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STUDIES ON SPIROBOLOID MILLIPEDS. II. A SECOND PAPER ON THE GENUS EURHINOCRICUS

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My previous treatment of the genus *Eurhinocricus* (1953, Proc. Biol. Soc. Washington, 66: 179-183) rediagnosed the genus on the basis of gonopod structure, and admitted four species to the group in its emended sense. However, quite a few species of rhinocricids which, because of the shape of the posterior gonopod, should have been referred to *Eurhinocricus,* were omitted. These neglected millipeds included five described by Verhoeff and Chamberlin and simply overlooked; three published while the manuscript of my paper was in press; and a considerable number of West Indian species which had been inadequately described and whose identity was until quite recently unknown.

The forms belonging to the last category all are Jamaican, and represented in a rich and valuable collection loaned to me for study by Mr. C. Bernard Lewis, Director of the Institute of Jamaica. These species will be thoroughly treated in a systematic account of the diplopods of Jamaica, now in preparation. In my previous paper (*op. cit.,* p. 181) I wrote concerning one diagnostic character: "The usual transverse sulcus is replaced by a secondary one lying in front of the repugnatorial pores (a characteristic shared, however, with certain West Indian species of *Rhinocricus*)." Inasmuch as the Antillean species referred to have proved to be congeneric with *E. biolleyi,* the peculiarity may now be regarded as one exclusive with *Eurhinocricus.*

As treated in my summary, *Eurhinocricus* consisted of the following species:

E. biolleyi Brolemann	Cocos Islands
E. omiltemae Pocock	Guerrero
E. tidius (Chamberlin)	California
E. parvissimus Hoffman	Chiapas

In all of these forms, the posterior gonopod is a somewhat shortened appendage, its distal segment composed of a long, acicular solenomerite arising very near the coxal articulation, and two slender subparallel rods joined by a membrane. This plan is very constant, and is practically identical in all of the above named species as well as the others listed below. It will be noted that the occurrence of these species in widely

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separated, high-altitude localities along the main Cordilleran uplift suggests a strong likelihood of reliction.

It is accordingly of exceptional zoogeographic interest to record the discovery that *Eurhinocricus* is the dominant spirobolid genus occurring on Jamaica, a circumstance affording the first good evidence of the relationship of the fauna of that island with the millipeds of the Central American mainland. In the rich material sent for study by the Institute of Jamaica, I find that at least eight established species of earlier workers are referable to *Eurhinocricus*, as well as an equal number of undescribed forms.

In the first paper of this series I proposed to base generic categories almost entirely upon sexual characters, to the exclusion of such developments as the number of antennal sensory cones, which, although quite useful for identification, occur in many forms which are entirely unrelated in gonopod structure. From the results of my study of the Jamaican collections, it would appear that still another superficial characteristic must be put aside as regards its utility as a generic distinction. This is the presence or absence of scobinae. There is no correlation between the incidence of those cavities and the confiuration of the posterior gonopods; scobinae are present on some of the *Eurhinocricus* forms but not on others, a state of things duplicated in the case of typical *Rhinocricus* species (in both genera, Jamaican forms are now known in which scobinae are present in one sex and absent from the other!). The genus *Cubobolus* was set up by Chamberlin in 1918 for the West Indian rhinocricids lacking scobinae, and has embraced in the past about a half dozen forms widely divergent in size, structure, and distribution. Chamberlin himself regarded *Cubobolus* as a category of convenience, and remarked that it might have to be withdrawn into *Rhinocricus*. As I am ignorant of the sexual characters of *Cubobolus beliganus*, the generotype, I am unable to say whether the name is a synonym of *Rhinocricus* or of *Eurhinocricus*, but suspect that it belongs with the former, as *beliganus* is a Cuban species and no eurhinocricids are presently known to occur on that island.

The following list represents an attempt to account for all of the species described to date which appear to be referable to *Eurhinocricus*. That many others remain to be collected and described cannot be doubted.

Genus *Eurhinocricus* Brolemann

Eurhinocricus Brolemann, 1903, Ann. Soc. Ent. France, vol. 72, p. 131.—Pocock, 1907, Biol. Centr.-Amer., Diplop., pp. 68, 73.—Hoffman, 1952, Proc. Biol. Soc. Washington, vol. 66, pp. 179-183.

