

An Additional Record of the Lichen *Stereocaulon massartianum* Hue. (Stereocaulaceae) from Mawphanlur in West Khasi Hills District of Meghalaya, India

Utpal Phukan

Department of Botany

Rabindranath Tagore University, Hojai-782435, India

Abstract:

Present study reports the occurrence and distribution of the lichen species *Stereocaulon massartianum* Hue. in the locality of Mawphanlur of West Khasi Hill district in Meghalaya. The genus is one of the fruticose lichen group that distributed world widely in tropical to polar zone. This species is frequently distributed in the study area during the month of July at the altitude of 6081 ft. from mean sea level. General morphology has been studied and apothecia, phyllocladia and pseudopodium have been illustrated.

Keywords:

Mawphanlur, *Stereocaulon*, fruticose lichen, apothecia, phyllocladia, pseudopodium.

Introduction:

North east India being a megadiversity resource centre, the area represents more diverse species in all plants and animal life forms. Regarding the lichen forms, India represents 2902 species under 407 genera (Sinha and Jagadeesh Ram 2020). In between North east India, Meghalaya is one of the states that is rich in lichen flora. The state comprises of an area of 22,429 sq. km. and fall under the Indo Myanmar Biodiversity Hotspot (Mayers et. al. 2000). Its geological structure is composed of lofty hills, dense forests and small mountain valleys. There are also some sacred grooves conserved by the local inhabitants.

Stereocaulon massartianum Hue. distributed in the states of Arunachal Pradesh, Sikkim and West Bengal –hills of India, and extends through Eastern Himalaya to Indonesia, Borneo, Malaya, New Guinea, Philippines and Taiwan.

Pioneer worker of lichen in this area were Awasthi and Singh (1977). They reported five saxicolous lichen from the area. Other pioneer workers are Patwardhan and Nagarkar (1980), Makhija and Adawadkar (2007), Jagadeesh Ram and Sinha (2009), Sing and Sinha (2010), Sharma and Khandikar (2012), Sing and Pinokiyo (2014), Sing and Singha (2016) etc. Later on few other workers have compiled the enumeration to 244 species so far reported. Although, several unexplored and rich area have been left till today. Therefore, an attention has been kept in mind to survey lichen species in the study area to understand the lichen diversity. One of the unexplored and virgin area is Mawphanlur village in West Khasi Hill District. Its lies at an altitude of 6081 ft from mean sea level and 73 km far from Shillong towards Nongstoin. Geographical location of the study area is 25°32'45.28'' N 91°25'54.87''E near Mawphanlur natural Lake and nearby peak is Mawthadraishan Peak.

During the month of June-July, Mawphanlur area is extensively showered by monsoon wind, cloud and rainfall. Temperature ranges from 10-22°C.

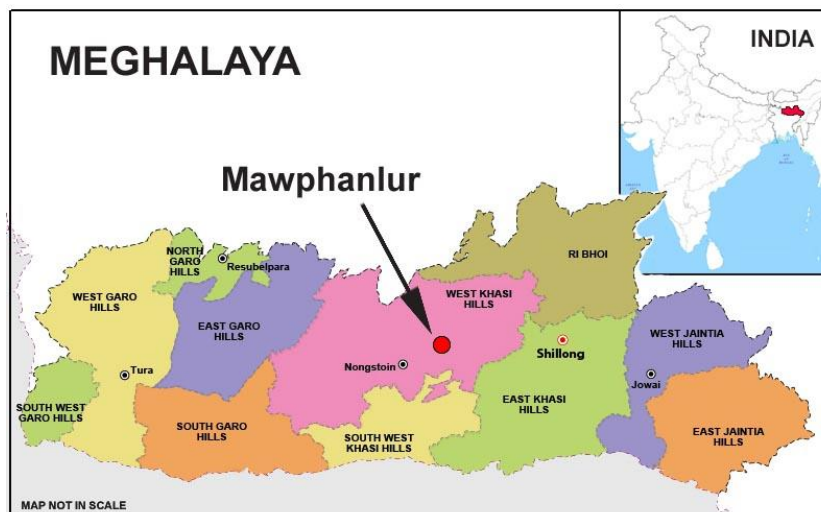


Fig : 1 Map showing the locality of surveyed area in Meghalaya

Materials and Methods:

Fresh specimen has been collected in the month of July (09-07-2022) from the mentioned place along with the nearby mountain peak. Also, survey has been done within the vicinity of the Mawphanlur village and found to be frequent in distribution. Collected lichen samples were dried and preserved in herbarium of the department of Botany, Rabindranath Tagore University, Hojai. Morphological studies have been done under Labovision stereo zoom microscope.

Table : 1 List of places of collection of the lichen sample in Meghalaya.

