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A NEW SPECIES OF *MONODIAMESA* KIEFFER, 1922 FROM SOUTHERN CHILE (DIPTERA: CHIRONOMIDAE: PRODIAMESINAE)

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ABSTRACT

Monodiamesa mariae n. sp., from southern Chile is described and figured based on two males and one female netted along a slow flowing river in Puerto Aisén. The genus *Monodiamesa* Kieffer has a bipolar distribution, known also from the Palaearctic, Nearctic, and Oriental regions.

RESUMEN

Se describe *Monodiamesa mariae* n. sp., del sur de Chile. La descripción y las figuras están basadas en dos machos y una hembra recolectados con red demacla en un río de poca corriente en Puerto Aisén. El género *Monodiamesa* Kieffer tiene una distribución bipolar y es también conocido en las regiones Palaearctic, Nearctic y Orientales.

INTRODUCTION

The genus *Monodiamesa* Kieffer, 1922 contains some of the more important members of chironomid indicator communities of temperate lakes. The immatures are found in the littoral to the profundal zone of, mostly, mesotrophic to strongly oligotrophic lakes, most commonly on sandy substrates. They also occur in running waters and sporadically in moderate eutrophic lakes (Sæther, 1979). Seven named species occur in the Holarctic region (Sæther, 1989). The European species was treated by Brundin (1952), while Sæther (1972) revised the North American species and gave a key to the Holarctic species. Further, two undescribed species are known from the Oriental region (Ashe *et al.*, 1987).

The genus *Monodiamesa* has also been recorded several times from South America. Edwards (1931) listed *Monodiamesa bathyphila* (Kieffer, 1918) in his work on the Chironomidae from Patagonia and South Chile. According to Pagast (1947) Edwards later reexamined the material and identified it to *Prodiamesa rufovittata* Goetghebuer, 1932. *P. rufovittata* is a Palaearctic species and Pagast (1947: 584) stated that the South American material " ... gehört zu *Prodiamesa rufovittata* oder einer nächst verwandten Art". Later, Brundin (1956a) discussed the identity of the South American species and concluded that it undoubtedly belongs to an undescribed *Monodiamesa* species close to the European *M. alpicola* (Brundin, 1952) and *M. ekmani* (Brundin, 1949). Brundin (1956b) listed *Monodiamesa chilensis* n. sp. as a member of the Chironomidae community in the larger lakes in Southern Chile. Brundin (1958) again listed *M. chilensis* n. sp. and stated that the new species seems to be close to *M. ekmani.* However, the species was never described and the name, *Monodiamesa chilensis* Brundin, thus is a *nomen nudum.* Later Brundin (1966: 367) stated that "*Monodiamesa* is represented by..... one species, *patagonica* Brund. (in litt.), in South Chile-Patagonia." Brundin apparently never de-

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scribed the species under this name either, so the name *Monodiamesa patagonica* Brundin also is a *nomen nudum.*

During a field trip to southern Chile in January 1996, I collected two males and a female of a *Monodiamesa* species in Puerto Aisén. The species is described and figured below and thus is the first *Monodiamesa* species to be described from the Neotropical region.

METHODS AND MORPHOLOGY

The material examined was mounted on slides following the procedure outlined by Sæther (1969). The general terminology follows Sæther (1980). The type of *Monodiamesa mariae* sp. n. is lodged in the Museum of Zoology, Bergen (ZMBN).

RESULTS

Monodiamesa Kieffer, 1922, emended

Generic description as in Sæther (1977, 1989) except pseudospurs present at apex of tarsomeres 1 and 2 of mid leg and on tarsomeres 1 or 1 and 2 of hind leg. Male antenna with sensilla chaetica present on flagellomeres 1-2 or 1-3 or 2-6 and 13. Female antenna with 6 flagellomeres (AR about 0.5) or with 7 flagellomeres (AR about 1.7).

