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Entomophthora pyriformis Thoizon, pathogenic on apple and thorn skeletonizer, Eutromula pariana (Clerck) (Lepidoptera : Glyphipterigyidae), in British Columbia, Canada

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Summary

At the first time it was observed that **Entomophthora pyriformis** Thoizon, which has previously been known as a pathogen of aphid, infects a lepidopterous larvae of **Eutromula pariana** (Cl.). By the works in Fall 1976, it was found that 5 % of the caterpillars, in the second or third instars, which were collected from apple leaves were killed by the fungus in Vancouver district, Britsh Columbia, Canada. The various stages of the fungus obtained from a lepidopterous host were described.

Introduction

Records of various species of *Entomophthora* infectious on some species of Lepidoptera has been noted from Europe, Japan, and North America (Gustafsson, 1965; Mac Leod and Müller-Kögler, 1973; Kushida *et al.*, 1975). However it has previously been reported that *Eutromula pariana* (Cl.) is infected only by *Beauveria bassiana* (Bals.) Vuill. (Kabasinkaite and Zajanckauskas, 1970) and an unidentified fungus species (Iliinsky, 1916) from USSR. Recently, an entomogenous fungus was found attacking *E. pariana* in Western Canada. The fungus was identified by Dr. J. Weiser as *Entomophthora* sp. Studies of morphological characters showed that the fungus is identical to *Entomophthora pyriformis* Thoizon which was reported as a pathogen of *Rhopalosiphum insertum* (Walk.), *R. padi* (L), *Sitobion avenae* (Fabr.) and *Aphis fabae* (Scop.) (Homoptera : Aphididae) (Thoizon, 1967).

This is the first record of *E. pyriformis* attacking Lepidoptera, an of *E. pariana* infected by *Entomophthora.*

Material and methods

In September 1976, the infected larvae, in the first and second instars, of *E. pariana* were collected from the leaves of apple trees in Vancouver district, British Columbia, Canada. These larvae were reared in the Lab. The larvae killed by the fungus were used for histological studies and for

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culturing. The culture media were Sabouraud's maltose agar, Sabouraud's dextrose agar, and egg yolk. Culture tubes were prepared by placing 10 ml aliquots of heated Sabouraud's maltose and dextrose agars into 15x150 mm tubes, which were then stoppered with cotton plugs, sterilized 15 minutes under 10 pounds pressure at 115 °C, and cooled into slants. The egg yolk was prepared according to Müller-Kögler (1959).

Small parts cut from the infected larvae were placed onto media and held at 20 °C, 25 °C, and 30 °C and 70 % R. H. in dark and light places.

The methods of Hall and Bell (1963) were used to mount and stain the diseased insects.

Results and Discussion

The fungus could not been grown on the all media and under the conditions. Although Mac Leod and Müller-Kögler (1973) stated that *E. pyriformis* might be cultured on Sabouraud agar and on coagulated egg yolk with glucose.

From field observations, the fungus attacks the larva probably in the first instar and kills it in the second or third instar. Hyphal bodies and conidiophores of fungus extend from intersegmentals area of the dead larvae, Inside, hyphal bodies of the fungus develop through the fatbody into the body cavity (Fig. 1). The hyphal bodies are nonseptate, and break up into short segments. Their measurements are 45.5-133 (av. 97-5μ) x 7-14 (av. 11.1$^{\mu}$)μ. Conidiophores which develop from the hyphal bodies are unbranched and their tip is narrower than the bottom (Fig. 2). The conidia are broadly ovate with rounded apex but without a papillate base, hyaline variable in size 21-34 (av. 25.09μ) x 14.24 (av. 19.06$^{\mu}$)μ (Fig. 2). According to the measurement of Thozion (1967) conidia from aphid are 15-31 x 12-25 μ. Azygospores are spherical, dark brown colour, and 14-21 (av. 19.04μ)μ in size (Fig. 3). Zygospores (Fig. 4) with a spore wall 1.3-1.5 (av. 1.38μ)μ thick, spherical, smooth, dark brown colour, and 14-15 (av. 14.50μ)μ in diam which was given by Thoizon (1967) as 12-25μ (av. 19μ).

About 5 % of 150 larvae of *E. pariana* collected from field were infected by the fungus. But it needs further studies in order to evaluate it as a biological control agent.

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Özet

British Columbia, Canada'da **Eutromula pariana** (Cl.) (Lepidoptera : Glyphipterigyidae) üzerinde patojenik olan **Entomophthora pyriformis** Thoizon üzerinde çalışmalar.

Özellikle bir aphid patojeni olarak bilinen **Entomophthora pyriformis** Thoizon'un ilk defa bir lepidopter olan **Eutromula pariana** (Cl). larva'larını enfekte ettigi saptanmıştır. Vancouver (British Columbia, Kanada) çevresinde 1976 sonbaharında yapılan araştırmalarda elma yapraklarından toplanan tırtıllardan % 5'inin, ikinci veya üçüncü dönemde bu mantar tarafından öldürüldüğü tespit edilmiş ve bir lepidopter konukçudan elde edilen bu mantarın çeşitli dönemleri tanımlanmıştır.

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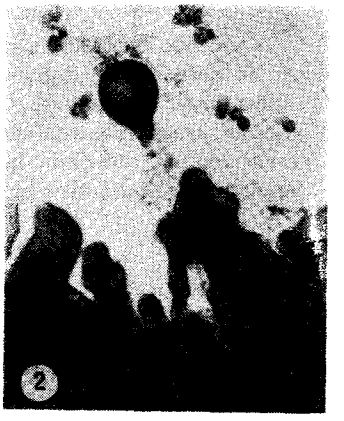

Fig. 1-4 **Entomophthora pyriformis** Thozion. 1: Hyphal bodies in the body cavity of ***Eutromula pariana*** larva (x 800); 2: *Conidiophore and conidium* (x 750); 3: Azygospore (x 750); 4: Zygospore (x 800).