

MICROSCOPIC DIAGNOSTICS OF UNDERGROUND ORGANS OF PRIMULA GENUS

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Introduction. Primula genus is one of most numerous in the world flora, and there are also thousands of artificially created ornamental forms, kinds, and hybrids. There are 9 species spread in the territory of Ukraine. As medicinal plant raw material (MPRM), which has expectorative, general strengthening, diaphoretic, and diuretic actions, rhizomes with roots of *Primula veris* L., *P. officinalis* (L.) Hill. are used. However, this species is getting rare, and requires preventive protection and rational use, which can be promoted by revealing and implementation of additional equivalent raw material. Similar to *Primula veris*, similar as for their chemical composition species are also used in medicine: *Primula macrocalyx* Bunge and *Primula elatior* (L.) Hill. As an official medical plant, *Primula veris* L. is indicated in British Herbal Pharmacopoeia. European Pharmacopoeia contains the following raw material: Rhizome and root of *Primula veris* L. or *Primula elatior* (L.) Hill. The State Pharmacopoeia of the USSR, edition XI, does not contain a respective monograph, which indicates to urgency of such monograph development of the State Pharmacopoeia of Ukraine. Identification section of the monograph that is based on microscopic analysis of the whole or milled raw material allows determination of MPRM reliability and detection of admixtures.

Aim. Study and comparison of microscopic structure of rhizomes and roots of 5 wild and cultivated Primula species, determination of common and diagnostic species characters, which can be used for determination of reliability and quality of the recommended initial raw material. The data obtained will promote increase of MPRM arsenal and preservation of natural resources.

Materials and methods. Rhizomes and roots of two wild Primula species: *Primula veris* L. and *P. macrocalyx* Bunge, harvested in Ternopil region and Crimea, and three ornamental Primula species: *P. denticulata* Smith., *P. saxatilis* Kom., and *P. juliae* Kusun., cultivated on the plots of M.M. Hryshko National Botanical Garden of the National Academy of Sciences, fixed in a mixture of alcohol-glycerol-water (1:1:1). The study of slices was carried out by commonly used methods. Microscopes MBS 9 and MS 10, as well as camera Samsung PL50 were used.

Results and discussion. On cross and longitudinal sections, the structure of rhizomes and roots has been analyzed; histochemical reactions have been carried out;

diagnostic signs of all types of raw material have been recorded via photographs. The data obtained indicate to the fact that underground organs of the species studied have sufficient quantity of individual and common generic signs. For rhizomes, the following characteristics are common: secondary structure, from fascicular to non-fascicular; thickened covers of external layers of exodermis impregnated with suberin; cortical and medullar parts are well developed, starch-containing, contain idioblasts with essential oil; sclerenchyma is pericyclic; phloem is obliterated. Common characteristics of roots are as follows: the structure is primary or transitive; mesoderm is well developed; endoderm cells are homogeneously thickened; central cylinder with miniscule phloem, without mechanical elements. Cumulative individual signs of rhizomes and roots of the species studied are as follows: *Primula veris*: starch grains are large, simple; content of idioblasts is colorless. *Primula macrocalyx*: starch grains are complex; content of idioblasts is colorless. *Primula saxatilis*: exodermis of rhizomes and roots is multi-layer, dark-brown, with secretory cavities and reservoirs; idioblasts of cortex, xylem, and core contain bright orange secretion; xylem contains mechanical fibers; parenchyma of cortex and core accumulates simple starch and aleurone grains; in the centre of secondary roots, there is nongenuine core. *Primula denticulata*: parenchyma of rhizome and root cortex practically has no starch grains, with rare single crystals of calcium oxalate of various forms; in parenchyma of all parts of rhizome, roots, and their embryos, there are multiple pigmented cells or their clusters with bright orange, light brown or almost red secretion. *Primula juliae*: cells of root exodermis are filled with bright orange secretion; parenchyma of rhizome and root cortex practically has no starch grains, with single crystals of calcium oxalate and frequent colored idioblasts; central part of roots consists of nongenuine core.

Conclusions. The studies conducted allowed to support, specify and complement data on anatomicohistological structure of the analyzed species of *Primula* genus. Comparative analysis has revealed distinctive features of cultivated primulas associated with content of significant quantity of secretory structures with essential oil. The data obtained allow supposition about prospects of ornamental primulas's use as initial plant raw material, which will promote increase of MPRM arsenal, preservation of natural resources, and diversity of wild rare plants. Over the long term, the peculiarities of structure determined may serve as diagnostic signs of MPRM.