

## Pharmacognostical review of *Monotropa uniflora*

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### ABSTRACT

Ghost plant, ghost pipe, corpse plant or indian pipe are the synonym of plant name **Monotropa uniflora**. The ghost plant mainly found in Russia, Asia, North America and South America. Appearance of

**Monotropa uniflora** is completely waxy white but it has black flacks and pink coloration..... The ghost plant or Indian pipe comes under the Monotropaceae family but after some advance research, it was reclassified into the Ericaceae family. Photosynthesis process is not performed by this plant because of absence of chlorophyll pigment. For the growth and development, the plant depends on other organism and fulfill its nutrition and food requirement. The plant has wide therapeutic benefits including in the treatment of many diseases like febrile disease, epilepsy, convulsion of children, chorea, etc. It can be use in pain, restlessness, ulcer, infection in gonorrhea, ulceration of the bladder. **Monotropa uniflora** was used as a substitute of opium therefore it act astonic, nervine tonic, and it was excellent antiperiodic agent(1). The present review on the plant **Monotropa uniflora** describe all updated information about the plant which will help in future research work.

### I. INTRODUCTION

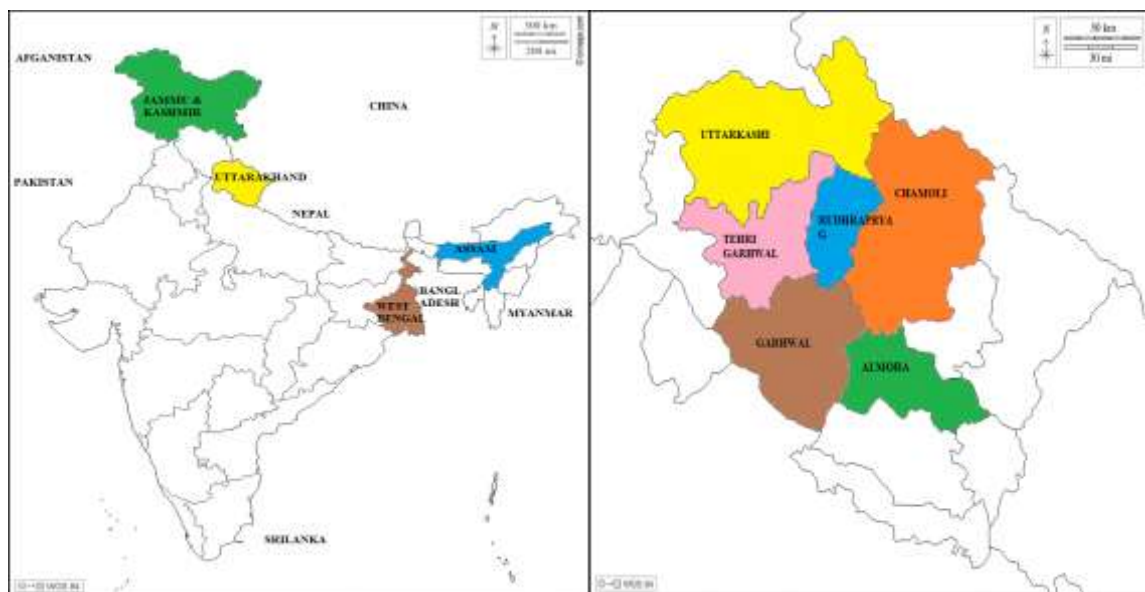
**Monotropa uniflora** comes under the family of Ericaceae is comprised of 4250 known species which are divided into 124 genera. Ericaceae are a family of flowering plants it is also known as heather family. There are well known and economically important plants comes under the Ericaceae family includes cranberry, blueberry, monotropa uniflora, huckleberry, rhododendron etc. Ericaceae family contain a morphologically diverse

range of taxa which includes herb, shrub, and tress. Historically, the Ericaceae family has six subfamilies which includes Rhododendroideae, Ericoideae, Vaccinioideae, Monotropidaeae, Wittsteinioideae, Pyroloideae. After some systemic research conclude that there are five subfamilies comes under the Ericaceae family which includes Empetraceae, Epacridaceae, Monotropaceae, Prionotaceae, and Pyrolaceae. The plants belong from Ericaceae family have a nearly worldwide distribution and are absent from Antarctica. The plants have capacity to tolerate acidic and infertile conditions like other stress tolerant plant(2).

**Monotropa uniflora** also known as ghost plant, Indian pipe which is widely distributed in Himalayan region. The plant is dark colored, fibrous, perennial root, stems are white in colour and 4-8 inches height. Leaves of the plant is white, lanceolate, large, transparent, and has terminal flower. The plant has 2-4 scale like structure which represents calyx, corolla(5), 8-10 stamens and anthers are present on apex or filament(3). The plant has many ethnobotanical uses which are includes epilepsy, convulsion, pain, ulcer etc.

