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Antinociceptive Activity of *Inula britannica* L. and Patuletin: In vivo and Possible Mechanisms Studies

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A B S T R A C T

Ethnopharmacological relevance: *Inula britannica* L. (IBL) is a predominant medicinal plant traditionally utilized in the treatments of arthritis and back pain in Iranian folk medicine.

Aim of the study: The purpose of this research was to evaluate the analgesic effects of *Inula britannica* L. flower essential oil (IBLEO) and one of its major constituents, Patuletin (Pn), in male mice.

Materials and Methods: In this study, we used pain assessment tests including acetic acid-induced writhing, tail flick, formalin, and glutamate-induced paw licking (GPL). For understanding the supposed analgesic mechanisms of IBLEO, opioid and L-Arginine/NO/cGMP/ KATP pathways were examined. A rotarod exam was performed to assess any possible effect of IBLEO on the motor activity of mice.

Results: In the tail flick, writhing, GPL, and formalin tests, a dosage of 100 mg/kg of IBLEO showed noteworthy analgesic effects ($p < 0.05$). In mice, pain decreased with the administration of Naloxone, an opioid non-selective antagonist, plus IBLEO ($p < 0.001$). However, administration of selective opioid antagonists (Naltrindole, Nor-binaltorphimine, and Naloxonazine) attenuated the antinociceptive effect of IBLEO ($p < 0.001$). Both Methylene blue and Glibenclamide blocked the antinociceptive effect of IBLEO ($p < 0.05$), but the administration of L-arginine or sodium nitroprusside fundamentally potentiated the antinociception induced by IBLEO in phase II of the formalin test ($p < 0.05$). Patuletin showed strong analgesic effects in all tests ($p < 0.01$).