

Research Article

TRADITIONAL USE OF *MANDRAGORA CAULESCENS* C. B. CLARKE, A POORLY KNOWN MEDICINAL PLANT OF SIKKIM HIMALAYA

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ABSTRACT: The traditional use of a Solanaceous plant, *Mandragora caulescens* C. B. Clarke, as medicine by the tribal communities of Sikkim is reported. The chemical constituents of the plant are also highlighted. In addition, the medicinal uses of its sister member, *M. officinarum* have also been mentioned. The scientific exploitation of *M. caulescens* through proper bioprospecting is highly recommended.

Key words: Himalayan Mandrake, European Mythology, Ethnobotanical use, Sikkim.

INTRODUCTION

The genus *Mandragora* L. of the nightshade family Solanaceae consists of three or four species, is distributed in South West Asia and Europe (Zhang *et al.* 1994, Mabberley 2017). The species *Mandragora caulescens* C. B. Clarke, a high Himalayan member, is the sole representative of the genus in India (Clarke 1883, Chowdhery *et al.* 2008). This species is commonly known as the 'Himalayan mandrake'. In India, *M. caulescens* is found to grow only in two states, viz., Arunachal Pradesh and Sikkim (Clarke 1883, Zhang *et al.* 1994, Chowdhery *et al.* 2008). Till date in Sikkim Himalaya the species is recorded from the alpine rocky crevices of Singaleleh Range, Nattung, Lasha Chu-Below Phaklung, Yume Samdong, Dzungri, Thangu valley, lower Gurugongmar valley and Yumthang valley. Tribal people of the state use this plant to cure different ailments in their daily lives. Present work aims to provide the information about the ethno-medico-botany through the report of traditional uses of the plant. Traditional uses of this plant in other parts of the globe are also recorded. Moreover, the taxonomy, habitat information and recorded chemical constituents of the species are also mentioned. Furthermore, emphasis is also given to provide valuable information of the related species *Mandragora officinarum* for better understanding.

PLANT SPECIMEN

The plant specimens were collected from alpine habitat of Gurudongmar and Yumthang valley of North Sikkim during the month of June to September in the year 2019. The plants were also located in the lower Yumthang valley. Photographs have been taken for better understanding of habitat information and characteristics of the plant in the field condition. The specimens were dried properly, mounted on herbarium sheet following standard herbarium methodology (Ranjan 2018) and deposited at CUH for future references. The species has been identified by using relevant literature (Clarke 1883, Zhang *et al.* 1994, Mill 2001).

Taxonomy of the plant

Mandragora caulescens C. B. Clarke in J. D. Hooker, Fl. Brit. India 4: 242. 1883; Zhang *et al.* in Wu and Raven, Fl. China 17: 330. 1994; Mill in Springate, Fl. Bhutan 2(2):1065. 2001 (Fig.1).

Perennial, fleshy, glandular hairy herb, to 50 cm tall; rhizome fleshy, elongated to 25 cm long; leaves mostly basal, few alternate along stem, obovate-oblongate, 2-20 cm × 1.5-5 cm, obtuse, sessile; flower solitary, on long pedicel, drooping, greenish yellow or purple; calyx 5-lobed to almost middle, campanulate, 13-15×6-10 mm, dark green; calyx tube 5-7 mm long; lobes lanceolate, 7-

9×6-10 mm, apex rounded, margin hairy, glabrous adaxially, sparsely hairy abaxially on upper side, mid vein prominent; corolla 5-lobed, spreading; tube 5-7 mm long; lobes broadly ovate or deltoid, 7-10×6-10 mm, dark purple, greenish purple or yellow; filaments hairy at base; stigma slightly 2-lobed, bearded; fruiting calyx enlarged, campanulate, usually covering half of the fruit; berry globose, yellowish; seeds compressed, reniform.

Phenology: Flowering– May-July. Fruiting– July-October.

Distribution: India: Sikkim, Arunachal Pradesh; Nepal, Bhutan, China.

Ecology: This species grows in open slopes, grassy fields, in rocky crevices in the temperate to alpine forests at 3000-4000 m amsl elevations commonly in association with *Primula capitata*, *P. kingii*, *P. sikkimensis*, *Salix* sp., *Rhododendron lepidotum* etc.



