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# Scolodiaptomus, a New Genus Proposed for Diaptomus (sensu lato) corderoi Wright, and Description of Notodiaptomus brandorffi, New Species (Copepoda: Calanoida), from Brazil

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*SCOLODIAPTOMUS*, A NEW GENUS PROPOSED FOR *DIAPTOMUS*  
(SENSU LATO) *CORDEROI* WRIGHT, AND DESCRIPTION  
OF *NOTODIAPTOMUS BRANDORFFI*, NEW SPECIES  
(COPEPODA: CALANOIDA), FROM BRAZIL

Janet W. Reid

A B S T R A C T

A new genus, *Scolodiptomus* (Copepoda: Calanoidea: Diaptomidae), is proposed for *Diaptomus corderoi* Wright, 1936, from southeastern Brazil. *Scolodiptomus corderoi* is redescribed. The genus is defined principally by characters of the female: the prominent spine on the anterior face of the first exopod article of the fifth leg, and the partial dorsal division of the genital segment. Important distinguishing characters of the males include the proportions of spines on the right antennule, and proportions and structures of the fifth legs. The genus is closely related to *Notodiptomus* Kiefer, 1936. *Notodiptomus brandorffi*, new species, is described from northeastern Brazil. Some current problems in the taxonomy of neotropical diaptomids are discussed.

Incomplete knowledge of the morphology of many neotropical species of Diaptomidae has contributed to confusion in the diagnoses of some genera and in problems in the inference of species relationships. Examination of specimens of *Diaptomus* (sensu lato) *corderoi* Wright, collected in the type-locality and two reservoirs in the State of Minas Gerais, southeastern Brazil, has resulted in the observation of some previously unrecognized characters that are sufficient to distinguish a new genus.

Specimens of a second species, collected in the State of Maranhão, northeastern Brazil, were confided to me for determination by Profa. Maria S. R. Ibañez. It is described below as *Notodiptomus brandorffi*, new species. Specimens collected by E. R. dos Santos in the State of Sergipe and transmitted to me by Prof. Carlos E. F. da Rocha are also *N. brandorffi*.

Several taxonomic problems and errors in procedure which have appeared in recent publications on neotropical diaptomids are also discussed.

*Scolodiptomus*, new genus

*Female*.—Fifth leg with prominent spine on anterior surface of first article of exopod; endopod of 2 articles. Urosome of 3 segments, genital segment sometimes divided by suture which is incomplete ventrally. Fourth pediger with dorsal blunt conical process.

*Male*.—Right antennule, spines on articles 10 and 11 of equal length, set obliquely to axis of antennule, spine on article 13 large. Right leg 5, basipod article 1 with large mammiform process; basipod article 2 with conical posterior expansion, several projections on inner surface and fields of hairs on anterior and posterior surfaces; exopod article 2 broad, outer spine inserted at distal two-thirds of outer margin. Left leg 5, endopod of 2 articles; exopod with well-separated inner hairy pads and proximal and distal processes of approximately equal length, proximal process haired, distal process crenulate.

*Type-species*.—*Scolodiptomus corderoi* (Wright, 1936), by original designation.

*Etymology*.—The generic name is derived from the Greek skolos = anything

pointed, prefixed to *Diaptomus*, and refers to the spine on the exopod article 1 of leg 5 of the female.

*Scolodiaptomus corderoi* (Wright, 1936)

Figs. 1–31

*Diaptomus corderoi* Wright, 1936: 82–83, pl. 1, figs. 3–5. — Wright, 1938: 563. — Cipólli, 1973: 567–612, pls. 1–12. — de Gouvêa, 1980: 1047, 1050, 1051, 1058–1059. — Okano, 1980: 1–168. — Sendacz and Kubo, 1982: 61, 64–66, 85–86, figs. 15–19. — Arcifa, 1984: 138–140, 143. — Sendacz *et al.*, 1984: 1629. — Sendacz *et al.*, 1985: 190, 193, 196, 199, 201, 203, 205, 207.

“*Diaptomus*” *corderoi*. — Brandorff, 1976: 618. — Matsumura-Tundisi and Okano, 1983: 35, 37, 38.

*Diaptomus* sp. — Barbosa *et al.*, 1984: 403.

*Notodiaptomus corderoi*. — Kiefer, 1956: 242. — Dussart and Defaye, 1983: 137, 138.

*Notodiaptomus* (*Notodiaptomus*) *corderoi*. — Dussart, 1985: 208.

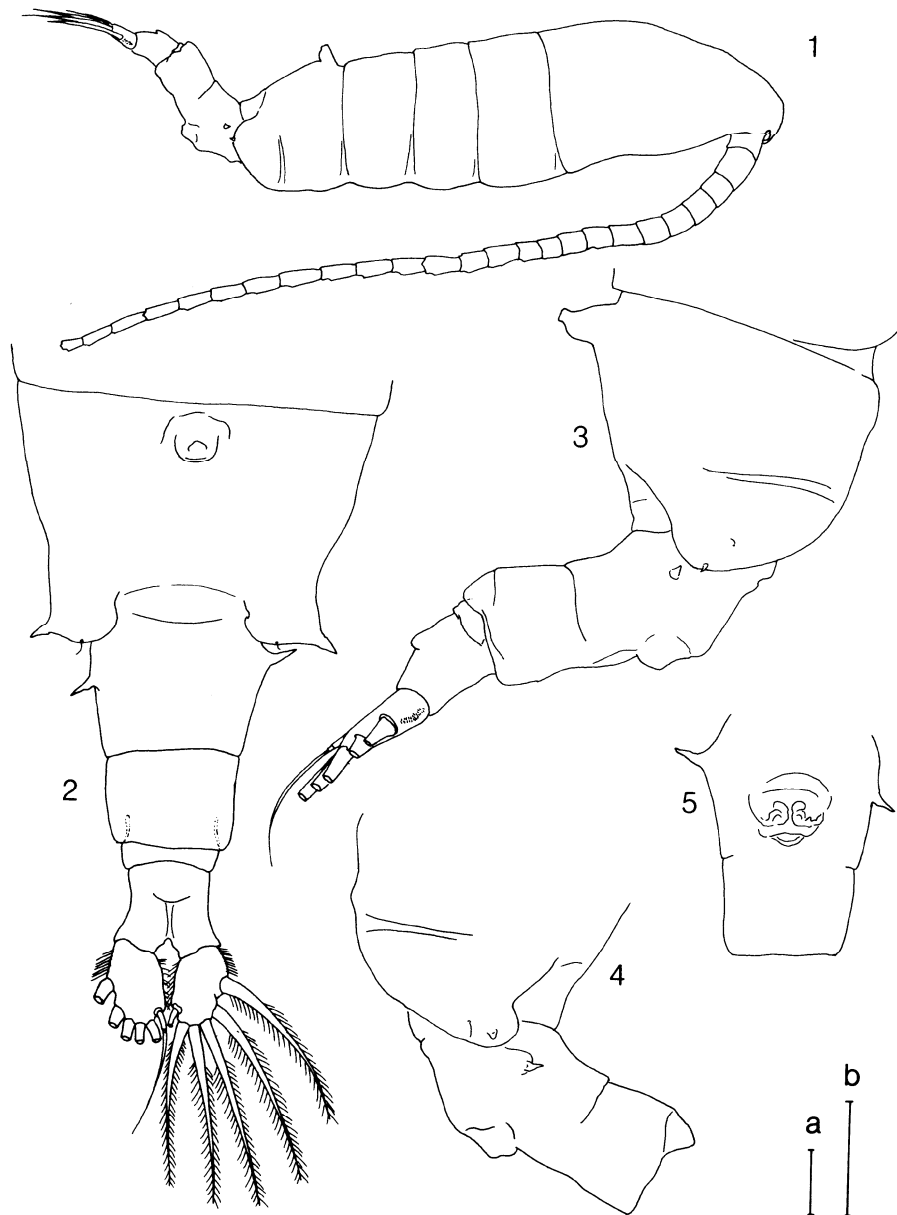
*Specimens Examined*. — 40 ♀♀ (Museu de Zoologia, Universidade de São Paulo) (MZUSP 7229) and 40 ♂♂ (MZUSP 7230); 40 ♀♀ and 40 ♂♂ (National Museum of Natural History) (USNM 227109); and 2 ♀♀ and 2 ♂♂, dissected on slides (author's collection), all from Lagoa Santa (type-locality), Município de Lagoa Santa, State of Minas Gerais, Brazil, 19°38'S, 43°53'W, collected 1 September 1985 by A. Giani, R. M. Pinto-Coelho, and J. W. Reid; 6 ♀♀ (MZUSP 7227) and 10 ♂♂ (MZUSP 7228), and 2 ♀♀ and 2 ♂♂, dissected on slides (author's collection), from Represa da Pampulha, Belo Horizonte, Minas Gerais, Brazil, 19°53'S, 43°59'W, collected 11 October 1984 by A. Giani and R. M. Pinto-Coelho; 95 ♀♀ and 88 ♂♂ (USNM 213819), from Represa Vargem das Flores, Belo Horizonte, 19°55'S, 44°02'W, collected 12 April 1984 by A. Giani and R. M. Pinto-Coelho. All undissected specimens preserved in alcohol.

