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TRANSACTIONS
OF THE
ROYAL SOCIETY OF NEW ZEALAND

ZOOLOGY

VOL. 2

No. 18

JULY 27, 1962

New Collembola from 83deg. South in Antarctica

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[Received by Editor May 8, 1962.]

Abstract

A new genus and two new species of Collembola from 83° 55' south on the Antarctic Continent are described. The new genus is particularly interesting as it shows affinities with both the Onychiuridae and the Hypogastruridae.

INTRODUCTION

THE Collembola dealt with in this paper are from a collection made during December, 1959, in the vicinity of Mt Harcourt, Antarctica, by Mr C. H. Tyndale-Biscoe of the University of Western Australia, and Mr B. L. Smith, of the University of Canterbury, New Zealand, who, at the time, were members of the New Zealand Alpine Club Expedition to the Antarctic. These insects were taken from localities at 83° 55' South and therefore represent the most southerly record known for the occurrence of any invertebrate.

I am indebted to Mr Tyndale-Biscoe for the opportunity to study this exceedingly interesting material, and I am pleased to name the new genus after him.

Genus *BISCOIA* gen. nov.

DIAGNOSIS. Ocelli present; postantennal organ absent. Mouth parts for chewing; mandible with four apical teeth and well developed molar area; maxilla head bidentate with five lamellae each bearing a distinct fringe (Fig. 10). Furcula present, complete but reduced. Foot without tenent hairs; unguiculus well developed. Sensory organ of Ant. III present, well developed, consisting of an integumentary fold as in the Hypogastruridae, together with five granulated papillae as in the Onychiuridae; two bent sense rods behind the papillae and two large additional exposed sense rods outside the main portion of the sensory organ.

TYPE SPECIES OF THE GENUS. *Biscoia sudpolaris* n. sp.
Biscoia sudpolaris n. sp. Text-figs. 1-13.

COLOUR. Deep blue to blue-black, paler or colourless ventrally and on the appendages.

CLOTHING. Rather sparse of both short and medium length simple setae, the latter being mostly round the posterior.

