World Academy of Science, Engineering and Technology
International Journal of Nutrition and Food Engineering
Vol:15, No:06, 2021

Solid Phase Micro-Extraction/Gas Chromatography-Mass Spectrometry Study of Volatile Compounds from Strawberry Tree and Autumn Heather Honeys

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Abstract : Strawberry tree (Arbutus unedo L.) and autumn heather (Erica manipuliflora Salisb.) are important beekeeping plants of Greece. Six monofloral honeys (four strawberry tree, two autumn heather) were analyzed by means of Solid Phase Micro-Extraction (SPME, 60 min, 60 oC) followed by Gas Chromatography coupled to Mass Spectrometry (GC-MS) for the purpose of assessing the botanical origin. A Divinylbenzene/Carboxen/Polydimethylsiloxane (DVB/CAR/PDMS) fiber was employed, and benzophenone was used as internal standard. The volatile compounds with higher concentration (μg/ g of honey expressed as benzophenone) from strawberry tree honey samples, were α-isophorone (2.50-8.12); 3,4,5-trimethyl-phenol (0.20-4.62); 2-hydroxy-isophorone (0.06-0.53); 4-oxoisophorone (0.38-0.46); and β-isophorone (0.02-0.43). Regarding heather honey samples, the most abundant compounds were 1-methoxy-4-propyl-benzene (1.22-1.40); p-anisaldehyde (0.97-1.28); p-anisic acid (0.35-0.58); 2-furaldehyde (0.52-0.57); and benzaldehyde (0.41-0.56). Norisoprenoids are potent floral markers for strawberry-tree honey. β-isophorone is found exclusively in the volatile fraction of this type of honey, while also α-isophorone, 4-oxoisophorone and 2-hydroxy-isophorone could be considered as additional marker compounds. The analysis of autumn heather honey revealed that phenolic compounds are the most abundant and p-anisaldehyde; 1-methoxy-4-propyl-benzene; and p-anisic acid could serve as potent marker compounds. In conclusion, marker compounds for the determination of the botanical origin for these honeys could be identified as several norisoprenoids and phenolic components were found exclusively or in higher concentrations compared to common Greek honey varieties.

Keywords : SPME/GC-MS, volatile compounds, heather honey, strawberry tree honey
Conference Title : ICBFN 2021 : International Conference on Biomarkers in Food and Nutrition
Conference Location : Tokyo, Japan
Conference Dates : June 10-11, 2021