

Taxonomic notes on the genera previously classified in the genus *Amiota* Loew (Diptera: Drosophilidae, Steganinae)

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ABSTRACT: Generic and subgeneric classification of the drosophilid genera previously assigned to *Amiota* LOEW, 1862, is revised. The subgenus *Apsiphortica* OKADA, 1971, is raised to the generic rank and *Apsiphortica holubi* sp.n. from Zimbabwe, representing the first finding of this genus in Africa, is described. New subgenus *Allophortica* of the genus *Phortica* SCHINER, 1862, is erected for two African species and *P. oldenbergi* DUDA, 1924 from Germany. A new species group of the subgenus *Phortica*, s. str. – *varipes*-group, is established. *Phortica* (s.str.) *kukuanensis* sp.n., from Taiwan, is described. Lectotypes are designated for *P. maculiceps* DUDA, 1924 and *P. varipes* DUDA, 1926. Taxonomic and distributional notes on some *Amiota* species are provided and five new Nearctic species are described: *A. hsui* sp.n. (USA), *A. lineiventris* sp.n. (Canada), *A. mariae* sp.n. (Canada), *A. nebojsa* sp.n. (USA) and *A. steyskali* sp.n. (USA, Canada).

INTRODUCTION

The drosophilid genera treated below were previously (DUDA 1934, WHEELER 1981) assigned to the genus *Amiota* LOEW, 1862, although some of them had been originally described as independent genera. They are rarely collected due to their dwelling in the tree canopies and this is why only 14 species of *Amiota* had been known before the revisional papers of MÁČA (1977, 1980) and OKADA (1977) were published; however, more than one hundred species have already been described in the following years or their descriptions are in preparation. SIDORENKO (2002) and CHEN (in litt.) have shown that the subgenera *Amiota* LOEW and *Phortica* SCHINER belong to different phylogenetic lineages – *Phortica* being associated with *Stegana* MEIGEN and *Leucophenga* MIK, but *Amiota* s.str. evolved separately; conclusions about the position of *Apsiphortica* OKADA have been unequivocal and relationships of other subgenera have not been analysed. Thus, in the present paper *Amiota* and *Phortica* are considered independent genera and comments to other previous subgenera

of *Amiota* are given. Five new Nearctic species of the genus *Amiota* (in the present sense) are described below; however, the Nearctic fauna of this genus still remains poorly known.

MATERIAL AND METHODS

Morphological terminology of male terminalia (principally according to MCALPINE 1981) is explained in the Figs 1–2. Some commonly used indices are used; for explanations see e.g. CHEN & TODA (2001). Tarsal index means length ratio basitarsus/remaining tarsal segments. The problem of the identity of aedeagus vs. parameres in *Amiota* is still somewhat unclear. Recently CHEN & TODA (2001) stated that the parts of aedeagus bearing sensillae are homologous with parameres while the rest is homologous with aedeagus. However, sometimes it is difficult to state which structure is still the part of the paramere and which one belongs to the aedeagus. Moreover, with this approach the paired structures positioned often laterally from parameres would be considered for aedeagus, which would anticipate the reversion of the position of aedeagus to parameres. As the orifice of aedeagal duct is at the medial notch of the caudal margin of apodeme (probably with the exception of the *A. apodemata*-group), there is no confirmation for the presence of the parts of proper aedeagus within the genus *Amiota*. As a whole, consideration of the paired apical structures (usually bearing sensillae) for parameres, seems plausible, although it is possible to suppose independent origin of sensillae on the structures not homologous with parameres. However, the unpaired or paired structure, lying often distinctly basally and/or laterally from the parameres, may represent basiphallus, not the proper aedeagus. Sometimes there is only a pair of relatively simple structures communicating directly with the apodeme. These structures are deliberately termed parameres although they do not bear sensillae and may represent partly, or wholly, the basiphallus.

It is the intention of the author that the type material of the species now deposited in his collection will be deposited in the Department of Entomology, National Museum, Prague.

Where appropriate, literal quotations of museum labels are given. Lines are divided by /, labels are divided by //, handwritten data is given in italics, (R) means red colour of the label. The catalogue of all described species of most genera and subgenera treated here is prepared by CHEN (in litt.) and thus the lists of included species are presented here only for the groups not treated by him in detail.

In the Systematic treatment the following acronyms are used for collections where the specimens are located:

IZT – Institute of Zoology, Academia Sinica, Taipei
MNP – Museum d' Histoire Naturelle, Paris
NMB – National Museum of Natural History, Budapest
NML – National Museum of Natural History, Leiden
SMF – Senckenberg Museum, Frankfurt am Main
ZMA – Zoological Museum of the University, Amsterdam
ZMZ – Zoological Museum of the University, Zürich

SYSTEMATIC TREATMENT

1. Taxonomy at the generic/subgeneric level

The taxa classified as subgenera of the genus *Amiota* e. g. by WHEELER (1981) have little in common. Separation of first basal cell from discal cell by the crossvein *bm-cu* is probably a symplesiomorphic character, found also in other genera. Also the well-developed prelabrum is probably a symplesiomorphy. Far-reaching modifications of aedeagal structures in *Phortica* and *Amiota* s. str. originated in different manners (lateral flattening of aedeagal apodeme in *Phortica* and its dorsoventral flattening with reduction of aedeagus in *Amiota* s. str.). Analyses

of further characters by SIDORENKO (2002) and CHEN (in litt.) have shown that some subgenera of *Amiota* s. l. deserve generic status. Below, status of all taxa previously classified as subgenera of *Amiota* LOEW, 1862, is revised. Synapomorphies are used as diagnostic characters.

Genus *Apsiphortica* stat.n.

Amiota, subgen. *Apsiphortica* OKADA, 1971: 90

Type-species: *Amiota (Apsiphortica) lini* OKADA, 1971: 90 (by orig. designation)

Diagnosis: Anepisternum with hairs. Parameres without sensilla. Aedeagus and apodeme straight, firmly connected. Plesiomorphies not seen in other former subgenera of *Amiota* s.lat.: Apodeme straight, rod-like, resembling that of the genus *Stegana* MEIGEN, 1830. Hypandrium plate-like (U-shaped in the following genera). Occurrence of the genus both in Oriental and in Ethiopian region supports the status of independent genus.

Species included: *Apsiphortica lini* (OKADA, 1971) comb.n., *A. holubi* sp.n.; one further species to be described by CHEN (in litt.). First two species have in common: Arista with shortened rays. Epandrium ventrally dilated, its anteroventral corners pointed (in *Phortica*, anteroventral corner is often pointed but oriented more dorsad). Aedeagal apodeme longer than aedeagus.

***Apsiphortica holubi* sp.n.**

Holotype ♂: Zimbabwe, Zambezi river, SE Angwa Bridge, 16.08 S, 30.15 E, September 1988, leg. J. Weyrich (ZMZ).

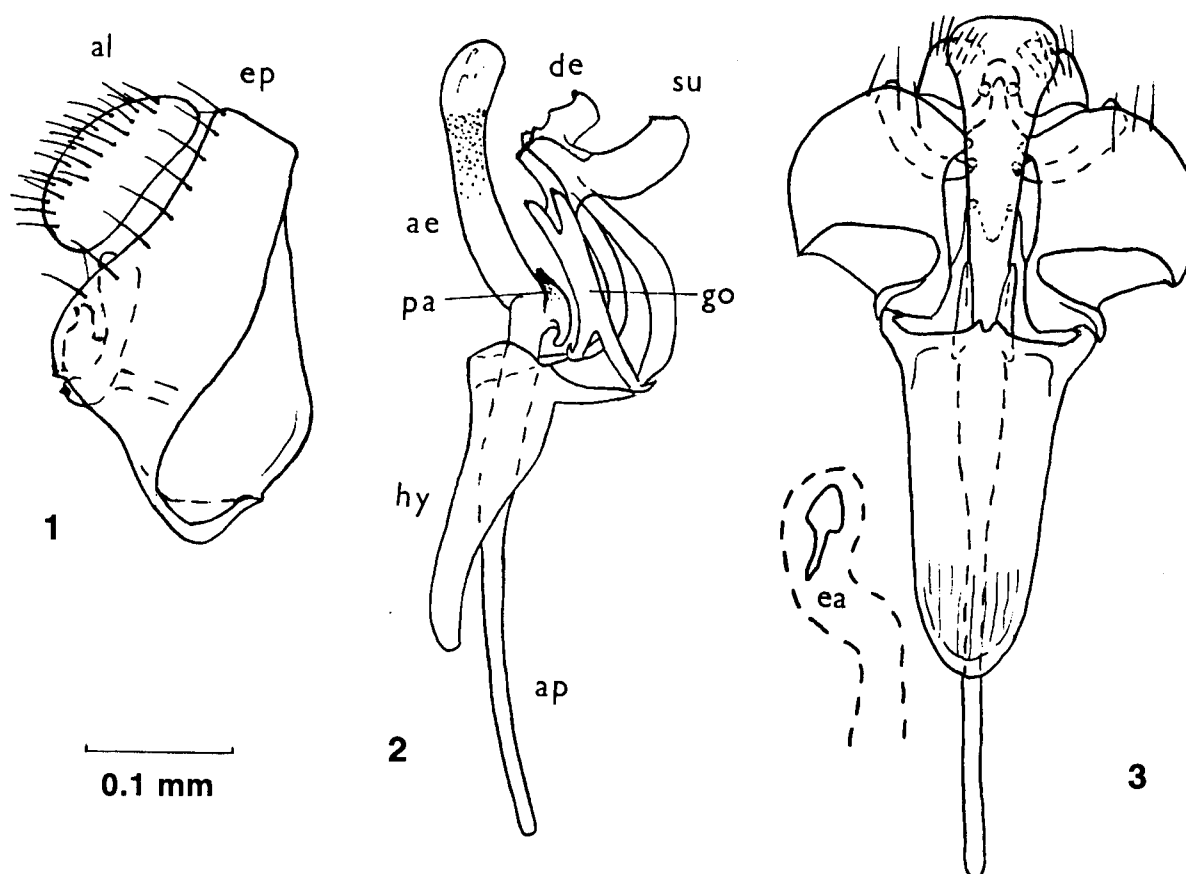
Diagnosis: Similar to *A. lini* in most characters, but anterior dorsocentral bristles reduced (0.5 length of posterior dorsocentrals in *A. lini*), epandrium anteroventrally with a flap-like dilation, aedeagus simply clavate, decasternum with two long arms connected to the base of fused gonopods.

Description: Body length 2.6 mm, wing length 2.5 mm. Head with purple eyes; frons, face, gena and appendages yellow to yellowish orange, ocellar triangle brown. Ocellar triangle with pair of ocellars and usual pair of setulae above them; no setae below ocellars. Postocellars crossing, length 0.16 mm. Frontal vitta with seven inwardly directed setulae each side. Orbita with eight setulae along eye margin, from the ptilinal fissure up to between 2nd and 3rd orbital seta. Distances ptilinal suture to 1st orbital; 1st to 2nd orbital; 2nd to 3rd orbital; 3rd orbital to inner vertical: 4:1:3:3. 1st orbital seta proclinate, its base somewhat shifted mediad (right seta completely, left partly broken). 2nd and 3rd orbital and inner vertical each 0.25 mm long. Antenna with short arisal rays, as in *A. lini*. Facial carina long, moderately high. Eye with almost straight hind margin. Gena narrow, less than 1/10 eye height. Vibrissa prominent, 2nd genal seta half its length, five further gradually shortened setae up to the genal angle; a strong seta just above genal angle, the usual row of postoculars above it, one small setula and one feeble but protruding setula behind it. Occiput concave. Palpus with short setulae, the subapical one (1/3 vibrissa length) prominent.

Thorax yellowish brown, with three longitudinal brown strips (one medial and one each in the level of dorsocentral bristles). Mesoscutum with about 10 lines of acrostichals. One pair of presutural setae. Posterior dorsocentrals long (0.56 mm), slightly longer than prescutellars.

