

Diversity of earthworms and ecology of the dominating species *Lumbricus rubellus* Hoffmeister, 1843 in the northern taiga podzols of the Murmansk region

(Oligochaeta, Lumbricidae)

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Abstract. Soil-zoological studies were carried out in ten old-growth forests of the northern taiga subzone of the Murmansk region and species composition, density, and the biomass of earthworms were assessed. Four species of earthworms were identified in pine and spruce forests, and among them dominant were the litter species *Dendrobaena octaedra* and the soil-litter species *Lumbricus rubellus*. It has been concluded that earthworm species composition, density, and biomass reach maximum values in forest litters characterized by increased ash content, reduced acidity, and containing organic matter of the humate type. Bioindicators of litters having such properties are *L. rubellus* and *Aporrectodea caliginosa* while the former is predominant. Body sizes and weight, seasonal and long-term dynamics of population are described for *L. rubellus*. Based on the peculiarities of intra-biotope distribution of earthworms, optima for main soil factors were determined.

Key words. Northern taiga podzols, pine, spruce, population, dynamics, spatial distribution, optima.

Introduction

The earthworm fauna of Russia include 56 species and 5 subspecies but only five species (*Dendrobaena octaedra* (Savigny, 1826), *Lumbricus rubellus* (Hoffmeister, 1843), *Dendrodrilus rubidus tenuis* (Eisen, 1874), *Eisenia fetida* (Savigny, 1826) and *Eiseniella tetraedra tetraedra* (Savigny, 1826)) extend to the territory of the Murmansk region (VSEVOLDOVA-PEREL 1997). On the White Sea islands of the Kandalaksha Nature Reserve and in the tundra zone along the coast of the Barents Sea only *D. octaedra* was recorded (STRIGANOVA 1973, BYZOVA et al. 1986). In the forest soils of the Khibiny Mountains *L. rubellus* was dominant, and *Dd. rubidus tenuis*, and *Ap. caliginosa* (Savigny, 1826) were also present (RYBALOV 2006). As a comparison, 16 species of earthworms were recorded in the southern and central parts of Finland and in Norway (TERHIVUO 1988), and six species (*D. octaedra*, *Dd. rubidus*, *Eis. tetraedra*, *L. rubellus*, *Ap. caliginosa*, and *Lumbricus terrestris* (Linnaeus, 1758)) in the northern Finland (TERHIVUO 1988).

Compared to the Scandinavian countries, earthworm fauna of the Murmansk region is rather poor or poorly studied. Northern taiga podzols have been formed in cool, humid environmental conditions which prevent the appearance of invertebrates, such as isopods