

Amiota (Amiota) apodemata Species-group, with Descriptions of Two New Species from Southeast Asia (Diptera: Drosophilidae)

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Abstract. A new species-group, the *Amiota (Amiota) apodemata* species-group, which may represent a link between the subgenera *Amiota* Loew and *Phortica* Schiner, is established, including *A. apodemata* Gupta et Panigrahy, 1987 from India and Hainan Is. and two new species, *parvipyga* from Java and *yangonensis* from Myanmar. The aedeagal structure of the new species-group is homologized with that of *Phortica*.

Key words: Aedeagal homology, Drosophilidae, *Amiota*, *apodemata* species-group, new species, Southeast Asia.

Introduction

Although six subgenera have been recognized in the genus *Amiota* Loew, 1862, their phylogenetic relationships have not been revealed yet. Especially, the position of *Phortica* Schiner, 1862, which is the biggest subgenus including 61 species, has been uncertain. *Phortica* originally established as a genus was later treated as a subgenus of the genus *Amiota* by Wheeler (1952). He mentioned, "Most authorities seem agreed that *Amiota* and *Phortica* are synonymous, and according to Malloch and McAtee (1924) Schiner's publication appeared several months after that of Loew, and hence *Amiota* should be used. European workers, however, have not accepted *Amiota* as valid and use *Phortica*. The type of the latter, *variegata* (Fallén), is distinct in many characteristics from *humeralis*² and its closest relatives, and I feel that ultimately they will be separated into different genera. However, the group of species concerned is very poorly understood at present, taxonomically, so that for the present it seems best to place *Phortica* as a subgenus, as it was first suggested by Sturtevant (private communication)". This tentative treatment has been, however, followed traditionally by subsequent taxonomists.

Although the male terminalia are of primary significance for considering the relationships among taxa of

the family Drosophilidae, Máca (1980) pointed out that it is difficult to homologize the components of aedeagus proper of the subgenus *Amiota* with those of other drosophilid taxa, but tried to compare the detailed structure of aedeagus between *Amiota* (s. str.) and *Phortica*, and found an extensive variation in the aedeagal structure among *Amiota* (s. str.) species.

Recently, Grimaldi (1990) interpreted that the aedeagus proper is lost in most species of the subgenus *Amiota* and regarded this character as an autapomorphy for the subgenus *Amiota*.

Examining *Amiota* (s. str.) specimens from Southeast Asia, we found two new interesting species which may represent a link between the subgenera *Amiota* and *Phortica*. Their aedeagal structure is peculiar, just intermediate between those of *Amiota* (s. str.) and of *Phortica*, and useful to homologize the aedeagal structure between the two subgenera. In addition, we noticed that *Amiota (Amiota) apodemata* Gupta et Panigrahy, 1987 shares the same structure of aedeagus with the above-mentioned species. Here we establish a new species-group, the *A. (A.) apodemata* species-group, including *apodemata* and the two new species to be described in this paper.

Amiota (Amiota) apodemata species-group

Diagnosis. Costal vein between R_{2+3} and R_{4+5} with several, distinct peg-like spinules on ventral surface; male 5th abdominal tergite large, broad, with 1 pair of dark colored expansions at posteroventral corners and 1 pair of pale colored strips on caudoventral margins (Fig. 1, E); male 6th abdominal tergite very

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² Belonging to the subgenus *Amiota*.

small, ventrally tapering and not reaching ventral margins of other tergites (Fig. 1, E); hypandrium separated into two lateral arches at middle of anterior portion (Figs. 1–3, B, C); aedeagus membranous, somewhat spoon-shaped, basally fused to aedeagal apodeme (Figs. 1–3, C).

This species-group certainly belongs to the subgenus *Amiota* in having distinct, milky white spots on the lower part of face and the upper parts of postpronotal lobe and anepimeron, the anterior reclinate orbital seta only slightly shorter than other orbitals, and the almost unicolorous, glossy, dark brown thorax. However, the presence of aedeagus is peculiar in the subgenus *Amiota*. Its position between the parameres and the gonopods and basal fusion to the aedeagal apodeme strongly suggest the homology to the aedeagal median rod or it + the rod elongating from the aedeagal apodeme in the subgenus *Phortica* (cf. Toda & Peng, 1990). Furthermore, the relatively narrow aedeagal apodeme, though dorsoventrally flat as in other *Amiota* (s. str.) species, may indicate some relatedness to the laterally flattened aedeagal apodeme of the subgenus *Phortica*.

