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Phytoliths of selected Sri Lankan species of the family Cucurbitaceae

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Detecting the possibility of using phytoliths in archaeobotanical and paleoenvironmental investigations is a great necessity for the advancement of archaeological sciences. Since several edible plant species exist in the family Cucurbitaceae, the family receives central attraction in archaeobotanical research that deals with ancient agriculture and food consumption. However, the use of phytoliths in archaeobotanical studies in Sri Lanka is still in its infancy due to the lack of morphometric details related to the identification of species based on phytoliths. The present study aims to reveal the morphometric features of phytoliths in different plant parts (leaf, stem, petiole, fruit and flower) of nine species of the family Cucurbitaceae, viz. *Citrullus lanatus*, *Cucumis melo*, *Cucumis sativus*, *Cucurbita maxima*, *Momordica charantia*, *Momordica denudata*, *Mukia maderaspatana*, *Sechium edule* and *Zanonia indica*, by wet oxidation method. The size (length and width) of phytoliths and their weight in 1 g of dried plant material were detected in three replicates per species while their shape was described using ICPN 2.0 nomenclature. Results revealed that *C. maxima* contained a significantly high mass of phytoliths compared to the rest of the examined species ($p < 0.05$), but no phytoliths were extracted from *M. charantia* and *M. denudata* by the used protocol. However, the shape of phytoliths of the above species does not allow the discrimination of these species into respective plant taxa. For a given plant species, the average length and width of phytoliths varied significantly in different plant parts ($p < 0.05$) though the shape did not vary significantly. Therefore, predicting the commonly grown Cucurbitaceae plant species in Sri Lanka in archaeological species based on the shape or the size of phytoliths in soils of past vegetations becomes impossible. Therefore, phytolith studies should be combined with studying other palynomorph types, such as pollen, to gain undeniable conclusions.

Keywords: Archaeobotanical research, Archaeological sciences, ICPN 2.0 nomenclature, shape of phytoliths, wet oxidation method