

**The first recorded earthworms from Burkina Faso
with description of a new species
(Oligochaeta: Eudrilidae, Acanthodrilidae)**

by

Cs. Csuzdi

(Received July 5, 1999)

Abstract. The first recorded earthworms from Burkina Faso are presented. Besides the species *Millsonia inermis* (Michaelsen, 1892) and *Legonea rapta* Sims, 1964 a further earthworm *Legonea derouardi* sp. nov. is described.

Keywords: Burkina Faso, *Legonea*, new species

Introduction

The earthworm fauna of West Africa has intensively been investigated since the beginning of this century (Michaelsen 1912, 1914a, b, Omodeo 1955, 1958; Omodeo & Vaillaud 1967; Sims 1965, 1986, Zicsi & Csuzdi 1986, Csuzdi 1995). The investigations were concentrated — mainly for historical reasons — on the countries of the Gulf of Guinea. Almost no earthworm records are present from the inner West-African territories such as Mali, Burkina Faso and Niger notwithstanding that the southernmost parts of these countries possess a similar climate to that of the most investigated lands, Ghana and Ivory Coast.

In 1995 I received a small sample of earthworms from a fellow of IRD (Orstom) (Dakar, Senegal), which was collected in Burkina Faso. The material consisted of three species belonging to genera *Millsonia* (Acanthodrilidae) and *Legonea* (Eudrilidae). Of the three species *M. inermis* is widely distributed in Togo and Ghana. *Legonea rapta* Sims, 1964 was previously known only from the type locality, Jangebunga, south-eastern Ghana and the third one represents a new species.

Taxonomy

Acanthodrilidae Claus, 1880

Benhamiinae Michaelsen, 1897

Millsonia Beddard, 1894

Millsonia Beddard 1894: 380

Dichogaster (part.): Michaelsen, 1900: 334

Millsonia: Omodeo, 1955: 218; Sims, 1986: 277; Csuzdi, 1996: 360.

Millsonia inermis (Michaelsen, 1892)

Benhamia inermis Michaelsen, 1892: 209.

Dichogaster inermis: Michaelsen, 1900: 366; Michaelsen, 1912: 28; Michaelsen, 1937: 501.

Millsonia inermis: Omodeo, 1958: 59; Sims, 1965: 299; Sims, 1986: 293.

Locality: AF/3805 4 Ex. Burkina Faso, Sobaka, Koukalanasse, 200 km south from the capital Ouagadougou. Leg. L. Derouard, 16.X.1995.

Considering that this is the most variable species of the genus *Millsonia* a short description is given here.

External characters. Length 120–170 mm, diameter 5–7 mm. 310–321 segments, anteriorly triannulate. First dorsal pore 11/12. Clitellum saddle shaped, on segments 1/2 12–19. Female pores on segment 14 paired, between *ab*, located somewhat anteriorly to the setal ring. Prostate pores paired, open in the edges of a quadrate-shaped invagination (male field) on 17–19. Spermathecal pores paired in furrows 7/8–8/9, somewhat lateral to the setal line *b*. Paired papillae present on the posterior part of segments 9, 10, 11, 15, 16. Unpaired glandular pads mid-ventral, usually on segments 24–38.

Internal characters. Septa 5/6–9/10 greatly thickened, 10/11–11/12 less so. Gizzards in 5. and 6. segments, strongly muscularized and of equal size. Last hearts in 13. Calciferous glands in 15–17., the first pair is small. Intestinal caeca 14 pairs, in segments 27–40. Meronephridia 10 pairs, with a pair of caudal megameronephridia.

Racemose vesiculae seminalis present in segments 11–12. Prostates paired in 17 and 19, highly convoluted. Penial setae absent. Spermathecae in segment 8 and 9; the duct short with numerous sperm-chambers in the wall. Ampulla elongated sac-shaped.

Eudrilidae Claus, 1880***Legonea*** Clausen, 1963

Legonea Clausen, 1963: 301; Sims, 1964: 591.

Legonea rapta Sims, 1964

Legonea rapta Sims, 1964: 601.

Locality: AF/3803 2 Ex. Burkina Faso, Sobaka, Koukalanasse, 200 km south from the capital Ouagadougou. Leg. L. Derouard, 16.X.1995.

External characters. Length 110 mm, diameter 5 mm, 230 segments. Colour reddish-brown, on dorsal side intensively expressed. Dorsal pores absent. Clitellum annular, on 1/2 14, 15–17. segments. Male pore single median ventral in intersegmental furrow 17/18 with everted horn-shaped copulatory appendages (Fig. 1). Porophores absent. Female pores on small papillae, paired on the posterior margin of segment 14, in line with the nephridiopores. Spermathecal pore single, on a mid-ventral papilla in intersegmental furrow 12/13. Nephridiopores between setal lines *c*–*d*.

