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# Diversity of Woody Climbers (Lianas) and their Ethno-Medicinal Importance in the District of Paschim Medinipur, West Bengal, India

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## ABSTRACT

Lianas are woody climbers, which because of having poor mechanical strength climbs up a support with the help of different climbing mechanisms, mostly trees to reach the canopy. The present study focused on the diversity of the woody climbers (lianas) found in the district of Paschim Medinipur, West Bengal, India. Along with the study of the liana diversity, the ethnomedicinal importance of the lianas were also documented with an aim to protect the Intellectual Property Rights (IPR) of the tribal people. The study revealed a total of 26 liana species belonging to 18 different families comprising of both monocots and dicots. The following result concludes that the study area is rich in biodiversity. Lianas are even rich in the field of ethnomedicine having diverse group of active biomolecules. Apart from that, the documented lianas are also used in the non-medical field for the purpose of ornamentation, fencing and making of ropes and jewelry.

**Key words:** Woody climbers, Paschim Medinipur, Ethnomedicine, Biodiversity, IPR

The climbing habit is a key innovation in plants: climbing taxa have higher species richness than nonclimbing sister groups. Lianas are woody climbers that unlike trees are incapable of independent vertical growth, and rely on other supports, mostly trees to ascend the forest canopy. Lianas begin their life as self-supporting plants, but with the flexible stems, they grow up to only 1.5 m in height. Lianas are evolved with varied climbing structures and strategies that aid in attaching to the host trees. They contribute substantially to plant diversity and leaf biomass which makes them a potentially important food source for herbivores and folivores [1]. Lianas represent an important food resource for primates. Lianas may affect primate niche partitioning, sleeping tree selection, and home range use. Lianas can also affect several aspects of primate behaviour, including foraging, reproduction, locomotion, positional behaviour, and grouping patterns. Overall, this review supports the idea that lianas play an important role in the ecology and conservation of primates. The liana species are linked with the livelihood as well as for the socio-economic support to the local communities. The species are used for medicines, fruits and vegetables, and hence they are found to play a vital role in the fulfilment of the medicinal and

nutritional requirements of the local people.

The district of Paschim Medinipur lies between 22.4080° N latitude and 87.3810° E longitude, stretching over an area of 6,308 Km<sup>2</sup>. It has three sub-divisions and twenty-nine number of blocks. About 80% of the total population of Paschim Medinipur are agro based and resides in the villages. The dominating tribes comprises of the Santhals, Lodhas, Orans, Bhumij. The rural economy depends mainly on the agriculture, fishery, rearing live stocks and collection of forest products. The rivers like Kansabati, Silabati, Dulang, Subarnarekha, Keleghai and their tributaries flow through the land of Paschim Medinipur. During the rainy season, the rivers become spate and results in flood in the most of the low-lying lands. This ultimately end up with huge losses in the field of agriculture. The soil is poor to medium fertile-it is much hungry than thirsty. The study area falls under the sub-tropical and dry-deciduous vegetation [2]. During the summer months, the forest floor gets covered with dry leaves and extensive forest fires takes place mostly manually and least naturally, which results in loss of habitat and loss of biodiversity of many flora and fauna. The early summer and pre-monsoon change the vegetation which having maximum phenological changes take place due to stress prone condition [3]. The plants get flowers and fruits as early as possible which could be due to a natural threat. The study of traditional medicine based on bioactive compounds in plants called ethnomedicine has an increased demand of herbal drug in international trade because herbal medicines are cheap, more

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effective, easily available and supposed to have no side effects. The tribal people are using these medicinal plants from time immemorial and passing on their knowledge from one generation to the other. The present study focuses on the diversity of the woody climbers (lianas) and their ethnomedicinal importance in the district of Paschim Medinipur.

## MATERIALS AND METHODS

The study sites included the forest patches of the district of Paschim Medinipur and also the rural and urban localities within the district. The forest patches included the Bhadutala forest, Gurguripal forest, Godapiasal forest, Arabari forest. For the documentation of the diversity of the liana species in the district of Paschim Medinipur, field survey was done. The survey was done throughout the year in three different seasons namely -monsoon which commences from the month of July and end in the month of

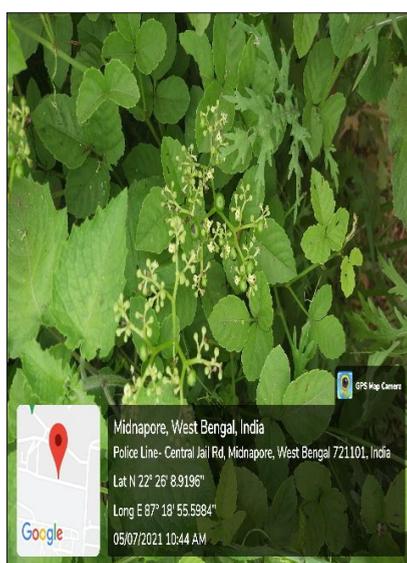
October. The winter season which commences from the month of November and ends in the month of February. The summer season commencing from March and ending in June. During the survey, specimens were collected and herbarium specimens were identified by performing morphological and anatomical studies with the help of Bengal Plants by D. Prain. For getting the updated names of the species, websites were consulted. For collection of data regarding the ethnomedicinal importance of the lianas, villagers residing near the forest and medicine men were selected as informants for the documented liana species. The information collected from the informants were recorded in suitable questionnaires.

