

PHYTOCHEMICAL REPORTS

ZEORIN FROM THE MYCOBIONT OF *ANAPTYCHIA HYPOLEUCA*

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(Received 12 March 1974)

Key Word Index—*Anaptychia hypoleuca*, Fungi, lichen mycobiont, zeorin, hopane triterpene

Previously, we have reported the formation of various lichen substances by isolated and cultivated lichen mycobionts. A number of anthraquinone pigments¹ and usnic acid² were isolated in crystalline form, and salazinic acid was detected by TLC. The formation of chromones³ and pulvinic acid derivatives⁴ by the isolated mycobionts were also reported by earlier workers, but the occurrence of terpenoids in mycobionts has not been so far demonstrated.

We have now found that zeorin,⁵ which is peculiar to and widely distributed in lichens, is formed by the cultivated mycobiont of *Anaptychia hypoleuca* (Muhl.) Mass. Since the pentacyclic triterpenes, including hopanes such as zeorin, have rarely been found in fungal metabolites, it has generally been assumed that those found in lichens would probably be produced by the phycobionts or transferred from higher plants.

The present investigation demonstrates that zeorin is formed by the isolated mycobiont cultivated under laboratory conditions, without any participation of the phycobiont. This shows that pentacyclic triterpenes can occur in lichens as metabolites of mycobionts. On the other hand, other chemical constituents of the lichen, such as atranorin, norstictic acid and salazinic acid were not detected in the mycobiont.

EXPERIMENTAL

The mycobiont was isolated from the lichen, *Anaptychia hypoleuca* (Muhl.) Mass, by the micromanipulator method, and cultivated for 5 months on Hamada's No. 117 medium (glucose 20 g, dried yeast 5 g, agar 20 g, water 1 l, pH 5.1–5.6). Colonies of the mycobiont were harvested and dried in air, and extracted with acetone. Zeorin was obtained as crystals (m.p. 222–224°) by silica gel column chromatography using CHCl₃. It was identified with an authentic sample by TLC on silica gel GF₂₅₄, and by IR and MS.

Acknowledgements—The authors thank Dr. S. Kurokawa, National Science Museum, Tokyo, for his lichenological advice. The authors' thanks are also due to Yakurikenkyukai for grant.

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