1.0 INTRODUCTION

Little work has been done on the molecular biology of indigenous algal species, especially *Sargassum*, although valuable chemicals and compounds are known to be potential products from these species. To ensure that the algae of interest are correctly identified and recognised, taxonomy plays a very important role. With an appropriate taxonomic system, the algae can be identified, classified and utilised effectively.

Sargassum species are known to be a source of many useful products. The alginic acid or algin which is isolated from the cell wall and intercellular matrix is a latex creaming and stabilising agent in the production of rubber (Khew, 1978). The soluble alkali salts of alginic acid known as alginates can also be used as a thickening material for dyes, paints or coatings, as a hardener and adhesive for joining threads in weaving and as an emulsifier in paints, drugs and cosmetics (Khew, 1978). *Sargassum* also offer pharmaceutical benefits in the treatment of goiter, scrofula, urinary diseases and dropsy. In addition, it can also be used as antipyretics and coolers to treat sunstroke (Tseng and Chang, 1984). The *Sargassum* usage is further enhanced as oil, sterol and manitol (Smith *et al.*, 1973; Chennubhotla *et al.*, 1982). In many countries, *Sargassum* is also utilised as a food resource, fodder and fertiliser. Environmentally, *Sargassum* is a bioindicator to remove pollutants from waste water (Sheila *et al.*

,1994). In addition, *Sargassum* also stabilises shorelines against wave erosion and provides food, shelter and nursery space for important fishery species.

Despite the usefulness, many problems arise in identification and classification of *Sargassum*. The statement that "identification often originates in early studies that assess the usefulness of an entity but are careless of its nomenclature" (Bird and van der Meer, 1993) applies very much to *Sargassum* as it does to other cases of economically important organisms. Thus, to make sure that "it is recognisable to the user and predictable in its performance", the exact identity of the taxa must be clarified (Bird and van der Meer, 1993). *Sargassum* with more than 400 described species is among the most taxonomically difficult and complex of macroalgae. Taxonomic inconsistencies occurred in *Sargassum* species, that is the descriptions are oversimplified, interspecific boundaries are difficult to perceive and the biology of the plant is poorly understood (Kilar and Hanisak, 1988; Kilar *et al.*, 1992). Therefore, *Sargassum* poses many problems to algal taxonomists who attempt either to identify or classify it.

Recently, application of new approaches in molecular genetics offers a potential increase in basic knowledge such as life histories, speciation, population genetics, biogeography and the phylogenetics of algae (Olsen, 1990) by supplementing traditional systematic approaches with nucleic acid data. According to Goff and Coleman (1988), molecular biology techniques provides new and powerful tools for

analysis where the variation in the genomes of individuals, populations and species can be examined. The potential for studies at the population and species level is largely unexploited although the application of DNA analysis to the study of algae are many. Molecular studies of *Sargassum* will help in resolving phylogenetic and evolutionary relationships. Also, initial DNA analysis is essential before gene analysis and genetic manipulation can be carried out to improve the species.