

DISTRIBUTION AND SPECIES DIVERSITY OF *RHINODRILUS* PERRIER, 1872 (ANNELIDA, CLITELLATA, LUMBRICINA, GLOSSOSCOLECIDAE) IN SOUTH AMERICA

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ABSTRACT

A review of the terrestrial megadrile Glossoscolecidae of the genus *Rhinodrilus* produced 44 nominal taxa (species and subspecies) reported to date from South America. Gilberto Righi described 25 of these species-level taxa as new. Fourty two species are endemic to the South American continent. Only two species are found also in the Caribbean. Full synonyms and detailed South American occurrences are provided. This is the first assessment of the South American species and subspecies of *Rhinodrilus*.

Righi (1971a: 95) positioned *Rhinodrilus* Perrier, 1872 at the base of his group 'two-b', characterized by the presence of tubular calciferous glands.

Rhinodrilus fafner Michaelsen, 1918, a South American giant of the family Glossoscolecidae, can measure more than two meters in length and 24 mm in width (Stephenson 1930). This can be contrasted with the almost three meters attained by the largest of all earthworms, the megascolecid *Megascolides australis* McCoy, 1878, from Australia (Stephenson, 1930).

In this paper I provide a literature compilation of all species of *Rhinodrilus* cited to date from South America. Synonyms are established according to the latest taxonomic reviser. The largest number of species and subspecies (25) have been described by the late Gilberto Righi.

MATERIAL AND METHODS

I have used 3-letter abbreviations for South American countries (ARG, Argentina;

BOL, Bolivia; BRA, Brazil; COL, Colombia; GUI, French Guyana; PER, Peru; VEN, Venezuela) and 2-letter abbreviations for sampled States in Brazil (AM, Amazonas; AP, Amapá; BA, Bahia; CE, Ceará; DF, Distrito Federal; ES, Espírito Santo; GO, Goiás; MG, Minas Gerais; MT, Mato Grosso; PA, Pará; PE, Pernambuco; PR, Paraná; RJ, Rio de Janeiro; RO, Rondônia; RR, Roraima; SE, Sergipe; SP, São Paulo; TO, Tocantins).

RESULTS

Species marked with an asterisk (*) are previously only reported from South America.

LUMBRICINA De Blainville, 1830
Syn: Terricolae Örsted, 1850; Megadrili Benham, 1890; Diplotesticulata Yamaguchi, 1953; Crassiclitellata Jamieson, 1988

- GLOSSOSCOLECOIDEA Michaelsen, 1900
- GLOSSOSCOLECIDAE Michaelsen, 1900
- Rhinodrilus* Perrier, 1872
Type: *R. paradoxus* Perrier, 1872
Syn: *Aicodrilus* Righi, 1971 (Type: *A. panxin* Righi, 1971)
- 1* *R. adela* Cordero, 1943
Distr: BRA: CE: Acarapé do Meio reservoir (Cordero 1943: 1).
- 2* *R. alatus* Righi, 1971
Distr: BRA: MG: Sete Lagoas; Paraopeba (Righi 1971a: 10).
- 3* *R. annulatus* Cernosvitov, 1934
Distr: BRA: AP: Upper Calçoene river (Cernosvitov 1934: 54; 1935: 23).
- 4* *R. appuni appuni* (Michaelsen, 1892)
Syn: *Anteus appuni* Michaelsen, 1892; *Tykonus appuni* (Michaelsen, 1892); *R. paradoxus appuni* (Michaelsen, 1892); *Anteus callichaetus* var. *maussi* (part), Michaelsen, 1895; *R. (R.) paradoxus* (part), Cognetti, 1906 (non E. Perrier, 1872).
Distr: VEN: Carabobo State: Puerto Cabello (Michaelsen 1892: 220).
- 5* *R. appuni pavoni* Righi & Araújo, 1999
Distr: VEN: Amazonas State: Puerto Ayacucho (Righi & Araújo 1999: 96).
- 6* *R. ayacu* Righi, 1996
Distr: VEN: Amazonas State: Puerto Ayacucho (Righi 1996: 678).
- 7* *R. bursiferus* Righi, 1971
Distr: BRA: AP: Serra do Navio: Jazida do Veado; Middle Amaparí river margins (Righi 1971b: 13).
- 8* *R. contortus* Cernosvitov, 1938
- Distr: VEN: Amazônia (Araújo et al., 2004: 146). BRA (Cernosvitov 1938: 401): AM: Manaus (Zicsi et al. 2001: 158).
- 9* *R. corderoi* Righi, 1985
Syn: *R. fuenzalidae*, Righi, 1984 (non Cordero, 1944).
Distr: VEN: Carabobo State: San Esteban (Righi 1985c: 241); Aragua State: Henri Pittier national park: Rancho Grande (Righi 1984: 246).
- 10* *R. cucho* Righi, 1996
Distr: VEN: Amazonas State: Ayacucho (Righi 1996: 681).
- 11* *R. duseni* Michaelsen, 1918
Distr: BRA: PR (Zicsi & Csuzdi 1999: 123; Sautter et al. 2006: 299): Curitiba (Michaelsen 1918: 190); SP (Brown & James 2006a: 148): Pilar do Sul (Righi 1971a: 16); Itapeva (Righi 1974: 555); MT: Fátima do Sul (Righi 1984b: 101).
- 12* *R. elisianae* Righi, Ayres & Bittencourt, 1976
Distr: BRA: PA: Belém: Benfica; Capitão Poco; Estancia Embrapa (Zicsi & Csuzdi 1999: 131); RO: Espigão d'Oeste; Pimenta Bueno; Cacoal; Presidente Médici; Alvorada do Oeste; Ji-Paraná; Ouro Preto d'Oeste; Jaru; Boa Vista; Ariquemes; Oriente Novo; Porto Velho; Jaciparaná (Righi 1988: 121; 1989a: 288); AM: Sucurundi (Righi et al. 1976: 358).
- 13* *R. evandroi* Righi, 1971
Distr: BRA: DF: Brasília (Righi 1971a: 17).
- 14* *R. fafner* Michaelsen, 1918
Distr: BRA: MG (Michaelsen 1918: 195).
- 15* *R. francisci* Cordero, 1944
Distr: BRA: PE: Floresta Mun: Sabiucá (Cordero 1944: 1).
- 16* *R. fuenzalidae* Cordero, 1944

