

TWO NEW BRAZILIAN PREDACEOUS MIDGES OF THE GENUS *DOWNESHELEA* WIRTH & GROGAN (DIPTERA: CERATOPOGONIDAE)

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Two new Brazilian species of Downeshelea Wirth & Grogan, D. fluminensis and D. quasidentica, are described and illustrated.

Key words: Neotropical predaceous midges – *Downeshelea fluminensis* sp. n. – *Downeshelea quasidentica* sp. n. – Brazil

The predaceous midges of the genus *Downeshelea* show a world-wide distribution. From 25 known species, 13 have been recorded from the Neotropical region. Of these, only three were originally described from Brazil: *carioca* (Tavares & Pereira), *castroi* (Tavares & Pereira) and *multilineata* (Lutz) (Wirth & Grogan, 1988). A further species, *cebacoi* (Lane & Wirth), has also been reported from Brazil (Lane & Wirth, 1964; Tavares & Pereira, 1978).

In this paper two new species are described from light trap collections made by the Fundação Estadual de Engenharia do Meio Ambiente (FEEMA) in the state of Rio de Janeiro: *D. fluminensis* from Arraial do Cabo and *D. quasidentica* from São Pedro da Aldeia.

In our study we used the general terminology of the genus *Monohelea* and of the tribe Ceratopogonini explained in Wirth & Williams (1964), Lane & Wirth (1964), Ratanaworabhan & Wirth (1972) and Clastrier & Delécolle (1990).

Downeshelea fluminensis Felipe-Bauer & Quintelas, new species
(Figs 1-13)

Type locality: Arraial do Cabo, Rio de Janeiro, Brazil.

Male Holotype: wing length 1.23 mm; breadth 0.41 mm.

Head: eyes (Fig. 7) black, widely separated, bare. Antenna (Fig. 5) with pedicel brown, flagellar segments pale brown except on submedian portion of the 3rd segment and the last 3 segments which are brown; flagellar segments 4-11 somewhat barrel shaped, 12 about 3 times as long as wide, 13-15 elongated; lengths of segments 3-15 in proportion of 66-21-20-20-19-19-19-18-18-27-58-54-52; antennal ratio (12-15/3-11) 0.87; 1 sensilla ampullacea present in distal portion of segments 3-4; 2 sensilla basiconica (Fig. 4) in distal portion of segments 7-10. Palpus (Fig. 6) uniformly brown; lengths of segments in proportion of 11-23-32-22-24; 3rd segment elongated, with a small, shallow, rounded sensory organ in mid portion; palpal ratio 3.2.

