

박제표본을 가해하는 옷좀나방에 대한 보고

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Rediscovery of *Tinea translucens* Meyrick (Lepidoptera: Tineidae) infesting the Stuffed Mammal in Korea

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ABSTRACT : The clothes moth, *Tinea translucens* Meyrick is reported for the first time from Korea, based on the specimens rearing the larvae. The larvae make silk-made case from the first instar and pupate in the case at mature stage. Photographs of adult, genitalia, informations of occurrence and distribution in Korea are provided. Also a brief biological informations for the species are given.

KEY WORDS : Clothes moth, Fabric pest, *Tinea translucens*, Tineidae, Lepidoptera, Korea

초 록 : 본 연구를 통해 국내기록은 있으나 정확한 발생현황이나 현재까지 증거표본의 소재가 불분명해왔던 옷좀나방(*Tinea translucens*)에 대한 분포가 확인되었다. 본 연구를 위해서 국내 주요 자연사박물관의 수장고로부터 채집한 유충을 사육하였으며, 우화한 성충으로부터 옷좀나방의 발생을 확인할 수 있었다. 유충은 포유류 박제의 털과 가죽을 먹고, 1령 때부터 견사로 만들어진 주머니(case)를 만들며 종령기에 그 안에서 용화한다. 성충의 도판, 생식기 도해 및 종의 발생현황과 분포에 대해 보고한다. 또한 생활사에 대해서도 간략히 소개한다.

검색어 : 옷좀나방, 박제, 곡식좀나방과, 나비목, 한국

Introduction

Tinea Linnaeus is distributed throughout the world of which about 80 species are named. The species of *Tinea* include the well-known cloths moths. Their larvae are generally keratophagous, capable of utilizing most forms of keratin as a foodstuff. It has been known they utilize the domestic and industrial materials, including the wool,

fur, feathers, leather, silk, fish-meal, hooves, and probably also horn (Robinson, 1979; Robinson and Nielsen, 1987, 1993). The biology of the members of the *Tinea pellionella* complex including *T. translucens* Meyrick has been reviewed in detail by Robinson (1979). The case-making clothes moth, *Tinea translucens* Meyrick is well-known as fabric pest distributed in the world. This species has been known as *T. pellionella* Linnaeus in Korea (Zool.

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Soc. Kor., 1968). Subsequently Park (1983, 1994) corrected *T. pellionella* to *T. translucens* as a misidentification, and the correction followed by Robinson (1979). But this correction is not based on the specimen or genitalia but based on the expectation that Japanese *translucens* are also distributed in Korea. Paik (1984) described in detail about the external morphology, damage, biology, and control of clothes moths.

In the present study, we found the larvae and adults of *T. translucens* Meyrick at storage of several museums in Korea. The larvae feed on hairs and skins of the stuffed mammals in Korea. The external and genital characteristics of adults and immature stages of this species are briefly redescribed, with brief biological information.

Materials and Methods

A total of 34 specimens (15♀, 10♂ of adults, 4 specimens of pupae, and 5 specimens of larvae) were used for this study. Fundamentally preparation of genitalia slides was used methods by Robinson (1976) and modified if necessary.

The larvae were collected in storage of a public museum, Gyeonggi-do, in the year 2003 for the first time. And then in the year 2006, we could collect same kind of the dead adults at temporary storage of the other public museum, metropolitan area, Korea. But we couldn't find same species in Ewha Womans University Natural History Museum, Seoul (EWNHM). The larvae were reared in plastic breeding cases (Fig. 8, about 25°C, dried condition) in the laboratory successively.

Taxonomic Accounts

Tinea translucens Meyrick, 1917 옷좀나방 (Figs. 1-27)

Tinea translucens Meyrick, 1917, Exot. Microl., 2: 78. Type locality: Pakistan; Moriuti, 1982, Moths of Japan, 1: 168, 2: 187, pl. 2: 7; Zagulyaev, 1982, Keys to the Insects of the European Part of USSR 4(2): 60-64, figs. 52: 6-7, 53: 10-13; Park, 1983, Illustrated Flora and Fauna of Korea 27(9): 554-555, 934, fig. 210; Park, 1994, Check list of Insects from Korea, p. 322.

Tinea metonella Pierce and Metcalfe, 1934, Entomologist, 67: 266. Type locality: Britain.

