Composition and antifungal activity of Zhumeria majdae essential oil

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Background & Purpose: The essential oils from different plants are extensively used in the perfume, beverage and food industries and are reported to exhibit antimicrobial activities against a variety of fungi. Zhumeria majdae is a rare and endemic medicinal plant species grown wild in Iran. The leaves have been used for many years as a curative for stomach aches, as an antiseptic, carminative especially in infants and for treatment of painful menstruation. This plant belongs to the Lamiaceae family and has a strong and pleasant odor.

Materials & Methods: Gas chromatography/mass spectrometry (GC/MS) analysis was performed to determine the main constituents of aerial part of Z. majdae essential oil. Also the minimum inhibitory concentration (MIC) was determined using serial dilution method.

Results: Based on GC/MS analysis, 31 compounds representing 95.36% of the aerial part oil, respectively were identified; of which linalool (63.40%) and camphor (27.48%) were the major compounds. Total phenolic content was 42.74 mg GAE/g dw. The hydro distilled essential aerial part oil display potential of antifungal activity against the tested 7 phytopathogenic fungus (Candida albicans, Trichophyton mentagrophytesm, Aspergillus flavus, Trichophyton rubrum, Microsporum canis, Microsporum gypseum and Epidermophyton floccosum). The inhibition zones and MIC values for all test strains, which were sensitive to the essential oil of Z. majdae were in the range of 29 mm and 0.015 μl ml–1, respectively.

Conclusion: The results support the traditional usage and also possible use of Z. majdae essential oil in the food, pharmaceutical and cosmetic industries.

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Prophylactic effects of Bifidobacterium bifidum (strains of human origin), probiotic feeding on Escherichia coli O157:H7 infection in rats (in vivo antagonism)

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The B. bifidum strain (Bf1) was isolated on MRS medium contained 0.5 g/L of cysteine hydrochloride, 2 mg/L of nalidixic acid and 0.1 mg of mupirocin. This strain was isolated from (breastfed infant feces). The effectiveness of Bifidobacterium bifidum Bf1 as a probiotic against enterohemorrhagic Escherichia coli O157:H7 infection was studied using the rats model, were fed the probiotic for 7 days before or after single challenge with E. coli O157:H7. Fecal B. bifidum Bf1 and E. coli O157:H7 counts obtained by selective culturing methods were assessed for 1 week before and after infection while feed intake, body weight and composition were monitored during 1 week after infection. Histology of gut tissue (intestine) was analyzed until 1 and 2 weeks post infection, respectively. The pathogenicity of E. coli O157:H7, marked by body weight loss and intestinal histopathological changes in the infected group was significantly reduced in the B. bifidum treated group. Feeding B. bifidum Bf1 for 7 days before infection resulted in greater post challenge feed intake and weight gain and lower fecal levels of E. coli O157:H7. A lesser degree of protection against E. coli O157:H7 infection was observed when bifidobacteria were given during the 7 days after E. coli O157:H7 infection. These results demonstrate that feeding the probiotic B. bifidum Bf1 to rat can reduce the severity of E. coli O157:H7 infection and suggest that this strain represents a good candidate for the prevention of enteric infections in human.

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