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AMERICAN POLYDESMOID MILLIPEDS OF THE GENUS *SIGMORIA*, WITH NOTES ON DISTRIBUTION

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Through the kindness of Dr. Willis J. Gertsch, Associate Curator of Insects and Spiders, the American Museum of Natural History, I have been able to examine a large number of polydesmoid millipeds from eastern United States. Two of the species included, both members of the xystodesmid genus *Sigmoria*, are represented by specimens of considerable interest. It is felt that information on these animals, together with notes and records on other species accumulated separately, may profitably be assembled and presented in the form of a brief account of the genus as currently known.

I am assembling materials for monographic revisions of the larger genera of the Xystodesmidae; since these projected papers will include thorough descriptions and drawings of taxonomic characters, the present account is to be considered a preliminary one.

In addition to the material from the American Museum, I have studied specimens belonging to the United States National Museum, the Museum of Comparative Zoölogy, and the Carnegie Museum. For the opportunities to examine them, I am indebted to Dr. E. A. Chapin, Dr. Joseph Bequaert, and Mr. Gordon K. MacMillan. Dr. Mike Wright, Tusculum College, Greeneville, Tennessee, has sent me much-appreciated material from western North Carolina.

SIGMORIA CHAMBERLIN

Sigmoria CHAMBERLIN, 1939, Bull. Univ. Utah, vol. 30, no. 2, p. 7. Genero-type, *S. munda* Chamberlin, by original designation.

DIAGNOSIS: Large xystodesmid millipeds characterized in particular by the male gonopods, in which one prefemoral process, of variable size and shape, is present; the prefemoral division is considerably swollen and setose; and the femur and tibiotarsus are fused without perceptible suture or joint, forming a telopodite element which is strongly differentiated from the prefemur and which is bent distally into a sigmoid curve. Gynopods of the female large, with the receptacle well developed, box-like, the valves broad, their distal faces corrugated; entire organs without setae.

Dorsum gently arched, completely smooth; keels broad and overlapping; repugnatorial pores dorsal in position. Sternites without spines at bases of legs. Coxae and prefemora with well-developed ventral spines. Terminal tarsal claw stout, with a light sinuous curve.

Color pattern variable, typically black dorsally with caudolateral halves of the keels yellow, orange, or red; often with a transverse band of the same color across dorsum on caudal edge of the tergites. Pleurites yellowish.

RANGE: Appalachian Mountains from western South Carolina to central West Virginia; Nashville Basin of central Tennessee; eastern Texas.

SPECIES: Fourteen, as listed below.

***Sigmoria aberrans* Chamberlin**

Sigmoria aberrans CHAMBERLIN, 1939, Bull. Univ. Utah, vol. 30, no. 2, p. 8, figs. 24, 25.

TYPE LOCALITY: Linville Falls, North Carolina.

TYPE SPECIMEN: Collection of R. V. Chamberlin.

DISTRIBUTION: Chamberlin's drawings cited above are not particularly useful for identification, and it was not until August, 1949, when I obtained a topotype at Linville Falls, that I was able to associate the name *aberrans* with a number of undetermined specimens on hand from the southern Appalachians.

The following localities add a great deal to the range of the species, heretofore known only from the type locality:

Virginia: *Patrick County:* Lovel's Creek, 2 miles north of North Carolina line, north of Mount Airy, North Carolina, June 13, 1937, L. P. Schultz and E. D. Reid (U.S.N.M.). *Washington County:* Holston Mountain, near Damascus, August 14, 1941,

Dr. and Mrs. S. T. Brooks (C.M. No. 75); Straight Branch at Dripping Rock, near Damascus, August 3, 1941, Brooks (C.M. No. 52); opposite Mendota, southeast side of Clinch Mountain, July 30, 1941, Brooks (C.M. No. 45); Clinch Mountain at Duncansville (location unknown), July 29, 1941, Brooks (C.M. No. 41).

North Carolina: *Ashe County*: Mill Hill and vicinity, July–August, 1922, C. M. Breder, Jr. (A.M.N.H., many specimens). *Burke County*: Linville Falls, August 12, 1910, R. V. Chamberlin (types), August 3, 1949, R. L. Hoffman (topotype). *Watauga County*: Boone, Appalachian State Teachers College, June 18, 1948, Mike Wright (R. L. H. No. 6-1848-1).