Description. Head: Ocellar triangle and upper 2/3 of frontal vitta dark brown; lower 1/3 of frontal vitta and fronto-orbital plate orange brown; frontal vitta pollinose. Face orange brown on upper 1/3, dark brown medially. Pedicel orange brown; 1st flagellomere yellowish gray. Carina short, relatively broad. Clypeus black to dark brown. Palpus somewhat triangular, yellowish gray, with 2 rows of lateral setae. Vibrissa prominent; other orals small. Postgena black; occiput glossy, brownish black.

Thorax: Postpronotal lobe with only 1 prominent seta. Acrostichal setulae in about 12 irregular rows. Prescutellar setae present. Basal scutellar setae divergent; apicals crossed each other. Wings hyaline. Veins grayish yellow; crossveins clear. Basal medial-cubital crossvein present. R_{2+3} slightly curved to costa at tip; R_{4+5} and M_1 distally convergent. C_1 seta less differentiated. Halter white. Legs yellow. Apical seta present on mid tibia; preapical dorsals on all tibiae. Fore femur posteriorly with 2–3 irregular rows of setae. Mid tarsus ventrally with 2 rows of minute cuneiform setulae; hind tarsus with 1 row of similar setulae. Fore and hind 1st tarsomeres each slightly shorter than rest of tarsomeres together; mid 1st tarsomere slightly longer than rest together.

Abdominal tergites glossy, brown to brownish black; 1st and 2nd tergites medially paler [but not confirmed for *Amiota (Amiota) yangonensis* sp. nov. because of long preservation of the specimen in 70% ethanol solution]. Sternites pale grayish yellow.

♂ terminalia: Epandrium small, dorsomedially constricted, pubescent except for anterior margin, with about 5–6 setae near caudal margin and about 5–7 setae near ventral margin. Surstylus unpubescent, but somewhat setigerous, with 1 row of about 6–8 relatively long prenisetae on distal margin, finger-like process at caudoventral corner, and several stout setae on distal portion of inner surface. Cercus separated from epandrium, entirely pubescent and setigerous. Membrane between epandrium and cercus pubescent. Gonopods fused, forming posteromedian plate, posterolaterally contiguous to posterior ends of hypandrium and anteroventral corners of epandrium, anteriorly forming vertical process. Parameres subbasally fused to each other, basally contiguous to short arms of aedeagal apodeme. Apical plate of ejaculatory apodeme narrow, with 4 pits; stalk thick, short.

Amiota (Amiota) apodemata Gupta et Panigrahy, (Fig. 1)

Amiota (Amiota) apodemata Gupta et Panigrahy, 1987: 57.

Diagnosis. Paramere narrow in lateral view, apically triangularly notched, submedially with 3–4 sensilla (Fig. 1, C); vertical process of fused gonopods very narrow, slightly bifid at apex (Fig. 1, C).

Measurements: BL (body length) = 1.90–2.52 mm in 5♂, 2.41–2.72 mm in 4♀; ThL (thorax length) = 0.90–1.18 mm in ♂, 1.16–1.25 mm in ♀; WL (wing length) = 1.80–2.09 mm in ♂, 2.00–2.44 mm in ♀; WW (wing width) = 0.76–0.91 mm in ♂, 0.88–0.90 mm in ♀.

