



ORIGANUM MAJORANA: A POTENTIAL HERB FOR FUNCTIONAL FOOD

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ABSTRACT

In India, a number of medicinal herbs have been contributing significantly in sustaining economic developments, affordable health care and conversation. *Origanum majorana* is one such herb which has been used in India for thousands of years for its therapeutic properties. It is commonly known as Sweet marjoram. It is a cold sensitive perennial herb or under shrub with sweet pine and citrus flavors. The present study aims at reviewing the various researches done in the past on the uses of this herb. Its flower and leaves are used as a remedy for the treatment of digestion problems, diarrhea, colic, dyspepsia etc. Various researcher investigated that the used of marjorama are beneficial for some diseases such as diabetes, alzheimer, anti cancer, hypercholesterolemic and hypertension patients. Marjoram has wide application, herb also used as antimicrobial, antioxidant, insecticidal, encapsulation, antifungal. As from all the studies, that done and concluded that Marjoram have be used as functional food for humans by combine with unit operations of food processing for treatment of various ailments.

KEYWORDS: Biodiversity, Diabetes, Alzheimer, Hypercholesterolemia, Hypertension, Insecticidal, Symbiotic.

INTRODUCTION

Herbal ingredients have been used as food flavorings for hundreds of years, some herbs have also been traditionally regarded as natural remedies for common ailments, yet it is only in recent years that food producer focused on the health benefits of such ingredients in food products. Among these herbs, the hypocholesterolemic and antioxidant properties of a few specific herbs which also used as spices have nutraceutical value.^[1]

Functional food is a food where a new ingredient(s) has been added to a food and the new product has an additional function (often one related to health-promotion or disease prevention). Functional food contains known biologically active compounds which defined quantitative and qualitative amounts provide a clinically proven and documented health benefit.

This review emphasis on traditionally used or with recent up to date of this herb which has medicinal property also be used as a functional food for humans. *Origanum majorana* (Sweet Marjoram) is one such herb which has been used in India for thousands of years for its therapeutic properties. It is commonly known as Marjoram. Marjoram is a cold sensitive perennial herb or under shrub with sweet pine and citrus flavors. The Greeks and Romans dedicated it to Aphrodite, the goddess of love, fertility and beauty. It is a culinary herb used in various foods such as soups, pizza, meat, sauces etc. With its strong spicy pleasant odour, this herb also

classify in spices board of India. Marjoram also regarded as GRAS by FDA (food and drug administration).

The US Food and Drug Administration (FDA) classify herbs as health foods and not medicine which includes marjoram too. Dursun Esiyok^[2] referred that phytochemicals are a major line of defense in the fight against cancer, and herbs rich in these powerful substances have an important role to play in our diet.

CLASSIFICATION

Kingdom: Plantae
Division: Magnoliophyta
Class: Magnoliopsida
Order: Lamiales
Family: Lamiaceae
Genus: *Origanum*
Species: *O. majorana*

PARTS OF HERB

Herb is a plant with simple leaves, opposite and stalked, elliptic, 10-16 mm long and leaves o both sides felt like hairy. Flowers are small, purple or white, few to many, arranged in spikelets. Inflorescences with enlarge overlapping bracts. Sweet marjoram is propagated by its seeds, which need to be sown indoors around six to eight weeks prior to the last spring frost date in your area. The seeds were sown in a depth of 7 mm (1/4 inch) or even less. This herb is easily cultivated in the full sun, but they need shadow of the noons and the soil must good drain what dry, alkaline and rich on nutrients.



The leaves, soft stems and flowers of this herb are commercially used to add essence to dressings, syrups, liqueurs, vinegar as well as sauces. The seeds of sweet marjoram are used in beverages, condiments, candy and processed meat.

COMPOSITION

Many researchers studied on the composition of essential oil of marjoram and the important findings and reported that following types of compounds in sweet marjoram. Mainly it contains acids, flavanoids, hydrocarbons, phenol glycosides, phenolic terpenoids and tannins.

Active compounds: Terpenic esters, Monoterpenols and Monoterpenoids.

Monoterpenoids: a-pinene, beta-pinene, sabinene, myrcene, a-terpinene, γ-terpinene, paracymene, terpinolene, a-phellandrene, beta-phellandrene.

Sesquiterpenoids: beta-caryophyllene, a-humulene.

Monoterpenols: linalool, terpine-1-ol-4, terpine-1-ol-3, a-terpineol, cis-thuyanol-4, trans-thuyanol-4.

Terpenic esters: linalyl acetate, terpenyl acetate, geranyl acetate.

Phenol-methyl-ethers: trans-anethol

Aroma components: Bicyclic monoterpene alcohol, cis-sabinene hydrate, a-terpinene, 4-terpineol, a-terpineol, terpinenyl-4-acetate, and 1, 8-cineol. The compound eugenol is present which is as used as flavoring agent.