*Female*. — Median length (including caudal rami) of 10 specimens from Lagoa Santa 1.20 mm (range 1.08–1.30 mm); median length of 8 Represa da Pampulha specimens 1.38 mm (range 1.32–1.40 mm); median length of 10 Represa Vargem das Flores specimens 1.32 mm (range 1.28–1.38 mm). Body widest at first pediger in dorsal view. Suture between fourth and fifth pedigers incomplete dorsally (Figs. 1–4). Fourth pediger with blunt conical process near dorsal anterior margin, this process more or less well developed in different specimens. Fifth pediger produced posteriorly on each side in small wing tipped with laterally directed spine and bearing 1 short hair at midlength of posterior margin. Urosome of 3 segments, second segment telescoped into genital segment and partly fused ventrally to third segment. Genital segment slightly saddle-shaped in lateral view and most often partly divided dorsally at midlength. In some specimens this division indicated by shallow dorsal groove, in others by fold of tegument (Figs. 1–4). Degree of development of dorsal division varying in three populations examined: all females from Represas Pampulha and Vargem das Flores possessing well-developed fold, while of 20 females from Lagoa Santa, 5 showing fold, 11 showing groove, and 4 showing no discernible indentation. Anterior half of genital segment asymmetrically expanded laterally, with strong spine on each side; right spine anterior to left spine. Outer and inner margins of caudal rami haired. Genital field as in Fig. 5.

Rostral points acute (Fig. 1). Antennule reaching past end of caudal rami; complete armature as in Fig. 6. Antenna (Fig. 7) and mandible (Fig. 8) with normal structure for family; dentition of gnathal lobe in ventral to dorsal order as follows (nomenclature after Fleminger, 1967): apical tooth blunt, subapical tooth pointed. Medial teeth 3 in number, ventralmost tooth bicuspidate, dorsalmost 2 teeth each with 2 rounded and 2 smaller acute cusps. Basal teeth 3 in number, 2 ventralmost teeth tricuspidate, dorsalmost tooth slender, serrated (Fig. 9). Maxillula, maxilla, and maxilliped as in Figs. 10–12, respectively.

Swimming legs 1–4 as in Figs. 13–16; article 2 of endopod of leg 2 with Schmeil's organ on posterior surface.

Leg 5 (Figs. 17–19), basipod article 1 with conical posterodistally directed



Figs. 1-5. *Scolodiaptomus corderoi* (Wright). Female: 1, habitus, lateral; 2, pedigers 4 and 5 and urosome, dorsal; 3, pedigers 4 and 5 and urosome, right lateral; 4, pedigers 4 and 5 and urosome, left lateral; 5, genital segment, ventral. Scale a, Fig. 1; scale b, Figs. 2-5; scale bars = 100  $\mu$ m.

process. Inner margin of basipod 2, 3 times longer than outer margin. Exopod 1 about 2.5 times longer than broad, armed with blunt socketed spine on anterior distal surface. Exopod 2 with short spine lateral to base of article 3; claw stout, curved slightly anteriorly, sides straight in anterior view. Exopod 3 distinct, slightly



Figs. 6-12. *Scolodiaptomus corderoi* (Wright). Female: 6, right antennule; 7, antenna; 8, mandible; 9, gnathal lobe of mandible; 10, maxillula; 11, maxilla; 12, maxilliped. Scale a, Fig. 6; scale b, Figs. 7, 8, 10-12; scale c, Fig. 9; scale bars = 100  $\mu\text{m}$ .

longer than broad, with 2 terminal spines, inner being about 5 times longer than outer. Endopod of 2 articles, reaching midlength of exopod 1, endopod 2 with 2 spines and group of hairs on oblique distal half of inner margin (Fig. 19).

*Male.*—Median length of 10 specimens from Lagoa Santa 0.99 mm (range 0.95–1.03 mm); median length of 10 Represa da Pampulha specimens 1.12 mm (range 1.05–1.14 mm); median length of 10 Represa Vargem das Flores specimens 1.10 mm (range 1.07–1.14 mm). Body widest at first pediger in dorsal view (Fig. 20). Suture between fourth and fifth pedigers complete but faint dorsally. Fifth pediger produced into small posteriorly directed wings, each with 1 spine and 1 hair (Figs. 20–23). Urosome of 5 segments. Right side of genital segment produced posteriorly over succeeding segment. Inner margins of caudal rami haired, outer margins smooth.