## RESULTS AND DISCUSSION

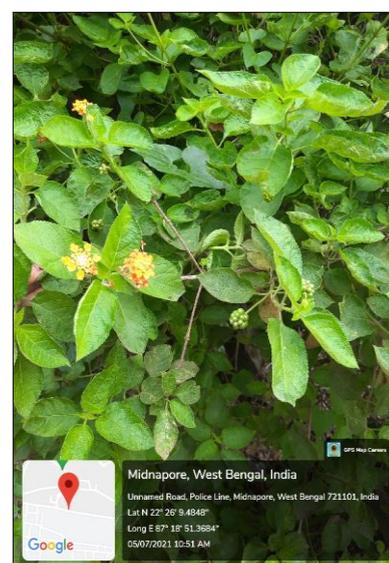
On the basis of the lianas documented and the ethnomedicinal information available from the medicine men, the result is presented in the (Table 1-4, Fig 1).



*Asparagus sp.*



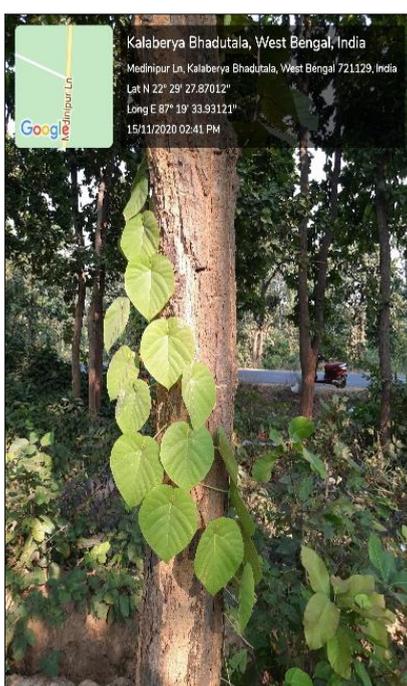
*Cayratia japonica*



*Lantana camara*



*Mucuna monosperma*



*Dioscorea alata*



*Spatholobus parviflorus*

Table 1 List of the documented lianas with their scientific names, common names and ethnomedicinal importance

Scientific name	Family	English name	Local name	Uses
<i>Ampelocissus latifolia</i> (Roxb.) Planch.	Vitaceae	Wild grape	Jongli angur	Leaves used for the treatment of insect bite. Fruits are edible.
<i>Antigonon leptopus</i> Hook. & Arn.	Polygonaceae	Coral vine	Ananta lata	Leaf decoction is used for the treatment of cold. The plant is widely used for the purpose of ornamentation.
<i>Asparagus racemosus</i> Willd.	Asparagaceae	Asparagus	Swet mul	Root used for the treatment of infertility. Leaves used for leucorrhoea treatment.
<i>Butea superba</i> Roxb.	Fabaceae	Butea gum tree	Lata palash	Leaves and roots used for the treatment of menstrual problem.
<i>Bougainvillea spectabilis</i> Willd.	Nyctaginaceae	Paper flower	Kagaj ful	Leaves are used in treatment of diabetes. The plant is widely used as an ornamental plant.
<i>Caesalpinia bonducella</i> (L.) Fleming = <i>C. bonduc</i> (L.) Roxb.	Caesalpinaceae	Nickernut	Nata karanj	The seeds are used for the treatment of fever, malaria and abdominal pain.
<i>Capparis separia</i> L.	Capparaceae	Caper bush	Kaliakra	Root is used for the treatment of small pox.
<i>Cayratia japonica</i> (Thunb.) Gagnep.	Vitaceae	Bush killer	Moth	Bark decoction is used for the treatment of fever.
<i>Cissampelos pareira</i> L.	Menispermaceae	Ice vine	Akon bindi	Root is used for the treatment of malaria and leucorrhoea.
<i>Clitoria ternatea</i> L.	Fabaceae	Butterfly pea	Aparajita	Leaves are used to treat inflammations and diarrhoea.
<i>Coccinia grandis</i> (L.) Voigt.	Cucurbitaceae	Ivy gourd	Tite kundri	Leaves used for the treatment of diarrhoea and as a blood purifier. Fruit is edible.
<i>Combretum decandrum</i> Jacq.	Combretaceae	Bushwillows	Atang	Sap is used for the treatment of eye infection. Powder of the root used for treating malaria.
<i>Ichnocarpus frutescens</i> (L.) W.T. Aiton.	Apocynaceae	Black creeper	Dudhi lata	Leaves are used in veterinary.
<i>Ipomoea carnea</i> Jacq.	Convolvulaceae	Pink morning glory	Bon kolmi	Latex of the plant is used to treat skin problems. Leaves are toxic to the herbivores. Used for fencing and ornamentation purposes.
<i>Lantana camara</i> L.	Verbenaceae	Spanish flag	Bhutbhairabi	Extract of leaf is used for the treatment of skin itches. Fruits are edible. Used for the ornamentation purpose.
<i>Mucuna monosperma</i> (L.) DC.	Fabaceae	Negro bean	Aal kusi	The whole plant is used for antivenom properties. Bark powder is used for the treatment of rheumatism.
<i>Passiflora foetida</i> L.	Passifloraceae	Passion flower	Begumbahar	Dried leaf powder taken with tea for treatment of cough and cold. Used as an ornamental plant.
<i>Abrus precatorius</i> L.	Fabaceae	Rosary pea	Lal Kunch	Tea made from the leaf powder is used for the treatment of fever and cold. Seeds are poisonous and after treatment, used to make jewellery.
<i>Aristolochia indica</i> L.	Aristolochiaceae	The Indian Birthwort	Isharmul	Paste of root is used for the treatment of different skin ailments. Leaf juice is given for the treatment of diarrhoea and stomach pain.
<i>Tinospora sinensis</i> (Lour.) Merr.	Menispermaceae	Malabar gulbel	Padmagulancha	Stem is used for the treatment of hypertension and rheumatism.
<i>Smilax zeylanica</i> L.	Smilacaceae	Kumarika	Hosti karna lata	Root paste is used for the treatment of skin problems.
<i>Dioscorea bulbifera</i> L.	Dioscoreaceae	Air potato	Gosh alu	Roots i.e., the yam is used to get relief from discomfort during the menstruation. It is also given to the patients with indigestion, rheumatoid arthritis.
<i>Zizyphus oenoplia</i> (L.) Mill.	Rhamnaceae	Jackal jujube	Shial kul	Paste of the leaf is used for curing wounds. Bark is used for the treatment of sore throat. Fruit is edible.
<i>Alamanda cathartica</i> L.	Apocynaceae	Golden trumpet	Alakananda	Paste of flower and leaf is used for the treatment of ulcers and inflammations of the skin and for the treatment of jaundice.
<i>Spatholobus parviflorus</i> (Roxb. Ex G. Don) Kuntze	Fabaceae	Flame of the forest	bandolata	Leaf paste is used for the treatment of conjunctivitis. Decoction of the bark is used for treating bowel complaints and dropsy. Fibre obtained from bark used for making ropes.
<i>Dioscorea alata</i> L.	Dioscoreaceae	Water yam	Kham alu	Tuber paste is applied on the skin infections, wounds on the skin. Tuber is cooked with vegetables like potato and eaten with rice.

