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A new species of Anopsobius from the Falkland Islands, with commentary on the geographical distribution of the genus (Chilopoda: Lithobiomorpha)

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ABSTRACT

A new species of lithobiomorph centipede, *Anopsobius macfadyeni*, is described from the Falkland Islands and compared with related taxa in South America. Most of the immature stadia are described.

INTRODUCTION

During the Cumbria and Lancashire Falklands Expedition, November-December 1989, Professor A. Macfadyen, Coleraine, Northern Ireland, carried out a survey of soil invertebrates and collected a number of examples of a new species of *Anopsobius* Silvestri, 1899. Further examples of the same species were collected by Dr. Kate Thompson of Falklands Conservation, Edinburgh, in 1991. These specimens are believed to constitute the only records of a lithobiomorph centipede from these islands.

The new species is here described and its similarity to other species of *Anopsobius* discussed. It is concluded that only those recorded from Australasia, South Africa, and temperate South America belong in this genus, and those described as *Anopsobius* from Vietnam and Japan must be referred to other genera.

TAXONOMY

Family Henicopidae Pocock, 1901

Subfamily Anopsobiinae Verhoeff, 1907

Anopsobius

Anopsobius Silvestri, 1899, Rev. chil. Hist. nat., 3: 143.— Silvestri, 1905, Zool. Jahrb. Suppl. VI, 3 (3): 749.
Type species: *Anopsobius productus* Silvestri.

Anopsobius macfadyeni, new species

Figures 1–3

Diagnosis: Differing from other known members of the genus by the presence of stigmata on the first trunk segment and by having a ventrodistal process on the coxa of the 14th legs.

Holotype: Adult male 7.6 mm long with 15 antennomeres on one side (the other antenna missing), 5+6 prosternal teeth and 3,3 coxal pores, from East Falkland Island, between Peak Shanty and Wineglass Hill, under stone in area dominated by *Blechnum magellanicum* and *Gunnera magellanica*. A. Macfadyen leg. 16 November 1989.

Paratypes: Adult male, three adult females, juvenile male, taken with holotype; two adult males, three juvenile males, three juvenile females, same data as holotype but taken from Tullgren funnel samples. West Falkland Island: near Christmas Harbour, two adult males, four juvenile males, four juvenile females, three agenitalis, two 4th larval stadia, a 3rd larval stadium, three 2nd larval stadia, from Tullgren funnel samples from area dominated by *Cortaderia pilosa* and *Blechnum magellanicum*. West Falkland Island: near Gunn Hill Shanty, adult female, two juvenile males, juvenile female, two agenitalis, two 4th larval stadia, a 2nd larval stadium, a 1st larval stadium, from Tullgren samples from area dominated by *Gleichenia* sp., *Cortaderia pilosa*, and *B. magellanicum*. West Falkland Island: near Fox Bay West, juvenile male from Tullgren sample from area dominated by *Gunnera magellanica*. All of the foregoing specimens leg. A. Macfadyen.

