Climbers of Rourkela Forest Division: ecological, medicinal, food and economical aspects

ABSTRACT

For plants growing on the forest floor, sunlight is a limited factor, but climbers could scramble up trees and shrubs towards the light. Climbers are important because they help to reduce temperature, i.e., keep the garden cooler on a hot day. Some climbers are also edible, which makes it more important to grow them in the backyard garden and on the terrace. It is also planted because of the decoration on the walls. It is beneficial in forest areas because the climber creates a perfect shade where any wild animal can take shelter on summer days and can help them avoid hunters. It is also one of the economic purposes for tribal people. Several studies have documented plants used for medicinal, ecological, economic, and food purposes, but categories as different as climbers are less documented. The survey in Rourkela Forest Division took place, and we documented climbers in different aspects. In this paper, it comprises about 52 plant species and is specifically divided into food, medicinal, economic, and ecological. Therefore, authors summarized the climber and documented it in a scientific manner in Rourkela Forest Division, Odisha.

Comment [DS21]: Mention the time period of the study

Keywords: Wild animal, edible, tribal communities, medicinal, economic, decoration, shading

INTRODUCTION

Rourkela Forest Division is one of the three forest divisions in Sundargarh District. Other divisions are the Sundargarh Forest Division and the Bonai Forest Division. Rourkela Forest Division is bounded by longitudes 84 0 46’ E to 85 0 14' E and latitudes 210 83' N to 220 48' N.The division has Reserved Forests, Proposed Reserved Forests, Demarcated Protected Forests, Village Forests, Protected Forests, and DLC Forests. The total forest area was computed to be 1100.43 sq. km, which is about 36.73% of the geographical area of the division. It is also known as the Steel City of Odisha," and it is situated in the northern district of Sundargarh, Odisha, India. The area is rich with forests and tribal communities with abundant traditional knowledge. Climbers are pretty vigorous. However, despite its importance in the world’s flora, it has subsequently been generally neglected. The climbers exist among ancestral angiosperm groups and monocotyledonous families and are commonly

represented in major groups of Rosids and Asterids. Climbers generally identify them as having elongated internodes (the length of stem between each leaf joint) to help cover the distance, but they employ other structures to get a grip, including tendrils, aerial roots, and twining stems. Some climbers are characterised by spring-like tendrils as members of the cucumber family (Plate 1). It is derived from modified leaves. They hook on to a branch, then coil up, pulling the vine towards its support structure. The tendrils coil when the cells on each side grow at different rates. Surface hairs detect foreign objects and stimulate twining. Tendrils recognise their own stems and avoid twining around them. Another climbing technique is characterised by twining stems (Plate 2). Tendrils, aerial roots, and hooked prickles all attach themselves to supports, but in some climbers, the stem itself can cling by twining. Some twining plants twist clockwise, while others twist anti-clockwise. Long leaf stalks allow the leaves to reach away from the support and face the sun. Emerging flowers have the potential to release many seeds, further expanding the plant's territory. It can easily reach bee, moth, and butterfly pollinators. The ability of one stem to twine around another is due to thigmotropism. When climbing stems and tendrils detect the presence of a support, one side of the growing point begins faster than the other, making the stem bend (Gianoli 2015). It is quietly available all over the world, and some are used for an edible purpose and others for a medicinal purpose, economical, ecological, etc. The survey takes place in tribal communities in Rourkela Forest Division, Odisha. Rourkela Forest Division (RFD) Among the floral diversity, climbers are less documented. Therefore, we attempt to document the climbers available in Rourkela Forest Division, Odisha, in a scientific manner.

METHODOLOGY

The survey was carried out in Rourkela Forest Division, Odisha. Through an extensive survey through a semi- questionnaire conducted with tribal communities. The plant was identified by the authors with the help of literature (Haines 1925; Saxena and Brahman 1995).

