

Allocyclops silvaticus sp. n. (Copepoda, Cyclopoida, Cyclopidae), the first representative of the genus in South America

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Abstract

Allocyclops silvaticus sp. n. is described from cultures of leaf litter collected in Atlantic rain forest in the State of Sergipe, northeastern Brazil. It is the first record of the genus in South America.

Introduction

To date, *Allocyclops* is represented by six species from ephemeral freshwater surface microhabitats or subterranean waters in Africa, Europe and the West Indies. The African species are *A. chappuisi* Kiefer, 1932 described from a spring near Daloa, Ivory Coast, *A. ritae* Dumont & Lamoot, 1978 from a small pool on granitic rock at Lamto, also in the Ivory Coast, and *A. cavicola* Chappuis, 1951 from a cave in Zaire. The European species *A. minutissimus* (Kiefer, 1932) and *A. kieferi* Petkovski, 1971 co-occur in some Yugoslavian groundwaters. The West Indian species is *A. botosaneanui* Plesa, 1981 from a cave in Cuba.

Dussart (1984) tentatively included *A. neotropicalis* from Venezuela in the genus. Reid (in press) transferred this species to a neotropical endemic genus, *Yansacyclops*. Thus, the species here described is the first representative of the genus *Allocyclops* in South America.

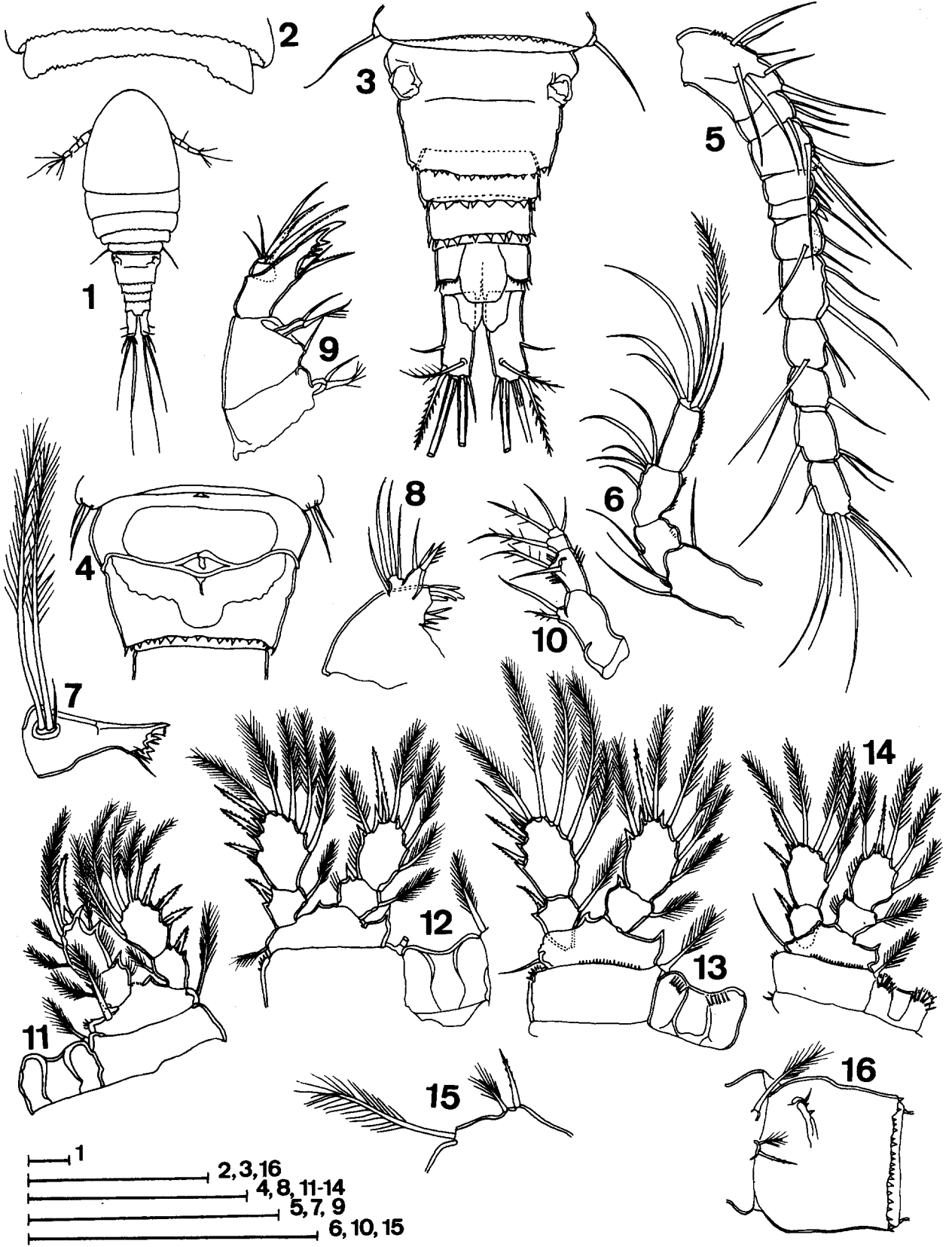
The abbreviations used in the text are: ae = aesthetask; A1 = antennule; A2 = antenna; Basp 1–2 = 1st and 2nd segments of basipodite; Enp 1–2 = 1st and 2nd segments of endopodite;

Exp 1–2 = 1st and 2nd segments of exopodite; Md = mandible; Mx1 = maxillule; Mx2 = maxilla; Mxp = maxilliped; MZUSP = Museu de Zoologia, Universidade de São Paulo; P1–P6 = 1st to 6th legs; sp = spine.

