

ISOLATION OF FLAVONOIDS FROM THE RHIZOMES OF MADDER (*Rubia tinctorum* L.) IN THE SURKHANDARYA REGION AND EVALUATION OF THEIR SEDATIVE ACTIVITY

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Due to the adverse side effects of synthetic sedative medications, the demand for plant-based phytopreparations is steadily increasing. Although madder (*Rubia tinctorum* L.) is primarily known for its anthraquinone content, its flavonoid components interact with GABA-receptor complexes in the central nervous system. The soil and climatic conditions of the Surkhandarya region foster the rapid biosynthesis of these secondary metabolites, enabling the effective utilization of local medicinal raw materials.

Field and laboratory experiments were conducted on madder rhizomes harvested from the Surkhandarya region. Standardization and extraction procedures were carried out in accordance with the State Pharmacopoeia (XI). The flavonoid fraction was isolated using ultrasonic extraction with various concentrations of ethyl alcohol (40%, 60%, and 80%). Quantitative analysis was performed on an SF-2000 spectrophotometer using aluminum chloride reagent. Sedative activity was evaluated in laboratory mice using the "Open Field" test.

Solvent concentration and extraction methods significantly influenced the flavonoid yield and biological activity. Traditional aqueous extraction yielded a mere 0.42%, whereas 60% ethyl alcohol combined with ultrasonic treatment for 45 minutes at 50°C achieved a maximum yield of 1.82% and an optical density of 0.842. In pharmacological evaluations, spontaneous motor activity decreased by 12.5% in the control group, 48.0% in the reference standard group (*Valeriana officinalis*), and 61.2% in the group administered the optimized extract. The sedative effect of the flavonoid complex is attributed to the optimization of neurotransmitter metabolism and ion channel permeability in synapses.

The application of 60% ethyl alcohol combined with a 45-minute ultrasonic treatment regimen at 50°C ensures maximum yield (1.82%) in isolating flavonoids from madder rhizomes of the Surkhandarya region. The obtained fraction demonstrates superior sedative efficacy (61.2%) compared to standard valerian extract, representing a promising raw material source for creating novel anxiolytic phytopreparations.