Indices: arb (dorsal branches of arista/ventral branches of arista) = 5–6/3–4, FW/HW (frontal width/head width) = 0.32–0.36, ch/o (maximum width of gena/maximum diameter of eye) = 0.07–0.09, prorb (proclinate orbital/posterior reclinate orbital) = 0.96–1.00, rcorb (anterior reclinate orbital/posterior reclinate orbital) = 0.65–0.76, vb (subvibrissal/vibrissa) = 0.30–0.35, dcl (anterior dorsocentral/posterior dorsocentral) = 0.40–0.50, presctl (prescutellar/posterior dorsocentral) = 0.55–0.57, sctl (basal scutellar/apical scutellar) = 1.15–1.25, sterno (anterior katapisternal/posterior katapisternal) = 0.95–1.02, orbito (distance between proclinate and posterior reclinate orbitals/distance between inner vertical and posterior reclinate orbital) = 1.82–2.00, dcp (distance between ipsilateral dorsocentrals/distance between anterior dorsocentrals) = 0.30–0.32, sctlp (distance between ipsilateral scutellars/distance between apical scutellars) = 1.34–1.45, C = 1.03–1.20, 4c = 1.77–2.00, 4v = 2.50–3.00, 5x = 1.24–1.50, ac = 5.00–5.48, M = 0.60–0.71, C3F = 0.76–0.80.

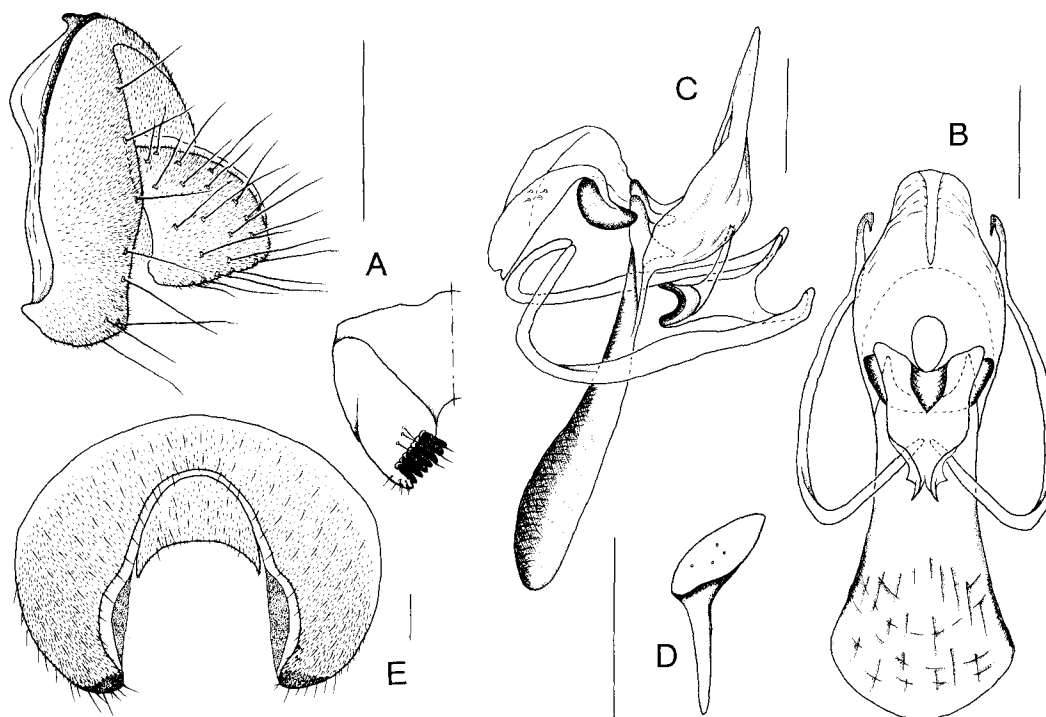


Fig. 1. *Amiota (Amiota) apodemata* Gupta et Panigrahy ♂ (from Jianfeng, Hainan Is.) — A, Epandrium, cercus, and surstylus; B, hypandrium, parameres, aedeagus, and aedeagal apodeme (ventral view); C, ditto and gonopod (ventrolateral view); D, ejaculatory apodeme; E, 5th and 6th abdominal tergites. (Scale-line=0.1 mm)

