

MICROPROPAGATION OF TWO MEDICINAL PLANT SPECIES OF *UNGERNIA* BUNGE (*U. SEWERTZOWII* (REGEL) B.FEDTSCH. AND *U. VICTORIS* VVED. EX ARTJUSH.) AS THE SOURCE OF BIOLOGICAL ACTIVE COMPOUNDS

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Ungernia sewertzowii (Regel) V.Fedtsch. is an endemic plant distributed in Tashkent region in Uzbekistan and in Southern Kazakhstan. The plant is perennial. It grows at 1,300-2,300 m above sea level. The leaves of the plant are collected as raw material usually in April. The alkaloids with a predominance of lycorine (up to 0.45%) are found in the leaves. Baked *Ungernia* bulbs are used in a wound treatment; they are also applied to boils to cleanse pus. Currently, lycorine hydrochloride is used in medicine as an expectorant for chronic and acute inflammatory processes in the lungs and bronchi and for bronchial asthma.

Ungernia victoris Vved. ex Artjush. Red book status 2. Rare endemic to the Southwestern Pamir-Alai with a greatly declining range. The main reason of the decreasing in numbers and distribution range is intensive harvesting of leaves as medicinal raw material. *U. victoris* is an endemic plant distributed on the Gissar ridge and its southern spurs. It is perennial. It grows at 800-2700 m above sea level. The fully developed leaves (30-35 cm) are used as raw material. The leaves contain alkaloids, mainly galantamine, galantine, and lycorine. Up to 0.2% of galantamine was found in the leaves. Some alkaloids are being accumulated in the underground parts of the plant. Galantamine also accumulates in the bulbs with roots, nevertheless lycorine predominates in them. Currently, the leaves of *U. victoris* serve as the main raw material source for galantamine, produced in the form of galantamine hydrobromide. Galantamine hydrobromide is used for myasthenia gravis, progressive muscular dystrophy, motor and tactile disorders associated with neuro-

tis, polyneuritis, and radiculitis.

As part of the project A-FA-2021-146 "Developing of the technology for organizing and propagating medicinal plants using *in vitro* method" of the Institute of Botany of the Academy of Sciences of the Republic of Uzbekistan, a protocol for microclonal propagation of these species was developed for the purpose of conservation and implementation in medicinal plant clusters. As a result of the studies, it was established that *in vitro* propagation of two species of the genus *Ungernia* Bunge. is possible by using parts of the sprouted seed (hypocotyl and cotyledone). Two micropropagation pathways have been identified for *U. sewertzowii*: direct organogenesis and indirect organogenesis. The formation of callus on the hypocotyl (up to 80% of explants) and on cotylidon (up to 60% of explants) was observed, and the number of formed microbulbs on the callus was up to 200 microbulbs on the hypocotyl, and up to 120 microbulbs per explant on cotylidone. The process of direct organogenesis for *U. sewertzowii* resulted in formation of up to 4-5 microbulbs per explant. Adaptability to soil of microbulbs was up to 60%. Microclonal propagation of *U. victoris* is possible only through indirect organogenesis. Callus formation was observed on the hypocotyl (up to 80% of explants) and cotyledon (up to 60% of explants), while the number of formed microbulbs on the callus was up to 200 microbulbs per explant on the hypocotyl and up to 120 microbulbs per explant on the cotyledone. Direct organogenesis was not observed for *U. victoris*. The soil adaptability of the bulbs was 60%.