959/E2

Application of fluorescence spectroscopy as a tool for quality determination of two selected ayurvedic medicinal oils.

S.M. Vithanarachchi* and A.J. Liyanarachchi

Department of Chemistry, University of Colombo, Colombo 03, Sri Lanka

Preparation of Ayurvedic medicinal oils follows unique processes to preserve the medicinal quality of the oils. However, the quality of these oils may vary depending on the altered procedures used by different manufacturers, and also fake products can be found in the market. Further, due to storage conditions (temperature, light) these herbal oils tend to degrade. Therefore, determination of oil quality is of primary importance. The availability of an easy, inexpensive, and quick qualitative method is desired for initial screening of the oil quality. The quality of edible oils has been determined using fluorescence spectroscopy. Hence, this research is focused on investigating the ability to adopt fluorescence spectroscopy to determine quality of Ayurvedic oils. Ayurvedic oils, which are prepared using plant parts, contain fluorophores: polyphenols (λ_{em} 320 nm− 370 nm), tocopherols and vitamin E compounds (λ_{em} 330 nm− 600 nm), and chlorophyll pigments (λ_{em} 650 nm– 680 nm). Two Ayurvedic oils with complex composition –Nirgundyadi oil and Sarshapadi oil– were selected for the study. The quality of different brands (Brand I and Brand II) of the two selected oils was compared with reference oil obtained from the Sri Lanka Ayurvedic Drugs Corporation, which prepares oils in accordance with the Ayurvedic pharmacopeia. Also, the changes that occur in the selected reference oils upon degradation by exposure to sunlight, ultra-violet light, air, and heat were monitored. The emission wavelength and intensity were used in identifying the differences in the quality of oils under study. Obtained data were treated statistically (t-test) to identify the usefulness of fluorescence emission to evaluate the quality of Ayurvedic oils. A significant difference in emission wavelength ($P \geq 0.05$) and fluorescence intensity was observed for Brand I and Brand II of both selected Ayurvedic oils compared to the reference oils. The emission wavelengths of the reference oil samples exposed to air and sunlight were found to be same as the emission wavelength obtained for Brand I and Brand II of Nirgundyadi oil, indicating a possible adulteration in these brands. Although emission wavelength for adulterated Sarshapadi oil exposed to air and heat were different from the reference, it was not same as the values obtained for Brand I and Brand II. This study reveals the potential of fluorescence spectroscopy as a primary screening tool to determine quality of Ayurvedic oils.

sashimv@chem.cmb.ac.lk +94 112503367