

A review of *Diphuia* (Diptera: Ephydriidae) with description of two new species from southern Brazil

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ABSTRACT. The species of *Diphuia* Cresson, 1944 are reviewed with an emphasis on the fauna from southern Brazil, where two new species have been discovered and herein are described: *Diphuia antonina* sp. nov. and *Diphuia grandis* sp. nov. All known species are placed into two species groups (the *anomala* and *nitida* groups), which are characterized, and a key to these species is included. To facilitate identification of species of this uncommon genus, we have included diagnoses of the genus and tribe Hecamedini and have also provided an annotated key to New World genera in the tribe and to the known species of *Diphuia*. We have also provided illustrations of structures of the male terminalia of all included species. The species from southern Brazil, including the new ones, are illustrated.

KEY WORDS. Neotropical; New World; shore-fly; taxonomy.

This review was prompted by recent field work in southern Brazil that is part of an overall survey of the shore flies of this biologically diverse country. A focus of the field work in 2009-2010 was the shore-fly fauna from the state of Paraná and to a lesser degree from Santa Catarina and São Paulo and resulted in specimens of the rarely collected shore-fly genus *Diphuia* Cresson, 1944. We soon discovered that three species were represented and that two are undescribed. The purpose of this paper is to describe these new species within the context of a review of the genus, which is only known from the New World, primarily from subtropical and tropical zones (MATHIS & ZATWARNICKI 1995, MATHIS 1997).

As specimens of *Diphuia* are uncommon in collections, their descriptive history is brief and relatively recent. The available literature on the genus is limited to new species descriptions (CRESSON 1944, STURTEVANT & WHEELER 1954, WIRTH 1956), catalog entries (WIRTH 1965, 1968, MATHIS & ZATWARNICKI 1995), and in more recent decades, to two reviews (MATHIS 1991, 1997). CRESSON (1944) first described *Diphuia* towards the end of his productive research career on shore flies and included only the type species, *D. anomala*. STURTEVANT & WHEELER (1954) added *D. nitida*, based on a single specimen collected from Long Island, New York. WIRTH (1956), in a review of the shore flies of the Bahamas, then described *D. nasalis*. MATHIS (1991, 1997) added *D. zatwarnickii* and *D. flinti* in his reviews of the genus and also proposed the synonymy of *D. nasalis* with *D. nitida*. Until this review, there were four species in the genus (MATHIS 1997) and herein we add two more.

Specimens are usually collected in habitats associated with brackish water but we have also found specimens in freshwater environments. Nothing is known about the immature states.

To facilitate identification of species of this uncommonly collected genus, we have included a diagnosis of the genus and of the tribe Hecamedini and have also provided an annotated key to New World genera in the tribe and to the known species of *Diphuia*. We have also provided illustrations of structures of the male terminalia for all included species.

MATERIAL AND METHODS

The descriptive terminology, with the exceptions noted in MATHIS (1986) and MATHIS & ZATWARNICKI (1990a), follows that published in the Manual of Nearctic Diptera (McALPINE 1981). Because specimens of *Diphuia* are small, usually less than 2.0 mm in length, study and illustration of the male terminalia required use of a compound microscope. We have followed the terminology for most structures of the male terminalia that other workers in Ephydriidae have used (see references in MATHIS 1986, MATHIS & ZATWARNICKI 1990a, b), such as surstylus.

ZATWARNICKI (1996) suggested that the pre- and postsurstylus correspond with the pre- and postgonostylus and that the subepandrial plate is the same as the medandrium. The terminology for structures of the male terminalia is provided in the legends.

Dissections of male and female genitalia and descriptions were performed using the method of CLAUSEN & COOK (1971) and GRIMALDI (1987). Microforceps were used to remove abdomens, which were macerated in a potassium hydroxide solution. Cleared genitalia were rinsed in a weak solution of acetic acid and then transferred to glycerin for observation and illustration. If necessary for proper orientation, the specimen was transferred from glycerin to glycerin jelly. The glycerin jelly was heated, and the specimen appropriately oriented. After cooling, the embedded specimen in glycerin jelly became immobilized. The abdomen was placed in a plastic microvial filled with glycerin and attached to the pin supporting the remainder of the insect from which it was removed.

The new species descriptions are composite and not based solely on holotypes. Two head and two venational ratios used in the descriptions are based on three specimens (largest, smallest, and one other): Eye ratio: maximum width/maximum height; gena-to-eye ratio: genal height (immediately below maximum eye height)/eye height; costal vein ratio: the straight line distance between the apices of R_{2+3} and R_{4+5} /distance between the apices of R_1 and R_{2+3} ; M vein ratio: the straight line distance along vein M between crossveins dm-cu and r-m/distance apical of dm-cu.

Specimens for this study are in the Universidade Federal do Paraná (DZUP: Coleção Entomológica Padre Jesus Santiago Moure, Departamento de Zoologia, Curitiba) and the National Museum of Natural History, Smithsonian Institution, Washington, D. C. (USNM).

