2) left fore wing apico-anteriorly deficient.

Designation of the second female paralectotype of *Ipobracon guineensis*: (first label, printed) “SO. Kamerun / Lolodorf / L. Conradt [18]95”; second label is the paralectotype card; third label is with the actual name *Serraulax lukombensis* (CAM.), see before. – Paralectotype is in good condition: right flagellum apically deficient.

Taxonomic remark – The type specimens of the two taxa, *Iphiaulax lukombensis* and *Ipobracon guineensis*, are quite identical with each other, *I. guineensis* is the junior synonym.

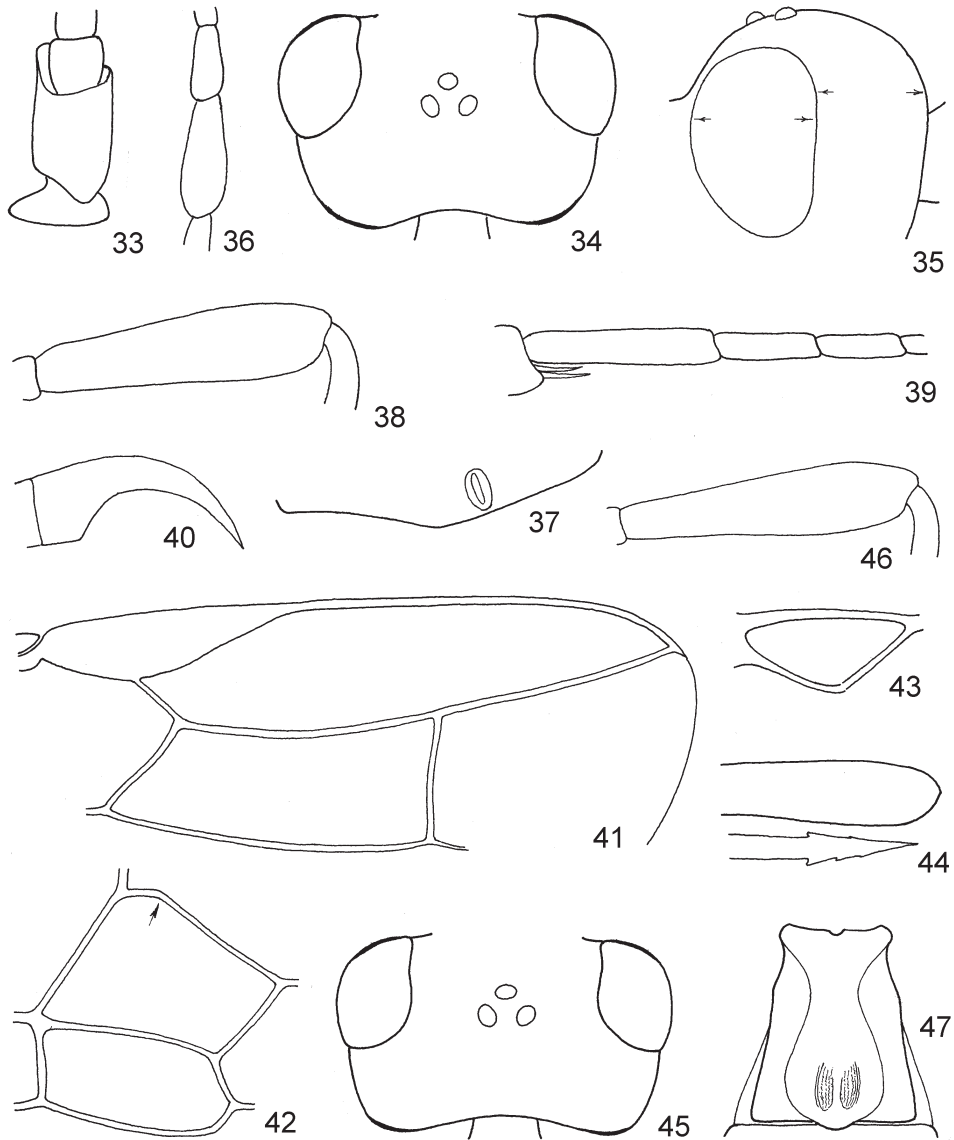
Material examined (2 ♀♀, in Museum Budapest) – 1 ♀: Cameroon, Abong Mbang, 1958, leg. LENCZY. 1 ♀: Togo, Bismarckburg, 9–11 V 1895, leg. L. CONRADT.

Redescription of the female holotype of *Iphiaulax lukombensis* (completion of QUICKE’s description) – Body 15 mm long. Antenna about as long as body. Scape in outer-lateral view twice longer than broad apically and here less deeply excised (Fig. 33). Head in dorsal view less transverse (Fig. 34), 1.6 times as broad as long, eye almost 1.4 times longer than temple, temple rather receded. Ocelli small, near to each other. OOL three times longer than POL. Eye in lateral view 1.5 times as high as wide and slightly wider than temple, temple beyond eye narrowing ventrally (Fig. 35, see arrows). Horizontal diameter of oral opening somewhat shorter than shortest distance between opening and eye (cf. Fig. 331 in QUICKE 1987: 146). Third joint of maxillar palp weakly flattened (Fig. 36). Head polished, face coriaceous-subrugulose.

Mesosoma in lateral view twice as long as high, polished. Notaulix faintly distinct. Propodeum polished, pair of spiracles small and on its lateral-declivous part (Fig. 37). Hind femur four times as long as broad distally (Fig. 38). Hind basitarsus as long as tarsomeres 2–3 combined (Fig. 39). Claw gradually thickening basally, i.e. without basal lobe (Fig. 40).

Fore wing as long as body. Pterostigma (Fig. 41) four times as long as wide, *r* issuing proximally from its middle and a bit shorter than width of pterostigma. Second submarginal cell long, 3–*SR* 2.5 times as long as 2–*SR*, 3–*SR* and 2–*M* clearly diverging, i.e. second submarginal cell widening distally, *r-m* just longer than 2–*SR*; *SRI* somewhat shorter than 3–*SR* and reaching tip of wing. First discal cell: 1–*M* 1.38 times length of *m-cu* and two veins parallel, 1–*SR-M* 1.3 times longer than 1–*M* and broken at 1–*M* (Fig. 42, see arrow). First subdiscal cell wide: *cu-a* just interstitial, 3–*CUI* longer than *CUIb*, 2–*IA* arched (Fig. 42). – Hind wing: *cu-a* clearly inclivous (Fig. 43).

First tergite (Fig. 71, 91) somewhat longer than broad posteriorly, evenly broadening posteriorly, pair of spiracles before middle of tergite, scutum fairly domed, its upper (or horizontal) surface longitudinally striate, median stria cariniform, otherwise smooth and shiny. Second tergite transverse, almost 1.9 times broader posteriorly than long laterally, basally with an elliptic median and a pair of three-sided lateral fields, fields polished, otherwise tergite striated (Fig. 71, 91). Suture be-



Figs 33–47. *Serraulax lukombensis* (CAMERON) (female holotype: 33–44, female: 45–47): 33 = scape + pedicel in outer-lateral view, 34 = head in dorsal view, 35 = head in lateral view, 36 = joints 2–3 of maxillary palp, 37 = spiracle of propodeum, 38 = hind femur, 39 = tarsomeres 1–3 of hind leg, 40 = claw, 41 = distal part of right fore wing, 42 = first discal and first subdiscal cells, 43 = nervellus of hind wing, 44 = hind end of ovipositor apparatus, 45 = head in dorsal view, 46 = hind femur, 47 = first tergite

tween tergites 2–3 deep, weakly bisinuate, crenulated. Third tergite transverse, 2.3 times broader posteriorly than long laterally, its hind margin concave, medially striated, before its hind margin with a crenulate sulcus. Further tergites polished, tergites 4–6 basally with finely crenulated sulcus (Fig. 71). Ovipositor sheath long, as long as metatarsus and half of mesosoma combined; its end with ovipositor as in Fig. 44.

Head yellow, meso- and metasoma testaceous. Black: antenna, hind tibia and tergites 4–7. Legs also testaceous, hind basitarsus faintly brownish. Wings yellow, fore wing distally with three dark brown transverse streaks (Fig. 83); hind wing distally brown with a yellow patch anteriorly.