### II. GEOGRAPHICAL DISTRIBUTION

**Monotropa uniflora** plant is widely distributed in South Asia and the longitudinal range is about 68.94-117.8 decimal degrees and latitudinal range is about 6.76-36.81 decimal degrees, which covers 1,50,316 square Km area for the growth of the plant. **Monotropa uniflora** mainly found in the countries like Tajikistan, Afghanistan, Pakistan, India, Nepal, China, Bangladesh, Myanmar, Srilanka, Laos and Vietnam. In India, Nepal, China, Afghanistan, Sri Lanka, Myanmar and Vietnam 39,968 square Km area covered by the plant(4).



In India mainly distributed in Uttarakhand region like Uttarkashi, Tehrigarhwal, Garhwal, Almora and Chamoli.

### III. BOTANICAL DESCRIPTION

**Monotropa uniflora** plant root is dark-coloured, fibrous and perennial in nature. Stems of the plant is ivory-white in colour and height of the stem is about 4 to 8 inches long, simple, sub-cylindrical in shape and smooth. Leaves of the plant is semi-transparent, lanceolate and white in colour and bearing white, large, terminal, solitary flower. There are deciduous bracts are present which shows the presence of calyx. Sepals are replaced by 2 to 5 caducous bodies which is bracteolate, lanceolate and irregular. The corolla is permanent which consist of 5 distinct, erect, fleshy, gouge-shaped petals are present at the base. Stamens 10 are short, recurved, Nipple like shape present at the base of the ovary and stamens are shorter than the petals(5). Anthers 8 are present on the apex of the hairy filament which are horizontal, reniform, one celled and opening by transverse chinks(6). Pollen grains are simple and show 1 to 2

translucent depressed spots. Stigma are naked, discoid, and funnel shaped. Fruit of the plant is erect, ovoid and consist of 8 to 10 grooved, 4 to 5 celled loculicidal pod. Flower is pubescent and colourless except where colored anthers and pistils are present. Mature seeds are present in plant *Monotropa uniflora* which is spindle-shaped and length of the seed aboutrange from 0.6-0.8 mm and width about 0.12-0.15 mm. The seed core consist of the endosperm and embryo and the nucellar tissue are absent in the seed(7). The *Monotropa uniflora* has well developed root system. The roots of plant are divided into the three categories and they are designated as roots of the first, second & third order. In this plant root hairs are absent. First order roots are the largest component of the root system and join adjacent plants(8). Stomata are present on the leaves of *Monotropa uniflora*(9).



Figure 3: Monotropa uniflora (Arielle the plant humorist)

#### IV. PLANT PROFILE

##### SCIENTIFIC

##### CLASSIFICATION

Kingdom: Plantae  
 (unranked): Angiosperms  
 (unranked): Eudicots  
 (unranked): Asterids  
 Subkingdom: Viridiplantae  
 Infrakingdom: Streptophyta  
 Division: Tracheophyta  
 Superdivision: Embryophyta  
 Subdivision: Spermatophytina  
 Class: Magnoliopsida  
 Order: Ericales  
 Superorder: Asteranae  
 Family: Ericaceae  
 Genus: Monotropa  
 Species: uniflora(10).



Whole plant Monotropa uniflora (Arielle the plant humorist)

##### COMMON NAME

Indian pipe, Ice-plant, Bird's nest, Fit-plant, Ova-ova, Pipe-plant, Ghost-flower, Corpse-plant, Convulsion root, Monotropacoccinia(11&12).

##### CHEMICAL CONSTITUENTS

In this plant a crystallizable poisonous principle, which also occurs in several other ericaceous plants; it is named andromedotoxin (C<sub>31</sub>H<sub>51</sub>O<sub>10</sub>). It also contain volatile oil and salicylates of methyl. It consist of two compound quercetin 3-O-glucoside and quercetin 3-O-glucuronide(13). It also consist of many fatty acids and some sterols like linoleic acid, palmitic acid,

cholesterol, campesterol, stigmasterol, sitosterol, cycloartenol, cycloeucaenol(14). Fungus name Colletotrichum dematium also isolated from plant(15). An amoeba Acanthamoeba polyphaga is isolated from Monotropa uniflora(16).

##### PHYSICAL PROPERTY

Monotropa uniflora has physical property like Mucilaginous and astringent property(17).

##### ETHANOBOTENICAL USES AND HEALTH BENEFITS

Indian pipe root is used as a tonic, sedative, nervine, and antispasmodic. It also employed in febrile diseases, as a sedative and

diaphoretic. The powder of the plant is used in instances of restlessness, pains, nervous irritability, etc., act as a substitute for opium. It is also used in treatment of fever and act as excellent antiperiodic. Indian pipe also considered or employed in the treatment of convulsions of children, epilepsy, chorea, and other spasmodic affections. Juice of the plant is active against the obstinate ophthalmic inflammation, ulceration of the bladder and use as an injection form in gonorrhoea. Dose of the powdered root is from 1/2 to 1 drachm, 2 or 3 times a day. It is also reported as an anti-mycobacterial activity(18). It also use as a skin infection and wound healing(19). Roots of the plant used in the treatment of epilepsy and convulsion specially in children's (20).

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