TAXONOMY

Hecamedini Mathis, 1991

Hecamedini Mathis, 1991: 2. Type genus: *Hecamede* Haliday, 1837. – Mathis & Zatwarnicki, 1995: 149-160 [world catalog].

Diagnosis. Head: arista with 3-5 dorsally branching rays, longer two or three rays subequal, inserted toward arista base; compound eye bare of microsetulae or the latter very sparse. Thorax: usually with a gray to silvery stripe on thorax from postpronotum through ventral portion of notopleuron; anterior supra-alar seta lacking; posterior notopleural seta inserted at distinctly elevated position, especially as compared to anterior seta; anepisternum usually two toned, dorsal portion concolorous with mesonotum, ventral portion gray; anepisternum with two subequal setae inserted along posterior margin. Wing: venation of wing generally pale colored; vein R_{2+3} elongate, section III much shorter than section II; apical section of vein M longer than section between crossveins r-m and dm-cu; alula wide, width subequal to that of costal cell. Abdomen: male terminalia: pregonite either lacking or fused indistinguishably with postgonite; subepandrial sclerite lacking; postgonite generally elongate and bearing few setulae, usually only two are conspicuous.

Key to New World genera of Hecamedini

1. Scutellum bearing three marginal setae; postgenal margin sharp; gena high, over 1/2 eye height *Hecamede* Haliday, 1837
- 1'. Scutellum bearing two marginal setae; postgenal margin rounded; gena short, less than 1/2 eye height 2
2. Color generally black; microtomentum sparse, subshiny to shiny *Diphuia* Cresson, 1944
- 2'. Color generally gray to brown; microtomentum dense, generally appearing dull *Allotrichoma* Becker, 1896

Diphuia Cresson, 1944

Diphuia Cresson, 1944: 3. Type species: *Diphuia anomala* Cresson, 1944, original designation. – Wirth, 1968: 5 [Neotropical catalog]. – Mathis, 1990: 746-756 [revision]; 1997: 28-36 [review]. – Mathis & Zatwarnicki, 1995: 155-156 [world catalog].

Diagnosis. Small shore flies, body length 1.35-1.80 mm; mostly black, subshiny to shiny, microtomentum usually sparse. Head: wider than high; face width-to-head width ratio 0.28; frons black, mostly unicolorous, lacking distinctively colored ocellar triangle; frons wider than long, frontal length-to-width ratio 0.58; frontal vestiture variable; ocellar seta well-developed, inserted slightly in front of alignment of anterior ocellus and at about the same distance apart as between posterior ocelli; pseudopostocellar setae usually well-developed, length subequal to ocellar setae, proclinate, slightly divergent; one reclinate and one proclinate fronto-orbital seta present, reclinate seta inserted slightly anteromedial of proclinate seta; both medial and lateral vertical setae present; ocelli in isosceles triangle, with distance between posterior ocelli larger than between anterior ocellus and either posterior ocellus. Antenna exerted; pedicel with well-developed, proclinate, dorsal seta; arista length subequal to antennal length and bearing 4-5 dorsal rays, with basal three rays longer than apical 1-2, latter subequal. Eye apparently bare. Face black in both sexes and with silvery white, microtomentose antennal grooves and with two lines, sometimes irregular, paralleling parafacials, these and similarly invested and colored ventral margin (microtomentum sometimes interrupted at middle) form a facial triangle that has a small microtomentose area below facial prominence; face not carinate between antennal bases but slightly, conically protruding at middle (best seen in lateral view); ventral facial margin shallowly emarginate; face bearing two facial setae, the dorsal seta very slightly larger, both inserted near parafacials; parafacials densely microtomentose, silvery white; clypeus very sparsely microtomentose, black; palpus blackish brown to black; mouthparts not geniculate, labella shorter than mediproboscis. Thorax: generally black, vestiture of microtomentum variable with species, although generally sparse; pleural areas lacking stripes of distinctly colored microtomentum. Chaetotaxy with

mesonotal setae poorly developed except for those at posterior margin; mesonotal setulae numerous and not in well-defined setal tracks; prescutellar acrostichal setae much larger than other acrostichal setulae and more widely set apart; only one dorsocentral seta, inserted posteriorly; intra-alar setulae irregularly seriated; presutural seta well-developed, length subequal to notopleural setae; two scutellar setae and scutellar disc with sparse, scattered setulae; postpronotal seta 1; postalar seta 1; notopleural setae 2, insertion of posterior seta elevated dorsally above anterior one; anepisternal setae 2, inserted along posterior margin; katepisternal seta well-developed, conspicuous. Wing: membrane mostly hyaline to very slightly milky white; veins behind costa pale, usually yellowish to yellowish brown; vein R_{2+3} extended well beyond level of crossvein $dm-cu$, costal section II at least 1.5X longer than section III; alular marginal setulae short, less than 1/2 alular height. Legs: femora black; tibiae dark basally, concolorous with femora, apices yellowish. Abdomen: fifth segment of male well-sclerotized, elongate, not normally visible from a dorsal view, usually retracted within 4th segment; 5th tergite and sternite of male united anteriorly to form a complete annulus. Male terminalia as follows: cercus rod shaped, bearing 2-3 conspicuously longer setae at ventral margin; surstylus well-developed, well-sclerotized, and conspicuous, length as long as cercus.

