



ANTI-INFLAMMATORY ACTIVITY OF LUPANE-TYPE TRITERPENES FROM HAIRY ROOTS OF *Galphimia glauca* GROWING IN AIR-LIFT BIOREACTORS

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Introduction. *Galphimia glauca* (Gg) is a medicinal species that synthesizes nor-secofriedelanes denominated as galphimines (A-I) with sedative and anxiolytic activities. In genetically transformed roots (line VYT) and transformed cell suspensions of Gg cultivated in shake flasks (250 ml), four new nor-friedelanes (glaucacetalins A-D), with sedative activity were purified and characterized from the nutrient media⁽¹⁻²⁾ Maslinic acid was also isolated from biomasses of these cultures. In order to obtain higher amounts of these compounds growing of *G. glauca* cultures were performed in 2 L *air-lift* bioreactors. The aim of this study was to analyze the growth and the triterpene production of Gg hairy roots cultivated in a modified *air-lift* reactor, as well as to determine the biological activity of the isolated compounds

Methods. The hairy root line VYT was established in MS medium without phytohormones in a 2 l *air-lift* reactor. Triterpenes production was characterized in a batch-growth 30 days. with the following conditions : 0.5 VVM, pH 5.7, 25°C, and constant light (25 μ Mn⁻²S⁻¹); pH and conductivity were monitored for the time in culture. The new isolated products were elucidated by spectroscopic techniques and biological activities (sedative, and anti-inflammatory) were analyzed by using the following procedures: The sedative activity was demonstrated in ICR mice by using the sodium pentobarbital-induced hypnosis model. Anti-inflammatory activity was determined by using the tetradecanoylphorbol acetate-induced mouse ear inflammation model (TPA).

Results. The triterpenes production in Gg hairy roots was characterized through a batch kinetic culture; roots growth and the production of intracellular and extracellular triterpenes was registered by 30 days. In this work we only report the intracellular triterpenes content, where the presence of two interesting triterpenes was observed at day 30. These Lupane-Type triterpenes corresponded to glochidone and glochidonol (Figure 1), reaching yields of 2.606 mg g⁻¹ DW and 1.64 mg g⁻¹ DW, respectively. It is noteworthy that these compounds have not been previously reported in the wild plant or in any other *in vitro* culture of *G. glauca*. Both compounds exhibited a high

anti-inflammatory activity compared with indomethacin that was used as a control³ (Figure 2). However, they did not show any sedative or cytotoxic activity.

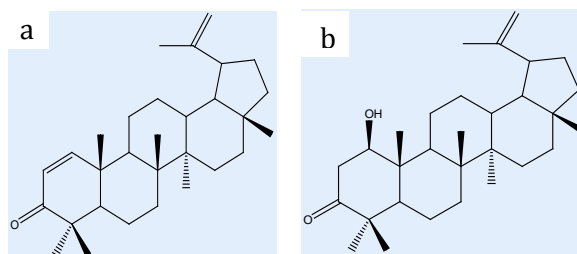


Figure 1. Lupane-Type Triterpenes from Hairy Roots of *Galphimia glauca* growing in Air-lift bioreactors.
a) Glochidone b) Glochidonol

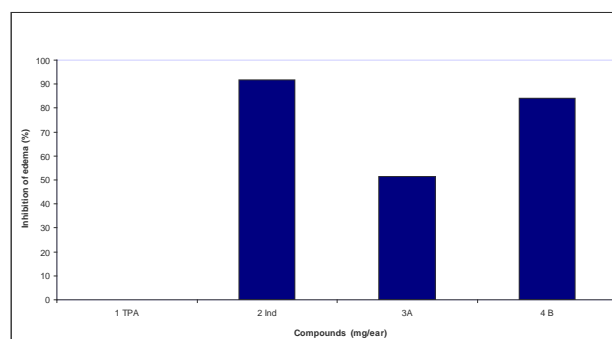


Figure 2. Anti-inflammatory activity of Lupane-type triterpens from *Galphimia glauca*. Column 1) TPA, 2) Indomethacin, 3) Glochidone 4) Glochidonol

Conclusions. Two triterpenes in Gg hairy roots growing in airlift bioreactors were isolated and elucidated for the first time. These compounds exhibited a significant anti-inflammatory activity comparable to indomethacin.

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