

(170)

A Rare Likely *Azolla microphylla* in Sri Lanka

Amarapathy A.M.U.S.¹, Gunawardana D.^{2*}

¹*Genetech Research Institute, Colombo, Sri Lanka*

²*Research Council, University of Sri Jayewardenepura, Nugegoda, Sri Lanka*

**dilanthag12@gmail.com*

Abstract

Azolla is an independent floating aquatic pteridophyte that is widely used by its generic name, as simply *Azolla* and holds an unparalleled presence in terms of its contribution as a biofertilizer in paddy-growing parts of Asia. *Azolla* is divided along new-world and old-world species. A likely new-world *Azolla microphylla* was discovered in Sri Lanka growing in a paddy field in a rice research station and our identification was based on the sequence of a partial *rbcL* barcode (581 bp) that was bidirectionally sequenced. This is the second such report of this particular species, in South Asia, after Bangladesh. Phylogeny inference fortified the viewpoint of BLAST searches employed on NCBI nucleotide resources, as three species (*A. microphylla*, *A. mexicana* and *A. carolina*) that had a joint ~3.3 Mya history, emerged as sharing a monophyletic clade. Although we are unable to designate without doubt the species under scrutiny as *A. microphylla*, the *rbcL* sequence along with plant and cyanobiont morphology points to that identity. The characteristics of the likely *Azolla macrophylla* include densely surface covering growth, multi-lobed bright leaves, which show imbricate-like overlapping features, and showcasing widespread dichotomization/branching of stem, both symmetrically and asymmetrically, which are all synonymous with *A. microphylla*. The corresponding obligate cyanobiont is equipped with widespread intercalary and apical heterocysts and are capable of forming akinetes in the foliar cavity, which are atypical in such environments as compared to lab cultures. A second *rbcL* locus sequenced, unearthed an *A. pinnata* identity but the respective *rbcL* sequence had a N-terminal extremity similar to that of *A. microphylla* and distinct from the NCBI *A. pinnata* counterpart, which shows a likely event of convergent evolution between the two Sri Lankan resident species. To generalize, old-world *Azolla* species have a shorter N-terminal extremity which is truncated by 40-50 bp compared to the new world species, with the exception of *A. nilotica*.

Keywords: *Azolla microphylla*, *Azolla pinnata*, DNA barcoding, New-world, Heterocysts