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Aniulus Paludicolens, N. SP. (Julida: Paraiulidae), a Bog-Dwelling Milliped

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ANIULUS PALUDICOLENS, N. SP. (JULIDA: PARAIULIDAE), A BOG-DWELLING MILLIPED

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Almost without exception, millipeds require a continuously moist substratum, yet they do not tolerate flooding. Other ecological factors that limit their distribution are subtle and difficult to recognize. *Aniulus paludicolens*, n. sp., is unique in that all collections are from *Sphagnum* bogs in the vicinity of the Great Lakes. It is best known from Byron Bog, in southern Ontario. This bog has the following vegetation zones: *a*, a central bog based on a mat of *Sphagnum* moss and covered almost entirely by leatherleaf; *b*, a low wooded region, damp or flooded, with hardwood trees and shrubs at its outer limits and black spruce and larch at its inner limits; and *c*, wooded slopes occupied by deciduous trees and shrubs. *A. paludicolens* occurs only in zones *b* and *c*, and in greatest numbers in the former. Other millipeds in the bog include *A. bollmani* Causey, which was collected only in zone *c* (Judd, 1965).

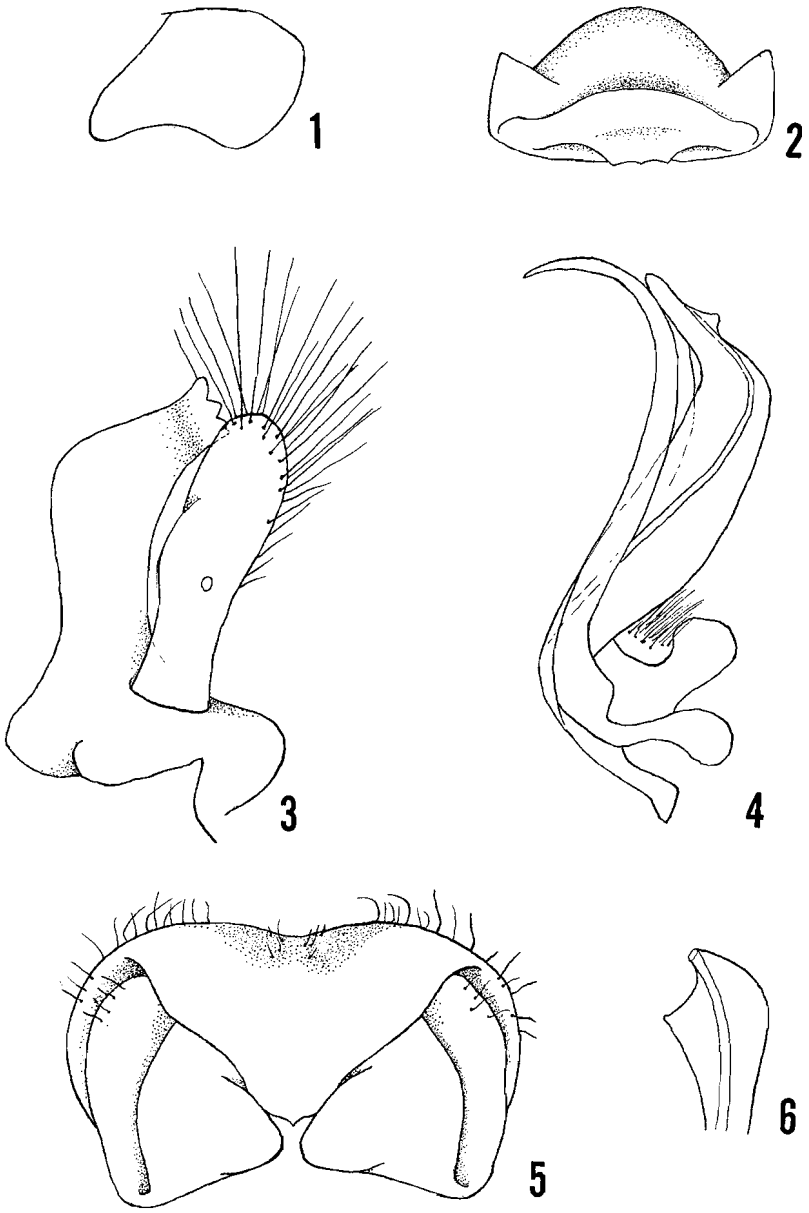
These two species represent the most northern distribution of the genus, of which there are many species in the southern states and Texas. The species most closely related to *A. paludicolens* is *A. paitus* Chamberlin, which occurs in disjunct polytypic populations in the mountain valleys of Arizona, Colorado, and New Mexico.

