

13

CHAPTER

Mycorrhizal Association in Pteridophytic Flora of Pachmarhi Hills of Central India: Occurrence, Ecological and Evolutionary Significance

¹Santosh Kumar Shukla, ²Sarvesh Kumar Singh, ³Pradeep Kumar Shukla, ²Nawal Kishore Dubey[✉] and ⁴Gopal Krishna Srivastava

¹Department of Botany, Kamla Nehru Institute of Physical and Social Sciences, Sultanpur–228118, UP, India

²Centre of Advanced Studies in Botany, Institute of Science, Banaras Hindu University, Varanasi–221005, UP, India

³Department of Botany, Brahmanand Post Graduate College, Kanpur–208002, UP, India

⁴Department of Botany, University of Allahabad, Prayagraj–211002, UP, India

ORCID: <http://orcid.org/0000-0001-9817-2203>

Email: pteridologicaexpress@gmail.com, nkdubeybhu@gmail.com,

ABSTRACT

During the survey of the pteridophytic species of Pachmarhi hills of Central India, 46 out of 54 species (85.15 %) were found to be associated with arbuscular mycorrhizae (AM). Highest AM colonization was recorded in the members of the families viz. Lycopodiaceae, Marattiaceae Dennstaedtiaceae and Pteridaceae, while it was completely absent in the families viz. Psilotaceae, Osmundaceae and Marsileaceae. The highest colonization of AM was found in terricolous plants and the lowest in arenicolous ones, however, the degree of association in the latter category was significantly lower than those of aquatic habitat. The substrate composed of largely clay particles appeared to be strongly favoring the mycorrhizal association. The findings of the present investigation do not support Boullard's theory of the phylogenetical evolution of pteridophytes and that of Baylis hypothesis on root morphology and mycotrophy. Consequently, a new hypothesis of evolution of mycorrhiza in pteridophytes has been suggested in the present study. A tentative and modified phylogram of classification of pteridophytic families based exclusively on the degree of mycotrophy has been put forth.

Keywords: Arbuscular mycorrhizae, consistency, habitat, mycotrophy status, pteridophytes, stability of data, significant review.