Some Green Algal Flora Found in Rih Lake, Rihkhawdar Township, Chin State

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Abstract

In this research, algal flora of Rih Lake, Rihkhawdar Township, Chin State were presented. Rih lake is a natural lake location in northwestern Chin State in Myanmar. It lies at about 3 kilometers for Rihkhawthar, the nearest village situated at an Indo-Burma border. It has a heart-shaped outline. Algal sample were collected from three sampling sites during December 2018 to October 2019. All the collected specimens had been listed by the classification system of John *et al.* (2002). Totally 24 species of 1 division were identified and mention. Among 7 order, 11 families, 16 genera and 24 species of Chlorophyta were identified, described and recorded. The information on distributed sites of individual species that interested to be looking for and contribute the information on systematic characterization in taxonomic study of algae in the future.
Keywords: Lake, Algal Flora

Introduction

Algae are unicellular or multicellular organisms. They are green in colour. They are mostly found on rivers and sometimes on seas too. It is commonly seen when the mound of phosphorus controls the amount of algae found in water bodies, the more nutrient- enriched a water bodies, typically the more algae will be there (Round, 1981).

Some species of algae form symbiotic relationships with other organisms. In these symbioses, the algae supply photosynthesis to the host organism providing protection to the algal cells. The host organism derives some all of the energy requirements from the algae(Bhattacharya, 1998). The greatest variety of algae is found in the permanent or semi-permanent water of lakes, reservoirs, ponds, bogs, rivers, streams and canals. Some algae are attached to a substrate like plants, some are motile like animals, some are simply suspended in water, some grow loosely on soil, trees and animals, and some form symbiotic relationships with other organisms (Lee, 2008).

Algal flora of Rih lake, Rihkhawdar Township, Chin State were presented were studied in this work. Many researchers worked on the algal flora in many places. But, the area of Rih Lake, Rihkhawdar Township, Chin State was not done completely yet. Thus it was the research to select chosen as a study area It lies between latitude 22° 10' and 22° 32' N and between longitude 95° 35' and 95° 6' E and 6000 ft above the sea level.

The aims of this present study are to identify and describe varieties of algae from lakes and ponds, to understand cold tolerance phytoplankton of Rih lake, Rihkhawdar Township and to determine freshwater microalga phytoplankton of Chin State.

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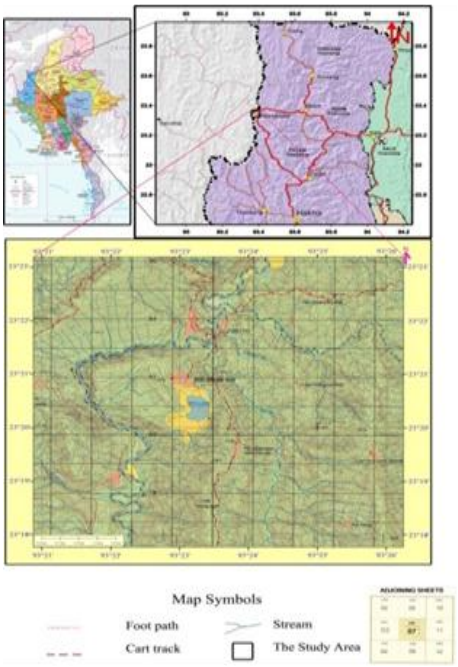
Materials and Methods

Algae samples were collected from of Rih lake, Rihkhawdar Township, Chin State .Specimens were collected from December 2018 to October in 2019. Laboratory observation on algae specimen were made by using compound microscope at Department of Botany, Hakha College. Several slides were prepared and the measurements of algae were taken by using micrometer. After that the images of specimens were recorded by digital camera. Specimens were identified up to specific level based on thallus shape, size, colour and distinguished characters of chloroplast, pyrenoid and sinus. The taxonomic description and nomenclature of observed algae have been done by the references on Fritsch (1935), Skuja (1949) Prescott (1962), Dillard (1982-2000), Hoek *et al*. (1995), and John *et al*. (2002).