Remarks. *Diphuia* can be distinguished from other genera of Hecamedini as follows (characters indicated by an asterisk (*) are apomorphies that corroborate the monophyly of *Diphuia*) (MATHIS 1991): *(1) coloration very dark, usually black; *(2) microtomentum of head and thorax generally sparse, giving a subshiny to faintly dull appearance; (3) facial coloration of males and females similar, lacking sexual dimorphism; (4) face, although slightly protrudent medially, not acutely pointed in lateral view; *(5) face with silvery white microtomentose markings (antennal grooves, two vertical lines, epistomal margin, triangular spot below facial prominence, and parafacials); (6) presutural and prescutellar setae well-developed; *(7) pleural region lacking stripes; (8) 5th segment of male well-sclerotized and its tergite moderately elongate; *(9) 5th tergite and sternite of male united anteriorly to form a complete annulus; *(10) cercus of male bearing 2-3 elongate, well-developed setae from ventral margin; and (11) surstylus distinct, well-sclerotized.

Although *Diphuia* is clearly a monophyletic group, its sister-group relationships are unclear. The most recent cladistic analysis of the genera of Hecamedini (MATHIS 1991) placed *Diphuia* at the base of a lineage also giving rise to *Allotrachoma* and its included subgenera (*Pseudohecamede* Hendel, 1936 and an undescribed subgenus). The evidence for this relationship is not totally convincing, however, and *Diphuia* could be more closely related to *Hecamede* (MATHIS 1997).

We recognize two species groups in *Diphuia* that are based primarily on characters of the abdomen (see species group diagnosis below).

Key to species of *Diphuia*

1. Anepisternum with anteroventral 1/3-1/2 bare, shiny black, otherwise with thin investment of whitish gray microtomentum; mesonotum thinly invested with microtomentum, subshiny; 5th tergite of male with anterior margin even; surstylus with ventral margin broadly rounded; gonite trapezoidal; aedeagus with apex bifurcate 2
- 1'. Anepisternum almost entirely invested with whitish gray microtomentum. Mesonotum moderately densely microtomentose, golden brown; 5th tergite of male shallowly or deeply emarginate; surstylus truncate ventrally, pointed apically; gonite with basal half subrectangular; aedeagus not bifurcate apically 4
2. Frons mostly bare, shiny but not polished
..... *D. antonina* sp. nov.
- 2' Frons mostly microtomentose, only anterior margin bare, subshiny 3
3. Surstylus with broad ventral margin that is extended posteroventrally; aedeagus not forked apically.....*D. grandis* sp. nov.
- 3'. Surstylus with ventral margin rounded, not with a posteroventral extension; aedeagus forked apically
..... *D. nitida* Sturtevant & Wheeler, 1954
4. Ventral portion of face with medial, vertical, densely microtomentose, silvery white stripe extended dorsad from and connected to microtomentose ventral margin; 5th tergite longer than wide, anterior margin shallowly emarginate...
..... *D. flinti* Mathis
- 4'. Ventral portion of face with medial, densely microtomentose, silvery to golden white spot (frequently triangular or diamond shaped) that is not directly connected with microtomentum along ventral margin; 5th tergite wider than long, anterior margin deeply emarginate, emargination V-shaped 5
5. Surstylus long and narrow, length subequal to that of cercus; gonite pointed posteroventrally; aedeagus only moderately curved apically *D. anomala* Cresson, 1944
- 5'. Surstylus moderately short and robust, length shorter than cercus; gonite with posteroventral portion broadly bifurcate; aedeagus more curved apically, point oriented anteriorly....
..... *D. zatwarnickii* Mathis

The *anomala* group

Diagnosis. This species group is distinguished by the following combination of characters: Thorax: mesonotum moderately densely microtomentose; pleural region almost entirely but thinly invested with whitish gray microtomentum. Abdomen: 5th tergite of male wider than long and with anterior margin deeply emarginate, broadly V-shaped. Male terminalia: epandrium bulbous, shiny, usually evident from a dorsal view;

aedeagus robust, length in lateral view about twice height, apex broadly rounded and ventrally produced as an acute point.

Discussion. In addition to *D. anomala*, *D. zatwarnickii* also belongs to this species group.

Diphuia anomala Cresson, 1944

Figs 1-7

Diphuia anomala Cresson, 1944: 4 [Panama. Canal Zone: Monte Lirio; HT male, USNM (70450)]; 1946: 138 [review]. – Wirth, 1968: 5 [Neotropical catalog]. – Mathis, 1990: 749-750 [revision]. – Mathis & Zatwarnicki, 1995: 156 [world catalog].

