

Some Algal Flora found in Rih Lake, Phalan Township, Chin State

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Abstract

This study deals with some algal flora in Rih Lake, Phalan Township, Chin State. All of the collected algal specimens were included into three groups; Bacillariophyceae, Euglenophyceae and Chlorophyceae. Among the collected specimens; diatoms were found abundantly such as *Cymbella*, *Amphora* and *Navicula*. Some genera of Chlorophyceae and one genus of Euglenophyceae were commonly found in this area.

Key words: Euglenophyceae, Chlorophyceae

Introduction

Freshwater algae constitute a very diverse group of organisms. Their range of shapes and beauty, when viewed through a microscope, has delighted biologists for more than a hundred years. They have an enormous range of size from less than one micrometer to several centimeters. Algal morphology is diverse, ranging from single cells to complex colonies and filaments. The term "algae" embraces a number of phyla (e.g. Cyanophyta, Chrysiophyta, Euglenophyta and Chlorophyta etc.) of chlorophyll containing organisms will different growth forms. In many lakes and rivers, they generate biomass which is the foundation of diverse food chains. Although algae have beneficial impacts an aquatic ecosystem, they can also have adverse effect. (Bellinger & Sigeo 2015).

Algae are abundant and ancient organisms that can be found in virtually every ecosystem in the biosphere. Freshwater lakes, ponds and streams contain similar botanical gardens of planktonic microalgae and attached forms (periplankton) which are often they festooned with epiphytes. Freshwater phytoplankton and periplankton (also known as benthic algae) form the base of the aquatic food chain. The classification scheme includes nine phyla. These are Cyanobacteria, Glaucophyta, Euglenophyta, Cryptophyta, Haptophyta, Dinophyta, Ochrophyta, Rhodophyta and Chlorophyta. (Gram 2000).

Cyanophyta were dominant forms of life for more than 1.5 billion years. Algae taxonomists have historically used morphological features to define cyanobacterial taxa, including variations in cyanobacteria lthallus structure, which include occurrence as unicells, colonies unbranched filaments or branched filaments. Glucophytes include unicellular flagellates, planktonic colonies, and attached colonies, which inhibit freshwaters. Chryptomonads and euglenoids are fundamentally biflagellate, with flagella emerging from an apical depression. The green algae (Chlorophyta) are commonly known as Chlorophytes because they appear bright grass green, as do more plants. (Graham & Wilcox, 2000)

Rih Lake is the natural lake which located in Phalan Township, north western Chin State in Myanmar and it is near to an Indo-Burma border. It is situated between 23°10' 23' 23' north latitude and 93° 24' 93° 32' east longitude. It has a heart shaped outline. It is about 1 mile in length, half a mile in width, about 3 miles in circumference and about 60 feet in depth. The elevation of area has 2966 feet above sea level.

There are so many lakes all over the world. Among them this one is stranger than other as it is on the mountain range which is over 1900 in high. It is

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extraordinary that the water in the lake is warm although it is freezing cold in Hakhar, the capital city of chin state. The strangest one is that the water in the lake is automatically dirty in late December and beginning of January by the time the lake cannot be mixed other water from some streams and rain.

The local people believe their folktale. According to their legend, Mizo and Hualngo started to live there in 1450. One day Huathan, the second president of the town name Swaypee, had a strange dream. It was that one of the Gods came to him and said "My name in Poll Rih and I am the God who looks after soul. I come to this place to look after your soul. I have found a good place at the north-east of the town and I have created a pond heart shaped. And I live there from now on. All the soul has come to me after dying".

The next day, Huathana made his men find that lake. Seven days later, the men found the lake heart-shaped. Then that lake was named Rih Lake. There are different background stories. No metter what it is an interesting place.

The aims of this study are; to investigate fresh water algae from Rich Lake, to identify and classify the species level of algae in study area, to contribute the knowledge of freshwater algae of different sample collecting sites and to provide the information of different algal species to other researchers.

Materials and methods

All the algae specimens were collected from Rih Lake, Phalan Township, Chin State during November to December in 2019. These algae specimens were collected from the upper surface of the water sample and to observe under compound microscope using high magnification (x40) at the Department of Botany, Monywa University. Algae populations were counted by three time and slide preparation by using compound microscope. The sketch of the live algae was taken by digital camera. The collected water samples were measured with temperature (10 to 15°C) and pH value with special indicator paper. The identification of algal Specimens was based on Smith (1950), Prescott (1962) John *et al.*, (2002). The orders, families, genera and species are arranged by alphabetically.