Source : Department of Geography
Figure 1. Location Map of Rih Lake, Rihkhawdar Township, Chin State

Figure 2. Sampling Site

Results

Algal Flora

In this research, all of the 24 collected algae specimens were recorded from the study areas. All of the collected algal samples were included into one divisions; 8 species, 5 genera, 4 families and one order of Chlorococcales, 2 species, one genera, one family and one order of Ulotrichales, one species, one genera, one family and one order of Microsporales, 2 species, one genera, one family and one order of Cladophorales, , one species, one genera, one family and one order of Oedogoniales, 9 species, 6 genera, 2 families and one order of Zygnematales and one species, one genera, one family and one order of Charales were classified, described and recorded with photomicrographs. The systematic classification of algae was shown in Table 1.

Table 1. Classification of some algal species of of Rih Lake, Rihkhawdar Township, Chin Stat

Division	Order	Family	Genus	Species
1.Chlorophyta	1. Chlorococcales	1. Chlorococcaceae	1. *Tetraedron*	1. *Tetraedron minimum* Hansgirg
		2.Oocystaceae	2. *Oocystis*	2. *Oocystis eremosphaeria* Smith
		3. *Scenedesmaceae*	3.*Coelastrum*	3. *Coelastrum microporum* Nageli
			4. *Scenedesmus*	4. *Scenedesmus dimorphus* Kuetzing
				5. *Scenedesmus quadricauda* West & West
				6. *Scenedesmus subspicatus* Chodat
		4. Hydrodictyaceae	5. *Pediastrum*	7. *Pediastrum simplex* Rabenhorst
				8. *Pediastrum tetras* Ralfs
	2. Ulotrichales	5. Ulotrichaceae	6. *Ulothrix*	9. *Ulothrix aequalis* Kuetzing
				10. *Ulothrix cylindricum* Prescott

Table 1. Continued

Division	Order	Family	Genus	Species
	3. Microsporales	6. Microsporaceae	7. *Microspora*	11. *Microspora flocosa* Thuret
	4. Cladophorales	7.Cladophoraceae	8. *Cladophora*	12. *Cladophora fracta* Kuetzing
				13. *Cladophora oligoclona* Kuetzing
	5. Oedogoniales	8. Oedogoniaceae	9. *Oedogonium*	14. *Oedogonium plusiosporum* Wittrock
	6.Zygnematales	9.Zygnemataceae	10. *Spirogyra*	15. *Spirogyra gratina* Transeau
				16. *Spirogyraplatensis* Transeau
			11. *Zygnema*	17. *Zygnema insigne* Kuetzing
		10.Desmidiaceae	12. *Netrium*	18. *Netrium digitus* Prescott
			13. *Closterium*	19. *Closterium parvulum* Nageli
				20. *Closterium ralfsii* Brebisson
			14. *Cosmarium*	21. *Cosmarium biretum* Ralfs
				22. *Cosmarium luscum* Borge
			15. *Staurastrum*	23. *Staurastrum distentum* Wolle
	7. Charales	11. Characeae	16. *Chara*	24. *Chara vulgaris* Linnaeus