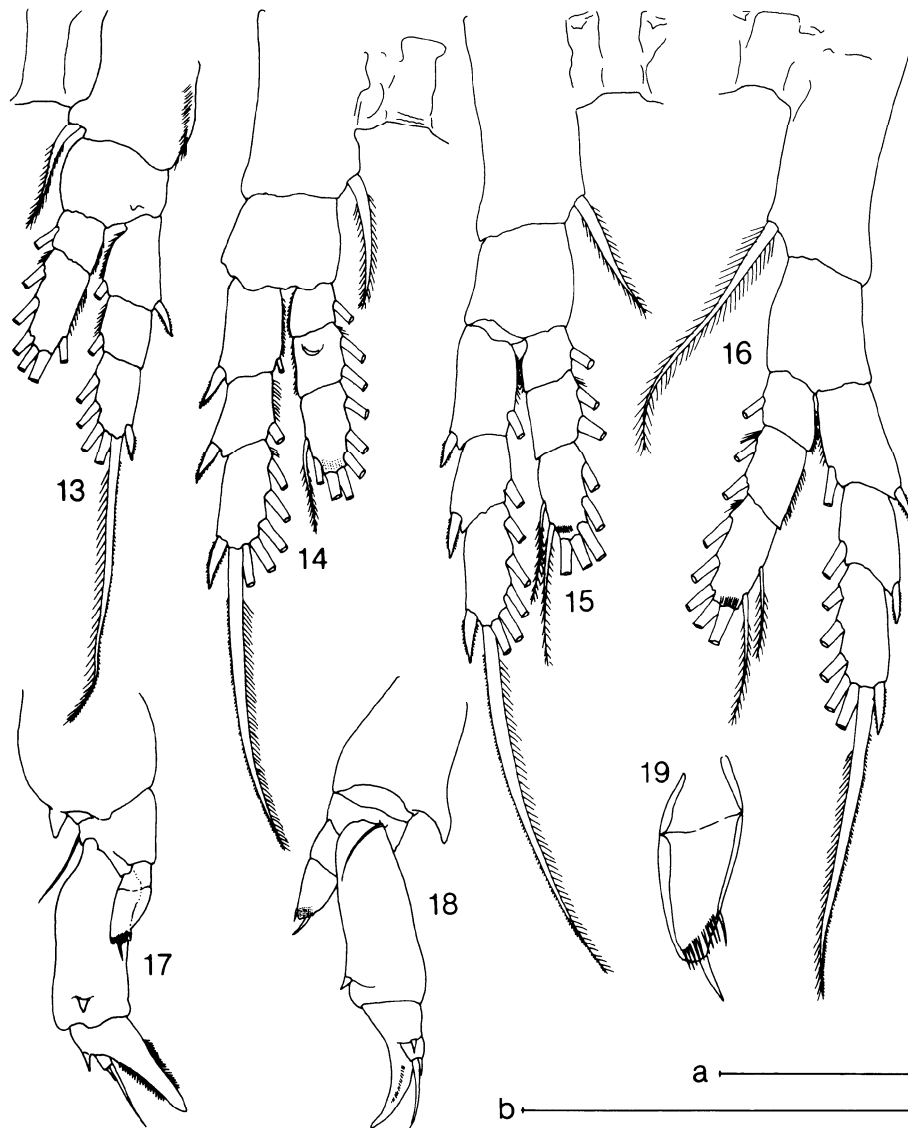
Right antennule (Figs. 24, 25) with socketed spines on articles 8 and 12; spines on articles 10 and 11 of equal length, at oblique angle to axis of antennule. Spine on article 13 large, with recurved spinule near tip. Spine on article 15 blunt, twice length of spine on article 16. Antepenultimate article with narrow hyaline membrane (Fig. 25). Armature of left antennule as in female.

Structure and armature of antenna, maxillula, maxilla, maxilliped, and swimming legs as in female, except article 1 of endopod of antenna with 2 setae and group of 7 spines (Fig. 26).

Right leg 5 (Figs. 27–31), basipod 1 with large posterior mammiform projection ending in slender spine. Inner margin of basipod 2 convex, with 3 projections, proximalmost largest; posterior surface with conical expansion and oblique field of hairs (Figs. 27, 28); anterior surface with proximal field of hairs (Fig. 29); lateral seta inserted on nodule (Figs. 27–29). Exopod 1 with convex outer margin and posterior conical expansion (Figs. 27, 28). Exopod 2 nearly twice length of exopod 1, expanded distally, inner and outer margins convex; with some cuticular thickenings on posterior surface. Lateral spine smooth, bent slightly at proximal third, inserted at distal third of outer margin. Terminal claw longer than exopod, broadly curved inwards and posteriorly, with slightly recurved tip and 2 rows of spinules. Endopod small, conical (Fig. 30) with oblique crescentic row of hairs on inner surface.

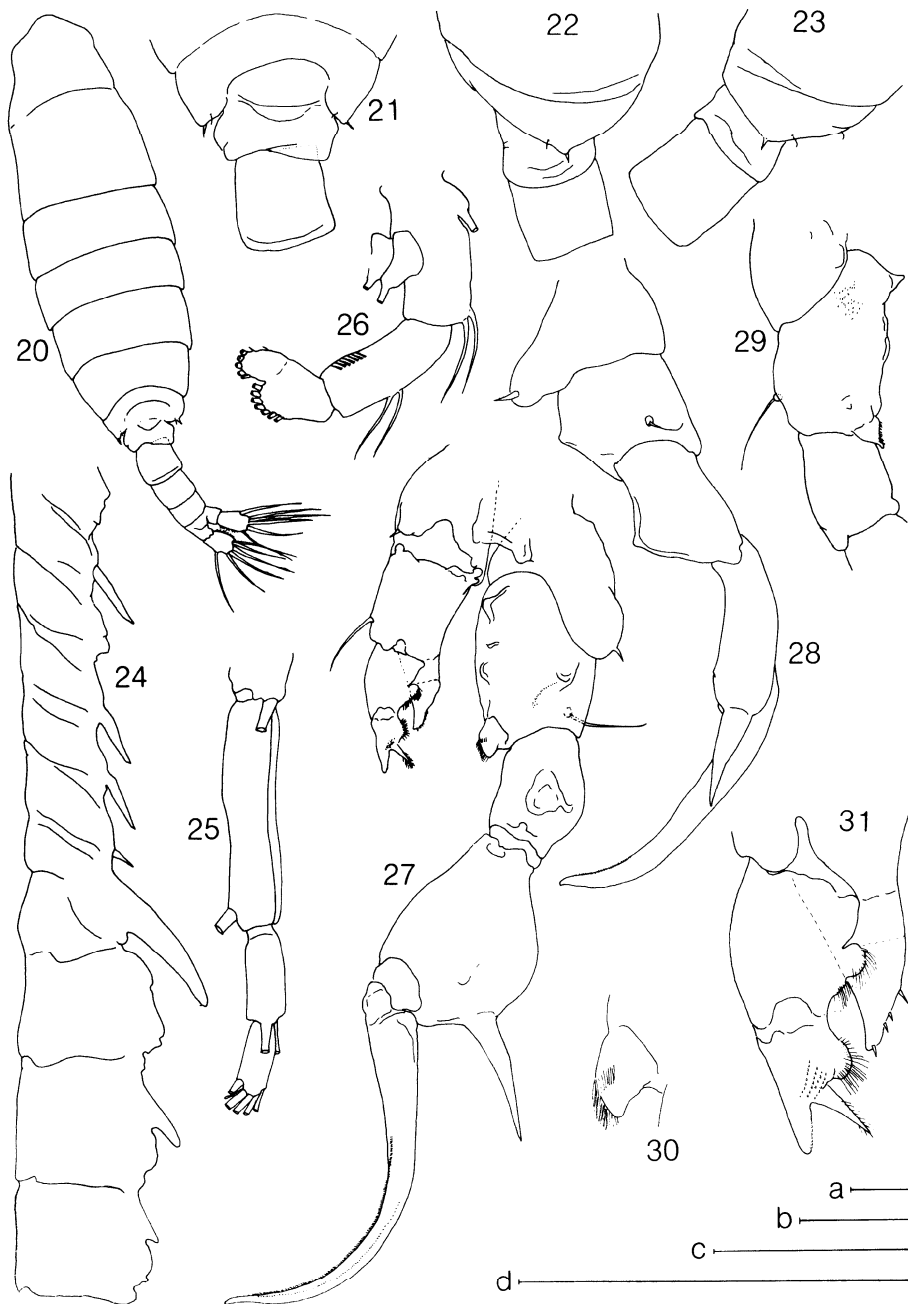
Left leg 5, basipod 1 (Fig. 27) with small posterior mammiform process bearing terminal spine. Basipod 2 slightly longer than broad, inner proximal corner produced into rounded knob, seta inserted near outer distal corner. Endopod (Figs. 27, 31) reaching midlength of distal pad of left exopod, of 2 indistinct articles; distal half of inner margin of article 2 with 4 spinules and row of hairs. Exopod (Figs. 27, 31) of 2 articles, article 1 with partly divided, finely haired inner pad; article 2 with haired inner pad and rows of spinules or hairs on posterior surface distal to pad. Distal process with comblike crenulations on inner margin; proximal process slender, equal in length to distal process, with fine hairs.