Deviation features of the two females – Body 14 mm long. Head in dorsal view 1.7 times as broad as long (Fig. 45). Hind femur 4.3 times (1 ♀, Fig. 46) and 5 times (1 ♀) as long as broad distally. Scutum of first tergite only striated behind (Fig. 47). Metasoma entirely testaceous.

Male and host unknown.

Distribution – Cameroon, Equatorial Guinea, Togo, Uganda, Zaire.

Affinity – *Serraulax lukombensis* is nearest to *S. trifasciatus* (SZÉPLIGETI), their distinction is presented in the key-couplets 5 (4) – 7 (6).

Serraulax orientalis (SZÉPLIGETI, 1914)
(Figs 48–53, 84, 92)

Iphiaulax orientalis SZÉPLIGETI, 1914a: 177 ♀ (two females), type locality: “Deutsch-Ostafrika, Langenburg” (?=Lilongwe, Malawi), female lectotype (and one female paralectotype designated by QUICKE & KOCH l.c.) in Museum für Naturkunde, Berlin; examined. – FAHRINGER 1935: 525 (in key) and 593 (redescription). SHENEFELT 1978: 1794 (literature up to 1935).

Serraulax orientalis (SZÉPLIGETI): QUICKE & KOCH 1990: 223 (comb. n., type designations).

Designation of the female lectotype of *Iphiaulax orientalis*: (first blue label, printed) “Kenya / Nyassa See / Langenburg / 9–10. VIII. [18]98”; (second label) “Iphiaulax / orientalis Sz.” (SZÉPLIGETI’s original label with his handscript and a separate det. Szépligeti label added reverse by me); third label is the lectotype card, fourth label is with the actual name *Serraulax orientalis* (SZÉPL.) given by me. – Lectotype is in less good condition: (1) pinned by mesosoma; (2) left flagellum missing, right flagellum apically damaged; (3) left pair of wings glued on a separate card; (4) missing: left fore leg except coxa, tarsomeres 3–5 of right middle leg, fifth tarsomere of right hind leg.

Designation of the female paralectotype of *Iphiaulax orientalis*: (first blue label) “Tanzania” (printed) “Ost-Usumbara” (handscript) “D.O. Africa / F. Fischer S.”; second label is the paralectotype card and third label is with the actual name *Serraulax orientalis* (SZÉPL.). – Paralectotype is in fairly poor condition: (1) pinned by mesosoma; (2) right damaged flagellum glued on a separate card; (3) tarsomeres 3–5 of fore left and fifth tarsomere of left hind leg missing; (4) ovipositor apparatus missing.

Material examined – 4 ♀♀ (in Museum Budapest): Mozambique, Boroma.

Redescription of the female lectotype of *Iphiaulax orientalis* – Body 15 mm long. Right and apically damaged flagellum with 57 flagellomeres. Scape in outer-lateral view 1.7 times as long as broad apically and here deeply excised (Fig. 48). Head in dorsal view transverse (Fig. 49), 1.6 times as broad as long, eye 1.4 times longer than temple, temple less rounded. Temple in lateral view wide beyond eye and 0.7 times as wide as eye (Fig. 50, see arrows). Hind femur almost 4.4 times as long as

broad distally (Fig. 51). Pterostigma 3.6 times as long as wide and r 0.8 times as long as width of pterostigma; 3- SR distinctly bisinuate (Fig. 52). First tergite (Fig. 92) as long as broad posteriorly, beyond pair of spiracles less broadening, scutum relatively broad. Second tergite transverse, twice as broad posteriorly as long medially (Fig. 53). Tergites 3-5 striated (Fig. 92). Head and mesosoma ochre, metasoma testaceous. Antenna black. Legs ochre, hind tibia + tarsus black. Pterostigma: proximal half yellow, distal half black. Wings: proximally yellow, more than distal half blackish brown with white small maculae at 2- $SR-M$ and along $r-m$ (Fig. 84).

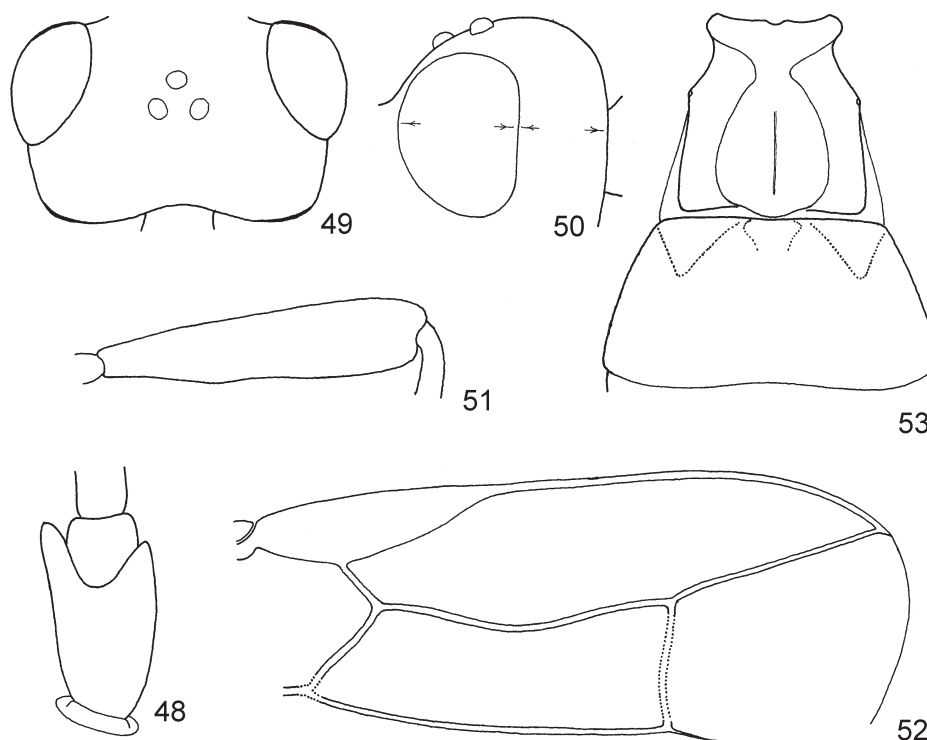
Deviating features of the female paralectotype of *Iphiaulax orientalis* – Similar to the female lectotype. Body 12 mm long, less strong. Dark colour of wings light brown (colour fading?).

Deviating features of the four females – Similar to the lectotype. Body 13–15 mm long. Head in dorsal view almost 1.6 to 1.6 times as broad as long, temple rather receded. Hind femur 3.9–4.4 times as long as broad distally (3.9: 1 ♀, 4.1: 2 ♀♀, 4.4: 1 ♀).

Male and host unknown.

Distribution – Malawi, Mozambique, Tanzania.

Affinity – *Serraulax orientalis* is near to *S. palpator* (SZÉPLIGETI) and *S. per-similis* (SZÉPLIGETI), their distinction see in key-couplets 19 (22) – 22 (19). *S. orientalis* is also near to *S. semiluteus*, their distinction is presented at the latter species.



Figs 48–53. *Serraulax orientalis* (SZÉPLIGETI) (female lectotype): 48 = scape and pedicel in outer-lateral view, 49 = head in dorsal view, 50 = head in lateral view, 51 = hind femur, 52 = distal part of right fore wing, 53 = tergites 1–2

Serraulax palpator (SZÉPLIGETI, 1914)
(Figs 54–59)

Iphiaulax palpator SZÉPLIGETI, 1914a: 176 ♀ (one female), type locality: “Süd-Aethiopien, Schedia” (Ethiopia), female lectotype (designation in 2005 by me) in Museum für Naturkunde, Berlin; examined. – QUICKE 1983: 83.

Bathyaulax palpator (SZÉPLIGETI): FAHRINGER 1931: 370 (in key) and 392 (comb. n., redescription); 1935: 523 and 525 (in key for Afrotropical *Iphiaulax* species). SHENEFELT 1978: 1455 (literature up to 1935).

Serraulax palpator (SZÉPLIGETI): QUICKE 1987: 145 (comb. n.).

Designation of the female lectotype of *Iphiaulax palpator*: (first blue label, handwriting) “S. Aethiopien /Schedia 29.4.1901. / Coll. O. Neumann”; (second label) “Iphiaulax / 3. palpator / Sz.” (SZÉPLIGETI’s original label with his handscript and a separate det. Szépligeti label added reverse by me); third label is the lectotype card and fourth label is with the actual name *Serraulax palpator* (SZÉPL.) given by me. – Lectotype is in fairly poor condition: (1) pinned by mesosoma; (2) pair of flagelli missing; (3) wing somewhat damaged, pair of left wing glued on a separate card; (4) missing: right fore leg except coxa, tarsi of middle legs.