Monodiamesa mariae n. sp.
(Figs. 1 - 13)

? *Monodiamesa chilensis* Brundin, 1956: 217, nomen nudum
? *Monodiamesa patagonica* Brundin, 1966: 367, nomen nudum

Type locality: CHILE: XI Region, Provincia de Aisén, Puerto Aisén, Rio de los Palos.

Type material: Holotype ♂, CHILE: XI Region, Provincia de Aisén, Puerto Aisén, Rio de los Palos, 45° 23'S 72° 41'W, 13. Jan. 1996, net, T. Andersen leg. (ZMBN No.: 244). Paratypes: 1 ♂ 1 ♀, as holotype.

Diagnostic characters: The male imago is characterized by presence of sensilla chaetica on flagellomere 2-6 and 13, by having an AR of about 1.7 and by the rounded, wide-based inferior volsella. The female imago by the 6 segmented antennae with an AR of 0.55.

Etymology: Named after my wife Maria Graciela Diaz Gonzalez, who grew up in Puerto Aisén and introduced me to the impressive nature of Southern Chile.

Description:
Male imago (n = 2, if not otherwise stated).

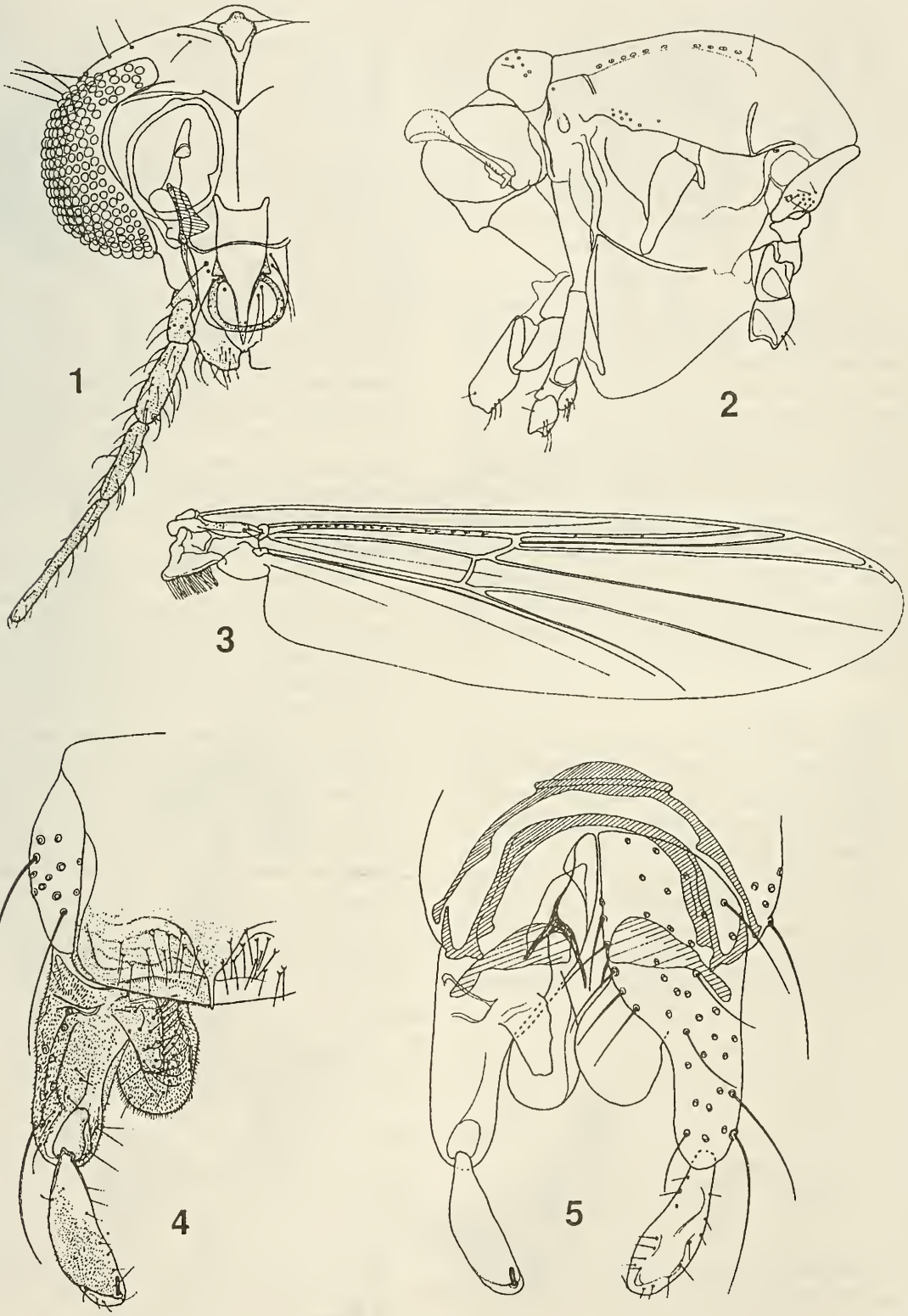
Total length 5.13-5.85 mm. Wing length 2.93-3.15 mm. Total length / wing length 1.62-2.00. Wing length / length of profemur 2.34-2.43. Coloration of thorax yellowish with vittae and markings blackish brown, abdomen and legs brown.