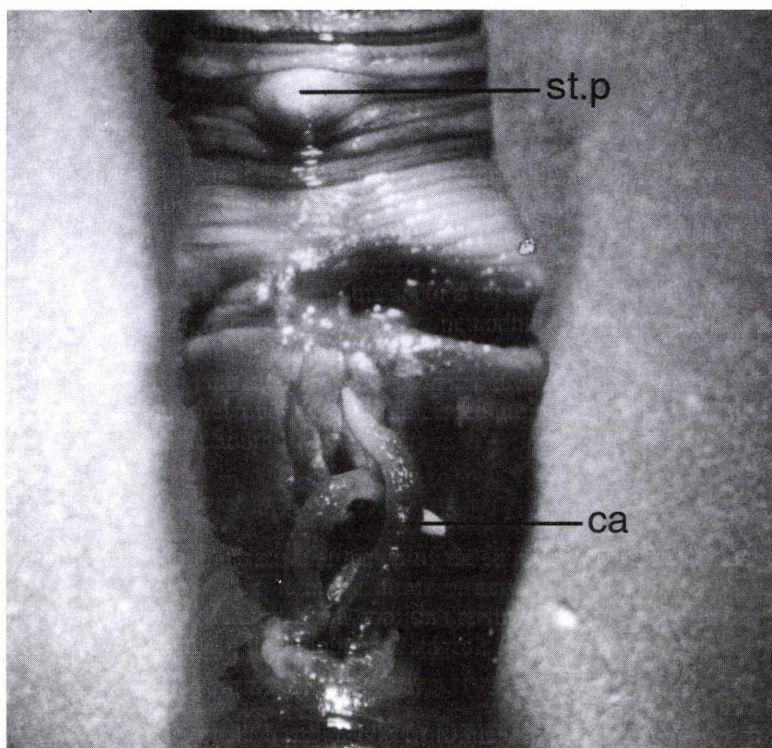


Fig. 1. *Legonea rapta* Sims, 1964 Ventral view of the clitellar segments.
st.p = spermathecal pore; ca = copulatory appendages everted

Internal characters. Oesophageal gizzard in 5, intestinal gizzards in 19–26, 8 pairs. As septum 13/14 absent, the exact location of the calciferous gland could not be determined. It might equally be in segment 13, as well as in 14.

Testes paired in 10 and 11 enclosed in U-shaped sperm-reservoirs. Spermathecal receptaculum single, supra intestinal, circumoesophageal duct (Verbindungsslauch) present. Euprostates paired, flexed into U-form, ectally taper into slender ducts and communicate with the thick penis sheath (Sims, 1964 p. 602, Fig. 5).

Remarks: Our specimens conform to the original description, apart from their smaller size and the number of intestinal gizzards. The long distance between the two known localities suggests a wider, but unsampled distribution of this species.

Legonea derouardi sp. nov.

Locality: Holotype; AF/3805 Burkina Faso, Sobaka, Koukalanasse, 200 km south from the capital Ouagadougou. Leg. L. Derouard, 16.X.1995. Paratypes; AF/3970 2 +4 Ex. Locality same as that of the holotype.

External characters. Holotype. Length 85 mm, diameter 4 mm, 171 segments. Paratypes 70–90 mm in length, 3.5–4 mm in diameter, 176–216 segments. Colour dark violet above, paler below. Prostomium prolobous, dorsal pores absent. Setal arrangement eudriline, on segment 22, aa:ab:bc:cd:dd = 3.7:2.7:3.3:1:17

Clitellum annular, on segments 15–17. Male pore single, median ventral in intersegmental furrow 17/18 (Fig. 2). Porophores absent. Female pores on small papillae, paired on the posterior margin of segment 14, in line with the nephridiopores. Spermathecal pore single, on a mid-ventral papilla on the frontal edge of segment 13. Nephridiopores between setal lines *c* and *d*, near anterior margins of the segments.