*Ecology and Distribution.*—*Scolodiaptomus corderoi* inhabits lakes and reservoirs in the southeastern Brazilian states of Minas Gerais and São Paulo. Of ten São Paulo reservoirs studied by Arcifa (1984), it was most abundant in the two least productive reservoirs but comprised more than 10% of the numbers of zooplankton in the most productive reservoir. Of 17 reservoirs in São Paulo, *S. corderoi* occurred in four, and was numerically abundant in two with low water transparency, relatively high electrical conductivity, and high concentrations of nutrients and chlorophyll (Sendacz and Kubo, 1982; Sendacz *et al.*, 1985). In Minas Gerais, the species is abundant in Lake Dom Helvécio, a deep monomictic natural lake (Matsumura-Tundisi and Okano, 1983), as well as in the mesotrophic reservoirs



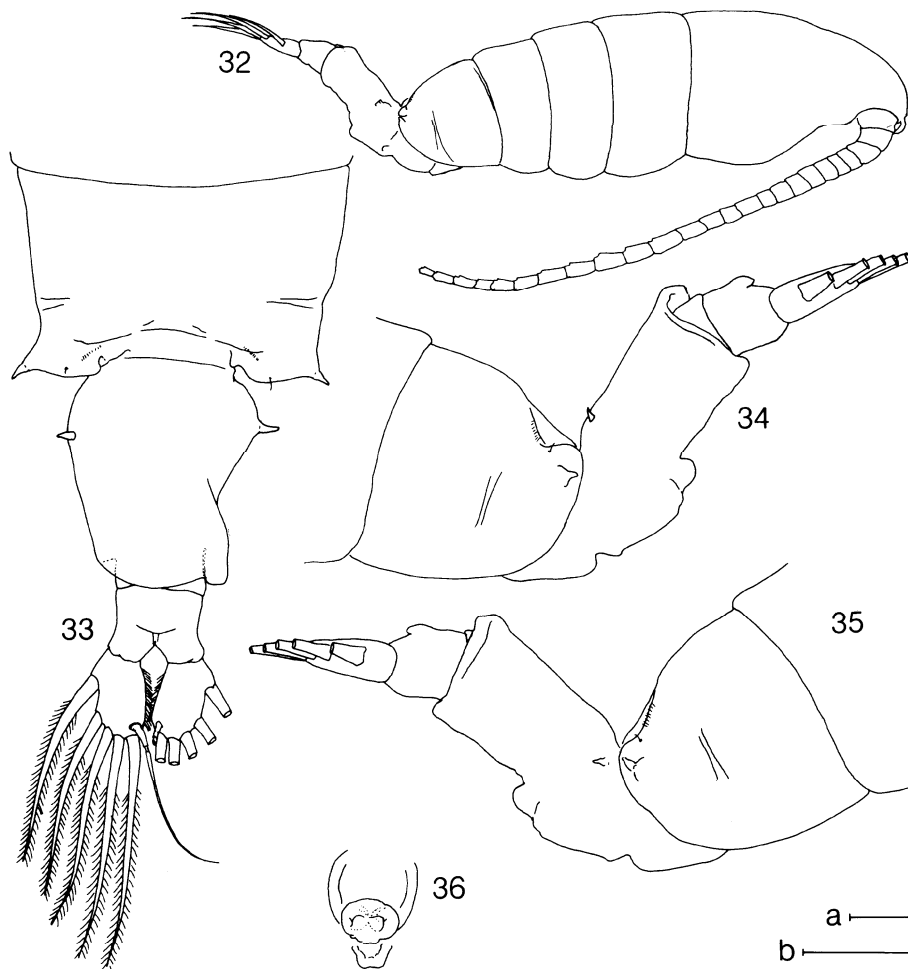
Figs. 13–19. *Scolodiaptomus corderoi* (Wright). Female: 13, leg 1, anterior; 14, leg 2, posterior; 15, leg 3, anterior; 16, leg 4, anterior; 17, leg 5, anterior; 18, left leg 5, lateral; 19, leg 5, endopod. Scale a, Figs. 13–18; scale b, Fig. 19; scale bars = 100  $\mu$ m.

Pampulha and Vargem das Flores (A. Giani and R. M. Pinto-Coelho, personal communication). Several efforts in 1984 by Giani and Pinto-Coelho to collect in Lagoa Santa, the type-locality, yielded only a few calanoid nauplii and young copepodite stages. Recently Lagoa Santa underwent a “general reform” by the municipality, during which all littoral macrophytes were removed, resulting in abundant growth of phytoplankton. The recent visit on 1 September 1985 yielded



Figs. 20–31. *Scolodiaptomus corderoi* (Wright). Male: 20, habitus, dorsal; 21, pedigers 4 and 5 and anterior urosome, dorsal; 22, pedigers 4 and 5 and anterior urosome, right lateral; 23, pedigers 4 and 5 and anterior urosome, left lateral; 24, right antennule, articles 8–16; 25, right antennule, articles 23–25; 26, antennal endopod; 27, leg 5, posterior; 28, right leg 5, lateral; 29, right leg 5, basipod, endopod and exopod article 1, anterior; 30, right leg 5, endopod, posterior (endopod drawn without hairs); 31, left leg 5, endopod and exopod, posterior (endopod drawn without hairs). Scale a, Fig. 20; scale b, Figs. 21–23; scale c, Figs. 24–29; scale d, Figs. 30, 31; scale bars = 100  $\mu$ m.