Allocyclops silvaticus sp.n.

Material. Female holotype (MZUSP 8903) and paratypes (29 females, 29 males, 19 copepodites and 20 nauplii, nos. 8904 to 8907, respectively) from Riachão do Dantas (11° 02' S – 37° 45' W) State of Sergipe, Brazil.

Female. Body length of 7 females 470–555 µm; holotype 550 µm. Third and fourth metasomites and all urosomites (except anal somite) with posterior border irregularly crenulated (Figs. 1–3). Posterior margin of anal somite (Fig. 3) with ventrolateral row of spinules. Anal operculum smooth, with straight posterior margin. Genital complex (Fig. 3) 1.5 times wider than long, but narrower than first urosomite. Seminal receptacle as in Fig. 4.

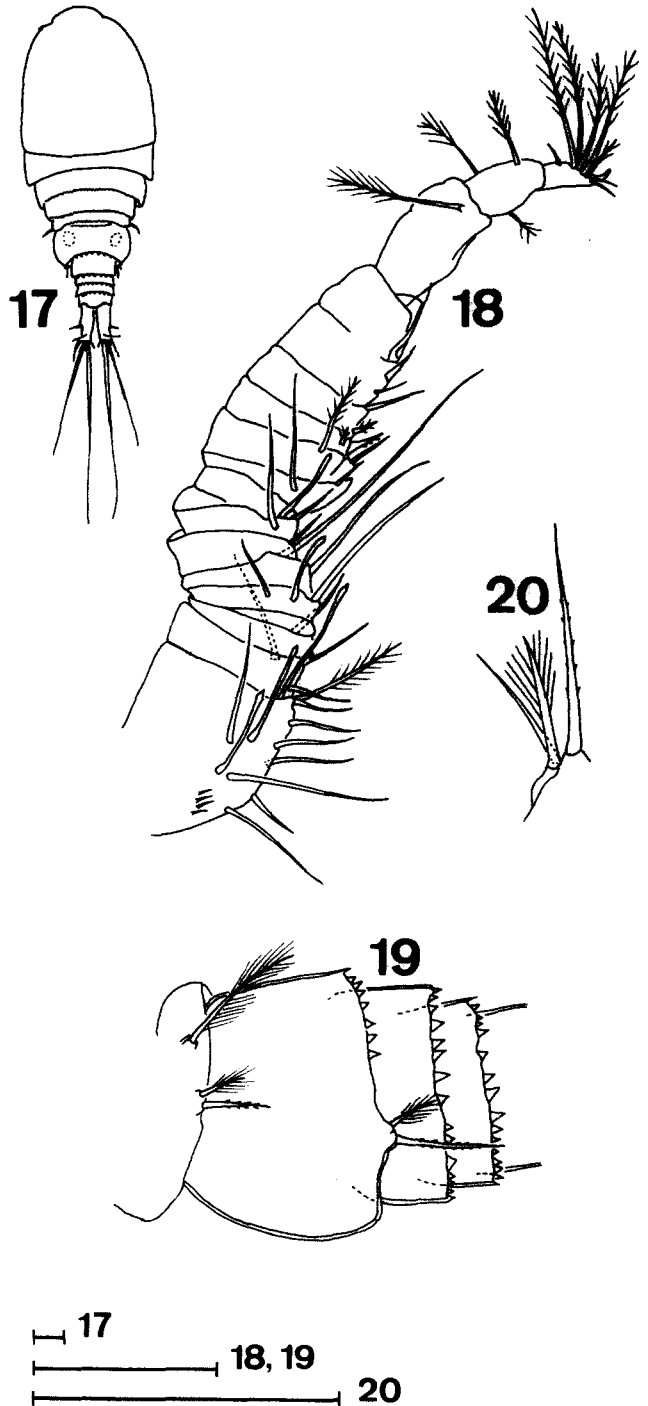


Caudal rami (Fig. 3) about 2.5 times longer than wide. Lateral seta inserted at distal third of ramus. Outer apical seta thicker and twice as long as naked inner apical seta. Median apical setae homogeneously plumose, the innermost 1.5 times longer than outer one. Dorsal seta plumose, 0.7 times length of outer apical seta.

