

Description of a New *Amynthas* Earthworm (Megascolecidae *sensu stricto*) from Thailand

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Abstract *Amynthas siam* sp. nov. is described from an agronomic site in Sakon Nakhon Province, Northeast Thailand. Although it is comparable to cosmopolitan *Metaphire houlleti* (Perrier, 1872) with which it was found, it is thought to be a native, bringing the Thai total to just 31 species. It is only the third wholly endemic earthworm and the first hexathecal *Amynthas* from that country with spermathecal pores in furrow 6/7/8/9, plus it has a pair of sucker-like disks postsetally in 18 median to the male field.

Key words: Pheretimidoids, new species, agricultural trials, Thailand, Southeast Asia.

Introduction

“Siam” had only one species listed by Michaelsen (1900), that was cosmopolitan *Perionyx excavatus* Perrier, 1872, and before Gates started work on the fauna, Thai earthworms were poorly studied. Gates (1939) published a taxonomic summary of information then known of just 27 Thailand earthworms. This was updated and revised by Blakemore (2007a, 2008a, b) to reveal approximately 30 currently recognized species with many more to be expected given the size and terrain of the country (cf. Somniam and Suwanwaree, 2009). The current paper describes a decidedly new species from Sakon Nakhon Province dug from fields in 2009.

Materials and Methods

Specimens were sketched, dissected and described under low power microscope using the techniques and conventions noted in Blakemore (2000, 2002, 2008a). Original preservation methods are not known but specimens are now stored in 80% ethanol (EtOH). Tissue samples were taken and submitted to the International Barcode

of Life Secretariat under protocols of the working group WG1.9 program (see iBOL <http://ibol.org/> for details), where mtDNA extraction, amplification and COI sequencing will be attempted and, if successful, the data will be automatically entered into the BOLD database and to the GenBank online facility [<http://www.ncbi.nlm.nih.gov/genbank/>]. Nomenclature follows ICZN (1999) and discussion is confined to remarks after the species description.

Taxonomic Results

Family **Megascolecidae** Rosa, 1891, *sensu*
Blakemore (2000)

Amynthas siam sp. nov.

(Fig. 1)

Material examined. Holotype (abbreviation: H), NMST-An 422 (mature specimen, lacking tip of tail, here figured and dissected) from Sakon Nakhon Province, NE Thailand from CIRAD agricultural trials. Coll. by Dr Johnny Boyer in July and November, 2009. Paratypes, all with same collection details as for H: Paratype No. 1 (abbreviation: P1) Thailand National Museum

THNMH-An-06337 (mature, dissected and male field figured); Paratype No. 2 (abbreviation: P2), NMST-An 424 (an undissected mature).

Etymology. After the historical name for the Kingdom of Thailand.

External characteristics. Colour only faintly pigmented with white clitellum (in alcohol). Body puckered in anterior to about 10 (H, P1), possibly obscuring markings, but none seen in unpuckered P2 either. Body round, 70+ (H), or 85–90 (Ps) by ca. 3 mm with 73+ (H) or 118 (P2) segments. Prostomium, small epilobous. First dorsal pore in furrow 12/13. Spermathecal pores ca. 0.25 circumference apart in furrows 6/7/8/9. Male pores minute, superficial apparently (from high magnification) on rims of lateral infoldings that bracket segment 18. Genital markings are the distinctly infolded structures inboard of male pores plus, in H and P2, a pair of sucker-like disks postsetally in segment 18 median to the male field (manifestly absent from P1).

Internal morphology. Septa 8/9/10 are aborted around large, muscular gizzard. Spermathecae in segments 7–9 with large spherical ampulla on moderately short duct with ectal diverticulum composed of narrow convoluted stalk and curt iridescent bulb. Male organs as iridescent testes in sac in segments 10 and 11 with seminal vesicles extensive in segments 11 and 12. Prostates multi-lobed glands on muscular ducts that enter infolded male ridge (i.e., no copulatory pouch cf. *M. houletti*). Slight sessile genital glands correspond internally to papillae in H. Ovaries palmate in 13, ovisacs not noted. Last hearts in segment 13. Intestine in segment 15 with simple intestinal caecum from 27 (Fig. 1); pronounced typhlosole not found; gut contains brown soil (perhaps indicating, along with lack of pigmentation, geophagous habits).

