

Drosophila seriema n. sp.: New Member of the *Drosophila serido* (Diptera: Drosophilidae) Superspecies Taxon

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ABSTRACT *D. seriema* n. sp. is a member of the *buzzatii* cluster (*D. buzzatii* complex) of the *D. repleta* species group of the genus *Drosophila*. It is distinguished from other species of the group, *D. serido*, *D. borborema*, and *D. koepferae*, by morphological, genetic, ecological, and reproductive criteria.

KEY WORDS *Drosophila*, *repleta* group, speciation

THE *BUZZATII* CLUSTER consists of several species of the *Drosophila buzzatii* complex (Ruiz & Waserman 1993), inhabiting South and Central America and sharing chromosomal similarities (Ruiz et al. 1982). Currently, four species are included in this cluster: *D. buzzatii*, the only species of the cluster that has become cosmopolitan; *Drosophila borborema*, found in northeastern Brazil; *Drosophila koepferae*, found in Argentina and Bolivia; and the group of populations known as *Drosophila serido*, distributed in various areas of open vegetation in South America (Vilela et al. 1980, 1983). These species are always associated with cactus (Ruiz et al. 1982, Pereira et al. 1983).

Drosophila serido is polytypic with respect to male genitalia (Silva & Sene 1991), presence of paracentric inversions in the polytenic chromosomes (Tosi & Sene 1989), metaphase chromosome morphology (Baimai et al. 1983), and degree of reproductive isolation (Bizzo 1983). However, there is no concordance among these characters that would explain their geographic distribution (Sene et al. 1982, 1988).

According to Sene et al. (1988), the distribution of *D. serido* in South America is particularly interesting because some populations differ from others with respect to several characters. This is the case for the Argentinean populations and those living in the southern part of the "Cadeia do Espinhaço" in Brazil. The populations in Bolivia and northern Argentina were raised to species level by Fontdevila et al. (1988), as *D. koepferae*.

We analyzed morphometrically (Tidon-Sklorz & Sene 1994) the aedeagi of populations included in *D. serido* from Cadeia do Espinhaço and identified

two morphologically distinct groups. We mapped the geographic distribution of each group and confirmed the previously suspected differentiation among populations from this area. In this report we describe the differentiated populations as *Drosophila seriema* sp. n., characterize the new species, and discuss its relationship with the remaining members of the *buzzatii* cluster.

Drosophila (Drosophila) seriema Tidon-Sklorz & Sene, New Species

External Characters of Imagines. Male: Arista with 4 dorsal and 3 ventral branches; antennae yellowish with bases dark brown; front light brown, pollinose. Anterior, middle orbital, and posterior vertical arising from a yellowish area. Hairs of anterior orbits, posterior orbital, anterior vertical, and postvertical with basal dark spots. Middle orbital about half the length of other two. Second oral about half the length of first. Carina broad below, sulcate. Palpi pale yellow, with several bristles. Face yellowish brown. Cheeks yellowish gray, their greatest width about one-fourth greatest diameter of eyes. Eyes vermilion, with short black pile. Achromostical hairs in 8 rows; no prescutellars; anterior scutellars convergent. Sterno index about 0.8. Mesonotum gray, pollinose, bristles arising from dark spots with tendency to fuse. Scutellum dark brown, pleurae dark brown. Halteres pale yellow. Legs uniform dark brown. Apical bristles on first and second tibiae, preapicals on all three. Abdomen pale yellow, each segment with strongly contrasting, interrupted, wide, dark brown band, this bending to anterior margin at angle of tergite, leaving a small irregular pale area. Wings clear, veins brown, apex of first costal section black. Costal index ≈ 2.7 ; 4th vein index ≈ 1.8 ; 5 \times index ≈ 1.2 ; 4c

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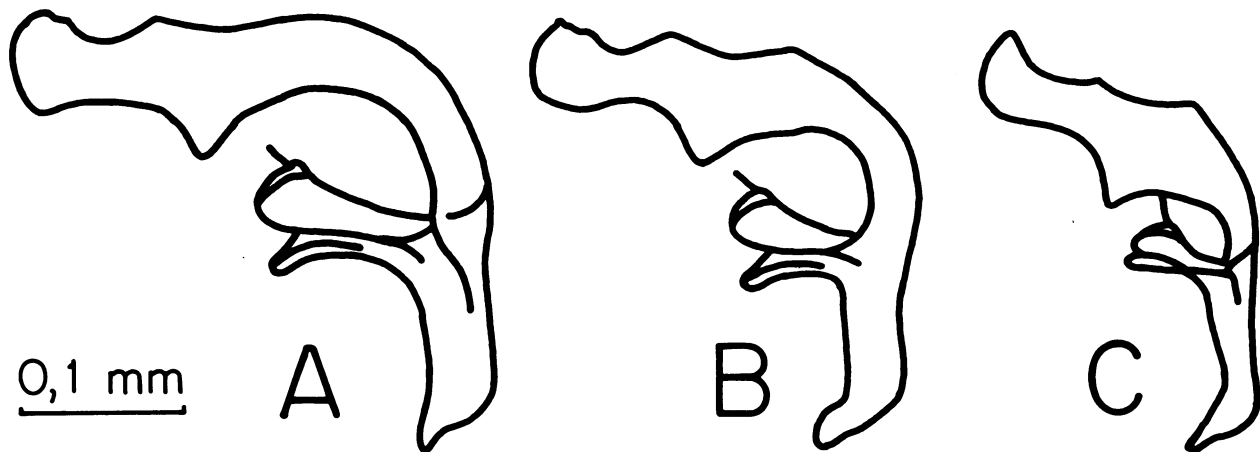