A1 (Fig. 5) 11-segmented and ornamented as follows: (Roman numerals = segments; Arabic numerals = number of setae) I = 7, II = 3, III = 5, IV = 2, V = 1 + 1sp, VI = 3, VII = 3, VIII = 2 + 1ae, IX = 2, X = 3, XI = 6 + double seta. A2 (Fig. 6) with 4 segments; segment 1 with short weak outer seta and 2 inner setae; segment 3 with 5 setae. Mandibular palp (Fig. 7) with 1 short seta and 2 long plumose setae reaching insertion of P1. Mx1 as in Fig. 8. Mx2 (Fig. 9) 5-segmented; beak-like outgrowth of 3rd segment with 4 unequal denticles on inner margin. Mxp (Fig. 10) 4-segmented and with 2.2.1.3 setae from basal to distal segment.

P1-P4 (Figs. 11-14) each with seta on inner corner of Basp 1. Basp 2 P1 with inner seta adjacent to Enp. Inner corner of Basp 2 P2-P4 expanded into pointed protuberance. Number of spines on Exp2 P1-P4 = 3.3.3.2. Number of setae internally to spine on Enp2 P1-P4 = 3.4.5.3. Enp2 P4 1.2 times longer than broad and with 1 terminal spine. Intercoxal plates of P3 and P4 with 2 subterminal curved rows of spinules on anterior side. P5 (Figs 15,16) reduced, its basal segment represented by 1 long plumose seta implanted dorsolaterally on first urosomite and its distal segment reduced to slight protuberance with inner slender serrated spine 1.7 times longer than outer plumose seta. P6 (Fig. 16) consisting of 1 seta and 2 spinules.

Male. Length range of 5 specimens 420-475 μm . Body (Fig. 17) more slenderly built than female.



◀ Figs. 1-16. *Allocyclops silvaticus* sp.n. Female 1. habitus, dorsal; 2. posterior borders of 2nd and 3rd metasomites, dorsal; 3. urosome, dorsal; 4. genital complex with seminal receptacle, ventral; 5. A1; 6. A2; 7. Md; 8. Mx1; 9. Mx2; 10. Mxp; 11. P1; 12. P2; 13. P3; 14. P4; 15. P5 (dissected); 16. P5 and genital somite with P6, lateral. Scale bars: 100 μm .

Figs. 17-20. *Allocyclops silvaticus* sp. n. Male 17. habitus, dorsal; 18. A1, ventral; 19. anterior part of urosome bearing P5 and P6, lateral; 20. abnormal P6. Scale bars: 50 μm .

A1 as in Fig. 18. Enp2 P4 narrower than in female. P6 (Fig. 19) consisting of ventral, slender, finely serrated spine and weak, plumose, dorsal seta which reaches mid-length of spine. One specimen with P6 represented by 2 setae and 1 spine (Fig. 20).

Etymology. The specific name (from the Latin 'silvaticus', of woods) refers to the habitat.

Habitat. *A. silvaticus* was found living in a culture made from leaf litter and a small quantity of superficial moist soil collected at the bank of a rill in an Atlantic rain forest remnant.

Biological Notes. The adults, copepodites and nauplii were observed crawling on the substrate of the culture dish, but they frequently made incursions into the water over the sediment. As water evaporated the copepods burrowed into the moist sediment. They began to swim again as soon as water was added to the culture dish.

Adults and copepodites occasionally fed on nematodes and injured oligochaetes.

Remarks. The species here described is included in *Allocyclops* based on the structure of P5, although the inner spine is more slender than usual for the genus and longer than its adjacent seta. This feature as well as the setation of Enp2 P1-P4, the length ratio of the spine and seta of the male P6, and the ornamentation of the intercoxal plates of the P3 and P4 are diagnostic characteristics that separate *A. silvaticus* from all other species of the genus. Dumont & Lamoot (1978) described *A. ritae* as having the spine formula of Exp2 P1-P4 = 3.3.3.2, the same formula as *A. silvaticus*. However, the re-examination of the type-material of *A. ritae* by one of us (C E F da R.) revealed the presence of only 2 spines on Exp2 P1.

A. silvaticus shares with *A. ritae* the presence of only one terminal spine on the Enp2 P4. All other species of *Allocyclops* have two terminal spines on that segment. A similar situation is to be found in *Metacyclops* to which *Allocyclops* is closely related (Kiefer, 1933).

Mouthparts were previously known for

A. kieferi (Petkovski, 1971) and *A. minutissimus* (Kiefer, 1932). Mx1 and Mx2 of both species and *A. silvaticus* follow the usual structural plan of the family Cyclopidae. Md has its palp represented by only one short seta in *A. kieferi*, while the other two species bear a palp with one short and two long plumose setae as in *A. botosaneanui*. Mxp is 4-segmented in *A. kieferi* and *A. silvaticus*, but these species differ in setation. Since these appendages are not known for other representatives of the genus, their taxonomical value remains uncertain. However, what is known suggests that examination of these and other appendages usually neglected in the majority of descriptions might provide better conditions to determine whether the diverse species nowadays included in *Allocyclops* should be combined in one genus or separated in two or more genera. *Allocyclops* badly needs revision.

Acknowledgements

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