Type.—*E. biolleyi* Brolemann, by original designation.

Range.—Middle America, from southern California south to Panama; Jamaica.

Species.—20.

Eurhinocricus barrios Chamberlin

Eurhinocricus barrios Chamberlin, 1953, Amer. Midl. Nat., vol. 50, p. 138, figs. 11, 12.

Type locality.—Escobas, opposite Point Barrios, Guatemala.

Range.—Known only from the type locality.

Eurhinocricus biolleyi Brolemann

Rhinocricus (*Eurhinocricus*) *biolleyi* Brolemann, 1903, Ann. soc. ent. France, vol. 72, p. 132, pl. 1, figs. 1-6.—Pocock, 1907, Biologia Centrali-Americana, Diplopoda, p. 72.

Rhinocricus wheeleri Chamberlin, 1922, Proc. U. S. Nat. Mus., vol. 60, art. 8, p. 21, pl. 10, figs. 1-3 (type locality: Port Limon, Costa Rica).

Rhinocricus cocos Chamberlin, 1947, Proc. Acad. Nat. Sci. Philadelphia, vol. 99, p. 38, figs. 27, 28 (type locality: Chatham Bay, Cocos Islands).

Eurhinocricus biolleyi Hoffman, 1953, Proc. Biol. Soc. Washington, vol. 66, p. 182.

Type locality.—Cocos Islands.

Range.—Costa Rica, probably introduced into the Cocos Islands.

Synonymy.—I have already suggested that *cocos* is a synonym of *biolleyi*, since the type specimens of both are from the same place and since there is nothing in the descriptions and illustrations of the two that would indicate any significant differences.

In describing *R. wheeleri*, Chamberlin wrote "This form differs from other Central American species in having an anterior or secondary sulcus deeply impressed across dorsum, whereas the primary sulcus is obliterated above." But such a condition had already been noted in the description of *biolleyi*, and was repeated by Pocock in the Biologia! The gonopods of *wheeleri*, *cocos*, and *biolleyi* are identical, as can be ascertained by reference to illustrations given in the works cited above. Nor is there any difference between the three in size or segment number.

Eurhinocricus chichivacus Chamberlin

Eurhinocricus chichivacus Chamberlin, 1953, Amer. Midl. Nat., vol. 50, p. 139, figs. 1, 2.

Type locality.—Chichivac, near Tecpam, Guatemala.

Range.—Known only from the type locality.

Eurhinocricus cingendus (Loomis)

Rhinocricus cingendus Loomis, 1937, Bull. Mus. Comp. Zool., vol. 80, p. 218, figs. 5, 6.

Type locality.—Main Ridge, Blue Mountains, Jamaica.

Range.—The Blue Mountains, St. Andrew Parish, Jamaica.

Eurhinocricus cockerelli (Pocock)

Rhinocricus cockerelli Pocock, 1894, Journ. Linnean Soc. London, (Zool. Ser.), vol. 24, p. 505.

Type locality.—Mandeville, Manchester Parish, Jamaica.

Range.—Central and eastern parishes of Jamaica, at lower elevations.

Eurhinocricus eutypus Chamberlin

Eurhinocricus eutypus Chamberlin, 1953, Amer. Midl. Nat., vol. 50, p. 139, figs. 21, 22.

Type locality.—Volcan Tajumulco, Guatemala.

Range.—Known only from the type locality.

Eurhinocricus fissus Verhoeff

Eurhinocricus fissus Verhoeff, 1937, Zool. Anz., vol. 118, p. 97.

Type locality.—Sierra de la Victoria, between Todos Santas and Miraflores, Baja California.

Range.—Known only from the type locality.

Eurhinocricus gossei (Pocock)

Rhinocricus gossei Pocock, 1894, Journ. Linnean Soc. London, (Zool. Ser.) vol. 24, p. 490, pl. 38, fig. 2.—Chamberlin, 1918, Bull. Mus. Comp. Zool., vol. 62, p. 186.

Cubobolus gossei Chamberlin, 1922, Proc. U. S. Nat. Mus., vol. 61, art. 10, p. 10.

