

UGC-SPONSORED MINOR RESEARCH PROJECT

TOPIC: “EVALUATION OF PHENOLICS, FLAVONOIDS AND ANTIOXIDANT POTENTIAL OF SELECTED WILD EDIBLE FRUITS FROM KERALA”

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EXECUTIVE SUMMARY

Wild edible fruits are a promising source of several beneficial phytochemicals and are often employed in treating a multitude of human diseases. They are significant as a source of natural antioxidants and are regarded as a healthier and safer alternative to synthetic antioxidants. Wild edible fruits can be a good alternative to the currently available range of edible fruits, being potential sources of functional foods and dietary supplements. Inspite of their potential benefits on human health there are no concrete studies on phenolics, flavonoids and antioxidant potential of wild edible fruits from Kerala. In view of this fact the present investigation was carried out to estimate the total phenolics, flavonoids and reducing power of methanol extracts of 35 selected wild/underutilized fruits. These wild fruits were analysed for their antioxidant potential by DPPH, ABTS and FRAP assays. Significant variation was observed among the fruit extracts in the colour attributes, extract yield, total phenolics and flavonoids. The colour of the extracts ranged from light yellow, through golden yellow, orange, Violet, Brownish violet and brown. Maximum extract yield was achieved in case of *Alangium*

salvifolium followed by *Melastoma malabathricum*, *Annona squamosa*, *Sonneratia caseolaris*, *Zizyphus jujuba* and *Annona reticulata*. Phenolic content was highest in *Sonneratia caseolaris* followed by *Bridelia retusa*, and *Syzygium zeylanicum*. *Annona squamosa* exhibited the minimum amount of total phenolics as determined by Folin ciocalteau method. Maximum flavonoid content was observed in *Melastoma malabathricum* followed by *Sonneratia caseolaris*, *Mukia maderaspatna*, *Glycosmis pentaphylla* and *Alangium salvifolium*. *Leea asiatica* exhibited the minimum amount of total flavonoids.

Statistical analysis of free radical scavenging activity and reducing power determined using the DPPH, ABTS and FRAP methods revealed significant difference between the fruit extracts. Maximum and minimum DPPH free radical scavenging activity was observed in *Bridelia retusa* and *Canthium rheedii* respectively. *Melastoma malabathricum*, *Sonneratia caseolaris* and *Syzygium zeylanicum* also exhibited significant antioxidant activity in DPPH assay. In ABTS assay maximum free radical scavenging activity was observed in *Sonneratia caseolaris*, while *Averrhoa bilimbi*, *Syzygium zeylanicum*, *Zizyphus oenoplia*, *Melastoma malabathricum*, *Glycosmis pentaphylla*, *Solanum torvum*, *Bridelia retusa*, *Grewia microcos*, *Alangium salvifolium*, *Averrhoa carambola* and *Solanum nigrum* also exhibited significant radical scavenging activity. In the FRAP assay maximum absorbance and reducing power was observed in *Bridelia retusa* followed by *Sonneratia caseolaris* and *Syzygium zeylanicum*. *Melastoma malabathricum*, *Muntingia calabura*, *Solanum torvum* and *Flacourtie jangomas* also showed significant reducing power.

A strong positive correlation between total phenolics and reducing power was evident from all three assays in the present study which indicate the possible role of these compounds in combating oxidative stress. Correlation between total flavonoid content and antioxidant potential was also obvious.

Based on the present study it can be concluded that *Bridelia retusa*, *Sonneratia caseolaris*, *Melastoma malabathricum* and *Syzygium zeylanicum* extracts have significant ability to react with free radicals, to convert them into more stable nonreactive species and to terminate radical chain reaction. These wild fruits can serve as natural sources of antioxidants and their consumption and domestication must be promoted. Studies on isolation, purification, characterization and structural elucidation of polyphenols present in these wild fruits should be encouraged, both from nutritional and phyto- therapeutic points of view. This study also provides useful and relevant information that justify the influence of phenolics and flavonoids in quenching reactive oxygen species thereby demonstrating potent antioxidant activity. It was obvious from the present study that consumption of these wild fruits provides protection from harmful free radicals and alleviates the cause of many major chronic diseases.