Diagnosis. This species is distinguished from congeners by the following combination of characters: Small shore-fly species, body length 1.60-1.80 mm. Head: frons moderately invested with brownish microtomentum, microtomentum sparse or lacking on two small areas laterad of posterior ocelli and on two spots along anterior margin. Thorax: mesonotum densely invested with brownish to golden brown microtomentum, especially medially, along posterior portion of scutum and scutellum; anepisternum with fine investment of whitish microtomentum. Wing with costal vein ratio 0.47-0.51; M vein ratio 0.40-0.42. Abdomen: 5th tergite (Figs 1 and 2) almost as high as long, anterior margin in dorsal view with deep, broadly V-shaped emargination, posterior margin with sparse setae; 5th sternite (Fig. 1) clearly divided into 2 broad sternites that are connected only anteroventrally. Male terminalia (Figs 3-7): epandrium bulbous, shiny, in lateral view (Fig. 3) almost as wide as high; surstylus long (Fig. 3), narrow, parallel sided, width and length subequal to that of cercus, apex angulate, pointed anteriorly, and bearing a few setulae; cercus bearing two elongate, prominent setae at ventral margin; gonite (Fig. 5) broad basally, with posteriorly extended process sheathing aedeagus, posterior apex of gonite curved anteroventrally; phallapodeme triangular in lateral view, narrowly produced dorsally; aedeagus in lateral view broad, thumb-like, produced posteroventrally to a ventral point, in dorsal view becoming wider apically, apex broadly rounded; hypandrium in ventral view longer than wide, anterior margin with a small, anterior process.

Specimens examined from Brazil, *Paraná*: Matinhos (N.; 25°46.4'S, 48°30.8'W; 1 m; beach/estuary), 9.IV.2010, D. and W.N. Mathis (2 males, 2 females; DZUP, USNM). *Santa Catarina*: Barra Velha (26°38'S, 48°40.9'W; beach), 29 Apr 2010, D. and W.N. Mathis (1 male; DZUP). *São Paulo*: Ubatuba, (Praia Puruba, 23°21'S, 44°55.6'W; beach), 30.III.2010, D. and W.N. Mathis (2 males; DZUP, USNM).

Distribution. Neotropical: Brazil (Paraná, São Paulo, Santa Catarina), Colombia, Ecuador, Panamá, West Indies (Dominica).

Remarks. This is the type species of *Diphuia*. It is very similar externally to *D. zatwarnickii* Mathis and can be distinguished only by reference to structures of the male terminalia. From *D. nitida* it may be distinguished by the following characters: Frons and mesonotum invested moderately densely with

brownish to golden brown microtomentum; anepisternum invested with fine, grayish to whitish microtomentum, anteroventral portion not bare, shiny; second costal section long, costal vein ratio 0.50; and several characters of the male terminalia (see description).

