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Database of marine and freshwater algae resources of Andaman and Nicobar Islands*

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Algae refer to an assemblage of polyphyletic organism that conducts oxygen-evolving photosynthesis other than land plants. They are omni present in the sea, in freshwater and in moisture situations on land, forming an important component of biodiversity of Andaman and Nicobar Group of Islands. Algae have a wide application in a variety of industries such as food additives, fish feeds, medicines and biofertilizers and pesticides etc. They are also important source of protein, iodine, vitamins, minerals and substances of antibiotic nature.

The union territory of Andaman and Nicobar Islands constitutes the farthest and the remotest part of India. The islands are situated in the Bay of Bengal surrounded by sea with neighboring countries such as Burma in north-east and Singapore, Malaysia and Indonesia in south-east. Andaman and Nicobar Islands are situated between 6° and 14° North latitude and 92° and 94° East longitude forming a broken row of continuous islands from north to south direction. The word algae represent a large group of different organisms from different phylogenetic groups, representing many taxonomic divisions (Abbott and Hollenberg 1976). In general, algae can be referred to as plant-like organisms that are usually photosynthetic and aquatic, but do not have true roots, stems, leaves, vascular tissue and have simple reproductive structures (Chapman *et al.* 1970). They are distributed in the Andaman sea, in freshwater and wastewater (Fig 1). Most are microscopic like Prochlorococcus, Synechococcus etc , but some are quite large, e g Laminaria i.e. 1–3m in length. Microalgae like cyanobacteria and dinoflagellates comprise a vast group of photosynthetic, heterotrophic organisms, which have an extraordinary potential for cultivation as energy crops (Cullinane and John, 1973, Greeson and Phillip 1982).

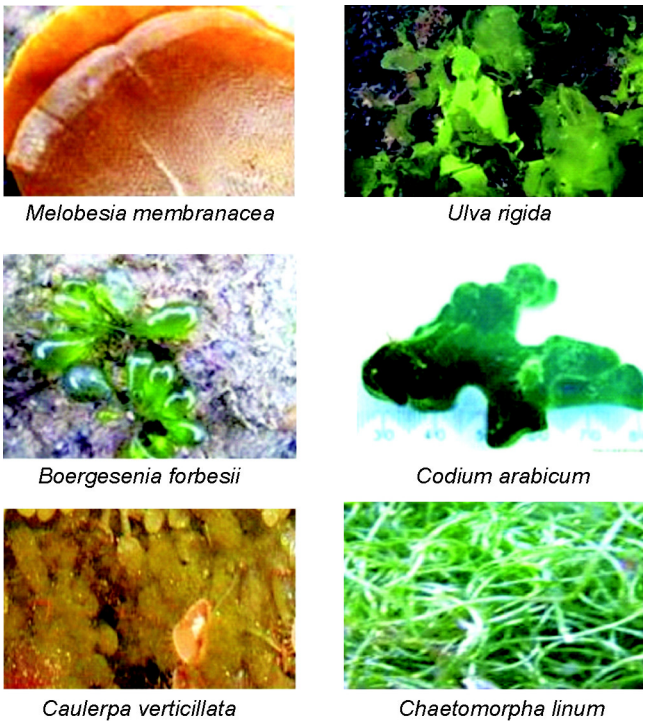

Fig 1 Marine and freshwater algae

They can be cultivated under difficult agro-climatic conditions and are able to produce a wide range of commercially interesting byproducts such as fats, oils, sugars and functional bioactive compounds (Huisman 2000, John *et al.* 2002). Algae are an extremely important species as they produce more oxygen than all the plants in the world, put together and are important food source for many animals (Knight *et al.* 1931, Lembi and Waaland 1988). They are at the bottom of the food chain with many living things depending upon them (Michiel van Otegem 2007, Morton and Osborne 2003, Mumford and Miura 1988). With the recent research and interest into using algae for producing

*Short note

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biodiesel, e g diatoms, they have the potential to become even more important (Round 1981, Stegenga *et al.* 1997, Taylor and William Randolph 1996).

Extensive survey and database development was conducted during April 2009 – March 2010, in Andaman and Nicobar Islands. The information collected was crosschecked and authenticated with secondary data. In this survey, all details of taxonomy, habitat, characteristics, distributions, and parts of algae used for medicinal purpose were documented for algae of surveyed areas. Secondary data were collected from institute/organization of these islands and mainland such as Botanical Survey of India (BSI), Department of Agriculture and publications of Islands as well as mainland.

The database has been developed to be uploaded on the institute website as algae Resources of Andaman and Nicobar Islands, to provide technical details and document existing bio-diversity. The database was designed in MS-SQL Server (Kalen 2007) at the backend and the interface was created using ASP.Net (Stephen 2008). The database is enriched with up-to-date information from latest Island-wise statistical census and other data from BSI, CARI and other medicinal plants sources. Entity relationship (ER) diagram shown in Fig 2.

