

Studies on a Korean Unrecorded Pamphilid-Sawfly(Hymenoptera, Symphyta) Feeding on Korean Pine (Ⅲ)

The Natural Enemies

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잣나무를 食害하는 韓國未記錄種 넓적잎벌(膜翅目, 廣腰亞目)에 關한 研究 (Ⅲ)

天敵에 對하여

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摘 要

本 論文은 京畿道 光陵試驗林에서 잣나무 넓적잎벌의 天敵에 對해서 1958—1961 年에 調査 研究한 것을 報告하는 것이다. 잣나무 넓적잎벌의 天敵은 다음과 같다.

1. 卵을 侵害하는 것 :

Trichogramma dendrolimi MATSUMURA 송충알사리벌

2. 樹上의 幼虫을 侵害하는 것 :

Phora egregia BRUES 벼룩파리(新稱)……未記錄科屬種

Sarcophaga albiceps MEIGEN 알비취파리(新稱)

Streptopelia o. orientalis(LATHAM) 멧비둘기

3. 地中의 前蛹을 侵害하는 것 :

Paratrechina flavipes (F. SMITH) 불개미

Myrmica kurokii FOREL 빗살핍개미(新稱)……未記錄種

A Species of Acarina (진뚝이의 一種)

A Species of Nematoda (線虫의 一種)

Isaria sp. (硬化菌의 一種)

INTRODUCTION

The present paper deals with the natural enemies of the Pamphilid-Sawfly(*Acantholyda p. posticalis* MATS.) feeding on Korean pine in Kwan-nung Experimental Forest during 1958—1961. The author has published three preliminary reports on this subject(Lee and Cho, 1959; Lee, 1961 and 1962).

In accordance with Dr. Lucien Berland (1947), the following two parasites were known in Europe: *Tachina larvarum* L. (Diptera, Tachinidae) (after Hartig), and *Enteden ovularum* Rtz. (Hymenoptera, Chalcididae) (after Xambeu, Ed. André).

There is no record for the natural enemies of this pest in Korea and Japan.

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MATERIAL AND METHOD

The observation on all stadia of *Acantholyda p. posticalis* MATS. feeding on *Pinus koraiensis* SIEB. et ZUCC. was made in the forest and in the laboratory. In forest, by digging-out method the natural enemies which attack the prepupae in soil and by a binocular telescope the same ones which attack the larvae on the tree were observed; and in laboratory, by rearing method the same ones which attack the egg, larva and prepupa were observed.

RESULT AND CONSIDERATION

The author discovered the following species as the natural enemies of *Acantholyda p. posticalis* MATS. in Korea:

1. *Trichogramma dendrolimi* MATSUMURA.....attacking the egg. Jour. Coll. Agric., Hokk. Imp. Univ., XVIII, 18: 1—42, pl. 5, 1926.

Hymenoptera, Trichogrammidae

Body. Length about 0.6 mm.

The specimens of adults were collected from the eggs which became changing color to black in laboratory, July 20, 1960.

The diameter of the escaped hole is about 0.23 mm. One or two holes were made on the dorsal or lateral side of the egg. 34.5% among 200 eggs were attacked. It was recorded that the egg of *Dendrolimus spectabilis* BUTLER was attacked by this Hymenopterous parasite in Korea (Takagi, 1925; Kamiya, 1934).

Distribution: Korea, Japan and Saghalien.

2. *Paratrechina flavipes* F. SMITH.....attacking the prepupa in soil.

Trans. Ent. Soc. London, P. 404, 1874.

Hymenoptera, Formicidae.

Worker. Length about 2.3 mm.

The worker devours the prepupa of this pest in soil. 20 specimens of the worker were collected from the prepupa in soil at June 6, 1960.

Distribution: Korea, Japan.

3. *Myrmica kurokii* FOREL.....attacking the prepupa in soil. Mitt. Naturhist. Mus. Hamburg, V, 24, 2, Beiheft, P. 18, 1907.

Hymenoptera, Formicidae.

Worker. Length about 5.3 mm.

The worker devours the prepupa of this pest in soil. 17 specimens were collected from the prepupae in soil at June 6, 1960.

Distribution: Korea (unrecorded), Japan, Saghalien, China, Formosa.

4. *Phora egregia* BRUES.....attacking the larva on the tree. Annales Hist. Nat. Musei Nationalis Hungarici, Vol. 9, P. 534, 1911.

Diptera, Phoridae (unrecorded in Korea).

This species is quite unique in several particulars and can be confounded with no other species on account of its extremely long, lanceolate wings, with straight light veins. The absence of dorso-central bristles, the place of which is taken by the row of long bristles along the posterior edge of the mesonotum, is a character.

Male. Length about 4 mm.

7 specimens, 3 males and 4 females, were collected in laboratory on September 23, 1960 from the prepupae which were collected in Kwang-nung forest. It is considered that perhaps this Dipterous parasite oviposited in the larva before becoming prepupa on the tree.

Distribution: Korea (unrecorded), Japan, Formosa and Java.

5. *Sarcophaga albiceps* MEIGEN.....attacking the larva on the tree. Syst. Besch. Eur. Dipt. V.P.N. 122, 8, 1826.

Diptera, Sarcophagidae.

Male. Length about 11 mm.

5 Specimens, 2 males and 3 females, were collected in the laboratory on September 9, 1961 from the prepupae which were collected in Kwang-nung forest. It is considered that perhaps this Dipterous parasite laid down her larva in this pest larva before becoming prepupa on the tree. It was recorded that the larva of *Dendrolimus spectabilis* BUTLER was attacked by this Dipterous parasite in Korea (Takagi, 1925).

Distribution: Korea, Europe, Egypt, Siberia, China, Japan, India, Burma, Formosa, Philippines, Java, Hawaii, and Africa.

6. *Streptopelia orientalis orientalis* LATHAM.....attacking the larva on the tree.

Ind. Orn. ii, P. 606, 1790.

Columae, Columbidae.

Articles of diet detected from two individuals at Aug. 12, 1960.

No. 1. The larva of this pest. 3. Some sand. 30

No. 2. The larva of this pest. 3. *Prunus donarium* SIEBOLD 1.

Some sand. 30.

It is considered that this bird pick-ate the larva of this pest on the tree.

Distribution: Korea, Japan, China, Manchuria, Mongolia, Saghalien, Siberia, Kurile Is.

7. A species of Acarina.....attacking the prepupa.

It is discovered from prepupae in soil at Sep. 9, 1960.

8. A species of Nematoda.....attacking the prepupa.

It is discovered from prepupae in soil at Sep. 9, 1960.

9. *Isaria* sp.... ..attacking the prepupa.

It is discovered from prepupa in soil at Sep. 9, 1960.

CONCLUSION

The natural enemies of *Acantholyda p. posticalis* MATS. in Korea are as follows:

1. That which attacks the egg:

Trichogramma dendrolimi MATS. (Hymenoptera, Trichogrammidae).

2. Those that attack the larvae on the tree:

Phora egregia BRUES (Diptera, Phoridae)

Sarcophaga albiceps MEIGEN (Diptera, Sarcophagidae)

Streptopelia o. orientalis LATHAM (Columae, Columbidae)

3. Those that attack the prepupae in soil:

Paratrechina flavipes F. SMITH (Hymenoptera, Formicidae)

Myrmica kurokii FOREL (Hymenoptera, Formicidae)

A species of Acarina

A species of Nematoda

Isaria sp.

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