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New resources of inulin-rich plants among the species of flora of the Ukrainian Carpathians

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Carpathian Biosphere Reserve (CBR) was established as a nature reserve in 1968 and became part of the World Network of Biosphere Reserves of UNESCO in 1992. It consists of six separate massifs, two botanic preserves (Chorna Hora and Yulivska Hora) and regional landscape park Stuzhytsia, with a total area of 57,880 hectares (143,000 acres). The greatest part of the reserve is covered by virgin forests. The mentioned areas are rich in wealth and diversity of medicinal plant species. The flora of CBR consists of 262 fungi species, 392 species of lichens, 440 species of mosses and 1062 species of vascular plants. Plants of the family *Asteraceae* are known for their use in ethnopharmacology. *Carlina acaulis L. (Asteraceae)* is widely spread herb in the Ukrainian Carpathians. Commonly used part of this plant in ethnopharmacology is root, known as Carlinae radix. This plant has a long history of medicinal use in Europe due to its antimicrobial properties. Carlinae radix is an herbal drug, commonly used for the treatment of respiratory and urogenital diseases and externally, for various skin conditions. The rhizome is massive and vertically set in the ground. The leaves are elliptic-oblong, pinnatisected, up to 30 cm long, and collected in a rosette. The stem rarely reaches 15 cm height, and usually the plants are

acaulescent. The anthodium (25–50 mm diameter) are surrounded by silvery white or pale pink bracts. Flowering occurs from July to September. The flowers are bisexual. The fruits are achenes 5 mm long. It is considered a medicinal plant for the inulin, essential oil and tannins that it contains. Roots of these plants contain inulin (ca. 20%), which belongs to a so-called inulin-type fructans, the most important group of prebiotics. It was confirmed that inulin and flavonoids from roots have the antitumor, antiviral, antibacterial, antidiabetic, antioxidant and neuroprotective activity. They also contain essential oil (1-2%), with carlina-oxide as the main compound (over 90%). Essential oil isolated from the roots of *C. acaulis* possesses substantial antimicrobial activity along with other pharmacological effects: anti-inflammatory, anti-ulcer, and antioxidant. There still seems to be no detailed studies correlating the chemical composition of this drug and its ethnopharmacological uses.

Due to the fact that the inulin such a substance has a lot of important properties for human health, considering a wide source of raw materials we can conclude that *Carlina acaulis L.* is new interesting object for studying.

Determination of pharmacological activities of *Epilobium angustifolium* aqueous extract in enlarged rat prostates.

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Introduction

In recent years there has been an emphasis on the search for alternatives to the classical pharmacotherapy of benign prostatic hyperplasia (BPH - a progressive disease with age resulting in impairment urinating in mature males) based on plant raw substances. One of the representatives with a growing interest are from the *Epilobium* genus (including *Epilobium angustifolium*), which are attributed to the i.e. antiandrogenic, antiestrogenic,