Anterior dorsocentral seta only on the left side; it is 2.5 times as long as usual setulae in front of dorsocentrals and about 0.2 length of the posterior dorsocentral. Right-side anterior dorsocentral undistinguishable. Postpronotal callus with one strong seta (0.29 mm) and one setula. Two strong notopleurals (0.35 mm), feeble postsutural seta, two equally strong supraalars and one feeble postalar seta. Scutellum large, with usual four setae almost as long as the posterior dorsocentrals. Subscutellum not swollen. Anepisternum with three (left side) to four (right side) setulae, katepisternum with two strong setae and two small setulae. Legs yellow. Preapical tibial setae (about 1/3 of width of tibia – not much longer than usual tibial setulae but stronger) on all tibiae, apical setae (as long as tibial width) on middle tibiae. Tarsal chaetotaxy usual for the Steganinae. Wing hyaline. Costal break at R1 apparent, the preceding pair of cuneiform setulae unmodified. R4+5 parallel to M1. 3rd costal section: cuneiform setulae along 0.55 length, spinules on ventral surface indistinct. C-i 2.7, 4v-i 1.7, 5x-i 1.4, 4C-i 0.9, Ac-i 2.0, Cx-i 1.25, M-i 1.4. Halter yellow.

Abdomen yellow, 2nd to 6th tergites each with narrow posterior dark band. Periphallalic organs (Figs 1, 3): Epandrium with about 16 bristles along posterior margin, posteroventrally angular, anteroventrally with a large flap-like dilation, epandrial phragma large, shifted ventrad and attached to this dilation. Anal cerci higher than long, with more than twenty bristles each. Surstylus elongate, lacking teeth, posterior side basally angular, apex narrow and



Figs 1–3. *Apsiphortica holubi*. 1 – periphallalic organs; 2 – phallic organs, decasternum and surstylus, lateral aspect; 3 – male terminalia, ventral aspect. Explanations: ae – aedeagus, al – lamella of anal conus, ap – apodeme of aedeagus, de – decasternum, ea – ejaculatory apodeme, ep – epandrium, go – gonites, hy – hypandrium, pa – paramere, su – surstylus.

sclerotised. Decasternum medially narrow and with one pointed projection each side, paramedially dilated and attached to surstyli, basally with two long arcuated arms connected to the bases of gonopods. Phallic organs (Figs 2, 3): Hypandrium more than twice as long as wide, very slightly arcuated in lateral aspect, each side with a strong rod connected to the base of gonopod. Gonopods fused but apically with pointed bifurcation, almost straight in lateral aspect. Parameres small, without sensilla, shifted to the dorsolateral position on aedeagal base. Aedeagal apodeme much elongated, narrow but somewhat expanded basally. Aedeagus club-shaped, almost straight, four times as long as wide, apex somewhat dilated and slightly curved dorsad. Ejaculatory apodeme small, spoon-shaped, ejaculatory duct robust.

Etymology: The species is named in the honour of Dr. Emil Holub (1847–1902), Czech traveller over the Southeastern Africa, on the occasion of the centenary of his death.

Genus *Erima* KERTÉSZ, 1899: 193

Type-species: *Erima fasciata* KERTÉSZ, 1899: 193 (by monotypy)

TSACAS (1983) studied probably the only available specimen (of two collected) of *Erima fasciata*, the type species of the genus. The male terminalia show some similarities to those of *Apsiphortica* (aedeagus and apodeme firmly connected, epandrium with anteroventral corners elongate and pointed). However, there are many modifications specific to *Erima* (hypandrium connected to aedeagus, decasternum – if the term is correctly applied – produced into a “pseudophallus”, etc). The loss of arisal branches occurs also in *Sinophthalmus*, and the surstylus is reduced also in *Sinophthalmus* and the *Phortica: foliiseta*-complex. Anyway, *Erima* is not closely related to *Amiota* (s.str.) and it seems best to preserve its original generic status.

Genus *Phortica* SCHINER, 1862: 433

Type-species: *Drosophila variegata* FALLÉN, 1823: 5 (by orig. designation)

Diagnosis: Ocellar triangle with a pair of microsetae below ocellars. Distal margin of subscutellum swollen. Aedeagal apodeme laterally flattened, with a notch between parameres and aedeagus. Ejaculatory apodeme small, desclerotised. Some additional characters, given by CHEN (in litt.), not checked.

Note: WHEELER (1952) classified *Phortica* (described as genus) tentatively as a subgenus of *Amiota*, which was followed by subsequent authors, though he also noted that *Phortica* should be separated from *Amiota* in the future.

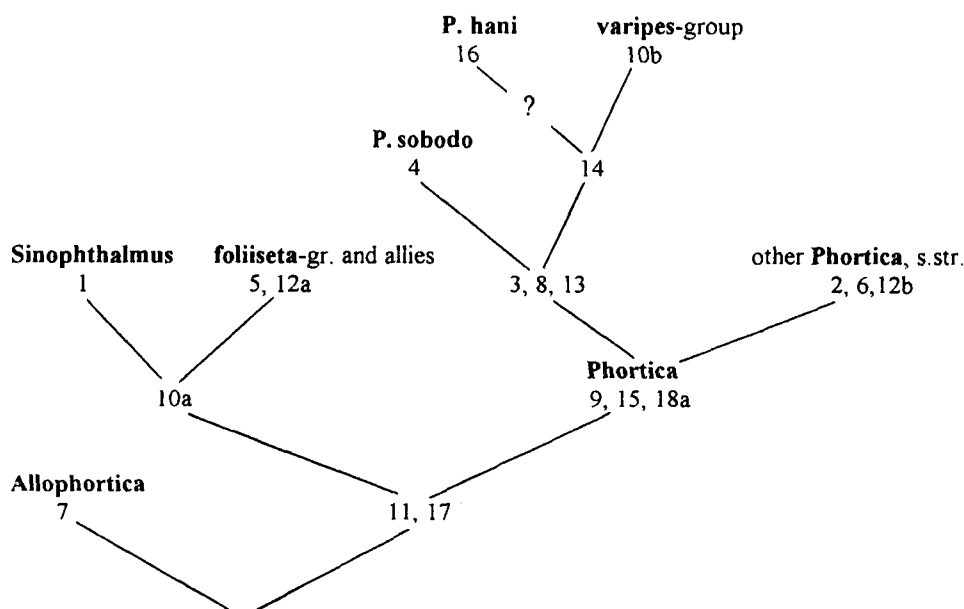
Subgenus *Allophortica* subgen.n.

Type-species: *Phortica fenestrata* Duda, 1939: 14

Diagnosis: Abdominal tergites 2nd to 5th with basal margin dark, apical margin each side with paramedial pale spot, additional sublateral pale spot not touching margins (Fig. 4); aedeagus prominent, slightly curved dorsad, without recurved medial rod.

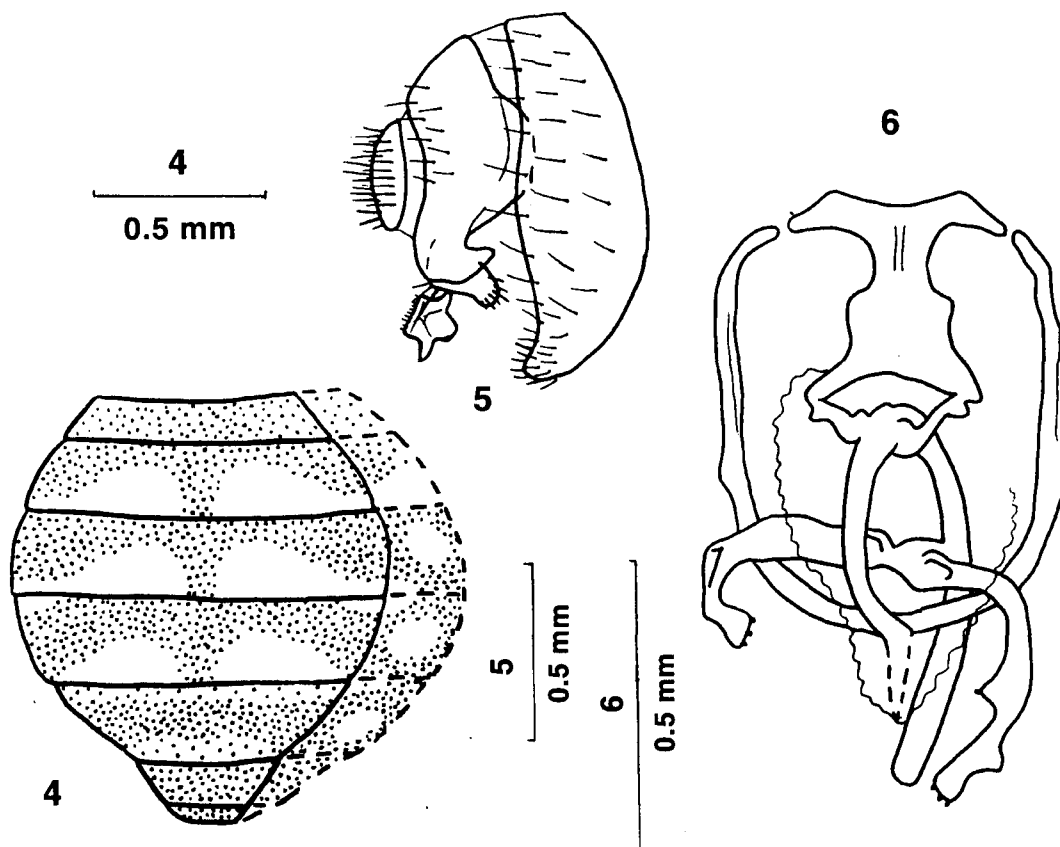
Table 1. Diagram of relationships among the subgenera of *Phortica* (plesiomorphies given first), showing also the position of the *P. varipes*-group and related species:

1. Arista: with long rays at least dorsally / without long rays
 2. Frontal setulae: coarse / tiny
 3. Gena: wide (more than one eighth of eye width) / narrow (less than one tenth of eye width)
 4. Setulae of postpronotum: tiny / coarse
 5. Tibiae: with dark annuli / pale
 6. Wing veins r5 and m1: parallel / convergent
 7. Abdominal tergites 2nd to 5th: dark in apical part (except the very margin behind bristle row) / apical part paramedially with pale spot each side
 8. 6th tergite: at most 1.5 times higher than epandrium / twice higher than epandrium
 9. Epandrium: with at least 30 setae each side / with less than 20 setae each side
 10. Surstylus: prominent, roughly isodiametric / (a) flat / (b) elongate, stick-like
 11. Cuneiform bristles of surstylus: in distinct row / scattered or absent
 12. Decasternum: simple / (a) absent / (b) divided transversally
 13. Anal conus lamellae: short, without modified bristles / elongate, with some thorny bristles
 14. Gonopod: free / fused to aedeagus
 15. Medial rod of aedeagus: straight or slightly curved dorsad, shorter than aedeagal apodeme / curved ventrad, longer than aedeagal apodeme
 16. Basolateral parts of aedeagus: not separated / separated (as isolated sclerites)
 17. Aedeagal apodeme between base of aedeagus and base of parameres: shallowly concave / deeply concave
 18. Apex of aedeagal apodeme: wide / (a) narrowed / (b) desclerotized
- ? = Material not studied



Species included: *Phortica fenestrata* DUDA, 1939, *P. oldenbergi* DUDA, 1924, *P. vumbae* (TSACAS, 1990) comb. n. (= *Amiota vumbae* TSACAS, 1990).

