Description of a mysterious new lumbricid from Tasmania

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Several years ago an apparently unique and unusual species was unearthed in a Tasmanian forest that initially appeared intermediate between families Criodrilidae and Lumbricidae and for which no match is yet found. Closest relationship is perhaps to criodrilids *Criodrilus* Hoffmeister, 1845 and *Drilocrius* Michaelsen, 1917 or, more likely, to lumbricids *Helodrilus* Hoffmeister, 1845 and *Eophila* Rosa, 1893. A formal name, *Eophila eti* sp. nov., and description are given in anticipation that some light can be cast on its true identity and that its provisional placement at species, genus, and family levels can be resolved. This taxon brings total earthworms from the island state of Tasmania to 230 species, with 27 non-endemic taxa including the current one.

INTRODUCTION

An apparently unique and unusual species was unearthed in a Tasmanian forest that appeared intermediate between several genera and families such as the Criodrilidae and Lumbricidae. No matching description was found in extensive searches of the literature, thus a provisional name and description are given in the hope that more light may eventually be cast on its identity and allow its correct placement at species, genus, and family levels. Addition of this taxon brings to 230 the number of earthworm species now known from Tasmania (Blakemore, 1999; 2000; 2007) comprising: 202 natives in 25 genera, 1 neo-endemic species (from Sub-Antarctic Macquarie Island), 24 exotic species and 3 translocated mainland species. The current species is assumed to be introduced and is included with the non-endemic exotics.

MATERIAL AND METHODS

Taxonomic description and format conforms to that presented by Blakemore (2000; 2002) and complies with ICZN (1999). Representative specimens are sketched using a camera lucida in the author's usual style. Discussion is confined to Remarks following the species description below. Types are housed in the Queen Victoria Museum and Art Gallery (QVM), Launceston, Tasmania.

TAXONOMIC RESULTS AND CONCLUSION

Eophila eti sp. nov.

[Fig. 1].

[Fig. 2].

Material examined: Dalgarth Forest Reserve, north Tasmania 41°41'S.146°34'E (Tamar EQ 707-343), 120m asl, 30.vi.1992. Collector R.D. D'Orazio. QVM 14:1494 Holotype, H (75mm long, here figured, dissected and described); other material from same batch – two aclitellate syntypes identified here as S1 (62mm long, dissected) and S2 (80mm long, undissected).

Habitat: woodland "wet sclerophyll to rainforest".

Species from same locality: *Graliophilus praestringor* Blakemore, 2000; *Vesiculodrilus*

oeconomicus Blakemore, 2000; and *Notoscolex dorazioi* Blakemore, 2000 (all natives).

Behaviour: not recorded, but as it is unpigmented and has organic soil in its gut this suggest it is neither a litter species nor a subsoil species, most likely a topsoil dwelling species.

Body length: 62-80mm. Body cylindrical throughout and mostly turgid.

Width: 2mm.

Segments: 140 (H).

Colour: unpigmented or milky white in anterior but after segment 14 the cuticle becomes almost transparent.

Prostomium: open epilobous.

First dorsal pore: 10/11 and possibly rudimentary or minute in 9/10 (H), or 11/12 (S1).

Setae (ratio of aa:ab:bc:cd:dd:U): closely paired in regular rows from 2; (ca. 5:1:2:1:9:0.5?). Several reserve setae in bundles of about 5 in ab and 4 in cd noted in segments 9-11 from internal inspection seen only in H (not in S1). Ventral couples on 16 and 17 within slightly tumid pads.

Nephropores: not found.

Clitellum: ill-defined possibly absent or as faintly saddle-shaped to b-lines from 16 to around 32.

Male pores: not found.

Female pores: not found - minute on 14 or possibly intersegmental in 14/15 (from oviducts).

Spermathecal pores: not found but very small pores appear in c lines in 9/10/11 although nothing corresponds internally.

Genital markings: absent although a pair of small dish-like depressions possibly with a minute central pore lateral of b setae on 15; setae ab on 16 and 17 slightly tumid. No glands or other structures appear internally to correspond with any of these pads.

Cerebral ganglia: paired in 2 with small nerves projecting to prostomium.

Pharyngeal mass: in 3-5.

Septa: 4/5-10/11 only slightly thickened. No septum divides gizzard in 17-18.

Dorsal blood vessel: extra-oesophageal trunks pass to dorsal trunk in 12.

Vascularization: dorsal blood vessel single onto pharangeal mass in 3, supra-oesophageal vessel absent, ventral blood vessel on ventral nerve cord but not connected to it except where they join at septa; commissurals small in 6, large hearts paired in 7-11.

Alimentary canal: large pharyngeal pads internally in 3-4, oesophagus has annular calciferous sacs with wider lip from half 10 and internal striations from 11-12,13, other striations in 14 may mark transition to oesophageal valve; intestinal crop dilated in 15-16; muscular gizzard in 17-18; from about 20 a wide and thick lamellar typhlosole develops.

