Some Ranunculaceae of Shivapuri Nagarjun National Park Central Nepal

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ABSTRACT

Four species of the family Ranunculaceae were collected from Shivapuri Nagarjun National Park (SNNP). These were *Aconitum ferox* Wall ex Ser, *Clematis smilacifolia* Wall, *Ranunculus scleratus* L. and *Thallictrum foliolosum* DC. Among these *Aconitum ferox* is threatened plant and are widely collected for medicinal purpose. The plant is used for curing many diseases.

Nepal is rich in biodiversity and it harbors 2% of the world's flowering plants and it boasts around 6200 species. Floral diversity is quite high in SNNP due to its location, altitudinal and climatic variations. However its detailed study is not undertaken till now. Human survival primarily depends upon the plant resources. Plants and plant product form an integral part of our life and it is extremely difficult to imagine the survival of human without it The area shows climatic variation from subtropical to lower temperate. Indigenous knowledge and traditional practice about the use of plants of SNNP has not been documented.

Key words: Enumeration, utilization pattern. vascular plants,

INTRODUCTION

Nepal is predominantly a mountainous country. The kingdom of Nepal occupies the central sector of Himalaya stretched east-west about 900 km (Mani 1984). The biodiversity of Nepal is important both in the view of species richness and habitat and ecosystem diversity (HMGN/MFSC 2002). Although Nepal shares 0.1% of the total land area of the world, it harbors 2% of the world's flowering plants including 5% endemic flora (Shrestha 1998). Nepal ranks tenth position in richness of flowering plants diversity in Asia (BPP 1995). Nepal boasts around 6,200 species of vascular plants, 5% of them endemic to Nepal and 30% endemic to the Himalayas as a whole (Press *et al*. 2000). Knowledge of vegetation and flora of any region is essential for the study of biodiversity and environment. Scientifically

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prepared flora of any part of the country can strongly support different research and development activities of the entire nation. Generally speaking local floras are much more valuable than those of bigger areas because explorations can be carried out intensively for the former minimizing the possibilities of plants being left out, and for studying biodiversity utilization and conservation strategies (Singh 1997). Many developing countries have felt the increased need to assess and revise their floras for economic utilization of plant wealth and to conserve rare, endangered and threatened plants.

The Park is located between 27^0 45' and 27^0 52' latitude and 85^0 15' and $85^0$30' longitude covering an area of about 159 km^2 of Kathmandu, Nuwakot and Sindhupalchok districts of Central Development Region. It is the protected area that falls entirely within the middle mountain range of Nepal. It is located on the northern fringe of the Kathmandu valley. The elevation of the park ranges from 1360m to 2732m at Shivapuri peak. However most of the park lies between 1600m to 2500m above the sea level.

Nepal is rich in floral diversity, but the exploration of total number of species is still awaiting. Therefore, the local explorations of all the regions of the country is necessary for the completion of the flora of Nepal. Floral diversity is quite high in SNNP due to its location, altitudinal and climatic variations. However its detailed study is not undertaken till now. The area shows climatic variation from subtropical to lower temperate. Indigenous knowledge and traditional practice about the use of plants of SNNP has not been documented. New generation is ignoring the traditional knowledge, culture and beliefs having no knowledge about ethnobotanical value. Obviously, documentation of ethnobotanical knowledge had got more importance.

OBJECTIVE

The main objective of the study is to explore the plants of family Ranunculaceae of Shivapuri Nagarjun National Park its conservation status and its utilization pattern by the local communities there.

MATERIALS AND METHODS

The plant specimens were collected from Bagdwar, Sundarijal and Kakani areas of SNNP. Plants in flowering and fruiting stages were collected carefully from their natural habitat in different seasons of the year in 2021. During collection a field note was prepared including date of collection, locality, altitude, specimen number, occurrence, habitat, longitude and latitude of the area using GPS. Generally 3-4 (at least 2) specimen was collected. Two to three sets of herbarium specimen was

prepared.

