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A new genus of Asteiidae with a key to the Old World genera (Diptera)

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Abstract – A new genus, *Polyarista* gen. n. in the subfamily Sigaloessinae is described from Thailand (type species *P. albistoma* sp. n.). A key to the Old World genera of the family is given. With 3 figures.

Key words – Ghana, new species, Oriental region, Polyarista, Sigaloessinae, Thailand

INTRODUCTION

The family Asteiidae is a small dipterous family of small to very small (1–3 mm), slender, weakly sclerotised flies. As a consequence of their fragile body, asteiids are uncommon in collections, although some species may be abundant, particularly in Europe (Papp 1998).

During a recent collection trip to Thailand (23 October to 14 November, 2012) the author collected a rich material of dipterous flies, including a specimen of an undescribed asteiid fly.

MATERIAL AND METHODS

The specimens were minuten pinned on site, double-mounted and labelled in Hungary.

The holotype of the new species and other specimens mentioned in this paper are preserved in the Diptera Collection of the Hungarian Natural History Museum, Budapest (HNHM).

The type specimens were photographed with a Nikon D200 camera with an Olympus 5× Plan objective. A large series of images were taken (appr. 120 consecutive images with different focal depths), then the series of photos were combined with Zerene Stacker software (by Mr Z. Soltész).

TAXONOMY

Diagnosis of the family – Head rather large, as wide as or wider than thorax, concave behind; shape of head varying from globular to very long and flat. Males of several genera and numerous species with linear interfrontal stripes. Frontal chaetotaxy: 0–1(2) upper fronto-orbitals, 1 *vte*, 0–1 *vti*, 0–1 *oc* bristle pairs. Postoculars (in some works: postverticals) weak, parallel or diverging, or completely reduced. Fronto-orbital bristles frequently replaced by rows of minute orbital hairs, sometimes 1 pair of distinct lunular bristles present. Gena narrow, usually one pair of thin vibrissae. Flagellomere usually large, arista with long zigzag rays, or with minute hairlets, or arista completely absent.

Thoracic chaetotaxy: 0–1 postpronotal, 1+1–2 notopleural, 0–1 weak presutural, 1 sometimes anteriorly placed postalar, 0–1 weak intra-alar, 1–4 dorsocental, 1–2 scutellar bristle pairs (laterals absent in some species). No prescutellar acrostichal or anepisternal setae, 1–3 katepisternals; many species without acrostichal microchaetae. Legs slender, without characteristic setae, at most a ventral apical bristle on mid tibia present. Wing always transparent, alula narrow or absent. Costal vein reaching to conjointment with medial vein, without breaks, only basal part of subcostal vein distinct, faded distally, not reaching costal vein as a true vein, radial vein R_{4+5} and vein M_{1+2} convergent distally. M-M crossvein present (subfamily Sigaloessinae) or absent (subfamily Asteiinae), basal crossvein always absent. Anal cell and anal vein absent or present only as faint vein-folds (*Phlebosotera*). Halteres usually with large knob.

Abdomen weakly sclerotised in the majority of species, or without distinct sclerotised sternites or tergites. Spiracles 7 absent in both sexes. Male postabdomen partly or completely asymmetrical. Epandrium with one or two pairs of appendages firmly coalescent with it; surstyli ± symmetrical (*Leiomyza*) or completely asymmetrical (*Asteia*). Phallus asymmetrical in three parts (basiphallus, mesophallus, distiphallus), with long and thin, in several species coiled, distiphallus. Female cerci short with short hairs, two spermathecae.

Polyarista gen. n.
(Figs 1–2)

Type species – *Polyarista albistoma* sp. n.

Gender – Feminine.

Description – Head higher than long. Frons dull. Face ventrally with a broad transverse band of minute dense snow-white hairlets. Scape very small, pedicel without dorsal seta. Gena narrow. No fronto-orbital seta, no ocellar seta. One pair each of short outer and inner vertical setae. A thin vibrissa present. No arista, first

flagellomere enlarged with 5 very long arista-like setae/thick cilia (Fig. 1), which are longer than flagellomere 1. Palpus with 2 short subapical and 1 ventral setulae.

Mesonotum finely microtomentose (colours see under description of type species). Thoracic chaetotaxy: no postpronotal, 2 moderately long notopleural, 1 dorsocentral seta not in prescutellar position but only slightly behind wing base, 1 supra-alar, no intra-alar seta. No acrostichal microchaetae. 2 scutellar pairs (basal pair very short), 2 very thin katepisternals.

Legs thin, without any characteristic setae, not even a ventro-apical on mid tibia.