Material examined – 1 ♀ + 1 ♂ (in Museum Budapest): Eritrea, Asmara (the female specimen was named by SZÉPLIGETI as *Iphiaulax tigrinus* SZÉPL.)

Redescription of the female lectotype of *Iphiaulax palpator* – Body 10 mm long. Scape in outer-lateral view deeply excised (Fig. 54). Head in dorsal view subcubic (Fig. 55), 1.5 times as broad as long, eye 1.25 times longer than temple, temple less rounded. Third joint of maxillar palp flattened (Fig. 56). Hind femur 4.1 times as long as broad distally (cf. Fig. 22). Pterostigma 3.6 times as long as wide and *r* issuing less distally from its middle, 3–*SR* and *SRI* equal in length (Fig. 57). First discal cell like that of *S. conradti* (cf. Fig. 23). First tergite slightly more broadening posteriorly, as broad posteriorly as long, its scutum narrowing in a straight line basally (Fig. 58). Second tergite 1.8 times as broad posteriorly as long medially (Fig. 58), its antero-median field almost entirely striate. Tergites 3–5 striated. Ovipositor sheath somewhat shorter than body or as long as hind tibia + tarsus combined. Scape and pedicel black. Head yellow, meso- and metasoma testaceous. Fore leg: coxa + trochanters and femur proximally blackish to brownish, rest of leg testaceous; middle and hind legs black, middle tibia blackish. Wings yellow, fore wing distally with three streaks; hind wing distally brown with an anterior yellow macula.

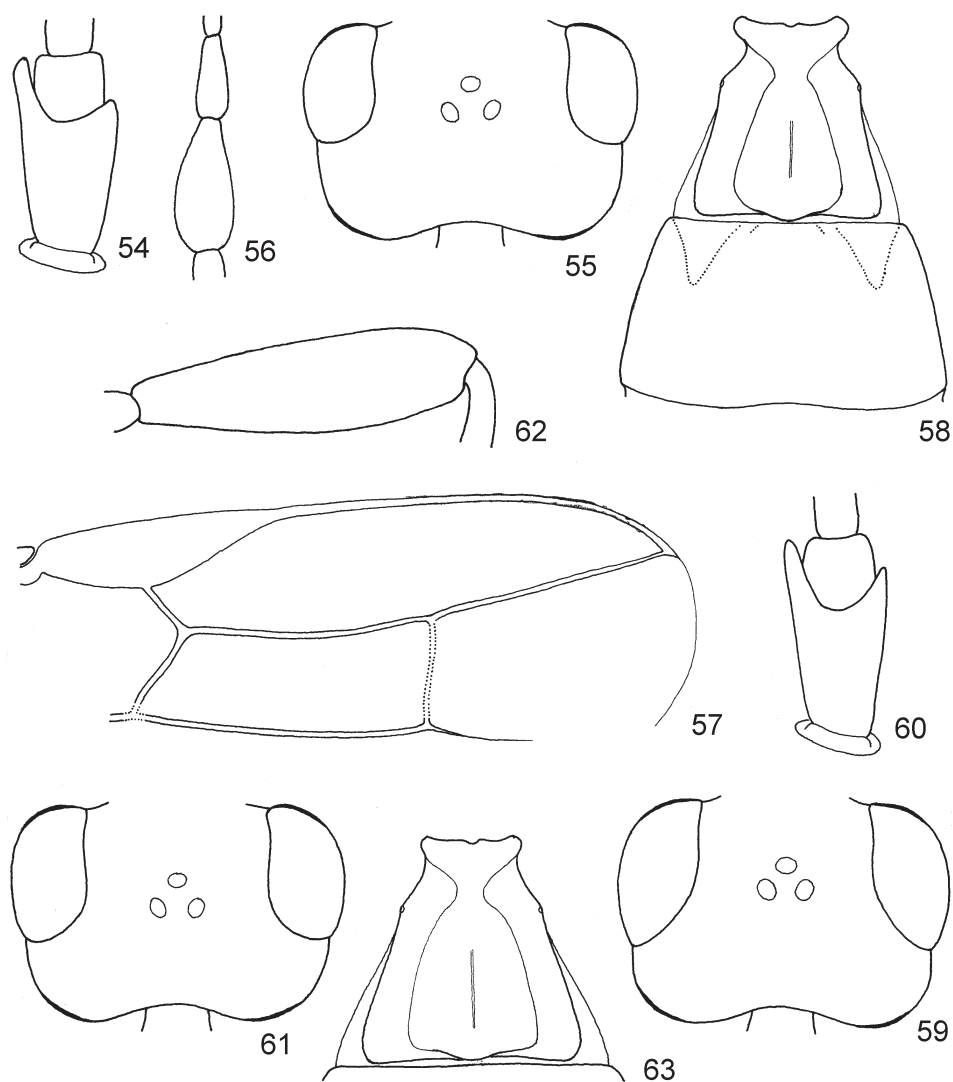
Deviating features of the female (1 ♀) – Similar to the female lectotype. Body somewhat stronger, 16 mm long. First tergite somewhat broader and slightly less broadening posteriorly (cf. Fig. 24).

Male new – Similar to the female. Body 11 mm long. Antenna longer than body and flagellum with 58 flagellomeres. Head in dorsal view a bit more subcubic, eye 1.9 times longer than temple (Fig. 59). Scutum of first tergite more domed. Striation of tergites somewhat stronger. Brown colour of wing less dark (fading?).

Host unknown.

Distribution – Eritrea, Ethiopia.

Affinity – *Serraulax palpator* is near to *S. orientalis* and *S. persimilis*, their distinction is presented in the key-couplets 19 (22) – 22 (19).



Figs 54–63. 54–59. *Serraulax palpator* (SZÉPLIGETI) (female lectotype: 54–58, male: 59): 54 = scape + pedicel in outer-lateral view, 55 = head in dorsal view, 56 = joints 2–3 of maxillar palp, 57 = distal part of right fore wing, 58 = tergites 1–2, 59 = head in dorsal view. – 60–63. *Serraulax persimilis* (SZÉPLIGETI) (female holotype): 60 = scape and pedicel in outer-lateral view, 61 = head in dorsal view, 62 = hind femur, 63 = first tergite

Serraulax persimilis (SZÉPLIGETI, 1906)
(Figs 60–63, 85, 93)

Megagonia persimilis SZÉPLIGETI, 1906: 582 ♀ (one female), type locality: “Deutsch-Ostafrika: Mto-ya-kifaru” (Tanzania), female holotype in Magyar Természettudományi Múzeum, Budapest; examined. – FAHRINGER 1935: 486 (in key) and 492 (redescription). SHENEFELT 1978: 1697 (literature up to 1935). QUICKE 1991: 183 (“Possibly an aberrant species of *Serraulax* QUICKE but there is no mid-basal area on the 2nd metasomal tergite.”).

Iphiaulax togoensis SZÉPLIGETI, 1914a: 177 ♀ (syntype series: four females), type locality: “Togo...Hinterland”, female lectotype (designated by QUICKE & KOCH 1990: 223) in Museum für Naturkunde, Berlin and “Togo, Misahöhe”, female paralectotype (designated by PAPP 1983) in Magyar Természettudományi Múzeum, Budapest; examined, *syn. n.* (two female paralectotypes, in Museum Berlin, designated by QUICKE & KOCH l.c. not seen).

Goniobracon togoensis (SZÉPLIGETI.): FAHRINGER 1935: 463, 465 (in key) and 481 (redescription), 524 (in key to Afrotropical *Iphiaulax* species). SHENEFELT 1978: 1686 (literature up to 1935).

Serraulax togoensis (SZÉPLIGETI): QUICKE & KOCH 1990: 223 (comb. n., designation of the lectotype and two paralectotypes).

Designation of the female holotype of *Megagonia persimilis*: (first label, printed) “Afr. or. / Katona”; (second label) “Mto-ya-Kifaru” (printed) “1904. / XII.” (handscript, reverse the label); (third label, printed) “Tanzania”; fourth label is the holotype card, fifth label is with the inventory number “1170”, sixth label is with the actual name *Serraulax persimilis* (SZÉPL.) given by me. – Holotype is in fairly poor condition: (1) pinned by mesosoma; (2) right flagellum missing, left flagellum damaged; (3) distal part of fore wings damaged; (4) right hind leg, except coxa + trochanter, missing; (5) left ovipositor sheath missing.

Designation of the female lectotype of *Iphiaulax togoensis*: (first blue label, printed) “West-Afrika / Togo Hinterland / Kling S.”; (second label) “Iphiaulax / 4 togoensis / Sz.” (SZÉPLIGETI’s original label with his handscript and a separate det. Szépligeti label added reverse the original label); third fairly large label is QUICKE’s lectotype card attached 1988 and reverse it my lectotype card attached 2005; fourth label is with the actual name *Serraulax persimilis var. togoensis* (SZÉPLIGETI) given by me in 2010. – Female lectotype is in good condition: (1) pinned by mesosoma, wings nicely expanded flat; (2) right flagellum missing, left flagellum distally deficient; (3) right fore tarsus missing.

Designation of the female paralectotype (in Museum Budapest) of *Iphiaulax togoensis*: (first blue label, printed) “Kamerun int. / Mao Godi / 9.–13.VI.[19]09”; second label is with the name “Iphiaulax togoensis” det. SZÉPLIGETI, third label is with the name “Goniobracon togoensis Szépl.” det. FAHRINGER; fourth label is the paralectotype card attached by me, fifth label is with the inventory number “11321”; sixth label is with the name *Serraulax togoensis* (SZÉPL.) det. QUICKE 1989; seventh label is with the actual name *Serraulax persimilis var. togoensis* (SZÉPL.) given by me 2010. – Paralectotype is in good condition: (1) pinned by mesosoma; (2) pair of flagelli not damaged.

Redescription of the female holotype of *Megagonis persimilis* – Body 14 mm long. Scape in outer-lateral view circularly emarginated (Fig. 60). Left flagellum with 21 flagellomeres. Head in dorsal view subcubic (Fig. 61), 1.5 times as broad as long, eye 1.6 times longer than temple, temple more rounded. Hind femur 3.5 times as long as broad distally (Fig. 62). Distal part of fore wings heavily damaged hence pterostigma etc. almost invisible. First tergite as long as broad posteriorly, clearly broadening posteriorly, i.e. somewhat more than twice broader posteriorly than basally (Fig. 63). Second tergite 1.75 times as broad posteriorly as long medially (cf. Fig. 58), its antero-median field

striate. Tergites 3–5 striated (Fig. 93). Ovipositor sheath somewhat longer than hind tibia + tarsus combined. Body and legs testaceous; wings evenly brown.

Serraulax persimilis var. *togoensis* (SZÉPLIGETI, 1914)

Deviating features from the nominate form: similar to the female holotype except the colour of the wings:

Nominate form: Wings evenly brown.

Var. *togoensis*: Ground colour of wings yellow, fore wing distally with three transverse brown streaks, hind wing distally brown anteriorly with a yellow macula (Fig. 85). Body 12–15 mm long. Flagellum with 61 flagellomeres.

Remark – The above deviations is a “taxonomic fillip”: supposedly the *var. togoensis* is the usual (or frequent) form of the species and the nominate form, contrary, is the less usual (or less frequent) form of the species. This supposition is based on the observation that the ground colour of the wings are usually yellow with brown streaks and less usually the ground colour of the wings are more or less brown. In the case the form *togoensis* would be described earlier than *persimilis* then this taxonomic situation would be considered “normally”.

Male and host unknown.

Distribution – Cameroon, Tanzania, Togo.

Affinity – *Serraulax persimilis* is nearest to *S. palpator* and *S. orientalis*, their distinction is given at the key-couplets 19 (22) – 22 (19).

Serraulax semiluteus (SZÉPLIGETI, 1911) **comb. n.**
(Fig. 86)

Iphiaulax semiluteus SZÉPLIGETI, 1911: 404 ♀ (one female), type locality: “Nyassa-See, Langenburg” (?= Lilongwe, Malawi), female holotype (“1 Exemplar”) in Museum für Naturkunde, Berlin; examined. – FAHRINGER 1935: 525 (in key) and 607 (redescription). SHENEFELT 1978: 1795 (literature up to 1935).

Designation of the female holotype of *Iphiaulax semiluteus*: (first blue label, printed) “Nyassa-See / Langenburg / V. [18]98 / Fülleborn S.”; (second label attached by me, printed) “Malawi”; third label is with SZÉPLIGETI’s original identification and manuscript; fourth label is the holotype card and fifth label is with the actual name *Serraulax semiluteus* (SZÉPL.) given by me 2010. – Holotype is in good condition: (1) pinned by mesosoma; (2) right fore wing apically deficient; (3) tarsomeres 3–5 of right hind and tarsomere 5 of left hind legs missing.

Redescription of the female holotype of *Iphiaulax semiluteus* – Body 14 mm long. Antenna as long as body and with 71 flagellomeres. Scape in outer-lateral view 1.6 times as long as broad apically and here excised (cf. Fig. 64). Head in dorsal view subcubic (cf. Fig. 65), 1.5 times as broad as long, temple rounded. Temple in lateral view just narrowing ventrally (cf. Fig. 21), 0.85 times as wide as eye. Hind femur 4.1 times as long as broad distally (cf. Fig. 51). Pterostigma three times as long as wide and r 0.75 times as long as width of pterostigma (cf. Fig. 29). First tergite a bit longer than broad posteriorly, beyond pair of spiracles subparallel (cf. Fig. 17). Second tergite transverse, twice as broad posteriorly as long medially (cf. Fig. 53). Tergites 1–4 striated, tergites 3–4 with much anastomoses, fifth and further tergites polished. Antenna black. Head yellow, mesosoma testaceous to yellowish, metasoma testaceous. Legs yellow, hind tibia distally and hind tarsus entirely blackish. Wings proximally yellow, distal half brown, pterostigma: proximal half yellow, distal half brown (Fig. 86).

Male and host unknown.

Distribution – Malawi.

Affinity – *Serraulax semiluteus* is nearest to *S. orientalis*, the two species are very similar to each other viewing the colour pattern of their wings (distal half of wings evenly brown), proportional length to width of tergites and form of femur. The distinctive features between them are as follows:

- 1 (2) Fifth tergite striated with much anastomoses. Head in dorsal view transverse, 1.6 times as broad as long (Fig. 49). Scape in outer-lateral view 1.7 times as long as broad apically and here emarginate (Fig. 48). Temple in lateral view beyond eye evenly wide (Fig. 50). Fore wing: 3–SR distinctly bisinuate (Fig. 52). ♀: 12–15 mm *S. orientalis* (SZÉPLIGETI, 1914)
- 2 (1) Fifth tergite polished. Head in dorsal view subcubic, 1.5 times as broad as long (cf. Fig. 65). Scape in outer-lateral view 1.6 times as long as broad apically and here excised (cf. Fig. 64). Temple in lateral view beyond eye just narrowing (cf. Fig. 21). Fore wing: 3–SR less bisinuate (cf. Fig. 8). ♀: 14 mm *S. semiluteus* (SZÉPLIGETI, 1911)

Affinity – In the key to the *Serraulax* species *S. semiluteus* runs to *S. tigrinus*, see key-couplets 15 (14) – 17 (16).

Serraulax tigrinus (SZÉPLIGETI, 1908)
(Figs 64–70, 87, 94)

Iphiaulax tigrinus SZÉPLIGETI, 1908: 33 ♀ (four females), type locality: “Usambara: Mombo” (Tanzania), female lectotype (and three female paralectotypes, present designations) in Naturhistoriska Riksmuseet, Stockholm; examined. – QUICKE 1984: 345 (“Type” designation).

Iphiaulax tigrinus var. *interruptus* SZÉPLIGETI, 1908: 34 ♀ (two females), locality: “Usambara: Mombo” (Tanzania), two females in Naturhistoriska Riksmuseet, Stockholm; examined.