The *nitida* group

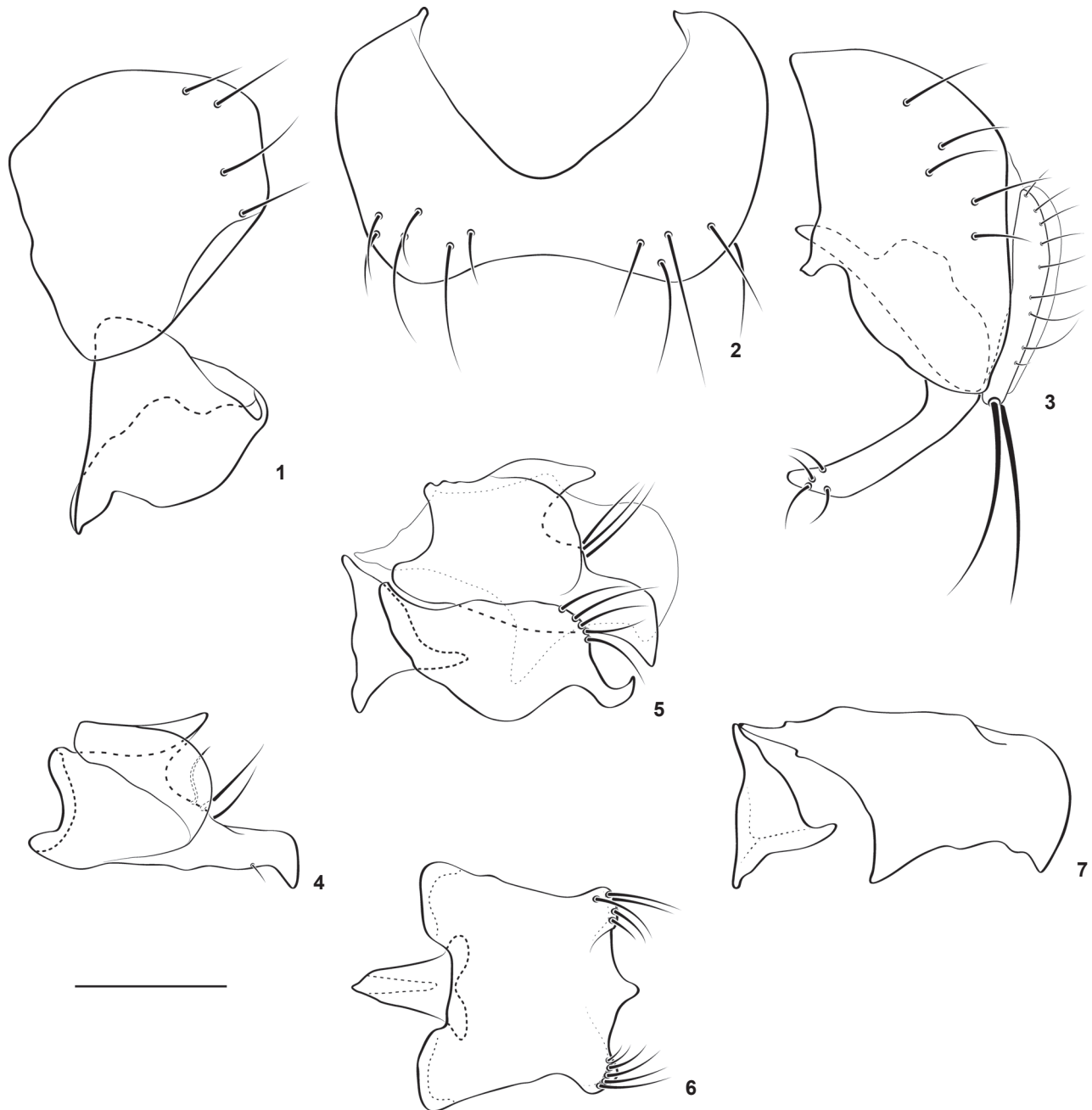
Diagnosis. This species group is distinguished by the following combination of characters: Thorax: mesonotum very thinly microtomentose, subshiny to shiny; pleural region with anteroventral portion bare or microtomentum, shiny or very thinly whitish gray microtomentose. Abdomen: 5th tergite of male longer than wide and with anterior margin truncate or very shallowly emarginate. Male terminalia: epandrium narrow, not conspicuously evident from dorsal view, thinly microtomentose; aedeagus elongate, 3-4 times longer than wide, tapered to thinly rounded or sharp apex that is not ventrally produced as an acute point.

Discussion. Three species, including both newly described species (*D. antonina* sp. nov., *D. grandis* sp. nov., and *D. nitida*), belong to this species group.

Diphuia antonina Mathis & Marinoni, sp. nov.