Comment [DS22]: Update

Plate 1: Climbing techniques: Spring like tendrils

Plate 2: Climbing technique: Twining stem

RESULTS AND DISCUSSION

Data enumerated through ethnobotanical survey plant species with their vernacular names: medicinal, economic, ecological, and food. The results revealed that about 52 plant species were enumerated in Rourkela Forest Division, Odisha. According to the results, it is revealed

that some climbers are used for medicinal purposes other than food, ecological, and economic purposes. Climbers are used for medicinal, food, economic, and ecological purposes listed according to family (Figure 1, Figure 2, Figure 3, Figure 4). Climbers are important because, due to their characteristic features, climbers on the wall will reduce the temperature and keep the garden, backyard, or balcony cooler on summer days. In forest areas, climbers are one of the reasons for shade in the forest. On summer days, the wild animal has a convenient place to rest beneath the climbers, like *Bauhinia vahlii, Buteasuperba,*and*Combretumroxburghii*. Climbers on the walls of the houses, like *Antigononleptopus*, *Capparizeylanica*, *Clitoriaternatea*, *Cocciniagrandis*, *Luffaacutangular*, *Luffaaegyptiaca*, *Momordicacharantia*, *Passiflorafoetida, Quisqualisindica,* and*Trichosanthestricuspidate*.Many researchers document climbers in Odisha. In 2014, Suthari et al. reported the ethnomedicinal and economic uses of climbers in northern Telangana, India. In 2012, Abhilash et al. reported the medicinal value and distribution of Nattika climbers. In 2020, Rahman et al. reported about the climbers in relation to their hosts in the Himalayas. In 2020, Mayurj and Kaushik reported on the climber and creeper plant species in Gujarat. In 2022, Khillar et al. reported climbers being used as food plants by the Santhal community in Odisha. In 2020, Das et al. reported the diversity of climbers in Odisha. In 2015, Kalam and Ahmad reported the medicinal importance of climbers used in the Unani system of medicine. Therefore, we need further documentation on climbers in Odisha.

Comment [DS23]: Arranged by years in ascending order

Table 1: Climbers of Rourkela Forest Division, Odisha, India

Botanical name	Family	Common name	Medicinal	Economical	Ecological	Food
Abrusprecatorius	Fabaceae	Kaincha	✓	✓	-	-
Ampelocissuslatifolia	Vitaceae	Paninoho	✓	-	-	-
Ampelocissustomentosa	Vitaceae	Kanjinoi	✓	-	-	-
Antigononleptopus	Polygonaceae	Nil	✓	-	-	-
Argyreia nervosa	Convolvulaceae	Brudhhataraka	✓	-	-	-
Aristolochiaindica	Aristolochiaceae	Iswarmula	✓	-	-	-
Asparagus racemosus	Asparagaceae	Satavari	✓	✓	✓	-
Bauhinia vahlii	Fabaceae	Siali	✓	✓	✓	✓
Buteasuperba	Fabaceae	Lotapalasha	✓	-	✓	✓

Cajanusscarabaeoides	Fabaceae	Ban koltha		-	-	-
Cappariszeylanica	Capparaceae	Asadua	✓	-	-	-
Celastruspaniculatus	Celastraceae	Kujuri	✓	✓	-	-
Cissampelospariera	Menispermaceae	Musakani	✓	✓	✓	-
Cissusquadrangularis	Vitaceae	Hadajodi	✓	-	-	-
Clematis roylei	Ranunculaceae	Ganamari	✓	-	✓	-
Clitoriaternatea	Fabaceae	Aparajita	✓	✓	✓	✓
Cocciniagrandis	Cucurbitaceae	Banakunduri	✓	✓	✓	✓
Combretumroxburghii	Combretaceae	Atundi	✓	-	✓	-
Cryptolepisbuchanani	Apocynaceae	Dudhinai	✓	-	-	-
Cuscutareflexa	Convolvulaceae	Nirmuli	✓	-	-	-
Derris scandens	Fabaceae	Kentia	✓	-	-	-
Dioscoreabulbifera	Dioscoreaceae	Pita alu	✓	✓	-	✓
Dioscoreaoppositifolia	Dioscoreaceae	Panialu	✓	✓	-	✓
Diplocyclospalmatus	Cucurbitaceae	Shivlingi	✓	-	-	-
Erycibepaniculata	Convolvulaceae	Jodakoli	✓	-	-	-
Getonia floribunda	Combretaceae	Dhonati	✓	-	-	-
Gloriosasuperba	Colchicaceae	Agnisikha	✓	-	✓	-
Gouanialeptostachya	Rhamnaceae	Rakta-pichali	✓	-	✓	-
Gymnemasylvestre	Apocynaceae	Gudmari	✓	✓	-	✓
Hemidesmusindicus	Apocynaceae	Anantamula	✓	-	✓	-
Hiptagebenghalensis	Malpighiaceae	Boromali	✓	-	✓	-
Ichnocarpusfrutescens	Apocynaceae	Shyamalata	✓	-	-	-
Ipomoea aquatic	Convolvulaceae	Kalama sago	✓	✓	✓	✓
Luffaacutangula	Cucurbitaceae	Jhonny	✓	✓	✓	✓
Luffaaegyptiaca	Cucurbitaceae	Luffa	✓	-	✓	-
Merremiaumbellate	Convolvulaceae	Nil	✓	-	✓	-
Merremiavitifolia	Convolvulaceae	Nil	✓	-	✓	-

