Comparative Pharmacognostic Studies on *Cyperus rotundus* Linn. and *Kyllinga monocephala* Rottb. (Cyperaceae)

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Cyperusrotundus Linn., a perennial grass like herb of Cyperaceae family which is widely used in Ayurvedic medicine, cosmetics and new drug formulations in allopathic medicine, is officially known as "Mustha" in the Ayurvedic Pharmacopeia. Locally, the plant is known as "Kalanduru". *Kyllingamonocephala* Rottb of the same family has similar characteristics to *C. rotundus* Linn. and the latter is adulterated by *K. monocephala* Rottb. In addition, *K. monocephala* appears under the official Ayurvedic name of *C. rotundus* in many documents and web sites which triggered the question of its usage as a substitute since it might be affecting the quality of the final product. Rhizomes of both plants are the parts used as medicine, and have similar appearances when presented as a crude drug and are hard to differentiate. This research was designed to compare the two plants using pharmacognostic methods employed to analyse plants or plant related substances. The methods comprised macroscopic, microscopic and chemical analyses.

Fresh plants of *C. rotundus* and *K. monocephala* were collected from Seeduwa, Anuradhapura, Nawinna and market samples of crude drug were collected from Seeduwa, Peradeniya, Nawinna and Anuradhapura. Identification of the two plants was performed at the National Herbarium, Royal Botanical Gardens, Peradeniya. Comparative studies of the two plants were perfomed macroscopically and microscopically, by comparison of plant morphological structures such as rhizomes, stems, leaves and inflorescences. For microscopic analyses, slides were prepared from fresh rhizomes of both plants and also from the market samples of the crude drug. The thickness of the exodermis, endodermis and parenchyma were measured using Image J 1.43U software. Iodine, Safranin and Sudan III tests were carried out to identify ergastic cell contents in rhizomes of both plants. Ten replicates (each containing three measurements) from each location were used for all the measurements mentioned above.

Upon completion of the comparative study and statistical analyses it was evident that these two plants could be easily distinguished mainly from their inflorescences and from the width of the leaves which is larger in *C. rotundus*. However; most of the other morphological structures were similar. From microscopical studies, it was apparent that rhizomes of the two plants and their contents were very similar except the thickness of exodermis, parenchyma and endodermis, which were greater in *C. rotundus*. In conclusion, more advanced procedures such as chemical assay tests, ash value tests, quantification analysis of ergastic cell contents should be employed to compare the crude drug as well as the fresh rhizome of these two plants to evaluate the substitution of *K. monocephala* over *C.rotundus* in Ayurvedic medicine, cosmetics and drug formulations.