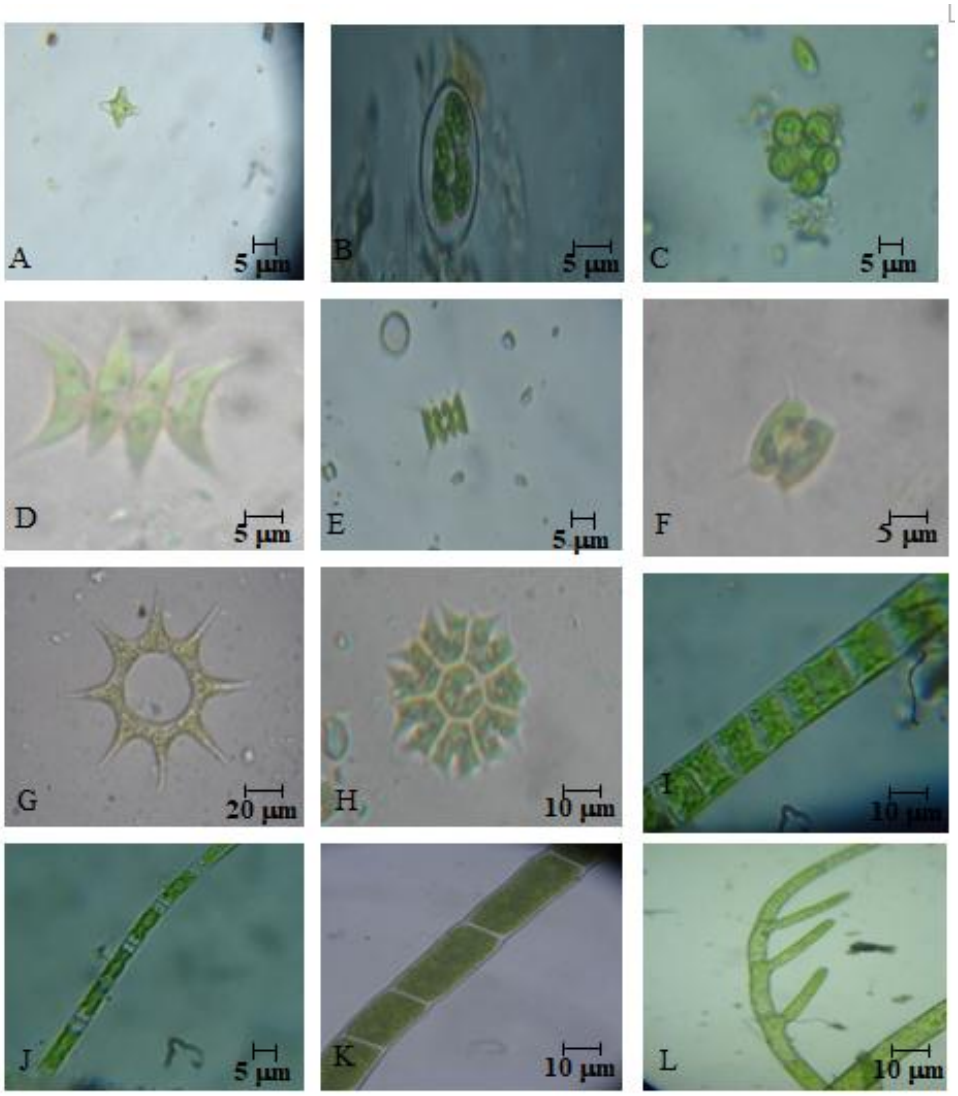


Figure 3 A. *Tetraedron minimum* Hansgirg B. *Oocystis eremosphaeria* Smith

C. *Coelastrum microporum* Nageli D. *Scenedesmus dimorphus* Kuetzing

E. *Scenedesmus quadricauda* West & West F. *Scenedesmsubspicatus* Choda

G. *Pediastrum simplex* Rabenhorst H. *Pediastrum tetras* Ralfs

I. *Ulothrix aequalis* Kuetzing J. *Ulothrix cylindricum* Prescott

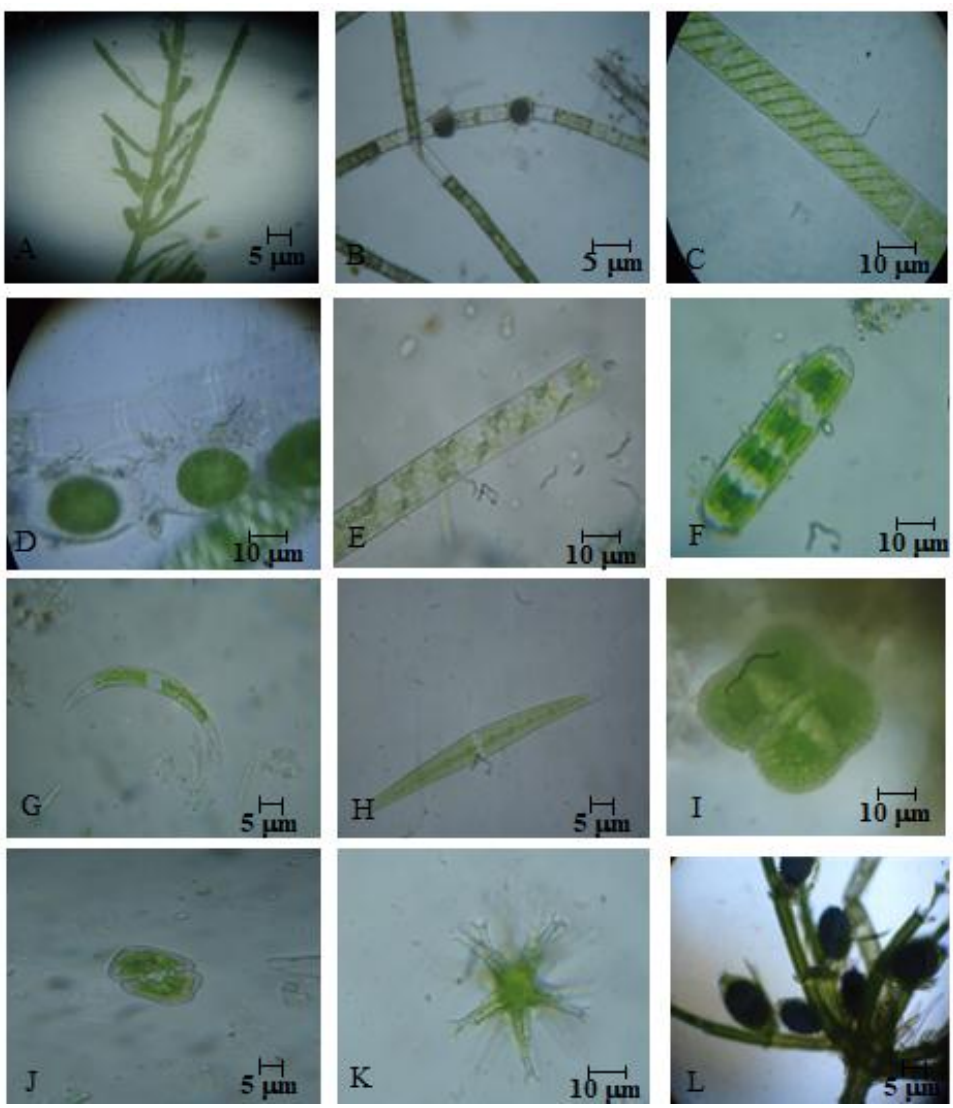


Figure 4 A. *Cladophora oligoclona* Kuetzing B. *Oedogonium plusiosporum* Wittrock

C. *Spirogyra gratina* Transeau D. *Spirogyraplatensis* Transeau

E. *Zygnema insigne* Kuetzing F. *Netrium digitus* Prescott

G. *Closterium parvulum* Nageli H. *Closterium ralfsii* Brebisson

I. *Cosmarium biretum* Ralfs J. *Cosmarium luscum* Borge

Discussion and Conclusion

In this study, 24 species of algae have been recorded from 3 sampling sites of of Rih lake, Rihkhawdar Township, Chin State. The species of *Scenedesmus*, *Closterium*, *Cladophora*, *Microspora* and *Spirogyra* were found in all sampling sites.

Microspora are able to grow at cold tolerate as well, making it virtually impossible to draw a sharp boundary between species adapted to freshwater and brackish habitats (Oren, 2000). In the present study, *Microspora* and *Spirogyra* were occurs in a wide rate of habitats, where it is typically attached to stable substratum but also occurs as free floating mats. Thus, these observations are in agreement with (Oren, 2000).