Note: Members of this subgenus have several plesiomorphic characters not present elsewhere in the genus: aedeagal apodeme shallowly concave, so that paramere holder and aedeagus holder are only slightly developed; cuneiform setae of surstylus unmodified, in a line, at least in *P. vumbae*. *Allohorthica* is considered here the most plesiomorphous subgenus of the genus *Phortica*. *P. oldenbergi* seems to stay somewhat apart from the other species because of some differences (supernumerary scutellar setae, loss of strong setae on



Figs 4–6. 4 – *Phortica oldenbergi*, abdominal pattern. 5 – *Phortica kukuanensis*, periphallallic organs and 6th tergite; 6 – phallic organs, ventral aspect.

surstyli, shape of parameres), at least until more African species can be more thoroughly studied. This species is strikingly different from all other Palaearctic and Oriental *Phortica* species. The occurrence of such isolated species in central Europe seemed somewhat mysterious. Previous authors (DUDA 1924, MACA 1977) neglected the coincidence of abdominal colouration with *P. fenestrata*, and TSACAS (1990) overlooked similarity of the structures of their male terminalia. *P. oldenbergi* should be considered an African element in the European fauna and it seems probable that it is an Afrotropical species of unknown autochthonous distribution, inadvertently introduced to Europe in the 20th century.

Undescribed subgenus, to be described by CHEN (in litt.)

Diagnosis: Tibiae without dark annuli. Epandrium with at least 30 setae each side. Surstylus flat, not prominent. Decasternum absent. Aedeagal apodeme strongly flattened (apical part higher than long) and deeply concave basally, so that both paramere holder and aedeagus holder are long. Medial rod shorter than apodeme or absent.

Note: The *P. foliiseta*-group of this subgenus has the peculiar dilation of the apex of male arista, but other species of the subgenus do not possess this character. Thick frontal hairs represent symplesiomorphic character, common with the subgenus *Allophortica* and

varipes-group of the subgenus *Phortica* s.str. *Amiota pappi* TSACAS & OKADA (1983) from New Guinea belongs most probably to this subgenus, contrary to the statement of MÁCA & LIN (1993b). The structure considered for aedeagus plus parameres in the description of *A. pappi* may be interpreted as parameres, the posteromedial recurved rod should then represent aedeagus and the structure originally interpreted as apodeme should represent fused gonites which overlap the proper apodeme.

Subgenus *Sinophthalmus* COQUILLET, 1904: 190

Type-species: *Sinophthalmus pictus* COQUILLET, 1904: 191 (by orig. designation)

Diagnosis: Arista minutely pubescent. Tibiae with two dark annuli each. Decasternum simple. Otherwise similar to the preceding subgenus.

Species included: *Phortica picta* (COQUILLET, 1904) comb.n. (= *Sinophthalmus pictus* COQUILLET, 1904), *P. polychaeta* (WHEELER, 1968) comb.n. (= *Amiota polychaeta* WHEELER, 1968). Subspecies included: *Phortica picta gagei* (PATTERSON & MAINLAND, 1944) comb.n. (= *Sinophthalmus pictus gagei* PATTERSON & MAINLAND, 1944). A number of undescribed species exists.

Note: The genus *Sinophthalmus* COQUILLET had been subsequently variously classified. WHEELER (1968, 1981) considered it a subgenus of *Amiota*. GRIMALDI (1990) considered *Sinophthalmus* (as genus) close to the genus *Apenethecia* TSACAS, 1983 because of its parallel veins R4+5 and M1, a plesiomorphic character occurring also in some members of the genus *Phortica*. In the most recent papers (e. g. SIDORENKO, 2002) the taxonomic status of *Sinophthalmus* has not been discussed. Most characters, including those of male terminalia (see GRIFFITHS 1972, Fig. 34, GRIMALDI 1990, Fig. 426), conspicuously resemble those of the previous subgenus (*P. foliiseta*-group and allies). Therefore, *Sinophthalmus* is transferred here from *Amiota* to a subgenus of *Phortica*.

Subgenus *Phortica* SCHINER, 1862: 433 (*Phortica* s.str.)

Diagnosis: Abdominal tergites with dark apical bands, mostly at least some of them medially dilated. Medial rod of aedeagus well developed, recurved, longer than apodeme. Apical part of aedeagal apodeme rod-like.

The subgenus includes *cardua*-, *omega*-, *magna*-, *orientalis*-, *subradiata*- and *variegata*-groups as defined or redefined by CHEN (in litt.). All of them possess longitudinally divided decasternum. Another species group is erected hereby:

***Phortica* (s.str.) *varipes*-group**

Diagnosis: Eyes large – width of gena is less than 1/10 width of eye height. 6th tergite very large. Epandrium small, tapering laterally. Lamellae of anal conus narrow-based, elongate, with several thorny bristles. Surstylus elongate, stick-like. Decasternum simple. Gonopod fused to aedeagus. Apical part of apodeme desclerotised.

The group includes *P. varipes* DUDA, 1926 (male terminalia treated farther below) and one new species to be described by CHEN (in litt.). *P. hani* ZHANG & SHI, 1997 may be remotely related to this group but some diagnostic characters are absent (e. g., surstylus and apodeme are almost unmodified). Except of these Oriental species, the African *P. sobodo* BURLA, 1954 possesses the same characters on genae, 6th tergite, epandrium and anal conus (male terminalia of supposedly this species are treated below). The relation of *P. varipes*-group, *P. hani* and *P. sobodo* to other groups of *Phortica* s.str., is remote. Further conclusions about the relationships of all species mentioned above should be postponed until more material can be studied.

Genus *Amiota* LOEW, 1862: 229

Type-species: *Amiota leucostoma* LOEW, 1862: 230 (design. by COQUILLET, 1910: 505)

Diagnosis: Face, humeri and pteropleurae each with a white spot (in some species this character is lost). Aedeagus more or less reduced, composed mostly of basal structures and parameres. Aedeagal apodeme dorsoventrally flattened. Its caudal part (connection to aedeagus) is bifid and the orifice of spermal duct is shifted to its very base.

Note: The diagnostic character “palpus without hollow sense organ” (plesiomorphy in Steganinae) given by CHEN (in litt.) apparently does not apply, according to GRIMALDI (1990, Fig. 111) at least to *Amiota humeralis* LOEW, 1862.

Genus *Paraphortica* DUDA, 1934: 36

Type-species: *Drosophila lata* BECKER, 1907: 306 (by monotypy)

Little is known about its type and the only species *P. lata* (BECKER, 1907), which is known only in the female sex. High facial keel and absence of visible prelabrum indicate that this species is not closely related with the abovementioned genera. Original conception of DUDA (1934), who considered *Paraphortica* as distinct genus, is thus adopted.

The interrelations of the genera in Steganinae are not well elucidated – compare disparate statements of OKADA (1989) and GRIMALDI (1990), as well as cautious and incomplete results of SIDORENKO (2002) and CHEN (in litt.). However, the genera *Apsiphortica*, *Phortica* and *Amiota* form at least an ecologically characterised group, living in tree canopies (not ascertained conclusively for *Apsiphortica*), and being attracted (mainly males) to eyes and perspiring skin of man and some animals.

The absence of the elongated pair of setulae in front of the costal break may be another common character of the taxa treated here. It is not clear if this character is plesiomorphous or apomorphous and its distribution among the genera of Steganinae is poorly known.

2. Taxonomic notes on some species of the subgenus *Phortica*

Contrary to modern taxonomic papers, in the descriptions given by DUDA (1924, 1926) no treatments of the male terminalia have been done and, therefore, characters of these

structures are presented here. Taxonomic and distributional notes are given also to some further species of *Phortica*.

***Phortica* (s.str.) *bandes* (SINGH & NEGI, 1992)**

Amiota (*Phortica*) *bandes* SINGH & NEGI, 1992: 321

One paratype of this species, which is deposited in the SMF, was studied. It consists of four slide preparations, named as “periphallic organs”, “phallic organs”, “wing”, and “♂ leg” (Nos. 7426–7429, respectively). Other parts of the specimen are lacking (probably lost). I did not obtain any answer to my request to borrow some additional specimens from the Kumaun University, Nainital, India. The “periphallic organs” are represented by two abdominal tergites. They are band-like, dark except of the pale apical margin of the more basal tergite; this tergite is much larger than the following one. Most probably they are 6th and 7th abdominal tergites of female. The “phallic organs” may represent 7th and 8th sternite. The 8th sternite (egg-guide) is indented medially and with poorly visible internal structure (pregenital lamella), and this sclerite is probably depicted by SINGH & NEGI (1992: Fig. 3). The preparation of wing conforms to the original description. The “male leg” is the fore leg according to the long coxa and long coarse setae on femur. Coxa and femur dark except for pale apex of the latter, tibia pale with three dark rings (the basalmost one fading in the interior part). Tarsus 1.3 times as long as tibia, tarsal index 0.44; three basal segments pale, apical two segments dark. Thus, the diagnosis “fore metatarsal segment with three black bands” is a mistake (at least in female). This species is difficult to interpret; the remaining distinguishing characters (the colour of mesoscutum, combined with the dcl-index) were not checked by the author.

***Phortica* (s.str.) *erinacea* (MÁCA, 1977)**

Amiota (*Phortica*) *erinacea* MÁCA 1977:125

This species was misidentified as *A. variegata* by GRIMALDI (1990, Fig. 431).

***Phortica* (s.str.) *iota* (TODA & SIDORENKO, 1996)**

Amiota (*Phortica*) *iota* TODA & SIDORENKO, 1996, in TODA et al., 1996: 457

Material examined: PR (North) Korea: Myohyangsan Mts, nr. Hyangsan, 12.5.1988 2 ♂, leg. M. Kozánek; Manmulsang, Kumgangsan Mts, 25.5.1988 1 ♂, leg. M. Slovák; same locality, 26.5.1988 1 ♂, leg. M. Kozánek. All Coll. M. Kozánek.

New record for North Korea.

***Phortica* (s.str.) *kukuanensis* sp.n.**

Amiota (*Phortica*) *flexuosa*: MÁCA & LIN, 1993b: 180

Holotype ♂: Taiwan, Kukuan, 15.8.1991, leg. J. Máca, M. H. Hong and S. F. Lin. Coll. IZT.

The species was misidentified as *P. flexuosa* (ZHANG & GAN, 1986) (terra typica Hua-hong Dong, Yunnan) by MÁCA & LIN (1993b). Most characters of the only known specimen of

Phortica kukuanensis conform to data given in the description of *P. flexuosa*, including the shape of hypandrium, parameres and fused gonites, if observed in certain aspects. On the other hand, *P. kukuanensis* differs in having aedeagus subapically curved, basally less swollen and its apodeme being much longer (Figs 5–6; compare ZHANG & GAN 1986, Fig. 4A), allowing the status of a distinct species. The male 6th tergite of *P. kukuanensis* is extended below, with heavy setation laterally (no information on this tergite is known in *P. flexuosa*).