Tinea pellionella sensu Inoue (nec Linnaeus), 1954, Check List Lep. Japan, 1: 15; Issiki, 1957, Icon. Het. Jap. Col. Nat., 1: 16.

Tinea leonhardi Petersen, 1957, Beitr. Ent., 7: 146. Type locality: Yugoslavia.

Tinea margaritacea Gozmany, 1967, Ann. Mus. R. l'Afrique Cent. (Sci. Zool.), 157: 14. Type locality: Zaire.

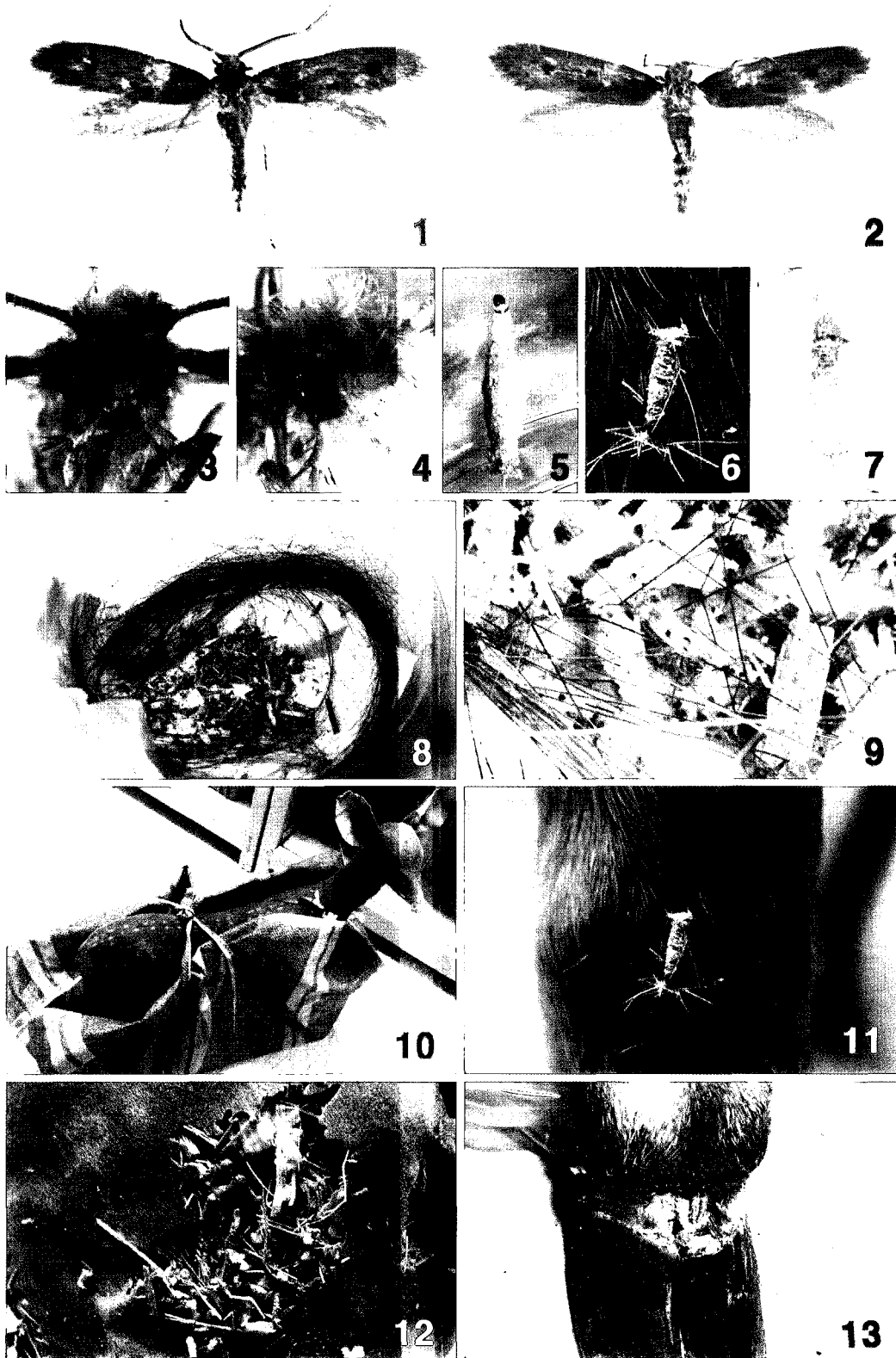
Tinea fortificata Gozmany, 1968, Act. Zool. Acad. Sci. Hung., 14: 302. Type locality: South Africa.