John *et al*. (2002) pointed that *Netrium* may be abundant among mosses covering dripping rock. In the present study, the member of algae such as *Netrium* and *Closterium* were commonly occurred in sampling sites 2 and 3. Thus, these observations are in agreement with John *et al*., (2002).

Bellinger & Sigee (2010) stated that attachment to other algae, such as *Chara* is particularly important in parts of lakes and rivers. *Chara* algae usuallystarts growing along the edges or bottom of a lake or ponds and surfaces along the top when it has substain enough oxygen. . In the present study, *Chara* is abundantly in Rih Lake. Thus, these observations are in agreement with Bellinger & Sigee (2010).

According to Graham & Wilcox (2000) Desmid are more common in oligotrophic lakes and ponds ,but some species can occur in mesotrophic and eutrophic water bodies. In the present study, some desmid such as *Closterium*, *Cosmarium* and *Staurastrum* were observed in Rih Lake. Thus, these observations are in agreement with Graham & Wilcox (2000).

This indicates that green algae which was present initially in freshwater were very sensitive to subtle changes of salinity, temperature and extreme environment. It could be concluded that, algae grows in different habitat and in different locations but it is generally cosmopolitan distribution and grow almost everywhere in the world. In the present study, an attempt has been made to the knowledge of the freshwater algae of Chin State and to provide the information of algae for researcher who are working phycological field.

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