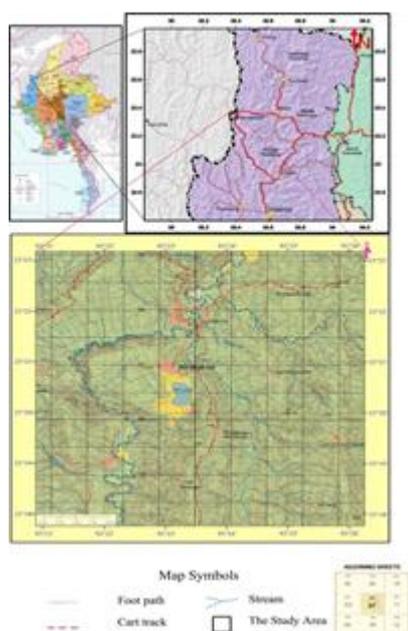


Figure (2) Sampling sites in Rih Lake

Figure. 1 Location Map of Rih Lake, Phalan Township, Chin State

(Source: Department of Geology, Monywa University)

Table 1. Classification of some species found in Rih Lake, Phalan Township, Chin State									
Division	Class	Order	Family	Genus	Species				
Euglenophyta	Euglenophyceae	Euglenales	Euglenaceae	<i>Phacus</i>	1. <i>Phacus anomalus</i> Fritsch et Rich				
Chrysophyta	Bacillariophyceae	Pennales	Cymbellaceae	<i>Cymbella</i>	2. <i>Cymbella aspera</i> Ehrenberg				
				<i>Amphora</i>	3. <i>Amphora ovalis</i> Kützing				
				<i>Navicula</i>	4. <i>Navicula cryptocephala</i> Kützing				
				<i>Rhopalodia</i>	5. <i>Rhopalodia gibba</i> (Ehrenberg) Kützing				
				<i>Synedra</i>	6. <i>Synedra ulna</i> Nitzsch				
				Fragilariaceae			7. <i>Gomphonema acuminatum</i> Ehrenberg		
				Gomphonemataceae		<i>Gomphonema</i>	8. <i>G. ferminatum</i> Ehrenberg		
			Chlorophyta	Chlorophyceae	Chlorococcales	Chlorococcaceae	<i>Actinotanium</i>	9. <i>Actinotanium curtum</i> Brebisson	
<i>Cylindrocapsa</i>	10. <i>Cylindrocapsa conferta</i> West John								
<i>Geminella</i>	11. <i>Geminella minor</i> Nageli Heering								
<i>Lebocormidium</i>	12. <i>Lebocormidium mucosum</i> Petersen								
	Microsporales	Microsporaceae					<i>Microspora</i>	13. <i>Microspora stagnorum</i> Kützing	
							<i>Tribonema</i>	14. <i>Tribonema affine</i> Kützing	
		Ulotrichales					Ulotrichaceae	<i>Ulothrix</i>	15. <i>Ulothrix zonata</i> Weber & Mohr
		Chaetophyales					Chaetophoraceae	<i>Stigeoclonium</i>	17. <i>Stigeoclonium lunarium</i> Dillwyn
			Zygnematales	Zygnemataceae	<i>Spirogyra</i>	16. <i>Spirogyra pratensis</i> (Muella) Cleve			
					Desmidiaceae	<i>Cosmarium</i>	18. <i>Cosmarium longience</i> Bissett		

