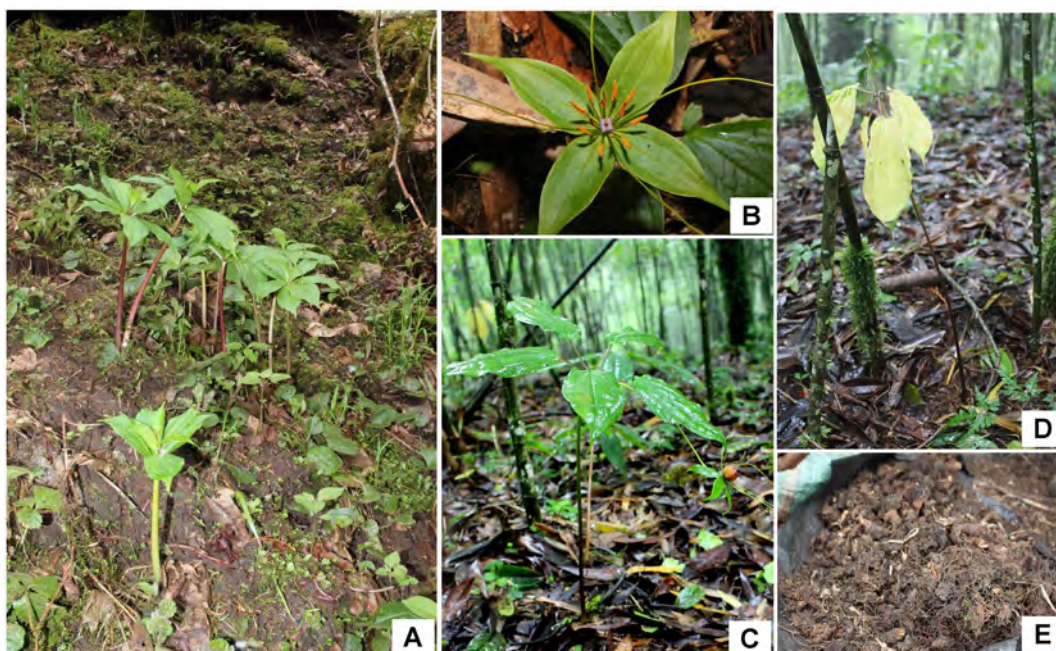


TAMMA

Report on unsustainable wild collection of *Paris polyphylla* (Smith, 1813), a high valued medicinal plant from Dibang Valley, Arunachal Pradesh, India



A - *Paris polyphylla* in its natural habitat; B - *P. polyphylla* in flowering stage; C - Mature seed; D - Plant started withering; and E - Dry rhizomes of the plant

Plantae
(Plant Kingdom)

Liliales
(Order of monocotyledonous flowering plants)

Melanthiaceae
(Family of flowering perennial herbs)

Paris polyphylla
(Tamma)

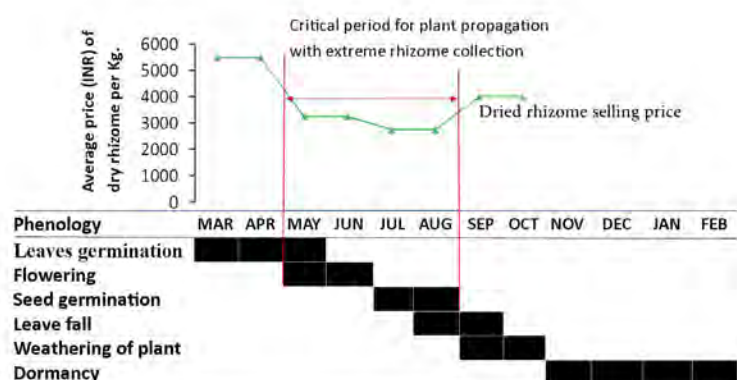
Species described by Smith in 1813

The *Paris polyphylla* (Smith, 1813) locally called “Tamma” in Idu-Mishmi means “medicine”, is a vulnerable Asian plant species in Nepal (Madhu et al. 2010). The rhizome of this species is rich in numerous active phytochemical compounds with high medicinal properties (IUCN 2004; Sharma et al. 2015); traded illegally with high international demand especially from traditional Chinese medicine production (Negi et al. 2014; Paul et al. 2015). The traditional use of this plant was known by the local people residing to the vicinity of naturally growing sites in Dibang Valley. It is used by the Traditional Chinese Medicine (TCM) System for

