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Nutritional Composition, Mineral Profile, Anti-nutritional Factors, and Anti-Diabetic Potential of Poruthumaan; An Underexplored Plant Species

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Poruthumaan is an underutilized medicinal creeper widely grown in the Northern Province of Sri Lanka and traditionally consumed for relieving menstrual discomfort, enhancing bone strength, and managing arthritis. Despite its long-standing use in local diets, its nutritional and functional values have not been scientifically reported. This study aimed to analyze the nutritional composition, mineral profile, anti-nutritional factors and anti-diabetic potential of Poruthumaan leaf powder. Poruthumaan leaf powder was prepared by grinding cabinet-dried (40°C for 12 hours) mature leaves into fine powder. The sample was analyzed for nutritional composition, mineral profile, anti-nutritional factors and anti-diabetic potential (using α-amylase inhibition assay). The results revealed that dried Poruthumaan leaf powder is highly rich in fiber (24.12 ± 1.39%). The crude protein, crude fat, and ash contents of the dried leaf powder were 8.94 ± 0.08%, 1.07 ± 0.02%, and 8.37±0.09%, respectively. Mineral analysis reported a notably high calcium content (1835±10.2 mg/100g). Further, the results demonstrated that Prothumaan leaf powder is a good source of other minerals such as Mn, Zn, Fe and Mg. Anti-nutritional factors such as tannins (hydrolysable tannin (92.9 ± 067 mg/100g) and condensed tannin (1.08 ± 0.12 mg/100g) and oxalates (352.24 ± 3.18 mg/100g) were detected at concentrations similar to those of commonly consumed medicinal leaves. The α-amylase inhibition assay showed strong enzyme inhibitory activity (IC_{50}=28.05 µg/mL) comparable to the standard (Quercetin) (IC_{50}=35.69 µg/mL). This study revealed that the first scientific evidence validating the nutritional richness and bioactive potential of Poruthumaan leaf. Future studies should focus on bioactive compounds profiling and underlying mechanisms responsible for the anti-diabetic effects, assessing mineral bioavailability and safety, and validate the functional potential through in-vivo experiments.

Keywords: Anti-diabetic, Anti-Nutrition, Antioxidant, Medicinal leaf, Poruthumaan