Adults (Figs. 1-4, 14, 15). Wingspan 8-13 mm in male, 8.5-11.5 mm in female. Head covered with light ochreous hairs. Labial palpus ochreous white, 2nd segment with about 15 blackish bristles. Antenna grayish dark brown, reaching to 3/4 length of costa of forewing. Thorax covered with light ochreous scales. Forewing ochreous, dark ochre at base, with three distinct black dots. Hindwing covered with whitish ochreous scales; fringe light ochreous, developed, more long at dorsal margin. Legs ochre, with fringe, spur formula 0-2-4. M_1 and M_2 on the forewing stalked near base in male, but separated in female; retinaculum hook-shaped, curved at apex. Hindwing M_1 and M_2 connate at base, but separate in female; frenulum with two bristles.

Male genitalia (Figs. 16-20). Uncus broad, triangle-shaped, with pointed apex. Gnathos concave; apex hooked toward outside. Valva narrow, with several long bristles on central area. Saccus elongate, 2 times as long as valva. Aedeagus elongate, cylindrical, with 6-7 short, fine spines at tip; vesica with a pair of blade-shaped cornuti.

Female genitalia (Figs. 21-24). Papilla analis pointed at apex. 8th sternite sclerotized, with deep, narrow V-shaped depression. Posterior region of antrum and 8th sternite with rhomboidal outline. Apophysis posterioris approximately 1.4 times as long as apophysis anterioris. Ductus bursae broad, long. Corpus bursae with two needle-shaped anterior-directed signa on circular sclerotized basal plate.

Pupa (Figs. 25-27). Length 4.8-5.7 mm, width 1.0-1.2

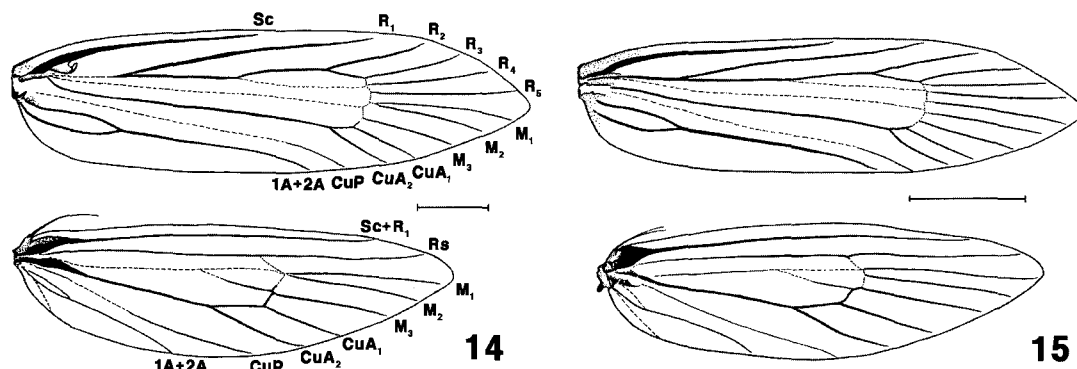


Figs. 1-13. Adults, Larvae, damages of *Tinea translucens*: 1. Male; 2. Female; 3. Head, frontal view (♀); 4. *ditto*, lateral view (♀); 5. Mature larvae bearing case; 6. Larvae at rest time; 7. Larval case and pupal case; 8. Breeding case; 9. Emerged adult (marked with red arrow); 10. Damaged deer; 11. Case on hair of nyala; 12. Damaged skin; 13. Damaged nyala's hoof.