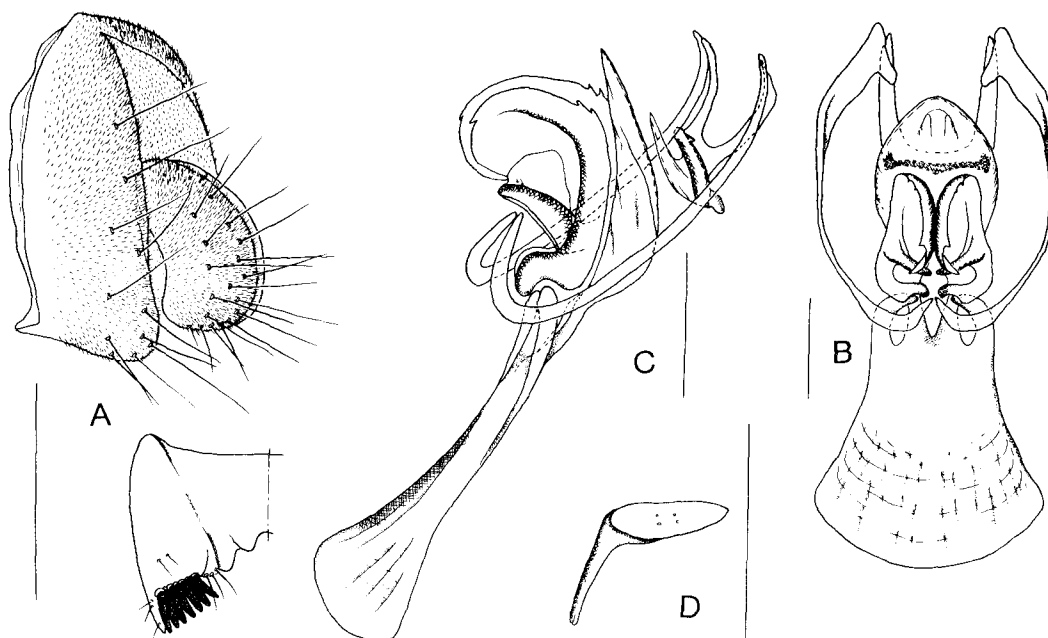


Fig. 2. *Amiota (Amiota) parvipyga* sp. nov. ♂ (holotype) — A, Epandrium, cercus, and surstylus; B, hypandrium, parameres, aedeagus, aedeagal apodeme, and gonopod (ventral view); C, ditto (ventrolateral view); D, ejaculatory apodeme. (Scale-line=0.1 mm)

Specimens examined: China: 17♂, 4♀, Jianfeng, Hainan Is., 200 m, 21, 22.IX.1993, ex tree trunks, coll. M. J. Toda.

Distribution. China (Hainan Is., n. loc.); India.

Amiota (Amiota) parvipyga sp. nov.

(Fig. 2)

Diagnosis. Paramere broad in lateral view, with a few serrations subapically and submedially on outer margin and about 1–2 sensilla near subapical inner

margin (Fig. 2, C); vertical process of fused gonopods very narrow, but apically not bifid (Fig. 2, C).

Measurements: BL=1.90 mm, ThL=0.80 mm, WL=1.72 mm, WW=0.72 mm.

Indices: arb=4-5/3, FW/HW=0.33, ch/o=0.10, prorb=1.10, rcorb=0.73, vb=0.45, dcl=0.40, pre-sctl=0.55, sctl=1.15, sterno=0.80, orbito=1.94, dcp=0.28, sctlp=1.25, C=1.13, 4c=2.13, 4v=2.80, 5x=1.38, ac=5.30, M=0.73, C3F=0.75.

Holotype: ♂, Indonesia: Bogor, Java, 8.XII.1996, ex tree trunk, coll. M. J. Toda (Museum Zoologicum Bogoriense, Bogor, Indonesia).

Distribution. Indonesia (Java).

Relationship. This species resembles *A. (A.) apodemata* in having the very narrow vertical process on the fused gonopods, but can be clearly distinguished from it by the morphology of paramere.

Etymology. In reference to the small periphallic organs.

***Amiota (Amiota) yangonensis* sp. nov.**
(Fig. 3)

Diagnosis. Paramere apically round in lateral view, basally expanded laterad and with about 6-8 sensilla on mesal surface (Fig. 3, B, C); vertical process of fused gonopods broad, somewhat spoon-shaped (Fig. 3, C).

Measurements: BL=2.03 mm, ThL=0.88 mm, WL=1.88 mm, WW=0.75 mm.