Figs 8-12

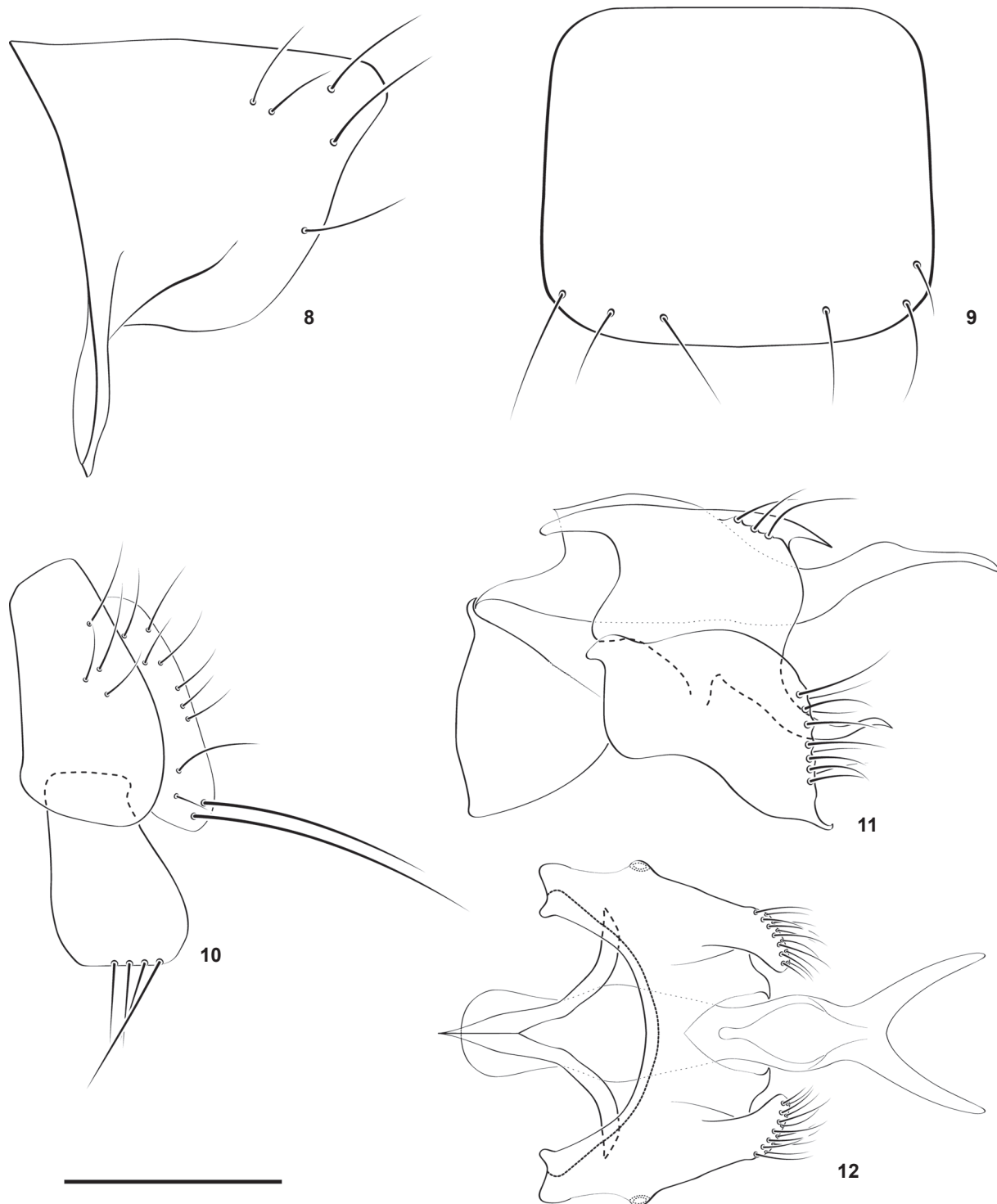
Diagnosis. This species is distinguished from congeners by the following combination of characters: small shore-fly species, body length 1.20-1.50 mm. Head: frons generally bare, shiny but not polished, contrasted with subshiny mesonotum, only fronto-orbits very sparsely and thinly microtomentose. Antenna black; arista bearing 4-6 long, dorsal rays. Face shallowly produced medially, generally black but with narrow, silvery white stripes; parafacial silvery white dorsad to level of ventral margin of antennal base; epistomal margin silvery white, interrupted ventromedially; antennal grooves, especially dorsally, partially silvery white; silvery white stripe from ventral margin of antennal groove ventrad slightly past medfacial protuberance, thereafter angled laterally to epistomal margin; with a small, triangular patch medially just dorsad of epistomal margin; epistomal margin silvery white with small notch in microtomentum medially. Gena moderately high, gena-to-eye ratio 0.20-0.22, posterior portion thinly invested with silvery white microtomentum. Thorax: mesonotum, including notopleuron, sparsely microtomentose, golden brown to brown, subshiny. Area immediately around anterior spiracle and posterodorsal corner of anepisternum sparsely invested with brown to white microtomentum, otherwise, anepisternum mostly bare, shiny black; anepimeron mostly very sparsely microtomentose, similar to posterodorsal corner of anepisternum; katepisternum mostly bare, shiny black except of posterodorsal corner, just posterodorsad of katepisternal seta. Wing with costal vein ratio 0.60-0.70; M vein ratio 0.28-0.33. Forecoxa mostly black, subshiny to shiny, only margins partially silvery white microtomentose; mid- and hindcoxae



Figures 1-7. *Diphuia anomala*: (1) 5th tergite and sternite, lateral view; (2) 5th tergite, dorsal view; (3) epandrium, cercus and surstylus, lateral view; (4) gonite, lateral view; (5), gonite, hypandrium, phallapodeme, lateral view; (6) hypandrium and phallapodeme, ventral view; (7) aedeagus and phallapodeme, lateral view. Scale bar = 0.1 mm.

black; femora black; tibiae black except for yellowish apical 1/4; tarsi yellow except for black, apical 2 tarsomeres. Abdomen: tergites mostly bare, shiny black, medial portion of anterior tergites slightly less shiny; 5th tergite of male with anterior margin es-

entially straight, at most very shallowly arched anteriorly (Fig. 9); 5th sternite undivided, as a narrow band connected dorsally with anteroventral portion of 5th tergite (Fig. 9). Male terminalia (Figs 10-12): epandrium narrow in lateral view, much higher



Figures 8-12. *Diphuia antonina* sp. nov.: (8) 5th tergite and sternite, lateral view; (9) 5th tergite, dorsal view; (10) epandrium, cerci and surstylus, lateral view, (11) aedeagus, phallapodeme, gonite and hypandrium, lateral view; (12) hypandrium, phallapodeme and aedeagus, ventral view. Scale bar = 0.1 mm.

than wide (Fig. 10); surstylus as long as cercus but almost twice its width, broadly truncate apically (Fig. 10), broad, nearly straight apex bearing 4-5 long setulae; gonite in lateral view parallelogram-shaped, posterior angles produced into pointed processes, posteroventral process sinuous (Fig. 11); phallapodeme rounded anteroventrally in lateral view (Fig. 11); aedeagus acutely pointed apically in lateral view (Fig. 11), in dorsal or ventral view bifurcate apically (Fig. 12); hypandrium in ventral view wider than long, anterior margin shallowly arched anteriorly (Fig. 12).