Behaviour and ecological associations. Naming a species is the first step in its understanding, and this act also facilitates current CIRAD agricultural trials in Thailand of effects of agricultural practices based on mulch cropping systems on soil macrofauna communities of earthworms, ants and termites. The species under considera-

tion was found below legume *Stylosanthes guanensis* (Aubl.) litter in holes 0–10 cm deep in association with *Metaphire houletti* (specimen NSMT-An 425). A fully illustrated eco-taxonomy of species *M. houletti* is detailed in Blakemore (2002, 2008a).

Remarks. Of the approximately 128 hexathecal pheretimoids with spermathecal pores in segments 6/7/8/9 (Blakemore, 2007b and unpub.) about 69 are *Amyntas* species. In the somewhat defunct classification of Sims and Easton (1972), the current species keys out to the 50 unreconciled members of an informal *Amyntas sieboldi*-group, although this Japanese taxon is now (Easton, 1981) held as *Metaphire sieboldi* (Horst, 1883). Cosmopolitan species with this spermathecal arrangement are *Metaphire houletti* (Perrier, 1872, p. 99), *M. peguana* (Rosa, 1890, p. 113), and *M. bahli* (Gates, 1945, p. 85), that are already reported from Thailand, and *Amyntas hupeiensis* (Michaelsen, 1895, p. 35).

The only previously known endemic pheretimoids from Thailand with spermathecal pores in segments 6/7/8/9 are *Metaphire virgo* (Beddard, 1900, p. 895) from Songkhala State and its erstwhile synonym, *M. perichaeta* (Beddard, 1900, p. 896) from Pattalung State that both lack external genital markings and have long coiled diverticula. *Metaphire virgo* is close to, but perhaps a separate taxon from, both *M. houletti* and from Malaysian *M. perichaeta* [for which Beddard had originally mistaken location of spermathecae in 6–8, rather than 7–9 as found by Stephenson (1932)] that differs in its slender spermathecal diverticulum that is a “coiled mass...” “...in a ball of closely compacted loops.” Gates (1972, p. 222) accepted that *M. virgo* and *M. houletti* comprise several parthenogenetic morphs.

Amyntas carinensis carinensis (Rosa, 1890, p. 107) from Karen Hills, Myanmar (and Laos) has markings paired, usually median to male pores but other elongate and hour-glass shaped genital markings lateral to male pores. Other species known from Laos having simple intestinal caeca, all with provisional new combinations in *Amyntas* from *Pheretima* by Blakemore

