

## Mini Review

# A Phyto-Pharmacological-Based Review on *Uraria lagopodies*

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**Abstract**

**Context:** *Uraria lagopodies* DC. (Fabaceae) is currently used as a traditional medicinal plant in many small communities of Bangladesh, India, Africa and other countries in the world.

**Objective:** This text offers a review on *U. lagopodies*.

**Methods:** A search was made in the electronic databases such as PubMed, Science Direct and Google scholar for the published articles till January 31, 2017.

**Results and conclusion:** The findings suggest that the plant is rich in flavonoids and glycosides and it possesses a number of important biological activities, including antioxidant, anti-inflammatory, antimicrobial, cytotoxic, anti-diarrheal, analgesic and others. *U. lagopodies* may be a good contributor of plant-based modern medicines.

**Keywords**

- Phytochemicals
- Traditional uses
- Therapeutic promises

**INTRODUCTION**

*Uraria lagopodies* DC (synonym: *Uraria lagopodioides* (L.) Desv also called *Uraria lagopoides*) (Fabaceae) is a shrub. In Bangladesh, it is mainly found in Sal forests of Gazipur and Tangail. However, it is also found in Chittagong hill-tracts. It has a large geographical distribution, including tropical Africa, southern and south-east Asia, and Australia. The Bengali/vernacular name of this plant is lata-chakuley, chakuley, chakulia, gorkha-chakulia and golak-chakulia [1-3].

Traditionally, the plant is used as an abortifacient, aphrodisiac, laxative; and used in remittent fever, asthma, dysentery as well as for the treatment of chest inflammation. The decoction of the leaf is used for diarrhea. Moreover, the plant is also used in rheumatism, bleeding piles, catarrh and scorpion-sting [1,2]. The shoot extract of this plant is evident for oxytocic and anti-implantation activity [3]. The scientific evidence of this plant is very limited. This review provides an up to date compilation of its phytochemical and pharmacological profiles.

**METHODS****Stratagem**

A search was made in the PubMed, Science Direct and Google scholar databases with the keyword '*Uraria lagopodies*', which was then paired with 'morphology', 'traditional/ethno pharmacological uses', 'phytochemicals' and 'pharmacological activities'. The obtained evidences were included and excluded as follows:

Inclusion criteria:

- In vitro*, *ex vivo* and *in vivo* studies on *U. lagopodies*

- Phytochemical and/or pharmacological reports on *U. lagopodies*
- Reports on extract(s) or isolated compound(s) and their activities

Exclusion criteria:

- Data not related to the focusing study.
- Reports on other species of *Uraria* genus.
- Data duplication.

**Findings**

To date, a total 34 articles were found in which PubMed, Google scholar and Science Direct belonged to 19, 10 and 5 respectively. After exclusion, 9 were included in this study.

**Plant morphology**

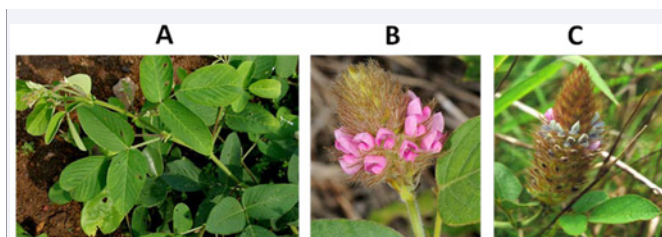
*U. lagopodies* (Figure 1) is a prostrate and ascending woody small shrub (30-90 cm long). Leaves are 2.5-5 cm long; leaflets solitary or 3-foliolate; oblong, rhomboid, rounded, hairy beneath. The racemes are denser, oblong, 2.5-6.3 cm long and 2 cm in width. Flowers are white, pods 3.8 cm long and 2 cm wide [3].

Plant taxonomy has been shown in Box 1.

**Chemical composition**

Flavonoids are the principal constituents of this [3]. The stems and leaves contain alkaloid, glycoside and sterol [4]. The root contains alkaloids, glycosides, steroids, tannins, saponins and flavonoids [5].

The whole plant contains carbohydrates, flavonoids,



**Figure 1** *Uraria lagopoides* DC. [A. aerial parts, B. flower, C. mature fruit body].

**Box 1.** Plant taxonomy  
(*Uraria lagopoides* DC.)

Kingdom: Plantae  
Order: Fales  
Family: Fabaceae  
Sub-family: Faboideae  
Tribe: Desmodieae  
Subtribe: Desmodiinae  
Genus: *Uraria*  
Species: *lagopoides*

**Box 1**

glycosides, alkaloids, saponins, steroids and tannins [1,2]. [6] isolated four new compounds, namely - 7'-carboxylic-n-heptacosanyl-glutarate, n-nonacosan-6-ol-1,13-dioic acid, 4,12-dimethyl-n-tetradeca-6,8,10-triene-1-ol-4-oic acid, and 8,14-13,17-diseco-stigmast-5,22-diene-3- $\alpha$ -ol, along with 2-hydroxytricontane and  $\beta$ -sitosterol glycoside from the aerial parts of the *U. lagopoides*.

### Biological activities

**Antioxidant capacity:** The aqueous and ethanolic root extracts (100, 500 and 1000  $\mu$ g/mL) of *U. lagopoides* exhibited a concentration-dependent antioxidant capacity in 1, 1-diphenyl-2-picrylhydrazyl (DPPH $\cdot$ ), hydroxyl radical ( $\cdot$ OH) and nitric oxide (NO $\cdot$ ) radical scavenging tests. Moreover, the extracts also exhibited a significant ferric reducing capacity [7,8], also reported a concentration-dependent DPPH $\cdot$  scavenging capacity of the ethanol extract (10-100  $\mu$ g/mL) of the aerial parts of the *U. lagopoides*. Moreover, methanol and petroleum ether extracts of the whole plant are also evident to show DPPH $\cdot$  scavenging capacity in a concentration-dependent manner at 5-500  $\mu$ g/mL (Hossain et al. 2015).

**Anti-inflammatory/membrane stabilization activity:** In a study, the alcohol and aqueous extracts of the aerial parts of *U. lagopoides* at 100 and 200 mg/kg (oral) were found to show an anti-inflammatory effect in rats, where the paw edema of the animals was significantly ( $p < 0.01$ ) reduced in comparison to the indomethacin (20 mg/kg) [9]. In another study, Islam et al (2012a) also reported that the ethanolic aerial parts extract (250 and 500 mg/kg) of *U. lagopoides* showed anti-inflammatory and membrane stabilization capacity in egg-albumin and human red blood cell (HRBC) tests, respectively.

**Antimicrobial activity:** The aqueous and ethanol extracts (100 and 200 mg/mL) of *U. lagopoides* were found to act against multi-drug resistant bacteria- *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Escherichia coli*, *Salmonella typhimurium*, *Bacillus subtilis* and *B. cereus*. The extracts were also found to show sensitivity against the fungi: *Aspergillus flavus*, *A. niger*, *A. fumigatus*, *Rhizopus* and *Candida albicans*. However, the ethanol extract of the plant showed higher sensitivity against the bacteria and fungi [5]. In this study, the zone of inhibition was seen within 7 and 17 mm. The ethanol extract of aerial parts of *U. lagopoides* at 250  $\mu$ g/disc is evident to act against *B. subtilis*, *S. paratyphi*, *S. typhi*, *Shigella dysenteriae*, *S. sonnei*, *Vibrio cholerae*, *A. niger*, *C. albicans*, *Cryptococcus neoformans*, *Microsporium* spp. and *Trichophyton* spp., where the zones of inhibition were seen within 10 to 25 mm [8]. The methanol and petroleum ether extracts at 375, 750 and 1500  $\mu$ g/disc were found to act against *S. aureus*, *E. coli*, *S. typhi*, *Klebsiella pneumonia* within the zone of inhibition range 7 and 12.25 mm [2].

**Anti-diarrheal/anti-motility activity:** In castor oil-induced diarrheal mice, the ethanol extract of the aerial parts of *U. lagopoides* showed a significant ( $p < 0.05$ ) anti-diarrheal effect at 250 and 500 mg/kg (p.o) [1]. The same extract also showed an anti-motility effect in charcoal meal-defecation mice at the same doses [1]

**Cytotoxicity:** In a study, the aerial parts ethanol extract of *U. lagopoides* showed a strong cytotoxic activity in *Artemia salina*, where the median lethal concentration (LC<sub>50</sub>) was calculated as 5.76  $\mu$ g/mL [8].

**Neuropharmacological activity:** The alcohol and aqueous extracts of the aerial parts of *U. lagopoides* at 100 and 200 mg/kg (oral) were found to show a significant ( $p < 0.01$ ) analgesic activity in rats in comparison to the standard drug, acetylsalicylic acid (100 mg/kg) in acetic acid-induced writhing test [9]. Moreover, the ethanol extract (250 and 500 mg/kg, p.o.) of the aerial parts of *U. lagopoides* also showed a significant analgesic activity in acetic acid-induced writhing test in mice [8]. The methanol and petroleum ether extracts of whole plant are also evident to show an analgesic effect in mice at 250 and 500 mg/kg (p.o.) [9]. Furthermore, the ethanol extract of the aerial parts of *U. lagopoides* at 250 and 500 mg/kg (p.o.) showed a significant ( $p < 0.05$ ) anti-depressant effect in pentobarbital-induced Swiss mice [8].

**Abortifacient activity:** Hot alcoholic extracts of the stems and leaves of the plant at 250 mg showed a potent uterine stimulant effect in rabbit, guinea pig and pregnant and non-pregnant rats and human [4].

**Toxicological report:** In a study, the alcohol and aqueous extracts up to 1 g/kg (intra-peritoneal) did not exhibit any toxicity in mice [9].

### CONCLUSION

The plant *U. lagopoides* may be a good source of antioxidant, antimicrobial and analgesic phytochemicals. More researches are necessary for this plant.

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