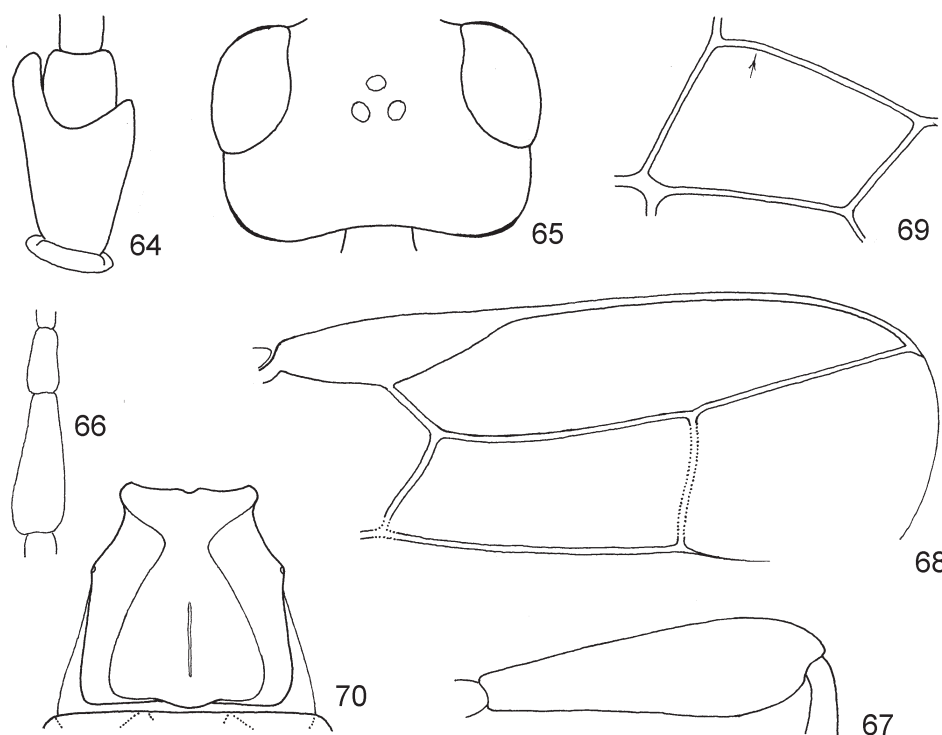
Goniobracon tigrinus (SZÉPLIGETI): ROMAN 1910: 128 (comb. n.). FAHRINGER 1935: 464 (in key) and 481 (redescription). SHENEFELT 1978: 1686 (literature up to 1935).

Goniobracon tigrinus var. *interruptus* (SZÉPLIGETI, 1908): SHENEFELT 1978: 1686 (literature up to 1926).

Serraulax tigrinus (SZÉPLIGETI): QUICKE 1987: 146 (comb. n.).

Designation of the female lectotype of *Iphiaulax tigrinus*: (first label, printed) “Tanzania / Usambara”; (second label, printed) “Mombo / Sjöstedt”; third label is the lectotype card and fourth label is with the actual name *Serraulax tigrinus* (SZÉPL.) given by me 2009. – Lectotype is in good condition: (1) pinned by mesosoma; (2) both flagelli missing; (3) tarsomeres 2–5 of right middle leg missing; (4) left ovipositor sheath missing; (5) wings nicely expanded flat.

Designation of one female paralectotype of *Iphiaulax tigrinus*: (first label, printed) “Tanzania / Usambara”; (second label, printed) “Mombo / Sjöstedt”; (third label, printed) “juni”; fourth label is the paralectotype card, fifth label is with the actual name *Serraulax tigrinus* (SZÉPL.) given by me 2009. – Paralectotype is in less good condition: (1) pinned by mesosoma; (2) both flagelli missing; (3) missing: right hind leg (except coxa), tarsomeres 2–5 and tibia + tarsus of middle leg.



Figs 64–70. *Serraulax tigrinus* (SZÉPLIGETI) (female lectotype): 64 = scape + pedicel in outer-lateral view, 65 = head in dorsal view, 66 = joints 2–3 of maxillar palp, 67 = hind femur, 68 = distal part of right fore wing, 69 = first discal cell, 70 = first tergite

Designations of two female paralectotypes of *Iphiaulax tigrinus* var. *interruptus* SZÉPLIGETI: first and second labels identical with those of the lectotype; (third label, printed: 1 ♀ “juni”; (third label, manuscript: 1 ♀ “v. interruptus Sz.”); fourth labels are the paralectotype cards and fifth labels are with the actual name *Serraulax tigrinus* var. *interruptus* SZÉPL. – The two paralectotypes are in good condition: (1) pinned by mesosoma; (2) one flagellum missing (1 ♀), otherwise flagelli more or less deficient; (3) 1 ♀: tarsomeres 4–5 of right hind leg missing.

Material examined – 1 ♀ (in Museum Budapest): Mozambique, Boroma.

Redescription of the female lectotype of *Iphiaulax tigrinus* – Body 15 mm long. Scape clearly broadening apically, i.e. 1.5 times as long as broad apically, in outer-lateral view deeply excised (Fig. 64). Head in dorsal view subcubic (Fig. 65), 1.5 times as long as broad as long, eye almost 1.5 times longer than temple, temple rounded. Third joint of maxillar palp less flattened (Fig. 66). Hind femur 3.7 times as long as broad and clearly broadening distally (Fig. 67). Pterostigma 3.7 times as long as wide and *r* issuing less proximally from its middle, *r* almost as long as width of pterostigma; first submarginal cell more widening distally, i.e. 3–*SR* and 2–*M* clearly diverging distally (Fig. 68). First discal cell less high, 1–*SR–M* and 1–2*CU1* nearly parallel, 1–*SR–M* faintly bent at 1–*M* (Fig. 69, see arrow). First tergite as long as broad posteriorly, beyond pair of spiracles less broadening posteriorly, its sides apically rounded and its scutum fairly wide (Fig. 70). Second tergite twice broader posteriorly than long medially (cf. Fig. 53), antero-median field striated. Tergites 1–4 striated (Fig. 94). Ovipositor sheath as long as hind tibia + tarsus combined. Scape and pedicel black (flagellum missing). Head yellow, meso- and metasoma testaceous, legs 1–2 yellowish and leg 3 testaceous, hind tibia + tarsus blackish to black. Wings yellow with brown pattern, fore wing with three transverse brown streaks (Fig. 87).

Redescription of the female paralectotype of *Iphiaulax tigrinus* – Similar to the female lectotype. Body 14 mm long. Eye 1.5 times longer than temple.

Deviating features of the two female paralectotypes of *Iphiaulax tigrinus* var. *interruptus* – Similar to the lectotype and paralectotype. Body 13 (1 ♀) and 14 mm (1 ♀) long. Fore wing: inner two brown streaks interrupted twice at longitudinal alar veins.

The female specimen from Mozambique (Boroma) is quite identical with the female lectotype.

Male and host unknown.

Distribution – Mozambique, Tanzania.

Affinity – *Serraulax tigrinus* is near to *S. semiluteus*, their distinction see in key-couplets 15 (14) – 17 (16).

Serraulax trifasciatus (SZÉPLIGETI, 1905) (Figs 72–81, 89, 95)

Iphiaulax trifasciatus SZÉPLIGETI, 1905: 31 ♀ (one female), type locality: “Camerun”, female holotype (designated by PAPP 1968 in QUICKE 1991: 180) in Magyar Természettudományi Múzeum, Budapest; examined. – SZÉPLIGETI 1914a: 177. QUICKE 1983: 83.

Ipobracon trifasciatus (SZÉPLIGETI): SZÉPLIGETI 1906: 562 (in key).

Bathyaulax trifasciatus (SZÉPLIGETI): FAHRINGER 1929: 252 (♀), 255 (♂) (in key to *Ipobracon* species), 1931: 373 (♀), 375 (♂) (in key to *Bathyaulax* species), 1935: 398 (redescription). SHENEFELT 1978: 1457 (literature up to 1953).

Serraulax trifasciatus (SZÉPLIGETI): QUICKE 1987: 146 (comb. n.), 1991: 180 (type depository).

Designation of the female holotype of *Iphiaulax trifasciatus*: (first label, printed) “Africa / Cameron”; (second label) “Ipobracon trifasciatus Sz.” (my manuscript) / “det. Szépligeti” (printed) “1906” (my manuscript, cf. SZÉPLIGETI 1906: 562); third label is the holotype card, fourth label is with the inventory number “951”; fifth label is with QUICKE’s determination in 1989 “Serraulax trifasciatus (Sz.)” (the label was added by me with my manuscript after QUICKE 1991: 180). – Holotype is in good condition: (1) pinned by mesosoma; (2) both flagelli apically deficient; (3) right fore wing medially (before pterostigma) damaged, left fore wing glued on a separate small card; (4) pair of ovipositor sheaths glued also on a separate small card.

