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Studies on the Pests of *Phyllostachys heterocyla* (CARR.) MITF. (Gramineae: Graminaeae). I. Life History of *Cosmopterix phyllostachysae* KUROKO (Lepidoptera: Cosmopterigidae) and Records of its Natural Enemies¹

In 1971-1973 the adults of *Cosmopterix phyllostachysae* appeared in Ishikawa Prefecture from mid May to late June, and the peak of its emergence occurred in early June. The adults emerged from the leaves of bamboo and were commonly found among the weeds in the bamboo grove as well as on the leaves of bamboo.

The female oviposited her eggs on the leaves of bamboo. The newly hatched larvae penetrated into the mesophyll of the leaf.

Mine: A linear-blotch mine. A linear portion was 15-20 mm in length and increased in width from 0.5 mm in the first instar cell to 1.5-2.0 mm in the fourth instar cell. The fifth instar created an oval chamber enlarged to 10 mm in width (Fig. 2). In mid December the fifth instar larva made a small overwintering chamber 5-6 mm in length and 1 mm in width of silk-like fiber inside the larger blotch mine (Fig. 3). The instar cells were separated by a septum presumably constructed from plant tissue by each succeeding instar. Instars I-V do not void feces. In March of next year, the larva begins to feed on the mesophyll

Figs. 1-5. Linear-blotch mine of *Cosmopterix phyllostachysae* KUROKO. (1) Linear mine of third instar larva; (2) Position of overwintering chamber; (3) Linear-blotch mine of 6th instar larva; (4) Pupation chamber, ventral view; (5) Do, lateral view. H. C., Hibernating chamber; P. C., Pupation chamber.

¹ Appl. Ent. Zool. **9** (2): 101-103 (1974).

Fig. 6. Life history of *Cosmopterix phyllostachysae* KUROKO.

of the leaf. In late April, the full-grown larva, after the fifth moult, cuts the epidermis of the underside of the leaf archwise and makes a pupation chamber of silk-like fiber inside the blotch mine (Figs. 4–5) and pupates in the chamber after 6–7 days.

Before the pupation chamber is made by the sixth instar larva, it ejects its frass through a hole prepared on the underside of the basal portion of the fifth cell.

At first the pupa is pale brown, and finally becomes dark brown.

Usually one larva was found in a single leaf but in some areas two larvae were found.

The life history of this species is shown in Fig. 6.

No report on the natural enemies of this species has ever been made in Japan. However, the following species of natural enemies were found during the course of this study.

I. Parasites

Five hymenopterous parasites were found as follows:

(1) Ichneumonoidae

Fam. Braconidae

Macrocentrus sp.

This species is known from Ishikawa Prefecture and a solitary parasite of the larva of *C. phyllostachysae*.

After a pupation chamber of the host caterpillar was made, the full-grown larva of this parasite emerged from a single host spun its cocoon just posterior to the host body inside the blotch mine of the host caterpillar. After emergence, the adult parasites were seen in the same habitat as its host adult moths.

Fam. Ichneumonidae

Itopectis alternans spectabilis (MATSUMURA)

This species emerged from the larva of *C. phyl-*

lostachysae in May.

Other hosts of this species reported from Japan as follows:

Plutella xylostella (LINNAEUS), *Coleophora laricella* (HÜBNER), *Grapholitha molesta* (BUSCK), *Epinotia diviana* GM., *Adoxophys orana* (FISCHER VON ROESLERSTAMM), *Archippus piceanus similis* (BUTLER), *Archippus pulchra* (BUTLER), *Canephora asiatica* (STAUN-DINGER), *Clania minuscula* (BUTLER), *Mahasena nitobei* MATSUMURA, *Cystidia stratonice* (STOLL), *Malacosoma neustria testacea* MOTSCHULSKY, *Dendrolimus spectabilis* BUTLER and *Oulema oryzae* (KUWAYAMA).

Pristomerus vulnerator PANZER

This species emerged from the larva of *C. phyllostachysae* in May. It is a solitary parasite.

After a pupation chamber of the host larva was made, the larva of this parasite invaded into the host chamber leaving the host body and spun its cocoon inside the blotch mine. The cocoon was rather elongate ellipsoidal in shape and pale yellowish in colour. After emergence, the adult parasites were seen in the same habitat as its host adult moths. On the other hand, he observed the swarming of this parasite around the aphid colonies which were seen on the stem of *Zanthoxylum ailanthoides* SIEB. et ZUCC. near-by the bamboo.

Other hosts of this parasite reported from Japan as follows:

Exartema mori MATSUMURA, *Grapholitha molesta* (BUSCK) and *Pectinophora gossypiella* (SAUNDERS).

(2) Chalcidoidae

Fam. Eulophidae

Cotterellia sp.

This species is a solitary parasite of the larva of *C. phyllostachysae* in Japan. According to B. D. BURKS, this genus is distributed in Africa, India and the Philippines, and its species are known parasites of leaf miner moths.

Pnigalio sp.

The author has captured only one male specimen reared from the larva of *C. phyllostachysae*.

II. Predator

One spider was found as follows:

(1) Araneae

Myrmarachne japonica (KARSCH)

This species is rather commonly found among weeds in bamboo groves where the author has frequently observed it preying on the adults of *C. phyllostachysae* on the leaves of weeds.

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