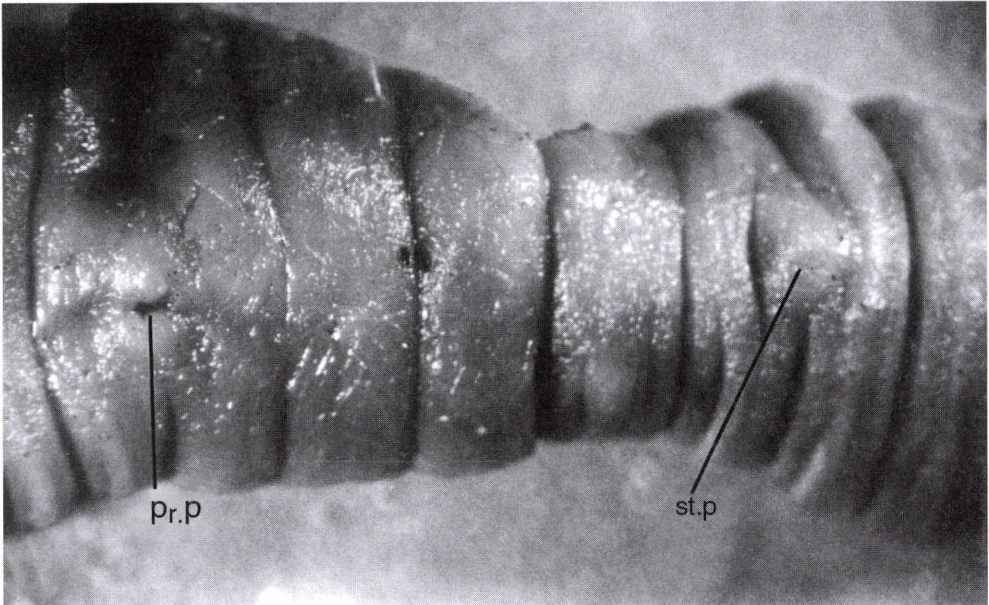


Fig. 2. *Legonea derouardi* sp. nov. Ventral view of the clitellar segments.
pr. p = prostata pore; st.p = spermathecal pore

Internal characters. Septa 5/6 muscular, 6/7–11/12 thickened, 13/14 missing. Oesophageal gizzard in 5, intestinal gizzards in 19–24, 6 pairs. Typhlosole is very small, almost lacking. Unpaired oesophageal glands are present in 9, 10, 11. A pair of calciferous glands located in the fused cavity of segments 13 and 14. Hearts in segments 6–11. Holonephridial. One pair of nephridia in each segment, nephridial sac biarmous (Fig. 3).

Holoandric. Testes paired in 10 and 11, each enclosed in an ectally convoluted sperm-reservoir (Fig. 4). Seminal vesicles paired in 11, 12. Spermathecal system complex. A ring-shaped coelomic sac (Verbindungsslauch) with a supra-intestinal diverticulum (Fig. 5) encircles the oesophagus in the cavity of segments 13–14, and communicates ventro-medially with the muscular spermathecal atrium. The ovaries are paired and situated laterally to the spermathecal atrium in 13. Each ovary is enclosed in an ovarian vesicle from which

the ovarian duct passes into an ovisac. The ental part of this ovisac forms a bursa propulsoria, which medially communicates with the ring-shaped coelomic sac, while laterally opens into the female pores on the postero-lateral part of segment 14 (Fig. 6).

Euprostates paired, somewhat flexed, ectally taper into slender ducts and communicate with the ental end of the thick penis sheath, bearing a rounded penial chamber (Fig. 7). Within the penial chamber a pair of small copulatory appendages arises from the ventral surface (Fig. 8).

The new species is most closely related to the other penis bearing species; *L. rapta* Sims, 1964, however differs in the position of the spermathecal pore, the shape of the copulatory appendages, the shape of sperm reservoirs and in size.

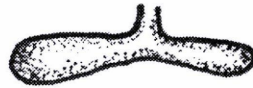


Fig. 3. *Legonea derouardi* sp. nov. Nephridial vesicle



Fig. 4. *Legonea derouardi* sp. nov. Sperm reservoir

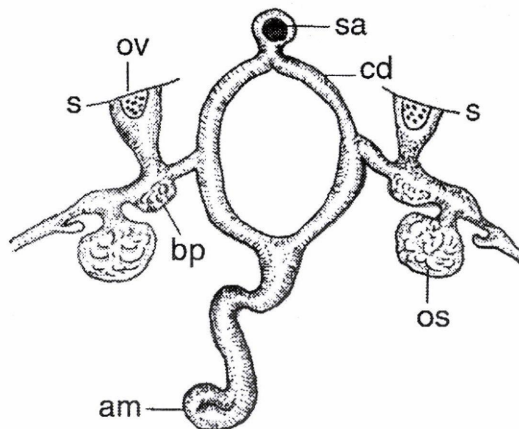


Fig. 5. *Legonea derouardi* sp. nov. Theco-ovarian system. s = septum 12/13; ov = ovarium; sa = spermathecal atrium; cd = circumoesophageal duct; os = ovisac; bp = bursa propulsoria; am = spermathecal ampulla

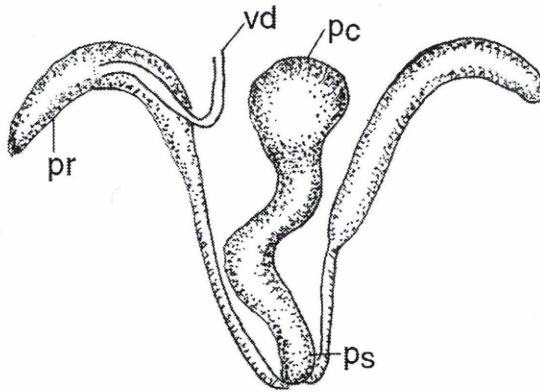


Fig. 6. *Legonea derouardi* sp. nov. Posterior male organ. pr = prostata; vd = vas deferens; ps = penial sheath; pc = penial chamber