Material examined (3 ♀♀) – 2 ♀♀: Equatorial Guinea (on label Spanish Guinea), Hinterland Makomo, leg. TEBMANN (1 ♀) and Uelleburg, Benietogebiet (currently Mbini), 15–31 VII, leg. TEBMANN (1 ♀). 1 ♀: Togo, Bismarckburg, 14–30 VI 1893, leg. L. CONRADT.

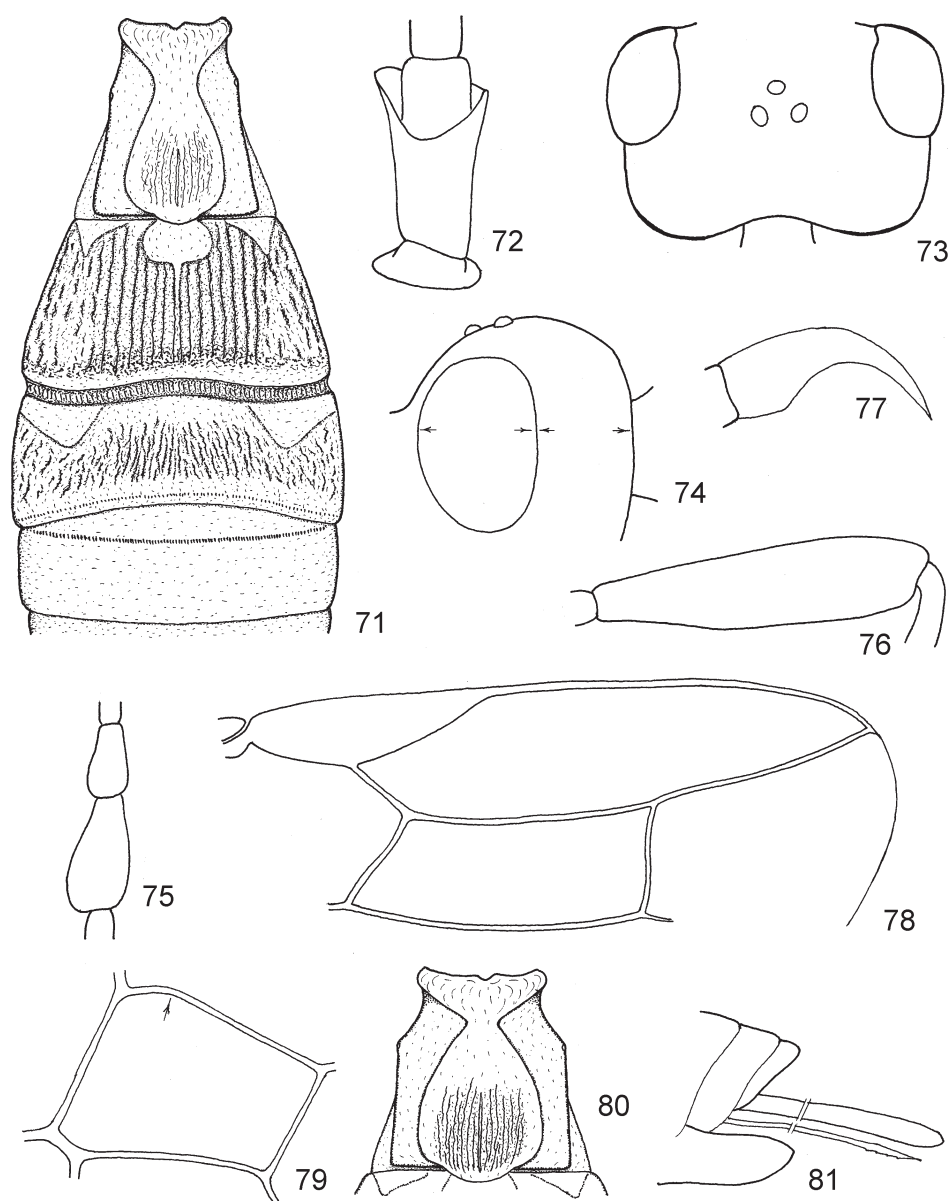
Redescription of the female holotype of *Iphiaulax trifasciatus* – Body 14 mm long. Scape in outer-lateral view 1.5 times as long as broad and clearly broadening apically, here deeply excised (Fig. 72). Both flagelli damaged distally: right flagellum with 66 and left flagellum with 63 flagellomeres. First flagellomere 1.6 times longer than broad, flagellomeres 2 to 8–9 gradually shortening so that further flagellomeres transverse, i.e. broader than long, ultimate 8 to 10 flagellomeres cubic. – Head in dorsal view transverse (Fig. 73), 1.6 times as broad as long, eye somewhat, i.e. 1.2 times longer than temple, temple moderately rounded, occiput weakly excavated. Ocelli round, near to each other, OOL almost four times longer than POL. Eye in lateral view nearly 1.5 times as high as wide, temple beyond eye evenly broad and one-fifth less wide than eye (Fig. 74, see arrows). Horizontal diameter of oral opening just longer than shortest distance between opening and eye. Clypeus medially with a special margination. Third joint of maxillar palp flattened (Fig. 75). Head polished, face finely-densely granulate.

Mesosoma in lateral view 1.6 times as long as high, polished. Notaulix weakly distinct. Spiracle of propodeum medially on its lateral declivous part (cf. Fig. 37). Hind femur four times longer than broad distally (Fig. 76). Hind basitarsus as long as tarsomeres 2–3 combined (cf. Fig. 39). Claw gradually thickening basally, i.e. without basal lobe (Fig. 77).

Fore wing somewhat longer than body. Pterostigma (Fig. 78) four times as long as wide, r issuing somewhat proximally from its middle and as long as width of pterostigma. Second submarginal cell long, $3-SR$ 2.5 times as long as $2-SR$, $SR1$ somewhat shorter than $3-SR$ and reaching tip of wing; $3-SR$ and $2-M$ less diverging, i.e. second submarginal cell less widening distally, $r-m$ one-sixth longer than $2-SR$. First discal cell: $1-M$ one-sixth longer than $m-cu$, $1-SR-M$ bent (and not angled) at $1-M$, $cu-a$ postfurcal (Fig. 79, see arrow).

First tergite (Fig. 80, 95) somewhat longer than broad posteriorly, beyond pair of spiracles less broadening posteriorly, scutum domed and finely striated behind and with a weak median carina-like stria. Tergites 2–3 striated, further tergites polished (cf. Figs 71, 95). Second tergite transverse, 1.85 times as broad posteriorly as long laterally, antero-medially with a quadratic and laterally with a pair of small three-sided smooth fields. Third tergite more transverse, 2.5 times as broad posteriorly as long laterally, pair of lateral fields large, hind margin slightly concave, sulcus before its hind margin crenulated. Fourth tergite basally also with a transverse and crenulated sulcus. Ovipositor sheath as long as meso- and metasoma combined. Ovipositor apically with a less distinct notch dorsally and weakly serrate ventrally (Fig. 81).

Antenna blackish. Head yellowish, meso- and metasoma testaceous. Scutum of first tergite black, sternites 1–3 black patterned. Legs also testaceous, fore tarsus with yellowish tint, hind tibia and tarsus blackish. Wings yellow. Fore wing (Fig. 89) distally with three transverse brown streaks. Hind wing (Fig. 89) distally brownish and here medially with a yellow macula.



Figs 71–81. 71. *Serraulax lukombensis* (CAMERON) (female holotype): tergites 1–4. – 72–81. *Serraulax trifasciatus* (SZÉPLIGETI) (female holotype): 72 = scape + pedicel in outer-lateral view, 73 = head in dorsal view, 74 = head in lateral view, 75 = joints 2–3 of maxillary palp, 76 = hind femur, 77 = claw, 78 = distal part of right fore wing, 79 = first discal cell, 80 = first tergite, 81 = hind end of female metasoma

Deviating fetures of the three females – Body 13 (1 ♀), 14 (1 ♀) and 17 (1 ♀) mm long. Antenna as long as body and with 78 (1 ♀) and 68 (1 ♀) antennomeres, penultimate 10 to 30–32 flagellomeres cubic. Head in dorsal view 1.5 times as broad as long and eye just longer than temple. Hind femur 3.7 times (1 ♀) and 3.9 times (1 ♀) as long as broad distally. Scutum of first tergite less striated and (1 ♀) tergite itself somewhat longer than broad posteriorly (cf. Fig. 71). Meso- and metasoma entirely testaceous.