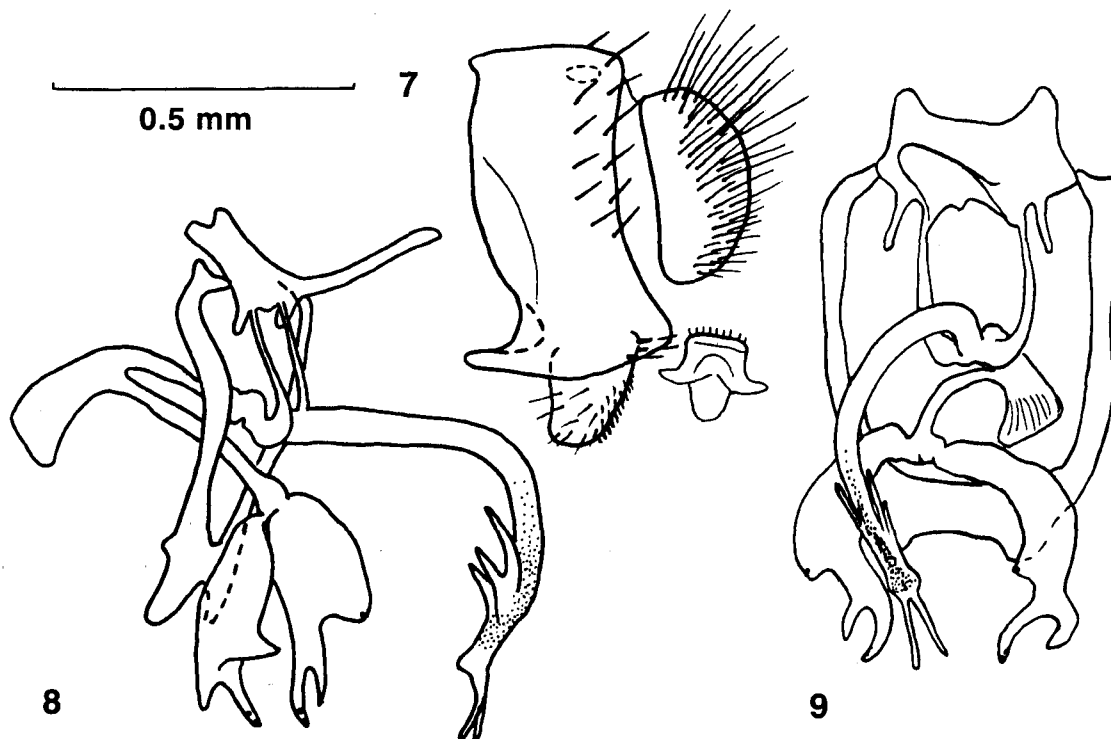
***Phortica* (s.str.) *maculiceps* DE MEIJERE in DUDA, 1924**

Phortica variegata var. *maculiceps* DE MEIJERE in DUDA, 1924: 183

Phortica maculiceps: DUDA, 1926: 46

Material examined: Lectotype ♂ (here designated): 70/16 // E. Jacobson Sum. / Air Njuruk Dempu / 1400 M. 8 1916 // *Drosophila maculiceps* / det. de Meijere / Type // Syntype (R). Paralectotype ♂: Air Njuruk Dempu / Lum 1400 14.8.1916 / Edw. Jacobson // *Phortica / variegata* / det. Dr. O. Duda // Syntype (R). Both Coll. ZMA.

Periphallallic organs (Fig. 7): Epandrium dorsally with a slightly desclerotised patch, its basal phragma strong. Cerci large, bristles of the upper half elongated. Surstylus setigerous, with only several cuneiform prenisetae. Decasternum V-shaped, apical margin with fine bristles. Phallic organs (Figs 8, 9): Hypandrium with a pair of anterior flaps, arms not widened subapically. Fused gonopods medially not narrowed, their vertical process long, pair of aedeagal articulations slender, laterad from it a pair of narrow flaps. Paramere trilobed, basally wide. Aedeagal apodeme cranially widened, aedeagus subapically with two pairs of lateral recurved spurs and one unpaired ventral spur, apically with a pair of short filaments.



Figs 7–9. *Phortica maculiceps*. 7 – peripheral organs; 8 – phallic organs, lateral aspect; 9 – the same, ventral aspect.

Phortica (s.str.) *okadai* (MÁCA, 1977)

Amiota (*Phortica*) *okadai* MÁCA, 1977: 122

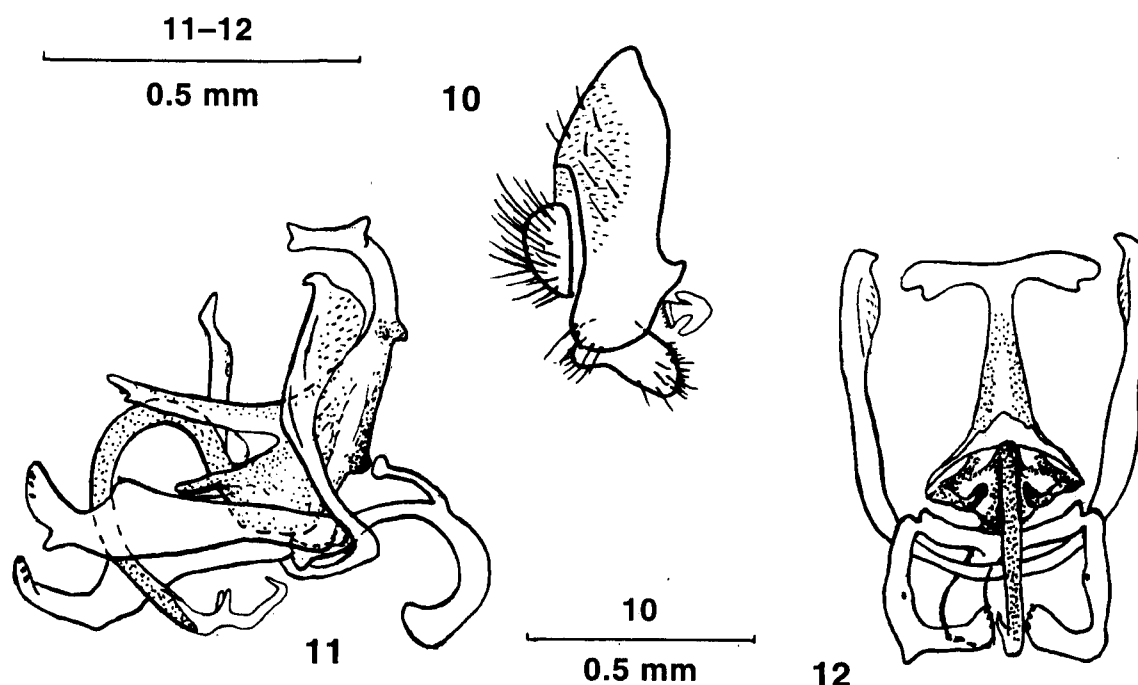
Material examined: PR (North) Korea: Suyangsan Mts, 10 km NW of Haeju, 6.5.1988 1 ♂, leg. M. Kozánek; the same, 1 ♂, leg. M. Slovák; Ryongaksan Mts, 10 km W of Pyongyang, 11.5.1988 1 ♂, leg. M. Kozánek; the same, 1 ♂, leg. M. Slovák; same locality, 14.5.1988 1 ♂, leg. M. Slovák; same locality, 16.5.1988 1 ♂, leg. M. Slovák. All Coll. M. Kozánek.

New record for North Korea.

Phortica (s.str.) *protrusa* (ZHANG & SHI, 1997)

Amiota (*Phortica*) *protrusa* ZHANG & SHI, 1997: 370

This species shows structural similarity in the male genitalia with *P. bipartita* (TODA & PENG, 1992), which is arranged in the *P. cardua*-group by CHEN (in litt.). Lateral formations of 6th tergite – anterolateral projection and posterolateral long setae – indicate relations to the *P. omega*-group.



Figs 10–12. *Phortica radiata*. 10 – periphallallic organs; 11 – phallic organs, lateral aspect; 12 – the same, ventral aspect.

Phortica (s.str.) *radiata* DUDA, 1926

Phortica maculiceps var. *radiata* DUDA, 1926: 46

Amiota (*Phortica*) *radiata*: WHEELER, 1981: 22

Material examined: Holotype ♂: Fort de Kock / (Sumatra 920 M / 1925 / leg. E. Jacobson // *Phortica* / *maculiceps* / var. *radiata* ♂ / det. Duda / Type! 1926 // Type (R) // *Phortica* / *maculiceps* / de Mey / var. *radiata* / ♂ mas Duda / det. O. Duda 1926 / Type! // Holotype (R). Coll.NML

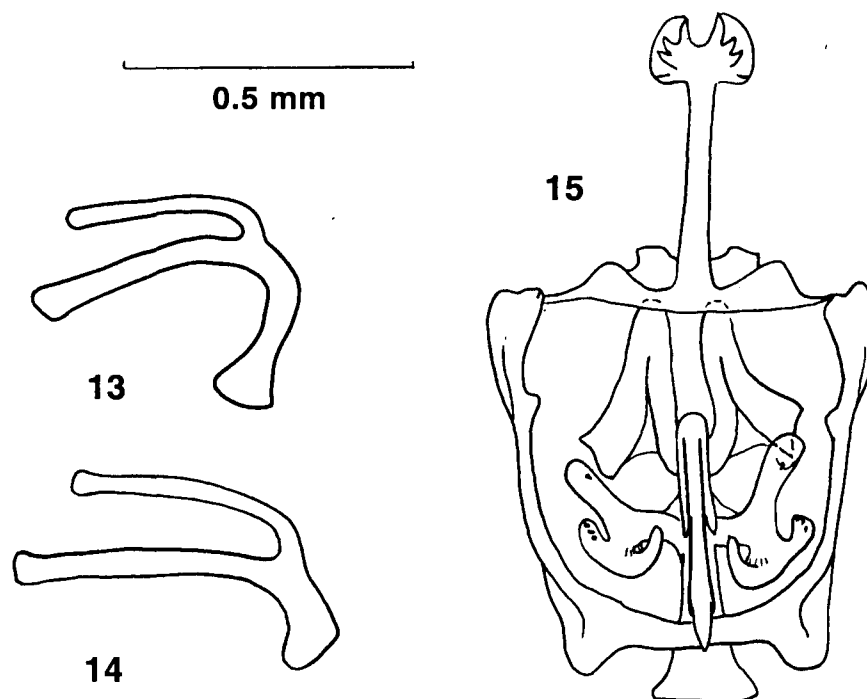
Periphallic organs (Fig. 10): Epandrium with anteroventral corner shifted well above the level of the posteroventral corner. Cerci relatively small, rounded. Surstylus with outstanding posteroventral corner, cuneiform bristles of inner side irregularly dislocated. Decasternum finely sclerotised. Phallic organs (Figs 11, 12): Hypandrium with almost undeveloped anterior flaps, arms subapically with setigerous membranous flaps. Fused gonopods of usual T-shape in dorsal part, ventrally much dilated, broadly connected to the base of aedeagus and protruding caudad into inconspicuously trilobed prominence (vertical process) and lateroventral pair of sclerotised rods. Parameres inserted widely apart, widened medially, slightly trilobed, with apex strongly bent inwards. Aedeagal apodeme strongly curved, aedeagus almost S-shaped, apically with three membranous hooks, the middle one long and twisted.

***Phortica* (s.str.) *semivirgo* (MÁCA, 1977)**

Amiota (*Phortica*) *semivirgo* MÁCA, 1977: 123

Material examined: For the present study, 20 males collected in Czech Republic: Hluboká nad Vltavou, 29.7.1992 were studied. Leg. et Coll. J. Máca.

Apodeme of aedeagus of most of studied specimens strongly curved, with holder of parameres about 1.5 times as long as the basal section of apodeme (Fig. 13, also MÁCA 1977: Fig. 8). In four specimens apodeme is slightly curved, holder of parameres at least three times as long as the basal section of apodeme (Fig. 14). Since no correlated morphologic fluctuations were observed, this difference is considered a manifestation of intraspecific variability.



Figs 13–15. *Phortica semivirgo*, aedeagal apodeme: 13 – usual shape; 14 – aberrant shape; 15 – *Phortica subradiata*, phallic organs, ventral aspect.