These records indicate a fairly extensive range centered around the Iron Mountains of the Southern Blue Ridge Physiographic Province. In a general way, the range of *aberrans* is very similar to that of the plethodontid salamander *Plethodon yonahlossee* Dunn. The Clinch Mountain, Virginia, localities are of interest in being outside of the Blue Ridge, on the northwest side of Washington County in the folded Appalachians. Doubtless *aberrans* occurs in northeastern Tennessee in the Iron Mountains and possibly the Unakas.

Despite the occurrence of the species in a mountainous region, it would seem that it does not ascend very high and may be found to be a valley form. I did not obtain any at Mount Rogers, Virginia (5000–5700 feet), nor did the Brookses find specimens at high elevations during their extensive malacological collecting in southwest Virginia. This observation, indeed, holds generally for the other Appalachian forms of *Sigmoria*, which occur widely at lower elevations throughout western North Carolina.

***Sigmoria brachygon* Chamberlin**

Sigmoria brachygon CHAMBERLIN, 1940, Ent. News, vol. 51, pp. 283–284, fig. 2.

TYPE LOCALITY: Glen Bald, Pisgah National Forest, North Carolina.

TYPE SPECIMEN: Collection of R. V. Chamberlin.

DISTRIBUTION: Known only from the type locality, which is located approximately 7 miles southwest of Asheville, in Buncombe County, North Carolina.

Sigmoria conclusa Chamberlin

Sigmoria conclusa CHAMBERLIN, 1939, Bull. Univ. Utah, vol. 30, no. 2, p. 8, figs. 22, 23.

TYPE LOCALITY: "Altapass, Tennessee" (*sic*).

TYPE SPECIMEN: Collection of R. V. Chamberlin.

DISTRIBUTION: Known only from the type locality, which is actually in Mitchell County, North Carolina, instead of in Tennessee as originally cited.

Sigmoria divergens Chamberlin

Sigmoria divergens CHAMBERLIN, 1939, Bull. Univ. Utah, vol. 30, no. 2, p. 8, figs. 19-21.

TYPE LOCALITY: Landrum, Spartanburg County, South Carolina.

TYPE SPECIMEN: Collection of R. V. Chamberlin.

DISTRIBUTION: Known only from the type locality.

Sigmoria evides (Bollman)

Fontaria evides BOLLMAN, 1887, Proc. U. S. Natl. Mus., vol. 10, p. 620.

Sigmoria evides CHAMBERLIN, 1939, Bull. Univ. Utah, vol. 30, no. 2, p. 8.

TYPE LOCALITY: Mossy Creek, Jefferson County, Tennessee.

TYPE SPECIMEN: In the United States National Museum, a male in which only one gonopod was developed; this was removed and is now lost, so that the identity of the species cannot be ascertained without topotypical material.

DISTRIBUTION: Known only from the type locality.

Sigmoria furcifera Hoffman

Sigmoria furcifera HOFFMAN, 1949, Proc. U. S. Natl. Mus., vol. 99, pp. 387-389, pl. 27, figs. 17, 18.

TYPE LOCALITY: Near Pineville, Wyoming County, West Virginia.

TYPE SPECIMEN: U.S.N.M. No. 1809, male.

DISTRIBUTION: This species is the northernmost representative of the genus at present. An additional record may be given here: West Virginia: *Lewis County*: 4-H Camp, Jackson Mill, September 10, 1938, G. K. MacMillan (C.M. No. 59), a female referred to this species with some hesitation.

Sigmoria gracilipes Chamberlin

Sigmoria gracilipes CHAMBERLIN, 1947, Proc. Acad. Nat. Sci. Philadelphia, vol. 99, p. 29, fig. 15.

TYPE LOCALITY: Pine Mountain, Bell County, Kentucky.

TYPE SPECIMEN: A.N.S.P. No. 9952, male.

DISTRIBUTION: Known from the type locality only.

Sigmoria houstoni Chamberlin

Sigmoria houstoni CHAMBERLIN, 1943, Proc. Biol. Soc. Washington, vol. 56, p. 144, fig. 1.

TYPE LOCALITY: Houston, Harris County, Texas.