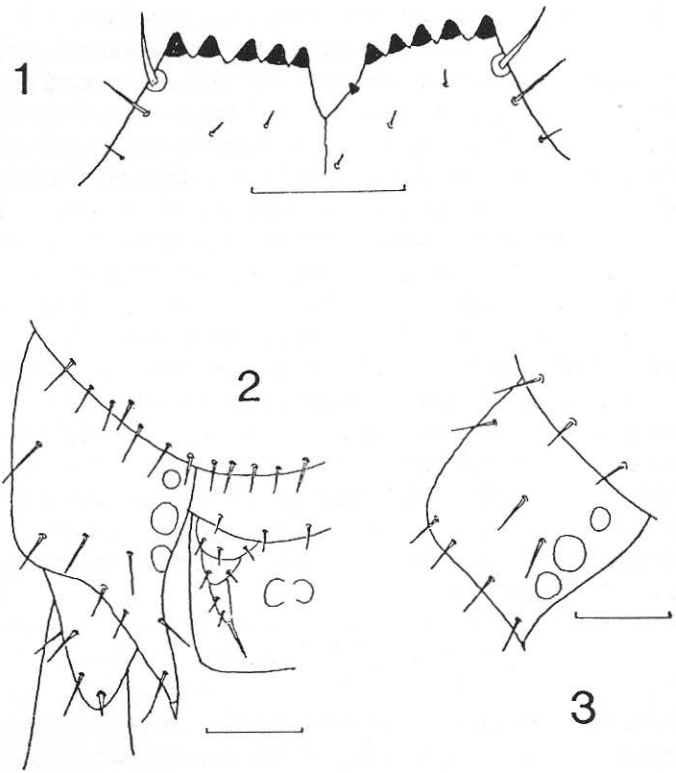
East Falkland Island: Estancia track, juvenile female from damp *Blechnum* litter, 23 December 1991; above Bluff Cove, adult male, juvenile female from damp *Blechnum* litter, 3 January 1991. These three specimens leg. K. Thompson.

Holotype and most paratypes to be deposited in the Port Stanley Museum, Falkland Islands; adult topoparatype of each sex deposited in The Natural History Museum,

London.

Name: The species is named for Professor Amyan Macfadyen, who collected most of the material and made it available to the author.

Description of adults (composite of seven males, four females): Color: yellow to pale brown. Size (although lengths are given, owing to the varying degrees of extension and contraction of the trunk in preservation, head width is a better measure of size than overall length): males 5.2–7.8 mm long, head 0.58–0.85 mm broad; females 7.6–9.2 mm long, head 0.85–0.94 mm broad. Shape: breadths of head and tergites 1, 3, 5, 8, 10, 12 and 14 to each other about as 21:19:19:21:23:23:22:20. Antenna: a third to two-fifths of body length with 14+15 to 16+18 articles, but usually with 15 on each side; first two



Figs. 1–3. *Anopsobius macfadyeni*, sp. nov. 1. Dental margin of prosternum. 2. Posterior extremity with right 15th coxa and trochanter and right gonopod. 3. Right 14th coxa. Drawings from male holotype, all ventral aspect. Scale bars on drawings equal approximately .2 millimeters.

articles relatively stout, the others more slender and mostly elongate, one and a half to twice as long as broad; last article only slightly longer than penultimate. Ocelli absent. Second maxillary claw: a single large element with one or two smaller branches. Prosternum: usually with 5+5 or 5+6 teeth, the medial on one or both sides sometimes very small (Fig. 1), but the smallest male has 4+5 teeth; porodont posterolateral to the lateral tooth, about twice as stout as a large seta; lateral to the porodont the free border slopes obliquely caudad. Tergites: smooth; large tergites with posterior angles evenly rounded and posterior borders straight; posterior angles of short tergites rounded without projections. Intermediate tergite: in males less than half the breadth of tergite 10 with posterior border straight or very slightly emarginate; in females about three-fifths the breadth of tergite 10 with posterior border distinctly emarginate. 15th sternite: in males unremarkable, in females broader with posterior border emarginate in larger specimens. Stigmata: present on segments 1, 3, 5, 8, 10, 12, and 14. Coxal pores: present on 14th and 15th legs only; circular, separated from each other by less than their own diameter, the medial pore on each coxa sometimes very small; in males 3,3 (Fig. 2); in females 4,4 or 4,3. Coxal processes: the 15th coxa bears a prominent posteromedial acuminate extension ending in a small spine; this process is usually larger in males (Fig. 2) than in females; unlike other known species of *Anopsobius* a smaller but similar process is borne on the 14th coxae (Fig. 3), sometimes almost obsolete in females. First to 12th legs: tarsal articulations fused; tibial teeth characteristic of the Henicopidae present (Attems, 1928, Fig. 18). 13th to 15th legs: tarsal articulations distinct; tibial teeth absent; a large ventral distal spine on the 14th and 15th prefemora and a small such spine on the 15th trochanter (Fig. 2); 15th a third to almost half body length with the prefemur, femur, tibia, and basitarsus all of much the same length and the distitarsus shorter; the 15th basitarsus seven to nine time longer than broad; accessory apical claws rather less than half the length of the principal claw. Male gonopod (Fig. 2) typical of the Henicopidae. Female gonopod as in *Lamyctes* with two spurs, the medial slightly smaller than the lateral, and a simple claw; one female from the type locality has a spur on the second article of one gonopod in addition to the usual two on the basal, as figured by Silvestri (1935: fig. vii,9) for *Lamyctes albipes* Pocock.