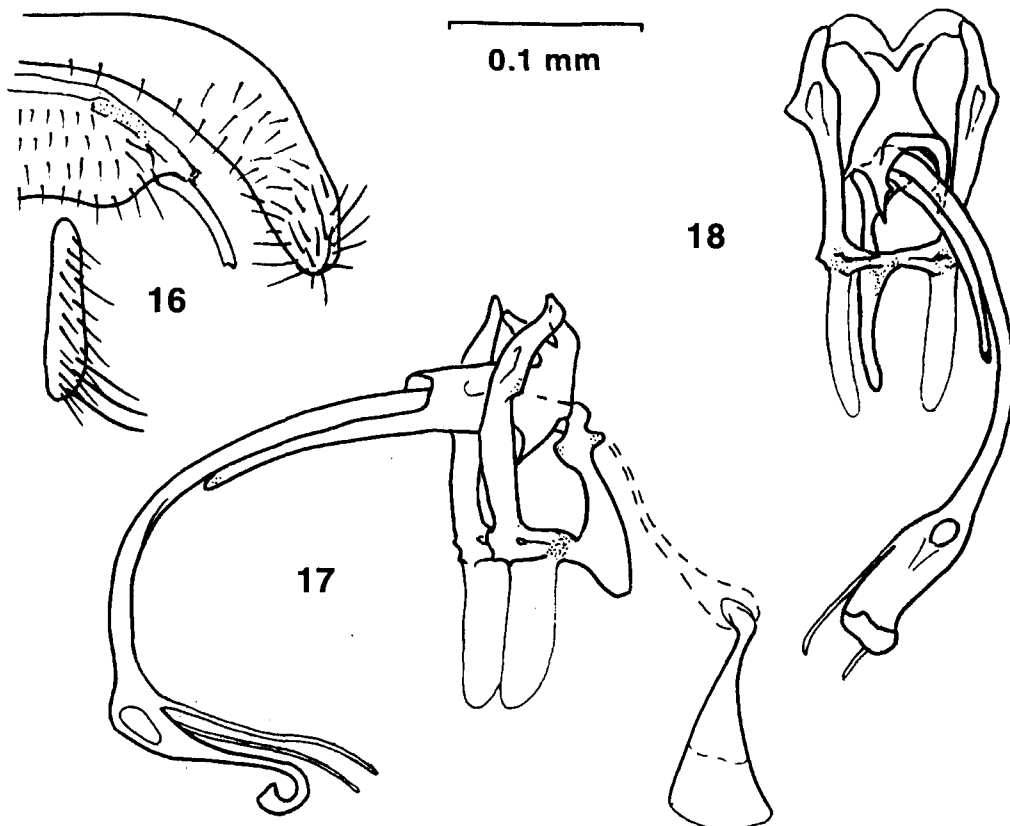
***Phortica* (s.str.) *sobodo* BURLA, 1954**

Phortica sobodo BURLA, 1954: 36

Material examined: Cameroun, Ebolowa-Nkuemvone, 31.7.196, 1 ♂, leg. L. Matile (MNP).

The male specimen studied corresponds well with the description of *P. sobodo*, previously known only from the holotype female.

Male (new): 6th sternite large, medially bare, lateral margin evenly rounded, with cluster of strong bristles. Periphallalic organs (Fig. 16): Epandrium plate-like, anterolateral corner pointed, lateral margin evenly passing into posterior margin. Cerci elongate, each with two setae very long and one moderately long, in addition to the usual setation. Surstylus slender, about as long as the width of epandrium but only slightly protruding. Decasternum lamellar. Phallic organs (Figs 17, 18): Hypandrium roughly pentagonal, paramedially each side with unusually strong flap (phragma). Gonopods fused, posteriorly bicornute, anteriorly developed into vertical process apposed to the base of aedeagus and bearing two rods. Parameres stick-like, apparently fused with hypandrium. Aedeagal apodeme apically much dilated. Aedeagus very long, widely arcuate, strongly sclerotised, with a long ventral spur; subapical part tubiform, apical part flattened and folded ventrad. Ejaculatory apodeme with flattened stalk.



Figs 16–18. *Phortica sobodo*. 16 – periphallalic organs; 17 – phallic organs, lateral aspect; 18 – the same, ventral aspect.

***Phortica* (s.str.) *subradiata* (OKADA, 1977)**

Amiota (*Phortica*) *subradiata* OKADA, 1977: 24

Material examined: Taiwan: Taipei-Nankang, 20.6.1991 1 ♂, leg. J. Máca (Coll. IZT) used for illustration, additional specimens from Taiwan as quoted by MÁCA & LIN (1993b).

Vertical process of fused gonopods long, caudally directed, apically with four denticles each side. This structure was not presented in detail by OKADA (1971, Fig. 24, as *P. orientalis*, misidentified). However, in a personal communication (letter dated 21.ix.1991) Prof. Okada sketched the characteristic denticles of the vertical process of this species. Phallic organs of this species are now illustrated here (Fig. 15), on the basis of a specimen from Taiwan.

The species shown by GRIMALDI (1990, Figs 424, 425) as *Amiota* (*Phortica*) sp. conforms to *Phortica subradiata*.

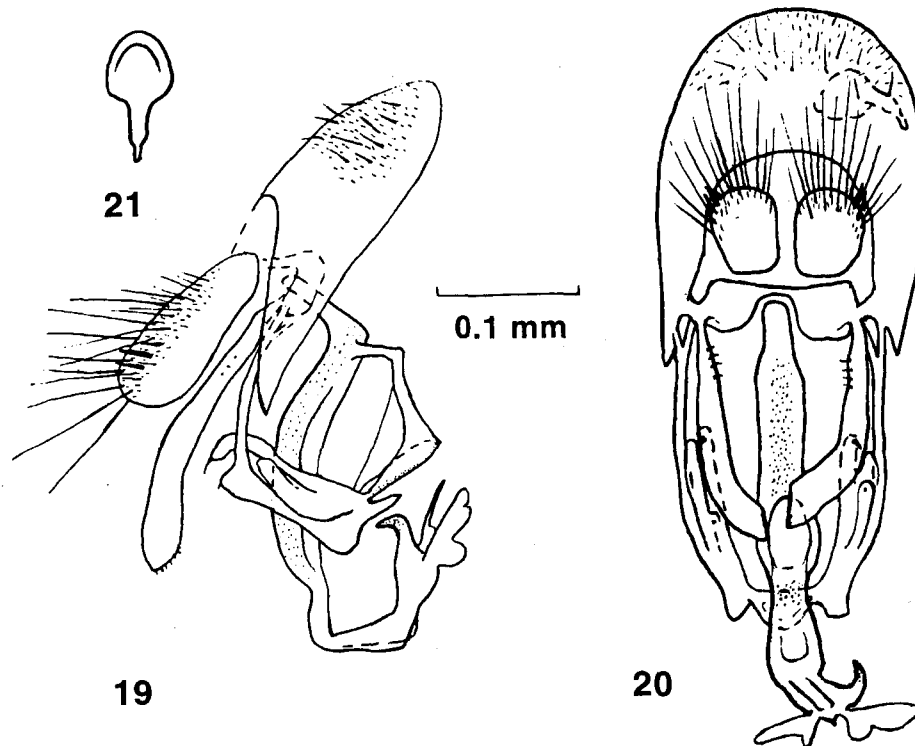
***Phortica* (s.str.) *takadai* (OKADA, 1977)**

Amiota conifera takadai OKADA, 1977: 18

Material examined: PR (North) Korea: Okryu valley, Kumgangsan Mts, 19.5.1988 1♂, leg. M. Kozánek; Manmulsang, Kumgangsan Mts, 26.5.1988 1♂, leg. M. Kozánek; the same, 1 ♂, leg. M. Slovák. All Coll. M. Kozánek.

New record for Korea.

Note: The specific status of *Phortica takadai* has been established by CHEN (in litt.).



Figs 19–21. *Phortica varipes*. 19 – male terminalia (periphallic and phallic organs), lateral aspect; 20 – the same, ventral aspect, anal lamellae and aedeagal rod in erect position; 21 – ejaculatory apodeme.

***Phortica* (s.str.) *varipes* DUDA, 1926**

Phortica varipes DUDA, 1926: 47

Lectotype ♂ (hereby designated): Fort de Kock / (Sumatra) 920 M. / 1926 / leg. E. Jacobson // Type (R) // Museum Leiden / *Phortica* / *varipes* Duda / Det: Type ♂/ Syntype (R). Syntype ♀: upper two labels same as in Lectotype// *Phortica* / *varipes* ♀/ Duda/ Type/ det Duda / 1926// Syntype. Both Coll. NML.

Both 6th abdominal tergite and the terminalia of male (Figs 19–21) of unusual structure. 6th tergite very large, medially narrow and bare, laterally with several lines of setae which are especially dense at the posterolateral corner. Epandrium crescent, with setulae and micropubescence only in the anterior part. Cerci three times as long as basally high, well movable, with about three strong cuneiform setae except of usual tuft of setae. Surstylus much elongate, basally with several setulae on the inner side, apically denticulate. Decasternum spectacles-shaped. Hypandrium arched, with a pair of anterior flaps, its arms very narrow. Fused gonopods probably represented by a perpendicular rod articulated to the narrowed part of decasternum and fused with the base of aedeagus. Parameres indistinctly trilobed, apparently fused with the hypandrium. Aedeagal apodeme with cranial section undeveloped, caudal part consisting of a narrow rod connected to the base of aedeagus and perpendicular, apically crescent holder of parameres. Aedeagus distinctly tubiform in basal part, apical half consisting of recurved rod on movable stalk with a pair of flat lamellae subapically. Ejaculatory apodeme (Fig. 21) spoon-shaped.

The female has much darker colouration especially on pleura and legs and its conspecificity is uncertain.

P. varipes shows many distinct, apparently apomorphic characters as described above. 6th abdominal tergite is very large, lamella of anal conus narrow-based, with several thorny bristles. Surstylus very long, almost bare. Aedeagal apodeme (if correctly interpreted) reduced to the holder of parameres and a tiny lamella connecting it to aedeagal tube. Gonopods not only fused together but reduced to a perpendicular bar fused to aedeagus. On the other hand, aedeagus apparently retained long tubular part (plesiomorphic character). Recurved medial rod of aedeagus developed, which is characteristic for *Phortica* s.str. The related new species to be described by CHEN (in litt.) differs by the tibiae with three dark rings, anal conus and surstylus tapering apically, etc.; see also Taxonomy at the generic/subgeneric level.

***Phortica* sp.**

Amiota (*Phortica*) *orientalis*: GUPTA & GUPTA, 1992: 24

I did not succeed in obtaining the material of this species from NE India (Arunachal Pradesh), but according to the description (vertical process of fused gonopods narrow and apically dentate) it is evident that it is a member of the *Phortica subradiata*-group. It differs from the other species by the posterior crossvein of wing clouded and by the distinct shape of aedeagus (GUPTA & GUPTA 1992, Fig. 6).

3. Taxonomic and distributional notes to some species of the genus *Amiota*

Only single descriptions of North American *Amiota* species appeared until now (LOEW 1862, JOHNSON 1921, MALLOCH 1921, 1926, MALLOCH & MCATTEE 1924, WHEELER 1952, TAKADA & TODA 1981, see also TODA et al. 1996). However, some undescribed species were mentioned by WHEELER (1949, 1952). The following descriptions and redescrptions contribute to partly fill this gap. It is evident that the North American species of *Amiota* represent several phylogenetic lineages; however, no attempt is made to classify them into species groups at present. Some notes to the European species are supplemented.

Amiota albilabris (ROTH in ZETTERSTEDT, 1860)

Drosophila albilabris ROTH in ZETTERSTEDT, 1860: 6425

Leucophenga leucostoma BECKER, 1908: 320, syn. n.

The Lectotype of *Leucophenga leucostoma* BECKER (deposited in NMB) was examined by the author, and it has been found to belong to *Amiota albilabris*. It was previously considered for *A. alboguttata* WAHLBERG, e.g. by BÄCHLI (1984), who designated the Lectotype and precised data on its locality.