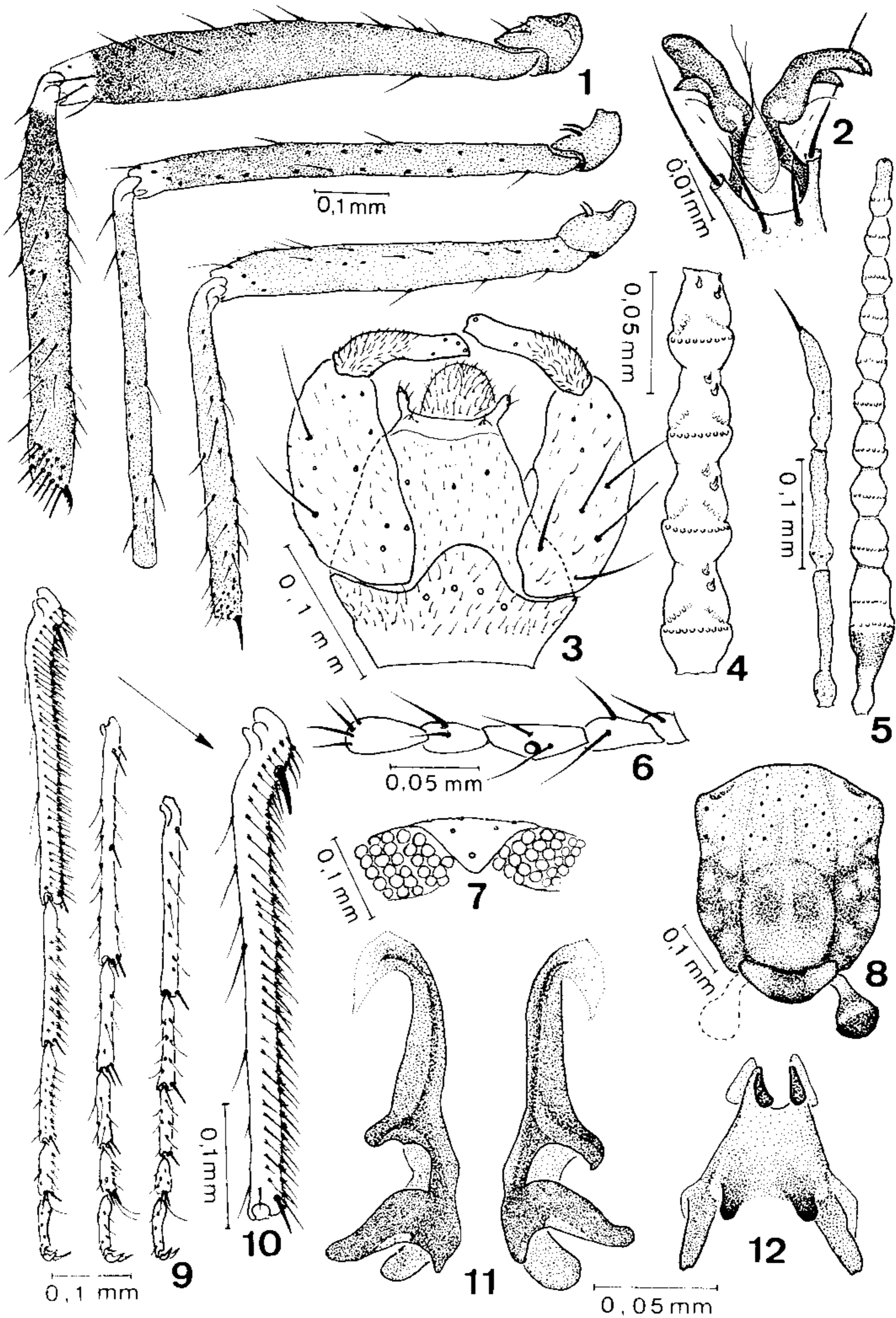
Thorax: mesonotum (Fig. 8) brown with golden, rounded lateral areas; anterior portion pale brown with dark brown spots; scutellum yellowish with a median brown band; posts-cutellum and pleura brown. Legs (Fig. 1) brown, paler on fore leg, darker on hind leg, mainly on subapical femur and subbasal tibia portion; knees yellowish; fore tibia with a slender spur; fore and hind tibiae with a patch of packed bristles on subapical portion; hind tibia with a short apical spur; hind tibial comb with 6 spines; trochanters, femora and tibiae of the fore, mid and hind legs with lengths respectively in the following proportions: 13-59-55, 12-70-62; 13-78-68. Tarsi (Fig. 9) pale and pilous; hind basitarsus (Fig. 10) with one row of ventral palisade setae; basitarsi of fore and hind legs with 1 basal and 1 apical spine; basitarsus of mid leg with 2 basal, 2 apical and 1-2 ventrally scattered spines; apical spines of tarsomeres 2-4 of fore, mid and hind legs as follow: 1-1-2, 2-2-2 and 1-1-2, basal spines