Head (Fig. 1). Antennae with 13 flagellomeres, ultimate flagellomere 817-842 µm long. AR 1.66-1.71. Sensilla chaetica on flagellomeres 2-6 and 13. Temporal setae 11 - 12, including 2-3 inner verticals, 2-3 outer verticals, 6-8 postorbitals. Clypeus with 9-10 setae. Tentorium 216-228 µm long, 60-64 µm wide, with microtrichia along margin of posterior tentorial pit. Stipes 168-188 µm long, 32-54 µm wide. Palp segment lengths in µm: 40-44, 72-80, 148-156, 136-148, 264 (n=1). Third palpal segment with 2 sensilla clavata apically, 18-21 µm long.

Thorax (Fig. 2). Antepronotum with 8-12 lateral setae. Dorsocentrals 9-11, prealars 6-7, supraalar 1. Scutellum with 13-15 setae.

Wing (Fig. 3). VR 0.98- 1.00. R_{2+3} ends 1/3 of distance between R_1 and R_{4+5}- MCu 119-121 µm long, reaching M 91-99 µm basally of RM. Costal extension 62-72 µm long, with 1-2 non-marginal setae. R with 16-19 setae, R_1 with 2 setae, R_{4+5} with 1-2 setae near tip. Brachiolum with 2 setae, squama with 28-29 setae.

Leas. Spur of front tibia 79-95 µm long, spurs of mid tibia 63-73 µm and 70-75 µm long, of hind tibia 78-84 µm and 90-105 µm long. Width at apex of front tibia 70-79 µm, of mid tibia 59-62 µm, of hind tibia 76-77 µm. Hind tibial comb of 13-14 setae, shortest setae 26-30 µm long, longest setae 45-63 µm long. Pseudospurs of ta_1 of mid leg 47-48 µm and 48-53 µm long, of hind leg 44-47 µm and 47-49 µm long, of ta_2 of mid leg 40-41 µm and 44-45 µm long. Lengths (in µm) and proportion of legs:



Figures 1-5: *Monodiamesa mariae* n. sp., male imago. 1: head; 2: thorax; 3: wing; 4: left side of hypopygium, dorsal view; 5: hypopygium with tergum IX removed, left dorsal view, right ventral view.

	fe	ti	ta_1	ta_2	ta_3	ta_4
p_1	1234-1291	1422-1536	1168-1234	588-596	449-474	302-310
p_2	1275-1324	1332-1405	605-613	335-359	261-279	188-196
p_3	1299-1364	1569-1650	915-1013	482-523	351-417	229-237

	ta_5	LR	BV	SV	BR
p_1	155-172	0.80-0.82	2.55-2.61	2.27-2.29	2.3-2.5
p_2	123-131	0.43-0.45	3.44-3.55	4.31-4.45	2.3-2.5
p_3	131-139	0.58-0.61	3.04-3.14	2.97-3.13	2.8-3.0