Male and host unknown.

Distribution – Cameroon, Equatorial Guinea, Togo.

Affinity – *Serraulax trifasciatus* is nearest to *S. lukombensis*, the distinction between the two species is presented in key-couplets 5 (4) – 7 (6).

KEY TO THE *SERRAULAX* SPECIES DESCRIBED BY SZÉPLIGETI IN 1905–1914

Introductory remark to the key – The *Serraulax* species are very similar to each other considering measures of their corporal parts (e.g. head's breadth to length, proportional length of alar veins, length to breadth of hind femur, proportional length to breadth of tergites 1–3) and the yellow or testaceous colour of body with more or less dark colour pattern. The subtle differences between the species considerably make difficult their identification. In the future the possibility of synonymization of species name(s) is (are) not precluded. The generic type species, *Serraulax lukombensis*, and the new species, *Serraulax ater*, are also included in the key.

- 1 (8) Tergites 2–3 striated, further tergites polished (Figs 71, 90, 91, 95).
- 2 (3) Fourth tergite antero-medially weakly sculptured, otherwise polished (Figs 18, 90). Distal half of fore wing yellow, only apically margined brown (Fig. 82). Further details see in couplets 10 (11)
S. calopterus (SZÉPLIGETI, 1908)
- 3 (2) Fourth tergite entirely polished (Figs 91, 95). Distal half of fore wing with three transverse brown streaks.
- 4 (5) Head in dorsal view subcubic (Fig. 5), 1.5 times as broad as long, temple weakly rounded. Second tergite less transverse, 1.6 times as broad posteriorly as long laterally, first tergite 1.2 times longer than broad posteriorly (Fig. 10). Body and legs black; yellow: head, palpi, prosternum and fore leg; wings evenly blackish brown. ♀: 14 mm **S. ater** sp. n.
- 5 (4) Head in dorsal view transverse (Figs 34, 73), 1.6 times as broad as long, temple either rather receded or moderately rounded. Second tergite transverse, 1.8–1.9 times as broad posteriorly as long laterally, first tergite

somewhat longer than broad posteriorly (Fig. 71). Body and legs testaceous with brown to black(ish) pattern; wings yellow with brown transverse streaks (fore wing) or brown pattern (hind wing).

- 6 (7) Temple in dorsal view rather receded, eye (almost) 1.4 times longer than temple (Fig. 34). Scape in outer-lateral view twice longer than broad apically and here less deeply excised (Fig. 33). Fourth joint of maxillar palp slightly flattened (Fig. 36). First tergite evenly broadening posteriorly, somewhat longer than broad posteriorly (Fig. 47). Second submarginal cell slightly more widening (i.e. 3-SR and 2-M slightly more diverging) distally (Fig. 41). Tergites 4–7 black (female holotype, Fig. 91) or metasoma entirely testaceous (female). ♀: 14–15 mm

S. lukombensis (CAMERON, 1912)

- 7 (6) Temple in dorsal view moderately rounded, eye 1.2 times longer than temple (Fig. 73). Scape in outer lateral view 1.5 times longer than broad apically and here more deeply concave (Fig. 72). Third joint of maxillar palp flattened (Fig. 75). First tergite beyond pair of spiracles less broadening, somewhat longer than broad posteriorly (Figs 80, 95). Second submarginal cell slightly less widening (i.e. 3-SR and 2-M slightly less diverging) distally (Figs 78, 89). Metasoma testaceous. ♀: 13–17 mm

S. trifasciatus (SZÉPLIGETI, 1905)

- 8 (1) Tergites 2–4 or 2–5 striated, rest of tergites polished (Figs 92–94).

- 9 (18) Tergites 2–4 striated, rest of tergites polished (Figs 24, 31, 90).

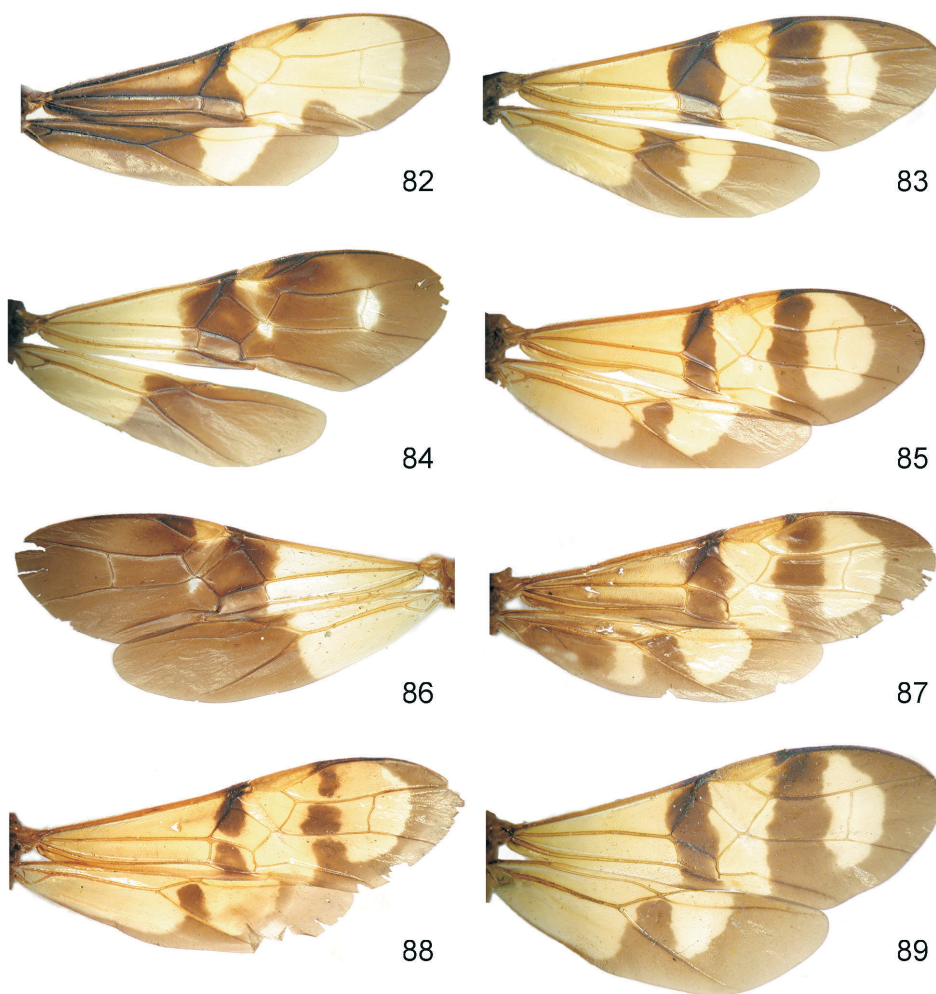
- 10 (11) Fourth tergite only antero-medially weakly sculptured, otherwise polished (Figs 18, 90). Proximal half of fore wing brown, its distal half yellow and apically brown (cf. Table 3 Fig 7 in SZÉPLIGETI 1908). Scutum of tergite 1 somewhat more narrowing basally (Fig. 17). Hind femur 4.6 times as long as broad distally (Fig. 14). Legs black. ♀: 11 mm