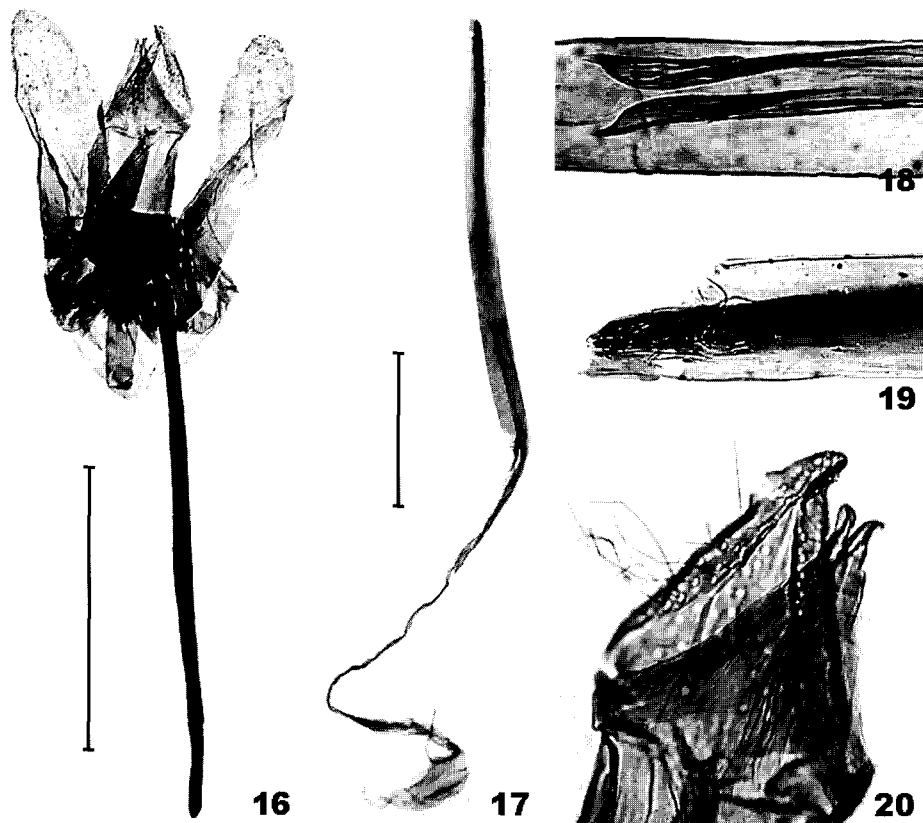
mm. Body pale yellow. Antenna shorter than hind leg, extending to half of 9th abdominal segment. Forewing extending to 2/3 of 7th abdominal segment. Foreleg about half of length of midleg. Hind leg extending beyond tip of antenna, reaching to half of 9th abdominal segment. Abdominal segments with six anterior bands of spines on 4th-9th segments dorsally, without posterior band of

spines. Anterior bands of spines are mostly hid and shows through on posterior margin of previous segment. 9th abdominal segment with two pointed caudal processes laterally.

Material examined. Adults: 13 ♀, 10 ♂, em. 16. VI. 2004-3. VII. 2004 and 21. XI. 2003, ex. hairs and skins



Figs. 14-15. Wing venations of *Tinea translucens*: 14. Male; 15. Female. <Scale bar = 1 mm>

