

Is there Anything Useful in That? High Value Product Extraction from *Artemisia annua* L. in the Spent Leaf and Waste Streams

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Abstract : The world population is estimated to grow from 7.1 billion to 9.22 billion by 2075, increasing therefore by 23% from the current global population. Much of the demographic changes up to 2075 will take place in the less developed regions. There are currently 54 countries which fall under the bracket of being defined as having 'low-middle income' economies and need new ways to generate valuable products from current resources that is available. *Artemisia annua* L is well used for the extraction of the phytochemical artemisinin, which accounts for around 0.01 to 1.4 % dry weight of the plant. Artemisinin is used in the treatment of malaria, a disease rampant in sub-Saharan Africa and in many other countries. Once artemisinin has been extracted the spent leaf and waste streams are disposed of as waste. A feasibility study was carried out looking at increasing the biomass value of *A. annua*, by designing a biorefinery where spent leaf and waste streams are utilized for high product generation. Quercetin, ferulic acid, dihydroartemisinic acid, artemisinic acid and artemisinin were screened for in the waste stream samples and the spent leaf. The analytical results showed that artemisinin, artemisinic acid and dihydroartemisinic acid were present in the waste extracts as well as camphor and arteannuin b. Ongoing effects are looking at using more industrially relevant solvents to extract the phytochemicals from the waste fractions and investigate how microwave pyrolysis of spent leaf can be utilized to generate bio-products.

Keywords : high value product generation, bioinformatics, biomedicine, waste streams, spent leaf

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