S. calopterus (SZÉPLIGETI, 1908)

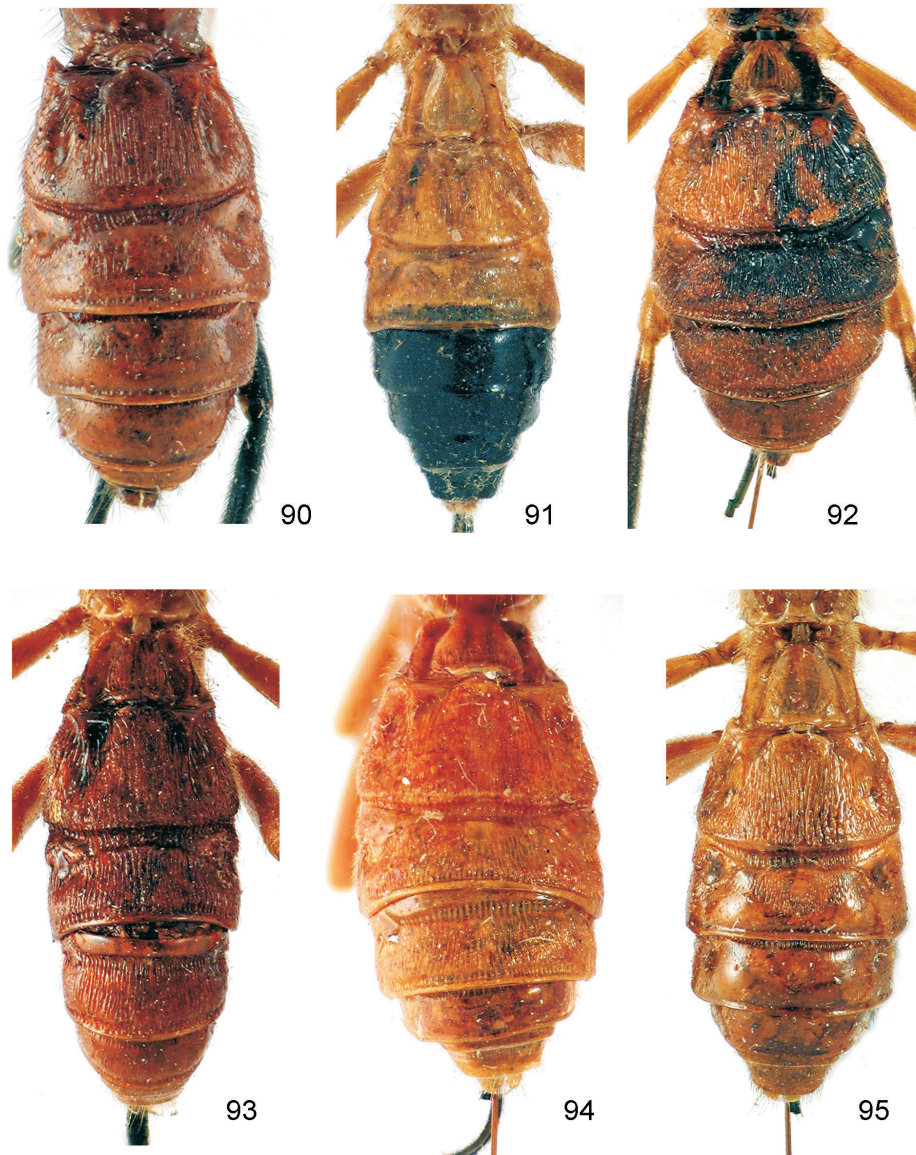
- 11 (10) Fourth tergite at least its anterior two-thirds striated. Fore wing with three transverse streaks (cf. Table 3 Fig. 8 in SZÉPLIGETI l.c.). Scutum of tergite 1 less narrowing basally (Figs 24, 31, 70).

- 12 (13) Second tergite more transverse, 2.6 times as broad posteriorly as long laterally (Fig. 24). Temple in lateral view narrowing ventrally and almost half (0.5 times) as wide as eye (Fig. 21, see arrows). Head in dorsal view 1.6 times as broad as long, eye almost 1.6 times as long as temple (Fig. 20).

21 (20) Temple in dorsal view more rounded, eye 1.2 times longer than temple (Fig. 61). Hind femur 3.5 times as long as broad distally (Fig. 62). Scape in outer-lateral view apically circularly emarginated (Fig. 60). Legs testaceous. Fore wing evenly brown (nominate form) or yellow with three transverse brown streaks (*var. togoensis* SZÉPLIGETI, Fig. 85). ♀: 13–14 mm
S. persimilis (SZÉPLIGETI, 1906)



Figs 82–89. Fore and hind wings (right wings: 82–85 and 87–89, left wings: 86): 82 = *Serraulax calopterus* (SZÉPLIGETI), 83 = *S. lukombensis* (CAMERON), 84 = *S. orientalis* (SZÉPLIGETI), 85 = *S. persimilis* *var. togoensis* (SZÉPLIGETI), 86 = *S. semiluteus* (SZÉPLIGETI), 87 = *S. tigrinus* (SZÉPLIGETI), 88 = *S. tigrinus* *var. interruptus* (SZÉPLIGETI), 89 = *S. trifasciatus* (SZÉPLIGETI)



Figs 90–95. Metasoma in dorsal view: 90 = *Serraulax calopterus* (SZÉPLIGETI), 91 = *S. lukombensis* (CAMERON), 92 = *S. orientalis* (SZÉPLIGETI), 93 = *S. persimilis* (SZÉPLIGETI), 94 = *S. tigrinus* (SZÉPLIGETI), 95 = *S. trifasciatus* (SZÉPLIGETI)

- Hind femur 4.1 times as long as broad distally (Fig. 22). Transverse brown streaks of fore wing wide (cf. Figs 83, 89). ♀: 13 mm
S. conradti (SZÉPLIGETI, 1913)
- 13 (12) Second tergite less transverse, 1.7–1.8 times as broad posteriorly as long laterally (Fig. 31). Temple in lateral view not narrowing ventrally and 0.7 times as wide as eye (Fig. 27, see arrows).
- 14 (15) Head in dorsal view somewhat more transverse, 1.6–1.7 times as broad as long, temple rather receded (Fig. 26). First tergite beyond pair of spiracles somewhat more broadening posteriorly (Fig. 31). Scape twice as long as broad apically, i.e. not broadening apically (Fig. 25). First discal cell virtually high, i.e. *1-SR-M* and *1-2CUI* not parallel (Fig. 30). Hind femur less broadening distally (Fig. 28). ♀: 10–14 mm
S. dorsalis (SZÉPLIGETI, 1914)
- 15 (14) Head in dorsal view subcubic, 1.5 times as broad as long, temple rounded (Fig. 65). First tergite beyond pair of spiracles less broadening posteriorly (cf. Figs 17, 70). Scape 1.4–1.6 times as long as broad and broadening apically (Fig. 64). First discal cell (*DI*) less high, i.e. *1-SR-M* and *1-2-CUI* nearly parallel (Fig. 69).
- 16 (17) Fore wing: distally with three transverse brown streaks; streaks continuous (nominat form, Fig. 87) or interrupted at longitudinal veins (*var. interruptus* SZÉPLIGETI, Fig. 88). Hind femur 3.7 times as long as broad and clearly broadening distally (Fig. 67). Second submarginal cell widening, i.e. *3-SR* and *2-M* clearly diverging distally (Fig. 68). Temple in lateral view beyond eye evenly wide. ♀: 12–15 mm
S. tigrinus (SZÉPLIGETI, 1908)
- 17 (16) Fore wing: distal half evenly brown (Fig. 86). Hind femur 4.1 times as long as broad and less clearly broadening distally (cf. Fig. 51). Second submarginal cell not widening, i.e. *3-SR* and *2-M* less diverging distally (cf. Fig. 57). Temple in lateral view beyond eye just narrowing ventrally (cf. Fig. 21). ♀: 14 mm
S. semiluteus (SZÉPLIGETI, 1911)
- 18 (9) Tergites 2–5 striated, rest of tergites polished (Figs 92–93).
- 19 (22) Head in dorsal view subcubic, 1.5 times as broad as long (Figs 55, 61).
- 20 (21) Temple in dorsal view less rounded, eye 1.25 times longer than temple (Fig. 55). Hind femur 4.1 times as long as broad (cf. Fig. 22). Scape in outer-lateral view apically deeply excised (Fig. 54). Legs black. Fore wing yellow with three transverse brown streaks. ♀: 10 mm
S. palpator (SZÉPLIGETI, 1914)

22 (19) Head in dorsal view transverse, 1.6 times as broad as long, eye almost 1.4 times longer than temple, temple less rounded (Fig. 49). Hind femur 4.4 times as long as broad distally (Fig. 51). Scape in outer-lateral view deeply excised (Fig. 48). Distal half of fore and hind wings brown (Fig. 84). Legs ochre, hind tibia and tarsus black. ♀: 12–15 mm

S. orientalis (SZÉPLIGETI, 1914)

*

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