ANIULUS PALUDICOLENS, NEW SPECIES

Figures 1-6

Diagnosis: Nearest to *A. paitus*, differing in the bog habitat and in details of the sexual characters. *Male* characterized by the large sternum of legpair 10, the deeply recessed gonopods, and by details of the gonopods. *Female* characterized by the rounded metapleurites of segment 3 and by the large, triangular caudal thickening on the synoperculum of the moderately short vulvar apparatus.

Male holotype: Width 2 mm. 49 segments, with the last 3 legless. Dorsum is red-brown; black dorsal line and lateral spots are indistinct; under magnification the usual mottled pattern is visible; venter and legs are light brown. Apical margin of anal tergite is obtusely angular when viewed from above, extending not quite as far back as anal valves do. Mandibular cheek (Fig. 1) is moderately thick, as is usual in the genus. Sternum of legpair 10 (Fig. 2) is the largest in the genus; its broadly rounded anterior margin crowds the small gonopods into the anterior part of the gonopodal cavity; its posterior margin is unusual in that it is a thick, rounded, transverse ridge that projects much farther below the body surface than the gonopods do.



Figs. 1-6. *Aniulus paludicolens*, n. sp. Fig. 1, left mandibular cheek, male; Fig. 2, sternum of legpair 10, male; Fig. 3, left anterior gonopod, lateral view; Fig. 4, left posterior gonopod, lateral view; Fig. 5, apical region of telopodite of left posterior gonopod, mesial view; Fig. 6, vulvar apparatus, caudal view. Drawings are from topotypical paratypes.

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From a lateral view of the gonopods, all 4 branches are visible, but none is as conspicuous as the sternum of legpair 10. From a ventral view, the broad telopodites of the posterior gonopods are directed mesiad and are contiguous at the apex, and their slender coxites, which are directed mesiocaudad, intersect in the midline and extend back to the sternum of legpair 10; the small, inconspicuous coxites of the anterior gonopods are directed mesiad behind their telopodites; the sternum of legpair 10 fills more than the posterior half of the gonopodal cavity. Caudal surface of syncoxa of anterior gonopods is thick, vertical, and not visible from ventral view. In lateral view (Fig. 3), coxite of anterior gonopods is asymmetrical, lanceolate, with the broad surface ectad and the apical margin, on which there are 3 minute teeth, bent mesiad; its telopodite is more slender than in most congeners. The narrow, attenuated S-shaped coxite of the posterior gonopods (Fig. 4) arises ectad of its telopodite, which is broader, shorter, and unusual in that the apical region is bent mesiad, expanded, and part of the margin is concave; it lacks serrations and a scabrous area.

Female allotype: Width 2.2 mm. 49 segments, with the last 3 legless. Metapleurites of segment 3 are large, rounded and almost contiguous in the midline. From a lateral view, vulvar apparatus is slightly visible below segments 2 and 3. From a ventral view, vulvar apparatus is largely covered by third pleurites. The dissected vulvar apparatus is flattened on both anterior and posterior surfaces and its ventral and ectal margins are broadly rounded; on the anterior surface, legpair 2 does not extend to the ventral margin of the synoperculum; on the posterior surface (Fig. 6), ratio of length and width of synoperculum is about 1/2; vulvae are partly covered by synoperculum, and inner valves are wider than outer valves.

Variations of 19 known specimens: Width 1.9 to 2.2 mm. 45 to 49 segments, of which 12 have 2 legless caudal segments and 7 have 3. Apex of coxite of anterior gonopods has either 2 or 3 minute serrations. Ventral margin of synoperculum of vulvar apparatus is either almost straight or sinuous, and inner valves are either contiguous or slightly separated above synoperculum.

Type locality and specimens: Michigan. Livingston County: Dollar Tamarack Swamp, Edwin S. George Reserve, 4 May 1961, holotype ♂, allotype ♀, Walter Suter.

Paratypes: Illinois. Lake County: Volo, Soyer Bog, 12 April 1960, ♂, Walter Suter. *Indiana.* Porter County: Dune Acres, Cowle's Bog, 16 April 1960, 3 ♀, larvae, Walter Suter. *Michigan.* Livingston County, same data as holotype, 1 ♂, 2 ♀. *Ontario.* Middlesex County: London, Byron Bog, 9 May to 9 Sept. 1961, 4 ♂, 6 ♀, Walter Judd.

Deposition of specimens: Male holotype, female allotype and paratypes of each sex from the Ontario collection are in the U.S. National Museum. The remaining paratypes are in my collection.

LITERATURE CITED

Judd, W.W. 1965. Studies of the Byron Bog in southwestern Ontario XXI. Distribution of centipedes (Chilopoda) and millipedes (Diplopoda). Nat. Mus. Canada, Nat. Hist. Papers, No. 26, pp. 1-4.