

Characterization Of Fennel Fruits: Types And Quality (1)

Osama Salama

Abstract

Four samples of different fennel fruit cultivars (F1- F4), obtained from El Fayoum, Egypt (F1), El Menia, Egypt (F2), Sudan, El Khartoum (F3) and Germany (F4) were cultivated in MEPACO's farm (Arab co. for Pharm. And Med. Plants, Cairo, Egypt) and the obtained fruits were subjected to macro and micro morphological stereo-microscopic examination as well as GC-MS analysis of their volatile oils. The aim of the study is to determine the differences in the macro and micro characters of different fruit cultivars as well as their oil constitutes. The results show different exomorphic parameters Viz. shape, color, dimensions and surface sculpture. Also the stereo-microscopic examination showed differences in the epicarp, mesocarp, vittae and endosperm. GC-MS analysis of volatile oils of (F1-F4) showed on comparing three parameters: fenchone, estragole and trans-anethole that F4 has the highest percentage of trans-anethole (78.98%), while F1 and F2 have close values (1.05 and 1.02%, respectively) followed by F3 (3.02%). F4 has the lowest percentage of estragole (3.97%), while (F1-F3) have higher values (78.58, 64.81 and 25.79 %, respectively). Also F4 has doubled the percentage of fenchone (6.73%) of F1 and F2 (2.54 and 2.57%, respectively), while F3 has 0.69%. Thus results show that the two cultivars growing in Egypt (F1 and F2) have almost the same ratios of the compared parameters while the Sudan cultivar F3 is closer to F2 and F1 than it is to F4. Also the 3 cultivars (F1-F3) are far from specification of sweet fennel oil but close to bitter fennel oil. The German cultivar (F4) has the best oil quality as a sweet fennel. Investigation of the powdered samples (F1-F4) showed that only F4 is different in having higher abundant fragments of reticulate parenchyma cells with ratio of 2:3. In Conclusion: These findings are of pharmaceutical and industrial value helping in the production of herbal pharmaceutical products of fennel fruit and/or oil of known higher quality.

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