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CHEMICAL COMPOSITION AND ANTIMICROBIAL ACTIVITY OF ESSENTIAL OIL FROM *Nepeta cadmea*

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The Genus *Nepeta* L. (Lamiaceae) is represented by 34 species in Turkey, including eighteen endemic species [1, 2]. *Nepeta cadmea* Boiss. is an endemic species with limited distribution and included in the lower risk and least concern category in the red data book of Turkey [3]. Here we report on the antimicrobial activity of the essential oils from *N. cadmea* because very little information is available on this endemic species. Table 1 shows the percentages of the main components present in the essential oils isolated from *N. cadmea* collected in June from Honaz Mountain.

The yields of essential oil from *N. cadmea* on a dry weight basis was 2.1% (v/w). Thirteen components in *N. cadme*a (97.91%) were identified. The components are listed in order of their elution time on the HP 1 MS column. Among the compounds, nepetalactone (81.6%), caryophyllene (3.71%), and germacrene D (3.25%) were identified as the major components in the essential oil of *N. cadmea.*

The antimicrobial activity of the essential oil measured by the disc diffusion method is given in Table 2. The essential oil isolated from *N. cadmea* showed antimicrobial activity, but differences in microbial susceptibility were observed.

Our findings indicate that the essential oil isolated from *N. cadmea* has antimicrobial activity and can be used to control microorganisms since this has been used in folk medicine for decades. It will be worth-while to investigate the individual components in antibacterial and antifungal assays.

TABLE 1. Percentage Composition of the Essential Oil Isolated from *N. cadmea* (% of Total Ion Current)

Components	Rt[a]	%	Components	Rt[a]	%
Nepetalactone	12.70	81.6	Calamene	8.30	1.10
Caryophyllene	8.36	3.71	Δ-Cadinene	8.40	0.59
Germacrene D	5.30	3.25	Terpinen-4 ol	4.03	0.39
Sabinene	8.04	1.96	1,8-Cineol	7.70	0.37
Caryophyllene oxide	5.70	1.91	δ-Muurolene	8.40	0.35
Linallol	8.82	1.36	δ-Terpinene	7.03	0.18
Carvacrol	6.17	1.13	Total	98.95	97.91

[a]Retention time (as minutes).

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TABLE 2. Antimicrobial Activity of the Essential Oil of *N. cadmea* Using the Disc Diffusion Method

Microorganisms	DD[a]	Ac[b]	Pl[b]	Microorganisms	DD[a]	Ac[b]	Pl[b]
Bacillus subtilis ATCC 6633	6±0	N.t.[d]	12	*Escherichia coli* ATCC 218	4±0	19	17
Staphylacoccus aureus ATCC 25923	6±0	N.a.	30	*Klebsiella pneumoniae* ATCC 27736	N.a.[c]	N.a.	N.t.
Staphylacoccus aureus ATCC 29213	4±0	N.t.	31	*Salmonella enteritidis* RSKK 171	2±0	N.a.	N.t.
Cowan liyofilii	10±0	N.a.	29	*Yersinia enterecolitica* ATCC 1501	N.a.	20	18
Morganella morgani	7.5±0	M.t.	29	*E. coli* ATCC 25922	2±0	18	18
Proteus vulgaris RSKK 96026	4±0	N.t.	29	*Micrococcus luteus* MRLL B-4375	6±0	28	31
Bacillus cereus RSKK863	7.5±0	N.t.	22				

[a]DD, agar disc diffusion method; [b]Ac, ampicillin; [c]N.a.: not active; [d]N.t.: not tested.

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