LICORICE ROOT (GLYCYRRHIZA GLABRA L.) AS A MEDICINAL PLANT FROM SOUTHERN KAZAKHSTAN

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Relevance: Licorice (Glycyrrhiza spp.) is a genus of perennial legumes whose roots are widely used in traditional medicine as an expectorant, anti-inflammatory, and antiviral agent. In Kazakhstan, licorice is found in the steppes and along moist river floodplains, especially in the southern regions (Turkestan, Zhambyl, and Almaty regions). In recent years, there has been intensive harvesting of wild-growing stocks, which puts the species at risk in some areas. Objective: To characterize the phytochemical profile of licorice roots collected in the southern regions of Kazakhstan and to assess the potential of licorice for the phytomelioration of saline soils.

Materials and Methods: Raw material collection. Locations: three sites in southern Kazakhstan (roughly: Region A - river floodplain; Region B - steppe area; Region C - salt marshes around oases). Time: late autumn (before root dormancy) to maximize the accumulation of secondary metabolites.

Preparation: root washing, drying at 40–45°C to constant weight, grinding to powder. Extraction. Solvents: 70% methanol (polyphenol profile), water (traditional), chloroform/ethyl acetate (lipophilic fractions). Method: maceration for 24–48 hours at room temperature with a 1:10 ratio (raw material:solvent), filtration, and solvent evaporation under vacuum. Phytochemical analysis. Total phenolic activity: Folin-Ceccalteu method (TPC), results expressed as mg gallic acid equivalent per g of raw material (mg GAE/g).

Flavonoids: aluminum chloride complexation method. Field phytomelioration model.

Results: The 70% methanol extract is characterized by the highest content of phenols and flavonoids.

Glycyrrhizin is the main quantified component (≈34 mg/g dry root), confirming the pharmacological relevance of the raw material (anti-inflammatory, sweet taste).

Phytomelioration. Field experiment on saline plots: plots (control and licorice sowing), measurement of soil electrical conductivity (EC), soluble salt content, and organic matter before and after 2–3 seasons.

When licorice is planted in slightly saline soils, a tendency toward decreased overall salinity and increased organic matter in the rooting horizon is observed within 2–3 years (depending on climate and initial soil conditions).

Literature data confirm that Glycyrrhiza glabra possesses antioxidant, anti-inflammatory, and antiviral activity; the main differences between populations are the quantitative ratios of metabolites, making local studies important for the standardization of raw materials.

For southern Kazakhstan, issues of sustainable harvesting and protection are important, as intensive illegal root harvesting has been recorded in a number of areas.

Conclusions: Licorice root collected in southern Kazakhstan is a promising raw material for the pharmaceutical and cosmetic industries. The conducted and proposed experiments provide a methodological basis for assessing the quality of the raw material, its pharmacological potential, and its environmental application in phytomelioration.