The plant specimens were identified with the help of available standard literatures, as Hooker (1872-1897), Bailey (1949), Malla et al. (1986), Pandey (1982), Lawrence

(1967); Grierson and Long (1983,1987, 1991, 1994, 1999, 2000,and 2001), Nolite (1994,

2000), Polunin and Stainton (1997), Siwakoti and Varma (1999), Borthakur et al. (2001),

Stainton (2001), Gaunghua (1998, 1999, 2000, 2001, 2002, 2003, 2004), Zheng-yi and Raven (1998, 2000, 2005). Identification of specimens was conformed at the National Herbarium and Plant laboratories Godawari, Nepal (KATH) and Central Department of Botany, Tribhuvan University Central Herbarium, Kirtipur (TUCH).

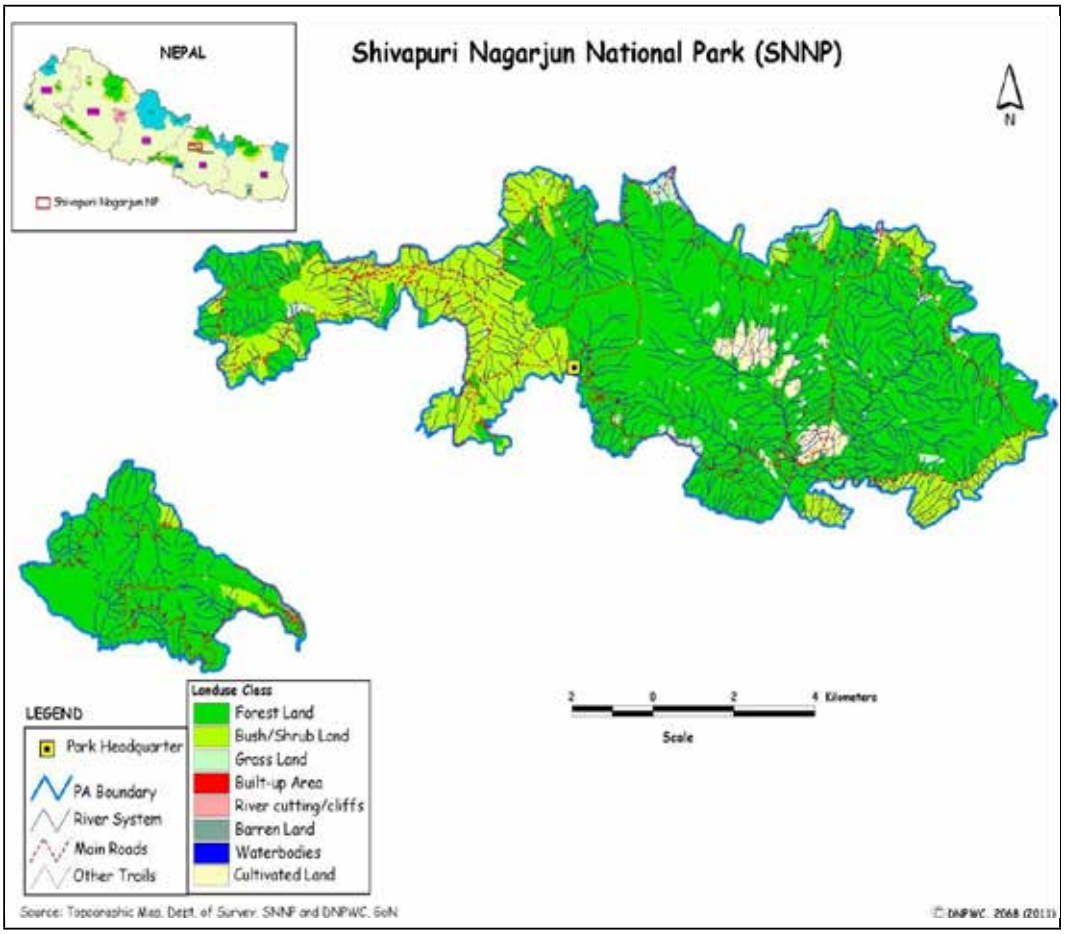

Figure 2. Map of Shivapuri Nagarjun National Park

RESULTS AND DISCUSSION

Ranunculaceae

Annual or perennial herbs, erect or stoloniferous, rarely shrubs or woody climbers. Leaves basal and cauline, alternate, rarely opposite, entire or palmately, ternately or pinnately dissected, exstipulate. Inflorescence solitary cymose, racemes or paniculate. Flowers actinomorphic or zygomorphic, bisexual or unisexual. Sepals 3-8, mostly 5. Petals sometimes absent, 1-many, free. Stamens many. Carpels 1-many, superior, free or shortly connate at base. Ovule 1, basal or few- many marginal. Fruit a cluster of 1- seeded indehiscent achenes or few to many seeded follicles.

Key to the Genera

1. Plant climber..... Clematis

1. Plant an erect annual or perennial herb :

    2 Fruit an achene:

    3 Petal present ..... Ranunculus

4 Petal absent..... Thallictrum

2 Fruit follicle, Petals ± S – shaped..... Aconitum

Aconitum ferox Wall. ex Ser., *Mus. Helv. Bot*. **1** : 160, t. 15, f. 43 & 44 (1823). Hara and Williams*, Enum. Fl. Nep*. **2** : 9(1979); Grierson and Long*, Fl. Bhu*. **1**(2): 319 (1983); Press et al. *Ann. Check. Fl. Pl. Nep*.: 248 (2000).

