

Preliminary investigation on subaerial algae (corticolous) in Lady Keane college campus, East Khasi Hills District

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Introduction

Sub-aerial algae are those which inhabit any object above the soil level, away from water. They are also known as aero-terrestrial algae. Algal substrates in these habitats include trees, large rocks, unpainted compound walls, old wood works, metals, exposed areas of old buildings, bark and leaves of trees, rocky monuments as well as numerous man-made structures. On the basis of their habitats, they are subdivided into epiphytic (living on plants), epiphyllous (on leaves), corticolous (on bark, stems or trunks of trees), epizoic (on animals), lithophilous (on stones, brick or cement), epixylous (on dead wood such as poles, posts, doors) and epimetallous (inhabiting on metals) (Barkman, 1958; Golubic, 1967; Lewin & Robinson, 1979; Lopez-Bautista et al., 2002; Rindi & Guiry, 2002).

Reports on community structure and abundance of corticolous microalgae was scantily available (Neustupa & Stifterova, 2013). According to Hedenas et al. (2007) and Neustupa and Skaloud (2008, 2010) higher Trentepohliacean algae from tree barks, in a shaded, old boreal forest was observed than in comparatively lighted dry and clear area. Literatures on subaerial algae from this part of the region are rare and none has been encountered from this area. Therefore, this preliminary study on subaerial algae (corticolous) in Lady Keane College campus has been undertaken.

Materials and methods

In this investigation, corticolous algae (occurring on tree bark) within Lady Keane College campus were collected and observed. Trees with visible algal biofilms on their trunks were randomly collected from trees such as *Alnus nepalensis* D. Don, *Euphoria pulcherima* Willd. ex Klotzsch, *Exbuclandia populnea* Brown, *Lagerstroemia indica* Linn, *Pinus kesiya* Royle ex Gordon, *Schiima khasiana* Dyer etc.

The algal samples collected were homogenized in distilled water and placed on a glass slide and covered with a piece of cover slip. Algal samples were examined in temporary preparations under the microscope. Taxonomic identification up to species level wherever possible were carried out with the help of standard books.

Result and Discussion

A total of 10 algal taxa were identified. *Trentepohlia* sp was observed as the most dominant taxa in all the selected tree barks. *Chlorella*, *Chlorococcum*, *Chroococcus*, *Gloeocapsa*, *Gloeotheca* and *Trebouxia* were other unicellular algae also observed in abundance while few individuals of *Navicula*, *Tetraspora* and *Synechococcus* were also observed (Table 1).

In the present study, though members of Bacillariophyceae, Chlorophyceae, Trebouxiophyceae and Cyanobacteria were observed, members of the group Trentepohliales i.e. *Trentepohlia* sp has been found to be the most abundant group in subaerial community. Wee and Lee (1980) also had documented the Trentepohliales as the most diverse and abundant group in humid tropical regions.

Trentepohlia Martius, belonging to the order Trentepohliales and class Ulvophyceae, is a dominant subaerial green alga occurring in surroundings of Shillong on different substrata (Kharkongor and Ramanujam, 2014). Coloured biofilms of subaerial algae is a common

phenomenon on many substrata and is usually contributed by the group Trentepohliales, due to accumulation of large quantity of carotenoids in the chloroplast which masks the green colour of the chlorophyll. Rindi et al. (2007) reported the presence of abundant β -carotene and hematochrome which are responsible for imparting colour to the group Trentepohliales.

Table 1: List of subaerial algal species observed in tree barks of Lady Keane College Campus

Sl. no	Algal Taxa	Class	Number of individuals (per cm ²)
1	<i>Trentepohlia</i> sp	Ulvophyceae	800 x 10 ²
2	<i>Chlorella vulgaris</i>	Trebouxiophyceae	85 x 10 ²
3	<i>Chlorococcum</i> sp	Chlorophyceae	80 x 10 ²
4	<i>Chroococcus minor</i>	Cyanobacteria	75 x 10 ²
5	<i>Gloeocapsa</i> sp	Cyanobacteria	65 x 10 ²
6	<i>Gloeothece</i> sp	Cyanobacteria	65 x 10 ²
7	<i>Trebouxia</i> sp	Trebouxiophyceae	55 x 10 ²
8	<i>Synechococcus aeruginosus</i>	Cyanobacteria	21 x 10 ²
9	<i>Pinnularia</i> sp	Bacillariophyceae	6 x 10 ²
10	<i>Navicula</i> sp	Bacillariophyceae	5 x 10 ²



Figure 1: Bark of trees covered with biofilms of subaerial algae in Lady Keane College Campus

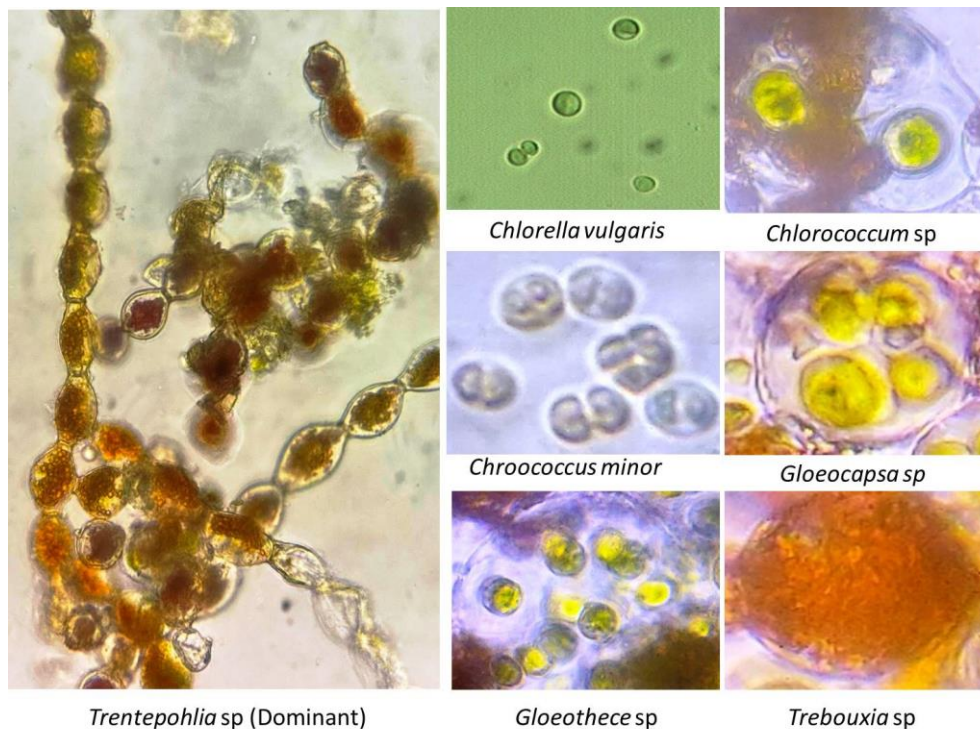


Figure 2: Photographs of some dominant subaerial algae from tree barks in Lady Keane College Campus

Conclusion

Trentepohlia sp are known to contain large quantity of carotenoids in the chloroplast and also specific carotenoids are present in different species of *Trentepohlia*. Carotenoids have become the object of much attention in recent years, as a source of vitamin A and important antioxidant function. In the present work the species observed were a result of a one-time collection. Further collection and observation especially a seasonal study will be required to carry out in order to get the better picture on the different species of *Trentepohlia* growing in this part of the region.

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