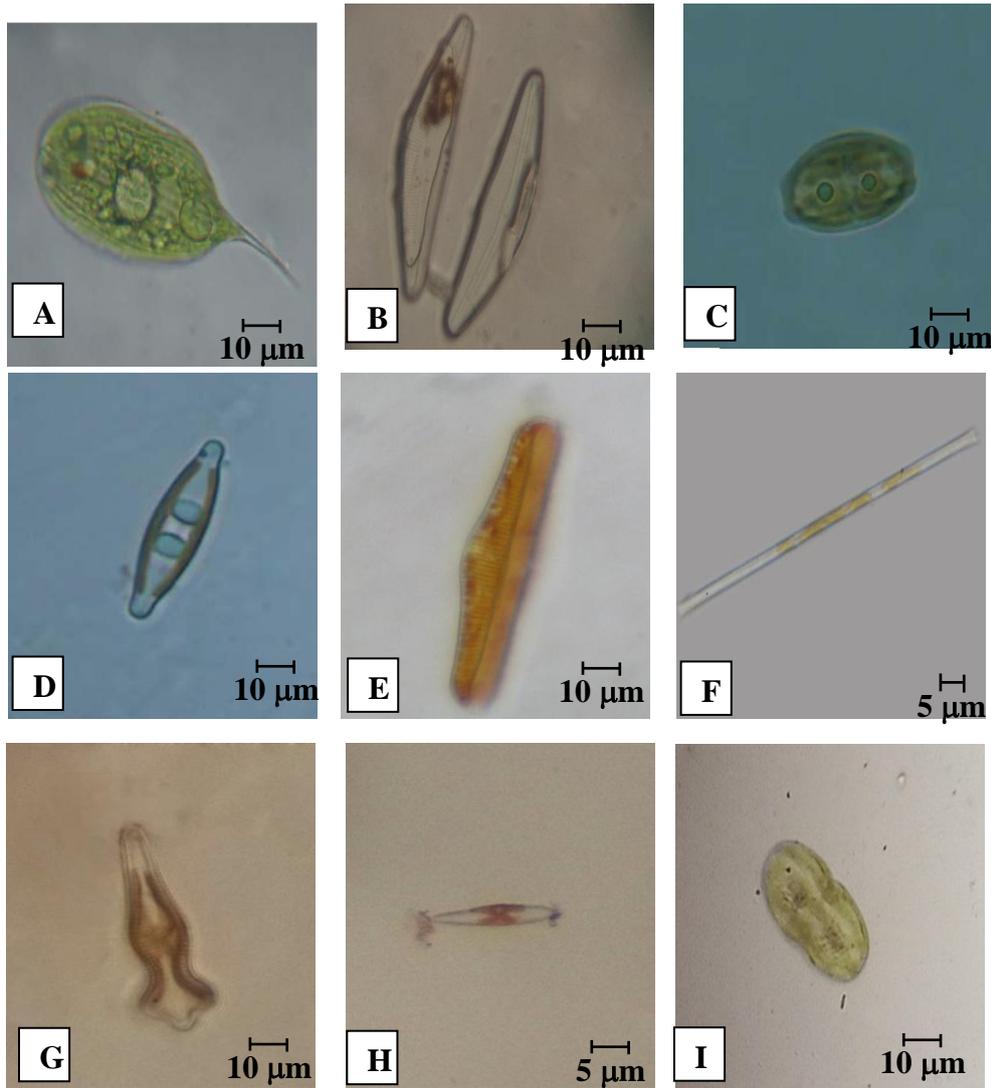


Figure 3. A. *Phacus anomalous* Fritsch et Rich
 B. *Cymbella aspera* Ehrenberg
 C. *Amphora ovalis* Kutzing
 D. *Navicula cryptocephala* Kutzing
 E. *Rhopalodia gibba* (Ehrenberg) Kutzing
 F. *Synedra ulna* Nitzsch
 G. *Gomphonema acuminatum* Ehrenberg
 H. *G. ferminatum* Ehrenberg
 I. *Actinotanium curtum* Brebisson

