SUPPORTING MATERIAL

Composition and biological activities of the essential oil from a Sicilian accession of *Prangos ferulacea* (L.) Lindl.

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Prangos ferulacea (L.) Lindl. (Fam. Apiaceae), is an orophilous species of eastern Mediterranean and western Asia which possesses several biological properties, which are worthy of exploitation in different fields. With the aim to provide new insights into the phytochemistry and pharmacology of this species, a local accession growing in Sicily (South Italy) was investigated as well. Notably, the *P. ferulacea* essential oil chemical composition and the antioxidant, anti-acetylcholinesterase (AChE) and cytotoxic activities have been studied. This analysis allowed to identify a new chemotype and to report good biological results for this oil.

Keywords: *Prangos ferulacea*; Apiaceae; essential oil; biological activities

Table S1. Chemical profiles reported in literature for the essential oil obtained from the aerial parts of *Prangos ferulacea*.

Origin and phenological stage (wherever specified)	Main compounds (%)	Ref.
Greece, Crete	γ-terpinene (27.5), α-pinene (10.4), α-terpinolene (9.0), (*E*)-β-ocimene (8.8), *p*-cymene (6.8), apiole (5.5), myrcene (4.4)	Evergetis et al. 2013
Iran, W.Azerbaijan	β-pinene (43.1), α-pinene (22.1), δ-3-carene (16.9), α-terpinolene (3.9)	Delnavazi et al. 2017
Iran, North Fars (grow. stage), fresh	terpinolene (56.3), (*E*)-caryophyllene (4.7), bornyl acetate (3.0)	Safaeian et al. 2012
Iran, North Fars (grow. stage), dry	terpinolene (38.1), (*E*)-caryophyllene (3.6), bornyl acetate (1.8)	Safaeian et al. 2012
Iran, North Fars (veget. stage), fresh	δ-3-carene (45.9), indole (11.6), terpinolene (9.6), *p*-cymen-8-ol (6.2), *n*-pentadecanol (5.5)	Safaeian et al. 2013
Iran, North Fars (veget. stage), dry	limonene (55.1), γ-terpinene (10.7), bornyl acetate (8.5)	Safaeian et al. 2013
Iran, North Fars (flow. stage), fresh	α-pinene (41.3), δ-3-carene (34.6), limonene (14.6), β-pinene (9.5), terpinolene (8.1), myrcene (7.4), sabinene (4.7), α-phellandrene (4.1)	Safaeian et al. 2013
Iran, North Fars (flow. stage), dry	α-pinene (24.2), δ-3-carene (7.7), β-pinene (8.6), terpinolene (3.8), β-phellandrene (4.4)	Safaeian et al. 2013
Iran, Kermanshah (flow. stage)	(*E*)-caryophyllene (48.2), α-humulene (10.2), spathulenol (9.3), linalool (3.5), δ-3-carene (3.4)	Mohebi et al. 2017
Iran, Lorestan (pre-flow. stage)	β-pinene (43.0), α-pinene (40.0), β-phellandrene (6.5), α-terpinene (5.1)	Amiri 2007
Iran, Lorestan flow. stage)	α-pinene (37.1), β-pinene (33.8), δ-3-carene (6.7), α-terpinene (6.5), β-phellandrene (5.6), terpinolene (4.9)	Amiri 2007
Iran, Lorestan (fruit. stage)	α-pinene (31.7), β-pinene (38.5), β-phellandrene (10.3), terpinolene (5.1), α-terpinene (4.9), *p*-cymene (3.2)	Amiri 2007
Iran, Sanandaj	β-pinene (22.9), δ-3-carene (16.0), α-pinene (12.6), *epi*-α-bisabolol (7.7), terpinolene (3.5), limonene (3.1)	Sefidkon et al. 1998
Iran, Semnan	β-phellandrene (20.4), α-terpinolene (15.3), α-pinene (11.6), δ-3-carene (11.1), (*E*)-β-ocimene (9.7), α-phellandrene (9.1), myrcene (4.5), sabinene (4.4), γ-terpinene (3.4)	Mohammadhosseini 2012
Turkey, market	β-phellandrene (22.3), α-pinene (16.2), *p*-cymene (11.2), β-myrcene (7.2), indene (6.4)	Dagdelen et al. 2014
Turkey, East Anatolia	2,3,6-trimethylbenzaldehyde (66.6), chrysanthenyl acetate (15.1), (*E*)-β-ocimene (3.8), *p*-mentha-1,5-dien-8-ol (3.6)	Sumer Ercan et al. 2013

