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Research article

Ethnomedicinal aspects of climbing plants of Palpa district, Nepal

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Abstract: Climbers are those plants which germinate on land and grow by adhering to other plants to attain great stature. Climbers are different in their mechanical characters, well adapted to climb on support like large trees, hedgerows or rocks by twining their stems, some climbers climb on support by the way of adventitious clinging roots, with twining petioles or by using tendrils. A total of 51 climbing plants species belonging to 40 genera and 22 families used in folk medicine have been documented from different VDCs of Palpa district.
Keywords: Climber - Clinging roots - Tendrils - Ethnomedicine - Liane.

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INTRODUCTION

Climbing plants are one of the most interesting group but a much-neglected group of plants. A climbing habit has evolved independently in several plant families, using many different climbing methods because of their weak stem. Climbers are different in their mechanical characters (Isnard *et al.* 2009), well adapted to climb on support like large trees, hedgerows or rocks. Some climbers climb by twining their stems around a support another climb by way of adventitious clinging roots, with twining petioles or using tendrils which can be specialized shoots, leaves or even inflorescence.

Climbers are the plants that germinate on the floor and grow for part of their life by winding ground, anchoring or adhering to other plants (Jongkind & Hawthrone 2005), to attain great stature (Swaine *et al.* 2005). They comprise 7% and 20% of regional flora in temperate and tropical forest respectively (Gentry 1991) and thus become an important constituent of an area. Climbers are not only the important components of plant diversity but, are also valuable for their medicinal uses, nutrient cycling etc. (Schnitzer & Bongers 2002). The climbers are rooted in the ground but need support for their weak stems (Richards 1952). In nature, climbers generally use plants growing nearby as external support media to ascend (den Dubbelden & Oosterbeek 1995). Schimper (1903) classified climbers into scrambles, root climbers, twiners and tendril climbers. The term 'vine' and liane are generally used as synonymous for climber and woody climbers respectively (Kelly 1985).

Today the climbers are an important constituent of non-timber forest products (NTFPs) According to the best of our knowledge there is no comprehensive study assessing the role of climbers in Nepalese forests for healthcare management and economic subsistence of local people. Keeping above view in mind present study was proposed to document the ethnomedicinal uses of climbers for the first time in the Palpa district of Western Nepal.

MATERIALS AND METHODS

Study Area

Palpa district is a part of Lumbini Zone, is one of the seventy-five districts of Nepal, landlocked country of South Asia, is located at 27º34" to 27º54" N and 83º15" to 84º22" E with an altitude ranging from 152 m to 1936 m above the sea level. It has unique physiography due to Churia and Mahabharat ranges. The district, with Tansen as its headquarters, covers an area of 1,373 Km^2 and has a population of 2, 61,180 of which male and female proportions are 1, 15,840 and 1, 45,340 respectively (CBS 2011). Palpa district is divided into two municipalities *i.e.* Tansen and Rampur and 61 VDCs. It is bounded by Gulmi and Arghakhanchi districts from West; Gulmi, Syangja, and Tanhun district from North; Nawalparasi and Tanhun from East and Rupandehi and

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Nawalparasi from South (Fig. 1). Palpa district is located in hilly region of Nepal. The average temperature of the district is maximum 32ºC and minimum 4ºC (DDC 2009) with dry winter and wet summer. The average annual rainfall is around 2006 mm, with a fluctuating pattern for total of 29 years between 1985 and 2013 A.D., (DCEP 2016). The monsoon starts from June and pronounce rainfall occurs during June to mid-September. Palpa district of Western Nepal is inhabited by many ethnic communities of which 50% or majority is comprised by Magars and rest by Brahmin, Newar, Chhetri, Gurung, Kumal, Sarki, etc.