the treatment of cancer (Mao et al. 2009). This practice threatens vegetative propagation of this species followed due to exploitation. This report is about unsustainable collection of *P. polyphylla* in large scale from last several years from Dibang Valley.

The *P. polyphylla* is a broad-leaved perennial plant species (Family: Melanthiaceae); grows 10 to 100cm tall; the leaves 5–10 rarely up to 22. Stem stout, rhizome creeping and segmented; the flowers are spider like, terminal, greenish at the apex, hermaphrodite, subtended by 4–9 lanceolate long-pointed leaf-like bracts. It has distribution from tropical to temperate region of Indian Subcontinent particularly in Bhutan, China, India, Laos, Myanmar, Nepal, Thailand and Vietnam (Paul et al. 2015).

The present study was conducted during March 2015 to December 2016 from Dibang Valley of Arunachal Pradesh (28°42'N & 95°42'E) situated in the foothills of eastern Himalaya. The species distribution was recorded at different forest patches of altitudinal range 2,000–3,500 m. It grows in moist forest with thick canopy cover; humus rich soil; rhododendron and bamboo forest with low light intensity; and sloppy areas near streamside. New leaves sprout in the beginning of March that continues until May. The flowering period is from the end of May to June followed by seed setting during July and August; leaves fall during August to September. The weathering of plant observed during September to October. In November upper plant parts dies and the plant remain dormant for four months (November to February).



Schematic representation of reproductive phenology of *P. polyphylla* and selling price of dried rhizome at different months

Rhizome collection of this species started with the germination of new leaves and continued till leaves fall (March to October).

We observed that fresh rhizomes were sold in the local market at INR 300–400/kg and dry rhizomes at INR 5,000–6,000/kg during early season

(March–April). It was primarily sold by the local villagers to agents who subsequently sell it to other traders. It is reportedly sent to China via Myanmar (Basar 2014; Mao et al. 2009). Illegal trade of the rhizomes has also been reported from West Kameng, Lower Dibang Valley and Lower Subansiri (Paul et al. 2015) in Arunachal Pradesh. Mao et al. (2009) reported its illegal trade from Manipur, Nagaland, Meghalaya and Arunachal Pradesh.

We observed that price gradually decreases upto INR 2,500/kg for dried rhizome when more number of people start collecting the rhizome. However, value for the fresh rhizome remained constant throughout the year. We have reported more availability of the species during May–August and high collection, this results decline in selling price of dried rhizome by traders/middle men and thus enhanced local people to collect more and to get a good amount for their sale. Although not studied thoroughly, such mass collection of the rhizome of this species most likely to have impact on its regeneration and population in future as collection is done by complete uprooting of the whole plant irrespective of its life stage. Therefore, unsustainable and unscientific collection of this species from its natural habitat would increase vulnerability of this species in the region.

Concerned over illegal rhizome collection and trading, the Arunachal Pradesh State Medicinal Plants Board (APSMPB) once banned rhizome sale during 2012 and 2013 (The Arunachal Times 2016). However, the ban has no impact on collections. It is important to highlight such mass extraction of *P. polyphylla* from the study area to create awareness among concerned authorities so that rhizome collection and sale is regulated for the conservation of the species. We also recommend study on ecology and economics of this species for future sustainable harvest through cultivation. Further, the community leaders may play a vital role in regulating collection and minimize harvest by imposing customary rules and regulations to ensure that sustainable harvest leads to conservation of this species for future generation.

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