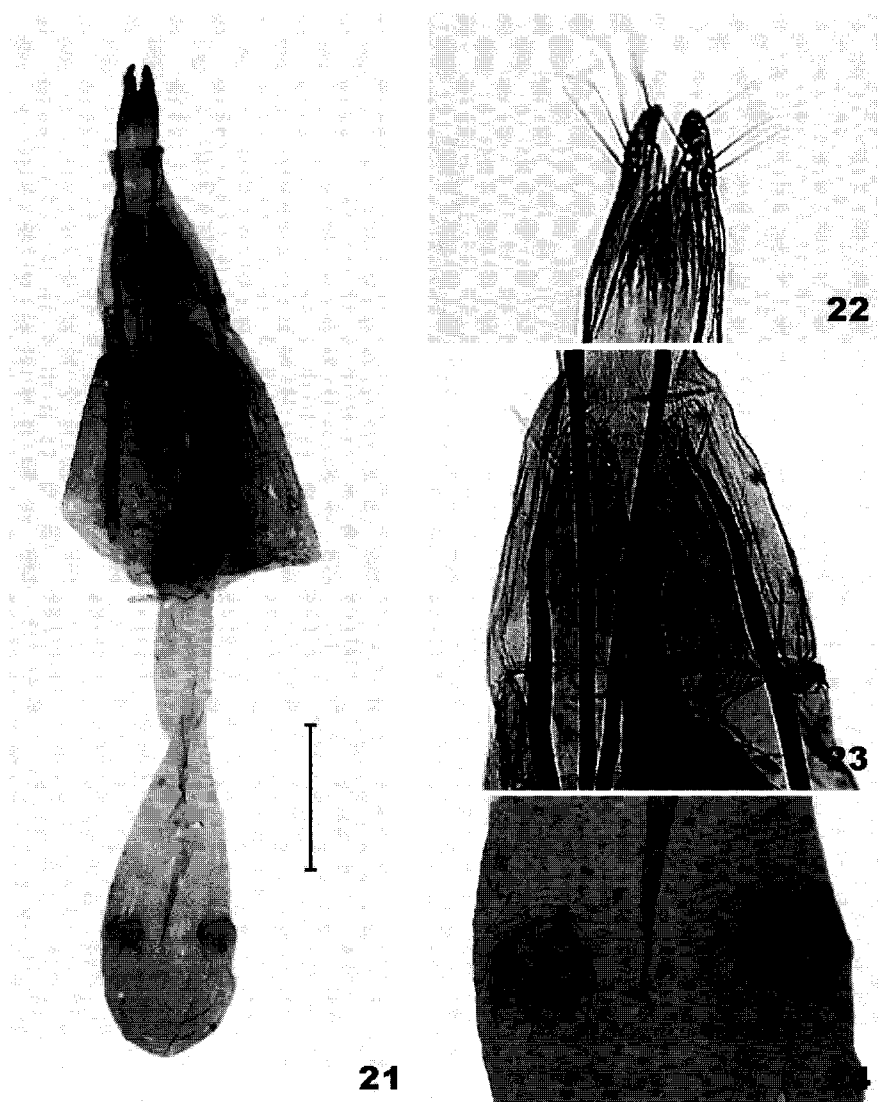


Figs. 16-20. Male genitalia of *Tinea translucens*: 16. whole genitalia (dorsal view); 17. aedeagus; 18. cornuti in vesica; 19. tip of aedeagus; 20. uncus and gnathos. <Scale bar = 0.5 mm>

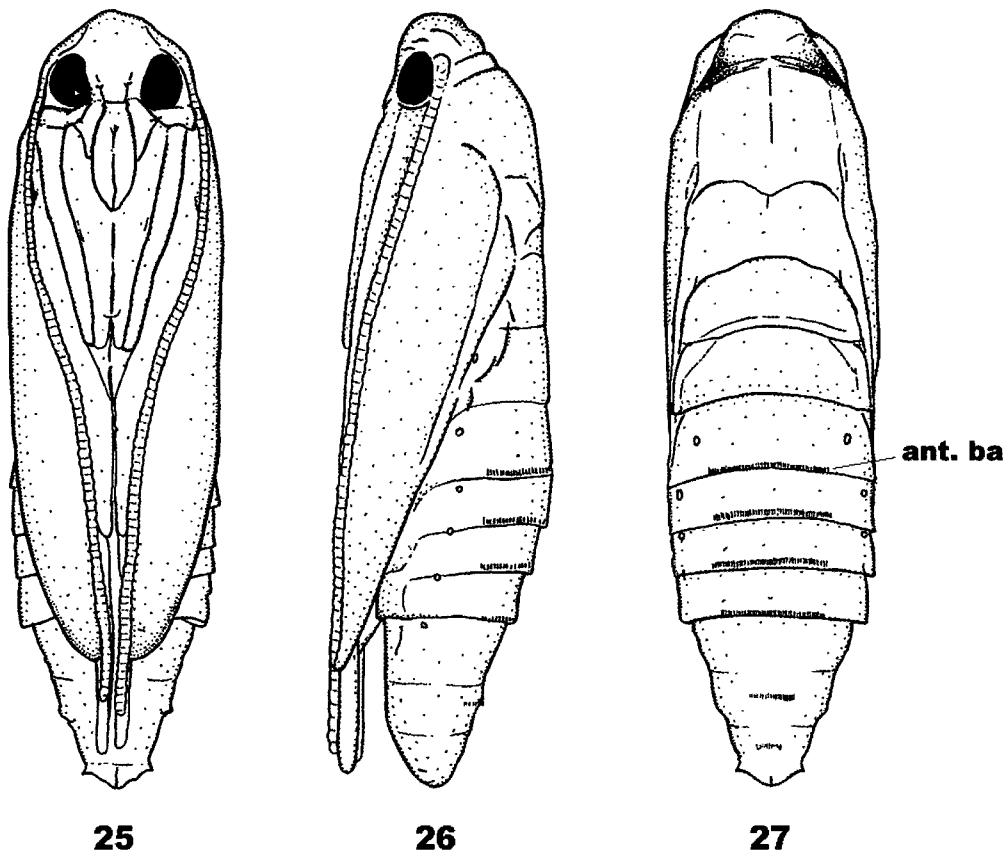
of nyala and deer, a stuffed mammal specimen in storage of one museum, Gyeonggi province (col. 2. XI. 2003, S. Kim), genitalia slide (male: UIB-61311, female: UIB-61421, UIB-61422, UIB-61423); 2 ♀, dead adults from stuffed mammals in temporary storage the other museum, ditto (col. 16. XII. 2005, S. Kim), genitalia slide (female: UIB-61424). Pupae: 4 exs., storage of public museum, ditto, fixed on 3. XI. 2003 in 70% ethyl alcohol (S. Kim). Larvae: 5 exs., storage of public museum, ditto, fixed on 12. XI. 2003 in 70% ethyl alcohol (S. Kim).