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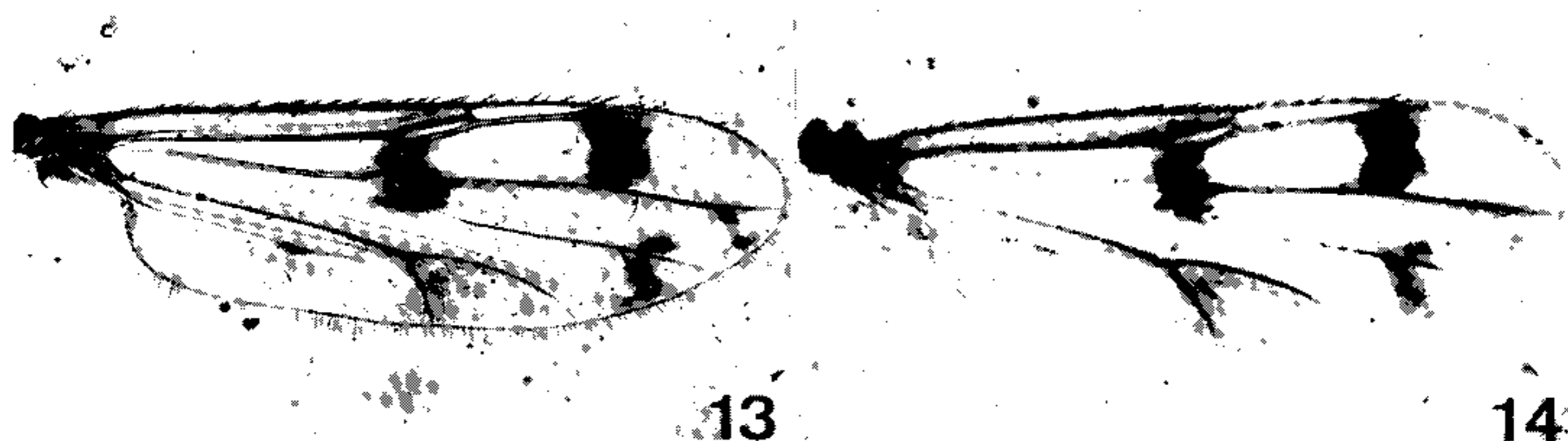
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Downeshelea fluminensis sp. n., male. Fig. 1: legs (left to right) hind, mid and fore. Fig. 2: tarsal claws. Fig. 3: genitalia, aedeagus and parameres removed. Fig. 4: antennal segments 7-10. Fig. 5: antenna. Fig. 6: palpus. Fig. 7: eye separation. Fig. 8: mesonotum. Fig. 9: tarsi (left to right) hind, mid and fore. Fig. 10: hind basitarsus. Fig. 11: parameres. Fig. 12: aedeagus.



Photographs of wings of male of *Downshelea*. Fig. 13: *fluminensis*. Fig. 14: *quasidentica*.

absent; lengths of fore, mid and hind tarsal segments 1-5 in the following proportions: 30-15-11-7-9, 36-16-11-7-9, 47-21-14-9-10; fore, mid and hind tarsal ratios 2.0, 2.25, 2.24. Claws (Fig. 2) paired, equal, about 0.3 times the length of 5th tarsal segment, each one with external basal tooth. Wing (Fig. 13) hyaline with a few scattered macrotrichia on the margin, dark bristles on the costa; 2 prominent dark spots, one located on the r-m crossvein extending over the fork of veins M1 and M2, the other in cell R5 extending from the end of the 2nd radial cell to the vein M1; 4 less distinct grayish areas, one triangular near apical portion of vein M1, one rounded at apex of cell ml, one sigmoid near apex of vein M2 and one on the fork of veins Cu1 and M3+4 extending on these veins; 2nd radial cell nearly 2.2 times longer than 1st; costal ratio 0.73. Halter stem pale, knob brown with exception of the ventral basal portion which is pale.

