

DISTRIBUTION OF LICHEN IN INDIA

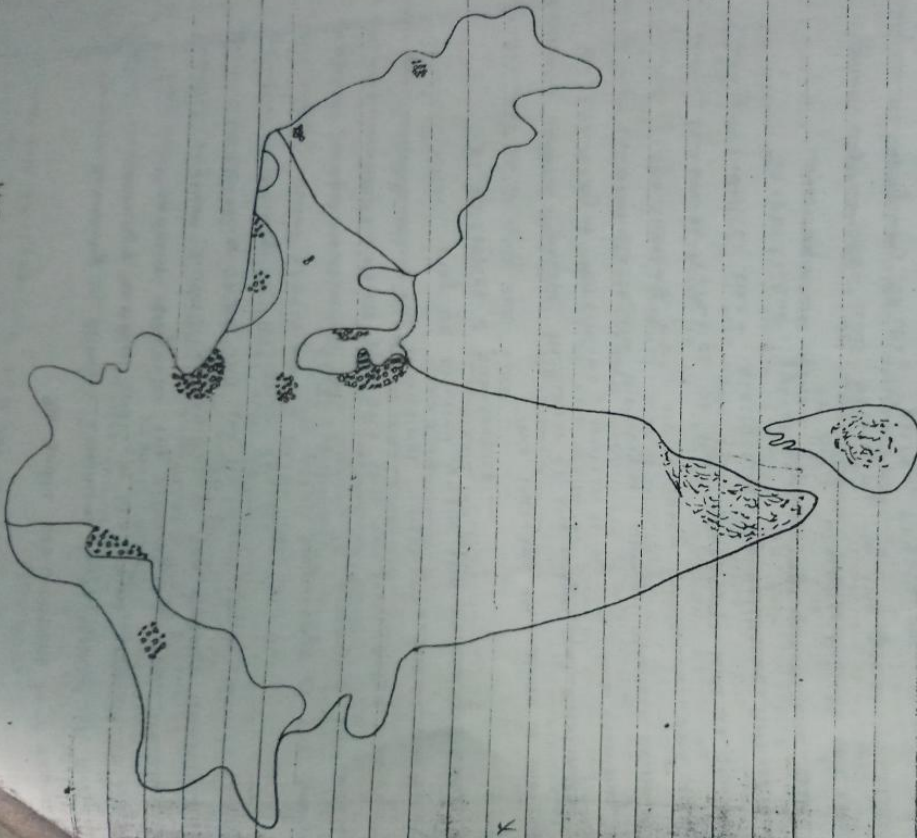


Fig:— Indian continent showing distribution of lichen. (Based on Singh, 1964)

Lichens are of the most widely distributed groups of plants found all over the world and in diverse habitats. The factors for its world wide distribution are:—

- (i) their symbiotic life &
- (ii) their prolific methods of vegetative propagation and efficient means of dispersal.

In India sub-continent is a vast area with a variety of climatic conditions. From tropical in southern central & eastern India, to the alpine or tigid on the top of mountain ranges of the Himalayas. There are regions of great humidity like Assam the eastern Himalayas western Ghats and the Andamans while almost complete aridity in Rajasthan desert.

The detail knowledge of the geographic distribution in this country is somewhat difficult due to limited no. of sps and that too from some specific areas. Based on the altitudinal variations, the lichen flora of India may be studied under the following heads:

(i) In tropics & sub-tropics...

This includes the whole of the southern India except the coast of the Nilgiri and Palni hills, Bengal, Andamans, portion of Assam and Manipur & part hills of the Himalayas, upto an altitude of 1,525 mts. The lichens here, are chiefly corticolous and belong to several families of Pyrenopezizaceae, as well as of the families like - Caliciaceae, Cypheliales, Arthoniaceae, Graphidaceae, Gyrogonaceae, Pylaeozoraceae etc.

In most places, Foliose and Fruticose types also occur belonging to the genera - Collema, Lepridium, Stricta, Pyxine, Phyzia etc. Certain lime-loving lichens are reported from the plains at Punjab ex - Endocarpon, Pucillum and Heppia patellata. There are xeric lichens extending extreme desiccation.

(ii) In Temperate Zone:-

The temperate zone lichens are confined to the Himalayas at an altitude of 1,525-3,660 meters. The area represents a portion of Assam, Manipur & a few localities on the plains and Nilgiri hills. The lichen flora of these areas shows the greatest abundance in variety and luxuriance of

growth and prevent the bark of trees, rocks and shrubs
substratum.

comparatively, *Urtica* stems and many ferns are common
Indian tallose lichens, growing on trees. *Peltigera* species
and spp. of *Ulex* are common terrestrial lichens.

(iii) In Alpine regions:— The occurrence of alpine lichens
has been reported from the Himalayas at an altitude
3000 mts and above. Alpine lichens include genera like
Leclerchia, *Rhizocarpon*, *Ulex*, *Stereocaulon*, *Leccaria*,
Synaldis, *Cetraria*, *Nephrolepis*, *Thamnolia*, *Leptogium*,
Budelia, *Rinodina* and members of the families *Agaricaceae*,
Raceae & *Acarosporaceae*.

(iv) Lichen flora of Sikkim:—
Hooker, who while surveying northern Sikkim collected
Calopogon, *Fraxinaria* and *Tallichthya* thalloid lichens at an
altitude of 5666 mts. Hooker also collected *Rinodina*,
Cetraria, *Acarosporidium*, *Rhizocarpon*, *Leptogium* etc.

At an altitude of 5700 mts
the following were observed: *Parmelia*, *Physcia*,
Heterotermia, *Leccaria* spp. etc.

FACTORS DETERMINING LICHEN DISTRIBUTION:—

- (a) Substrate specificity:— It is known that many
lichens are tree species. Conifers have an unique
lichen flora, rich in spp. of *Cetraria* and
fruticose spp. of *Ulex* etc.
- (b) bark pH → Kerehan (Juli) found uncolonized areas
to have a lower pH than colonized areas. Conifers have
a lower pH (3-5) act as substrate.
- (c) Water holding capacity:— is related to the
porosity and bark structure.]

GROWTH OF LICHEN

Lichens are among the slowest growing plants known to botanists. They grow at lobe & branch tips as such their radial circumference and length increases at a constant rate.

Causes of slow growth:—

- i) It has been suggested that low protein synthesis rate may be one reason.
- ii) It is also due to environmental conditions which only allow lichens brief periods of metabolic activities such as assimilation.
- iii) Recently, a new concept - Physiological zwittering has been introduced to explain the slow growth rate of lichen. According to this concept, the disturbances caused due to environmental fluctuations are mainly confined to the physiological reactions involving Polysac. A high concentration of Polysac is essential for the existence of lichen. When Polysac concentration fluctuates with environment, it may especially "buffer" the growth process. Polysac act as a substrate for respiration & their high concn in cytoplasm increases its osmotic pressure that is essential for the plants.

Chemistry of Lichen:—

- i) Among the chemical constituents of lichen substances lichenin, β -lichenin, Hemicellulose, Fatty substances, Amino acids & growth substances - are important.
- ii) Besides these, lichen excretes a no. of organic compounds which become encrusted crystals on its surface.

Various lichen acids obtained from lichens are in the table:—

Aliphatic & Acyclic substances

Aromatic substances

Group - 1 - Acid

Gr-1 - Pulvic acid derivatives

Gr-2 - Triterpenoids

" 2 - Depsides

Gr-3 - Polymeric acids

" 3 - Depsidones

" 4 - Quinones

" 5 - Xanthone derivatives

" 6 - Dibenzofuran

derivatives