Damage and Biology (Figs. 8-13). The larvae of *T.*

translucens Meyrick feed the hair and skin of stuffed mammal specimen. And the young larvae feed dead adults of moths except on wings. Therefore specimens being found in damaged district are mostly incomplete and remained only wings. The 1st instar larvae make a tubular case with the silk and attached the frass or small fragments on the surface. The size of the case become larger with larval growing. At rest time, the larvae seal off the entrance of case and fix by using the silk (Figs. 5, 6). They can easily breed at the room temperature (about 25°C) and withstand at low relative humidity. The larvae pupate in the case. The pupa is protruded clear



Figs. 21-24. Female genitalia of *Tinea translucens*: 21. Whole genitalia; 22. Papilla analis; 23. Eighth sternite and antrum; 24. Signum. <Scale bar = 0.5 mm>



Figs. 25-27. Pupa of *Tinea translucens*: 25. Ventral view; 26. Lateral view; 27. Dorsal view. ant. ba= anterior band of spines.

for 1/2-3/4 of its length (Fig. 7). The adults emerged at midnight and like a dark place.

Recently we found the larvae of *T. translucens* from the storage of several museums in Korea, which keep constant temperature and humidity. Robinson (1979) stated that larvae of *translucens* developed satisfactorily at 21-32.5°C and died at temperatures outside this range, and also *translucens* is apparently common in the humid tropics. This species likes humid and warm conditions, but cannot live in cold condition. Also Robinson and Nielsen (1987) stated that case-making clothes moths (*Tinea* of the *pellionella*-group) occupy climate zones from subarctic to semi-desert and humid tropical. Through the rearing, we could confirm that *translucens* withstand well in dried condition except delaying their development. Robinson (1979) stated that there are no records of *translucens* being found (except as an adult) in non-domestic circumstances. We could not find the specimen

or report collected at outside of house or building in Korea.

Distribution

Korea (Gyeonggi-do), Japan, England, Germany, Austria, Sicily, S. Russia, Afghanistan, Tunisia, Egypt, Pakistan, India, Kashmir, Sri Lanka, Rhodesia, South Africa, U.S.A., Chile.

Remarks

Tinea translucens has been known as distributed in Korea. But the information for the species, including distribution, biology, and damage has not been available in Korea until now, due to not enough material data. The venation of this species is strongly variable in the specimens of Korea, Japan, and England. Korean species is different from the latter by following table:

	Korea (present study)	Japan (Moriuti, 1982)	England (Robinson, 1979)
Male			
Forewing	M ₁ and M ₂ stalked near base	All veins separate	All veins separate or M ₂ divided into two branches near terminal margin, M ₃ and CuA ₁ short-stalked
Hindwing	M ₁ and M ₂ connate	All veins separate	All veins separate
Female			
Forewing	All veins separate	-	R ₄ and R ₅ short-stalked, M ₃ and CuA ₁ stalked at middle
Hindwing			Rs divided into two branches near costa

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