

Notizen

Monoterpene Hydrocarbons from Ants

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Hiroshima University, Hiroshima, Japan(Z. Naturforsch. **28 c**, 626 [1973]; received June 26, 1973)*Pristomyrmex pungens* Mayr, *Pheidole nodus* Smith, *Lasius*
(*Dendrolasius*) *spathepus* Wheeler, *Crematogaster laboriosa*
Smith, monoterpene hydrocarbons (α -pinene, β -pinene,
camphene, limonene)

In the course of the systematic study of ants pheromone, we have shown the presence of *n*-paraffins from the four species of the worker ants (*P. lamellidens*, *F. japonica*, *C. obscuripes*, *C. japonicus*) in Japan in an earlier paper¹. In addition to the paper, we reported the presence of monoterpene hydrocarbons from another four species of ants in this paper.

The whole bodies of the worker ants (*P. pungens*, *P. nodus*, *C. laboriosa*, *L. spathepus*) obtained from Hiroshima Prefecture, Japan in Apeil were macerated with *n*-hexane for 4 days at room temperature. The organic layer was separated from the *n*-hexane solution, and then the solvent was removed under reduced pressure after being dried with sodium sulfate and oily matters were obtained. The isolation is shown in Table I.

The hydrocarbon fractions were obtained from the oily matters by column chromatography using silica gel over *n*-hexane and individual terpene constituents were detected by gas chromatography using two different columns (PEG-20M-10% at 70 °C, and SE-30-10% at 50 °C). Among the constituents, β -pinene (main constituent of *P. pungens*) was further identified by infrared spectrum. The results are shown in Table II.

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¹ N. Hayashi, H. Komae, and H. Hiyama, Z. Naturforsch. **28c**, 226 [1973].

Table I. The isolation of the oil from ants.

Species	Weight of ants [mg]	Yield of oil [mg]
<i>P. pungens</i>	3405.3	52.7
<i>C. laboriosa</i>	105.0	5.1
<i>P. nodus</i>	24.8	2.4
<i>L. spathepus</i>	193.5	4.9

Table II. Terpenic constituents of the ants.

Constituents	<i>t_R</i> [min]	Samples [%]*			
		A	B	C	D
unknown	2.4			3.0	10.9
α -Pinene	3.2	10.3		71.8	3.3
unknown	3.7			9.9	
camphene	4.2	11.8	1.3		
β -Pinene	5.4	68.9	57.2	9.9	85.3
unknown	6.2			5.4	
unknown	7.1		1.7		
unknown	7.8		0.5		
limonene	9.6	9.0	34.4		
unknown	14.7		4.9		

A: *P. pungens*, B: *C. laboriosa*, C: *P. nodus*, D: *L. spathepus*.

* PEG-20 M (10%) at 70 °C.

It is of interest chemotaxonomically that the main constituents of the ants (*P. lamellidens*, *F. japonica*, *C. obscuripes*, *C. japonicus*) previously reported were *n*-undecane, while those of the present ants (*P. nodus*, *L. spathepus*, *P. pungens*, *C. laboriosa*) were monoterpenes (α -pinene or β -pinene). These monoterpenes may be alarm or defense substances of the worker ants.

The authors are indepted to Dr. M. Kubota (Odawara, Japan) for identification of the ants to be *P. pungens*, *L. spathepus*.



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