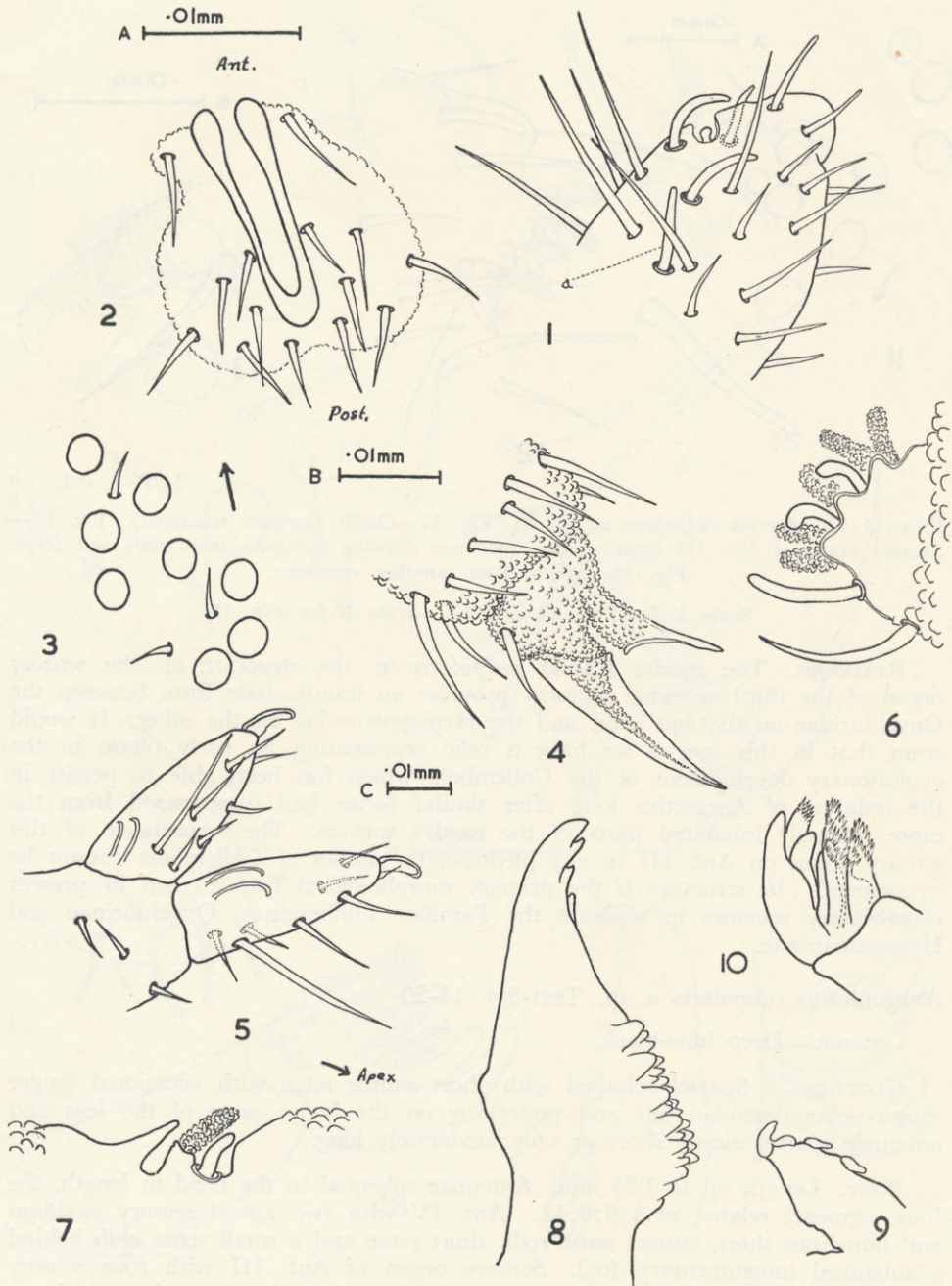
BODY. Length up to 0.7 mm. Antennae about two-thirds as long as head with the four segments related as 5:6:9:11. Ant. IV with apical swelling; subapical pit containing a small sense club; four long, curved, stout sense rods, mostly to one side, and on opposite side to them, 6-7 shorter, more slender, tapering sense rods intermingled with some larger setae; there are more of these large setae towards the base of Ant. IV. Sensory organ of Ant. III consisting of five granulated papillae as found typically in the Onychiurinae, with in front of them an integumentary fold similar to that found in typical Hypogastrurinae; behind the papillae are two long, stout, bent sense rods, both bent in the same direction towards a single exposed, larger, curved sense rod situated on the outer edge of the sense organ, beyond the group of granulated papillae; just above and to one side of this sense rod, but situated on Ant. IV, is a further exposed, long, curved sense rod reaching almost to the base of the group of four stout curved sense rods of Ant. IV (Fig. 12 (a), and 1 (a)); below and close to the sense organ of Ant. III there is a further stout, exposed sense rod; two long and two short guard setae occur in front of the integumentary fold. Ocelli eight to each side subequal as in Fig. 3; on one specimen, however, there are nine ocelli, to one side as in Fig. 11. Mandibles each with four rounded apical teeth and large molar area (Fig. 8). Maxilla head with two teeth and five fringed or comb-like lamellae arranged as two basal pairs and one apical lamella (Fig. 10). Genital aperture bordered by 14 setae arranged as in Fig. 2. Abds. III:IV:V as 30:27:32. Rami of tenaculum each with three barbs, the corpus without setae; the apical barb of each ramus enlarged and hook-like with a superficial appearance of being two barbs (Fig. 9).

LEGS. Claw and unguiculus distinctly granulated as in Fig. 4; neither inner nor outer teeth on claw but a backwardly projecting ridge occurs on the inner edge of the unguiculus; a moderately long basal seta to each side of claw base.