Amiota alboguttata (WAHLBERG, 1839)

Drosophila alboguttata WAHLBERG, 1839: 22

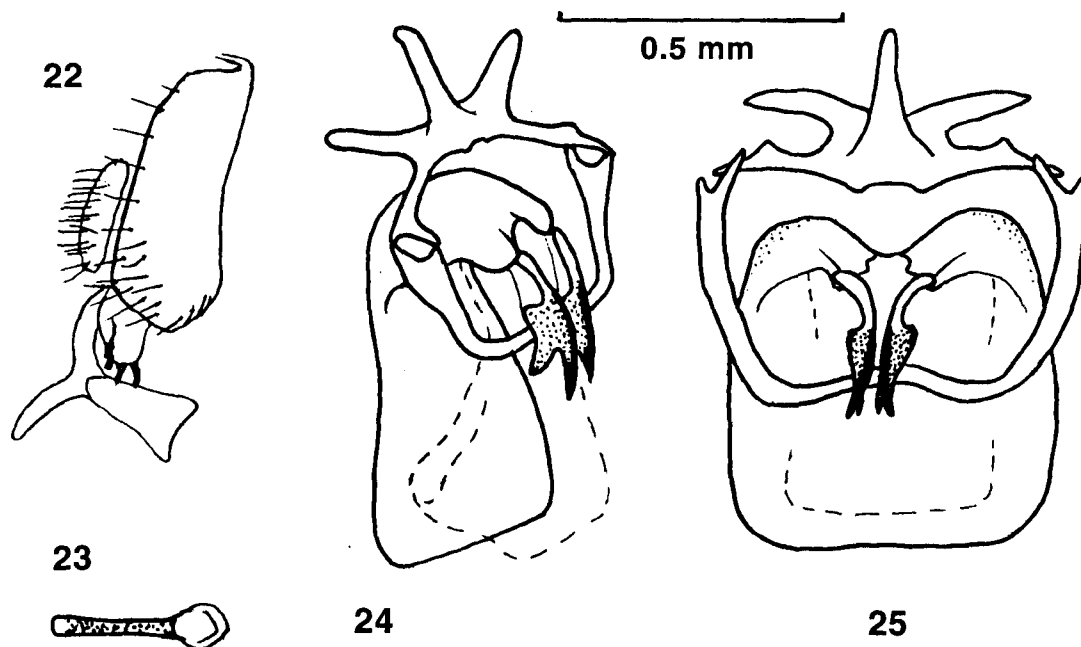
Material used for the study of preabdomen: Czech Republic: Soběslav – Svákov, 22.9.1979 1 ♂, Veselí nad Lužnicí, 3.6.2002 2 ♂, Karlštejn, 31.5.2002 1 ♂, all leg. and Coll. J. Máca.

This species has distinctive male abdominal tergites: inverted parts of 4th and 5th tergites elongated, 6th tergite almost quadrangular, 1.5 times as wide as high, laterally not reaching margins of foregoing tergites and epandrium. Wrong data on these structures, given by CHEN & TODA (2001, Pl. 3), can be explained by using inadequate material (both male specimens of *A. alboguttata* studied by them had probably been already dissected).

Amiota minor MALLOCH, 1921

Material examined: Canada, Ontario: Algonquine, mixed wood, 1.6.1991 2 ♂; Beaver Bay, mixed wood nr. river, 31.5.1991 1 ♂; Canada, Quebec: Lac Roddic, 16 km S Maniwaki, 22.6.1991 6 ♂; same locality, 23.6.1991 5 ♂. All leg. M. Barták. USA, Washington D.C.: Deanwood, nr. brook, 9.6.1991 1 ♂, leg. M. Barták; USA, Arizona: Cochise Co., Huachuca Mts, Ash Cyn., 5100 ft., 9.8.1991 1 ♂, leg. Y. F. Hsu. All Coll. J. Máca.

The species seems to be recognizable according to its brown colouration and virtually lacking white patches on face, humeral callus and pteropleuron. WHEELER (1949) distinguished further two closely related undescribed species in the USA but he refrained from mentioning them later (WHEELER 1952). The original description of *A. minor* was very cursory, a further paper (MALLOCH & MCATTEE 1924) brought drawings of male genitalia. Because of the lack of detailed information on their inner structure they are illustrated in the present paper (Figs 22–25).



Figs 22–25. *Amiota minor*. 22 – peripheral organs; 23 – ejaculatory apodeme; 24 – phallic organs, lateral aspect (with outline of 6th sternite, dotted); 25 – the same, ventral aspect.

Epandrium roughly quadrangular in profile, narrow above. Anal conus flat. Decasternum well developed, with triangular plate medially. Surstylus with two moderately long teeth staying somewhat apart from one another and an indistinctly visible group of teeth or warts. Ejaculatory apodeme with small plate. Hypandrium wider than long in ventral aspect, its arms caudally widened. Each paramere basally and subapically bilobed, with an apical hook. Gonite with almost straight anterior arms, vertical process horn-like. Aedeagal apodeme nearly quadrangular but curved ventrad at the connection of parameres.

***Amiota rufescens* (OLDENBERG, 1914)**

Material examined: Spain: Queralbs, 21.6.1997 1♂, leg. et Coll. L. Serra.

New record for Spain.

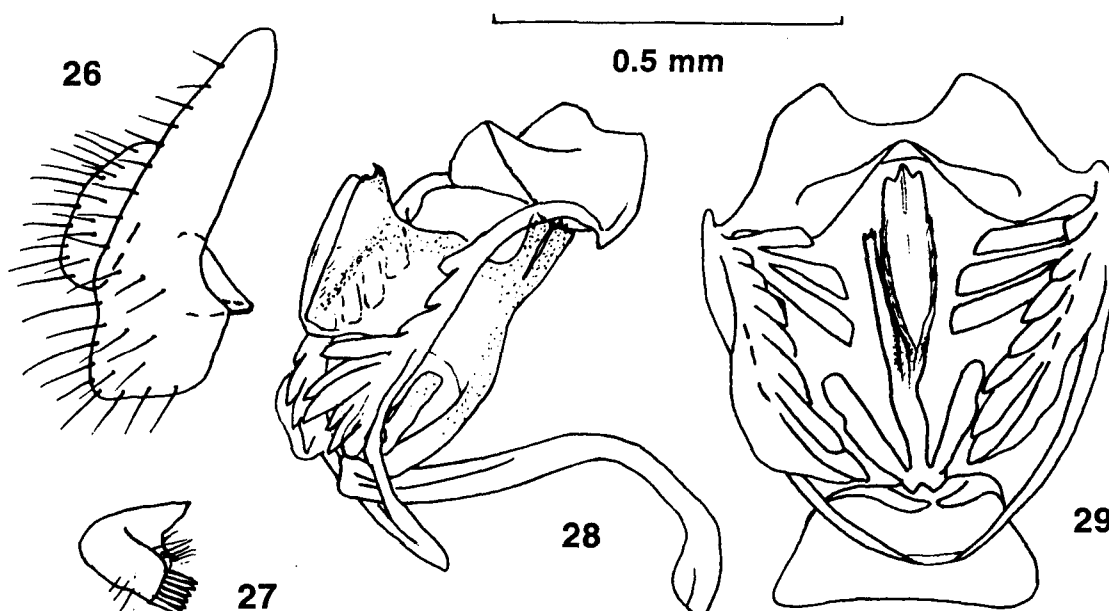
***Amiota setigera* MALLOCH, in MALLOCH & MCATTEE, 1924**

Material examined: USA, Maine: Catoctin Mt. Park (Lantz), meadow near pond, 15.6.1991 1♂, leg. M. Barták. Coll. J. Máca.

First published description of this species (though very short) is the couplet 2 in the key by MALLOCH & MCATTEE (1924), which preceded by two months the description published by MALLOCH (1924). The species seems to be easily distinguished by its narrow frons (twice as long as its width measured above lunula), which is strongly pollinose and iridescent. Mesonotum also pollinose. The presence of 4–5 long setae on the hind femora of males is very characteristic. STEYSKAL (personal information) discovered a similar undescribed

species (unknown to me) with three setae on male hind tibia, mesonotum only slightly pollinose and appendix of hypandrium hook-like.

The male genitalia of *A. setigera* are of peculiar structure, as follows (Figs 26–29): Epandrium widened in lower part, posteroventral part with scattered setae. Surstylus with six teeth, inner processes of surstyli medially touching one another. Hypandrium arc-like medially, caudal part each side with appendix consisting of about ten unequal lamellae reminding feathers of bird wings. Basiphallus complicated, rod-like, basally with a pair of club-like appendages, apically with parallel-sided and apically serrate projections. Parameres flat and apposed one another, apicomediaally with a hook (and there contiguous one another). Apodeme narrow, almost not vaulted in transverse plane, curved ventrad at free end.



Figs 26–29. *Amiota setigera*. 26 – peripheral organs; 27 – surstylus; 28 – phallic organs, lateral aspect; 29 – the same, ventral aspect.

Amiota hsui sp.n.

Holotype ♂: USA, Arizona: Cochise Co., Huachuca Mts, Ash Cyn., 5100 ft., 9.8.1991, leg. Y. F. Hsu. Paratypes: same data, 4 ♂. All Coll. J. Máca.

Diagnosis: Black species of medium size with usual white markings. Arista with both upper and lower rays long. Palpus yellow, proboscis brown. Male 6th tergite large, tapering laterally. Aedeagal apodeme with a pair of ventral projections. Basiphallus long, parameres projecting at right angle from its caudal end.

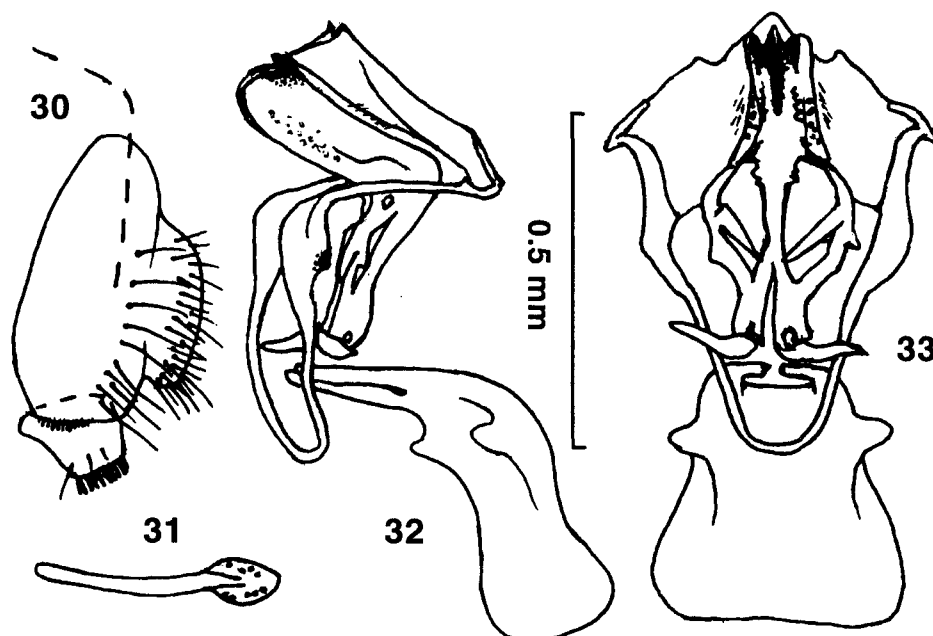
Description: Frons black, with brown stripe above lunula. Length of frons 0.53 mm, posterior width the same, anterior width 0.42. Orbitals 0.26, 0.18, 0.26 mm. Orbito-index 0.67.

Face brown, with white spot over lower third. Facial carina roof-like above, narrow below. Palpus yellow, proboscis brown. Antenna brown, 1st flagellomere twice as long as wide, arista with four rays above and three below, avd-index 1.54, longest lower ray as long as width of 1st flagellomere. Gena yellow, index eye/gena width 0.14. Occiput black. Vibrissa 0.19 mm, buccal bristle 0.13 mm.

Mesoscutum black, slightly pollinose, humerus with white spot. Dcl-index 0.5, presctl-index the same. Anterior scutellars as long as posterior scutellars (0.58 mm). Pleura black, meron brown, white spot on boundary between anepisternum and anepimeron. Prosternum yellow. Legs yellow, tarsal index 1.0 on all tarsi. Preapicals small. Wing length 2.6–3.4 mm. C-i 1.9–2.5, 4v-i 2.5–2.8, 5x-i 1.2, 4C-i 1.5, Ac-i 4.0–5.8, Cx-i 0.6, M-i 0.7–0.9. Cuneiform setulae of 3rd costal section over 0.65–0.85 its length.

