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Bological activities and terpenoid composition from Essential Oil of *Thuja orientalis*

Jae Kyung Yang, Won Taek Seo[1], Hee Young Jung, Young Min Kang, Seung Mi Kang, and Myung Suk Choi and Seon Won Kim[2]*

Division of Forest Science, Gyeongsang National University, Jinju, Korea
[1]Department of Food Processing, Chinju National University, Jinju, Korea
[2]Department of Food Nutrition, Gyeongsang National University, Jinju, Korea

Objectives

For elucidation of terpenoid biosynthesis and development of valuable essential oil from forest resources, various biological activity from the *Thuja* orientalis were studied, and chemical composition of essential oil was analyzed by GC-MS.

Materials and Methods

The leaves of *Thuja orientalis* were collected at June 2003, extracted with steam distillation method. Chemical composion was analyzed by GC-MS analysis (HP 5890 Series II GC, HP-1 column (60 mm x 25 mm x 25 μm). The essential oils were tested for thier antimicrobial activity against 28 test organism including Gram-negative and Gram positive and fungi using agar diffusion method. Also, esential oils were assessed by scavenging of 1,1-diphenyl-2-picrylhydrazyl (DPPH) radicals.

Results and Discussion

The main aromatic constituents of Thuja as characterized by MS study, were were monoterpene as d-isothujone (46.19), L-fenchone (14.87), camphor (4.55), bornyl acetate (2.56) and etc. Thuja essential oil showed strong antimicrobial activity, and exhibited broard antimicrobial spectrum (Table 1). In the free radical scavenging ability, it was shown that the DPPH signal intensity was inversely related to the oil concentration and to the reaction time.

Table 1. Antimicrobual activity of *Thuja* essential oil against 28 test microorganisms.

Test organism	Concentration(μl/disc)	
	20	40
Escherichia coli kctc 1682	14.0	15.0
Klesiella pneumoniae kctc 2208	17.0	28.8
Proteus vulgaris kctc 2433	10.4	14.5
Pseudomoanas aeruginosa kctc 1750	-	-
Salmonella typhymurium kctc 1925	13.9	14.2
Shigella flexineri kctc 2008	21.4	28.6
Vibrio vulnificus kctc 2980	20.2	21.9
Bacillus cereus kctc 1012	16.6	17.6
Lactobacillus plantarum kctc 1048	11.5	13.6
Leuconostoc mesenteroides kctc 3532	15.9	16.4
Listeria monocytogenes kctc 3444	-	-
Staphylococcus aureus kctc 1916	13.5	15.1
Streptococcus pyogenes kctc 3208	13.8	15.5
Streptococcus mutans kctc 3065	14.5	12.2
Alternaria alternata kctc 6972	13.2	16.0
Aspergillus niger kctc 1225	10.1	11.2
Aspergillus oryzae kccm 11371	13.2	14.5
Aureobasidium pullulans kctc 6081	18.4	19.4
Botrytis cinerea kctc 6973	-	-
Candida albicans kctc 7121	13.8	16.4
Candida tropicalis kctc 7212	11.5	13.6
Fusarium solani kctc 6326	10.3	11.9
Mucor rouxii kccm 60146	10.0	11.0
Penicillium citrinum kctc 6972	10.0	8.2
Pityrosoprum ovale kccm 11894	24.0	28.0
Rhizopus oryzae kctc 6945	8.8	15.0
Saccharomyces cerevisiae kctc 7904	18.8	26.5
Tricoderma viride kctc 6047	9.5	11.5

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* Corresponding author: TEL: 055-751-5974; E-mail: swkim@nongae.gsnu.ac.kr