

Development and Characterization of a Herbal Extracts Incorporated Confectionery with Immune Enhancing Active Compounds

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Immune enhancement is a widely discussed area in the world. Several medicinal herbs namely ginger, shallot, coriander, and green tea have been found out to be possessing active compounds which aid in enhancing the immune function by stimulating innate and cell mediated immune responses. The aim of this study was to develop a confectionery using convenient herbs available in Asian regions to enhance human immunity. Initially ethanolic extracts of ginger, shallot, coriander and green tea were obtained using soxhlet extraction and Gas Chromatography Mass Spectrometric (GCMS) study was done. The candy was developed with incorporated herbal extracts and the optimal amounts were calculated using previous research data. Flavor profile was characterized with concentrated lime juice. The herbal candy with no added lime juice, 0.7%, 1.0% and 1.3% citric acid from concentrated lime juice were given to a semi-trained sensory panel of 36 panelists and the sensory data were used to perform one way ANOVA to compare the preference. The final product was tested for immune boosting active compounds using GCMS analysis. Analytical tests for moisture, ash, titratable acidity, reducing sugar, polyphenols, texture and test for yeast and moulds were also done. The product with 1.0% citric acid was the best formula. Six active compounds, namely Quercetin, Linalool, Zingiberene, Gingerol, Caffeine and Shogaol were present in the final product out of the 8 main active compounds detected in plant extracts. The main immune boosting active compounds in shallot and coriander respectively were Quercetin and Linalool. Ginger was detected with Gingerol, Shogaol, Zingerone and Zingiberene, and green tea was detected with Epigallocatechin gallate and Caffeine as the main immune boosting active compounds. Product contained 2.137% of moisture, 1.313% of ash, 31.22% of reducing sugar and 0.138 mg GAEg⁻¹ of total phenols. A total of 0.970% titratable acidity was also present in the candy. Texture analysis with 50 kg load cell, at the first hardness cycle resulted a 54500.00g with 1.79 mm deformation. Yeast and mould test was negative after five days of incubation. As the final outcome, a herbal extracts incorporated hard candy was developed with 75% of targeted immune boosting active compounds.

Keywords: Immunity; Herbal candy; Ginger; Shallot; Green tea; Coriander