

Earthworm diversity in urban habitats of Basel (Northwestern Switzerland)

(Oligochaeta: Lumbricidae)

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Abstract. The diversity and ecology of the soil fauna in Central European towns is not yet well known. There are references that earthworms, by their biomass, dominate all other animal groups in cities – surpassed only by man. Basel (11 km²) is, with its 170 000 inhabitants, Switzerland's third largest community. Open green spaces in the city are scarce; the green belt is narrow. Nevertheless, in more than 60 locations studied between 1999 and 2010, 22 species (12 genera) of Lumbricidae were found. Eleven near-natural habitats could be sampled: private front gardens and backyards, wooded river sides, industrially watered flood plain forest plots, and a Zoological Garden with a large number of green spaces built up from imported soil. Nearly a dozen of these species are quite rare in their natural distribution area and in Basel; many of them are riparian, e.g. *Aporrectodea georgii*, *Fitzingeria platyura depressa*, and *Helodrilus oculatus* – while two are strictly endogeic (*Allolobophora satchelli*, *Murchieona muldali*). The sampling method “digging and hand-sorting plus mustard meal suspension” yielded the best possible quantitative results in urban habitats. A maximum of earthworm species (18) was sampled in the Zoological Garden, and the intensely used public lawns had the highest mean density and biomass (450 individuals resp. 280 g fresh mass/m²).

Key words. Quantitative sampling, public parks, private gardens, green belt, woodland, ground-water recharge plants, synanthropic species.

Introduction

Most published earthworm-related results in Europe were gathered by sampling rural or near-natural locations away from urbanized areas. But urban areas are also being focused on. In Brussels a research group showed that, by their biomass, earthworms dominate all other animal groups in towns, such as dogs, cats, birds, and arthropod groups – only surpassed by man (DUVIGNEAUD & DENAYER-DE SMET 1977). So, after studying earthworms (Lumbricidae) in the rural Swiss Jura Mountains ecosystems (GLASSTETTER 1991), the author started the first study of soils and their macrofauna of Basel, especially focussing on earthworms (GLASSTETTER & NAGEL 2001).

Basel, with its 170,000 inhabitants, is the third largest community in Switzerland. Its territory of 11 km², located at the bend of the River Rhine at 265 m a. s. l., is the heart of a densely built agglomeration of 11 communities belonging to three countries: Switzerland, France, and Germany. Compared to other Swiss cities, Basel has only few urban green spaces and only a relatively small green belt on its own territory. Mean annual precipitations are about 800 mm.