Hypopygium (Figs. 4-5). Tergite IX with 26-27 setae, laterostemite IX with 12-13 setae. Tip of anal point 27-33 µm long. Phallapodeme 119-121 µm long, transverse sternapodeme 168-172 µm long. Median volsella 65-68 µm long; superior volsella 69-72 µm long, 41-44 µm wide at base, 19-21 µm wide at tip, with altogether 38-44 strong setae on both surfaces and along margin; inferior volsella rounded with wide base, 121-127 µm long, maximum width 66-82 µm, with altogether 19-21 setae on dorsal surface and along margin. Gonocoxite 320-332 µm long. Gonostylus 128-132 µm long, megaseta 21-22 µm long. HR 2.42-2.59, HV 3.88-4.57.

Female imago (n = 1).

Total length 5.42 mm. Wing length 3.44 mm. Total length / wing length 1.57. Wing length / length of profemur 2.78. Coloration of thorax yellowish with vittae and markings blackish brown, abdomen and legs brown.

Head (Figs. 6-7). Antennae with 6 flagellomeres; pedicel with 3 setae; flagellomeres 2-5 each with one pair of sensilla chaetica; flagellomere 6 with about 18 sensilla chaetica; length/width (in µm) of pedicell and flagellomeres: 80/103, 84/45, 53/43, 62/39, 78/35, 82/36, 199/35. AR 0.55. Temporal setae 11, including 2 inner verticals, 4 outer verticals, 5 postorbitals. Clypeus with 14 setae. Tentorium 170 µm long, 39 µm wide. Stipes 162 µm long, 35 µm wide. Palp segment lengths in µm: 51, 72, 154, 146, 197. Third palpal segment with 2 sensilla clavata apically, 22 µm long.

Thorax (Fig. 8). Antepronotum with 13 lateral setae. Dorsocentrals 16, prealars 8, supraalars 1. Scutellum with 24 setae.

Wing (Fig. 9). VR 0.91. R_{2+3} ends 1/3 of distance between R_1 and R_{4+5}. MCu 159 µm long, reaching M 90 µm basally of RM. Costal extension 97 µm long, with 2 non-marginal setae. R with 24 setae, R_1 with 19 setae, R_{4+5} With 13 setae. Brachiolum with 3 setae, squama with 37 setae.

