بسم الله الرحمن الرحيم

شبكة المعلومـــــات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

﴿ قـــسـم ﴾

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد اعدت دون آية تغيرات

يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15 – 20 مئوية ورطوبة نسبية من 20-40 %

To be kept away from dust in dry cool place of
15 – 25c and relative humidity 20-40 %

بعض الوثائق الأصلية تالفة

بالرسالة صفحات

لم ترد بالأصـــل

COMPARATIVE TAXONOMIC STUDIES ON CHAROPHYTES IN RELATION TO OTHER GREEN PLANTS

Thesis

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For the Degree of Doctor of Philosophy in Science
(Botany)

By

EMAN MOHAMED FAKHRY ABD-EL SALAM

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M. Sc.(Botany) 1991

Supervised by

Dr. ABDEL-FATTAH KHALEAFA
Professor of Phycology
Botany Department

Dr. SAMI HAMED SHAALAN
Professor of Phycology
Botany Department

Faculty of Science
Alexandria University
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To

my parents, my husband,
Ahmed , Khaled & Dahlia
With all my love.

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Through new advances in electron microscopy, electrophoresis, gas chromatography, and other developing techniques, one may well wonder how systematics (which began as a relatively simple activity including only species recognition and classification) are involved into a highly complex science. The incorporation of new data arising from the application of modern botanical techniques, in recent years, allow the detection and identification of extremely minute samples of many compounds that are proving to be as useful systematic tools (Alston and Turner, 1963 a).

The two terms, systematic and taxonomy, are often used synonymously, but more accurately taxonomy is the study of the bases, principles, procedures, and rules of classification (Heywood, 1973) while systematic is the classifactory process itself. Also, careful must be taken to distinguish between the taxonomy of organisms, and the study of their phylogeny, i.e. their origin. Phylogeny can be considered as a taxonomy in which the resulting system is thought to be representative of the historical evolution of the organisms studied. Descent from common ancestors with evolutionary modifications is studied in its various manifestation: morphological, biochemical or otherwise. Consequently a phylogeny, adequately constructed, is a more powerful conceptual framework than is a taxonomy alone.

Why is it useful to construct a phylogeny of the taxa using biochemical data?. Much of the promise in chemical data from plants lies in the possibility that certain kinds of chemical evidence may be a reliable guide to phylogenetic relationships of living species.

However, the most objective method for determining phylogeny is to measure homology of the base sequences of comparable nucleic acids or amino acid sequences of comparable proteins (Pigott and Carr, 1972; Dayhoff and Schwartz, 1980; Fox *et al.*, 1980; Doolittle and Bonen, 1981; Cavalier-Smith, 1982; Gray and Doolittle, 1982; Hori *et al.*, 1985 and Lim *et al.*, 1986).

It is not easy to collect the necessary biochemical data, whether reaction pathways, molecular structures, or chemical compositions, there may be problems of the absence of a character due to the repression of a gene, or to a critical mutational step that has occurred recently, or to insensitivity of the analytical method. Also, the culture conditions or an abnormal environment for the organism may cause unnatural change in its biochemistry.

The extent current of interest in biochemical systematic is indicated by the appearance of several books on the topic (Hegnauer, 1962; Swain, 1963 and 1966; Alston and Turner, 1963b; Turner, 1966; Hawkes 1968; Smith 1976; and Ferguson, 1979).

It is important that one does not lose sight of the morphological characters associated with evolution and phylogeny. It is to some degree artificial to speak of morphological phylogenetics and biochemical phylogenetics as if they were independent undertakings. Also, it is important to distinguish between the morphology of the whole organism (macromorphology) and its subcellular structure (micromorphology; e.g. ultrastructural considerations). In algae, the phylogeny (and taxonomy) of the lower ranks "species, genera, and families" is based heavily upon the macromorphological characters, while the conservative micromorphological characters are used more in the erection of the phylogeny of the higher ranks "orders, classes, and divisions" (Ragan and Chapman, 1978).

Old trials for algal classification made by phycologists depended mainly on morphological and anatomical features. However, the prevailing emphasis on morphology has proven unsatisfactory especially in the assemblage of organisms that show polymorphism (algal species exhibit more than one vegetative from when growing in different environments i.e. ecotypes) that might result under different ecological, seasonal and geographical conditions (Dixon, 1973; Sinclair & Whitton, 1977; Cheney & Babbel, 1978; and Allam, 1994) or those in which uniformity of morphology is most noticeable.Therefore many phycologists would agree and acknowledge that algal classification does need new approaches, e.g. biochemical, physiological, cytological, and ultrastructural.

A lot of schemes have been suggested by leading phycologists for algal classification. Non of them could be considered as the best to be accepted and non-of them must not be considered final, (Mohammad, 1981). Authors regard all these systems as tentative and always to be modified in the light of new data (Bold and Wynne, 1978).

Bold (1970) emphasized the difficulties of a taxonomic treatment of the chlorophycean soil algae because of the morphological similarities (coccoid and palmelloid); lack of reproductive structures, and the masking of cellular organization by starch and lipids produced as a result of nutritionally deficient environment. However, Bailey and Samsel (1971) stated that the classification of many species of algae presents the taxonomists with a frustrating paradox.

A number of chemotaxonomic studies have been undertaken for green algae. The extent of these studies has varied considerably depending very much upon the question asked. By far the most extensive studies are those of Kessler's group aimed at establishing a well-substatiated taxonomy for the genera in the Chlorococcales (Kessler's 1974 and 1978; Kessker's and Czygan, 1966; Hellman and Kessler, 1974; Kerfin and Kessler, 1978).

Most of the work that have been done in the field of chemotaxonomy indicated that many biochemical metabolites could have a taxonomic value. The most important and promising of these are: