FIRST RECORD OF THE ENDEMIC EARTHWORM *ALLOLOBOPHORA* (*SENSU LATO*) *STRUMICAE* (ŠAPKAREV, 1973) (CLITELLATA: LUMBRICIDAE) IN SERBIA, WITH COMENTS ON ITS ECOLOGY AND DISTRIBUTION

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Introduction

The earthworm fauna of Serbia is quite well-known. It is worth mentioning that most of the earlier research focused mainly on northern, central and eastern Serbia, and not many collecting expeditions were led to the areas of Kopaonik Mountain. The Kopaonik Mt. (43°16'N, 20°49'E) is the largest mountain in Serbia, it is situated between the central and southern part of Serbia and belongs to the Dinaric Mountain range. The aims of the present study are to provide information on the distribution of *Allolobophora* (*sensu lato*) *strumicae* (Šapkarev, 1973) in the country and in the adjacent areas of the Balkan Peninsula. In addition, we comment on the ecological preferences.

Materials and Methods

The specimens for this study were collected during the period from 2018 to 2021, in the southwestern and southern slopes of Kopaonik Mt. They were collected using the diluted formaldehyde method complemented with digging (0.4 x 0.4 m^2). The earthworms were killed in 70% ethanol, immediately fixed in 4% formalin solution and transferred and stored in 90% ethanol. Earthworms were identified to species level and only mature individuals were counted. All of the specimens collected and examined are permanently archived at either and the Earthworm Collection of the University of Kragujevac, Serbia (CEKUS).

Results

Identified the earthworm material recently collected from this mountain range, resulting in a new record of the endemic species *All*. (*s.l*.) *strumicae* (Figure 1). The endemic earthworm species *All*. (*s.l*.) *strumicae* previously known only from the Strumica region in North Macedonia (Šapkarev, 1973; Mršić, 1991), is reported from the Serbia for the first time (Figure 2). Further, the new localities from Kopaonik Mt. represent the northernmost limit of the species' natural range for now. The distribution of this species is hill meadows, pastures and oak forests at altitudes of 600 to 800 m a.s.l. The most represented period of *All*. (*s.l*.) *strumicae* is identified as April–May. Regarding ecological categories, it belongs to the deep-burrowing-endogeic species. Actually, this species has a remarkable adaptation to life in the deep soil and strong development of the capacities of displacement in the soil.

Conclusion

The results of our study provide new faunistic data about expand the knowledge about the distribution of *All*. (*s.l*.) *strumicae* on the Balkan Peninsula. The finding endemic species in the Serbia confirms the rich and remarkable biodiversity in this country as well the importance of defining mitigation measures for minimizing the negative anthropogenic impacts towards the habitats of this species. Also, currently this species has an uncertain status within the genus *Allolobophora*. Our future research will try to solve the taxonomic status of this species by applying integrative systematics