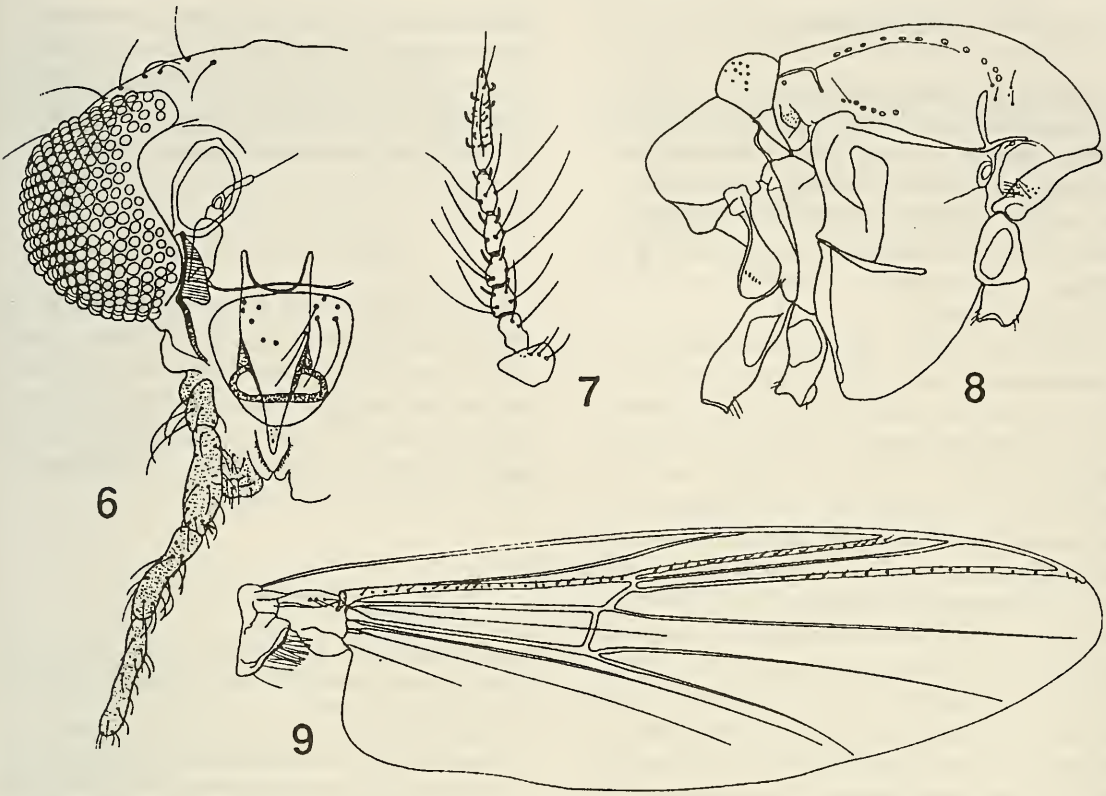
Legs. Spur of front tibia 75 µm long, spurs of hind tibia 66 µm and 76 µm long, of hind tibia 84 µm and 92 µm long. Width at apex of front tibia 72 µm, of mid tibia 72 µm, of hind tibia 84 µm. Hind tibial comb of 12 setae, shortest setae 29 µm long, longest setae 51 µm long. Pseudospurs of ta_1 of mid leg 43 µm and 53 µm long, of hind leg 49 µm and 51 µm long, of ta_2 of mid leg 41 µm and 45 µm long. Lengths (in µm) and proportion of legs:

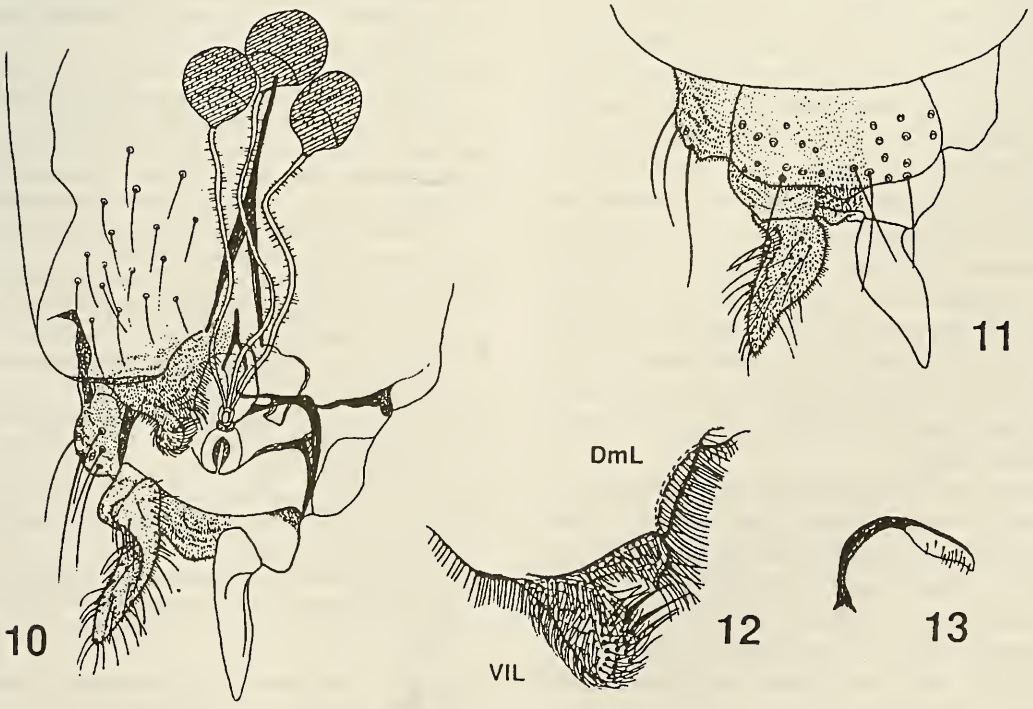
	fe	ti	ta_1	ta_2	ta_3	ta_4	ta_5	LR	BV	SV	BR
Pi	1234	1569	1201	613	458	302	172	0.76	2.59	2.33	2.1
P2	1373	1479	637	359	286	229	139	0.43	3.44	4.47	1.9
P3	1413	1732	972	498	401	237	155	0.56	3.18	3.23	2.1

