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RESEARCH ARTICLE

NEW RECORD OF THE EARTHWORM SPECIES *ALLOLOBOPHORA CHLOROTICA* (SAVIGNY, 1826) GREEN MORPH IN THE NILGIRI BIOSPHERE RESERVE OF PENINSULAR INDIA

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ABSTRACT

In the present study, the earthworm species *Allolobophora chlorotica* reported for the first time from India in the higher altitudes of Nilgiris part of Western ghats, Peninsular India. The original report of the species is from UK. The species is endogeic in nature and are found in the habitats like wet land as well as wood land. The result was documented and concluded by observing its morphological characters.

Key words:

Earthworm,
Allolobophora chlorotica,
Newrecord Species,
Nilgiri biosphere reserve.

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INTRODUCTION

Earthworms are soft bodied animal which serves as big source for soil biomass. They are divided into three groups such as epigeic, endogeic and anecic. A wide variety of earthworm species have already been reported not only from the study area but from elsewhere in India also Templeton (1844), Bourne (1889), Gates (1972), Julka, (1988). Further, ShyleshChandran et al. (2012), extensively surveyed the Earthworm fauna of Nilgiris biosphere reserve and did not find *Allolobophora chlorotica*. In the present study the earthworms were collected from various parts of Nilgiris. Those earthworms were morphologically studied and they were compared to the previous survey reports. The critical examination of the specimens and comparisons with other references have concluded presence of a new species *Allolobophora chlorotica* which clearly illustrates the first record from the higher altitudes of Nilgiris.

MATERIALS AND METHODS

Study Area

Earthworms were collected at various parts of upper Nilgiris viz., Kandhal with a latitude and longitude of 11°24'32.10"E 76°41'02.91"N (Fig-2), and kulisholai with a latitude and longitude of 11°25'32.57"E 76°40'45.43"N (Fig-3). They were collected following Quadrante method by hand sorting. The earthworms thus collected were grouped as clitellates and non-clitellates (Ishtiyah and Anisa, 2011).

Experimental setup

Those earthworms were cultured in the Laboratory condition, Department of Zoology and Wildlife Biology, Govt. Arts College, Udhagamandalam, Tamilnadu. The culture bed was prepared by soil collected from the site, which is the natural habitat, in the cement cisterns. The culture was maintained by adding water and cow dung repeatedly. The adult earthworms are subjected to morphological studies viz., colour, length, width, total segments, clitellum position, clitellum colour, clitellum shape, position of the genital pore.

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RESULTS AND DISCUSSION

The morphological features of *A. chlorotica* are documented as follows. Length 50-80mm; diameter 3-5mm. It appeared green in colour (Fig-4), thus the earthworm is originally called as green morph. Prostomium is epilobus. Setae is closely paired. Clitellum appeared from segment xxviii to xxxv or xxix to xxxvi; saddle shaped; yellowish green in colour. Genital pores present in 14/15 and 15/16 segments.

morph prefers slightly dry conditions and also in woodland and gardens. The green morph had a cryptic advantage over the pink morph under grass and bare soil (Kalmus *et al.*, 1955; Satchell, 1967; Lowe and Butt, 2008). Lowe and Butt (2007 & 2008) suggested that soil moisture content may act to isolate the two morphs, providing, in extremes, a barrier to inter-morphic mating. Pigmentation in *A. chlorotica* is known to develop with age and it is often impossible to visually determine colour morph until individuals are *chlorotica* was



Fig.1. Location



Map Fig.2. Kanthal



Fig.3. Kulisholai



Fig.4. *Allolobophora Chlorotica* shorted from the site

White glandular papillae is present 14-16 segments. The original distribution of the species is from the UK (Lowe and Butt, 2007 & 2008), Netherlands (Zorn *et al.*, 2005 & 2008), Germany (Kurek *et al.*, 2007), Poland (Homa *et al.*, 2010). After that they were introduced to New Zealand, North and South America and Africa by the Natural History Museum. *A. chlorotica* is an endogeic earthworm distributed widely and found in the horizontal burrows and the habitat was wet land, and rarely come to the surface. *A. chlorotica* is wide spread, found in wet gardens, fields, forests (Roots, 1956; Sims and Gerard, 1999). This species is easy to recognize by its muddy green or yellow colour and sucker-like tubercula pubertalis (King *et al.*, 2006). The earthworm species *A. chlorotica* lies in the endogeic groups (Savigny, 1826) are continuously burrowing through and eating from mineral soils (Zorn *et al.*, 2008), also exists as two colour morphs *viz.*, green morph and pink morph determined respectively by the presence or absence of a bilin pigment (Sims and Gerard, 1999). The green morph is dominant in wet conditions and grass lands While the pink

tolerant to water, although the worms tended to escape from flooded soil. They were present in flood plain systems, sometimes at high densities (Zorn *et al.*, 2008).

The higher altitudes of Nilgiri District where the species of Green morph *A. chlorotica* survive was a British colony due to more or less similar climatic conditions. The British colony flourished during the middle of the nineteenth century might have facilitated the migration of the species to the Nilgiris. It is because of nature of the soil which is wet condition, the species is, endogeic. The earthworms in India have been introduced to new areas by man, with the importation of Soil containing materials (plants, agricultural and horticultural products) and the species would have colonized successfully to other parts of India with similar climatic and soil characteristics.

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