Wing clear (Fig. 3), reflexing. Costal vein unbroken, present to vein M_{1+2}, R_{2+3} terminating in costa, section R_1 to R_{2+3} 0.03 mm (other sections see under the description of the type species). Subcosta short, costal cell merged with subcostal cell. R_{4+5} and M_{1+2} convergent. Hind crossvein present, discal cell long, intercrossvein section more than 4 times as long as M-M crossvein (cf. Papp 1972: fig. 2). Alar fringe long, particularly so for sub-basal parts.

Abdomen bag-like, tergites present though small. Female cercus and its hairs very short.

Etymology – The name of the new genus is composed of 'poly' [Greek: many] and 'arista', although it has no arista at all but 5 long aristiform setae on the first flagellomere.

Remarks – The new genus obviously belongs to the subfamily Sigaloessinae (Sabrosky 1957; see also discussion). Differentiating characteristics are given in the key.

Polyarista albistoma sp. n.
(Figs 1, 3)

Type material – Holotype female (HNHM): Thailand, Hat Yai, PSU guesthouse, on light, N 7° 00.442', E 100° 30.320', 100 m, 24.10.2012, leg. L. Papp.

Description – Measurements in mm: body length 1.15, wing length 1.31, wing width 0.43.

Outer vertical seta 0.10 mm, both inner verticals broken but (judged on their basal part remained) inner vertical pair must be at least as long as outer pair. Vibrissa and peristomal setae colourless, vibrissa 0.11 mm. Subapical seta of pedicel indiscernible. Flagellomere 1 with 5 strong cilia of 0.12 mm (length of whole antenna 0.16 mm). Palpus slender with 2 short (subapical ventral and ventral) setae. Proboscis short, yellow.

Mesonotum as well as abdominal tergites sub-shiny greyish dark brown. Katepisternum and meron light yellowish, propleuron and anepisternum (except for a dorsal caudal triangle), ventral 2/5 of anepimeron and whole metanotum

dark brown. Dark parts of pleura appearing as dark stripe. Scutellum yellowish white with colourless (white) scutellar setae.

Pulvilli minute, claws thin, black, c. 0.02 mm long. Basitarsi of mid and hind legs almost as long as tarsomeres 2–5 combined. Fore basitarsus 0.10 mm, fore tarsomeres 2 to 5 0.13 mm.

Figs 1–3. 1 = *Polyarista albistoma* sp. n., holotype female, head; 2 = *Anarista endroedyi* Papp, 1972, paratype male, antenna; 3 = *Polyarista albistoma* sp. n., holotype female, habitus

Wing clear with bright rainbow reflex. Subcostal vein discernible on its 3/5 length virtually measured to wing margin. No setae but only cilia of 0.04–0.05 mm on anterior margin of wing. Costal sections: from H to R_1 0.25 mm, R_1-R_{2+3} 0.03 mm, R_{2+3}-R_{4+5} 0.81 mm, R_{4+5} to M_{1+2} 0.033 mm. Inter-crossvein section of M_{1+2} 0.165 mm, terminal section 0.28 mm, M-M crossvein 0.04 mm, terminal section of M_{3+4} fading away apically. Hind margin of wing with 0.06 mm and 0.033 mm long alternating cilia. No alula at all, alular region with 0.07 mm long cilia. Halter light yellowish.

Abdominal tergite 3 quadratic, 0.21 mm broad and 0.13 mm long, tergite 4 0.175 mm broad and 0.077 mm long, tergites 5 and 6 similar but even smaller. Longest marginal setae 0.04 mm.

Etymology – The specific epithet of this new species is composed of 'albus' [Latin: white] and 'stoma' [Greek: mouth], referring to the broad white band on ventral part of prefrons over clypeus.

Remarks – It is difficult to separate features characteristic for a genus and for a species, when a new genus and its type species are synchronously described. Details of the body colouration, even the broad white band on ventral part of prefrons are regarded as specific features. On the contrary, not only the long thick cilia on the first flagellomere and reduction of arista but also reductions in cephalic and mesonotal chaetotaxy are more likely characteristics of the genus.

Anarista endroedyi Papp, 1972
(Fig. 2)

Anarista endroedyi Papp, 1972: 319, figs [holotype female] 1 (right antenna), 2 (wing).

Type material – Holotype female (HNHM): Ghana, Nr. 382: Kwadaso, 21.07.1969, light trap on field, UV light, leg. S. Endrődy-Younga. The holotype was preserved originally in alcohol; in the course of the present study it was prepared *in toto* in Euparal on a slide.