Aconitum virosum D. Don, *Prodr. Fl. Nep.* 196 (1825).

Herb, erect upto 1 m high. Leaves alternate, petiolate, nearly round, palmately lobed, segments acuminate. Flowers numerous in racemes, blue or violet in colour. Sepals 5, petaloid, uppermost sepal 2-2.5 x 0.8 – 1 cm; upper lateral sepals broadly obovate, c 1.5 x

1.3 cm; lower sepals ovate, c 10 x 3 mm;. petals 2, petal head ± S-shaped, 6 mm, spur recurved. Stamens numerous. Ovule solitary. Fruit a follicle.

Fl. and Fr.: June-October

Voucher specimen: Kathmandu, Bagdwar, 2650 m, October 6, 2021, Sabina 105 (TUCH). On moist and shady places of the forest.

Local name: Bikh, Nilo bikh

Uses: Plant is poisonous and used in many preparations of medicines, can be used as analgesic, antipyretic, expectorant, rodenticide and insecticide (Manandhar 2002).

Distribution: Nepal (CE., 2100-3800 m), Eastern Himalaya (Nepal to Bhutan).

Note: This is a commercially threatened plant widely collected for medicinal purpose and exported annually. It is rare, poisonous plant used for curing many diseases (Shrestha and Joshi 1996).

Clematis smilacifolia Wall., *Asiat. Res*. **13**: 402 (1820). Hara and Williams*, Enum. Fl. Nep*. **2** : 16 (1979); Grierson and Long*, Fl. Bhu*. **1**(2): 288 (1983); Press et al. *Ann. Check.*

Fl. Pl. Nep.: 253 (2000).

Woody climber. Leaves simple or ternate, opposite, long petioled, broadly ovate, 6-14 x 3-9 cm, acute, base cordate or rounded, margins entire or remotely and shallowly serrate. Flower in axillary panicle, creamy white in colour. Panicle branches often whorled and bearing a number of linear-spathulate bracts, c 2 cm. Sepals 4-8, ovate, 2-2.5 x 0.5-0.75 cm, creamy white in colour. Stamens numerous, filaments white, glabrous. Carpels numerous. Fruit flattened oval achene, pubescent; style up to 5.5 cm at maturity.

