

Notizen

Monoterpene Hydrocarbons from Ants

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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*-paraf-
fins from the four species of the worker ants (*P. la-*
mellidens, *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 isola-
tion 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 consti-
tuents, 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 chemotaxonically 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.

