

# *Inula racemosa* Hook. f.

Syn. *Inula helenium* L.

## Asteraceae

|                |                  |
|----------------|------------------|
| Ayurvedic name | Puskara          |
| Hindi name     | Puskarmool       |
| Trade name     | Puskarmool       |
| Parts used     | Root and rhizome |



*Inula racemosa* –  
a plant

### Therapeutic uses

**P**uskarmool is an aromatic tonic, febrifuge, and expectorant with anti-inflammatory, carminative, diuretic, and antiseptic properties. The plant is used in chronic bronchitis and rheumatism. Dried rhizomes and roots are used to cure loss of appetite and stomach troubles.

### Morphological characteristics

The species is a perennial herb up to 1.5 m tall with fragrant prominent root and rootstock. Stems are many in number, ascending from the base of the rootstock. Leaves are leathery, rough above and densely hairy below, 25–50 cm long and 10–12 cm broad, and elliptic–lanceolate in shape.

### Floral biology

Flower heads are yellow in colour, have bisexual florets, and occur in terminal racemes. Flowering occurs from January to July, while fruiting



*Inula racemosa* –  
a field view

occurs in October–November. Fruits (achenes) are slender and about 0.5 cm long.

### Distribution

The species occurs in temperate areas of Kashmir, Himachal Pradesh, and Uttarakhand in India. It extends up to Iran, Afghanistan, Baluchistan, and Europe, and is cultivated in temperate and sub-alpine regions of India. It is an oriental species in origin and distribution.

### Climate and soil

The conditions of temperate and sub-alpine regions are most suited for the cultivation of *Inula* species. Well-drained, clay-loam soils are ideal for the crop. It prefers open and sunny locations.

### Propagation material

Propagation can be done both by seeds and rootstocks. However, it is preferable to raise seedlings through seeds. The fruits (achenes) mature in winter and can be collected by the end of cold season (March–April) in high hills.

### Agro-technique<sup>1</sup>

#### Nursery technique

- *Raising propagules* The crop can be raised through seeds in nursery in November or early March by broadcasting the seeds in well-prepared nursery beds. Germination is completed in about 50 days. Seedlings are transplanted in the field with a ball of earth after about two months of growth.
- *Propagule rate and pretreatment* About 1 kg seeds are required to raise about 40 000 seedlings required for 1 hectare of land. No specific seed treatment is required before sowing.

<sup>1</sup> Agro-technique study carried out by S K University of Agricultural Sciences and Technology, Division of Floriculture, Medicinal and Aromatic Plants, Shalimar, Srinagar – 191121, Jammu and Kashmir.

### Planting in the field

- *Land preparation and fertilizer application* The land should be ploughed lightly in order to loosen the soil and mix organic manure or FYM (farmyard manure). Usually, FYM @ 15 tonnes/hectare is applied at the time of land preparation. If inorganic fertilizers are used, half of nitrogen (100 kg/hectare) and full dose of phosphorus and potassium at the rate of 100 kg/hectare and 50 kg/hectare, respectively, are applied at the time of land preparation.
- *Transplanting and optimum spacing* The germinated seedlings may be transplanted to the main field after about two months. Optimum spacing recommended in the main field is 50 cm × 50 cm. An optimum crop stand of approximately 40 000 plants per hectare is accommodated with the above-mentioned plant density.
- *Intercropping system* Puskarmool is preferred as a sole crop without intercropping.
- *Interculture and maintenance practices* NPK (nitrogen, phosphorus, potassium) @ 200 kg/hectare, 100 kg/hectare, and 50 kg/hectare, respectively, may be used per year to achieve high biomass yield. Nitrogen is usually applied in two split doses, one as a basal dose and the other (100 kg/hectare) as top dressing in six to eight weeks after transplantation. Only manual weeding is recommended twice during the establishment phase of the crop.
- *Irrigation practices* Light irrigation at an interval of three to four weeks is sufficient to maintain the crop.
- *Disease and pest control* No serious incidence of disease or pest has been observed in this crop.



Roots of *Inula racemosa*

### Harvest management

- *Crop maturity and harvesting* The crop is harvested after about one-and-a-half years in October–November under temperate conditions of Kashmir. Roots are dug after wetting the soil. The roots are cleaned well and soil particles are removed.



*Inula racemosa* –  
in full bloom

- *Post-harvest management* The harvested crop should be cut or sliced into small pieces, dried, and stored in airtight containers. The rootstock and roots should be separated from the aerial portion, chopped into small pieces, and allowed to dry in shade.
- *Chemical constituents* The rootstock and roots contain inulin, alantolactone,  $\beta$ -sitosterol, isoalantolactone, dihydroalantolactone, and its glucosides. Four sesquiterpene lactones have also been isolated from *Inula* sp.
- *Yield and cost of cultivation* The crop is harvested at one-and-a-half years of growth.

About 80 quintals of dried roots are obtained from 1 hectare cropped area. The estimated cost of cultivation is about Rs 37 800 per hectare.

### Market trend – 2006/07

Market demand: 3 tonnes per annum