Syn: (non Righi, 1984 = *R. corderoi*).

Distr: VEN: Federal District: Miranda State: El Guayabo, near Caracas (Cordero 1944: 1).

17*. *R. garbei cubanus* Righi, 1984

Distr: BRA: MT: Cuiabá (Righi 1984b: 101).

18*. *R. garbei garbei* Michaelsen, 1926

Distr: BRA: SP (Lüderwaldt 1927: 545; Brown & James 2006a: 148): Botucatu; MG: Pirapora (Michaelsen 1926: 274).

19*. *R. hoeflingae* Righi, 1980

Distr: MG: Caetanópolis: Bonanza and Vargem Grande farms; Macacos waterfall: Pedra Branca farm (Righi 1980: 7).

20*. *R. horsti* (Beddard, 1892)

Syn: *Anteus gigas*, Horst, 1891; *Anteus horsti* Beddard, 1892; *R. (R.) horsti* (Beddard, 1892); *R. ?horsti*, Righi, 1985.

Distr: BRA (Horst 1891: 77).

21*. *R. jucundus* Righi, 1985

Distr: GO: Brasília-Belém highway, km 30: north of Paraíso do Norte (Righi 1985: 241).

22*. *R. lakei* Michaelsen, 1934

Distr: VEN: Bolivar (Lavelle & Lapied 2003: 423). BRA: AM: Manaus; RR: Upper Catrimani river, an affleunt of Negro river (Michaelsen 1934: 9)

23*. *R. lavellei* Righi, 1992

Distr: PER (Righi 1992: 1225); Amazonia (Fragoso et al. 1997: 23).

24*. *R. longus* Cernosvitov, 1934

Distr: GUI: Mornes du bas Mahury. BRA (Cernosvitov 1935: 21): AP: Lower Calçoene river (Cernosvitov 1934: 54).

25*. *R. lourdesae* Righi, 1989

Distr: BRA: RO: Jaru-Ouro Preto do Oeste highway, km 23 (Righi 1989a: 289).

26*. *R. lucilleae* Righi, Ayres & Bittencourt, 1976

Distr: BRA: AM: Sucurundi (Righi et al. 1976: 354).

27*. *R. mamita* Cordero, 1943

Distr: BRA: CE: Maranguape (Cordero 1943: 3).

28*. *R. marcusae* Righi, 1985

Distr: BRA: BA: Porto da Mandioca, above Bananeiras; Paraguaçu river margins (Righi 1985: 244).

29*. *R. mortis* Righi, 1972

Distr: MT: São João da Serra Mun: Cuiabá-Rondonópolis highway, km 103: Mortes river margins (Righi 1972: 157).

30*. *R. motucu* Righi, 1971

Syn: *R. motucu unais* Righi, 1971; *R. motucu cuiabanus* Righi, 1984.

Distr: BRA: GO: Porangatú; TO: northeast of Uruaçu: Tocantins river margins (Righi 1971a: 21); MT: Cuiabá; Poconé (Righi 1984a: 243); BA: Uma; Itagiba (Righi 1971a: 21); SE: Umbaúba (Righi 1985: 243).