Type locality.—Jamaica.

Range.—Western end of Jamaica, in the Bluefields Mountains and vicinity.

Eurhinocricus heteroscopus (Chamberlin)

Rhinocricus heteroscopus Chamberlin, 1918, Bull. Mus. Comp. Zool., vol. 62, p. 194.

Type locality.—Liguanea Plain, Jamaica.

Range.—Lower portions of St. Andrew and adjoining parishes, Jamaica.

Eurhinocricus insulatus (Chamberlin)

Rhinocricus insulatus Chamberlin, 1925, Proc. Biol. Soc. Washington, vol. 38, p. 39.

Type locality.— Barro Colorado Island, Panama.

Range.—Known only from the type locality.

Eurhinocricus mandevillei (Pocock)

Rhinocricus mandevillei Pocock, 1894, Journ. Linnean Soc. London, (Zool. Ser.), vol. 24, p. 489.

Type locality.—Mandeville, Manchester Parish, Jamaica.

Range.—Central parishes of Jamaica.

Eurhinocricus omiltemae (Pocock)

Rhinocricus omiltemae Pocock, 1907, Biologia Centrali-Americana, Diplopoda, p. 67, pl. 6, figs. 12a-c.

Type locality.—Omilteme, Guerrero.

Range.—Known only from the type locality.

Eurhinocricus parvior (Chamberlin)

Rhinocricus parvior Chamberlin, 1918, Bull. Mus. Comp. Zool., Vol .62, p. 191.

Type locality.—Liguanea Plain, Jamaica.

Range.—Known only from the type locality (northern suburbs of Kingston, St. Andrew Parish, Jamaica).

Eurhinocricus parvissimus Hoffman

Eurhinocricus parvissimus Hoffman, 1953, Proc. Biol. Soc. Washington, vol. 66, p. 182, figs. 1, 2.

Type locality.—Volcan de Tacana, above Cacahuatan, Chiapas.
Range.—Known only from the type locality.

Eurhinocricus pygmoides (Chamberlin)

Rhinocricus pygmoides Chamberlin, 1933, Pan-Pacific Entom., vol. 9, p. 22 (2 figs.).
Type locality.—Parismina, Costa Rica.
Range.—Known only from the type locality.

Eurhinocricus sabulosus (Pocock)

Rhinocricus sabulosus Pocock, 1894, Journ. Linnean Soc. London (Zool. Ser.), vol. 24, p. 504, pl. 38, fig. 12.
Type locality.—Mandeville, Manchester Parish, Jamaica.
Range.—Central and eastern parishes of Jamaica, along the southern half of the island.

Eurhinocricus solitarius (Pocock)

Rhinocricus solitarius Pocock, 1894, Journ. Linnean Soc. London, (Zool. Ser.), vol. 24, p. 496, pl. 38, fig. 6.
Type locality.—Jamaica.
Range.—Not known with certainty; probably the central parishes of Jamaica.

Eurhinocricus storkani Verhoeff

Eurhinocricus storkani Verhoeff, 1937, Zool. Anz., vol. 118, p. 98.
Type locality.—Manzanillo [Colima?] Mexico.
Range.—Known only from the type locality.

Eurhinocricus townsendi (Pocock)

Rhinocricus townsendi Pocock, 1894, Journ. Linnean Soc. London, (Zool. Ser.), vol. 24, p. 505.
Type locality.—Jamaica.
Range.—North coast of Jamaica; Westmoreland, St. Mary, St. Ann, and Portland parishes.

Eurhinocricus williamsi (Chamberlin)

Rhinocricus williamsi Chamberlin, 1940, Bull. Univ. Utah, Biol. Ser. vol. 5, no. 6, p. 15.
Type locality.—Barro Colorado Island, C. Z., Panama.
Range.—Known only from the type locality.
Remarks.—This may prove to be a synonym of *E. insulatus*, which was also described from Barro Colorado Island. However, the gonopods of neither form have been illustrated, and assumption of their specific identify seems premature at this time.

Hoffman, Richard L. 1955. "Studies on spiroboloid millipeds. II. A second paper on the genus Eurhinocricus." *Proceedings of the Biological Society of Washington* 68, 31–35.

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