I. INTRODUCTION

A biotic community is any assemblage of populations living in a prescribed area or physical habitat. It is an organized and coherent unit to the extent that it has characteristics additional to its individual and population components. It forms the living component of the ecosystem, which is the basic functional unit in ecology. Biotic communities are natural assemblages of various sizes from the biota of a tiny log to that of a vast forest (Odum, 1971). They not only have a definite functional unity with characteristic trophic structures and pattern of energy flow, but also have compositional unity in that there is a definite probability that certain species will occur together. These species often belong to different (often widely different) taxonomic groups. The place occupied by an entire community is often referred to as a Habitat, while Ecological Niche is a more inclusive term that includes not only the physical space occupied by the community, but also its functional role in the community.

The lichens, which are composite organisms consisting of usually a dominant fungal partner (mycobiont) in symbiosis with an algal partner (phycobiont), often form very well-balanced microlevel ecological niches. To a large extent, the concept of the individual lichen as a community
has been realised only from a physiological standpoint (Farrar, 1976; Seaward, 1988) in view of the fact that it is the end point of a mutualistic and stable relationship between the phycobiont and mycobiont amongst which there is an efficient nutrient transfer (Smith, 1976). The acceptance of lichen as a microlevel ecological niche is also easily facilitated by recognition of the following facts listed by Seaward (1988):

1. At least 520 species which have green algae as their phycobiont may also form subsidiary associations with blue-green algae, usually in delimited areas of the thallus or as distinctive structures, broadly termed cephalodia.

2. Thallial dimorphism (chimaeroid) can develop as a result of different photobionts being associated with a single mycobiont.

3. Secondary fungi frequently associated with lichens exhibit a wide range of life styles, ranging from parasymbionts, whereby secondary fungi either enter into stable relationships with their lichen hosts; to parasites, causing discoloration, malformation, or death, to saprotrops occurring on decaying thalli.

4. Some parasitic lichens (lichenicolous lichens) kill certain tissue components of specific hosts, appropriating the latter's photobiont to build their own thalli, first internally and subsequently externally to the host; lichen-inhabiting lichens are thereby four-membered symbiosis.
5. The intimate relationship of the thallus with its substrate, including dependence on plants for support, emphasizes the complexity of lichen ecosystem.

In addition to the above features, the association of animals, belonging to several diverse groups, with lichens, further strengthens that lichen thallus is an excellent microlevel community and ecological niche.

The information about the association between lichens and animals is superficial and meagre, largely because (1) a few biologists possess a detailed knowledge of both the lichens and the associated animals; (2) lichenologists have seldom been interested in the microfauna present in their samples; and (3) zoologists have rarely bothered to get the lichen in their samples identified. Although meagre, the available information shows that the association of animals with lichens is very varied and range from caribou (Ahti, 1959), reindeer (Gilbert, 1974) and sheep (Wielgolaski, 1975), at one extreme, to protozoa (Ryan, 1981), on the other. There are many reports for nearly every animal taxon, of feeding on (Gerson, 1973; Gerson and Seaward, 1977) or being wholly or partly dependent upon (Richardson and Young, 1977), lichens in some way or the other. Mites, Molluscs, Rotifers, Plecoptera, Psocoptera, Coleoptera, etc., are also associated with lichens, often feeding on them (see full literature in Lawrey, 1987; Seaward, 1988;

Although most studies of mites have been in relation to breakdown and decay in soils (Swift et al., 1979) or as pests upon crops (Griffiths and Bowmann, 1984a, b), fewer investigations alone had been made of mite population on lichens (Gerson and Seaward, 1977; Andre, 1979; Seyd, 1979; Barlow and Ferry, 1989). Especially important are the reviews of Gerson and Seaward (1977) and of Seaward (1988), which did much to pinpoint the importance of these microarthropods as the main group of organisms associated with lichens, especially as grazers. Now only the importance of lichinivorous phytophagy of mites is being realised (Barlow and Ferry, 1989).
In a review of Oribatid mite-Lichen association, more than 400 references were assembled (Seyd and Seaward, 1984), from which it was possible to determine casual to highly dependent relationship for 83 mites, although the associated lichens were mainly unnamed. Four of the seven orders of mites have been found associated with lichens so far. Of these the Oribatids are the most commonly reported. The Prostigmata are less well researched in terms of their lichen-association but mainly are known/suspected to be lichen feeders. A few Astigmatid mites have been found in lichens but the degree to which the lichens are consumed by these mites is not known. Mesostigmatid mites were sometimes observed in association with lichens, but their actual importance, they being predators, in mite-lichen association is not very clear (see full literature in Lawery, 1987). As such, the realisation that not much is known regarding the mites associated with lichens was the impetus for this study. Several aspects/questions concerning this association need to be studied, and clarified/answered. These include:

1) A census of the lichen-dwelling mites and their morphological and taxonomic diversity. There is no study so far on this aspect in India, where, as many as 2500 species of lichens were already reported to exist (Krishnamurthy and Hariharan, 1994).
2) The actual relationship between the lichens and their associated mites (i) whether the mites are grazers and if so, whether they graze on the entire thallus, on the mycobiont or on the phycobiont; (ii) whether the mites are mere permanent or chance dwellers, without actually feeding on the lichens; (iii) whether they are mere trespassers or (iv) whether the relationship is anything other than the above.

3) Do the mites help in the dispersal of the lichen propagules either regularly or by chance?

4) And, whether the mites prefer the lichens as a means of camouflage?

The present thesis attempts at probing into these aspects.