Momordicacharantia	Cucurbitaceae	Kalara	✓	✓	✓	✓
Passiflorafoetida	Passifloraceae	Bisripi	✓	-	-	-
Quisqualisindica	Combretaceae	Madhumalati	✓	-	✓	-
Scindapsusofficinalis	Araceae	Gajapipalli	✓	-	✓	-
Smilax perfoliata	Smilacaceae	Nil	✓	-	✓	-
Smilax zeylanica	Smilacaceae	Ramdatun	✓	-	✓	-
Solenaamplexicaulis	Cucurbitaceae	Mithakundur i	✓	-	✓	✓
Spatholobusparviflorus	Fabaceae	Latapolasa	✓	-	✓	-
Stephania japonica	Menispermace ae	Sondhimali	✓	-	-	-
Symphoremainvolucrat um	Verbenaceae	Nil	✓	-	✓	-
Tiliacoraacuminate	Menispermace ae	Nil	✓	-	-	-
Tinosporacordifolia	Menispermace ae	Guluchi	✓	✓	✓	-
Trichosanthestricuspid ata	Cucurbitaceae	Mahakal	✓	-	-	-
Vallarissolanacea	Apocynaceae	Nil	✓	-	✓	-
Ventillagodenticulate	Rhamnaceae	Kantamali	✓	-	✓	-
Wattakakavolubilis	Apocynaceae	Nil	✓	-	✓	-

Plate 3: Climbers of Rourkela Forest Division, Odisha a) *Aristolochiaindica,* b) *Spatholobusparviflorus,* c) *Cajanusscarabaeoides,* d) *Cappariszeylanica,* e) *Celastruspaniculatus,* f) *Merremiaumbellata*

Plate 4: Climbers of Rourkela Forest Division, Odisha g) *Bauhinia vahlii,* h) *Momordicacharantia,* i)*Luffaaegyptiaca,* j) *Vallarissolanacea,* k) *Ventillagodenticulata,* l) *Merremiavitifolia*

Plate 5: Climbers of Rourkela Forest Division, Odisha m) *Diplocyclospalmatus*, n)*Symphoremainvolucratum*, o) *Hemidesmusindicus*, p) *Getonia floribunda*, q) *Tinosporacordifolia*, r) *Clitoriaternatea*

Plate 6: Climbers of Rourkela Forest Division, Odisha s) *Asparagus racemosus*, t)*Combretumroxburghii*, u) *Trichosanthestricuspidate*, v) *Cissusquadrangularis*, w) *Smilax zeylanica*, x) *Gloriosasuperba*

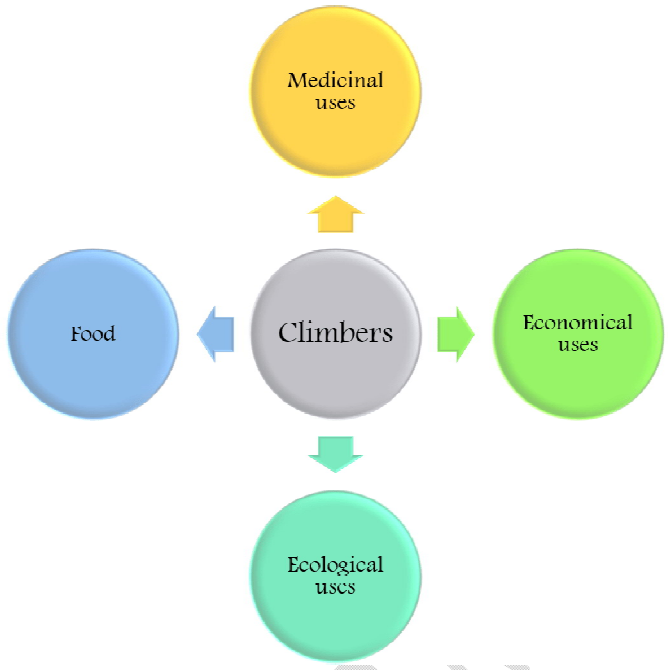

Figure 1: Uses of climbers in different aspects in Rourkela Forest Division, Odisha, India