Nephridia: holoic, nephridia rudimentary in 3-4, from 5 onwards large elongate (sausage-shaped) vesicles from median of ab setal pairs overlie coiled nephridial tubules (perhaps entering body wall ventral of ab setae).

Male organs: holandric; seminal vesicles elongate, saccular posteriorly in 9 and 10, and larger anteriorly in 11 and 12; testes and funnels in 10 and 11 (free?).

Ovaries: in 13, cup shaped and palmate without single egg-strings; funnels posteriorly; a small pair of ovisacs in 14 anteriorly.

Prostates: none.

Spermathecae: none found in 8-10, nor elsewhere in anterior of body.

Gut contents: some grits and woody material but mainly organic soil and debris.

Etymology: "*eti*" genetive abbreviation from *ex terrestris* referring both to its terrestrial rather than aquatic habitat and its obscure but assumed distant homeland.

Remarks: On balance, based on its characters, this species is considered a member of Lumbricidae that is endemic to the holarctic. Although not fully mature, it appears different from the 33 or so exotic cosmopolitan species of that family that are distributed around the world (Blakemore, 1999; 2002). Moreover, it does not clearly fit into current generic definitions (e.g. Michaelsen, 1900; Sims and Gerard, 1985; 1999; Csuzdi and Zicsi, 2003), that apply to similarly immature or to mature specimens, coming perhaps closest to *Eisenia* Malm, 1877, *Helodrilus* Hoffmeiseter, 1845, or *Dendrobaena* Eisen, 1873. It is compared to *Dendrobaena rubidus* (Savigny, 1826) (Fig. 1 vs. Fig. 2) but is provisionally attributed to the ill-defined genus *Eophila* Rosa, 1893 rather than the earlier *Helodrilus* that generally defines species lacking nephridial bladders. Its unique features appear to be the pads in segment 15 that are more usually associated with male pores in this segment in most lumbricids while the arrangement of the calciferous glands and intestinal gizzard are similar to those in *Dendrodrilus rubidus* species-complex. However, the nephridial bladders in *Dendrodrilus* are U- or J-shaped rather than sausage-shaped as in *Eisenia* and in the current species. For these reasons it is considered a unique species, at least amongst the

cosmopolitan lumbricids, and it given a name in anticipation of further specimens providing a fuller description (e.g. of clitellar extent). Although attributed to family Lumbricidae, some characters, such as the reserve setal bundles are unusual, while others appear intermediate with affinities perhaps to the Criodrilidae for *Criodrilus* and *Biwadrilus* as redescribed by Blakemore (2007) or to *Drilocrius* Michaelsen, 1917 (Family Almidae). However species in the families Cridrilidae and Almidae are aquatic and generally lack anterior nephridia and dorsal pores (except in possible synonym *Hydrilus*), and have neither gizzards nor calciferous glands. Confirmation of identity requires further material from the type locality or from abroad.

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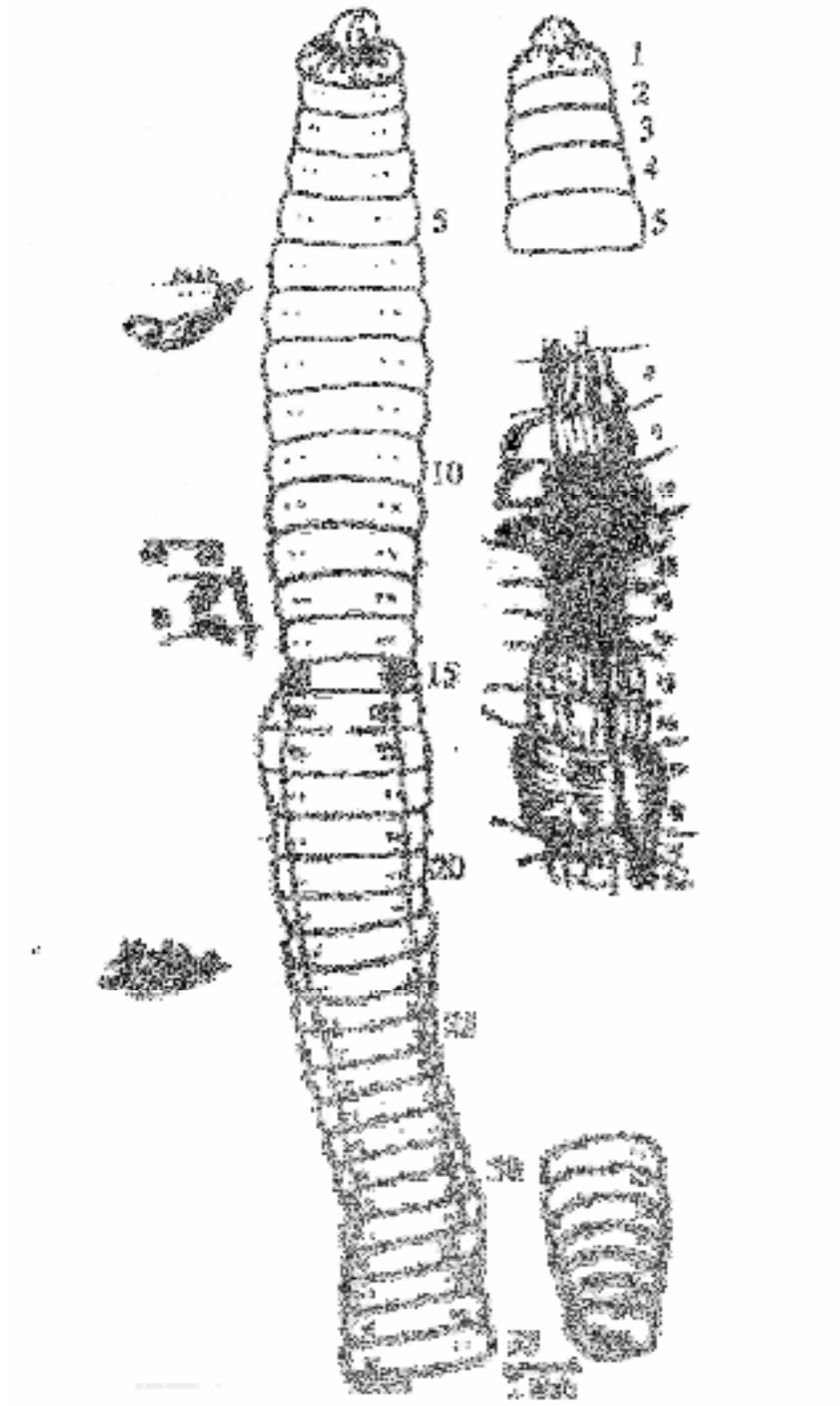