Fig. 1. Some aedeagi of the superspecies *D. serido*. *D. serido* (A), *D. seriema* (B), *D. borborema* (C).

index ≈ 0.9 . Two well-developed bristles at apex of first costal section; third costal section with heavy bristles on its basal third. Length of body 2.4–3.0 mm (in living specimens); wings ≈ 2.4 mm.

Internal Characters of Imagines and Genitalia. Testes orange, with 2.5 inner and 2.5 outer coils. Epandrium with 4–13 bristles, usually 8. Cerci not fused. Surstylus with 9–13 primary teeth, usually 11, and 7 marginal bristles. Aedeagus as in Fig. 1b. Ventral receptacle with ≈ 15 irregular coils.

Chromosomes. Metaphase plate showing 4 pairs of telocentric (rod-shaped) autosomes, a large submetacentric 6th chromosome and 1 pair of sex chromosomes. X chromosome telocentric, approximately one-third of its proximal region composed of heterochromatin. Acrocentric Y chromosome almost entirely heterochromatic (Baimai et al. 1983; Kuhn, personal communication). Fixed chromosomal inversions: Xabc;2abmz⁷e⁸;3b (Tosi & Sene 1989; Ruiz & Wasserman 1993).

Other Features. Eggs with 4 filaments. Puparia brownish, each anterior spiracle with ca. 14 branches, horn index ca. 2.2.

Type Material. HOLOTYPE: ♂, labeled "BRASIL, MG, Grão Mogol, 16°34' S, 42°54' W, Sene et alli col., 23–30.i.1990 / Holótipo *D. seriema* ♂". Seventeen PARATYPES: (6♂, 6♀) same data as holotype; (2♂, 2♀): BRASIL, BA, Morro do Chapéu, 11°36' S, 41°08' W, Sene et alli col., 14–18.vii.1990; (1♂): BRASIL, MG, Serra do Cipó, 19°17' S, 43°35' W, Tidon-Sklorz & Julio, cols., 5–9.vii.1989. The holotype and paratypes have been deposited in the Museu de Zoologia da Universidade de São Paulo (MZUSP), São Paulo, Brazil.

Etymology. The specific name is derived from *D. serido* and *D. borborema*, as *D. seriema* has aedeagi morphologically intermediate between these two species (Fig. 1). Coincidentally, *seriema* is the popular name of a land bird (Cariamidae) that inhabits a large area of central Brazil, including where *D. seriema* is found, and is considered one

of the birds symbolizing Brazil. Heretofore, this species was called "*D. serido* type C" (Silva & Sene 1991).

Classification. *D. seriema* belongs to the *D. buzzatii* cluster of the *D. buzzatii* complex (*D. mulleri* subgroup) of the *Drosophila repleta* species group.

Diagnosis. *D. seriema* can easily be distinguished from *D. serido* and *D. borborema* by the shape of aedeagus, although the external morphology of these three species are very similar. The pattern of metaphase chromosomes is unique in *D. seriema*, but none of the chromosomes has diagnostic inversions.

Distribution. *D. seriema* is apparently limited to Cadeia do Espinhaço in eastern Brazil. We have collected this species at the following sites: Serra do Cipó (Minas Gerais), Grão Mogol (Minas Gerais), Mucugê (Bahia), and the Morro do Chapéu region (Bahia), always at high altitudes ($\approx 1,000$ m). The distribution of the *D. buzzatii* species cluster is shown in Fig. 2.

Ecology. *D. seriema* has been collected only in rocky fields. Data on the breeding and feeding niches of *D. seriema* indicate that it lives, primarily, on columnar cacti. We have found this species in decayed portions of cacti of the genus *Cereus* sp.

Reproductive Isolation. Some investigators have studied the result of intercrosses between isolines of the superspecies *D. serido* of different origins, including lines from "Serra do Cipo" (MG) currently classified as *D. seriema*. In experiments with no male choice in which lines from Serra do Cipo (today classified as *D. seriema*) were intercrossed with lines of other origins, Moraes (1992) and Madi-Ravazzi (1992a, b) reported asymmetrical postmating isolation. Fertility was lower, complete sterility occurring when the intercross involved *D. seriema* females.