Geographically Palpa district is divided into mid-mountain hill region (82%) and Chure hill region (18%). Total forest in Palpa district is 67607 ha, the land area used for agriculture is 44,332 ha, shrubs area is 23,736 ha with 538 ha area of water bodies and 70 ha of barren land. The vegetation of the Palpa district is dominated on the southern side by lower tropical Sal (*Shorea robusta* Gaertn.) and mixed broad leaves forest. *Terminalia alata* Heyne ex Roth, *T. chebula* Retz., *T. bellirica* (Gaertn.) Roxb., *Dalbergia sissoo* DC., *Ficus semicordata* Buch.-Ham. ex Sm., *Castanopsis indica* (Roxb. ex Lindl.) A.DC., *Berberis asiatica* Roxb. ex DC., *Zanthoxylum armatum* DC., *Albizia* species, *Schima wallichii* (DC.) Korth., and *Pinus roxburghii* Sarg. etc. are also found dominated in the upper and mid belt of the district.

Palpa district of Western Nepal is selected for research activities because this district is potential in terms of ethnomedicine. Little works have been carried out by some workers (Shrestha 1985, Mahato 1998, Mahato & Chaudhary 2003, Singh *et al.* 2011) but no any work has been done on climbing plants.

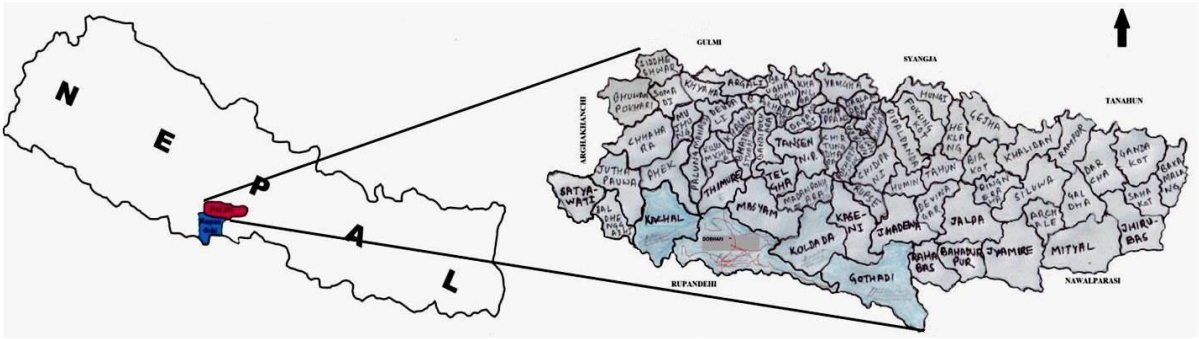

Figure 1. Location map of study site: Palpa district.

Data Collection

A preliminary survey was done in different VDCs like Kachal, Dobhan, Koldanda, Gothadi, Rahabas, and Jyamire to get information about the study area along with local persons and knowledgeable peoples. The area was visited three times in different seasons (summer, monsoon, and winter) to avail most of the plant resources in their flowering condition for this purpose. The study was conducted from October 2014 to August 2015. The methodology was based on interviews using checklist and questionnaire of information.

Plants collected from study area were identified by using previous literature (Hooker 1872–1897, Bailey 1949, DMP 1969, 1970, 1984, 1986, Polunin & Stainton 1984, Mc Crackers & Shrestha 1992, Stainton 1997, Chaudhary 1998, Manandhar 2002). Photographs were taken of the plants' habit in the flowering conditions, abundant plants were taken to prepare herbarium sheets. Herbarium specimens and photographs were identified by taxonomists and finally deposited in the Herbarium of the Department of Botany, Butwal Multiple Campus, T.U., Butwal, Nepal for future use. The questionnaire was prepared in terms of local language following Martin's (1995) manual. The Scientific name of the collected climbing plants were provided by Hara *et al.* (1978, 1979, 1982) and Press *et al.* (2000) have been adopted.

