

## SILICEOUS PHYTOLITHS IN TAXONOMY OF THE SRI LANKAN WILD RELATIVES OF RICE (*Oryza*, FAMILY POACEAE)

Wijesinghe T.<sup>1</sup>, Jeewani D. C.<sup>2</sup> and Perera A.<sup>1\*</sup>

<sup>1</sup>Department of Botany, University of Peradeniya, Peradeniya, Sri Lanka

<sup>2</sup>Plant Genetic Resources Centre (PGRC), Gannoruwa, Sri Lanka

\*anomap@sci.pdn.ac.lk

Understanding the origins and early evolution of rice cultivation and consumption is essential for studying ancient civilizations through archaeological and anthropological research. As a staple food, rice has attracted significant attention from scientists in these fields. However, identifying remnants of wild rice relatives in soil can be challenging due to the similarities in the morphological characteristics of pollen from the Poaceae family, making it difficult to distinguish different species based solely on pollen morphometrics. In such cases, phytoliths i.e., amorphous silica particles deposited in plants can serve as a useful tool for differentiating various Poaceae species, as many have unique shapes specific to certain taxa. This study aimed to examine the phytolith characteristics of the five wild rice species reported in Sri Lanka. Phytoliths from the mature leaves of *Oryza nivara*, *Oryza rufipogon*, *Oryza granulata*, *Oryza eichingeri*, and *Oryza rhizomatis* were extracted using the wet oxidation method. The shape of phytoliths was described using International Code for Phytolith Nomenclature 2.0, and their size parameters were recorded. The quantity of phytoliths produced in the lamina of mature leaves of the examined species was determined by measuring the weight of phytoliths in 1g of dried leaf samples. Results indicated that *Oryza rufipogon* had a significantly higher phytolith mass than the other species ( $p < 0.05$ ). *Oryza rufipogon* exhibited the highest diversity of phytolith morphotypes (21) while *Oryza rhizomatis* showed the least diversity (9). Additionally, both *Oryza nivara* and *Oryza eichingeri* had thirteen phytolith forms each, while *Oryza granulata* exhibited twelve morphotypes. The bilobate phytolith shape was found across all species. But each species also had at least one unique phytolith form, allowing for their differentiation.

**Keywords:** ICPN 2.0 nomenclature, Shape of phytoliths, Taxonomic studies, Wet oxidation method.