

A Report on *Megaselia tamiladuensis* Disney (Diptera: Phoridae) as a Pest of Oyster Mushroom, *Pleurotus ostreatus* in Korea

느타리버섯 해충 *Megaselia tamiladuensis* (버섯벼룩파리: 신칭) 보고

Heung Su Lee*, Kyu Chin Kim¹ and Bu Keun Chung

이흥수* · 김규진¹ · 정부근

Abstract - We found that the cultivated oyster mushroom, *Pleurotus ostreatus*, was damaged by the phorid fly, *Megaselia tamiladuensis* Disney (Diptera: Phoridae). This fly is newly recorded as a pest in Korea. Brief morphological characteristics are described.

Key Words - *Megaselia tamiladuensis* Disney, Phoridae, Mushroom-infesting fly, Mushroom, *Pleurotus ostreatus*

초 록 - 느타리버섯 재배시 발생하여 피해를 일으키는 버섯해충류에 대한 조사 중 국내미기록종인 *Megaselia tamiladuensis* Disney (신칭: 버섯벼룩파리)가 동정되었다. 본 종의 분류학적 위치 및 형태적 특징을 기술하였다.

검색어 - 버섯벼룩파리, 벼룩파리과, 버섯파리, 느타리버섯

Mushrooms are subject to a range of diseases and pests, which cause serious crop loss. The major insect pests of mushroom are sciarids, phorids (*Megaselia* spp.), and cecids (Steane, 1978; Rinker *et al.*, 1984; Scheepmaker *et al.*, 1996; White and Smith, 2000). Phorid flies are commonly found around decaying animal or vegetable matter and mushroom house, but they have been little investigated in Korea. In Korea, only two species of Phoridae, *Diplonevra bifasciata* and *Phora holosericea*, have been recorded (ESK and KSAE, 1994). They are generally small, hump-backed flies of a black, or brown color with inconspicuous antennae. Adults have a characteristically quick and jerky movement when walking. Damage by phorid larvae is caused by the consumption of mycelium (Rinker and

Snetsinger, 1984). In addition, adults of *Megaselia* sp. have been proven to transmit spores of mushroom disease such as *Verticillium fungicola* (White, 1981). The larvae of ten species of the genus *Megaselia* (Phoridae) including *Megaselia tamiladuensis* are known to attack *Pleurotus* spp. (Disney and Durska, 1999). Disney (1994) showed the genus *Megaselia* Rondani includes nearly 1,400 described species, but it has been estimated that the majority of the species remain to be described.

We found that the cultivated oyster mushroom, *Pleurotus ostreatus* was attacked by the larvae of phorid fly, *M. tamiladuensis* Disney for the first time in Korea. The larvae are mycelium and sporopore feeders. This paper presents the morphological features of the

*Corresponding author. E-mail: lhs6870@mail.knrda.go.kr

경남농업기술원 식물환경과 (Division of Plant Environment, Kyongnam Agricultural Research & Extension Services Jinju, 660-370, Republic of Korea)

¹ 전남대학교 농생물학과 (Department of Agriculture Biology, Chonnam National University, Kwangju 500-757, Republic of Korea)

phorid fly, *M. tamiladuensis* Disney.

Identification and Description

Samples of the adult phorids collected from the infested mushrooms, *Pleurotus ostreatus*, in Sachun, Kyeongnam, May 20, 1998 (H.S. Lee) were preserved in ethanol (75%) and were subsequently mounted on slides in polyvinyl alcohol (PVA). The larvae, pupae, and eggs, which were reared on the sawdust media with growing mycelium of *Pleurotus ostreatus*, were examined under a microscope (Nikon No. 84053). For identification of this species, we sent samples preserved in alcohol (75%) and slide mount to Dr. R.H.L. Disney, Department of Zoology, Cambridge U.K. This species was identified as *Megaselia tamiladuensis* Disney by R.H.L. Disney who described it as a new species (Mohan *et al.*, 1995). Both the genus and species is reported in Korea for the first time.

Systematics

Suborder Brachycera 짧은빨파리아목
 Superfamily Phoroidea 벼룩파리상과
 Family Phoridae 벼룩파리과
 Subfamily Metopininae
 Genus *Megaselia* Rondani
Megaselia tamiladuensis Disney
 (신칭: 버섯벼룩파리)

Genus *MEGASELIA* Rondani

MEGASELIA Rondani, 1856: 137. Type species: *Megaselia crassineura* Rondani, 1856 [= *Phora costalis* Roser, 1840], orig. des.

Megaselia tamiladuensis Disney

(신칭: 버섯벼룩파리)

Megaselia tamiladuensis Disney, 1995. Bull. Entomol. Res. 85: 515~518

(Holotype: ♂, INDIA, TamilNadu, Coimbatore, I. 1995, reared from *Pleurotus citrinopileatus*)

Adult flies measure about 3.13 mm (2.58~3.54 mm, ♂, Fig. 1A) to 3.28 mm (2.93~3.50 mm, ♀, Fig. 1B).

A dark species; with dark legs; vein 3 forked; costal section 1 clearly longer than sections 2+3; wing membrane almost colourless. Axillary ridge with two bristles, the inner being shorter and the outer being longer than costal cilia. Membrane only very lightly tinged grey. Wing length 1.40 mm (1.34~1.47 mm). Frons with dense microtrichia and 110~130 hairs. Both pairs of supra-antennal bristles robust, Third antennal segment subglobose with pale brown arista. The labrum pear shaped. Thorax brown, being darkest on scutellum and top of scutum. Each side of latter with a humeral bristle, Meso-pleuron bare. Abdomen with dark brown tergites with sparse short hairs, which are largely restricted to rear margins.