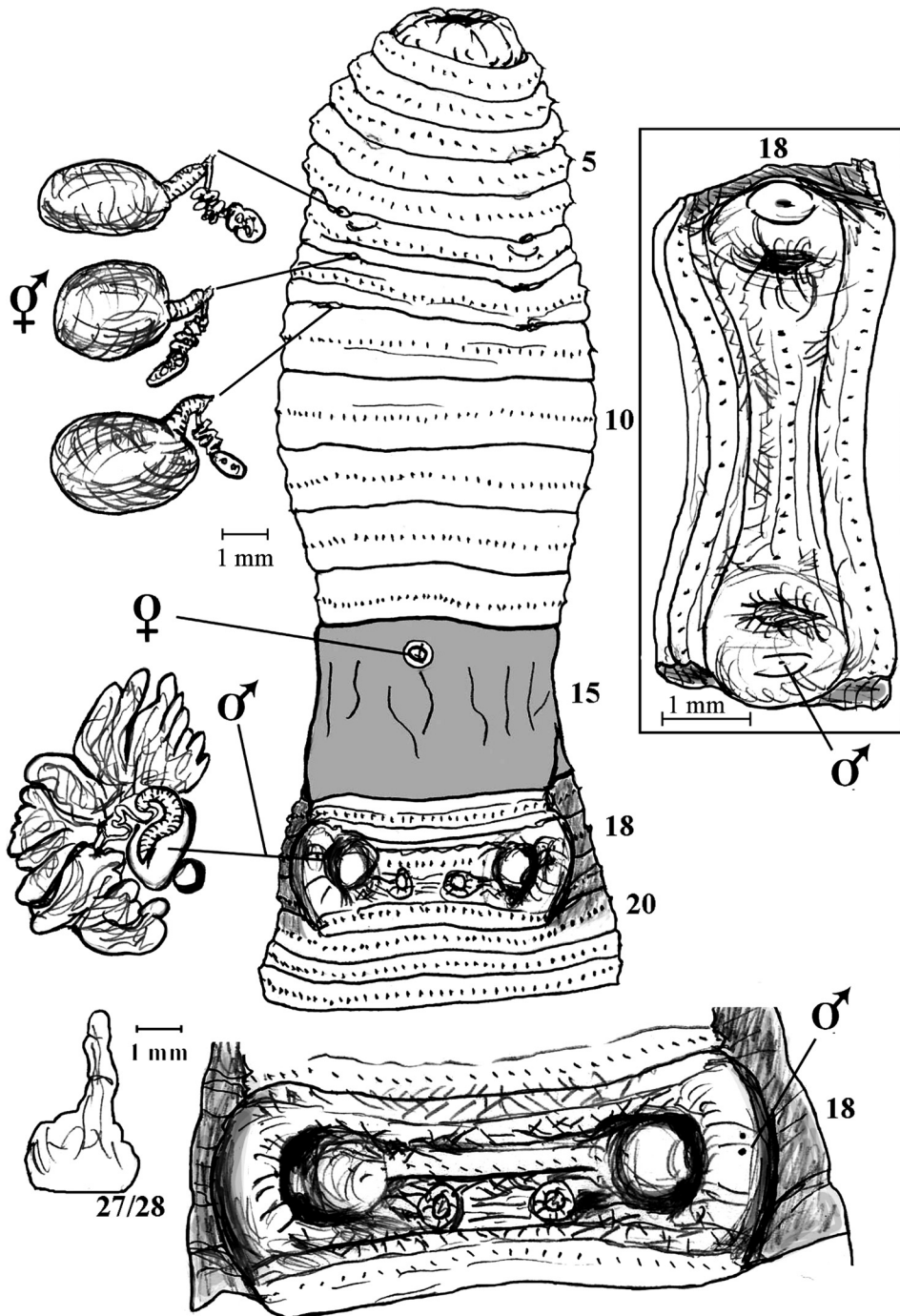


Fig. 1. *Amyntas siam* sp. nov, holotype (NSMT-An 442) anterior showing spermathecae, 18 lhs (left hand side) prostate and intestinal caeca *in situ* with 2X enlargement of male field. [Boxed image is P1 (THNMH-An-06337) male field to same 2X double scale.]

(2007c), are *Amyntas campypapillatus* (Thai and Samphon, 1988) and its sibling species *Amyntas lateropapillatus* (Thai and Samphon, 1988) that have markings on 18 and are both similar to *Amyntas fakhaensis* (Thai and Samphon, 1988) but differ in size and the arrangement of papillae in the male area. Laotian *Amyntas thevedaensis* (Thai and Samphon, 1989, p. 70) has markings that encircle each male pore and are paired pre- and post-setally on segment 17.

Thus, on the information available, it is considered that *Amyntas siam* is a species new to Thailand distinguished by its superficial male pores that appear on the rims of fairly deep pits laterally bracketing the male field, spermathecal pores paired in segments 6/7/8/9, simple intestinal caeca, and an occasional pair of post-setal, sucker-like markings in segment 18. The spermathecal diverticula have convoluted stalks. No stalked genital glands are found internally.

Generic placement of the current taxa mirrors that in a recent papers by Blakemore (2010a) and an earlier paper by Blakemore *et al.* (2007) where it was clearly re-stated that the taxonomic difference between *Amyntas* Kinberg, 1867 and *Metaphire* Sims & Easton, 1972 is the acquisition in the latter of non-superficial male pores as found in its type-species: *Metaphire javanica* (Kinberg, 1867). This contrasts to James *et al.* (2005) who misconstrue generic definition, such that this type would be ineligible for membership of its genus under their scheme. They also falsify their specific placement so that all nine of their proposed taxa were found subsequently to be synonyms by Tsai *et al.* (2006) and Chang *et al.* (2008)—see also Blakemore (2010b).

Further work is now required to survey and reconcile the earthworm faunas of all SouthEast Asia under a classification system that complies with ICZN (1999) Principal of Typification and its stated aim for: “Standards, sense and stability for animal names.” The current paper is a small contribution to this during 2010—UN’s designated International Year of Biodiversity.

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