RESULTS AND DISCUSSION

Survey of palpa district revealed that 51 climbing plants species belonging to 40 genera and 22 families are used in folk medicine by the inhabitants of different VDCs like Kachal, Dobhan, Koldanda, Gothadi, Rahabas, and Jyamire of Palpa district. Out of these climbing plants 38 plants belong to Dicots, 12 belong to Monocots and 1 belongs to Fern. The highest number of climbing plants belong to family Cucurbitaceae (12 species) followed by Fabaceae (8 species), Convolvulaceae, Dioscoreaceae, Piperaceae (3 species in each), Vitaceae, Menispermiaceae, Asclepiadaceae, Liliaceae, Smilaceae (2 species in each) etc. Singh (2016) described ethnobotany of 18 climbers of Paras district of Nepal. Out of these, 15 namely climbers *Abrus precatorius, Acacia rugata, Aristolochia indica, Bauhinia vahlii, Cissampelos pareira, Cuscuta reflexa, Dioscorea bulbifera,*

Figure 2. Some ethnomedicinally important climbers: **A,** *Abrus precatorius* L.; **B,** *Ampelocissus barbata* (Wall.) Planch; **C,** *Argyreia nervosa* (Burm.f.) Bojer; **D,** *Asparagus racemopsus* Willd; **E,** *Basella alba* L.; **F,** *Benincasa hispida* (Thumb.) Cogn.; **G,** *Bauhinia vahlii* Wight & Arn; **H,** *Boerhaavia difusa* L.; **I,** *Capparis zeylanica* L.; **J,** *Cissampelos pariera* L.; **K,** *Clitorea ternatea* L.; **L,** *Coccinia grandis* (L.) Voigt.

Figure 3. Some ethnomedicinally important climbers: **A,** *Cucumis sativus* L.; **B,** *Cucurbita maxima* Duch. ex Lam.; **C,** *Cucurbita pepo* L.; **D,** *Cuscuta reflexa* Roxb.; **E,** *Dioscorea deltoidea* Wall. ex Griseb.; **F,** *Gloriosa superba* L.; **G,** *Ipomea aquatic* Forssk.; **H,** *Lagenaria sineraria* (Molina) Standl.; **I,** *Lygodium japonicum* (Thunb.) Sw.; **J,** *Mucuna pruriens* (L.) DC.; **L,** *Pothos scandens* L.; **M,** *Tinospora cordifolia* (Willd.) Miers.

D. deltoidea, Gymnema sylveste, Lygodium japonicum, Mucuna pruriens, Passiflora edulis, Quisqualis indica, smilax aspera and *Tinospora cordifolia* were recorded during the present study. Climbing plants used in folk medicine are enumerated in table 1 arranged in alphabetical order by their botanical name along with their family, local name and ethnomedicinal uses. The photographs of some of these plants have also been provided (Fig. 2 & 3). These plants with high medicinal values are suggested here for the biological screening to develop the valuable pharmacological products.

Table 1. Ethnomedicinal usages of climbing plants of Palpa district, Nepal.