Abdominal tergites black, in some specimens 2nd to 3rd tergites brown. 6th tergite large, tapering laterally. Periphallalic organs (Fig. 30): Epandrium small, undivided, laterally not extending lateral margin of 6th tergite. Surstylus almost triangular, with ca. 10 teeth. Ejaculatory apodeme (Fig. 31) with well-marked pits. Phallic organs (Figs 32, 33): Hypandrium strongly curved in lateral aspect. Aedeagal apodeme with pair of ventral projections at its half-length. Basiphallus of complicate structure, long, basally bifid. Parameres hooked, projecting from basiphallus at right angle. Gonite almost flat, with fine hairs medially.

Etymology: The species is named after the collector, Dr. Yu-Fang Hsu. In 1991, he was a postdoctoral student at the Department of Entomological Sciences, University of California, Berkeley.



Figs 30–33. *Amiota hsui*. 30 – periphallalic organs; 31 – ejaculatory apodeme; 32 – phallic organs, lateral aspect; 33 – the same, ventral aspect.

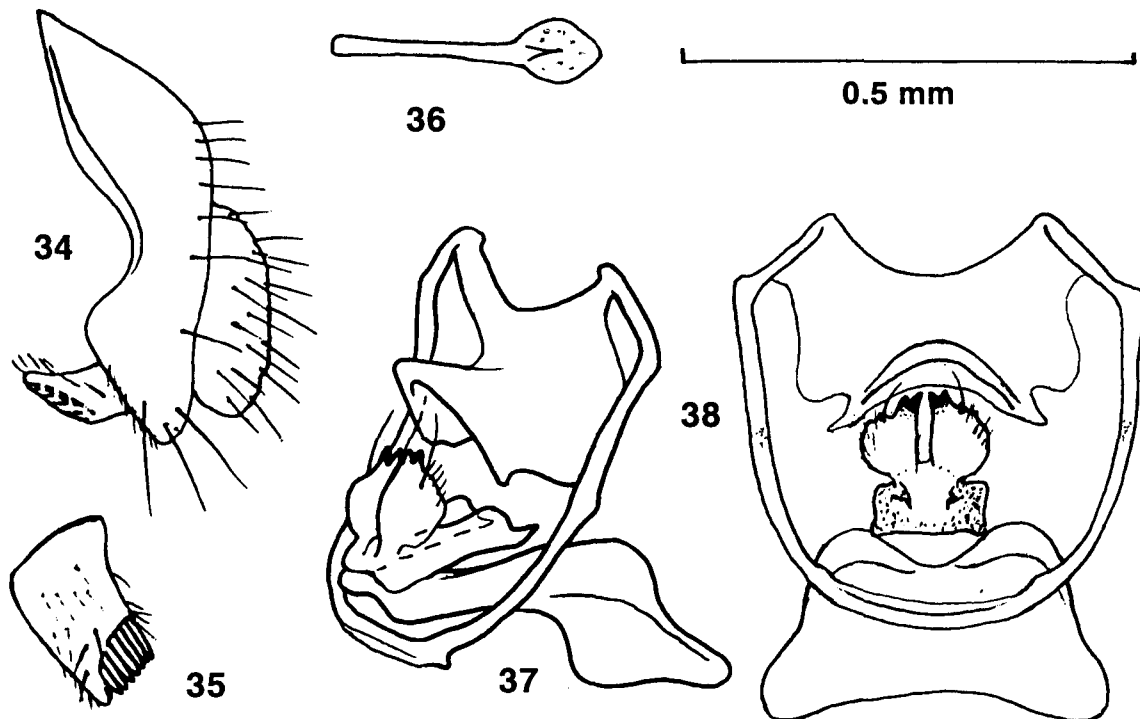
***Amiota lineiventris* sp.n.**

Holotype ♂: Canada, Ontario: Eganville, damp meadow near lake, 2.6.1991, leg. M. Barták. Paratypes: Same data, 1 ♂. Canada, Quebec: Lac Roddic, 16 km S Maniwaki, 23.6.1991 1 ♂, leg. M. Barták. All Coll. J. Máca.

Diagnosis: Medium-sized black species with usual white spots, the spot on face narrow. Antenna: 1st flagellomere black, arista with short lower rays. Sternites 3rd to 5th narrowly darkened in median line and along caudal margin. Anterior margin of epandrium sinuate. Basiphallus consisting of two anteriorly directed rods, parameres roughly rounded, with setulae.

Description: Frons and occiput black. Length of frons 0.40 mm, posterior width the same, anterior width 0.27 mm. Orbitals 0.16–0.23, 0.13, 0.18 mm. Orbito-index 0.5. Face brown, with narrow (somewhat more than thrice as wide as high) white spot below, carina almost flat. Palpus yellow. Antenna brown, 1st flagellomere black, little longer than wide. Arista with four upper and about four lower rays, avd-index 2.0, lower rays only 0.05 mm long. Gena yellowish brown, vibrissal and buccal angle apparent, index eyes/gena width 0.09. Vibrissa 0.16 mm, buccal bristle 0.13 mm.

Mesoscutum black, humeral callus with white spot. Dcl-index 0.55, presctl-index 0.6. Scutellar setae 0.58 mm (basals) and 0.42 mm (apicals). Pleura brownish black, with usual white spot. Sterno-index 0.7–0.9. Prosternum yellow, caudal end dusted. Legs yellow, preapicals small (0.05 mm), tarsal index 0.7, 1.0, 0.7 (first, middle and hind legs, respectively). Wing length 2.5 mm. C-i 2.3, 4v-i 2.4, 5x-i 1.3, 4C-i 1.3, Ac-i 2.5, Cx-i 1.1, M-i 0.6. Cuneiform bristles of 3rd costal section over 0.4–0.5 of its length.



Figs 34–38. *Amiota lineiventris*. 34 – peripheral organs; 35 – surstylus; 36 – ejaculatory apodeme; 37 – phallic organs, lateral aspect; 38 – the same, ventral aspect.

Abdominal tergites black. Sternites 3rd to 5th each with narrow dark median line and dark caudal margin (well visible when cleared by maceration). Periphallic organs (Figs 34, 35): Epandrium with anterior margin sinuate. Surstylus with 7 teeth and a small projection adjacent to them anteriorly. Ejaculatory apodeme (Fig. 36) of usual shape, with moderately distinct pits. Phallic organs (Figs 37, 38): Hypandrium virtually ribbon-like. Aedeagal apodeme almost angularly curved. Basiphallus consisting of two inwardly directed, apically hooked rods. Parameres roughly rounded, finely dentate apically, each with one moderately long and several short setulae. Gonite large, vertical process wide, rounded.

Etymology: Name given in reference to the linear pattern of (male) abdominal sternites.

Amiota mariae sp.n.

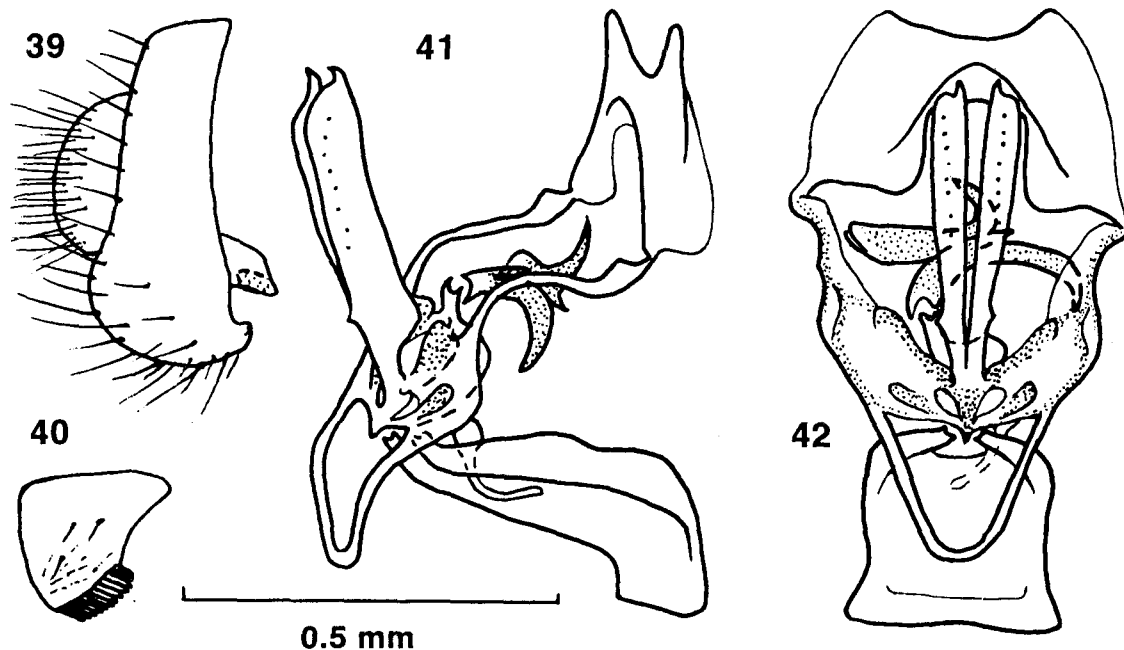
Holotype ♂: Canada, Quebec: Lac Roddic, 16 km S Maniwaki, 23.6.1991, leg. M. Barták. Coll. J. Máca.

Diagnosis: Brownish-black pollinose species. White spot on face indistinct. Arista with both upper and lower rays long. 6th tergum (of male) large, laterally tapering. Posterolateral corner of epandrium with a cluster of setae. Hypandrium with extensive, partly membranous, dilatations. Basiphallus consisting of bulbous part and two bifid hooked rods. Vertical process of gonite almost quadrangular in ventral aspect.

Description: Frons dark brown above, lower half and orbita light to medium brown, occiput dark brown. Length of frons 0.5 mm, lower width 0.4 mm, upper width 0.6 mm. Orbitals 0.23, 0.21, 0.26 mm. Orbits-index 0.45. Face yellow, without distinctly differentiated white spot, carina low. Palpus yellow to pale brown. Antenna brown; 1st flagellomere dark brown, almost twice as long as wide, virtually straight anteriorly but rounded posteriorly; five upper and three lower rays of arista long (longest upper ray 0.21 mm), avd-index 1.14. Gena yellow, with vibrissal and buccal angle almost indistinct, index gena/eye width 0.09. Vibrissa 0.23 mm, buccal bristle 0.13 mm.

Mesoscutum brownish black, pollinose, humeral callus with white spot. Dcl-index 0.6, presctl-index the same. Scutellar setae 0.52 mm and 0.60 mm (basals and scutellars respectively). Pleura brown, with the usual white spot. Sterno-index 0.8. Prosternum yellow. Legs yellow, tarsal index about 1.0, preapicals 0.08–0.1 mm; middle tibia ventrally with numerous soft hairs. Wing length 2.7 mm, C-i 2.2, 4v-i 2.4, 5x-i 1.2, 4C-i 1.4, Ac-i 3.9, Cx-i 0.7, M-i 0.55. Cuneiform bristles of 3rd costal section over 0.7 of its length.

Abdominal tergites brownish black. 6th tergum laterally tapering, protruded well below the lateral margin of epandrium. Periphallic organs (Figs 39, 40): Epandrium divided dorsomedially, somewhat inflated below, posterolateral corner with a cluster of setae. Surstylus with 12 teeth, inner side with numerous setae. Ejaculatory apodeme probably represented by a small stick unclearly visible among structures of aedeagal apodeme and basiphallus. Phallic organs (Figs 41, 42): Hypandrium medially ribbon-like, semilaterally with largely membranous but partly sclerotised dilations. Aedeagal apodeme with almost parallel sides, internal end curved ventrad. Basiphallus consisting of small bulbous part and two loosely attached hooked rods (the left-based one seemingly free); each of them is bifid



Figs 39–42. *Amiota mariaae*. 39 – peripheral organs; 40 – surstylus; 41 – phallic organs, lateral aspect; 42 – the same, ventral aspect.

but the ends are of very unequal length. Parameres represented by a pair of long, apically hooked lamellae, each with row of about seven sensilla. Gonite with almost quadrangular vertical process.