31*. *R. mucuba* Righi & Araújo, 2000

Distr: VEN: Andes (Righi & Araújo 2000: 115).

32*. *R. panxin* (Righi, 1971)

Syn: *Aicodrillus panxin* Righi, 1971.

Distr: BRA: GO: Porangatú; Porangatú-Alvorada highway, km 30 (Righi 1971a: 67); PA: Marabá; Geladinho: São João do Araguaia (Righi 1974: 555).

33. *R. paradoxus* Perrier, 1872

Syn: *Anteus paradoxus* (Perrier, 1872); *R. (R.) paradoxus* Perrier, 1872; *Anteus callichaetus* Michaelsen, 1892; *R. callichaetus* (Michaelsen, 1892); *Anteus callichaetus* var. *maussi* (part), Michaelsen,

1895; non *R. paradoxus appuni* (Michaelsen, 1892) = *R. appuni*).

Distr: COL: VEN: Federal District (Perrier 1872: 66); Carabobo State: Puerto Cabello (Michaelsen 1895: 24); El Junquito (Omodeo 1954: 202); Tovar colony: Cruz Verde; El Jarillo (Righi 1989b: 1067). GUI. BRA: AM: Between São Felipe and São Gabriel: Upper Negro river (Michaelsen 1928: 1).

Furth. Distr: Caribbean (Righi 1990: 46).

34*. *R. parvus* (Rosa, 1895)

Syn: *Anteus parvus* Rosa, 1895; *R. (Rhinodrilus) parvus* (Rosa, 1895).

Distr: ARG: Chaco Prov: Resistencia (Rosa 1895: 2). BOL: Quijarro Prov: Potosi Dep: Caiza (Cognetti 1902: 4).

35*. *R. pashanasi* Righi, 1992

Distr: PER (Righi 1992: 1227); Amazonia (Fragoso et al. 1997: 23).

36*. *R. pitun* Righi & Ferrer de Moraes, 1990

Distr: BRA: PE: Vitória de Santo Antão (Righi & Ferrer de Moraes 1990: 519).

37*. *R. priolii* Righi, 1967

Distr: BRA: AM: Manaus (Righi 1967: 475; Römcke et al. 1999: 520).

38*. *R. romani* Michaelsen, 1928

Distr: BRA: AM: Between São Felipe and São Gabriel: Upper Negro river (Michaelsen 1928: 1).

39*. *R. senckenbergi* Michaelsen, 1931

Distr: BRA: ES: Doce river (Michaelsen 1931: 83).

40*. *R. senex* Righi, 1984

Distr: VEN: Aragua State: Henri Pittier national park: Rancho Grande; Mount Guacamaia; Portachuello (Righi 1984a: 244); Tovar colony: El Jarillo (Righi 1989b: 1067).

41*. *R. sibateensis* (Michaelsen, 1900)

Syn: *Anteus sibateensis* Michaelsen, 1900; *R. (R.) sibateensis* (Michaelsen, 1900).

Distr: COL: Cundinamarca Dep: Bogotá; Sibaté, near Fusagasuga (Michaelsen 1900: 250).

42. *R. sieversi* (Michaelsen, 1895)

Syn: *Anteus callichaetus* var. *sieversi* Michaelsen, 1895; *R. paradoxus appuni* (part), Michaelsen, 1900 (non Michaelsen, 1892); *R. (R.) paradoxus* (E. Perrier, 1872).

Distr: VEN: Carabobo State: Puerto Cabello (Michaelsen 1895: 23).

Futh. Distr: Trinidad (Michaelsen 1935: 52).

43*. *R. timote* Righi, 1989

Distr: VEN: Aragua State: Henri Pittier national park: Rancho Grande: Mount Guacamaia; Portachuello (Righi 1989b: 1077).

44*. *R. xeabaibus* Righi, 1969

Distr: BRA: RJ: Itatiaia national park: Maromba (Righi 1969: 155).

DISCUSSION

Forty four exclusively tropical South American species and subspecies were cited up to date. Only 2 of these species have ranges that extend into the northern neotropical region: *R. paradoxus*, in the Caribbean (Righi 1990: 4), and *R. sieversi*, in Trinidad (Michaelsen 1935: 52).

This represents the first attempt to summarize our knowledge of a neglected group of earthworms, *Rhinodrilus*, in a megadiverse and faunistically least known continent, South America.

ACKNOWLEDGEMENTS

A continuous scholarship from CNPq permitted the planning and financial support for this research. Two anonymous

reviewers are thanked for providing suggestions that improved this contribution.

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