EARTHWORMS OF HEMIS NATIONAL PARK, JAMMU & KASHMIR, INDIA

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INTRODUCTION

Earthworms are distributed in tropical, subtropical and temperate regions of the world. Their presence in soil is primarily dependent on the availability of sufficient soil moisture and organic matter. The earthworms of Jammu & Kashmir have been studied by Stephenson (1922, 1923), Soota and Halder (1980), Sharma and Kaul (1974), Julka (1988), and Paliwal and Julka (2005). However, the trans-Himalayan region of the state remained unexplored for earthworms until recently Julka and Paliwal (in press) reported the occurrence of two species from Cold Desert ecosystem of Ladakh.

Hemis National Park is located (latitude 33°38'-34°11' north to longitude 77°00'-77°44' east) in the trans-Himalayan Cold Desert region of the Jammu & Kashmir. It is characterized by varying climatic conditions from temperate to sub-arctic, with scanty rainfall and sparse vegetation. Soil is sandy having low organic matter and moisture. The present communication deals with the earthworm diversity of Hemis National Park which has not so far been surveyed for earthworms. These species belong to the holarctic family Lumbricidae and occur mostly near human habitation in the Park, indicating their recent introduction in the region possibly due to accidental transportation in soil around roots of plants.

SYSTEMATIC ACCOUNT

Phylum ANNELIDA
Class OLIGOCHAETA
Order HAPLOTAXIDA
Suborder LUMBRICINA
Superfamily LUMBRICOIDEA
Family LUMBRICIDAE
Genus *Allolobophora* Eisen, 1874

1. *Allolobophora parva* Eisen, 1874


Length 25-52 mm, diameter 1.5-2.5 mm, 95-104 segments. Colour reddish on dorsum, venter yellowish. Body cylindrical. Prostomium epilobic, tongue open. First dorsal pore 5/6. Clitellum saddle-shaped, 24-30, rarely extending to 31; tubercula pubertas absent. Setae lumbricine, closely paired, \( aa = 3.18-3.67 \) \( ab = 1.09-1.14 \) \( bc = 2.92-5.0 \) \( cd = 0.31-0.41 \) \( dd \) on 12, \( aa = 2.67-3.82 \) \( ab = 1.14-1.31 \) \( bc = 5.0-6.0 \) \( cd = 0.31-0.47 \) \( dd \) on 36; genital tumescences lacking. Nephridiopores inconspicuous. Male pores minute, paired, at the base of small transverse clefts, located on somewhat circular whitish tumescences, confined to 15, extending laterally to mid \( bc \). Female pores paired, tiny, shortly above \( b \), on setal arc of 14. Spermathecal pores absent.

Pigmented, pigment red. Septa 5/6-12/13 slightly muscular. Typhlosole simple, lamelliform. Nephridial vesicles J-shaped in 14 and anterior segments with curved part directed caudal; U-shaped in 15 and posteriori segement with curved parts directed cephalad; lateral ends of vesicles closed. Holandric; testes and male funnels free, in 10 and 11; seminal vesicles paired, small, in 11 and 12. Spermathecae absent. Atrial glands well developed, reaching above longitudinal muscle layer, extending into 14 and 16; sometimes atrial glands rudimentary.

*Type locality*: Mount Lebanon, New York New England, U.S.A.


*Distribution*: INDIA: Jammu & Kashmir, Himachal Pradesh, Punjab, Uttarakhand, Uttar Pradesh, Bihar, West Bengal, Rajasthan and Tamil Nadu.

*Outside India*: Pakistan, Myanmar, Malay, Indonesia, Tibet, China, Korea, Central Asia, Russia, Kazakhstan, Japan, Afghanistan, Taiiti, Hawaii, Australia, Mauritius, St. Paul, South Africa, South West Africa, Iceland, Denmark, Germany, England, Wales, Portugal, Spain, Switzerland, Italy, Corsica, Rhodes, Hungary, Romania, Bulgaria, St. Helena, U.S.A., Mexico, Guatemala, Costa Rica, Brazil, Argentina.

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Genus *Dendrodrilus* Omodeo, 1956

2. *Dendrodrilus rubidus* (Savigny, 1826)


\[ aa = 1.87-2.35 \quad ab = 0.98-1.17 \quad bc = 1.33-1.69 \quad cd = 0.31-0.37 \quad dd = 0.90-1.20 \quad bc = 1.29-2.26 \quad cd = 0.33-0.42 \quad dd = 0.31-0.37 \]

Genital tumescences incorporating setae a, b on 16, 26-31, rarely on 25, 32. Nephridiopores inconspicuous. Male pores minute, paired, on 15, at the base of transverse clefts, located on somewhat spherical tumescences confined to 15, extending from b to mid bc. Female pores paired, tiny, just lateral to b, on setal arc of 14. Spermathecal pores minute, paired, in 9/10/11, close to c lines.

Pigmented, pigment red. Septa 5/6-12/13 slightly muscular. Typhlosole 20 to 78-97, with a median longitudinal groove on the ventral face. Nephridial vesicles U-shaped like hair pins, lateral ends closed, curved parts directed cephalad. Holandric; testes and male funnels free, in 10 and 11; seminal vesicles paired, in 9, 11, 12. Spermathecae in 9, 10; ampulla medium sized, spheroidal to ovoidal, duct slender, much shorter than ampulla. Glands of tubercula pubertatis, atrium and genital setae present.

*Type locality*: Paris, France.


*Distribution*: INDIA: Jammu & Kashmir, Himachal Pradesh, Uttarakhand, West Bengal, Sikkim, Arunachal Pradesh and Tamil Nadu.

*Outside India*: Pakistan, Bhutan, Manchuria, Korea, Siberia, Kazakhstan, Japan, Hawaii, Juan Fernandez Island, Australasia, New Zealand, Kermadec Islands, Stewart Island, Turkey, Turkestan, South Africa, Southwest Africa, Madagascar, Reunion, St. Paul Island, Kerguelen Island, Europe, Russia, Ukraine, Moldavia, Byelorussia, Crimea, Estonia, Latvia, Lithuania, Channel Islands, Rhodes Island, Azores, Madeira, Canary Islands, Tristan da Cunha, Tierra del Fuego, Falkland Islands, Greenland, Canada, U.S.A., Mexico, Guatemala, Colombia, Ecuador, Brazil, Chile, Argentina, Uruguay.
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