CONFERENCE PROCEEDING

Identification of Diatoms in Universiti Sains Islam Malaysia Reservoir Ponds, Negeri Sembilan, Malaysia

Adawiyah Nasihah M. Yuni, Athirah Soleha Md Solehhuddin, Izzatul Huda Ahmad Rapee, [2]Mohd Sanusi Mohamed, [3]Mohamad Arif iskandar Abdul Wahab, Ehwan Ngadi*, Mohamad Azani Abd. Khadir Jalani[1]

[1] Kolej GENIUS Insan, Universiti Sains Islam Malaysia, 71800, Nilai, Negeri Sembilan, Malaysia.
[2]Copenhagen Zoo (Malaysia), Masreca 19, Persiaran Rimba Permai, Cyber 10, 63000 Sepang, Selangor, Malaysia
[3]Hiking and Camping Around Malaysia (HACAM), B-12-4, Pangsapuri Kos Rendah Bandar Tasik Selatan, Jalan 30/146, 57000 Kuala Lumpur
*Corresponding author: ehwanngadi@usim.edu.my

Abstract

Diatoms, classified as photosynthesizing algae with siliceous skeleton frustules, can be found most in any aquatic habitat on earth, including fresh or coastal lakes, wetlands and almost everywhere humid. They can be classified in nine major classes which are Araphid, Eunotioid, Centric, Epithemioid, Monoraphid, Nitzschioid, Surirelloid, Asymmetrical Biraphid and Symmetrical Biraphid. Diatoms have precise ecological requirements, so they can also be sued as environmental indicators, it is telling us what is happening in the environment. The cell walls of diatoms may be preserved for long periods of time in sediments and provide a record of past changes in lake systems. This research aim is to identify the morphology of diatoms in lakes and reservoirs in USIM. The samples were collected by taking 250 ml of water from each lakes and reservoirs. Then, two drops of water sample were put on a cover slip and two drops of iodine were added. The samples were then observed under microscope and diatoms were identified by analyzing the types of morphology. Diatoms of symmetrical morphology were found in major lakes and reservoirs in USIM. The search for diatoms of other morphologies are still in progress. The morphology of diatoms can help us to know the water condition whether it is polluted or not. Therefore, this research is vital in environmental science as to provide information and support in the investigation to know the water condition.

Keywords: *Diatom, lake, reservoir*

INTRODUCTION

Diatoms are photosynthesizing algae, which known have siliceous skeleton frustules (Asmuje & Poupalan, 2015). Diatoms can be found most in every aquatic habitat on the earth including fresh and marine waters, soils and almost everywhere moist. These photosynthesizing algae are important biomass and oxygen producers that can be found in all aquatic ecosystems (Hilaluddin *et al*., 2011). Diatoms have precise ecological requirements, so they can also be sued as environmental indicators, telling us what is happening in the environment. The cell walls of diatoms may be preserved for long periods of time in sediments and provide a record of past changes in lake systems.

Diatoms can be classified into nine major classes, which are Araphid, Eunotioid, Centric, Epithemioid, Monoraphid, Nitzschioid, Surirelloid, Asymmetrical Biraphid and Symmetrical Biraphid. In general, diatoms are very sensitive to the

environment that they are living in. Other than that, some species of diatoms need a specific pH range and salinity to live. Diatoms are perceived to have different ranges and tolerances for environmental variables, such as nutrient concentration, suspended sediment, flow regime, elevation, and different types of human disturbance. Since the siliceous cell walls in diatoms do not decompose, they can be used to determine the water condition in the past decades (Asmuje & Poupalan, 2015). Thus, when more morphology of diatoms has been carried out from a reservoir pond, it shows that the reservoir pond does not pollute than other reservoir ponds at Universiti Sains Islam Malaysia, Negeri Sembilan.

MATERIALS AND METHODS

Sampling

Water sample were collected from five reservoirs in Universiti Sains Islam Malaysia, which are Kolam Takungan Abrar, Kolam Takungan Dewan Tunku Canselor (DTC), Kolam Takungan 1, Kolam Takungan 2, Kolam Takungan 3. Then, the water from each reservoir were poured into five labelled plastic sample bottles of 250 ml capacity.

Sampling Preparation

Two drops of water sample were placed onto a cover slip. Then, two drops of iodine solution were added onto the water sample to stain the diatom cells, especially the nucleus of the cell and make them more visible under microscope. The cover slip was then covered with sufficient sellotape.

Sampling Observation

The sample was viewed using MB1-400X compound microscope.

RESULTS AND DISCUSSION

Many diatoms were found in Kolam Takungan Abrar, Kolam Takungan Dewan Tunku Canselor, Kolam Takungan 1, Kolam Takungan 2 and Kolam Takungan 3 in Universiti Sains Islam Malaysia (USIM). The genera of diatoms can be identified based on their morphology referring to database from Diatoms of North America.

Diatoms of asymmetrical biraphid were found in all reservoirs. Figure 1 and 2 show the morphology of asymmetrical biraphid diatom. The diatoms of centric morphology were also presence, but only in Kolam Takungan 2. It was classified under centric morphology as it has round and flat faces. The structure of the diatoms that were found cannot be seen more clearly because the microscope used can only be zoomed at a rate of 40x.

Identification of Diatoms Based on Morphology

Figure 4. Asymmetrical Biraphid Morphology

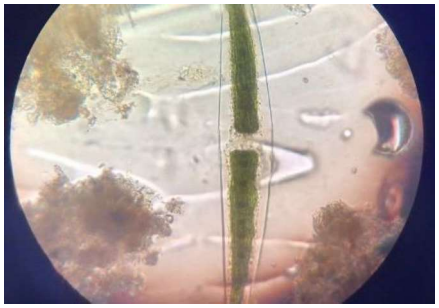

Figure 2. Asymmetrical Biraphid Morphology

Table 1. Type of Diatom Morphologies Present in Major Lakes and Reservoirs in USIM

Type of morphology/ Location	Kolam Takungan Abrar	Kolam Takungan DTC	Kolam Takungan 1	Kolam Takungan 2	Kolam Takungan 3
Araphid					
Eunotioid					
Centric				X	
Epithemioid					
Monoraphid					
Nitzschioid					
Surirelloid					
Asymmetrical Biraphid	X	X	X	X	X
Symmetrical Biraphid					

CONCLUSION

A total of 28 species of herbs and medicinal plants used traditionally as medicine by the indigenous people in Langkawi were inventoried and documented. Most of the plants that are used to cure snakebite have anti-inflammatory and antibacterial properties. The information collected from this study are precious sources for the future development of snake antivenom.

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