



Study of sporoderm pattern under SEM in the genus *Bryum*

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Abstract

A critical study of sporoderm pattern under SEM in nine taxa of genus *Bryum*, growing in various bryogeographical regions of India, has been carried out. Of these nine taxa, microdetails of sporoderm pattern of six taxa: *B. billardieri*, *B. caespiticium*, *B. capillare*, *B. dichotomum*, *B. pseudotriquetrum* var. *subrotundum* and *B. uliginosum* are provided for the first time.

Key words: Mosses, Scanning Electron Microscope, spores, sporoderm

Introduction

Mosses possess highly evolved structure in gametophyte as well as in sporophytes. Morphology and ultrastructure of moss spores are significant in the taxonomy and phylogeny of bryophytes (Jing *et al.* 2007) and can be successfully utilized for systematic treatment of various taxa. Clarke (1979) noted that spore morphology has not played a significant role in bryophyte systematics. Mogensen (1981) pointed out that the study of bryophytic spores is still in its infancy and very few scientists—if any—are able to claim a broad expertise in this field. However, the immense potential of palynology in plant taxonomy has dramatically increased with the application of Electron Microscopy. Most investigation have been directed towards pollens of higher plants (Skvarla *et al.* 1988; Harley & Ferguson 1990), while moss spores have received less attention. This is partially due to their generally small size, apparent uniformity of surface characters (as seen with light microscopy) and also spore ornamentation which is quite often difficult to correlate with macroscopic characters (Saito & Hirohama 1974). Many gaps remain in our knowledge of spore morphology in mosses, although it is known that several major discontinuities do occur (Boros *et al.* 1993).

Lindenberg (1836) was the first to observe spores in bryophytes. Perhaps the first extensive studies of the spores of diverse bryophytes were published by Roth (1905). Erdtman (1952, 1957) described spore morphology of some bryophytes observed under light microscope. In Japan considerable work has been done on moss spores; the contributions of Miyoshi (1969a, 1969b, 1973), Hirohama (1973, 1975, 1977) being of particular significance. Clarke (1979) suggested that the ornamentation patterns of many spores are irregular and a verbal system of terminology is unlikely to adequately describe them. Punt *et al.* (1994) summarized glossaries of pollen and spore.

A lot of SEM studies on moss spores have been published (Miyoshi, 1969 a,b, 1973; Hirohama 1973, 1975, 1977; Sorsa & Koponen 1973; Vitt & Hamilton 1974; Boros & Ja'rai-Komlódi 1975; Olesen & Mogensen 1978; Brown & Lemmon 1988; Blackmore & Barnes 1991; Gambardella *et al.* 1994; Estebanez *et al.* 1997; Luiz-Ponzo & Barth 1998, 1999; Carrión *et al.* 1995; Saito & Hirohama 1974). Indian bryologists were not too far behind and considerable attention has also been paid by them on SEM studies of liverworts (Udar & Gupta 1983; Udar & Srivastava 1983, 1984; Udar & Awasthi 1983; Udar & Agarwal 1985; Sinha *et al.* 1987; Nath & Asthana 1992, 1996, 2001) as well as hornworts (Asthana & Srivastava 1991; Asthana &