Abdomen. Number of setae on tergites II-VII as: 108, 79, 62, 61, 57, 49, 57. Number of setae on sternites II-VIII as: 4, 15, 21, 33, 41, 49, 39.

Genitalia (Figs. 10-13). Gonocoxite IX with 11 seta, tergite IX with 26 setae. Cercus pediform, 201 µm long with about 100 setae. Seminal capsule with relatively long microtrichia, 103 µm long including 10 µm long neck, 86 µm wide. Notum 215 µm long, rhamus 125 µm long.

Larvae and pupae unknown.





Figures 6-13: *Monodiamesa mariae* n. sp., female imago. 6: head; 7: antennae; 8: thorax; 9: wing; 10: genitalia, ventral view; 11: genitalia, dorsal view; 12: gonapophyses VIII (VIL, ventrolateral lobe; DmL, dorsomesal lobe); 13: apodeme lobe.

DISCUSSION

From *Monodiamesa bathyphila* to which Edwards (1931) identified his South American material, *M. mariae* n. sp. is easily separated by the much lower AR and the shape of the superior and inferior volsella. *Prodiamesa rufovittata,* which Pagast (1947) mention from South America, belongs to an other genus which lack the spine-like median volsella.

In the key to the males of the Palaearctic *Monodiamesa* given by Sæther (1973) M. *mariae* n. sp. will key out with *M. prolilobata* Sæther, 1973, *M. alpicola* (Brundin, 1952) and *M. ekmani* (Brundin, 1949). With *M. prolilobata* the new species shares characters like an AR of about 1.7. In hypopygial features, particularly in the rounded shape of the inferior volsella, it appears most similar to the Palaearctic *M. alpicola.* However, while the inferior volsella in *M. alpicola* has a comparatively long, narrow base, the base of the inferior volsella *in M. mariae* n. sp. is short and wide. Brundin (1958) suggested that the South American species is near to *M. ekmani,* but this species has an inferior volsella which is not rounded, but more foot-shaped apically.

According to Sæther (1973) *M. prolilobata, M. alpicola, and M. ekmani* forra a monophyletic group. *M. mariae* n. sp. clearly belongs in the same group. A phylogenetic analysis including also immatures is needed to sort out the closer relationship, but judging from the geographical distribution *M. prolilobata* is the likely candidate as the sister species of *M. mariae* n. sp. For the European and the North American species the distribution pattem can be explained by the vicariance event resulting from the Tertiary splitting of North America and Eurasia, while the occurrence of *M. mariae* n. sp. in Southern Chile is probably due to dispersal from North America along the South American Andes.