Fl. and Fr.: January-March

Voucher specimen: Nuwakot, Kakani, 2100 m, September 7, 2021, Sabina 441 (TUCH). On mixed forest.

Local name: Pinasi lahara, halure lahara

Distribution: Nepal (CW., 300-1800 m), India, Indo-China, Myanmar, China (SW China, Xizang), Malaysia.

Note: Not reported at 2100 m by Press et al (2000).

Ranunculus scleratus L., Sp. Pl.: 551 (1753).). Hara and Williams*, Enum. Fl. Nep*. **2** : 20 (1979); Grierson and Long*, Fl. Bhu*. **1**(2): 303 (1983); Press et al. *Ann. Check. Fl. Pl. Nep*.: 257 (2000).

Erect, annual glabrous herb, up to 75 cm high. Leaves alternate, radical as well as cauline; radical leaves long petioled, lamina three lobed, 2.5 – 5 cm across, apex toothed; upper cauline leaves are shortly petioled, obovate, 3-parted, segments narrow, 3-5

toothed at the apex. Flowers many, diffusely racemose, terminal. Sepals 5, elliptic, reflexed. Petals 5, oblong, yellow. Stamens many, short flattened. Carpels numerous, style minute, receptacle oblong. Fruit achenes, obovoid.

Fl. and Fr.: March-October

Voucher Specimen: Kathmandu, Sundarijal, 1900m, August 8, 2021, Sabina 261 (TUCH). On moist place, common.

Uses: The plant is poisonous (Manandhar 2002), therefore it is first boiled and then cooked as vegetable. Juice of the plant is dripped into the eyes of livestock suffering from conjunctivitis.

Distribution: Nepal (WCE., 800-1700 m), N America, Europe, C. Asia, N. India, China, Japan, Mongolia, Siberia.

Note: Not reported at 1900 m by Press et al (2000).

Thalictrum foliolosum DC., *Syst. Nat*. **1**: 175 (1817).). Hara and Williams*, Enum. Fl. Nep*. **2** : 21 (1979); Grierson and Long*, Fl. Bhu*. **1**(2): 298 (1984); Press et al. *Ann. Check.*

Fl. Pl. Nep.: 257 (2000).

Bushy herb upto 2 m high. Leaves radical as well as cauline, petiolate, pinnately decompound, 10-30 cm, leaflets broadly ovate, acute or obtuse, bluntly toothed or lobed. Flowers in branched panicles, yellowish in colour, sepals 4, elliptic petaloid. Stamens numerous, anther more or less as long as filament. Carpels few. Achenes ellipsoid, strongly ribbed, sessile.

Fl. And Fr.: June-August

Voucher specimen: Nuwakot, Kakani, 2300 m, August 29, 2021, S. Sabina 367 (TUCH). On moist shady as well as sunny places, occasion.

Local name: Dampate, mirmire.

Uses: The root juice about 6 teaspoons twice a day is for fever. It is also used in case of indigestion, toothache, earache. A paste of root is used to set dislocated bones in case of animals.

Distribution: Nepal (WCE., 1300-3400 m), Himalaya (Kashmir, Uttar Pradesh to Arunachal Pradesh), N. Myanmar, China (Xizang).

Out of four species *Aconitum ferox* and *Ranunculus scleratus* are poisonous. *Aconitum ferox* is commercially threatened and used for curing many diseases.

CONCLUSION

Four species of the family Ranunculaceae were recorded from the SNNP. These were *Aconitum ferox*, *Clematis smilacifolia*, *Ranunculus scleratus* and *Thallictrum foliolosum*. Among four *species Aconitum ferox*, *Ranunculus scleratus* and *Thallictrum foliolosum* have medicinal value. *Aconitum ferox* and *Ranunculus scleratus* were poisonous, the later one also used as vegetable. *Aconitum ferox* is a threatened plant.

Aconitum ferox Wall ex Ser

Clematis smilacifolia Wall

Rannunculus scleratus L.

Thallictrum foliolosum DC.

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