Abdomen: dark brown; terga with faint basal brown bands. Genitalia (Fig. 3): 9th sternum spiculate except on basal portion, posterior margin with a short, convex, median lobe with 2-4 long hairs; 9th tergum tapered with a pair of apicolateral processes. Gonocoxite moderately stout, nearly 1.9 times as long as basal wide; gonostylus moderately stout, slightly curved, about 0.65 times the length of the gonocoxite, moderately pilous on basal portion with some delicate hairs on the apex and 1 median delicate hair on the lateral ventral face. Aedeagus (Fig. 12) triangular, basal portion with a deep quadrate excavation forming 2 lateral sclerotized arms; median area with 2 ventral strongly sclerotized horn-like processes; apex with a slight mesal excavation forming 2 short lobes, each with a ventral sclerotized process and a dorsal membranous expansion. Parameres (Fig. 11) elongated, each with a strongly sclerotized trilobed base; mid portion with a well devel-

oped beak-shaped process; apex with a membranous expansion, like a sea-horse-head, externally directed; parameres length nearly 1.6 times the length of aedeagus.

Female: unknown.

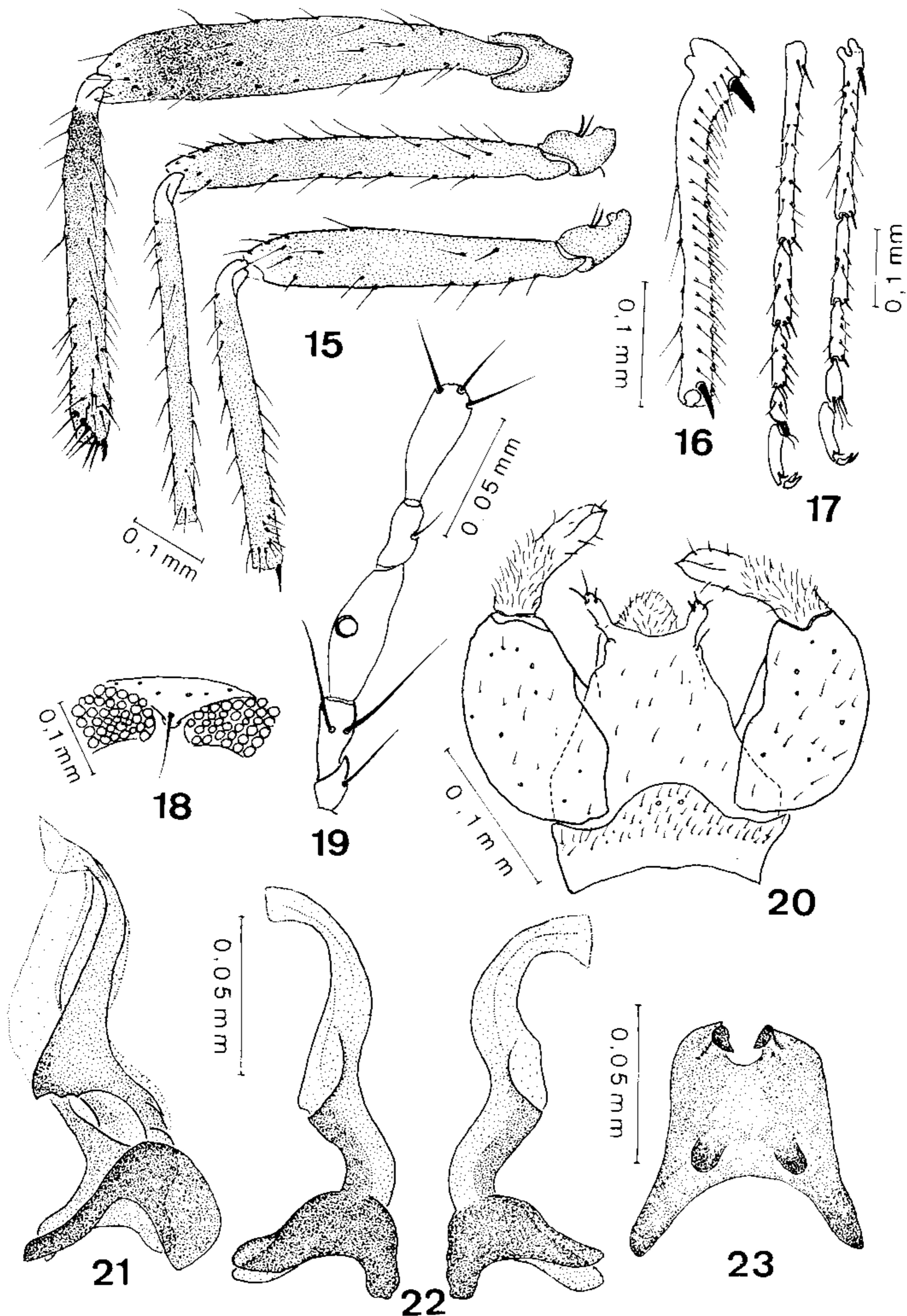
Distribution: Brazil (Rio de Janeiro).