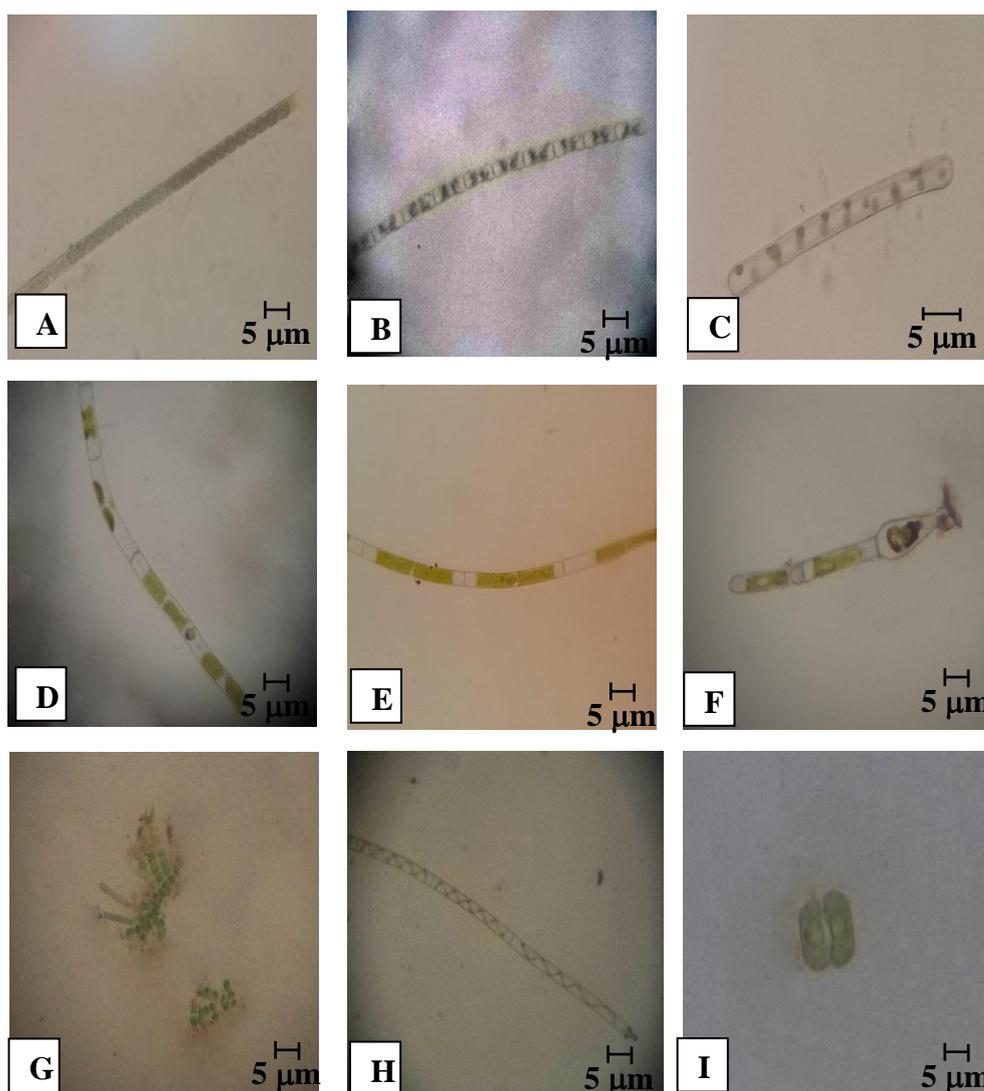


Figure 4. A. *Cylindrocapsa conferta* West John
 B. *Geminella minor* Nageli Heering
 C. *Keksormidium mucosum* Petersen
 D. *Microspora stagnorum* Kutzing
 E. *Tribonema affine* Kutzing
 F. *Ulothrix zonata* Webeer & Mohr
 G. *Stigeoclonium lunarium* Dillwyn
 H. *Spirogyra pratensis* (Muella) Cleve
 I. *Cosmarium longiense* Bissett

Discussion and Conclusion

In the study of Rih Lake, two sites were selected to study of algal distribution. It was composed of three major groups namely Euglenophyceae, Bacillariophyceae and Chlorophyceae. A total of eighteen alga taxa were recorded and presented in this study. Among the algal groups treated in this research, Chlorophyceae showed the highest number of species with ten genera, Bacillariophyceae was seven genera and Euglenophyceae was one genus. The percentage of Chlorophyceae was found to be 55.55 %, Bacillariophyceae 38.88 % and Euglenophyceae 5.55 % respectively.

According to this results, the species number of Chlorophyceae were dominant in this area. It may be due to adaptation of Chlorophyceae in different conditions of habitats. In the present investigation, the distribution and occurrence of algae in different location were presented.

The diversity of algae is mainly based on the environmental factors such as temperature and pH. In the studied area, the range of water temperature was between from 10°C to 15°C and the pH value of water has 7.24.

In rainy season, *Phacus*, *Cymbella*, *Rhopalodia* and *Cosmarium* were commonly found in study site. *Synedra*, *Spirogyra*, *Microspora*, *Tribonema*, *Cylindrocapsa* and *Actinotanium* were a few in all sites and remaining genera were not found.

In winter season, *Cymbella*, *Rhopalodia*, *Synedra*, *Gomphonema*, *Navicula* were abundantly found but *Spirogyra*, *Phacus*, *Cosmarium*, *Actinotanium*, *Microspora*, *Tribonema*, *Cylindrocapsa*, *Stigeochlunium*, and *Ulothrix* were commonly occurred in sampling sites. *Amphora* and *Geminella* were few in number.

In summer, *Phacus*, *Cymbella* and *Spirogyra* were abundantly in all sampling sites. Other remaining genera were commonly found in all sites. Bellinger & Sige (2010) stated that only filamentous algae *Spirogyra* together with diatoms were frequently found as surface blooms. In this present work, filamentous algae as *Spirogyra* can form large mucilaginous subsurface growth in Rih Lake. Thus, these observations were the agreement with above mentioned.

Green algae are ecologically important as major producers of biomass in freshwater system, either as planktonic or attached organisms where they respectively may form dense blooms and periphyton growth (Bellinger & Sige 2010). In this study, green algae of phytoplankton such as *Spirogyra*, *Microspora* and *Cosmarium* were abundant and periplankton such as *Ulathiax* species were mostly found. Therefore, this finding was agreement with Ballinger & Sige (2010).

It was concluded that all of the collected specimens were three major groups only. There were not being found Cyanophyceae which was different between other freshwater lakes and ponds. It is expected that these results will be useful not only for local people to get beneficial algae from their environmental but also for other researchers who are working in the field of phycology. This study was to inform the role of algae for local people and which algal floras were being found that in the study area.

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