Fig. 1 *Eophila eti* sp. nov. Holotype, aclitellate (subadult?), ventral view of body, with nephridial bladders in 7lhs and 23lhs, ovaries in 13lhs, and gut from calciferous glands to gizzard also showing hearts. Dorsal views are of anterior (prostomium) and posterior (pygidium). Setal ratio on 12 is shown with a,b,c,d convention for setae.

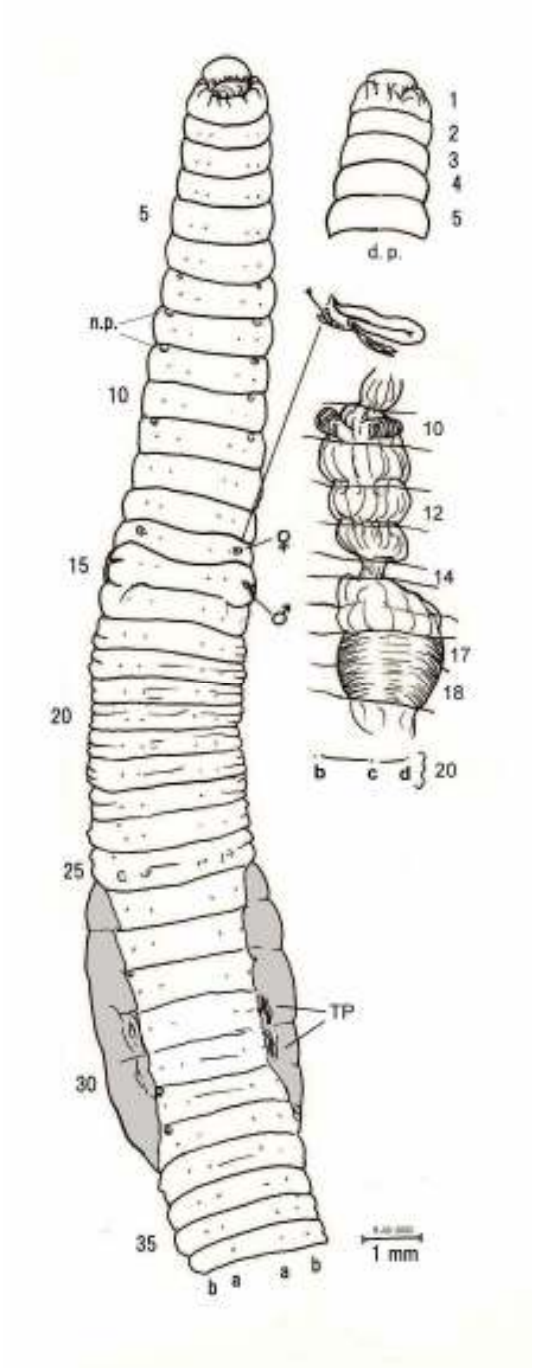

Fig. 2. Compares and differentiates *Dendrodrilus rubidus tenuis* (Eisen, 1874) from Biggles Track, Brothers Point to Green Gorge, Macquarie Island collected 20.x.1997 by R.J.B.; (sketch shows nephridial bladder opening in b lines on 14; gut, from calciferous glands to gizzard; and setal ratio on 20). Clitellum shaded; d.p. - dorsal pore; TP - Tubercula Pubertatis. Note: spermathecae are absent, seminal vesicles in 11-12 only and in life the tip of tail is characteristically yellow.