FURCULA. Short, reaching only to middle of Abd. III. The dens with seven ventral setae but no dorsal setae (Fig. 5); one basal seta always much larger than the rest. A few short setae scattered on the manubrium. Mucro short, simple, spoon-like and recurved apically; very distinctly granulated and with a poorly defined short basal lamella or basal granulated swelling (Figs. 5, 13). Manubrium:dens:mucro as 33:25:6.

LOCALITIES. Antarctic Continent, North-East spur of Mt Harcourt, 1,300ft alt., 83° 55' S, collected by C. H. Tyndale-Biscoe 6/12/59. (Type locality.) The insects were found crawling amongst foliose and filamentous black lichens growing on granite rocks in a granite scree with patches of snow. The site was moist from melting snow and the black lichens are recorded by the collector as turning green where damp, but the Collembola were found only amongst the black portion. A number of specimens were taken.

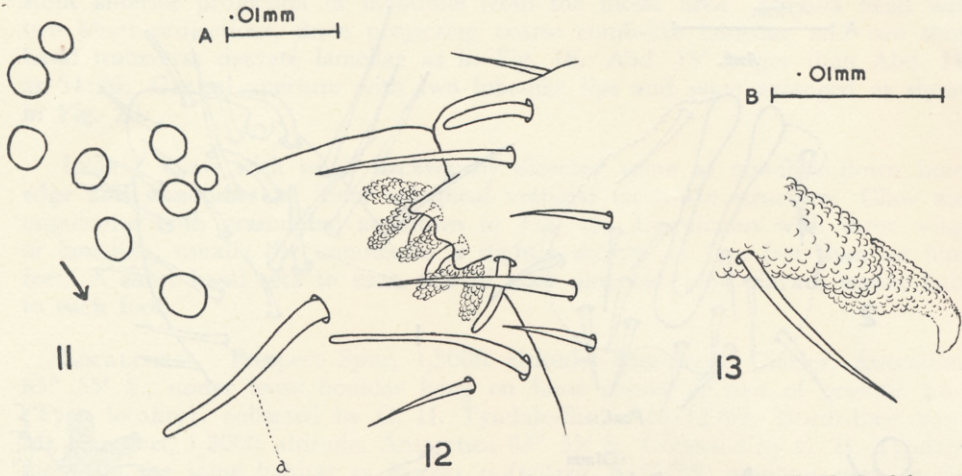
TYPES. Type specimens are being distributed as follows: Holotype and paratypes deposited in the Dominion Museum, Wellington, N.Z.; Paratypes as follows: Author's collection; Bishop Museum, Honolulu; U.S. National Museum, Washington, D.C., U.S.A.; British Museum Natural History, London.



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FIGS. 1-10.—*Biscoia sudpolaris* n.g. et. sp. Fig. 1—Apex of Ant. IV. Fig. 2—Genital aperture. Fig. 3—Ocelli. Fig. 4—Hind foot. Fig. 5—Furcula. Fig. 6—Sensory organ of Ant. III (the papillae partly cut away to show the sense rods behind). Fig. 7—Lateral view of sensory organ of Ant. III. Fig. 8—Head of mandible. Fig. 9—Ramus of tenaculum. Fig. 10—Head of maxilla.

Scale A for Figs. 6, 7 and 9. Scale B for Figs. 1-4, 8 and 10. Scale C for Fig. 5.



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FIGS. 11-13.—*Biscoia sudpolaris* n.g. et sp. Fig. 11—Ocelli (another specimen). Fig. 12—Sensory organ of Ant. III from another specimen showing accessory sense rods and setae. Fig. 13—Mucro from another specimen.

Scale A for Figs. 11 and 12. Scale B for Fig. 13.