USE AS TRADITIONAL MEDICINE

Aristotle reported that turtles that ate a snake immediately had to eat oregano not to die, thus became oregano also taken by men as anti-poison. In the old Egypt, it was known that oregano can cure, disinfect and preserve food and that knowledge since then has been kept.

More particular the use as a stomach strengthening and cough lowering properties and as expectorants (in case of violent coughing). The application and method corresponds to that of Marjoram, namely by cramps and cough.

Chopra^[3] reported that the use of marjoram oil in hot fomentations, for acute diarrhoea, and as an expectorant. Parry^[4] described marjoram to have properties of antiseptic, antispasmodic, carminative, stimulant, and expectorant and nerve tonic.

It also functions as cure for asthma, coughs, and indigestion, rheumatism, toothache and heart conditions. According to Mabey^[5] that marjoram contains tonic and astringent bitter components, which rouse the appetite and hence it is helpful for invalids the leaves and seeds of marjoram are considered as astringent and a remedy for colic.^[6] Chiej^[7] reported that the powder acts as a sternulatory (inducing sneezing) if inhaled, and is, therefore effective against head colds. Prakash^[8] mentioned the use of volatile oil as an aromatic stimulant in colic, dyspepsia, flatulence and dysmenorrhoea.

LATEST MEDICINAL USES OF ITS LEAF EXTRACT AND POWDER

Rafsanjani^[9] investigated that the effects of marjoram extract on gastric acid and pepsin secretion in rats. In this study researcher injected marjoram extract in stomach of rat. It seems that marjoram contains some components that activate chief and parietal cells and increase basal acid and pepsin secretion.

Mohamed M. Abdel Fatah^[10] aimed that functional food components that may reduce the deterioration or retard the onset of the Alzheimer' Disease (neuropsychiatric disease) and tested methanol and petroleum ether extracts of Carica fruit, leaves and seed, Origanum herb, ginger, grape leaves and fruit (raisin), and fig fruit on rats infected by this disease and results noted that the highest antioxidant activity belonged to methanol extract of ginger (88%), Carica leaves (85%) and Origanum (74% Combination of the previously mentioned extracts may have potential beneficial effect as functional food components towards Alzheimer' disease.

Roula^[11] evaluated that the potential anti-cancer effects of *O. majorana* ethanol extracts on human leukemic cell line Jurkat. They saw anti-proliferative activity of plant extracts from *Majorana hortensis* and concluded that this study suggests that marjoram extracts exhibit anti-proliferative effect and high antioxidant activity.

Ali^[12] examined that the effects of sedative, pre-anesthetic and anti-anxiety of *Origanum majorana* with

diazepam in rats to different groups of male wistar rats received herbal extract. As various chemical drugs are being used for sedation and antianxiety, but due to their high side effects its uses are hinders. Researcher concluded that the dose of herbal extract *Origanum majorana* relieving effects of sedative, pre-anesthetic and anti-anxiety.

Rosa Martha Perez Gutierrez ^[13] investigated that the effect of methanolic extract of the leaves of *Origanum majorana* on advanced glycation end-products (AGEs) inhibitors formation which is seen in diabetic rats. AGE are the final products of non-enzymatic reaction, they are the group of complex compounds. This advanced glycation end-products accumulation leads to process of diabetes and its complications. The development of AGE inhibitors is considered to have therapeutic potential in patients with diabetes diseases. In results this study showed that *Origanum majorana* was effective in inhibiting the formation of AGEs.

Dina H.EL Bushuty and Naglaa M. Shanshan ^[14] studied the effect of feeding on natural herbs marjoram and ginger or mixture of them on hypercholesterolemic male rats. The study recommended the use of marjoram and ginger in cholesterol patients food.

In Egypt Gamal Ramadanet ^[15] authors evaluated different doses of Egyptian sweet marjoram leaf powder and marjoram leaf aqueous extract in alleviating the genotoxicity, immunosuppression and other complications induced by CP in non-tumour-bearing albino rats. Cyclophosphamide (CP) is the one of the alkylating anticancer drug, it has high therapeutic index, despite many side effects and toxicity in high dose and long term use. The study, revealed that the use of marjoram lessen the most side effects and toxicity of CP-treated rats and marjoram leaves may be useful as an immunostimulant and in reducing toxicity in patients under chemotherapeutic interventions.

Gamal Ramadan ^[15] investigated the cardio protective activity of and marjoram against isoproterenol induced myocardial infarcted rats. Myocardial infarcted (MI) is a cardiovascular disease which involve imbalance in developed between coronary blood supply and myocardial demand. In this study, revealed the preventive potential effect of sweet marjoram leaves (especially in the form of an herbal tea) against myocardial damage in ISO-treated rats, which may have a significant impact on the prevention/alleviation of MI in patient.

MARJORAM OIL

Sweet marjoram essential oil, known in the trade as 'Oil of sweet Marjoram', is obtained by steam distillation of the dried leaves and the flowering tops of the herb yielding 0.3 to 0.4% oil from fresh and 0.7 to 3.5% from dry herb. Considerable variations in the compositional pattern are observed depending on the origin of herb,

climatic and drying conditions, production procedure of the oil and many other factors. The aroma and taste are spicy, fragrant, warm, aromatic, penetrating and resemble that of lavender. The taste has a slightly bitter after taste.