Type material. The holotype male is labeled "BRAZIL. Paraná: Antonina (25°28.4'S, 48°40.9'W; mangal), 3 Feb 2010, D. & W. N. Mathis/HOLOTYPE ♂ *Diphuia antonina* Mathis and Marinoni, DZUP [red]." The holotype is double mounted (minuten in a block of plastic), is in excellent condition, and is deposited in DZUP. Twenty paratypes (13 males, 7 females) bear the same label data as the holotype.

Other specimens examined from Brazil. *Paraná*: Paranaguá (Rio Itiberê; 25°30.8'S, 48°29.9'W; 3 m), 23.I.2010, D. and W.N. Mathis (1 male; USNM).

Distribution. Neotropical: Brazil (Paraná).

Etymology. The species epithet, *antonina*, is the name of a colorful, colonial port town on the Paranaguá Bay of the Brazilian state of Paraná.

Remarks. This species is similar and closely related to *D. nitida*. Structures of the male terminalia are also very similar, especially the bifurcate aedeagal apex. These characters demonstrate that these two species form a monophyletic lineage.

Diphuia grandis Mathis & Marinoni, sp. nov.

Figs 13-19

Diagnosis. This species is distinguished from congeners by the following combination of characters: small shore-fly species, body length 1.75-1.85 mm. Head (Figs 13 and 14): frons generally moderately microtomentose, concolorous with mesonotum, golden brown microtomentose, anterior margin, especially laterally, and narrow stripe just mesad of fronto-orbits shiny black, bare. Antenna black; arista bearing 3-4 long, dorsal rays (Fig. 14). Face shallowly produced medially, generally black but with narrow, silvery white stripes (Fig. 13); parafacial silvery white, silvery white microtomentum extended dorsad slightly past dorsal margin of antennal bases; epistomal margin silvery white, interrupted ventromedially; antennal grooves, especially dorsally, silvery white; silvery white stripe from ventral margin of antennal groove ventrad slightly past medifacial protuberance, thereafter angled laterally to epistomal margin; with a small, triangular patch medially just dorsad of epistomal margin; epistomal margin silvery white with small notch in microtomentum medially. Gena moderately high, gena-to-eye ratio 0.15-0.22, posterior portion thinly invested with silvery white microtomentum. Thorax: mesonotum, including notopleuron, sparsely microtomentose, golden brown, subshiny. Area immediately around anterior spiracle and posterodorsal corner of anepisternum sparsely invested with brown to white microtomentum, otherwise, anepisternum bare, shiny black; anepimeron mostly very sparsely microtomentose,