Table 2 Numerical break up of liana taxa occurring in the district of Paschim Medinipur, West Bengal, India

Type	Family	No. of species
Dicot	15	23
Monocot	03	03

Table 3 Numerical breakup of the number of families and the number of species present in each of the family

Families	No. of species
Vitaceae	2
Polygonaceae	1
Asperagaceae	1
Fabaceae	5
Nyctaginaceae	1
Caesalpiniaceae	1
Capparaceae	1
Menispermaceae	2
Cucurbitaceae	1
Combretaceae	1
Apocynaceae	2
Convolvulaceae	1
Verbenaceae	1
Passifloraceae	1
Aristolochiaceae	1
Smilacaceae	1
Dioscoreaceae	2
Rhamnaceae	1

A total of 26 woody climbers (lianas) were recorded from the district of Paschim Medinipur, West Bengal. The 26 documented liana species belonged to 18 different families. Out of the 18 families, 15 families belonged to the Dicotyledons (Magnoliopsida) and 3 families belonged to Monocotyledons (Liliopsida). The family Fabaceae had the highest number of species under it, which accounts to 05. Following by are the 04 families namely Vitaceae, Menispermaceae, Apocynaceae and Dioscoreaceae which has 02 species each. 13 families namely Polygonaceae, Asparagaceae, Nyctaginaceae, Caesalpiniaceae,

Capparaceae, Cucurbitaceae, Combretaceae, Convolvulaceae, Verbenaceae, Passifloraceae, Aristolochiaceae, Smilacaceae and Rhamnaceae have 01 species each. Lianas are widely used in the field of ethnomedicine. Different parts of the liana are used for the treatment of various ailments. The present study revealed that the leaves of 16 different species, root of 09 species, bark of 04 species and other parts of the plant like seeds, sap, latex, stem, flower of 01 species were used for the treatment of various diseases [4-6].

Table 4 Ethnomedicinal importance of the plant parts used for the documented liana species

Plant parts used	No. of species
Leaves	16
Roots	09
Seeds	01
Bark	04
Sap	01
Latex	01
Stem	01
Flower	01

## CONCLUSION

Despite of the fact that the lianas suppress tree growth, lianas are important for supporting and maintaining biodiversity, which is an increasingly necessary and important challenge. The districts of Paschim Medinipur houses such diverse groups of lianas which assures that the study area is a potent hub of biodiversity. The lianas are rich in bioactive chemicals which are used by the tribal people for the treatment of simple to complex ailments. The medicinal value of the lianas was identified by the tribal people from time immemorial. Hence, documentation of these data is a prime necessity of the time to protect and preserve the Intellectual Property Rights (IPR) of the tribal people.

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