Figs. 32–36. *Notodiaptomus brandorffi*, new species. Female: 32, habitus, lateral; 33, pedigers 4 and 5 and urosome, dorsal; 34, pedigers 4 and 5 and urosome, left lateral; 35, pedigers 4 and 5 and urosome, right lateral; 36, genital area, ventral. Scale a, Fig. 32; scale b, Figs. 33–36; scale bars = 100  $\mu$ m.

large numbers of adult specimens. *S. corderoi* therefore appears to thrive in mesotrophic waters.

**Remarks.**—Wright (1936) supplied only a short description of *Diaptomus corderoi*, and apparently did not deposit specimens. However, the proportions and structures of the right fifth leg of the male, together with the spine on exopod article 1 of the fifth leg of the female in the present specimens ascribed to *D. corderoi* agree closely with Wright's description and generally with later descriptions by Cipólli (1973) and Sendacz and Kubo (1982) of specimens from São Paulo.

Features not recognized by Wright are, in the female, the 3-segmented urosome with sometimes partly divided genital segment, and endopod of leg 5 of 2 articles. Characters of leg 5 of the male are: right basipod 2 with fields of hairs on anterior

and posterior surfaces and lateral seta set on nodule; left endopod of 2 articles; and left exopod, distal process with crenulations and proximal process with hairs. To my knowledge, the apparent sexual dimorphism of the antennal endopod is a feature not previously observed in diaptomids.

The relationship of *S. corderoi* to other species of neotropical diaptomids has been in doubt since its description (Wright, 1936; Brandorff, 1976). Most recently, Dussart (1985) placed it, without discussion, in a newly erected subgenus of *Notodiaptomus* Kiefer, *Notodiaptomus* sensu stricto. The entire diagnosis of the subgenus is: with exopod article 2 of left leg 5 of male "à soie spiniforme droite ou à peine courbée, dressée et courte." Actually, the proximal process (=soie spiniforme) is slightly curved and erect, but it is not short, that is, markedly shorter than the distal process, as implied by Dussart's diagnosis. Although males of *S. corderoi* resemble species of *Notodiaptomus* in several features, they differ in others. Following the diagnoses of Wright (1935, for the "nordestinus-group") and Kiefer (1956, for *Notodiaptomus*), males of *S. corderoi* are distinct in several features of the fifth legs; for example, the distal border of article 1 of the right exopod is not developed into several processes; and the left endopod is of 2 articles, the distal article bearing 4 spinules, the usual case in *Notodiaptomus* being a left endopod of 1 article with 1 or 2 spinules. Dussart agrees with me (personal communication) that several features of the left leg 5 of the male are distinct from species that he includes in *Notodiaptomus* sensu stricto. The urosomal structure and exopodal spine of leg 5 of females of *S. corderoi* are characters not shared by any other neotropical diaptomid.

Cipólli (1973) and de Gouvêa (1980) compared developmental stages of *S. corderoi* to those of some other diaptomids. De Gouvêa noted (1980, p. 1059) that advanced naupliar stages of *S. corderoi* possess more setae on the antennules, antennae, and mandibles than either *Notodiaptomus conifer* (Sars, 1901) or *N. coniferoides* (Wright, 1927).

Tropical and subtropical South America is rich in closely related species of diaptomid copepods, particularly the largest group under the umbrella of *Notodiaptomus*; these species are for the most part distinguishable only by a complex of microcharacters. The genus *Notodiaptomus* is at present ill defined (Brandorff, 1976; Dussart, 1985, and personal communication); future efforts both to improve the genus definition and to create, if necessary, subgenera will necessitate careful and complete morphological study of species within the genus as well as more and less closely related species.

***Notodiaptomus brandorffi*, new species**

Figs. 32–59

*Material Examined.*—Holotype, ♀ (MZUSP 7231). Allotype, ♂ (MZUSP 7232). Paratypes: 20 ♀♀ (MZUSP 7233) and 20 ♂♂ (MZUSP 7234); 20 ♀♀ and 20 ♂♂ (USNM 227108); 2 ♀♀ and 3 ♂♂, dissected on slides (author's collection); all collected from Lago Açú, State of Maranhão, Brazil, 3°50'S, 44°55'W, 11 October 1984, by M. S. R. Ibañez. 4 ♀♀ and 3 ♂♂ (USNM 227123); 1 ♂, dissected on slides (author's collection); all collected near Betume, State of Sergipe, Brazil, about 10°19'S, 36°35'W, 18 March 1983, by E. R. dos Santos. All undissected specimens preserved in alcohol.

*Female.*—Length (including caudal rami) of holotype 1.10 mm; median length of 10 specimens from Lago Açú 1.18 mm (range 1.10–1.24 mm) and of 4 specimens from Betume 1.17 mm (range 1.10–1.22 mm). Body widest at first pediger in dorsal view. Fourth and fifth pedigers fused dorsally (Figs. 32–35); fifth pediger produced on each side into posterior wing tipped with spine; each wing also with fine hair in middle of posterior margin and posterodorsal row of fine hairs. Urosome of 3 segments, second segment partly telescoped into genital segment. Gen-

ital segment about twice length of rest of urosome, anterior half expanded laterally, right side somewhat more expanded than left side, each expansion with laterally directed spine; right posterior margin of genital segment produced over succeeding segment (Figs. 32–35). Area of genital opening produced ventrally, appearing as in Fig. 36. Inner margins of caudal rami haired.

Antennule (Figs. 32, 37) short, reaching to anterior margin of urosome; setation normal for genus (Fig. 37). Antenna (Fig. 38) with 2 setae and group of 5 or 6 spines on first article of endopod. Mandible (Fig. 39) with normal structure for genus; gnathal lobe with following dentition in ventral to dorsal order (Fig. 40): apical and subapical teeth pointed, subapical tooth slender; medial teeth 3 in number, bluntly rounded; basal teeth 3 in number, 2 ventralmost teeth bicuspidate, dorsalmost tooth serrate. Maxillula, maxilla, and maxilliped (Figs. 41–43, respectively) with normal structure and armature for genus.

Swimming legs 1–4 (Figs. 44–47) with normal structure and armature for genus; second article of endopod of leg 2 with Schmeil's organ on posterior surface (Fig. 45).