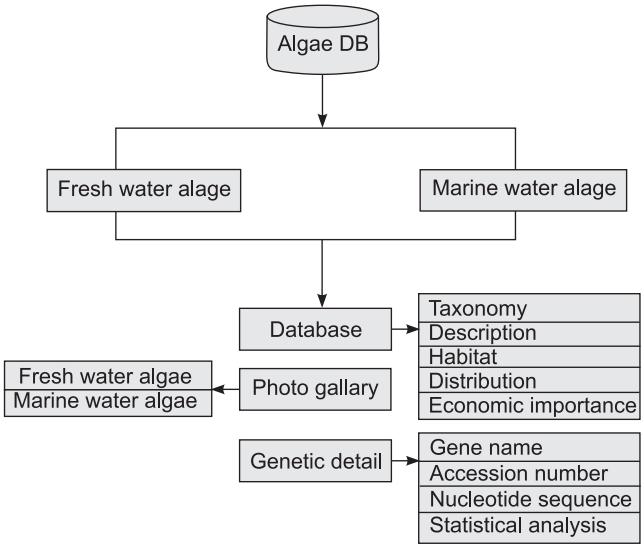

Fig 2 ER diagram of algae resources

The developed algae resource database is rich in information about Andaman and Nicobar Islands, details of taxonomy, habitat, characteristics, distributions, description its availability and parts of algae used for medicinal purpose. Once logged on, the user will get access to the entire database regarding different algae resources in these islands. Each of these categories comprises links to algae belonging within each category, which will take the user to the well-furnished database. Under the field of data entry, the following sub-fields were created and add, modify, delete and view plants through which the above-said operation could be made. To access the database one needs to login to the website. The administrator on request by e-mail for access will provide the username and password.

Once logged on to http://cari.res.in/Sub_DIC/Algae/Home.asp databases will give complete information about the individual species regarding their plant name, scientific name, its family, habitat, characteristics, distributions, description its availability and parts of plant and usages (Fig 3).

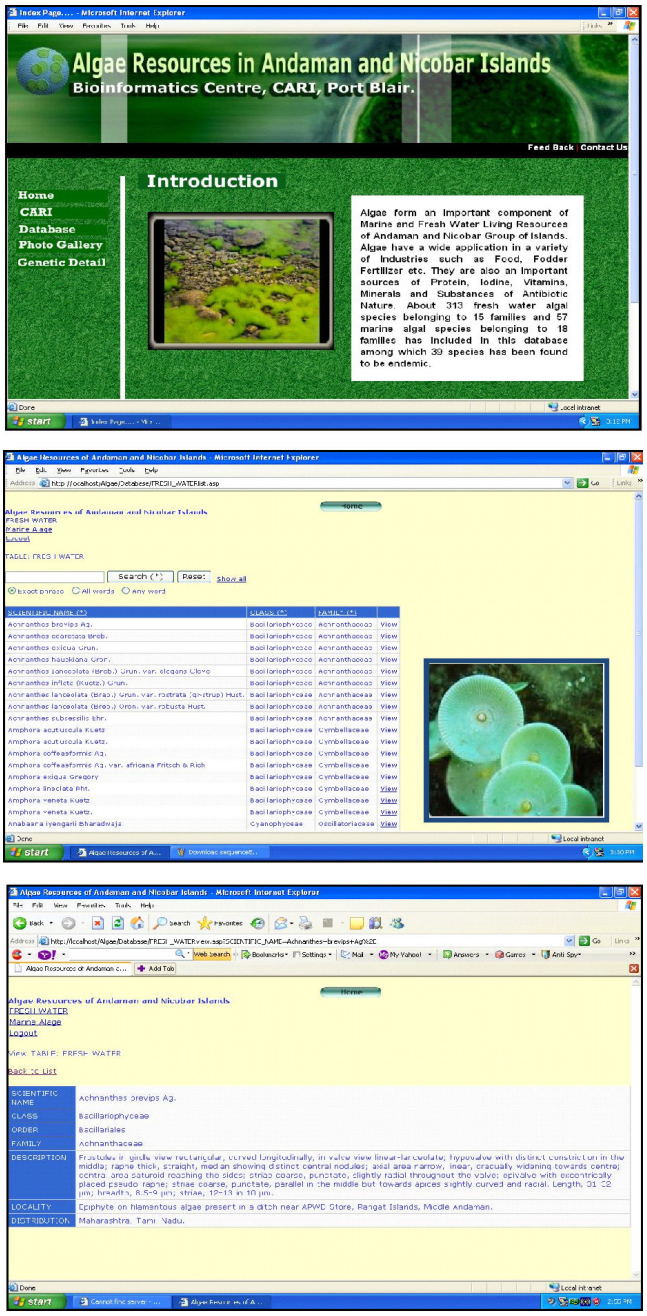

Fig 3 Home page and database pages of algae resources databases

SUMMARY

This repository can contribute and document all information of endemic algae resources of Andaman and Nicobar Islands and help prosperity. Database for algae resources of Andaman and Nicobar Islands has been developed with an aim of providing technical information to the researchers. About 313 freshwater algal species belonging to 15 families and 57 marine algal species belonging to 18 families have been included in this database among which 40 species are new records. It is needless to state that algal resources play an essential role in phytochemical industry, Pharmaceuticals, Sidha medicine, drug discovery research and agricultural economy in future. Algae products have a vital place in the list of essential commodities in the day-to-day life of common person. When compared to Indian mainland, very limited variety of algae is found in these islands. This database provides a common place for the entire information and user-friendly database. This database would be updated on a regular basis, so that it could provide status about the algae resources, which could be useful to scientists, research scholars, pharma companies and common person.

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