IMMATURE STADIA

The antennae of larvae, unlike those of adults, have the articles as long as broad or transverse with the last article very elongate. First stadium (one specimen): seven pairs of legs; 1.0 mm long; head 0.15 mm broad; ten antennal articles; no prosternal teeth. Second stadium (four specimens): eight pairs of legs; 1.5–2.0 mm long, head 0.18–0.24 mm broad; 13 or 14 antennal articles; 2+2 prosternal teeth. Third stadium (two specimens): ten pairs of legs; 2.0 mm long, head 0.27 mm broad; 14 antennal articles;

2+2 or 3+3 prosternal teeth. Fourth stadium (four specimens): 12 pairs of legs; 2.2–2.7 mm long; head 0.29 mm broad; 14 or 15 antennal articles; 3+3 prosternal teeth.

Agenitalis stadium (5 specimens): 15 pairs of legs; 3.0–3.6 mm long; head 0.29–0.42 mm broad; 15 antennal articles, each about as long as broad or transverse, ultimate article less elongate than in larval stadium, about twice as long as broad; 3+3 or 4+4 prosternal teeth; a single pore on each of the 14th and 15th coxae; process well-developed on 15th coxae, feeble on 14th; 14th and 15th prefemoral spines present but no spine on 15th trochanter; sexes not clearly differentiated.

Subsequent juvenile post-larval stadia: These stadia are difficult to define because the number of prosternal teeth is not strictly correlated with size, all males have fully segmented gonopods, and, unlike the comparable stadia of Lithobiidae described by Andersson (1979), all females have two spurs on each gonopod, as Andersson found in most females of *Lamyctes fulvicornis* Meinert, the only species of Henicopidae in which development has been fully described. Andersson, however, found these spurs in *L. fulvicornis* to be always of equal size throughout development, whereas in immature females of *Anopsobius macfadyeni* they are more or less unequal. It is assumed that males with fewer than 3,3 coxal pores and females fewer than 4,3 are immature, although in the case of males in the present sample there is some overlap in size between supposedly adult and immature specimens. On the basis of the number of coxal pores, both sexes may be divided into two stadia, which are assumed to be the second and third post-larval.

Second post-larval stadium: Males (two specimens): 3.9 mm long; head 0.42 mm broad; 15 antennal articles, as long as broad or very slightly elongate with the ultimate about one and a half times as long as broad; 3+4 or 4+4 prosternal teeth; 1, 1 or 2, 1 coxal pores; process well-developed on the 15th coxa, small on the 14th; adult spinulation on the 14th and 15th legs; gonopod fully segmented but with fewer setae than in adults. Females (seven specimens): 4.35–5.65 mm long; head 0.44–0.58 mm broad; usually 15 antennal articles but two with 13–15; 4+4, 4+5, or 5+5 prosternal teeth; usually 2,2 coxal pores but the largest with 2,2 + 3,2; process of 14th coxa sometimes obsolete; spinulation of legs as in males; gonopod with two small unequal spurs.

Third post-larval stadium. Males (nine specimens): 4.l–6.5 mm long; head 0.44–0.67 mm broad; usually 15 antennal articles but one with 15+16 and another with 15+17, the articles the same shape as in the second stadium; 3+4, 4+4, 4+5, or 5+5 prosternal teeth; usually 2,2 coxal pores but the largest with 2,2 + 3,2; gonopod as in second stadium. Females (two specimens): 5.2–5.65 mm long; head 0.60–0.67 mm broad; 15 or 15+16 antennal articles; 4+4 or 5+5 prosternal teeth; 3,3 coxal pores; gonopods with spurs only slightly unequal.

DISCUSSION

Taxonomy: A coxal process on the 14th leg, in addition to the one on the 15th which is present in all the Anopsobiinae (Attems, 1928), is characteristic of another genus within the subfamily, namely *Ghilaroviella* Zalesskaja, 1975, from Tadzhikistan, but the new species differs from *Ghilaroviella* in many other respects and clearly belongs to *Anopsobius*. Within the genus it is very similar to *A. patagonicus* Silvestri, 1909, from Argentina and *A. neozelandicus* Silvestri, 1909, from New Zealand. In addition to having a process on the 14th coxa, *A. macfadyeni* differs from Silvestri's description and Chamberlin's redescription (1962) of *A. patagonicus* in having more than one pore on the 14th and 15th coxae. Attems (1928) however, described examples from Cape Province, South Africa, with single pores on both these coxae in males but two in females: he named this form *A. patagonicus calcaratus* owing to a small difference in the structure of the second maxillary claw and figured the 14th coxa in a male without a trace of a process (Attems, 1928, fig. 21). *A. neozelandicus* is closer to *macfadyeni* in having up to three pores on each of the 14th and 15th coxae, but has 6+6 (occasionally 5+5) prosternal teeth (Silvestri, 1909; Chamberlin, 1962), and Archey (1937) found as many as 7+7 teeth in large specimens. Although the number of prosternal teeth in *Anopsobius* is obvicusly intraspecifically variable and so, to a lesser degree, is the number of coxal pores, the same cannot be said of the 14th coxal process. Further, Attems (1928) stated that stigmata are absent from the first segment in Anopsobiinae. Segmental stigmata are sometimes difficult to see, and the 14th coxal process may be inconspicuous in females, particularly in immature specimens, but assuming earlier descriptions to be accurate, *A. macfadyeni* seems to be unique within the genus in having 14th coxal processes and stigmata on the first segment.

Geographical distribution of *Anopsobius*: Three additional species of *Anopsobius*, which differ in several characters from those already mentioned, have been described from southern Chile (Silvestri 1909, Chamberlin 1962), and Mr. Robert Mesibov (Smithton, Tasmania) informs me (personal communication) that he has found two as yet unnamed species of the genus at numerous localities in Tasmania. Two further species have been described in the genus from the northern hemisphere, *A. (Anopsobiella) dawydoffi* Attems, 1938, from Vietnam and *A. japonicus* Murakami, 1967, from Japan, but both are awarded separate generic status by Zalesskaja (1975), who elevated *Anopsobiella* from subgeneric to generic rank. Shinohara (1982), however, concluded that *A. dawydoffi* might not belong to the Anopsobiinae at all but to the Henicopinae, and that *A. japonicus* should be removed to yet another genus within the Anopsobiinae, namely *Shikokuobius* Shinohara, 1982.

Lawrence (1984) suspected that the South African form of *Anopsobius patagonicus*, which Attems (1928) recorded from a number of localities, all in the neighborhood of Cape Town, had been introduced, but the genus seems to be truly indigenous in New

Zealand, Tasmania, the mainland of temperate South America, and the Falkland Islands, with distinct but closely related forms in each of these areas. In some groups of Falklands arthropods which have been studied, many species also occur in Patagonia, and in others the large proportion of apparently endemic species may reflect inadequate collecting in South America (Macfadyen, personal communication). It is therefore quite possible that *A. macfadyeni* may eventually be discovered on the South American mainland and other adjacent islands.

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