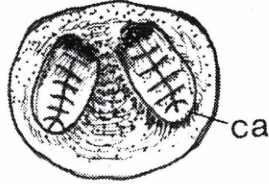


Fig. 7. *Legonea derouardi* sp. nov. Cross section of the penial chamber. ca = copulatory appendages



Fig. 8. *Legonea derouardi* sp. nov. Spermatechal ampulla

Acknowledgements

My thanks are due to Mr. Laurent Derouard IRD (Orstom) Bondy-Dakar, for collecting and sending me this small earthworm sample from Burkina Faso.

References

- Beddard, F.E. (1894): On two new genera, comprising three new species of earthworms from western tropical Africa. — *Proc. zool. Soc. Lond.* **1894**: 379–390.
- Clausen, M.W. (1963): Two new genera and three new species of *Eudrilinae* earthworms from West-Africa. — *Vidensk. Meddr Dansk naturhist. Foren* **126**: 301–315.
- Csuzdi, Cs. (1995): Neue und wenig bekannte Regenwürmer aus Senegal und Sierra Leone (*Oligochaeta*, *Acanthodrilidae*: *Benhamiinae*). — *Opusc. zool. Bpest* **27-28**: 25–40.
- Csuzdi, Cs. (1996): Revision der Unterfamilie *Benhamiinae* Michaelsen, 1897 (*Oligochaeta*: *Acanthodrilidae*). — *Mitt. zool. Mus. Berl.* **72**: 347–367.
- Michaelsen, W. (1892): Terricolen der Berliner Zoologischen Sammlung II. — *Arch. Naturgesch.* **1**: 1–53.
- Michaelsen, W. (1900): *Oligochaeta*. — *Das Tierreich* **10**: 1–575.
- Michaelsen, W. (1912): *Oligochäten vom tropischen und südlich-subtropischen Afrika I.* — *Zool. Stuttgart* **26**: 139–170.
- Michaelsen, W. (1914a): *Oligochäten vom tropischen Afrika.* — *Mitt. naturh. Mus. Hamb.* **31**: 81–127.
- Michaelsen, W. (1914b): *Oligochäten aus dem tropischen Westafrika gesammelt von Prof. Dr. F. Silvestri.* — *Boll. Lab. Zool. gen. agr. Portici* **9**: 171–185.
- Michaelsen, W. (1937): On a Collection of African *Oligochaeta* in the British Museum. — *Proc. zool. Soc. Lond.* **107**: 501–528.
- Omodeo, P. (1955): *Eudrilinae e Octochaetinae della Costa d'Avorio (Oligochaeta).* — *Mem. Mus. natn. Verona* **4**: 213–229.
- Omodeo, P. (1958): La reserve naturelle integrale du Mont Nimba. I. *Oligochetes.* — *Mem. Inst. fr. Afr. noire* **53**: 9–109.
- Omodeo, P. & Vaillaud, M. (1967): Les oligochètes de la savane Gpakobo en Cote-d'Ivoire. — *Bull. Inst. fr. Afr. noire ser. A.* **29/3**: 925–944.
- Sims, R. W. (1964): Internal fertilization and the functional relationship of the female and the spermathecal systems in new earthworms from Ghana (*Eudrilidae*: *Oligochaeta*). — *Proc. zool. Soc. Lond.* **143/4**: 587–608.
- Sims, R. W. (1965): *Acanthodrilidae and Eudrilidae (Oligochaeta) from Ghana.* — *Bull. Br. Mus. nat. Hist. (Zool.)* **12/8**: 285–311.
- Sims, R. W. (1986): Revision of the western African earthworm genus *Millsonia* (*Octochaetidae*: *Oligochaeta*) with notes on two new species of the genus *Agastrodrilus* (*Octochaetidae*) from Ghana. — *Bull. Br. Mus. nat. Hist. (Zool.)* **50/5**: 273–313.
- Zicsi, A. & Csuzdi, Cs. (1986): Neue *Eminoscolex*-Arten aus dem Kongo-Gebiet (*Oligochaeta*: *Eudrilidae*). — *Acta zool. hung.* **32(1-2)**: 181–205.

Author's address: Dr. Csaba Csuzdi

Systematic Zoology Research Group of the Hungarian Academy of Sciences at the Department of Systematic Zoology and Ecology, Eötvös Loránd University H-1445 Budapest. Pf. 330, Hungary
E-mail: csuzdi@cerberus.elte.hu