Paratypes: 2 males, same data; "Transferred to minutia pin from alcohol, hence strongly desiccated but in perfect condition" (Papp 1972).

Remarks – The reduction (or rather, a complete loss) of arista in the family Asteiidae seems to be a convergent character, emerged at least twice during their phylogeny. Arista was reduced independently in both subfamilies. Although I cannot prove factually now, I have the impression that the reduction occurred independently in *Anarista* and *Polyarista*, since the other body characteristics are so different that the two genera are not closely related. This is probably the case also with *Subanarista* Papp, 1978 and *Loewimyia* Sabrosky, 1943. The latter genus has no arista, however, it does not seem to be closely related to *Subanarista*, since its first flagellomere is bifurcate, its body is all black, its legs are banded, etc.

Anarista endroedyi is the type species of *Anarista*, the most closely related genus of *Polyarista*. It was described as the only species of the genus. Later Sabrosky (1977) described three other species from Africa.

KEY TO THE OLD WORLD GENERA OF ASTEIIDAE

1 Distinct M-M crossvein present. Only 0+1 pair of dorsocentral setae, mostly prescutellar. Sigaloessinae. **2**

– M-M crossvein lacking. 1+2 or 0+2 pairs of dorsocentral setae. Asteiinae. **6**

2 Arista lacking (Figs 2–3) or only basal aristomere present. No fronto-orbital and ocellar setae. Vein R_{2+3} very short, terminates in R_1 or in costa. First flagellomere enlarged. **3**

– Arista well-developed. Fronto-orbital and ocellar setae present. Vein R_{2+3} various, short or long. First flagellomere mostly normal. **4**

3 Arista with long hairs, first flagellomere with long hairs but only with basal aristomere (Fig. 2, Papp 1972: fig. 1). Ocellar seta weak but present. Pedicel with long dorsal seta. Two rows each of acrostichal and intra-alar microchaetae. Vein R_{2+3} very short, terminating in R_1, discal cell short (Papp 1972: fig. 2). Wing comparatively broader, length/width ratio slightly less than 2.5. ..... *Anarista* Papp, 1972

– Arista lacking, first flagellomere with short hairs but with 5 long setae (Fig. 1), longer than first flagellomere. Not only fronto-orbitals, but also ocellar seta lacking. Pedicel without long dorsal seta. No acrostichal or intra-alar microchaetae. Vein R_{2+3} slightly longer, terminating in costal vein, discal cell long, inter-crossvein section of M_{1+2} more than 4 times as long as M-M crossvein (Fig. 1). Wing comparatively slender, length/with ratio is slightly more than 3. ..... *Polyarista* gen. n.

4 Vein R_{2+3} long, ending in costal vein well beyond R_1. Anepisternum with numerous fine setulae. One pair of proclinate fronto-orbitals present. ..... *Leiomyza* Macquart, 1835

– Vein R_{2+3} short, ending in costal vein at or slightly beyond R_1, i.e. second costal section as long as R-M crossvein or even shorter. Anepisternum bare or with numerous fine setulae. **5**

5 Anepisternum with numerous fine setulae. One pair of fronto-orbitals. Outer vertical seta strong, inner vertical seta very small or lacking. Vein Cu_1 and cubital cell clearly outlined by vein traces or folds, cubital cell truncated distally. ..... *Phlebosotera* Duda, 1927

– Anepisternum bare. Two pairs of short weak fronto-orbitals. Both vertical pairs of the same length or nearly so. Vein Cu_1 and cubital cell at most weak, cubital cell not truncated distally. ..... *Astiosoma* Duda, 1927

6 Arista present, fronto-orbital setulae and ocellar seta present (although latter maybe short). 1+2 or 0+2 pairs of distinct dorsocentral setae present. Abdominal tergites distinct, though in some species weakly sclerotised. A speciose genus worldwide. ..... *Asteia* Meigen, 1830

– Arista lacking (Papp 1979: fig. 14), fronto-orbital and ocellar setae minute. Only 1–2 distinct dorsocentral pairs plus several shorter *dc*-s anteriorly. Abdomen bag-like, tergites not sclerotised. Tunisia, Baleares, Spain (peninsular)*. ..... *Subanarista* Papp, 1978

Genera in the New World (Sabrosky 1957): Asteiinae: *Loewimyia* Sabrosky, 1943; Sigaloessinae: *Bahamia* Sabrosky, 1957, *Sigaloessa* Loew, 1865, *Tucumyia* Sabrosky, 1957.

* New record: Spain, Roquetas de Mar, 9.VII.1997, leg. A. Orosz (5 females, HNHM)

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