Latest medicinal uses of marjoram oil

Hee Kim ^[16] investigated that the effects of essential oil inhalation on the 24-hour ambulatory blood pressure (BP) and salivary cortisol level, prehypertensive and hypertensive subjects. Authors used essential oil blended with lavender, ylang-ylang, marjoram and neroli and concluded that the inhalation of an essential oil had immediate and continuous effects on the home SBP, day time BP and the stress reduction. Essential oils may have relaxation effects for controlling hypertension.

APPLICATIONS

Antioxidant

Nessrien ^[17] investigated the effect of marjoram and thyme on the quality of semi fried mullet fish fillets during cold storage. Oxidation of fat is very common problem in food industry. Microbial analysis, may report that both essential oils of thyme and marjoram have antimicrobial properties too. Marjoram and thyme oils are also rich in phenolic compound being particularly active in both antioxidants and antimicrobials.

Ryszard ^[18] investigated the free radical scavenging and anti acetyl cholinesterase activities of *Majorana hortensis* oil. They extracted phenolic compounds from thyme (*Thymus vulgaris* L.), oregano (*Origanum vulgare* L.) and marjoram (*Origanum majorana* L.) with 95% ethanol. They observed antioxidant activities of extracts were higher in marjoram than in thyme and oregano.

Antimicrobial

Gutierrez ^[19] evaluated the efficacy of plant essential oils (EOs) in combination and to investigate the effect of food ingredients on their efficacy. The EOs assessed in combination included basil, lemon balm, marjoram, oregano, rosemary, sage and thyme. Combinations of oils were initially screened against *Bacillus cereus*, *Escherichia coli*, *Listeria monocytogenes* and *Pseudomonas aeruginosa* using the pot on agar test.

Antifungal activity

Deans and Svoboda ^[20] investigated the antimicrobial effect of marjoram and found that fungi which were inhibited. Antifungal activity of marjoram oil against the common spoilage fungus *Aspergillus niger*.

Alina ^[21] investigated the antifungal activity of eight essential oils against nine yeast species associated with food spoiling microflora was examined. Basil, onion, garlic, lemon, grapefruit, marjoram, peppermint and thyme and stated that thyme and marjoram have more fungistatic activity than peppermint, basil, lemon, grapefruit, onion and garlic oils.

Essence

Barauskiene^[22] investigated that the composition of volatile constituents and sensory characteristics of sweet marjoram (*Origanum majorana* L.) grown in Lithuania and performed sensory analysis of the ground herb, pure essential oil and the extract and aroma profiles of the products were expressed.

Renata^[23] encapsulated oil of oregano and aroma extracts of citronella and sweet marjoram by skimmed milk powder (SMP) and whey protein concentrate (WPC) with the coating by spray drying.

FUNCTIONAL FOOD

Ninfali^[24] investigated the antioxidant capacity of different salads, and salads to which aromatic herbs had been added. Lemon balm and marjoram increased the antioxidant capacity of salad portions by 150 and 200%, respectively.

Shreef^[25] formulated synbiotic tarhana was produced as a functional food from the fermentation of wheat flour, some spices [salt, pepper, dill and sweet marjoram (*Origanum majorana*)], some vegetables tomato, pepper and onion, and synbiotic yoghurt which prepared with prebiotic and different concentrations of the probiotic culture (0.5, 1.5, 3, 4.5% DVS-ABT2 containing *Streptococcus thermophilus*, *Lactobacillus acidophilus* and *Bifidobacterium bifidum* and observed efficacy of tarhana on hypocholesterolemic patients.

Hussein^[26] studied the effect of addition of essential oils of marjoram (*Origanum majorana* L.) and rosemary (*Rosmarinus officinalis* L.) at concentration of 200 mg/kg to beef patties formulated with mechanically deboned poultry meat (MDPM). Overall, the study indicated the potential use of natural herbal essential oils to protect against lipid oxidation and improve the sensory attributes of beef patties formulated with MDPM.

CONCLUSION

Majorana hortensis has been in use since times immemorial to treat wide range of infections. It has been subjected to quite extensive phytochemical, experimental and clinical investigations. Its active constituents include Monoterpene derivatives, terpenic esters, monoterpenol and sesquiterpenoids. Experimental studies have demonstrated its free radical scavenging, anti acetyl cholinesterase, insecticidal, synergistic effects, apoptotic, anti-proliferative activity, antimutagenic, genotoxic potential, antimicrobial and anti ulcer activity and it has calming effect on anxiety and depressant activities. As a from all the studies, that researchers done and concluded that Marjoram have be used as functional food for humans by combine with unit operations of food processing for treatment of various ailments. Since herb possesses more than one health beneficial property and there is also a possibility of

synergy among them in their action, a herb diet is likely to make life not only more “spicy” but more healthy also.

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