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Evaluation of the Anti-Asthmatic and Antihistaminic Properties of Urtica dioica Leaves

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Abstract
This study aims to evaluate the anti-asthmatic and antihistaminic activity of the leaves of Urtica dioica. Phytochemical analysis confirmed the presence of alkaloids, flavonoids, steroids, tannins, saponins, phytosterols, and glycosides. Acute toxicity studies established the safety of the extract at 5000 mg/kg. In vitro antihistaminic activity using isolated guinea pig ileum preparation showed significant inhibition of histamine-induced contraction. In vivo bronchospasm protection was also evident through increased preconvulsion time. The results confirm traditional claims and offer potential for development as a plant-based therapy for asthma and allergic conditions.

1. Introduction
Asthma is a chronic inflammatory disorder that is increasing globally. Current synthetic drugs have limitations due to adverse effects, prompting a search for safer alternatives from herbal sources. Urtica dioica, or stinging nettle, is traditionally used to treat respiratory conditions. This study provides scientific validation of its anti-asthmatic and antihistaminic properties.

2. Materials and Methods
2.1 Plant Collection and Authentication
Leaves were collected from Sagar forest, Madhya Pradesh and authenticated.

2.2 Extraction
Cold maceration using 50% ethanol was used to obtain the extract. The yield was 16.35%.

2.3 Phytochemical Screening
Standard methods confirmed the presence of various phytoconstituents.

2.4 Acute Toxicity Study
Following OECD 423 guidelines, no toxicity was observed up to 5000 mg/kg.

2.5 Antihistaminic Activity
Isolated guinea pig ileum preparation showed significant inhibition of histamine-induced contractions.

2.6 Bronchospasm Protection
Animals exposed to histamine aerosol showed increased preconvulsion time after extract treatment.

3. Results and Discussion
3.1 Phytochemical Screening

Phytochemicals	Presence (+/-)
Alkaloids	+
Steroids	+
Terpenoids	-
Flavonoids	+
Tannins	+

Phytosterol	+
Saponin	+
Glycosides	+

3.2 Toxicity Study

Parameter	Observation
Mortality	0%
Alive Percentage	100%
Convulsion	Absent
Locomotion	Absent
Sniffing	Observed for 4 hours
Rearing	Observed for 4 hours
Grooming	Observed for 4 hours
Hair loss	No
Excess urination	Nil
Excess feces elimination	Absent

3.3 Antihistaminic Activity on Guinea Pig Ileum

Dose (µg/mL)	Histamine Conc.	Log M	Histamine CRC (%)	Std. Resp. (%)	Extract Resp. (%)
0.1	10	0.002	21.42±1.6	9.9±1.3***	15.2±1.2**
0.2	20	0.3010	47.6±1.5	23.9±1.5***	36.02±1.6**
0.4	40	0.6021	61.4±2.1	37.5±2.0***	42.02±2.7**
0.8	80	1.202	76.12±1.5	38.12±1.0***	49.16±2.0**
1.6	160	2.002	88.32±2.4	36.08±1.8***	51.08±1.0**
3.2	320	4.060	100.23±1.4	35.06±2.4***	50.06±1.2**

4. Conclusion

The ethanolic extract of Urtica dioica leaves showed significant antihistaminic and anti-asthmatic activity in both in vitro and in vivo models. This validates its traditional use and supports its potential development as an effective herbal treatment for asthma.

5. References

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