

Antimicrobial Activity of Some Spices and Herbs Essential Oils Al-Geddawi, M. A. H.¹; W. S. M. Ragab¹; A. G. Nassar² and A. M. Abdelshafy²

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Abstract

Essential oils of marjoram (*Origanum majorana*), rosemary (*Rosmarinus officinalis*), sage (*Salvia officinalis*) and thyme (*Thymus vulgaris*), were tested for their antimicrobial activity against four Gram-negative bacteria, four Gram-positive bacteria, four filamentous fungi and two yeast species which possess an importance as food spoilers or pathogenic microorganisms. The antimicrobial activity of tested essential oils at different concentrations (1,2,3,5 and 10 mg/ml) was determined by the well agar diffusion method. Sage and thyme essential oils showed the highest inhibitory effect against tested microorganisms, followed by rosemary and marjoram essential oils. The microbial spectra were decreased with increasing the concentrations of essential oils.

Keywords: antimicrobial activity, marjoram, rosemary, sage, thyme, essential oils.

Introduction

Extracts and essential oils (Eos) of medicinal plants are increasingly becoming an area of interest as novel drugs of antimicrobial and antiviral agents (Schnitzler *et al.*, 2008). Several recent studies described in detail the antimicrobial properties of EOs against a number of relevant food-borne microorganisms. These EOs are suggested as possible natural alternatives to chemical-based antibacterial agents for food safety and preservation (Djenane *et al.*, 2011).

Currently, there is a strong debate about the safety aspects of chemical preservatives since they are considered responsible for many carcinogenic and teratogenic attributes as well as residual toxicity. For these reasons, consumers tend to be suspicious of chemical additives (Skandamis *et al.*, 2001).

The exploration of naturally occurring antimicrobials for food preservation receives increasing attention due to consumer awareness of natural

food products and a growing concern of microbial resistance towards conventional preservatives (Schuenzel and Harrison, 2002).

Antimicrobials are used in food for two main reasons: (1) to control natural spoilage processes (food preservation), and (2) to prevent/control growth of micro-organisms, including pathogenic micro-organisms (food safety) (Burt, 2004).

Rosemary (*Rosmarinus officinalis*) essential oil from natural populations showed high variations in their antimicrobial and antioxidant activity (Moreno *et al.*, 2006). *Salvia species* are used traditionally to treat microbial infection; they have been demonstrated to exhibit antimicrobial, antioxidant and anti-inflammatory activities (Kamatou *et al.*, 2008).

Marjoram (*Origanum majorana*) and thyme (*Thymus vulgaris*) display a good antimicrobial activity against Gram-positive and Gram-