ORIGINAL ARTICLE

INTERNATIONAL JOURNAL OF ARTIFICIAL INTELLIGENCE

ISSN: 2692-515-x, Impact Factor: 9.23

American Academic publishers, volume 6, issue 01,2026

Journal: https://www.academicpublishers.org/journals/index.php/ijai

INVESTIGATION OF THE HEMOSTATIC PROPERTIES OF LAGOCHILUS INEBRIANS

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Abstract

The isolation of biologically active compounds from medicinal plants, determination of their chemical structures, and evaluation of their pharmacological and toxicological properties constitute one of the key areas of modern pharmaceutical science and experimental medicine. The present study is devoted to the experimental evaluation of the hemostatic and coagulant activity of *Lagochilus inebrians* (introduced species) extract. The results demonstrate that the hemostatic effect of *Lagochilus inebrians* extract is associated with the influence of lagoxylin and its derivatives on the intrinsic mechanisms of the blood coagulation system. The obtained data substantiate the prospects for further pharmacological and clinical investigations of this plant extract as an effective natural-source-based hemostatic agent.

Keywords

Lagochilus inebrians, lagoxylin, medicinal plants, hemostatic activity, coagulant effect, hepatic parenchymal bleeding, rat model, biologically active compounds.

Introduction. At present, the comprehensive study of the chemical composition of medicinal plants, isolation of their major biologically active constituents (terpenoids, alkaloids, flavonoids, coumarins, glycosides, etc.), and elucidation of their chemical structures are of great scientific and practical importance. Chemical modification of individual compounds enables the development of novel biologically active substances and the assessment of their pharmacological and toxicological properties, thereby contributing to the pharmaceutical market with new, import-substituting and export-oriented medicinal products.

Pharmacological studies of plants belonging to the genus *Lagochilus* have shown that more than ten species exert a stimulatory effect on the blood coagulation system, whereas approximately five species demonstrate an inhibitory effect. It has been established that the presence of lagoxylin or its derivatives in these plants is associated with stimulation of blood coagulation, while the absence of these compounds results in an opposite pharmacological effect. In this context, the present study aimed to evaluate the hemostatic activity of *Lagochilus inebrians* (introduced species) extract by investigating its coagulant properties using a rat model of hepatic parenchymal bleeding.

Material and Methods. The experiments were conducted on laboratory rats of both sexes with a body weight of 200–220 g. The animals were divided into three groups, each consisting of three rats. Experimental procedures were performed under controlled conditions using a model of hepatic parenchymal bleeding. In the control group, bleeding time was assessed by applying sterile gauze to the wound. In the experimental groups, *Lagochilus inebrians* (introduced species) extract was administered at doses of 100 mg/kg and 200 mg/kg.

Determination of hepatic parenchymal bleeding time in rats

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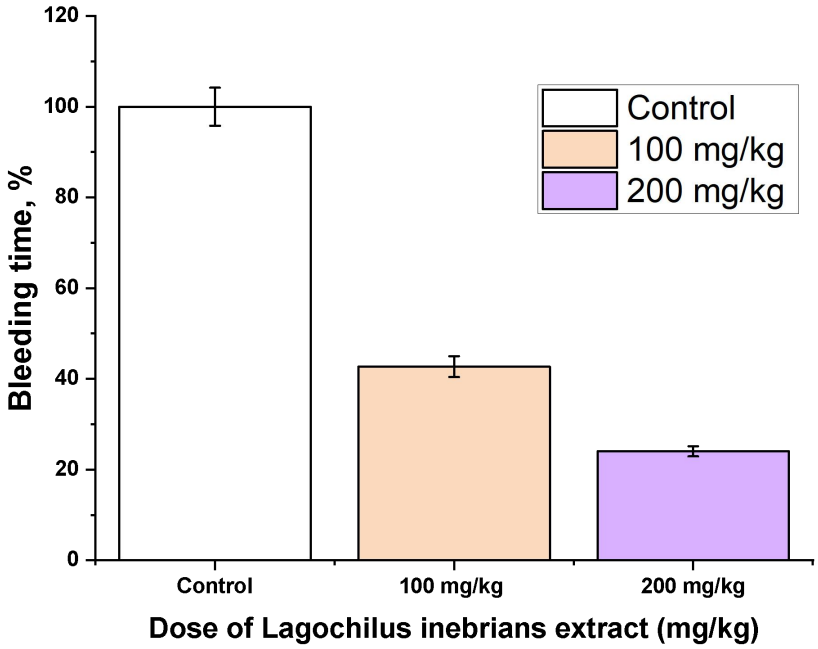

*"*Data are presented as mean ± SEM. $p < 0.01$ compared with the control group."*

The results showed that in the control group, the duration of hepatic parenchymal bleeding averaged 122.8 seconds. Administration of *Lagochilus inebrians* extract at a dose of 100 mg/kg reduced the bleeding time by 52.5 seconds compared to the control group, corresponding to a 42.75% acceleration of hemostasis. At a dose of 200 mg/kg, the bleeding time decreased to 29.5 seconds, representing a 24.02% reduction relative to the control.

When the coagulant activity of the L. inebrians extract obtained from in vitro cultivated plants was tested in rats, a pronounced hemostatic effect was observed. Notably, at a dose of 200 mg/kg, the extract achieved bleeding cessation 4.16 times faster than in the control group.

These findings suggest that the hemostatic effect of Lagochilus inebrians extract is likely associated with the action of lagoxylin on the intrinsic pathway of the blood coagulation system, particularly through modulation of platelet aggregation and activation of coagulation factors. Moreover, the rapid cessation of hepatic parenchymal bleeding indicates the potential applicability of this extract in surgical practice and in pathological conditions accompanied by parenchymal hemorrhage.

Conclusion. The results of the present study demonstrate that *Lagochilus inebrians* (introduced species) extract possesses pronounced hemostatic and coagulant activity. These findings support the feasibility and relevance of further pharmacological and clinical investigations of this extract as an effective natural-source-based hemostatic agent.

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