Types: Holotype ♂ (no. 202) R. São Januário, Figueira, Arraial do Cabo (42°2'W, 22°59'S), *Rio de Janeiro*, BRAZIL, 29.III.1989, FEEMA coll.; 1 Paratype ♂ (no. 203) R. Dr. Mesquita s/n, Centro, Itaboraí (42°52'W, 22°46'S), *Rio de Janeiro*, BRAZIL, 22.V.1989, FEEMA coll.; 1 Paratype ♂ (no. 204) R. Padre Anchieta, 234, Centro, Casimiro de Abreu (42°12'W, 22°29'S), *Rio de Janeiro*, BRAZIL, 10.IV.1989, FEEMA coll.; 1 Paratype ♂ (no. 205) R. Coronel F. Pinheiro 43, Estação, São Pedro da Aldeia (42°6'W, 22°50'S), *Rio de Janeiro*, BRAZIL, 27.III.1989, FEEMA coll., all deposited in the Instituto Oswaldo Cruz (IOC), *Rio de Janeiro*, Brazil; 1 Paratype ♂, same data as no. 205, deposited in National Museum of Natural History (USNM), Smithsonian Institution, Washington, D.C., USA.

Etymology: this species is named after the originaries of the state of Rio de Janeiro, where the types were collected.

Discussion: *D. fluminensis* is very similar in the wing pattern to *D. carioca* (Tavares & Pereira), but they can be easily separated by the male genitalia. In *D. fluminensis* the posterior margin of 9th sternum bears 2-4 long hairs (6 in *carioca*) and form a convex lobe (absent in *carioca*). The shapes of the aedeagus and the parameres are also distinctives.

The number of the sensilla basiconica on the 7th antennal segment, and of the spines on



Downeshelea quasidentica sp. n., male. Fig. 15: legs (left to right) hind, mid and fore. Fig. 16: hind basitarsus. Fig. 17: tarsi (left to right) mid and fore. Fig. 18: eye separation. Fig. 19: palpus. Fig. 20: genitalia, aedeagus and parameres removed. Fig. 21: right paramere, lateral view. Fig. 22: parameres, ventral view. Fig. 23: aedeagus.

the tarsi can be also used as data in the taxonomic separation of these species.

Downshelea quasidentica Felipe-Bauer & Quintelas, new species
(Figs 14-23)

Type locality: São Pedro da Aldeia, Rio de Janeiro, Brazil.

Male Holotype: wing length 1.10 mm; breadth 0.38 mm.

Head: eyes (Fig. 18) black, widely separated, bare. Antenna missing. Palpus (Fig. 19) uniformly brown; lengths of segments in proportion of 12-21-31-18-26; 3rd segment elongated, with a small, shallow, circular sensory organ in mid portion; palpal ratio 3.4.