Fig.1. *Mandragora caulescens* – Habit (inset: fruits).

ETHNOMEDICINAL USES IN SIKKIM

The Bhutia and Nepali communities of the Lachen, Thangu and Lachung areas of North Sikkim are often exploiting this plant as traditional medicinal herb. They use this plant in gastric problems, respiratory problems and even in case of joint pains. The fleshy rhizome of mature plants is usually collected during post monsoon season. This time plants are often with mature and ripe fruits. The fleshy rhizome washed in fresh water with proper care. Rhizomes are crushed with water and boiled gently. Generally, the decoction is filtered and then prescribed for required doses per day. However, the effective dose is given depending upon the age and severity of the problem encountered.

Reports on previous uses

Although, the article deals with some ancient uses of *Mandragora caulescens* by the tribal communities of Sikkim, however, no such report on medicinal uses of the species is available till date. But, another important species of the genus viz., *Mandragora officinarum* is exploited since eighteenth century under the common name 'Mandrake plant'. From the ancient time the species of *Mandragora* (Mandrake plant-*Mandragora officinarum*) is associated with some mystical properties and belief in Greek and Roman societies. It was believed by the ancient people of Greece and Rome that Mandrake plant helps to conceive child in barren woman. During the time of Pliny (23-79 C.E.) pieces of roots of *Mandragora officinarum* was being given to patients before surgery as it reduces the sensitivity of the brain or nervous system and for its soporific properties (Blakemore and Jennett 2001). Historically it has also

been used as emetic and purgative (Blakemore and Jennett 2001). Peduto (2001) has reported the use of root as an aphrodisiac and in fertility. The great Greek physician Dioscorides had described the use of wine made from mandrake against severe pain and as anesthesia (Peduto 2001). The plant is often used to treat travel sickness. The root of the plant contains the alkaloid hyoscyne and is used as cathartic, emetic, hallucinogenic and narcotic. In past, the plant is commonly used for its anodyne and soporific properties. The freshly grated root extract was applied externally against ulcers, rheumatic pains and scrofulous tumors. The root extract is also used internally for the treatment of melancholy, convulsions and mania. The leaf paste has been used externally for the treatment of ulcers (naturalmedicinalherbs.net). Furthermore, some side effects viz., drowsiness, dry mouth, heart problems, vision problems, overheating, problems with urination, hallucinations, etc. occurs due to over dose are also serious concern.

Chemical constituents

Members of *Mandragora* usually possess important alkaloids. Roots of *M. caulescens* contain higher concentration of two tropane alkaloids, viz. hyoscyne and anisodamine (Zhang *et al.* 1994). These tropane alkaloids are highly toxic. However, these alkaloids have many important medicinal uses. Notably, according to recent medical report it has no harmful effect on human (Poupko *et al.* 2007).

DISCUSSION

Sikkim is famous for its cosmic biodiversity along with rich cultural heritage (Maity *et al.* 2018). The Indigenous

Traditional Knowledge (ITK) of different aboriginal people of the state is tremendous (Maity *et al.* 2004, Maity *et al.* 2018). Till date about 4600 flowering plant species are recorded in this tiny state among which around 500 species are regularly used and exploited by different tribal communities (Panda and Mishra 2012, Maity *et al.* 2019). In a recent exploration trip to the high Himalayan mountains of North Sikkim unique ethnic medicinal uses of the 'Himalayan Mandrake' plant (*M. caulescens*) were recorded and have been presented here for future scientific exploitation. Bioprospecting of this plant is highly recommended to discover possible novel drugs for human welfare and sustainable development.

SPECIMENS EXAMINED

Thangu to Gurudongmar, 4000-4500 m, 07.06.2019, Ghosh & Midday 24119; Youngdi Army Workshop, 4000-4300 m, 10.07.2019, Midday & Ghosh 24299; Yumthang Valley, 3900-4200 m, 10.09.2019, Maity, Midday & Ghosh 24724 [all at Cal. Univ.Herb.].

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