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**BULGARIAN CONTRIBUTION FOR THE APPLICATION OF
MEDICINAL PLANTS OF FAMILY LAMIACEAE AND APIACEAE AND
THEIR AROMATIC PRODUCTS IN THE FOOD PRODUCTS AND
HERBAL TEAS¹⁶
(A SHORT REVIEW)**

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***Abstract:** The aim of this short review is to focus on the investigations of the Bulgarian scientific community on the medicinal plants of the family Lamiaceae (such as mint, basil, oregano, lemon balm, etc.) and the family Apiaceae (such as coriander, fennel, cumin, dill, etc.) and their aromatic products. The major nutrients, such as carbohydrates, proteins, lipids, vitamins, and minerals are identified as one of the most important substances to life and health. Their influence is related to the qualitative and quantitative characteristics of the medicinal plants. The aromatic products, such as essential oils and extracts, have antimicrobial and antioxidant activities and are used as a potential additive in different food products and herbal teas.*

***Key words:** medicinal plants, aromatic products, food, herb tea.*

INTRODUCTION

Bulgaria is a country with a diverse flora, including representatives of different families. The most widespread are the plants of the families Lamiaceae and Apiaceae. Their most characteristic representatives are respectively mint, basil, lemon balm, oregano, thyme, savory, etc., as well as coriander, cumin, anise, caraway, fennel, and others. All these plants contain various biologically active substances - carbohydrates, proteins, glyceride oils, mineral elements, vitamins and more. Most of these substances are characterized by antimicrobial and antioxidant activity, which is why plants are used in food industry (Petkov, 1982; Georgiev and Stoyanova, 2006).

Aromatic products obtained from plants by distillation (essential oils) and extraction (extracts) contain volatile substances, dyes, flavonoids, polyphenolic acids and other compounds. They are also characterized by antimicrobial (Denev et al., 2013; Girova et al., 2010; Nestorova et al., 1981, 1985, 1988, 1989; Stoyanova et al., 2006; Taneva, 2017) and antioxidant (Balev et al., 2003, 2009, 2016; Denev et al., 2013; Dragoev et al., 2016) activity, which is why they are also used in food industry (Balev et al., 2009a, 2016; Dragoev et al., 2010; Lasisi, 1993; Taneva, 2017).

The subject of this short review are studies by Bulgarian authors on the chemical composition and properties of plants and the aromatic products obtained from them for the purpose of their application in food industry.

REPRESENTATIVES OF FAM. LAMIACEAE

Genus Basil. Sweet basil (*Ocimum basilicum* L.) is an industrial raw material for the country and is processed by the local population, but different varieties are also selected. Bulgarian essential oil belongs to the type of sweet European oils with a high content of linalool (50-70%)

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(Ivanov et al., 1964; Jirovetz et al., 2001; Stoyanova, 2007). The essential oil exhibits antimicrobial activity (Karova et al., 1970; Stoyanova, 2007) and is used in dairy products (Kostova et al., 2014, 2016).

Genus *Melissa*. Aromatic products exhibit antioxidant activity (Mihailova and Georgieva, 2013) and are used in beverages (Kalcheva-Karadzova et al., 2013a, Lasisi, 1993).

Genus *Mentha*. There are four species that differ in morphological features and composition of the essential oils (Georgiev and Stoyanova, 2006).

Spicy peppermint (*Mentha piperita* L.) is introduced as a cultivated plant in the country in 1905. Today it is grown for both essential oil and tea leaves (Stoyanova and Georgiev, 2003). Aromatic products exhibit antimicrobial (Blazheva et al., 2013; Damianova et al., 2005; Denkova et al., 2001, 2002; Gochev et al., 2008; Jirovetz et al., 2007, 2009; Schmidt et al., 2009a, b) and antioxidant activity (Blazheva et al., 2013; Schmidt et al., 2009) and are used in beverages (Lasisi, 1993) and in chewy candies (Hadjikinov et al., 2000).

Mint (*Mentha crispa* L.) is known as a garden plant and is used as a spice for various foods (Georgiev and Stoyanova, 2006). The essential oil exhibit antimicrobial activity against some microorganisms that cause food spoilage (Nestorova et al., 1989).

Pennyroyal (*M. pulegium* L.) is a wild species that is found in many places in the country and is traditionally used in folk medicine (Georgiev and Stoyanova, 2006).

