Evaluation of Natural Products in Mamaki Tea Using Untargeted Metabolomics

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Mamaki tea, a native Hawaiian plant species, is best known for its medicinal properties. It is endemic to and geographically restricted to the Hawaiian Islands. Mamaki tea contains many types of antioxidants, including chlorogenic acid and catechin. Along with that, antioxidants were reported to play an important role in cancer chemoprevention and development. We here have used untargeted metabolomics to analyze natural products in Mamaki tea leaves. Prior to this study, very little has been researched about this tea, especially using untargeted metabolomics. Samples were extracted and run through LC-MS to identify metabolites. Two different types of tea were used, fresh tea leaves from the farmer's market and store-bought tea leaves. Fresh tea leaves were lyophilized prior to extraction. The leaves were extracted using two different methods for comparison, first with 100% ethanol and 80:20 methanol/water. Samples were injected onto an Kinetex PFP liquid chromatography column and analyzed using LC-MS/MS on a Thermo Fisher Q Exactive HF mass spectrometer coupled to a Vanquish UHPLC. Iterative MS/MS was also acquired to expand the metabolite identification coverage. Thirteen rounds of iterative MS/MS were performed on the tea samples. The data was then analyzed using MS-DIAL 4.17 with m/z-RT library and MS/MS reference library from MassBank of North America (MoNA) combined with NIST 20 MS/MS. MS-FLO was used for post-data curation. A total of 309 unique metabolites have been annotated so far.

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