Etymology: Dedicated to my wife, Marie Mácová, for her mostly kind and patient attitude to my entomological hobby.

Amiota nebojsa sp.n.

Holotype ♂: USA, Arizona: Cochise Co., Huachuca Mts, Pinary Cyn., 5100 ft., 9.8.1991, leg. Y. F. Hsu. Paratypes: same locality, 4 ♂ and 1 ♀; all Coll. J. Máca.

Diagnosis: Black, large species (wing length at least 3.5 mm). Palpus dark brown. Arista with short lower rays. Basitarsus of the midleg with anteroventral row of setulae. 6th tergite of male small. Anterolateral corner of epandrium projected cranially. Surstylus with finger-like process. Hypandrium widely arched. Paramere sinuate in lateral aspect. Vertical process of gonite apically indented.

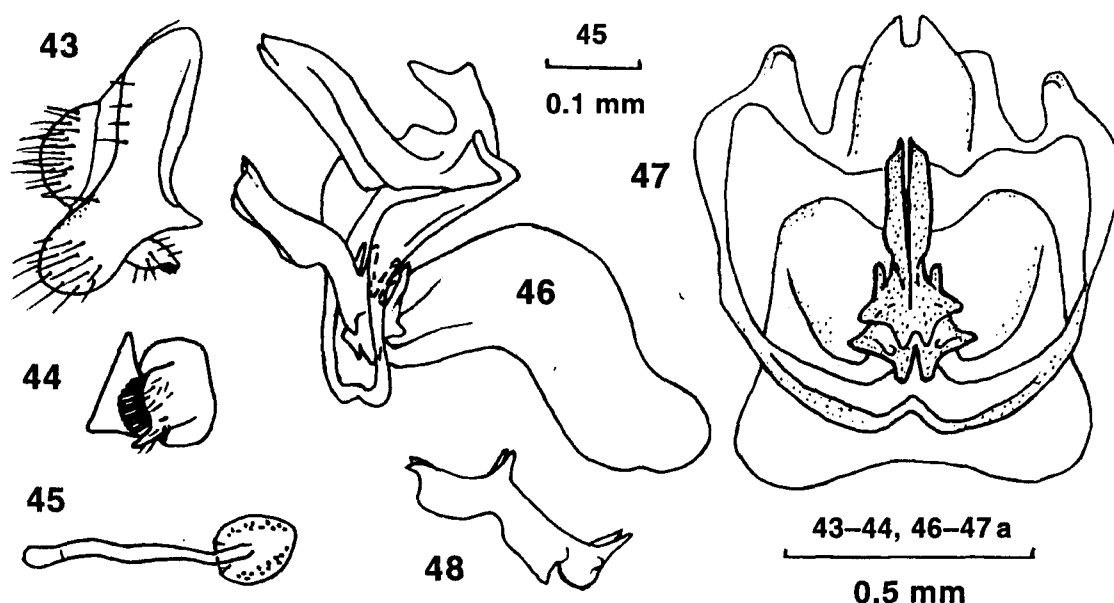
Description: Frons brownish black, occiput black but brown above. Length of frons 0.7 mm, anterior width 0.5 mm, posterior width 0.6 mm. Orbitals 0.21, 0.18, 0.26 mm. Orbito-index 0.6. Face yellowish brown, lower part with a white spot. Carina narrow, long. Palpus dark brown. Antenna dark brown, 1st flagellomere apically oval, arista with four upper rays, lower rays short (avd index 3.0). Gena yellowish brown, edge darkened, postgena yellow, index eye/gena width 0.17.

Mesoscutum black, slightly pollinose, humeral callus with a white spot. Dcl-index 0.6, presctl-index the same. Scutellars roughly equal, 0.55 to 0.79 mm according to the size of

specimen. Pleura dark brown, suture between anepisternum and katepisternum pale brown, white spot at anterior margin of pteropleuron present. Prosternum brown with pale margins. Legs yellow, tarsal index about 1.0 on all legs. Preapicals 0.06 mm on fore and hind tibiae, 0.11 mm on mid tibiae (equally long with the apicals). Basitarsus of midleg with anteroventral row of ca. 25 cuneiform setulae. Basitarsus of hindleg ventrally with soft hairs as long as the width of the segment. Wing length 3.5–4.6 mm, C-i 2.0–2.3, 4v-i 1.9–2.2, 5x-i 0.9–1.1, 4C-i 1.2, Ac-i 3.4, Cx-i 0.8–0.9, M-i 0.4–0.5. Cuneiform bristles of 3rd costal section over 0.6–0.7 of its length.

Most of abdominal tergites brownish black, 2nd tergite, and sometimes apical margin of 1st and 3rd tergites, greyish yellow. 5th tergite large, 6th tergite of male small. Periphallallic organs (Figs 43, 44): Epandrium small, dorsomedially divided, with a strong thorn-like projection at anterolateral corner. Surstylus with 12 indistinctly pointed teeth and a distinct finger-like process anteriorly to them. Decasternum triangular. Ejaculatory apodeme (Fig. 45): plate with numerous pits, stalk inserted almost in the centre of plate. Phallic organs (Figs 46, 47): Hypandrium widely arched. Aedeagal apodeme robust, wide. Basiphallus medially almost divided, each part projecting into three blunt points, the dorsalmost being the longest. Parameres somewhat sinuate in lateral aspect, each of them basally with three blunt points similar to those of basiphallus. The dorsalmost one of these points shifted to about the half of paramere length (Fig. 48) in one of the paratypes. Gonite large, vertical process with apical indentation.

Etymology: After Nebojsa (= Dauntless), a personality from a Czech fairy tale, with reference to the behaviour of flies fluttering in front of person's face.



Figs 43–48. *Amiota nebojsa*. 43 – periphallallic organs; 44 – surstylus; 45 – ejaculatory apodeme; 46 – phallic organs, lateral aspect; 47 – the same, ventral aspect; 48 – detail of the phallic organs of the aberrant specimen.

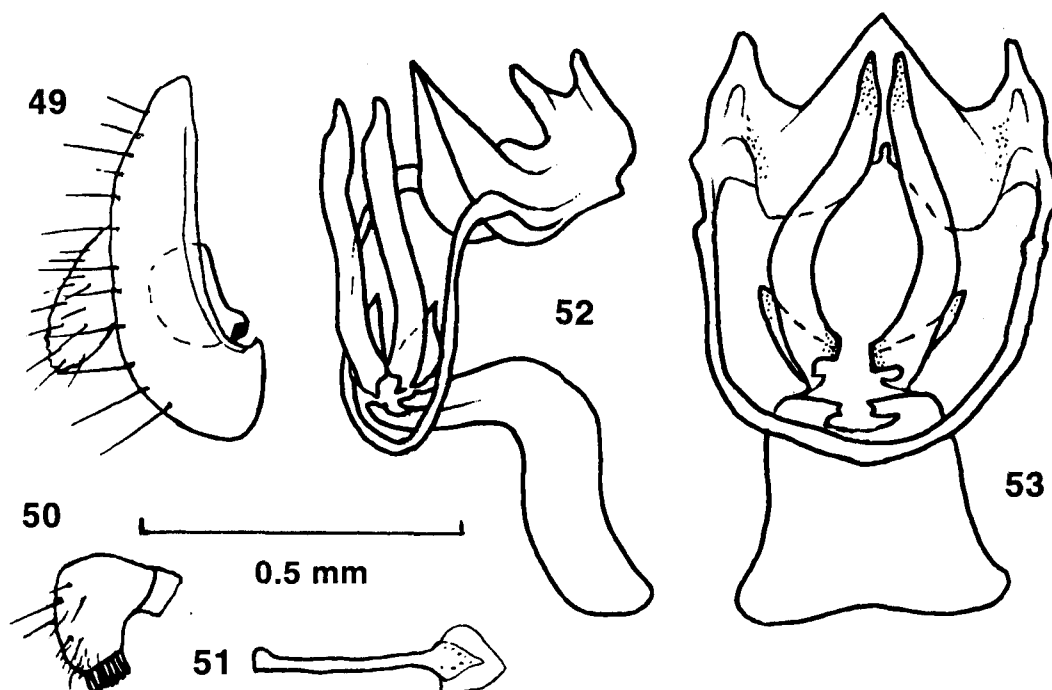
Amiota steyskali sp.n.

Holotype ♂: USA, Maine: Catoctin Mt. Park, Owens Creek, 15.6.1991, leg. M. Barták. Paratypes: 5 ♂, same locality; Catoctin Mt. Park, Chestnut wood, 15.6.1991 1 ♂ and 1 ♀, leg. M. Barták. Canada, Quebec: Lac Roddic, 16 km S Maniwaki, 23.6.1991 1 ♂, leg. M. Barták. Coll. J. Máca.

Diagnosis: Brownish grey to brownish black pollinose species with usual white spots. Upper and lower rays of arista almost equally long. Buccal angle indistinct. Middle tibia of male with ca. 9 upright bristles. Male cerci narrow and tapering. Articulating processes of aedeagal apodeme bilobed. Basiphallus represented by two small, roughly triangular sclerites. Parameres lamellar. Gonite with heart-shaped vertical process.

Description: Frons grey, pollinose, narrow strip above lunula yellowish brown, ocellar triangle black. Occiput brownish black. Length of frons 0.42 mm, anterior width 0.26 mm, posterior width 0.40 mm. Orbitals 0.18 mm, 0.16 mm, 0.24 mm. Orbito-index 0.5. Face yellowish brown, with a white strip over lower third, facial carina narrow, becoming indistinct in the lower half of face. Palpus yellow. Antenna brown, 1st flagellomere 1.5 times as long as wide, arista with 3–4 upper rays and 3–4 lower rays, avd-index 1.0 to 1.2. Gena narrow (gena/eye index about 0.1), yellow, buccal angle indistinct, buccal seta 0.1 mm, vibrissa slightly longer.

Mesoscutum brownish grey to brownish black, pollinose, some specimens with a yellowish brown patch behind posterior dorsocentrals. Humeral callus with white spot. Dcl-index 0.65, presctl-index 0.55. Scutellar setae 0.6 mm (basal), 0.4–0.5 mm (apical). Pleura greyish brown with the usual pteropleural white spot. Sterno-index 1.0. Prosternum yellow. Legs yellow. Preapicals almost undifferentiated. Middle tibia of male with about 9 upright bristles which



Figs 49–53. *Amiota steyskali*. 49 – peripheral organs; 50 – surstylus; 51 – ejaculatory apodeme; 52 – phallic organs, ventral aspect; 53 – the same, lateral aspect.

are as long as tibial width. Tarsal index 0.7, 0.9, 0.8 (fore, middle, and hind tarsi respectively). Wing length 2.4 – 2.6 mm, C-i 1.9–2.2, 4v-i 2.1–2.8, 5x-i 1.2, 4C-i 1.4–1.5, Ac-i 3.8–4.2, Cx-i 0.7, M-i 0.6–0.7. Cuneiform bristles of 3rd costal section over 0.6–0.7 of its length.

Abdominal tergites brownish grey but the first two tergites with medial patches of yellow colouration. Periphallallic organs (Figs 49, 50): Epandrium arch-like in lateral aspect. Cerci narrow, tapering. Surstylus with 7 teeth, decasternum rudimentary. Ejaculatory apodeme (Fig. 51) with plate partly desclerotised. Phallic organs (Figs 52, 53): Hypandrium ribbon-like, arched in lateral aspect. Aedeagal apodeme comparatively narrow, each of the two basal articulating projections bilobed. Basiphallus divided into two roughly triangular sclerites, each of them situated dorsolaterally at the base of paramere. Parameres lamellar, slightly hooked apically. Gonite with heart-shaped vertical process.

Etymology: The species is named in honour of Dr. G. C. Steyskal (1909–1996), famous American entomologist of partly Czech origin (his grandfather came to USA from Praha), author of many dipterological papers and also of unpublished notes to various North American *Amiota* species.

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