Thorax: mesonotum brown, apparently without a definite pattern; scutellum yellowish with a median brown band; postscutellum brown. Legs (Fig. 15) pale brown, subapical portion of hind femur and subbasal of hind tibia with a dark brown band; knees yellowish; fore tibia with a slender, spine-like spur; fore and hind tibiae with a patch of packed bristles on subapical portion; hind tibia with a short apical spur; hind tibial comb with 6 spines; trochanters, femora and tibiae of the fore, mid and hind legs with lengths respectively in the following proportions: 12-54-50; 11-63-56; 13-68-59. Tarsi (Fig. 16, 17) pale and pilous; hind basitarsus with one row of ventral palisade setae; fore and hind basitarsus with 1 strong basal and 1 apical spine; mid basitarsus with 2 basal, 2 apical and 1-2 ventrally scattered spines; apical spines of tarsomeres 2-4 of fore and mid legs as follow: 1-1-2, 2-2-2, basal spines absent; tarsomeres 2-4 of hind legs missing; lengths of fore and mid tarsal segments 1-5 and of the hind basitarsus in the following proportions: 25-13-10-7-9; 30-13-10-7-9; 33; fore and mid tarsal ratios 1.92; 2.31. Claws paired, equal, about 0.3 times the length of 5th tarsal segment, each one with external basal tooth. Wing (Fig. 14) hyaline with a few scattered macrotrichia on the margin, dark bristles on the costa; 2 slightly faint dark spots, one located on the r-m crossvein extending over the fork of vein M1 and M2, the other in cell R5 extending from the end of the 2nd radial cell to the vein M1; 4 inconspicuous grayish areas, one reduced in apical portion of vein M1, one reduced in the apex of cell ml, one near apex of vein M2 and one on the fork

of veins Cu1 and M3+4 extending on these veins; 2nd radial cell nearly 2.1 times longer than 1st; costal ratio 0.74. Halter pale, apex of the knob brown.

Abdomen: dark brown; terga with faint basal brown bands. Genitalia (Fig. 20): 9th sternum reduced, spiculate, except on basal portion, posterior margin with a short, convex, median lobe, with 2-3 long hairs; 9th tergum tapered with a pair of well developed apicolateral process. Gonocoxite greatly stout, nearly 1.4 times as long as basal wide; gonostylus nearly straight, strongly swollen, about 0.72 times the length of the gonocoxite, pilous on basal portion, with delicate hairs on the apical portion. Aedeagus (Fig. 23) quadrangular, basal portion with a deep concave excavation forming 2 lateral sclerotized lobes; median area with 2 ventral strongly sclerotized horn-like processes; apex with a slight mesal excavation and two ventral sclerotized processes. Parameres (Fig. 21, 22) elongated, sigmoid, each one with a strongly sclerotized trilobed base; mid portion with a triangular, sclerotized lobe; apex ending in a short, membranous lobe; paramere length nearly 1.6 times the length of aedeagus.

Female: unknown.

Distribution: Brazil (Rio de Janeiro).

Types: Holotype ♂ (no. 206) R. Coronel F. Pinheiro 43, Estação, São Pedro da Aldeia (42°6'W, 22°50'S), Rio de Janeiro, BRAZIL, 27.III.1989, FEEMA coll.; *ibidem* 1 Paratype ♂ (no. 207), deposited in the Instituto Oswaldo Cruz (IOC), Rio de Janeiro, Brazil.

Etymology: the name of this species is based on its close similarity with *D. fluminensis* Felipe-Bauer & Quintelas.

Discussion: this species closely resembles *D. fluminensis* Felipe-Bauer & Quintelas in the general aspects of the wings and legs. *D. quasidentica* can be separated from *D. fluminensis* by its smaller length, by the more faint dark spots of the wings and by the shorter hind basitarsus with stout basal spine.

The male genitalia of both species are similar, but the aedeagus in *quasidentica* is quadrangular (triangular in *fluminensis*) with broad apex, the parameres are more curved, and the gonocoxite and the gonostylus are stouter.

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