Sl. No.	Localities	Longitude/Latitude	Altitude (in ft from mean sea level)	Occurrence
1	Near Mawphanlur natural Lake	25°32'45.28'' N 91°25'54.87'' E	6081	frequent
2	Mawthadraishan Peak	25°32'23.51'' N 91°27'13.93'' E	6089	frequent
3	Mawphanlur Hill view point	25°32'52.49'' N 91°25'52. 74'' E	6071	frequent
4	Near by Markasa town	25°32'01.95'' N 91°38'37. 74'' E	5424	rare

Thin sections of apothecia and thallus are done and washed with distilled water. Lactophenol cotton blue, 5% KOH and Lugol's iodine solutions are applied. Then, observed under compound microscope. For identification, several literatures have been followed chronologically. Awasthi (1991, 2007); Bajpai et al. (2018); Bungartz et al. (2013); Joseph et al. (2018); Kalb and Staiger (2004); Sharma and Khadilkar (2012). For proper nomenclature, indexfungorum.org is followed.

Taxonomic Treatment:

Stereocaulon massartianum Hue, Nouv. Arch. Mus. Hist. Nat., ser. 3, 10: 252. 1898; Lamb, J. Hattori Bot. Lab. 43: 272. 1977; Pant & Upreti in K. G. Mukerjee & al. (eds.), Biol. Lichens 263. 1999; D. Awasthi, Comp. Macrolich. India, Nepal & Sri Lanka 458. 2007.

Synonym :

It is of fruticose type thallus. Primary thallus is crustose type. Complete thallus is ash-white coloured. Secondary thallus is branched and erect called pseudopodetium (Fig:3). It is compact axis produces small slender lateral branch lets called phyllocladia. Photobionts is more in this slender organs and mycobiont is present more in all along the parts of the thallus. Secondary thallus part terminally branched and produces reproductive structure at apices, called apothecia. It is disk shaped and convex like an inverted bowl. Colour is brown to dark orange-brown. Upper surface of apothecia is glabrous. It contains the spores.

Specimen examined:

1. Meghalaya, West Khasi Hills district, near Mawphanlur natural Lake, 25°32'45.28'' N 91°25'54.87''E, altitude 6081 ft, grows on the surface of rock, 23-07-2022.
2. Meghalaya, West Khasi Hills district, Mawthadraishan Peak, 25°32'23.51'' N 91°27'13.93''E, altitude 6089 ft, grows on the surface of rock, 23-07-2022.
3. Meghalaya, West Khasi Hills district, Mawphanlur Hill view point, 25°32'52.49'' N 91°25'52. 74''E, altitude 6071 ft, grows on the surface of rock, 23-07-2022.
4. Meghalaya, West Khasi Hills district, near by Markasa town, 25°32'01.95'' N 91°38'37. 74''E, altitude 5424 ft, grows over rocky surface near road.



Fig : 2(a-b) *Stereocaulon massartianum* Hue. grows on inclined wet rock surface and showing apothecia above the pseudopodetium

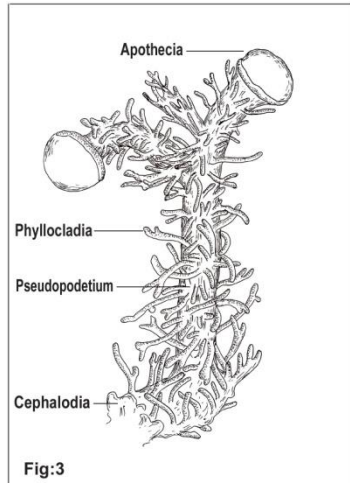


Fig : 3 General Morphology of *Stereocaulon massartianum* Hue.

Results and Discussion :

This species of lichen frequently occurred in pristine and less polluted area of Mawphanlur vicinity above an altitude of 5428 ft. Found rare occurrence in the human populated area. Generally grows on the surface of rocks with wet climate. This area is found to be rich in other lichen diversity due to its geographical and climatic factors as with high altitude and high humidity, pristine weather. Along with this, several aerial pteridophytes are also occurred a lot. Semi urban areas are have less diversity in lichen and other floristic compositions where climatic condition has been degraded by the anthropogenic activities. In those areas crustose lichen are found.

The occurrence of this particular species is mostly frequent in certain non polluted areas. The species may occur in other parts of the state also. Behera and Nayaka (2020) has reported this species from East Khasi Hill district. Present study reports it from West Khasi Hill district at higher altitude of the state. Further intensive survey and documentation needed in different parts of the state for finding out of new taxa of lichen. Lichen exploration is also important for investigating the environmental biomonitoring and bioprospecting.

Conclusion :

The state Meghalaya is rich in biodiversity. It has many evergreen to mixed semievergreen patches of forests, barren to wet rocky areas with seasonal herbs, shrubs etc. This area is also geologically diverse. Regarding the study of lichen biota, it has immense scope of study. About 93 species has been recorded throughout the state (Behera and Nayaka, 2020). Other regions like Garo Hills and Jayantia Hills are need more exploration. Exploration of natural resources and urbanization leads to threaten some virgin areas. Thereby, biomonitoring can be done with lichen study.

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