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Short Communication

Five New Records of Earthworms from Faisalabad, Pakistan

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Earthworms are very important soil creatures as they constitute a large portion of the total biomass of the soil. Although earthworms are well studied organisms all over the world, they are badly neglected creatures in Pakistan. A number of biologists have confirmed the importance of earthworms in soil fertility (Nijhawan & Kanwar, 1952, Guild, 1955, Edwards & Lofty, 1972). It is, therefore, not surprising that the earthworm activities result in increasing the yield of crops. In recent years, Bhatti (1962), Ghafoor *et al.* (1988, 1989), Khatoon (1996) and Noreen (1997) have listed the earthworms fauna of few localities in Pakistan. The present study is based on earthworm collection made during 1995-1996 from Faisalabad and adjoining areas. In the collection, most of the species collected were found to be the same as already reported by Ghafoor *et al.* (1988) from Faisalabad. As a result of this study, five species of earthworms are being reported for the first time from Pakistan.

Collection of earthworms was made during 1995-96 from various habitats such as croplands, grassy lawns, flower gardens, canal banks and forest plantations. The sites of collection were Jinnah Garden, Government College, Gutwala forest and Post-graduate Agricultural Research Station (PARS), Jhang Road, Faisalabad. These specimens were preserved following the method suggested by Stephenson (1923). Determination of the species was made with the help of monographic works by Stephenson (1923).

The five species of earthworms which contribute new records to Pakistan are given below alongwith diagnostic characters of each.

Family : MEGASCOLECIDAE

Genus : *Eutyphoeus* Michaelsen, 1900

1. *Eutyphoeus nepalensis* Michaelsen, 1907

Diagnostic characters. Colour greyish, Clitellum less marked ventrally, Avestibulate and apenile, male pores on thick transversely oval papillae, Dorsal pore from 10/11, Genital markings as paired transversely oval cushions nearly reaching the midventral line, postsetal most consistent on 15/16 usually on 19/20 and 20/21, sometimes unilaterally on 14/15. Female pores paired and each surrounded by a whitish area, First dorsal pore on 10/11, Length 100-160 mm, Diameter 5-7 mm.

Prostomum more or less distinctly taxylobous, Setae moderately large especially the ventral setae of the ante-chitellar region, all widely poured or separated, Lateral intestinal caeca in xxiv. Metandric, Testis sac annular. Seminal chambers in median and lateral rows on the spermathecal duct, at least 2 apertures into the duct lumen on each side. Genital marking glands sessile, interrupting the longitudinal musculature and protuberant into the coelomic cavity.

Distribution : Known only from the type locality, Nepal etc.

2. *Eutyphoeus orientalis* Beddard, 1883

Diagnostic characters. Dorsal pores present behind clitellum, Setae all ventral, Three pairs of genital papillae, intersegmental, in front of the male pores, transversely oval, depressed in the centre, another pair on 18/19, sometimes on 20/2, Female pore on the left side, Length 100-230 mm, Diameter 4-12 mm, 200 segments

Ventral intestinal caeca starts in xxxiv - ixvi. Dorsal blood vessel terminates with hearts of vii. Metandric, Testis sac ventral. Spermathecal diverticula paired, median and lateral. Genital marking glands interrupting the musculature and sessile.

Distribution : Calcutta, Rajshahi, Bengal, etc.

3. *Eutyphoeus scutarius* Michaelsen, 1907

Diagnostic characters. Greyish with violet colour, Avestibulate and apenile. Setae are lacking or invisible, Clitellum ring shaped, Dorsal pores from 11/12 segment, Spermathecal pores are small, transversely slit-like, Female pores just in front rather internal to setae "a" of 14, Spermathecal pores in 7/8 between "b" and "c" setae, Male porophores extend from "b" or slightly median to "b" into mid "bc" and area small, transversely placed, rather indefinitely demarcated areas, smooth, probably shortly elliptical in outline. On each porophore, there is a transversely slit like, rather slight depression within which there can be recognized only the tips or broken ends of the penial setae or the two peni-setal pits. The margin of the slit is very slightly tumescent. Length 130-200 mm. Diameter 6 mm.

Male pore is hexagonal and is located as genital marking on 16/17. Metamaric on 17/18. There is also an appearance of epidermal translucence but not as clearly visible as that on 16/17, the translucent appearance almost lacking midventrally. The intestine begins xv. The testicular coagulum is an a horseshoe shaped mass. The spermathecal duct is fairly long, over 1 mm long.

Distribution : Known only from the type locality, Comillah, Chittagong District, Bengal.

4. *Pheretima elongata* Perrier, 1892

Diagnostic characters. Multithecal, spermathecal pores minute and superficial, in paired groups of 2-4, on or near to 5/6 - 6/7. Male pore minute and invaginate, each pore on a disc shaped porophore on the median wall of a parietal invagination with a crescentic aperture. Genital markings transversely elliptical, presetal, widely paired, on xix - xxiv. Setae : xvii/12-17, xviii/10-15, xix/12-15, 50-66/iii, 67-104/viii, 54-80/xii, 55-75/xx. First dorsal pore on 12/13. Length 80-350 mm. Diameter 3-8 mm. Segments 160-280.

Testis sacs unpaired and annular, spermathecal diverticulum with stalk longer than the ovoidal to ellipsoidal seminal chamber. Genital marking glands sessile.

Distribution : Poona, Bombay, Mockoli, Bhaganamola, Manakoti (Curg), Shimoga (Mysore), Namkhana (Sunderbans) and Calcutta in Bengal. Outside of India: Ceylon, Burma, Siam, Sumatra, Java, Philippines, New Caledonia, Sumber, Salibaboe, Kei, Flores and Hawaiian islands Madagascar, Porta Rico, Haiti, Cuba, Panama, Venezuela, British and Dutch Guiana.

5. *Pheretima taprobanae* Beddard, 1892

Diagnostic characters. Bithecal, spermathecal pores minute and superficial, one pair, on the anterior margin of viii. Male pores minute and superficial, each on an indistinctly demarcated, circular, presetal, paired, on vi-xi and xviii-xxii. Setal circles present on all clitellar segment: viii/34-41, xvii/20-25, xviii/14-19, xix/19-25, 70/v, 77/x. First dorsal pore on 12/13. Length 70-180 mm. Diameter 3-8 mm. Segments 90-150.

Testis sacs unpaired and annular. spermathecal diverticulum with spheroidal to ovoidal seminal chamber and slender muscular stalk. Hearts of x and xiii lacking. Genital markings slight epidermal thickening without internal glands.

Distribution : Trivandrum, Travencore, Ceylon, Madagascar and Brazil.

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