Leg 5 (Figs. 48, 49), posterior surface of basipod 1 with large conical process. Outer seta of basipod 2 reaching midlength of exopod 1. Exopod 1 about twice as long as wide. Outer spine on exopod 2 about 3 times as long as exopod 3. Exopod 3 distinct, about as long as broad, with 1 short outer and 1 long inner spine. Endopod of 2 distinct articles, oblique inner distal margin of article 2 with 2 spines and row of hairs.

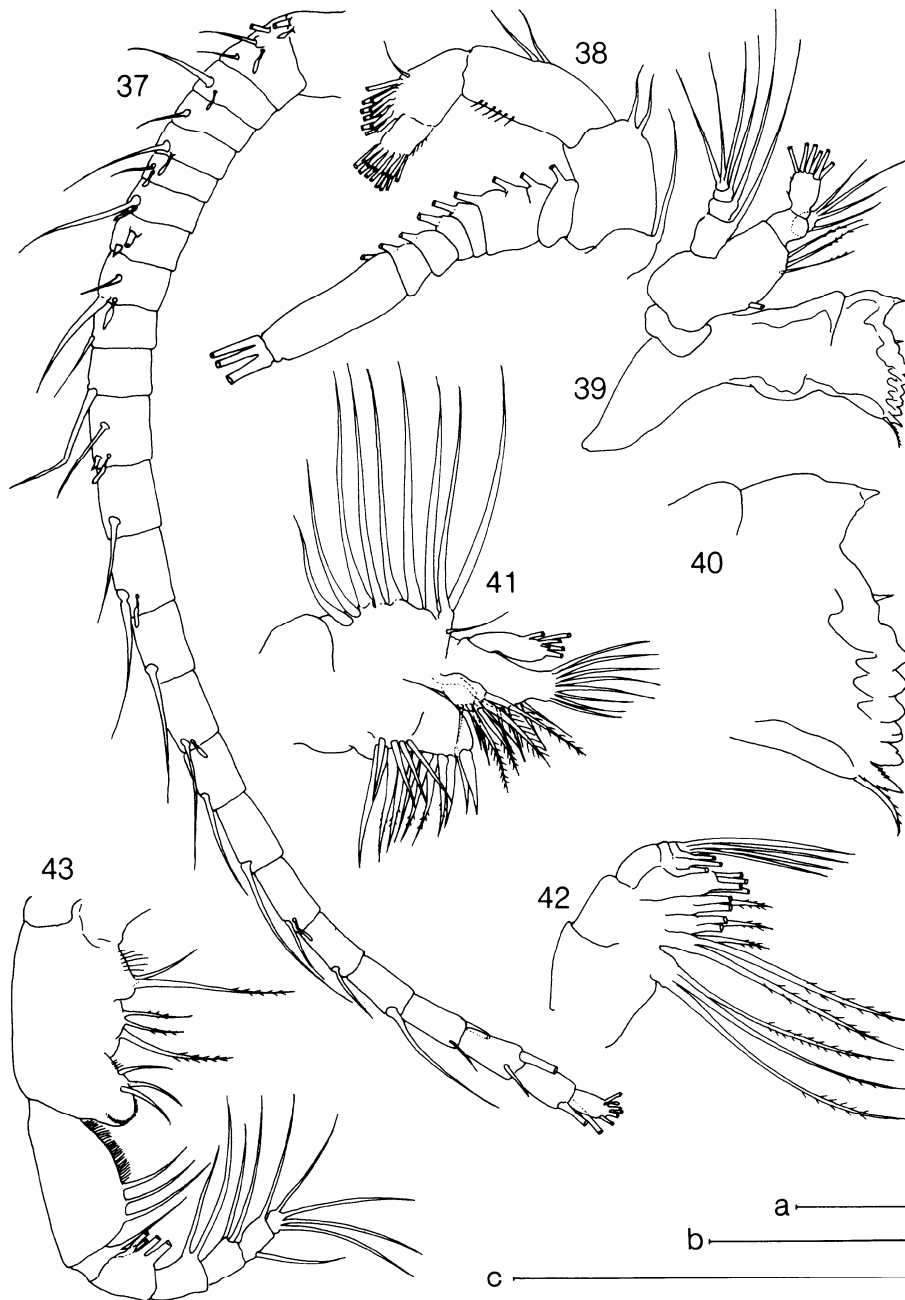
*Male.*—Length of allotype 1.16 mm. Median length of 10 specimens from Lago Açú 1.10 mm (range 1.06–1.16 mm); median length of 4 specimens from Betume 1.09 mm (range 1.07–1.12 mm). Body widest at first pediger in dorsal view. Fourth and fifth pedigers distinct, fifth pediger produced on each side in short wing bearing small spine (Figs. 50–52). Right posterior margin of genital segment slightly overlapping succeeding segment. Inner margins of caudal rami haired.

Right antennule (Figs. 53, 54), with short socketed spines on articles 8 and 12; spine on article 10 about two-thirds length of spine on article 11, both spines parallel to axis of antennule. Spine on article 13 large, with notched tip; spine on article 16 very small. Antepenultimate article with narrow hyaline membrane (Fig. 54). Structure and armature of antennule, mouthparts, and swimming legs similar to those of female, except gnathal lobe of mandible with apical tooth much reduced and medial and basal teeth less produced (Fig. 55).

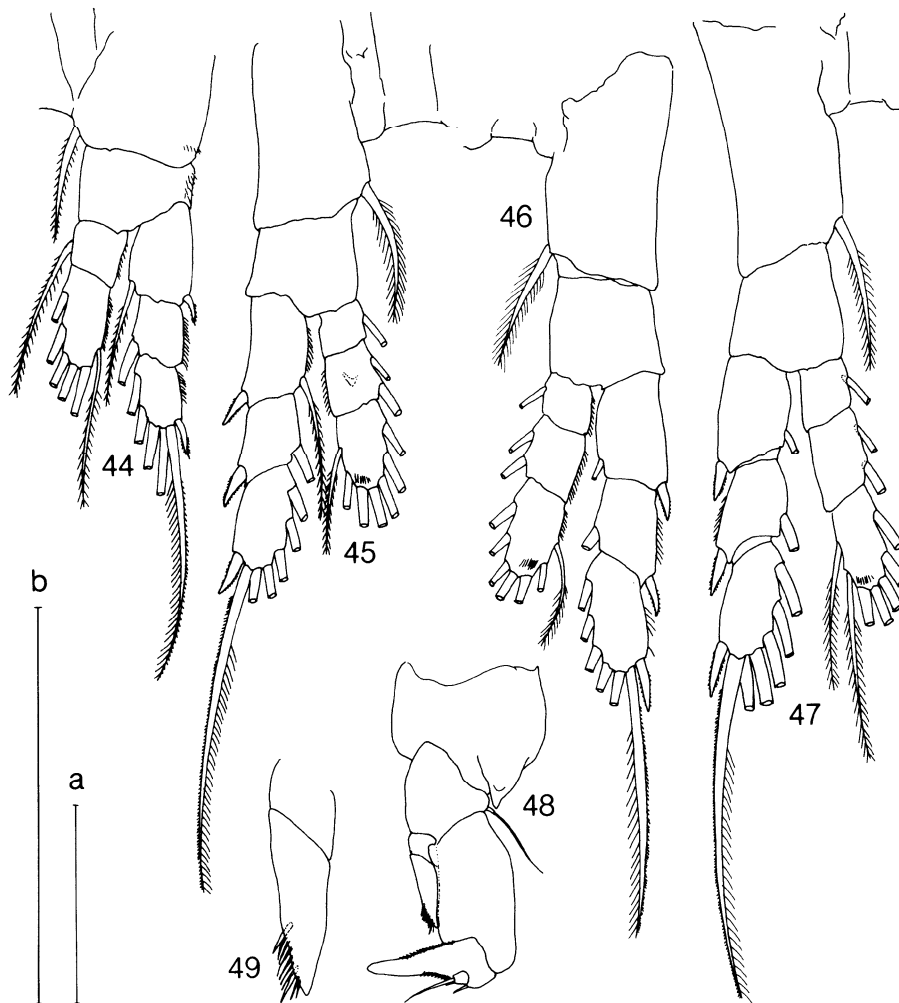
Right leg 5 (Figs. 56, 57), basipod 1 with posterior expansion ending in short spine. Basipod 2 with low cuticular thickening and field of hairs on posterior surface; inner margin smooth. Conical endopod haired on distal half of inner margin. Exopod, excluding claw, slightly longer than basipod; exopod 1 slightly longer than broad with outer and inner distal margins produced. Exopod 2 broadest at midlength; short spinulose lateral spine inserted at distal quarter of outer margin. Terminal claw slightly longer than exopod, curved inwards and forwards at distal third, with single row of teeth on inner margin.