Table S2. Antioxidant activity of the essential oil from the Sicilian accession of *Prangos ferulacea*

	DPPH		ABTS		FRAP
	TEAC[a]	IC_{50}	TEAC[a]	IC_{50}	TEAC[a]
	μmolTE/gr	μgr/ml	μmolTE/gr	μgr/ml	μmolTE/gr
Essential oil	11.04±1.0	726.5±6.0	60.64±3.1	89.5±2	52.5±2.1
Reference					
Trolox		$2.01\pm0.2\times10^{-3}$		$1.36\pm0.1\times10^{-3}$	

[a]TEAC, Trolox equivalent (TE) antioxidant concentration.

References

Amiri H. 2007.Essential oil variation of *Prangos ferulacea* Lindl. in different stage of plant growth. Iran J Med Arom Plants. 23:121-127.

Dagdelen S, Bilenler T, Durmaz G, Gokbulut I, Hayaloglu AA, Karabulut I. 2014. Volatile composition, antioxidant and antimicrobial activities of herbal plants used in the manufacture of Van Herby (OTLU) cheese. J Food Process Pres. 38:1716-1725.

Delnavazi MR, Soleimani M, Hadjiakhoondi A, Yassa N. 2017. Isolation of phenolic derivatives and essential oil analysis of *Prangos ferulacea* (L.) lindl. aerial parts. Iran J Pharm Res. 16:207-215.

Evergetis E, Michaelakis A, Haroutounian SA. 2013. Exploitation of Apiaceae family essential oils as potent biopesticides and rich source of phellandrenes. Ind Crops Prod. 41:365-370.

Mohammadhosseini M. 2012. Chemical profile and antibacterial activity in hydrodistilled oil from aerial parts of *Prangos ferulacea* (L.) Lindl. and prediction of gas chromatographic retention indices by using genetic algorithm multiple linear regressions. Asian J Chem. 24:3814-3820.

Mohebi Z, Heshmati GA, Sefidkon F, Zare Chahouki MA. 2017. The influence of plant growth stage, individuals of species, and extraction methods on the essential oil content and the chemical composition of *Prangos ferulacea* (L.) Lindl. Appl Ecol Env Res. 15:1765-1776.

Safaeian R, Amin G, Azarnivand H. 2013. Phytochemistry of *Prangos ferulacea* (L.) Lindl. in one of the habitats of Zagros Mountain. Ecopersia. 1:63-74.

Safaeian R, Amin G, Azarnivand H. 2012. Study of chemical compositions of the essential oils of aerial parts of *Prangos ferulacea* (L.) lindly in growing stage in the north of Fars province. Acta Horticulturae. 964:71-76.

Sefidkon F, Khajavi MS, Malackpour B. 1998. Analysis of the oil of *Prangos ferulacea* (L.) Lindl. J Ess Oil Res. 10:81-82.

Sumer Ercan F, Bas H, Koc M, Pandir D, Oztemiz S. 2013. Insecticidal activity of essential oil of *Prangos ferulacea* (Umbelliferae) against *Ephestia kuehniella* (Lepidoptera: Pyralidae) and *Trichogramma embryophagum* (Hymenoptera: Trichogrammatidae). Turk J Agric For. 37:719-725.