Botanical name and Family	Local name	Ethnomedicinal uses
1. *Abrus precatorius* L. Fabaceae	Ratti Gedi	Bronchitis, diuretic, tonic, abortifacient, boils, eczema, leucoderma, jaundice, back bone pain and gonorrhoea.
2. *Accacia rugata* (Lam.) Voigt Fabaceae	Sikakai	Fruit used as detergent, young shoot cooked as vegetable.
3. *Ampelocissus barbata* (Wall.) Planch Vitaceae	Jarilo Lahara	Bone fracture, skin diseases.
4. *Asparagus racemosus* Willd. Liliaceae	Kurilo	Aphrodisiac, galactagogue, urinary trouble, nervous debility, bronchitis, dysentery & throat infection.
5. *Argyreia nervosa* (Burm.f.) Bojer Convolvulaceae	Samundra phal	Aphrodisiac, dyspepsia, colic, anaemia, anti-diabetic, cardiac debility, nervous debility, weakness & syphilis.
6. *Aristolochia indica* L. Aristolochiaceae	Ishaharmool	Diuretic, stimulant, anti-arthritic, anti-diabetic, blood pressure, emetic, abortifacient & emmenogogue
7. *Basella alba* L. Basellaceae	Poi Sag	Demulcent, insomnia, dermatitis, diuretic, & laxative
8. *Bauhinia vahlii* Wight & Arn. Fabaceae	Bhorla	Aphrodisiac, diarrhoea, malarial fever, tonic, boils, pimples, blisters & blood dysentery.
9. *Benincasa hispida* (Thumb.) Cogn. Cucurbitaceae	Kubindo	Cooling, styptic (stop bleeding), laxative, diuretic, aphrodisiac, & anthelmintic.
10. *Boerhavia diffusa* L. Nyctaginaceae	Punarnawa	Pimples, scabies, cuts, wounds, stomachache, cardiac disorders, jaundice, anemia, constipation, cough, inflammations and bronchitis.
11. *Calamus erectus* Roxb. Arecaceae		Anti-diabetic, dyspepsia, stomach problems, eczema & wounds
12. *Capparis zeylanica* L. Capparaceae	Kukurkande	Diuretic, resolvent, antipyretic, anti-arthritic, toothache, jaundice and spleen problems.
13. *Cissampelos pariera* L. Menispermiaceae	Batulpate	Diuretic, diarrhoea, dysentery, dyspepsia, malarial fever, pulmonary disease, piles, cough, antipyretic, cut, wounds, burns & ring worm.
14. *Cissus quadriangularis* L. Vitaceae	Hathzode	Boils, ulcers, rheumatism.
15. *Clinopodium umbrosum* (M. Bieb) C. Koch. Lamiaceae	Suparnasa/ Birajor	Cuts, burns, wounds
16. *Clitoria ternatea* L. Fabaceae	Aparajita	Leucoderma, liver disease, nervous tonic, abdominal pain.
17. *Coccinia grandis* (L.) Voigt. Cucurbitaceae	Golkankri/ Kunaroo	Cataract, anti-diabetic, carminative, antipyretic, hepato-protective

18. *Cucumis sativus* L. Cucurbitaceae	Kankro	Galactagogue, refrigerant, diuretic.
19. *Cucurbita maxima* Duch. ex Lam. Cucurbitaceae	Pharsi	Refrigerant, diuretic, neuralgia.
20. *Cucurbita pepo* L. Cucurbitaceae	Pharsi	Anthelmintic, anti-inflammatory, kidney stones, urinary tract infection.
21. *Cuscuta reflexa* Roxb. Cuscutaceae	Akashbeli/ Amarbel	Jaundice, constipation, bronchitis, fever, antihypertensive, cardio-tonic, emetic, antiviral & antibacterial.
22. *Dioscorea alata* L. Dioscoreaceae	Ghar tarul	Wounds, leprosy, gonorrhoea, blood pressure & skin diseases.
23. *Dioscorea bulbifera* L. Dioscoreaceae	Githa/ Ban tarul	Piles, leprosy, asthma, cough, cold, tuberculosis, contraceptive, constipation, indigestion, dysentery, syphilis, cardiac debility, aphrodisiac, refrigerant, pulmonary disease and ulcers.
24. *Dioscorea deltoidea* Wall. ex Griseb. Dioscoreaceae	Kukur tarul/ Bhyakur	Stomachache, kill body lice, wash clothes.
25. *Dolichus lablab* L. Fabaceae	Rajsimi	Emmenagogue, febrifuge, stomachic, anti-spasmodic, aphrodisiac.
26. *Entada phaseoloides* (L.) Merr. Fabaceae	Pangra	Epilepsy, constipation, anthelmintic
27. *Gloriosa superba* L. Liliaceae	Karihari	Stomachic, anthelmintic, dermatitis & abortifacient.
28. *Gymnema sylvestris* (Retz.) R.Br. Asclepiadaceae	Gudmar/ Madhunasini	Anti-diabetic, malarial fever, cough, cold, jaundice.
29. *Ipomea aquatic* Forssk. Convolvulaceae	Laharo pani sag/ Kerunga sag	Emetic, purgative, gastric troubles, nervous and general debility. Tender shoot used as green vegetable.
30. *Ipomea batatas* (L.) Lam. Convolvulaceae	Sakharakand	Refrigerant, laxative, aphrodisiac, diuretic & tonic.
31. *Lagenaria sineraria* (Molina) Standl. Cucurbitaceae	Lauka	Anti-inflammatory, refrigerant, expectorant, purgative, hepato-protective, emetic & diuretic
32. *Luffa acutangula* (L.) Roxb. Cucurbitaceae	Pate Ghiroula/ Taroi	Skin diseases, demulcent, diuretic, tonic, nutritive, purgative, emetic & expectorant.
33. *Luffa cylindrica* (L.) Roem. Cucurbitaceae	Ghiu Taroi/ Ghrimala	Diuretic, emollient, laxative, expectorant, tonic, anthelmintic, galactagogue, fever & bronchitis.
34. *Lygodium japonicum* (Thunb.) Sw. Lygodiaceae	Janai Lahara	Expectorant, diuretic, cough, cold, fever, anti-arthritic.
35. *Marsdenia roylei* Wight. Asclepiadaceae	Baahuni Lahara	Stomachache, purgative, gonorrhoea.
36. *Momordica charantia* L. Cucurbitaceae	Tite Karela	Peptic ulcer, anti-diabetic, rheumatism. Anthelmintic, antipyretic, purgative & carminative.
37. *Momordica dioica* Roxb. ex Willd. Cucurbitaceae	Bankarela	Rheumatism, anti-diabetic