Left leg 5 (Figs. 56, 58, 59), basipod 1 broader than long, with small posterior process tipped with spine. Basipod 2 as broad as long, tapering distally, inner proximal corner produced into knob. Endopod (Figs. 56, 58) conical, of 1 article, with field of hairs on distal half of inner surface. Exopod (Figs. 56, 58, 59) of 2 articles, with 2 well-separated haired pads on inner margin; distal process appearing broad in posterolateral view (Fig. 58), with 2 spinules on posterior surface near tip; proximal process short, erect, smooth.

*Variability.*—Hairs on dorsoposterior margins of wings of females from Lago Açú



Figs. 37-43. *Notodiptomus brandorffi*, new species. Female: 37, left antennule; 38, antenna; 39, mandible; 40, gnathal lobe of mandible; 41, maxillula; 42, maxilla; 43, maxilliped. Scale a, Fig. 37; scale b, Figs. 38, 39, 41-43; scale c, Fig. 40; scale bars = 100  $\mu$ m.

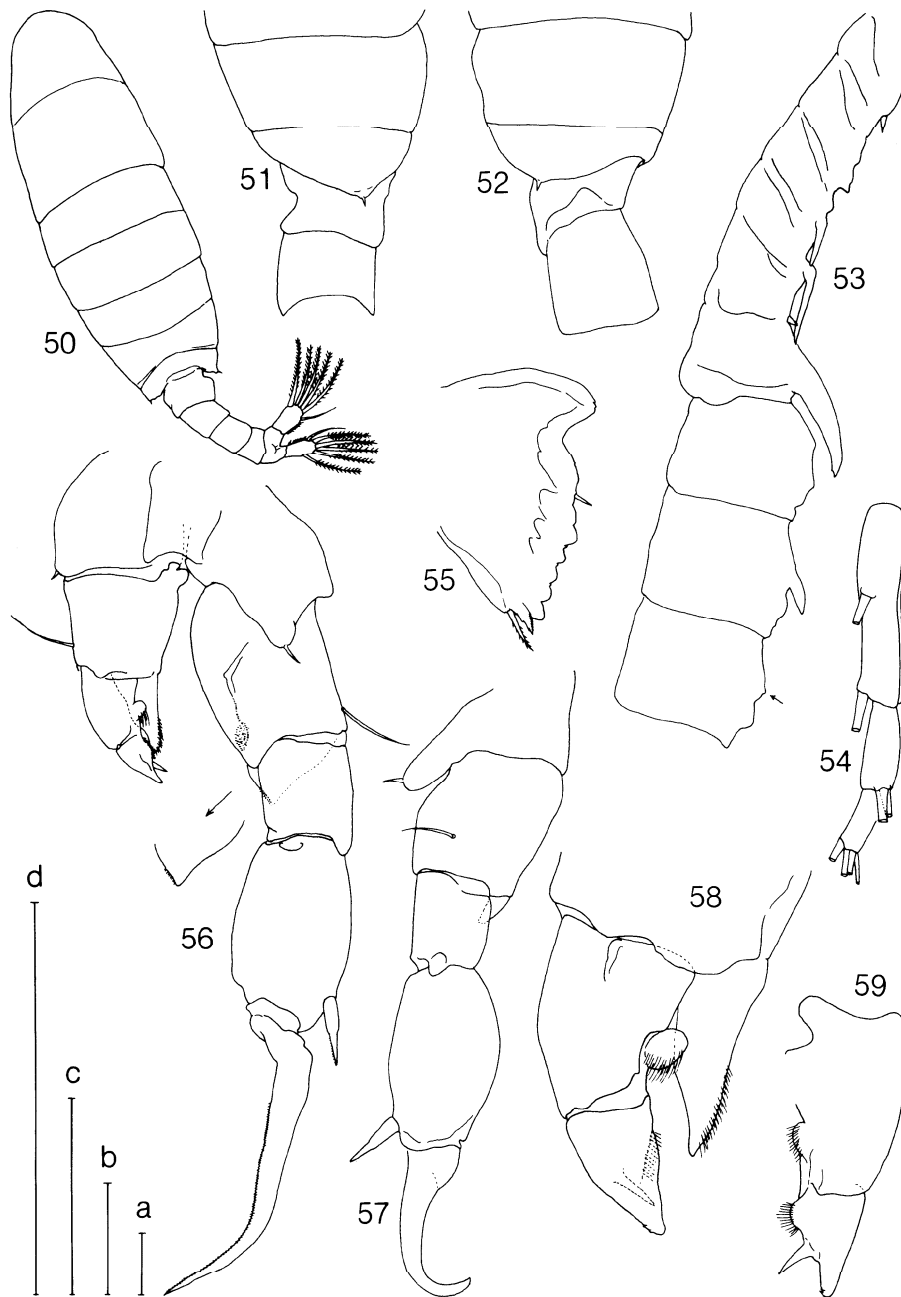


Figs. 44–49. *Notodiaptomus brandorffi*, new species. Female: 44, leg 1, posterior; 45, leg 2, anterior; 46, leg 3, anterior; 47, leg 4, anterior; 48, leg 5, posterior; 49, leg 5, endopod. Scale a, Figs. 44–48; scale b, Fig. 49; scale bars = 100  $\mu$ m.

short, fine; these hairs longer and relatively stouter in females from Betume. One male from Lago Açú and some males from Rio Coqueiro (M. J. S. Lopes, personal communication) with fine spinules on distal sixth of outer margin of terminal claw of right leg 5.