Female abdominal tergites not modified or reduced; Tergite 7 rectangular and longer than broad. Sternite 7 an elongate, irregular, narrow strip. The eggs are laid on the developing sporophores or tip of growing mushroom hyphae. Eggs are elongate, concave, smooth and opaque (Fig. 1C), measure about 0.26 mm (0.23~0.30 mm) length, 0.11 mm (0.09~0.14 mm) width. The larvae blunt on one end and pointed on the other with creamy white color (Fig. 1D), fed on the mycelium and spawn of mushroom, and also invade the stipe, gills and pileus of sporophores. As it's very difficult to rear this species larvae so we couldn't examined it well. Johal and Disney (1994) also reported that it's very difficult to rear these species larvae owing to infestation of rod-shaped bacteria. Many infected larvae pupariated but failed to pupate, as indicated by the failure of the respiratory horns to penetrate the eclosion plates of the puparium.

Pupariation takes place within the infested area of the mushroom bed. The pupae are 2.92 mm (2.18~3.34 mm) length and 1.04 mm (0.89~1.17 mm) width, being initially white with little detail visible, but gradually turning dark yellowish-brown and adult flies are visible through the pupal skin (Fig. 1E). Mohan *et al.* (1995) reported that from pupariation to adult eclosion took 6~9 days. From egg to adult took 13 to 18 days. The effect of yield of sporophores by infestation with *M. tamiladuensis* larvae were showed clear negative relationship. These results suggest that when mushroom beds suffering from rot exceed 3%, the yield is liable to be halved or more (Mohan *et al.*, 1995).

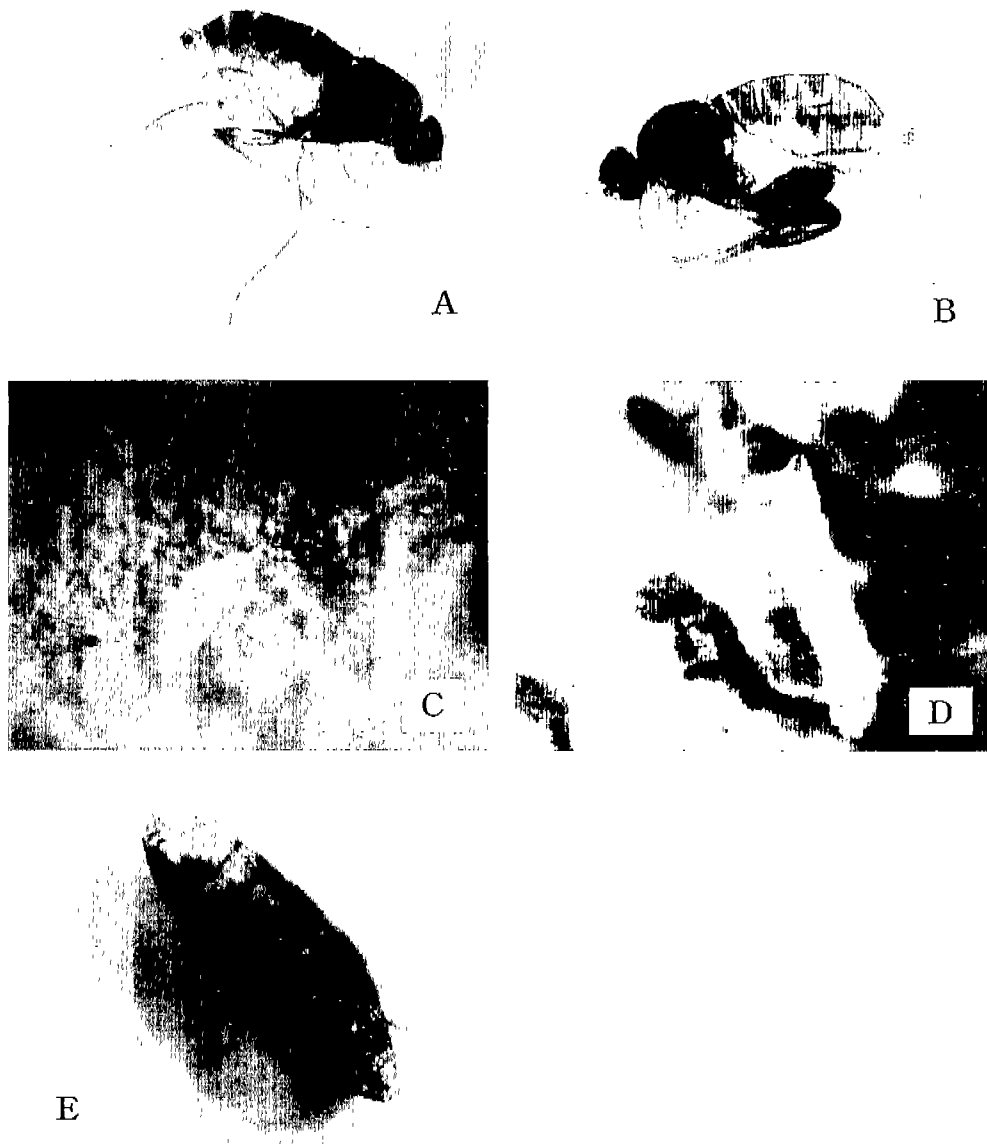


Fig. 1. *Megaselia tamiladuensis* Disney (A, Male; B, Female; C, Egg; D, Larva; E, Pupa).

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