Abstract

The importance of floristic studies of a plant group hardly needs any justification, particularly at a time when elimination of forests is continued, resulting in the destruction of plant habitats in large scale mainly due to biotic factors. For proper exploitation of plant resources and their effective conservation, it is always essential to have floristic inventories of all type of plants from different parts of the country. Lichens which form one of the important constituents of the Indian flora, have so far remained poorly studied as compared to other groups of plants in India.

From the botanical point of view the western ghats have a special position in the Indian subcontinent for their interesting lichen flora. Although, a large number of lichens have been recorded from the Western Ghats of south India, Maharashtra which lies on Western Ghats has been neglected. There has never been a comprehensive treatment of the lichens in Maharashtra. In this background presently we have been investigating the lichen flora of Maharashtra at Agharkar Research Institute under the All India Coordinated Project on Taxonomy (AICOPTAX), Ministry of Environment and Forests, Government of India.

As a part of this programme the present investigation has been carried out with the aim to investigate the species diversity of macrolichens in western Maharashtra, and to understand the delimitation and circumscription of the genus and species, evaluation of characters for speciation and correct nomenclature in the light of modern trends in lichen taxonomy. The present thesis thus, attempts to fulfill the need of a regional flora for the identification of macrolichens of Maharashtra state.

In the present work critical taxonomic studies of over 2000 specimens of macrolichens collected at various localities in Maharashtra have resulted into the recognition of 84 species in 25 genera belonging to 9 families. The occurrence of 39 species and 12 genera of macrolichens have been recorded for the first time from Maharashtra.

The morphotaxonomic account of 84 species of the macrolichens from Maharashtra has been prepared and presented in the thesis along with keys for the identification of taxa from Maharashtra. The detail taxonomic descriptions of the species together with the chemistry followed by a short discussion with their geographical distribution in world, their relationship and illustrations have been given.

Optimum conditions for rich and profuse growth of lichens in variety and development exist in the high hills on the Western Ghats in Maharashtra which get heavy rains and in forest localities in semi evergreen to moist deciduous forests. The species predominating in these high hill ranges belong to the genera *Dermatocarpon*, *Heterodermia*, *Leptogium*, *Phaeophyscia* and the members of the family Parmeliaceae. The deciduous tropical and subtropical forests existing on the eastern spurs and low hill ranges of the Western Ghats in Maharashtra have comparatively poor lichen growth.
As many as 773 macrolichens species in 97 genera belonging to 30 families are known from India (Awasthi 2000). The occurrence of 84 species in 25 genera and 9 families thus represents 10.86% species, 25.77% genera and 30% families of total diversity of macrolichens in India and reflects increasing phylogenetic divergence of lichens in Maharashtra.

Most of the lichens have been collected on the bark of trees. A moderate number of macrolichens are found to grow on rocks. However, only two terricolous lichens have been collected on calcareous soil.

The lichen flora of Maharashtra in general is poor and macrolichens in particular is very poor in abundance and diversity. The number of macrolichens in Maharashtra is comparatively very less in number than the microlichens. Only 28.28% of the total lichen flora of Maharashtra is composed of mainly tropical to subtropical foliose and fruticose lichens. It may be, primarily because humid temperate forests do not exist there.

It has been observed that the macrolichen flora of Maharashtra is very similar to the other parts of Western Ghats of south India. 73.80% of species also occur in other regions of the Western Ghats (i.e. Karnataka, Kerala and Tamil Nadu). The relationships between these three states were also tested by means of Sørensen Coefficient.

Comparison of macrolichen flora of three states and Maharashtra show good correlations within themselves and are given in decreasing order with closer similarity (K=41.21) between Maharashtra and Karnataka > (K=29.09) between Maharashtra and Kerala > (K=27.71) between Maharashtra and Tamil Nadu.

It has been observed that the original habitats are being gradually destroyed by topographic changes due to fast increasing urbanization. The rate at which the process of deterioration of biota is proceeding, it is urgently necessary that steps are taken to halt the process and thereby conserve the diversity of species so characteristics of these areas. The lichen hot spots can be identified and efforts should be made to protect lichen hot spots. One must bear in mind that recovery of lichen population is a slow process.

The importance of in situ and ex situ conservation should be recognized. As lichens, are a significant component of biodiversity on Earth, and a major source of useful bio-active compounds and other activities that can be used for human benefits. The ex-situ preservation of rare lichen germplasm can provide a resource for research as well as for reintroduction, if a species is lost in the wild.

The present work of my research will be helpful in the final preparation of the lichen flora of Maharashtra. It is hoped that the present studies on macrolichens of Maharashtra will be instrumental not only for the understanding of tropical lichen taxa but also in opening up India’s unique lichen flora for further study.
Parmotrema tinctorum (NyL) Hale

Heterodermia flabellata (Fée) D. D. Awasthi