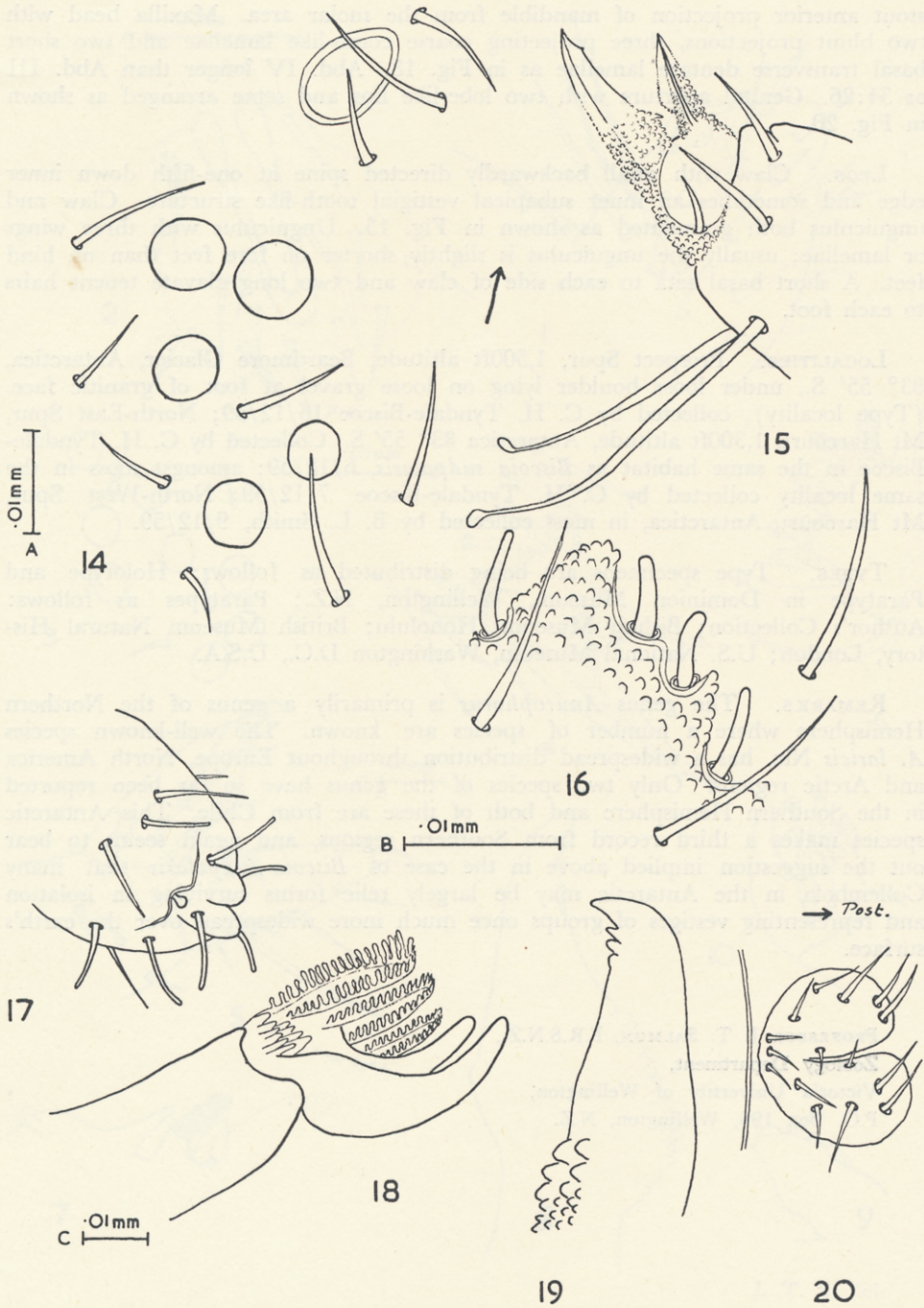
REMARKS. The species *Biscoia sudpolaris* in the structure of the sensory organ of the third antennal segment provides an intermediate form between the Onychiuridae on the one hand and the Hypogastruridae on the other. It would seem that in this species we have a relic representing an early phase in the evolutionary development of the Collembola which has been able to persist in the isolation of Antarctica long after similar forms had disappeared from the more intensely inhabited parts of the earth's surface. The importance of this sensory organ on Ant. III in any phylogenetic studies of Collembola cannot be overstressed. Its structure is the primary morphological feature used in present classificatory schemes to separate the Families Tullberginae, Onychiurinae and Hypogastrurinae.

Anurophorus subpolaris n. sp. Text-figs. 14-20

COLOUR. Deep blue-black.

CLOTHING. Sparsely clothed with short simple setae with occasional longer simple setae dorso-laterally and posteriorly on the body; setae of the legs and antennae sparse, mostly short or only moderately long.

BODY. Length up to 1.25 mm. Antennae subequal to the head in length, the four segments related as 4:8:6:12. Ant. IV with two apical sensory swellings and numerous short, curved sense rods, short setae and a small sense club behind a subapical integumentary fold. Sensory organ of Ant. III with four sensory rods, each slightly bent but not all bent in the same direction; the two inner rods behind a shallow integumentary fold, the other two rods situated one at either end of this fold (Fig. 16); in front of the fold are two guard setae. Ocelli five to each side arranged as in Fig. 14. Postantennal organ larger than an ocellus, oval to egg-shaped, distinctly double outlined and protected by three guard setae. Mandible (Fig. 19) with large apical tooth, two much smaller subapical teeth and a vestigial tooth or mound all situated close together on



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Figs. 14-20.—*Anurophorus subpolaris* n. sp. Fig. 14—Ocelli and postantennal organ. Fig. 15—Hind foot. Fig. 16—Sensory organ of Ant. III. Fig. 17—Apex of Ant. IV. Fig. 18—Head of maxilla. Fig. 19—Head of mandible. Fig. 20—Genital aperture.

Scale A for Figs. 14, 15, 18 and 19. Scale B for Fig. 16. Scale C for Figs. 17 and 20.

stout anterior projection of mandible from the molar area. Maxilla head with two blunt projections, three projecting coarse comb-like lamellae and two short basal transverse dentate lamellae as in Fig. 18. Abd. IV longer than Abd. III as 34:26. Genital aperture with two lobe-like lips and setae arranged as shown in Fig. 20.

LEGS. Claw with small backwardly directed spine at one-fifth down inner edge and sometimes an inner subapical vestigial tooth-like structure. Claw and unguiculus both granulated as shown in Fig. 15. Unguiculus with three wings or lamellae; usually the unguiculus is slightly shorter on fore feet than on hind feet. A short basal seta to each side of claw and two long clavate tenent hairs to each foot.

LOCALITIES. Prospect Spur, 1,500ft altitude, Beardmore Glacier, Antarctica, 83° 55' S., under loose boulder lying on loose gravel at foot of granitic face. (Type locality), collected by C. H. Tyndale-Biscoe 16/12/59; North-East Spur, Mt Harcourt, 1,300ft altitude, Antarctica 83° 55' S. Collected by C. H. Tyndale-Biscoe in the same habitat as *Biscoia sudpolaris*, 6/12/59; amongst moss in the same locality collected by C. H. Tyndale-Biscoe 7/12/59; North-West Spur, Mt Harcourt, Antarctica, in moss collected by B. L. Smith, 9/12/59.

TYPES. Type specimens are being distributed as follows: Holotype and Paratype in Dominion Museum, Wellington, N.Z.; Paratypes as follows: Author's Collection; Bishop Museum, Honolulu; British Museum Natural History, London; U.S. National Museum, Washington D.C., U.S.A.

REMARKS. The genus *Anurophorus* is primarily a genus of the Northern Hemisphere where a number of species are known. The well-known species *A. laricis* Nic. has a widespread distribution throughout Europe, North America and Arctic regions. Only two species of the genus have so far been reported in the Southern Hemisphere and both of these are from Chile. This Antarctic species makes a third record from Southern regions, and again seems to bear out the suggestion implied above in the case of *Biscoia sudpolaris* that many Collembola in the Antarctic may be largely relic forms surviving in isolation and representing vestiges of groups once much more widespread over the earth's surface.

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