

Short report

Antimicrobial activity of the essential oil of *Centaurea aladagensis*

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Abstract

Composition of the water-distilled oil of the aerial parts of *Centaurea aladagensis*, endemic in Turkey, was analysed by GC–MS. Hexadecanoic acid (39.3%), caryophyllene oxide (6.6%) and hexahydrofarnesyl acetone (4.3%) were found as main constituents in the oil. The oil was tested against 7 human pathogenic microorganisms.

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1. Plant

Centaurea aladagensis Wagenitz (Compositae) was collected from Nigde, Aladag road twentieth km, in June 2004. Voucher specimens are kept in the Herbarium of the Faculty of Pharmacy, Anadolu University (ESSE 14421) in Eskisehir, Turkey (ESSE 14421).

2. Uses in traditional medicine

Centaurea species have been used for their anti-dandruff, antidiarrhoic, antirheumatic, antiinflammatory, choleric, diuretic, digestive, stomachic, astringent, antipyretic, cytotoxic and antibacterial properties in folk medicine [1,2].

3. Previously isolated constituents

No data.

4. Tested material

Essential oil (yield: 0.1%). Main constituents (GC/MS analysis): hexadecanoic acid (39.3%), caryophyllene oxide (6.6%), hexahydrofarnesyl acetone (4.3%), phytol (4.0%), caryophylla-2(12),6-dien-5 β -ol (caryophyllenol II, 2.9%),

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Table 1
Antimicrobial activity of the *C. aladagensis* essential oil

Bacteria	MIC ^a	S ^b
<i>Escherichia coli</i> NRRL B-3008	0.44	0.003
MRSA ^c	0.22	0.007
<i>Enterobacter aerogenes</i> NRRL B-3567	0.44	0.003
<i>Salmonella typhimurium</i> NRRL B-13311	0.22	0.007
<i>Staphylococcus epidermidis</i> ATCC 1228	0.11	0.001
<i>Candida albicans</i>	0.22	0.063 ^d
<i>S. aureus</i> ATCC 6538	0.22	0.001

^a Minimum inhibitory concentration (mg/ml).

^b S: Standard antimicrobial agents: chloramphenicol and ketoconazole.

^c MRSA: Methicillin resistant *Staphylococcus aureus*.

^d Ketoconazole.

tetradecanoic acid (2.7%), heptacosane (2.6%), pentacosane (1.9%), tricosane (1.7%), caryophylla-2(12),6(13)-dien-5 α -ol (caryophylladienol II, 1.6%), heneicosane (1.5%), pentadecanoic acid (1.5%), caryophylla-2(12),6-dien-5 α -ol (caryophyllenol I, 1.4%), dodecanoic acid (1.4%).

5. Studied activity

Antimicrobial activity by microdilution-broth method [3,4].

6. Used microorganisms

Listed in Table 1.

7. Results

Reported in Table 1.

8. Conclusion

Eighty-five compounds representing 87.3% of the essential oil were characterized. Fatty acids, esters and oxygenated sesquiterpenes rich in oil have shown antimicrobial activity against *Staphylococcus epidermidis*.

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