Natural Product Sciences
3(2) : 106 ~ 107 (1997)

Isolation and Characterization of Indole-3-methylethanoate from *Camellia sinensis* (L.) O. Kuntz. and its biological activity

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Abstract – Indole-3-methylethanoate was isolated for the first time form natural source i.e. from the leaves of *Camellia sinensis* (L.) O. Kuntz and fully characterized by physical and chemical evidence, the biological activity of the compound was studied by wheat coleoptile bioassay which showed growth promoting activity.

Key words – *Camellia sinensis*, Indole-3-methylethanoate, Biological activity.

Introduction

Indole-3-acetic acid occurs universally in plants and its diverse role is well established. It forms complexs with a large number of compounds, proteins, amino acids and sugars. But the natural occurrence of Indole-3-methylethanoate is not known. In this communication we report the isolation, characterization and biological activity of Indole-3-methylethanoate from the leaves of *Camellia sinensis* (L.) O. Kuntz.

Discussion

The acidic part of the ethanolic extract of the defatted leaves of *C. sinensis* was chromotographed over Brockmann alumina using petroleum ether, benzene and chloroform successively as a eluent. A pinkish white solid was afforded from the chloroform part. This pinkish white solid was crystallized from chloroform-petroleum ether, m.p. 56°. It gave pinkish violet coloration changing to blue violet with Ehrlich's reagent and pink coloration with Salkawaski's reagent indicating that it was an indole derivative. The molecular formula of this compound was found as $C_{11}H_{11}O_2N$. The UV spectrum of the compound in ethanol showed λ max 228 nm (log ε 4.21) and 286 nm (log ε 4.54) which was characteristic of a β-substituted indole moiety. The IR spectrum of the compound showed the presence of >NH (3348 cm^{-1}) and $-CO_2CH_3$ 1702 cm^{-1}). Presence of the unsubstituted benzene ring in indole moiety was proved by the formations of a small quantity of indole on pyrolysis of this compound. The color test with Ehrlich's reagent indicated that the position of the indole nucleus was unsub- stituted. This was further supported by the IR spectrum which showed a band at 1106 cm^{-1} but no bands at 784 and 1430 cm^{-1} and very weak band at 1550 cm^{-1}, a pattern characteristic of β-substituted indole (Brown *et al.* 1952).

The NMR spectrum of the compound showed signals for C-2 hydrogen at δ 7.1. The signal for 3H singlet at δ 3.7 is for CO_2CH_3 and 2H singlet at δ 3.78 is for $CH_2CO_2CH_3$.

The mass spectrum of the compound showed a molecular ion peak at m/z 189. The ^{13}C NMR showed eleven carbon signals at δ 51.93

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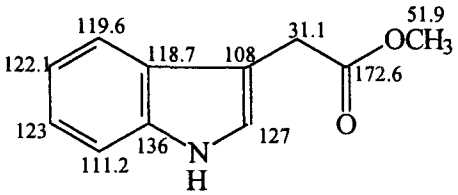
(OCH_3), 31.12 (-CH_2), 108.36 (C-3), 11.18 (C-8), 118.70 (C-4), 119.60 (C-5), 122.10 (C-6), 123.00 (C-7), 127.19 (C-2), 136.10 (C-8), and 172.56 (COO) (Fig. 1).



The alkaline hydrolysis of the compound yielded indole-3-acetic acid confirming that it is an ester of indole-3-acetic acid.

Table 1. Results of wheat coleoptile bioassay with Inlode-3-methylethanoate from *C. sinensis*

Concentration (ppm)	Mean length of coleoptile (mm)	Growth as percent over control
10	12.76	117.28**
20	13.82	127.02**
50	14.48	133.09**
control	10.88	100.00
S. E.	00.1118	
C. D. at 5%	00.3162	2.908
C. D. at 1%	00.4205	3.804

**Significant at 1% level.

Analysis of variance

Variation due to	d.f.	s.s	m.s.	F
Treatment	3	135.13	45.04	
Error	76	18.64	0.25	180.16
Total	79	153.77		

Biological activity

Biological activity of the compound was tested by wheat coleoptile extension straight growth bioassay using Sonalika variety of wheat. The bioassay was carried out in three different concentrations *viz.* 10, 20, and 50 ppm. The results are given in Table 1.

Result

From the data so far presented the compound appeared to be an indole derivative which has growth promoting activity on wheat coleoptile extension bioassay.

Acknowledgment

The mass spectral data and ^{1}H and ^{13}C NMR spectrum were obtained through the courtesy of Prof. A. K. Bose, Stevens Institute of Technology. New Jersy, U.S.A.

References

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(Accepted July 15, 1997)