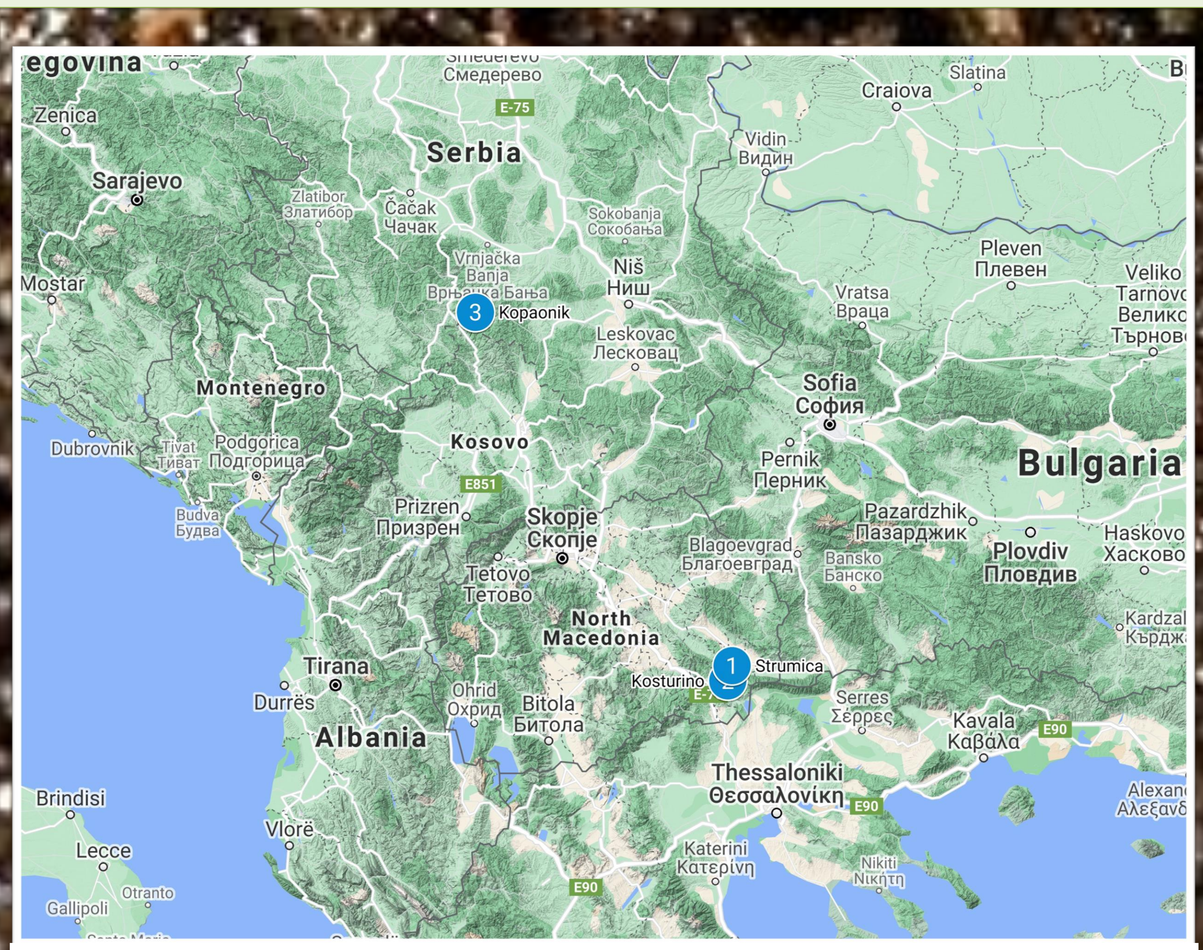

Figure 2. Geographic range size of *All*. (*s.l*.) *strumicae*

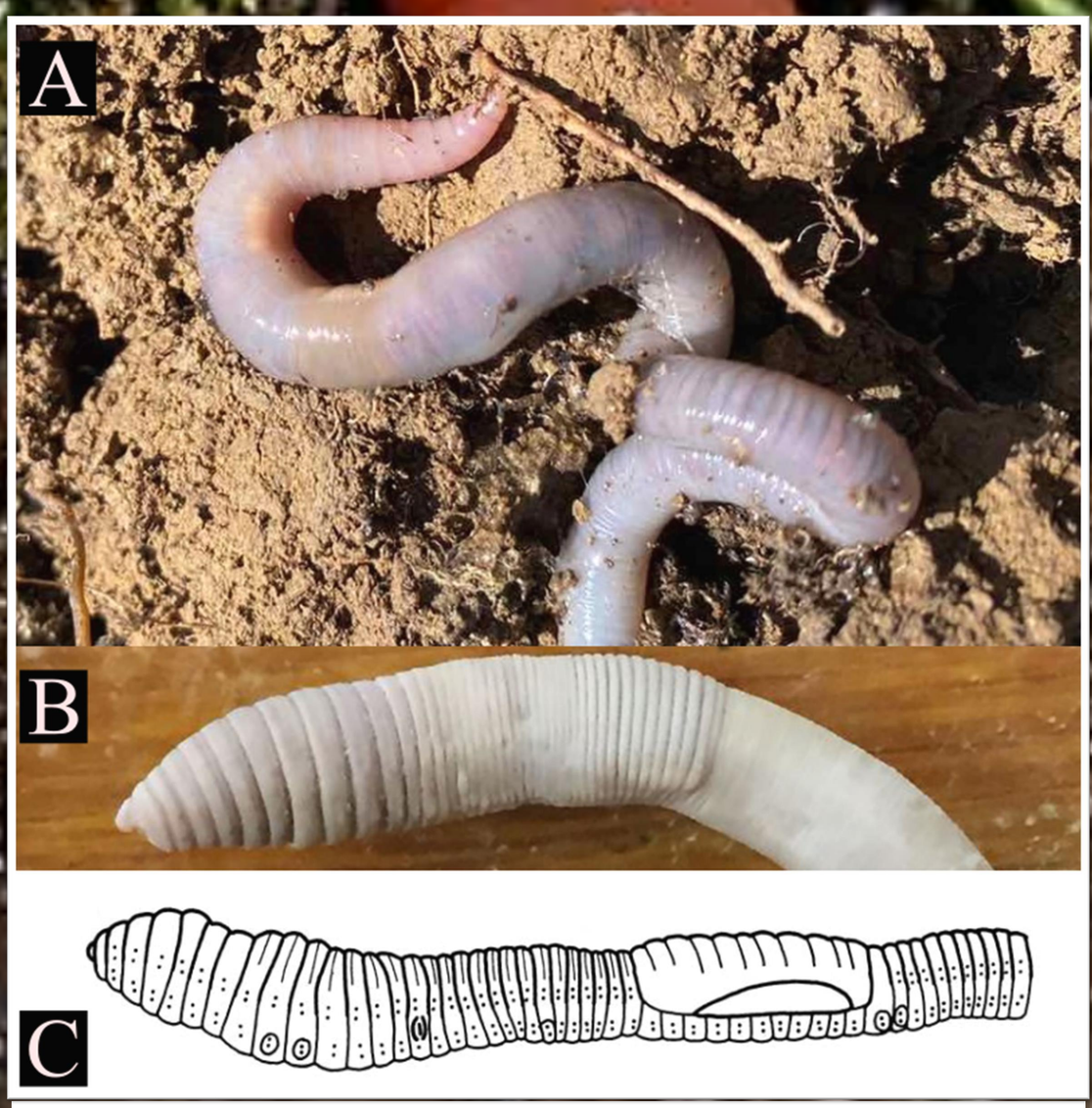

Figure 1. External morphology of *All.* (*s.l*.) *strumicae* a. Live specimen (© F. Popović). b. Fixed specimen. c. Schematic drawing according to Mršić (1991)