Corn mint (*M. arvensis* L.) is not cultivated in the country, but individual plants are found in some places (Georgiev and Stoyanova, 2006).

Genus *Origanum*. There are two types of oregano spread: common (*Origanum vulgare* L.) and white (*Origanum heracleoticum* L.), which the population uses as a spice and for the preparation of healing and aromatic teas (Genova et al., 1992; Petkov, 1982). Aromatic products exhibit antimicrobial (Baicheva, 2020; Stoyanova, 2007) and antioxidant activity (Kalcheva-Karadzova et al., 2013b; Valkova et al., 2003), and are used in dairy (Kostova et al., 2014) and confectionery products (Baicheva, 2020).

Genus *Rosmarinus*. Rosemary (*Rosmarinus officinalis* L.) is grown in different parts of the country. Aromatic products exhibit antioxidant properties (Perifanova-Nemska et al., 2013; Valkova et al., 2003) and are used in meat products (Balev et al., 2003).

Genus *Satureja*. There are two types of savory - *Satureja pilosa* Vel. and *S. montana* Wrzb. (Genova, 1984).

Genus *Thymus*. There are several species of thyme (*Thymus* sp.), and from them selected different varieties that have different chemical composition of the essential oil (Georgiev and Stoyanova, 2006). Aromatic products exhibit antimicrobial (Zhekova, 2015) and antioxidant activity (Mihailova and Georgieva, 2013), and are used in dairy products (Zhekova, 2015).

REPRESENTATIVES OF FAM. APIACEAE

Genus *Anethum*. Dill (*Anethum graveolens* L.) is widespread throughout the country, but is cultivated mainly in the northern and southern regions. The essential oil exhibits antimicrobial (Nestorova et al., 1981; Dimov, 2020) and antioxidant activity (Dimov, 2020) and is used in fish (Savova et al., 1988) and dairy products (Kostova et al., 2014, 2017).

Genus *Carum*. Caraway (*Carum carvi* L.) is cultivated in gardens and is found in the wild in different parts of the country (Georgiev and Stoyanova, 2006). The essential oil exhibits antimicrobial activity and is used in dairy products (Kostova et al., 2015, 2016).

Genus *Coriandrum*. A local population of coriander (*Coriandrum sativum* L.) is grown in the country, mainly small-fruited (var. *microcarpum* D. C.) and less large-fruited coriander (var. *vulgare* Allef.) (Nedkov et al., 2005). The essential oil is found to exhibit antimicrobial activity (Damianova and Stoyanova, 2007; Stoyanova, 2007) and is used in meat products (Dobrevva, 2009) and beverages (Lasisi, 1993).

Genus *Cuminum*. Three varieties are common: *C. cyminum* L. var. *scabridum* D.C., *C. cyminum* L. var. *setosum* Boiss., and *C. cyminum* L. var. *glabrum* D.C., as the first two being grown in Bulgaria (Georgiev and Stoyanova, 2006). The content of various biologically active substances

is determined in fruits (Badr and Georgiev, 1988). Aromatic products exhibit antimicrobial (Gochev et al., 2009; Nestorova et al., 1977) and antioxidant activity (Gochev et al., 2009), and are used in meat products (Balev et al., 2009b; Dobreva, 2009, Girova, 2010).

Genus *Foeniculum*. From the fennel (*Foeniculum officinale* Mill.) there are two varieties - *F. vulgare* var. *vulgare* Mill. (bitter) and *F. vulgare* var. *dulce* Mill. (sweet), and local populations and selected varieties are grown in the country (Peneva, 1986). The essential oil exhibits antimicrobial activity (Damianova and Stoyanova, 2007; Stoyanova, 2007). Anethole is isolated from it for use in food products (Georgiev and Stoyanova, 2006).

Genus *Pimpinella*. Anise (*Pimpinella anisum* L.) is cultivated in different parts of the country (Georgiev and Stoyanova, 2006). Aromatic products exhibit antimicrobial and antioxidant activity, and are used in chewy candies (Atanasova, 2007).

CONCLUSION

The representatives of the families Lamiaceae and Apiaceae are the subject of scientific research by Bulgarian authors for over 50 years. They contain various biologically active substances, which is why they are used in various food products and aromatic teas. The various aromatic products obtained from them - essential oils and extracts, exhibit antimicrobial and antioxidant activity, which is why they are used in the recipes of dairy, meat and confectionery products and various beverages.

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