Indices: arb=5/3, FW/HW=0.33, ch/o=0.10, prorb=1.10, rcorb=0.75, vb=0.40, dcl=0.45, sterno

=0.80, orbito=1.98, dcp=0.25, sctlp=1.30, C=1.15, 4c=2.17, 4v=2.89, 5x=1.46, ac=5.12, M=0.71, C3F=0.77.

Holotype: ♂, Myanmar: Yangon, 14.I.1982, ex tree trunk, coll. M. J. Toda (Entomological Institute, Hokkaido University, Sapporo, Japan).

Distribution. Myanmar.

Relationship. This species somewhat resembles the foregoing species, *A. (A.) parvipyga*, in having the parameres broad and apically round in lateral view, but can be clearly distinguished from it by the broad, spoon-shaped vertical process of the fused gonopods.

Etymology. In reference to the type locality.

Key to species of the *Amiota (Amiota) apodemata* species-group

The generic and subgeneric diagnoses were given by Toda & Peng (1992, 1990), respectively, and keys to the genera and the subgenera were provided by Okada (1971, 1988, 1989) and Toda *et al.* (1996).

Male.

- i. Costal vein between R₂₊₃ and R₄₊₅ with several, distinct peg-like spinules on ventral surface; 5th abdominal tergite large, broad, but 6th very small; aedeagus membranous, somewhat spoon-shaped *A. (A.) apodemata* species-group
- 1. Vertical process of fused gonopods broad, spoon-shaped *A. (A.) yangonensis* sp. nov.
- Vertical process of fused gonopods very narrow 2
- 2. Paramere narrow in lateral view, apically tri-

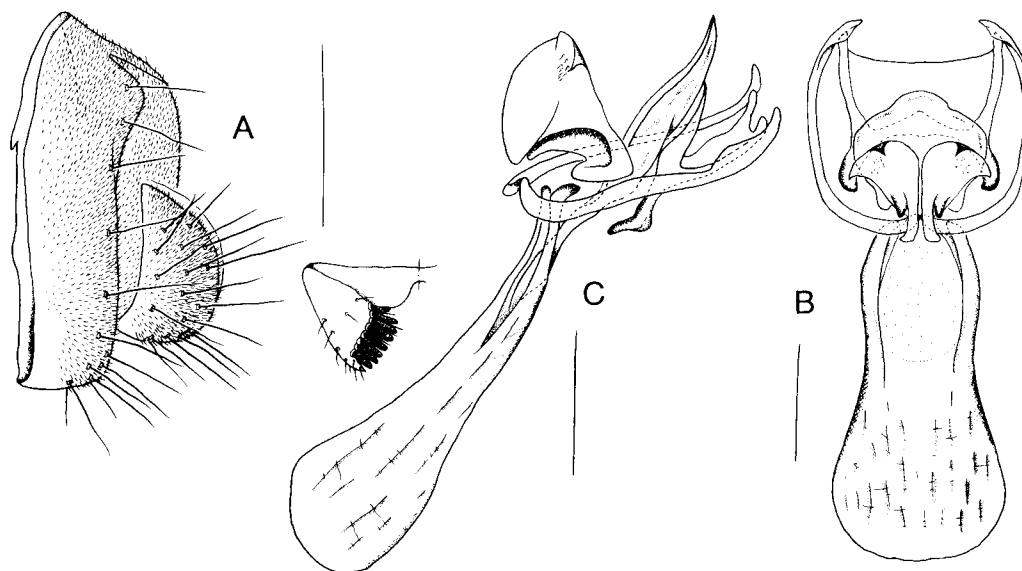


Fig. 3. *Amiota (Amiota) yangonensis* sp. nov. ♂ (holotype) — A, Epandrium, cercus, and surstylus; B, hypandrium, parameres, aedeagus, aedeagal apodeme, and gonopod (ventral view); C, ditto (ventrolateral view). (Scale-line=0.1 mm)

angularly notched, submedially with 3–4 sensilla; vertical process of fused gonopods slightly bifid at apex A. (A.) *apodemata* Gupta et Panigrahy
 – Paramere broad in lateral view, with a few serrations subapically and submedially on outer margin and about 1–2 sensilla near subapical inner margin; vertical process of fused gonopods not bifid apically A. (A.) *parvipyga* sp. nov.

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