CHAPTER 1

Introduction

Euglenoids are algae belonging to Division Euglenophyta that show dominant characteristics. These include chlorophylls *a* and *b*, eyespot, paramylon forms as the storage products in cytoplasm and flagella with fibular hair in one row. Generally, euglenoids occur in freshwater habitats, such as puddles, ditches, ponds, dams and particularly water contaminated by organic matter and are also present in marine water, brackish water bodies, and soil (Lee, 1999; Graham and Wilcox, 2000; Ciugulea and Triemer, 2010). However, euglenoids are rare in clean water but usually occur in various types of water quality, which possess a high level of nutrients (Wołowski, 2011).

So far, the investigation on euglenoids in tropical and sub-tropical areas has involved several reports from various regions, such as Australia (Playfair, 1915; Ling and Tyler, 2000); Africa (Bourrelly, 1961; Compere, 1975; Couté and Thérézien, 1985; Da *et al*., 2009); Asia (Yamagishi and Hirano, 1973; Yamagishi, 1977, 1992, 2010; Kim *et al*., 1998, 2000; Prowse, 1958); South America (Martinez, 1978; Conforti and Tell, 1986a; Thérézien, 1989; Conforti, 1993; Alves-da-Silva *et al*., 2007); and North America (Gojdics, 1953; Dillard, 2000; Wołowski and Walne, 2007).

A complete study on euglenoids in Thailand has not yet been completed due to a lack of basic information, a limitation in species identification, and limited ecological data. The main sources of information on the euglenoids are the references given by Lewmanomont *et al.* (1995) and Peerapornpisal (2005, 2013) in publications reporting on different taxonomic groups of algae. Moreover, Hanpongkittikul and Wongrut (2005) also recorded plankton communities that included 30 taxa of euglenoids from the Pasak Jolasid Reservoir. Yamagishi (2010) also published information on euglenoid species that occur in Thailand's

ponds. Chaimongkhon and Peerapornpisal (2012) presented 34 taxa of non-loricate euglenoids.

Euglenoids are also known as bioindicators of polluted water conditions (Palmer, 1969; Slàdeček and Sládečková, 1996; Peerapornpisal, 1996, 2013). Algae have long been used to assess environmental conditions in aquatic systems throughout the world. They are appropriate for water quality assessment because of their nutrient needs, rapid reproduction rate, and very short life cycle. Algae are valuable indicators for water conditions because they respond quickly both in species composition and densities to a wide range of water conditions due to changes in water chemistry (Stevenson and Smol, 2003). Nevertheless, the applications of euglenoids as bioindicators have not yet been fully studied in Thailand because of a lack of basic knowledge, a limitation in species level identification and limited ecological data.

The main objective of this research was to investigate the biodiversity of euglenoids in Northern Thailand by studying euglenoid communities that occur in various types of water bodies. Distribution of euglenoids in comparison with the physico-chemical properties of the water parameters was also studied. An additional euglenoid index to be used as a bioindicator for the assessment of water quality was established. This research also presented a reliable database of euglenoids in Thailand. Moreover, applications of euglenoids as bioindicators will be a good model for the euglenoid index of Thailand or Asia, and tropical areas in general. They will be an easy bioindicator for the assessment of water quality, which can be useful for all member of the community.

1.1 Objectives

    1.1.1 To study the biodiversity of euglenoids in Northern Thailand and their relationship to the physico-chemical parameters of water.

    1.1.2 To study the euglenoid communities that occur in various types of water bodies and microhabitats.

    1.1.3 To establish a euglenoid index as a bioindicator for water quality assessment.

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