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## Analgesic and anti-inflammatory activity of *Lactuca sativa* seed extract in rats


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### Abstract

*Lactuca sativa* (Lettuce) is a member of Compositae family. In folk medicine of Iran, the seeds of this plant were used for relieving of inflammation and osteodynia. In this study, anti-nociceptive and anti-inflammatory activities of a crude methanol/petroleum ether (70/30, v/v) extract of the seeds have been evaluated. The extract exhibited a time- and dose-dependent analgesic effect in formalin test and also a dose-dependent anti-inflammatory activity in a carrageenan model of inflammation. The extract had no analgesic effect in tail-flick test up to the highest dose used (6g/kg). No abnormal behavior and lethality was observed by the extract up to 6g/kg. Preliminary phytochemical analysis showed the presence of triterpenoids, saponins and simple phenols in the extract.

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### Introduction

*Lactuca sativa*, a plant well known as lettuce, is a member of Compositae family. Anticonvulsant and sedative-hypnotic effects have been mentioned for the leaves of this plant (Zargari, 1989). Recently, antioxidant activity of lettuce has been reported that would prevent chronic diseases related to oxidative stress such as cancer (Chu et al., 2002). This annual plant has small brownish to yellowish almond-shape seeds. The seeds of lettuce were traditionally used in Iran for relieving of inflammation, gastrodynia and osteodynia (Ave-Sina, 1988, Aqili Khorasani, 1991).

We have examined the putative analgesic and anti-inflammatory effects of a crude extract of *Lactuca sativa* in formalin and tail-flick models of nociception and in carrageenan-induced paw edema.

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### Section snippets

#### Plant materials

The seeds of *Lactuca sativa* were bought from a traditional grocery in Tehran. The plant seeds were authenticated and a voucher specimen (no. 660) was deposited in the herbarium of Faculty of Pharmacy, Shaheed Beheshti University of Medical Sciences, Tehran....

### Preparation of the extract

The seeds were macerated in portions of 100g, with the solvent consisting of methanol (210ml) and petroleum ether (90ml) for 2 days. The mixture was then shaken vigorously and filtered. The filtrate was concentrated with a rotaevaporator...

### Analgesic effect

The standard centrally acting analgesic drug, morphine produced significant analgesic effect in tail-flick test. However, the extract up to the dose of 6g/kg had no effect on tail-flick latency time (Table 1).

The extract exhibited a significant and dose-dependent reduction of the nociception in both early and late phase of the formalin test (Fig. 1). The maximum anti-nociceptive effect was observed at the dose of 2g/kg and at 0.5h after administration of the extract (Fig. 2). However, naloxone...

### Discussion and conclusions

We have evaluated the putative analgesic and anti-inflammatory activities of the seed methanol/petroleum ether (70/30) extract of *Lactuca sativa* to clarify the traditional belief in the pain and inflammation relieving effects of lettuce seeds.

Thermal painful stimuli are known to be selective to centrally but not peripherally acting analgesic drugs (Chang and Lewis, 1989). In the present study, morphine, a centrally acting analgesic drug, produced an inhibitory effect on the nociceptive response ...

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...This is consistent with present day recommendations for using opioid analgesics only as second-line therapy in neuralgia for patients who have insufficient pain relief or poor tolerability [49]. Results of recent pharmacological and animal studies of these medicinal herbs revealed that: (1) -*Linum usitatissimum* L. (flax, linseed) [38], *Amygdalus communis* L. (bitter almond) [23], *Apium graveolens* L. (seed of celery) [27] and *Prunus domestica* L. (plum) [46,47] *Papaver somniferum* L. (opium poppy) and *Opium* [45], *Hyoscyamus niger* L. (henbane) [34], *Conium maculatum* L. (hemlock) [30], *Lactuca sativa* L. (seed of lettuce) [35,46] have analgesic property; (2) *Linum usitatissimum* L. (flax, linseed) [38], *Anethum graveolens* L. (seed of dill) [24,50], *Melilotus officinalis* L. (yellow melilot) [43], *Apium graveolens* L. (seed of celery) [27], *Prunus domestica* L. (plum) [46,47], *Crocus sativus* L. (saffron) [32], *Althaea officinalis* L. (Marshmallow) [21], *Amomum racemosum* Lam. ( cardamom) [22], *Brassica oleracea* L. (cabbage) [29], *Hyoscyamus niger* L. (henbane) [34], *Conium maculatum* L. (hemlock) [30], *Lactuca sativa* L. (seed of lettuce) [35,36] may show anti-inflammatory property due to their strong terpenoid, alkaloids, alkaloids with analgesic and antispasmodic features, and phenolic compounds....

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