Sæther (1979) listed the Palaearctic *M. ekmani* and *M. alpicola* as characteristic members of the profundal chironomid community of oligotrophic lakes, *M. ekmani* also as a member of the sublittoral and littoral community of ultra- to strongly oligotrophic lakes. In the Nearctic, *M. prolilobata* is found in both oligotrophic and mesotrophic lakes. Brundin (1956b, 1958) include *Monodiamesa* as a member of his *Tanytarsus rothi*-community of the moderately oligotrophic lakes of the Southern Andes *(T. rothi* Brundin, 1956 is a nomen nudum, the species is a synonym of *T. clivosus* Reiss, 1972: 69). The present specimens were, however, netted along a slow-flowing, shalow river with rich vegetation of sedges and grasses.

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LITERATURE CITED

Ashe, P., Murray, D. A. & Reiss, F. 1987. The zoogeographical distribution of Chironomidae (Insecta: Diptera). Annales de Limnologie, *23*: 27-60.

Brundin, L. 1952. Zur Kenntnis der Taxonomie und Metamorphose der Chironomidengattungen *Protanypus* Kieff., *Prodiamesa* Kieff. und *Monodiamesa* Kieff. Report. Institute for Freshwater Research, Drottningholm, *33*: 39-53.

Brundin, L. 1956a. Zur Systematik der Orthocladiinae (Dipt. Chironomidae). Report. Institute for Freshwater Research, Drottningholm, *37*: 5-185.

Brundin, L. 1956b. Die bodenfaunistischen Seetypen und ihre Anwendbarkeit auf die Südhalbkugel. Report. Institute for Freshwater Research, Drottningholm, *37*: 186-235.

Brundin, L. 1958. The bottom faunistical lake type system and its application to the southern hemisphere. Moreover a theory of glacial erosion as a factor of productivity in lakes and oceans. Internationale Vereinigung für Theoretische und Angewandte Limnologie, Verhandlungen, *13*: 288-297.

Brundin, L. 1966. Transantarctic relationships and their significance, as evidenced by chironomid midges. With a monograph of the subfamilies Podonominae, Aphroteniinae and the austral Heptagyiae. Kungliga Svenska Vetenskapsakademiens Handlingar, *11*: 1-472 + 30 plates.

Edwards, F. W. 1931. Diptera of Patagonia and South Chile. Part II. Fascicle 5. Chironomidae, pp. 233-331. Trustees of the British Museum, London.

Pagast, F. 1947. Systematik und Verbreitung der um die Gattung *Diamesa* gruppierten Chironomiden. Archiv für Hydrobiologie, *41*: 435-596.

Reiss, F. 1972. Die Tanytarsini (Chironomidae, Diptera) Südchiles und Westpatagoniens. Mit Hinweisen auf die Tanytarsini-Fauna der Neotropis. Studies on the Neotropical Fauna, *7*: 49-94.

Sæther, O. A. 1969. Some Nearctic Podominae, Diamesinae, and Orthocladiinae (Diptera: Chironomidae). Bulletin of the Fisheries Research Board of Canada, 107: 1-154.

Sæther, O. A. 1973. Taxonomy and ecology of three new species

of *Monodiamesa* Kieffer, with keys to Nearctic and Palaearctic species of the genus (Diptera: Chironomidae). Joumal of the Fisheries Research Board of Canada, *30*: 665-679.

Sæther, O. A. 1977. Female genitalia in Chironomidae and other Nematocera: morphology, phylogenies, and keys. Bulletin of the Fisheries Research Board of Canada, *197*: 1-209.

Sæther, O. A. 1979. Chironomid communities as water quality indicators. Holarctic Ecology, 2: 65-74.

Sæther, O. A. 1980. Glossary of chironomid terminology (Diptera: Chironomidae). Entomologica scandinavica, Supplement, *14*: 1-51.

Sæther, O. A. 1989. 8. The adult males of Prodiamesinae (Diptera: Chironomidae) of the Holarctic region - Keys and diagnoses. Pp. 155-163 *in:* T. Wiederholm, ed., Chironomidae of the Holarctic region. Keys and diagnoses. Part 3. Adult males. Entomologica scandinavica, Supplement, *34*: 1-532.