*Etymology.*—This species is named for Dr. Gerd-Oltmann Brandorff, in recognition of his valuable contributions to the understanding of the taxonomy and ecology of Amazonian Copepoda, and in particular for his cordial advice and assistance to the author.

*Ecology and Distribution.*—Lago Açú is a broad, shallow, productive lake in the valley of the Rio Mearim. In the dry season (June–October) its greatest depth is 2 m; during the rainy season the lake level may rise 3 m or more and the area



Figs. 50–59. *Notodiptomus brandorffi*, new species. Male: 50, habitus, dorsal; 51, pedigers 4 and 5 and anterior urosome, right lateral; 52, pedigers 4 and 5 and anterior urosome, left lateral; 53, right antennule, articles 8–16 (arrow indicating spine on article 16); 54, right antennule, articles 23–25; 55, gnathal lobe of mandible; 56, leg 5, posterior; 57, leg 5, right lateral; 58, left leg 5 exopod and endopod, lateroposterior; 59, left leg 5 exopod, anterior. Scale a, Fig. 50; scale b, Figs. 51, 52; scale c, Figs. 53, 54, 56, 57; scale d, Figs. 55, 58, 59; scale bars = 100  $\mu\text{m}$ .

Table 1. Features of some species of *Notodiaptomus* Kiefer; the females of *N. dahli* and *N. jatobensis* are unknown. (? indicates feature not described; + indicates feature present; – indicates feature absent.)

Species	♀ leg 5, number of endopod articles	♀, dorsal thoracic process	♀ or ♂, spinules on pediger 4 or 5	♂ antennule, article 23 spinous process	♂ right leg 5, lateral spine distal (d) or medial (m)
<i>anisitsi</i>	2	–	–	–	m
<i>carteri</i>	2	+	–	–	d
<i>dahli</i>	?	?	–	?	d
<i>deitersi</i>	2	+	–	–	d
<i>isabelae</i>	?	+	–	?	d
<i>jatobensis</i>	?	?	–	?	m
<i>spinuliferus</i>	2	–	+	+	d
<i>brandorffi</i> , new species	2	–	–	–	d

expands severalfold, forming direct connections with smaller nearby lakes. *N. brandorffi* appears to remain the numerically dominant crustacean plankter year-round (M. S. R. Ibañez and J. W. Reid, unpublished data). This species also occurs in the oligohaline estuary of the Rio Coqueiro, a small river which flows into the Baía de São Marcos near São Luís (M. J. S. Lopes, personal communication). Betume, near Neópolis in the State of Sergipe, is more than 1,000 km southeast of Lago Açú, in the Rio São Francisco basin.

*Remarks.* — *Notodiaptomus brandorffi* is closely related to several species listed by Dussart (1985) in a proposed subgenus *Notodiaptomus* sensu stricto (but compare comments above). Those species in this group, which have the endopod of the female leg 5 of 2 articles, and those species in which this feature is undescribed are compared in Table 1. The female of *N. brandorffi* differs from that of *N. spinuliferus* Dussart, 1985, in lacking spinules on the fourth pediger, and from *N. carteri* (Lowndes, 1934), *N. isabelae* (Wright, 1936), and *N. deitersi* (Poppe, 1891) in lacking a dorsal conical process on the fourth pediger. In males, the lack of a spinous process on the antepenultimate article of the right antennule and the distal placement of the outer spine of article 2 of the exopod of leg 5 distinguish *N. brandorffi* from *N. anisitsi* (von Daday, 1905), *N. jatobensis*, and *N. spinuliferus*. Males of *N. dahli* (Wright, 1936) are distinguished by a crescentic cuticular thickening on the inner margin of basipod 2 of the left leg 5, a feature lacking in *N. brandorffi*. In the right leg 5 of the male of *N. isabelae*, the lateral spine of exopod 2 is very short, and the proximal part of the inner margin of basipod 2 has a bilobed expansion.

The general structure of leg 5 of the male, especially the left exopod and endopod and the proportions of the right exopod of *N. brandorffi*, is similar to that of *N. iheringi* (Wright, 1935). However, the endopod of leg 5 of females of the latter species is of 1 article, though constricted near the midlength; males differ in several details of leg 5; and both sexes bear spinules near the posterior border of the fourth pediger (Wright, 1935; Reid, 1985). It is possible that some of the many records of *N. iheringi* from the Brazilian northeast actually refer to *N. brandorffi*.

#### Remarks on Some Taxonomic and Nomenclatural Problems

The genus *Pectenodiaptomus* was erected by Dussart (1982) to accommodate *Notodiaptomus caperatus* Bowman, 1979. The principal diagnostic character for the proposed genus was “the particular ornamentation of the left fifth leg of the males . . . the aspect of the terminal digitiform extension of this left fifth leg . . . as well as the brushlike aspect of the subterminal appendage” (translation). Un-

fortunately, this does not constitute a differential diagnosis, since more or less serrated distal processes (=terminal digitiform extension) of the left exopod also occur in males of *Notodiptomus iheringi*, "*Diaptomus*" (sensu lato) *azureus* Reid, 1985, and "*D.*" *fluminensis* Reid, 1985; "*D.*" *carinifera* Lowndes, 1934; *N. paraensis* Dussart and Robertson, 1984, *N. dubius* Dussart, 1985, and several species of *Argyrodiaptomus* (Dussart, 1985), and *S. corderoi*. Proximal processes (=sub-terminal appendage) of the left exopod with hairs or spinules have been described in *S. corderoi* and *Argyrodiaptomus* spp. (Dussart, 1985). No doubt upon close inspection, additional species will be found to possess this combination of structures. The genus *Pectenodiptomus* must therefore be considered invalid as presently defined, and the species *caperatus* should be returned to the genus *Notodiptomus*.

Dussart (1984) elevated to species rank the subspecies *Notodiptomus venezolanus deeveyorum* Bowman, 1973, and altered the species name to *N. deeveyorum* (Dussart, 1984, 1985; Dussart and Defaye, 1983). Since Bowman (1973, p. 201) intended to recognize both Edward S. Deevey, Jr., and Georgiana B. Deevey, the genitive plural ending obtains. The correct name of this species is *N. deeveyorum*.

Dussart (1985) recently proposed four subgenera within the admittedly vaguely defined genus *Notodiptomus*, but only for the proposed subgenus *Notodiptomus* sensu stricto did he supply a diagnosis (discussed above). No diagnoses were provided for the proposed subgenera *Wrightius*, *Caleodiptomus*, and *Amazonius*, although type-species were named. These latter three subgeneric names are not available under Article 13a of the International Code of Zoological Nomenclature (ICZN, 1985), and they cannot be recognized as valid taxa until such time as they are sufficiently described and differentiated.

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