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A rediscovered treasure: mycorrhizal intensity database for 3000 vascular plant species across the former Soviet Union

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Abstract. The symbiosis between vascular plants and mycorrhizal fungi is paramount for carbon and nutrient cycling in most of the world's ecosystems. Most vascular plant species are associated with mycorrhizal fungal partners, and the association is essential for the carbon and nutrition economies of both partners. However, despite its clear importance, data on this symbiosis are lacking: for most vascular plant species, mycorrhizal type is unknown. Very rarely is there data on the levels of mycorrhizal infection intensity in multiple habitats.

We translated and digitized a huge data set on vascular plant mycorrhizal intensity throughout the former Soviet Union, previously available only as a hard copy appendix of the doctoral thesis of Ivan A. Selivanov published in Russian in 1976 and not accessible to the international research community. We updated the taxonomic plant nomenclature to the International Plant Name Index and adjusted mycorrhizal and ecological terminology according to the modern international literature.

The database contains 7445 records on mycorrhizal infection type and intensity of 2970 plant species from 155 families, in 154 sites, situated across the former Soviet Union (mostly on the territory of the current Russia, Ukraine, and Kazakhstan), comprising together extensive geological, topographic, and climatic gradients. The data set includes percentage infection for each species–site combination for arbuscular, ericoid, arbutoid, endo-mycorrhizal, dark septate, orchid- and ecto-mycorrhizal fungi. Each record has a detailed description of geography. For many records, soils and host plant community are described. Most of the sites are natural; 10 sites are situated in botanical gardens. For 1291 species the intensity of mycorrhizal infection is quantified in multiple plant communities (2–57). The remaining species are described at single sites.

Selivanov developed his own methods for quantifying mycorrhizal infection intensity. These methods are comparable, but not identical to, the methodology commonly used today. Based on our own sampling of 99 plant species collected in two distant sites (Caucasus [Russia] and Abisko [Sweden]), we provide a simple equation for data conversion between the two methods.

The availability of this database will help to provide answers to important questions concerning biogeochemical cycling, climate change impacts, and co-evolution of plants and fungi.

Key words: *arbuscular mycorrhiza; carbon cycling; ecto-mycorrhiza; ericoid mycorrhiza; Kazakhstan; mycorrhizal infection; mycorrhizal type; nutrient cycling; root colonization; Russia; symbiosis; Ukraine.*

The complete data sets corresponding to abstracts published in the Data Papers section of the journal are published electronically in *Ecological Archives* at (<http://esapubs.org/archive>). (The accession number for each Data Paper is given directly beneath the title.)

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