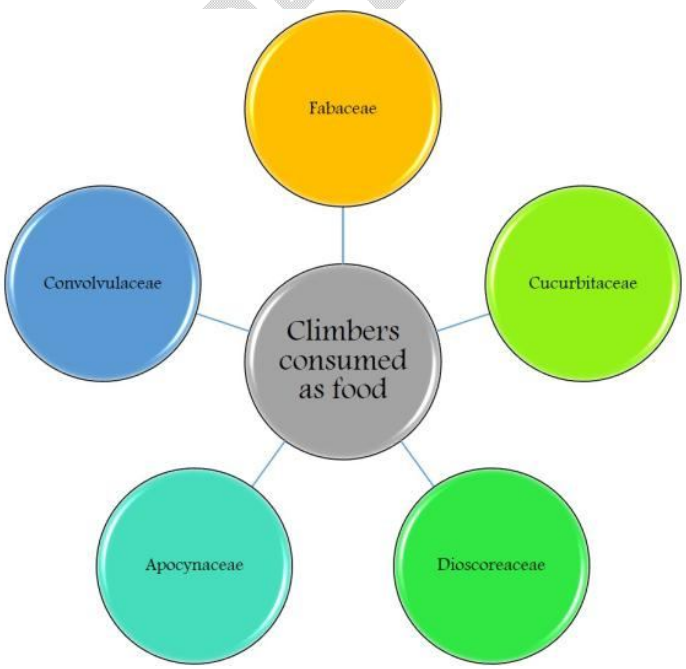

Figure 2: Family wise climber used as food purpose in Rourkela Forest Division, Odisha

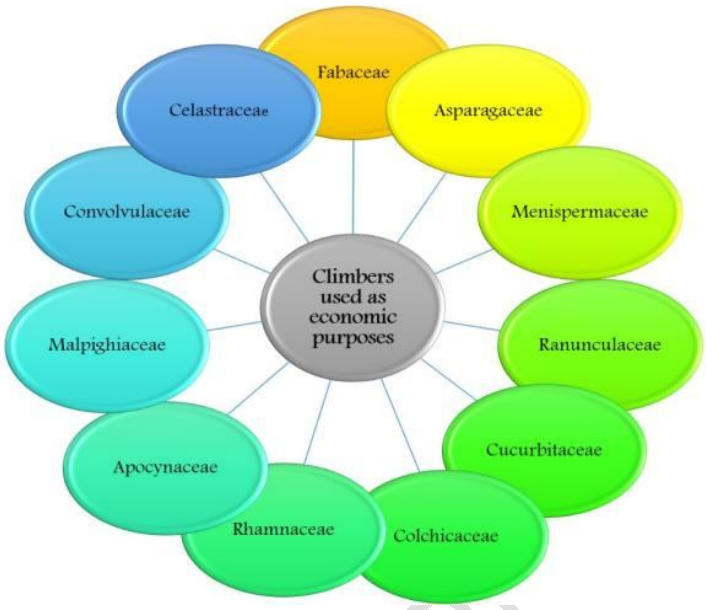

Figure 3: Family wise climbers used as economic purposes in Rourkela Forest Division, Odisha

Figure 4: Family wiseclimbers used as ecological aspects in Rourkela Forest Division, Odisha

CONCLUSION

Climbers are one of the important groups of plants whose morphological support comes entirely from their own tissue and their original rooting position in the soil, and whose climbing efforts can take their foliage and reproductive organs into tree canopies. The current studies show 53 climber species were documented in Rourkela Forest Division, Odisha. The present paper highlights the food, medicinal, economic, and ecological values. Therefore, we need further documentation in a scientific manner.

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Comment [DS24]: Update the references

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