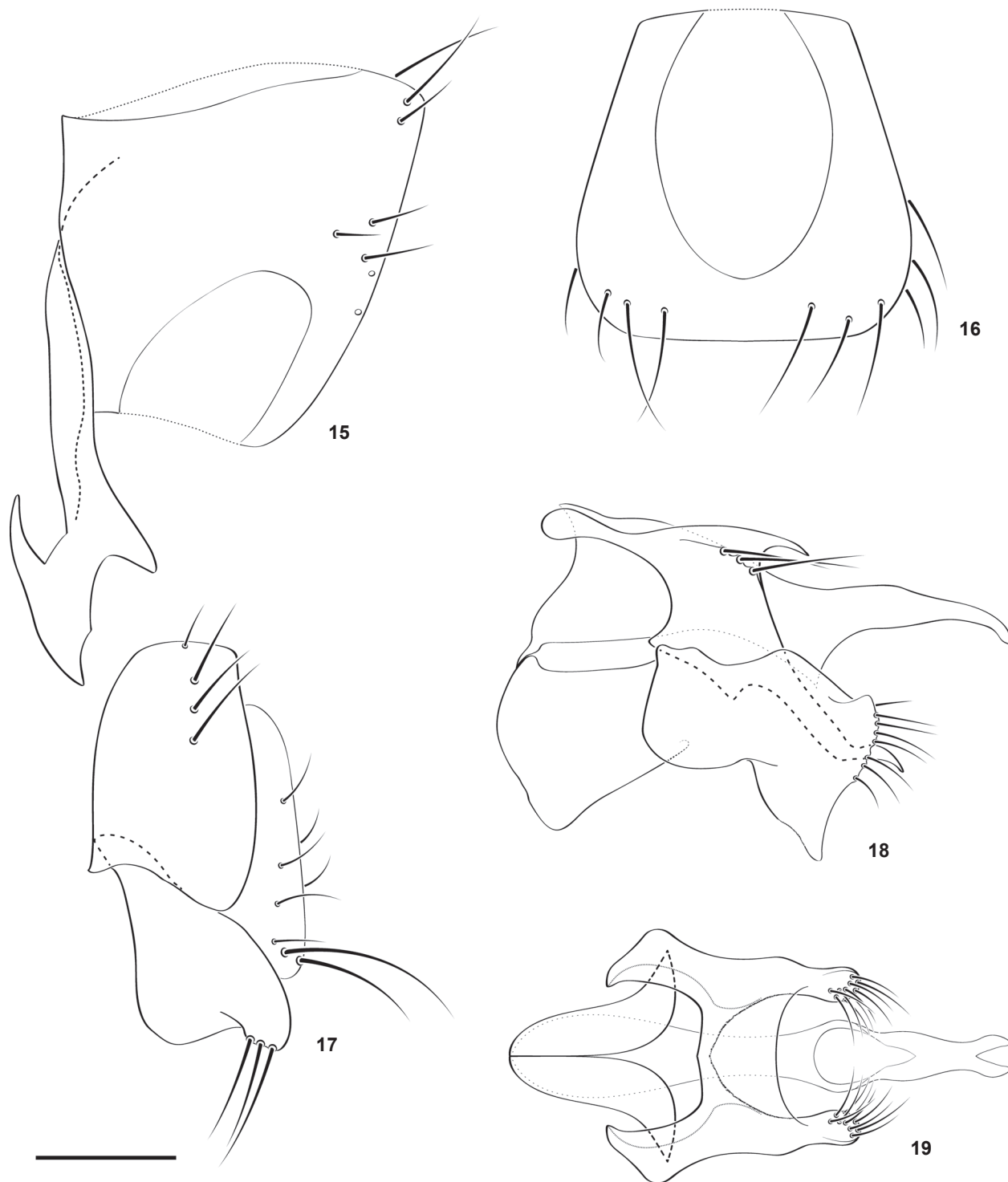


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14

Figures 13-14. *Diphuia grandis* sp. nov.: (13) face, anterior view; (14) head, lateral view.



Figures 15-19. *Diphuia grandis* sp. nov.: (15) 5th tergite and sternite, lateral view; (16) 5th tergite, dorsal view; (17) epandrium, cerci and surstylus, lateral view; (18) aedeagus, phallapodeme, gonite and hypandrium, lateral view; (18) hypandrium, phallapodeme and aedeagus, ventral view. Scale bar = 0.1 mm.

similar to posterodorsal corner of anepisternum; katepisternum mostly bare, shiny black except of posterodorsal corner, just posterodorsad of katepisternal seta. Wing with costal vein ratio 0.52-0.53; M vein ratio 0.38-0.42. Forecoxa silvery white microtomentose; mid- and hindcoxae black; femora black; tibiae black except for yellowish apical 1/4; tarsi yellow except for black, apical 2 tarsomeres. Abdomen: tergites mostly bare, shiny black, medial portion of anterior tergites slightly less shiny; with anterior margin essentially straight, at most very shallowly arched anteriorly; 5th tergite of male less well-sclerotized anterodorsally, with anterior margin more or less straight (Fig. 16); 5th sternite undivided, as a narrow band connected dorsally with anteroventral portion of 5th tergite (Fig. 15), ventrally in lateral view (Fig. 15) forming an H-shaped structure. Male terminalia: epandrium in lateral view (Fig. 17) narrow dorsally, ventral margin truncate; cerci linear, slightly wider ventrally, ventral margin bearing two well-developed setulae; surstylus in lateral view broadly and shallowly bilobed ventrally, posterior lobe narrower, bearing 2-3 longer setulae; aedeagus in lateral view elongate, narrow, basal 2/3 moderately well-sclerotized, widest at base, tapered toward apex, apical 1/3 more membranous, tapered to a thin point apically (Fig. 18); phallapodeme in lateral view somewhat rectangular with basal margin shallowly arched; gonite in lateral view as a parallelogram (Fig. 18); hypandrium in lateral view rectangular, apical margin bearing numerous short setulae (Fig. 18), in ventral view H-shaped (Fig. 19).

Type material. The holotype male is labeled "BRAZIL. Paraná: Matinhos (N.; 25°46.4'S, 48°30.8'W; 3 m), 30 Jan 2010, D. & W. N. Mathis/HOLOTYPE ♂ *Diphuia grandis* Mathis and Marinoni, DZUP [red]." The holotype is double mounted (minuten in a block of plastic), is in excellent condition, and is deposited in DZUP. Five paratypes (1 male, 4 females; DZUP, USNM) bear the same label data as the holotype. A sixth paratype female was collected at the same locality on 9 Apr 2010.

Other specimen examined. BRAZIL, São Paulo: Ubatuba (Cachoeira da Lage, 23°17.6'S, 44°52.1'W; 100 m), 30.III.2010, D. and W.N. Mathis (1 female; DZUP).

Distribution. Neotropical: Brazil (Paraná, São Paulo).

Etymology. The species epithet, *grandis*, is of Latin derivation, meaning large, and refers to the large size of this species relative to congeners.

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