TYPE SPECIMEN: Collection of R. V. Chamberlin.

DISTRIBUTION: This species is of unusual interest in light of its occurrence in central eastern Texas. There are a few other similar cases of "misplaced" Appalachian species in Texas (in insects and salamanders) but there is not enough information on millipeds to permit speculation on the exact nature of this phenomenon. One possibility is that *houstoni* represents a relict form of an earlier time when conditions permitted continuity of the faunas of the Appalachians and the Mexican Plateau. The presence of the isolated *Nannaria tuobita* (Chamberlin) in New Mexico lends some credence to this idea.

Sigmoria latior (Brölemann)

Fontaria latior BRÖLEMAN, 1900, Mem. Soc. Zool. France, vol. 13, p. 123, pl. 6, figs. 37-42.

Apheloria latior ATTEMS, 1938, Das Tierreich, no. 69, p. 168.

TYPE LOCALITY: "North Carolina."

TYPE SPECIMEN: Location unknown (Paris Museum?).

DISTRIBUTION: *Sigmoria latior* was described from an undesignated locality in North Carolina and has not since been reported, hence it is of interest to publish the first definite locality for the species: North Carolina: *Polk County*: Tryon, J. T. Nichols (A.M.N.H., two specimens).

Although well described by Brölemann, his species *latior* has been overlooked by all American workers. The very good drawings of the gonopods clearly represent a *Sigmoria*, but this is the first use of the name in proper combination. The species is related to *aberrans* and *furcifera*.

Sigmoria mariona Chamberlin

Sigmoria mariona CHAMBERLIN, 1939, Bull. Univ. Utah, vol. 30, no. 2, p. 9, figs. 17, 18.

TYPE LOCALITY: Marion, McDowell County, North Carolina.

TYPE SPECIMEN: Collection of R. V. Chamberlin.

DISTRIBUTION: Heretofore known only from the type locality, *mariona* is herewith recorded from an additional locality about 25 miles to the east: North Carolina: *Burke County*: Morganton, no date, H. K. Morrison (M.C.Z., three specimens).

Both of the stations for this species are in typical flat Piedmont terrain, in the Catawba River Valley.

Sigmoria mimetica (Chamberlin)

Fontaria mimetica CHAMBERLIN, 1918, Psyche, vol. 25, pp. 29-30.

TYPE LOCALITY: Nashville, Davidson County, Tennessee.

TYPE SPECIMEN: Male, in the Museum of Comparative Zoölogy.

DISTRIBUTION: Known only from the type locality.

This form was described without figures of the male gonopods, and in consequence its proper generic position has remained unknown until I recently examined the type at Harvard. The gonopods are suggestive of those of *S. divergens* and bear a strong superficial resemblance to the sort typical of the genus *Tucoria*. Publication of pertinent drawings is delayed in anticipation of securing females for study as well.

Sigmoria munda Chamberlin

Sigmoria munda CHAMBERLIN, 1939, Bull. Univ. Utah, vol. 30, no. 2, p. 8, figs. 15, 16.

TYPE LOCALITY: Hot Springs, Madison County, North Carolina.

TYPE SPECIMEN: Collection of R. V. Chamberlin.

DISTRIBUTION: Known only from the type locality and from Asheville, Buncombe County, North Carolina, both on the French Broad River.

Sigmoria stenogon Chamberlin

Sigmoria stenogon CHAMBERLIN, 1942, Bull. Univ. Utah, vol. 32, no. 8, p. 5, fig. 12.

TYPE LOCALITY: Bennet Gap Road, Pisgah National Forest, North Carolina.

TYPE SPECIMEN: Collection of R. V. Chamberlin.

DISTRIBUTION: Known only from the type locality. Bennet Gap is on the western edge of Transylvania County, 6 miles northwest of Brevard.

***Sigmoria zyga* Chamberlin**

Sigmoria zyga CHAMBERLIN, 1949, Proc. Biol. Soc. Washington, vol. 62, p. 3 fig. 2.

TYPE LOCALITY: Between Hot Springs and Paint Rock, Madison County, North Carolina.

TYPE SPECIMEN: Collection of R. V. Chamberlin.

DISTRIBUTION: Known from the type locality only.

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