Male choice experiments (Moraes 1992) have shown that individuals now classified as *D. seriema*

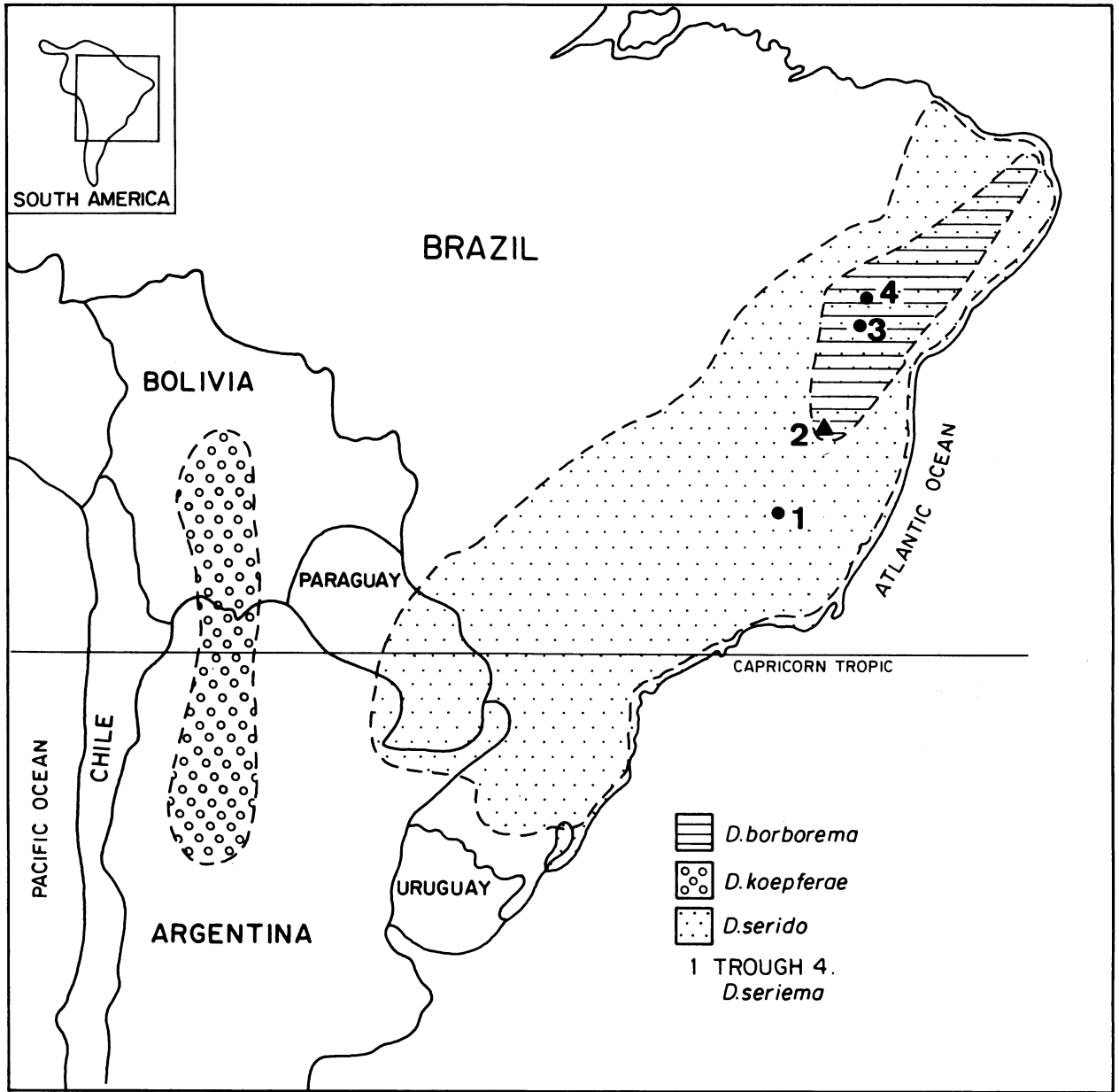


Fig. 2. Map of South America showing the known distribution of the *D. buzzatii* species cluster. *D. seriema* was collected at the following sites: (1) Serra do Cipó, (2) Grão Mogol, (3) Mucugê, and (4) Morro do Chapéu, always at high altitudes ($\approx 1,000$ m).

present a stronger premating isolation than do *D. serido* and *D. koepferae*.

Bizzo (1983) investigated the reasons for the postmating isolation observed in different intercrosses between lines of the *D. serido* superspecies and noted that the isoline originating from Serra do Cipo (*D. seriema*) produces hybrid males with azoospermia or gonadal digenesis when intercrossed with lines of a different origin.

These studies show that the isolines from Serra do Cipo belonging to *D. seriema* present strong premating isolation and moderate postmating isolation when intercrossed with strains *D. serido* or *D. koepferae*.

Genetic Differentiation. Lapenta (1992) analyzed the esterase pattern of lines of the *buzzatii* cluster of different origins currently classified as *D. buzzatii*, *D. serido*, *D. koepferae*, and *D. seriema*. The isoline belonging to *D. seriema* showed a characteristic esterase pattern easily distinguished from that of other isolines. Madi-Ravazzi (1992a) analyzed the same material studied by Lapenta (1993) in terms of asynapsis degree and extra masses of heterochromatin and concluded that the isoline belonging to *D. seriema* differs from the remaining ones, forming a separate group. These investigators suggested that the line from Serra do Cipo should be promoted to the species level.

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