38. *Mucuna monosperma* DC. Fabaceae	Baldhengra	Expectorant, cough, asthma
39. *Mucuna pruriens* (L.) DC. Fabaceae.	Kauso	Anthelmintic, aphrodisiac, kidney problems, uterine trouble & general debility.
40. *Paederia foetida* L. Rubiaceae	Bari Lahara/ Gandha Prasarini	Anti-arthritic, colic, flatulence, tonic, astringent, nervous tonic, gastro protective, antioxidant & anti-inflammatory.
41. *Passiflora foetida* L. Passifloraceae	Sanojhar	Anti-ulcer, antioxidant, diuretic, asthma & skin diseases.
42. *Piper bettle* L. Piperaceae	Pan	Mouth refreshment; improve digestion, diuretic, analgesic, cough & cold.
43. *Piper longum* L. Piperaceae	Pipli	Cough, digestion, bronchitis, fever
44. *Piper nigrum* L. Piperaceae	Kalo marich	Gastric trouble, cough, fever.
45. *Pothos scandens* L. Araceae	Money plant	Antioxidant, antipyretic, epilepsy, rheumatism.
46. *Quisqualis indica* L. Combrataceae	Madhumalati / Baja phul	Purgative, diarrhoea, fever, rheumatism & fever.
47. *Smilax aspera* L. Smilaceae	Kukurdaino	Paralysis, syphilis, diuretic, skin diseases, blood purifier.
48. *Smilax ovalifolia* Roxb. ex D. Don Smilaceae	Ramdatun	Venereal diseases, rheumatism, abdominal pain, dysentery,
49. *Tinospora cordifloia* (Willd.) Miers. Menispermiaceae	Gurjo/ Giloy	Anti-diabetic, malarial fever, hepato-protective, rheumatism, stomach troubles, diuretic, diarrhoea, dysentery.
50. *Trichosanthes dioica* Roxb. Cucurbitaceae	Parwal	Febrifuge, laxative, refrigerant.
51. *Trichosanthes anguina* L. Cucurbitaceae	Chichinda	Purgative, anthelmintic, emetic, refrigerant, syphilis & verminopsis.

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