J Am Oil Chem Soc (2008) 85:493–494
DOI 10.1007/s11746-008-1209-y

LETTER TO THE EDITOR

Promising New Oil Derived from Seeds of *Chamomilla recutita* (L.) Rauschert Produced in Southern Brazil

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Received: 11 November 2007 / Revised: 21 January 2008 / Accepted: 4 February 2008 / Published online: 26 February 2008

Dear Sir,

There is growing interest in plants with medicinal properties, and it is well recognized that Brazil is a country with one of the richest floras in the world. Paraná State, southern Brazil is a substantial producer of chamomile [*Chamomilla recutita* (L.) Rauschert], most of which is grown in Mandirituba County [1–4]. According to government statements ([4]; unpublished data), of all the medicinal plants cultivated in Brazil, the largest area of farmland is used for chamomile cultivation. Chamomile cultivation also involves the highest numbers of small farms in terms of rural production in Brazil. Mandirituba County alone has around 500 hectares of land cultivated in chamomile, producing 250 tons of dried flower heads, which are separated from the seeds during the drying process [5]. Since chamomile is one of the plants selected for Phytotherapy by the Health Secretary of Paraná State, research into the pharmaceutical properties of other parts of the plant are required, in particular, the dried fruits (or seeds as they are normally referred to [5]; N. Pereira, personal communication). Most plant seeds are good sources of oils and fats [6–9], and oils from seeds frequently show biological activity [10–12]; it is likely that the seeds of chamomile are no exception. In earlier publications, we reported the potential applicability of chamomile seed oil in pharmaceutical formulations, such as emulsions [13, 14], without elaborating on the method employed to obtain this seed oil or on its biological activity evaluation.

A fixed oil, light yellow in color, can be extracted from the seeds. The botanic matter utilized to obtain this oil were seeds derived from flower heads of *C. recutita* during the flowering period of chamomile, which in southern Brazil occurs in the second half of the year. The seeds were sprayed into a grinding mill and ground into a fine powder based on the specifications found in the Supplement of Portuguese Pharmacopoeia [15]. The fine powder obtained in this process was extracted with hexane in a traditional Soxhlet extraction system [16] to obtain a crude oil. The yield was 19% after solvent evaporation.

We used the paper-disc diffusion method to evaluate the antibacterial screening activity of chamomile seed oil; chloramphenicol was used as the reference mould [17]. For this test, the concentration of the crude oil was lowered by successive dilutions in hexane to final concentrations of 50, 25 and 12.5%. Prior to hexane evaporation, each disc was impregnated with a dilution of the seed oil [18, 19]. The discs were placed on the surface of sterile Petri dishes and then incubated under aerobic conditions at 35°C for 24 h, followed by a measurement of the diameter of the inhibition zone (mm). The microorganisms used were obtained from stock cultures of the Paraná Technology Institute (TECPAR) in Brazil and are listed in Table 1.

Attention should be given to the apparent antibacterial effects demonstrated by the crude oil rather than the chloramphenicol (30 μg in disc) pattern, while not forgetting that active substances in crude oils are often found in minimal concentrations. At all three concentrations, the oil inhibited *Pseudomonas aeruginosa*, *Escherichia coli* and *Enterobacter aerogenes*, suggesting that its inhibitory effect is good in comparison with the mould pattern of

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Table 1 Antibacterial activity of chamomile [*Chamomilla recutita* (L.) Rauschert] oil seeds

Crude oil concentration in paper-disc	Crude oil mass (mg) in 20 μL	Zone of inhibition/microorganism[a]			
		Pseudomonas aeruginosa	*Escherichia coli*	*Enterobacter aerogenes*	*Salmonella choleraesus*
100.0%	18.54	8.0	4.0	4.0	0.0
50.0%	9.27	7.0	4.0	4.0	0.0
25.0%	4.63	5.0	6.0	3.0	0.0
12.50%	2.32	4.0	7.0	4.0	0.0
Hexane(100%)[b]	–	0.0	0.0	0.0	0.0
Chloramphenicol (30 μg)[c]	–	0.0	10.0	2.0	21.0

Values record the inhibition zone (mm), the mean of triplicate experiments

[a] *Pseudomonas aeruginosa* (ATCC65969); *Escherichia coli* (ATCC11229); *Enterobacter aerogenes* (ATCC13048); *Salmonella choleraesus* (ATCC 10708)

[b] Analytical grade (p.a)

[c] Newprov disc (p.a of 99.5% purity)

chloramphenicol. Only the microorganism *Salmonella choleraesus* remained apparently uninhibited by the crude seed oil.

These result show that the oil of *C. recutita* can be obtained using a simple extraction method and suggests that further studies are required to determine its chemical composition, which in turn would enable identification of the active substance or substances. Only at this stage can there be any discussion of the use of this oil in therapeutics. The results also suggest that the oil has the potential to act as an anti-phytopathogenic agent and, as such, to become a new pharmaceutical product. Such developments will increase the value of chamomile production in southern Brazil.

Acknowledgments The authors are grateful to the agricultural experts of Mandirituba County for providing the *Chamomilla recutita* (L.) Rauschert seeds and to the Paraná Technology Institute (TECPAR) for providing the microorganisms.

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