

## Notes on Three Species of the Laboulbeniales (Ascomycotina) Newly Collected from Korea

Yong-Bo Lee\* and Young-Hee Na

\*Department of Biology, College of Education, Chosun University, Kwangju 501-753, Korea  
Department of Environmental Landscape Architecture, College of Naju, Naju 523-930, Korea

### 한국산 총생자낭균류의 미기록종에 관하여

이용보\* · 나영희

\*조선대학교 생물교육학과, 나주대학 환경조경과

**ABSTRACT:** Three species belong to the genus *Laboulbenia* were collected on Carabidae (Coleoptera) and Harpalidae (Coleoptera) from several regions of Korea. *Laboulbenia anoplogeni* Thaxter was collected from *Stenolophus quinquepustulatus* Widemann. The characters of this species are the fourth layer of receptacle consisted of two or three cells and the distal end of its posterior cell projecting upward. The thalli were produced on posterior and anterior legs of the hosts. *Laboulbenia habui* Terada was collected from *Chlaenius variicornis* Bates. This species is characterized by the basal cells of the secondary appendage composed of short-cylindrical cells, arranged alternately on a double row. The thalli were produced from the elytra and anterior abdomen of the hosts. *Laboulbenia pallida* Thaxter was collected from *Anisodactylus signatus* Panzer. This species is distinguished from other related species by the rounded tip of perithecium and the outer appendage branched on the basal cell. The thalli were produced on the posterior elytra of the hosts.

**KEYWORDS:** *Laboulbenia*, Laboulbeniales, Ascomycotina, Coleoptera

### Descriptions of Species

1. *Laboulbenia anoplogeni* Thaxter, Proc. Amer. Acad. Ants Sci 35: 156. 1899 et Mem. Amer. Acad. Arts Sci 13: 348. 1908; Sugiyama, Ginkgoana 2: 42. 1973; Balazuc, Bull. Soc. Linn. Lyon 43: 12. 1974; Sugiyama & Phanichapol, Not. Hist. Bull. Siam Soc. 31(2): 71. 1984. (Fig. 1: 1 & 6).

Thallus suffused with yellowish or blackish brown, consisting of a receptacle and perithecium. Total length to the top of perithecium 275~289  $\mu\text{m}$ . The thickest portion of the thallus 85~89  $\mu\text{m}$ . Receptacle comprising receptacle proper and distal two appendages; receptacle proper 207~222  $\mu\text{m}$  long, 35~41  $\mu\text{m}$  thick; each layer one-celled except for the fourth one; basal two layers forming a stalk of thallus; the stalk stright, thickest at the distal end, gradually tapering toward the basal blackish obconical foot; the first layer 56~60  $\mu\text{m}$  long, 21~25  $\mu\text{m}$  thick; the second layer more or less thicker than the first ones, 56~63  $\mu\text{m}$  long, 29~37  $\mu\text{m}$  thick; the third layer about twice as long as thick, 47~57  $\mu\text{m}$  long, 30  $\mu\text{m}$  thick; the fourth layer composed of two or three cells arranged antero-posteriorly;

the distal end of the posterior cell projecting upwards; insertion cell blackish, band-shaped, forming a constricted part of the receptacle, 7~8  $\mu\text{m}$  long, 17~18  $\mu\text{m}$  thick; distal appendages of receptacle placed above the insertion cell, arranged inner-outerly; the inner appendage dichotomous, forming lateral antheridia; the outer appendage branched once or twice above the basal cell.

Perithecium composed of a stalk and perithecium proper; the stalk consisting of a large basal cell and a few small distal cells; the basal cell 43~50  $\mu\text{m}$  long, 27~30  $\mu\text{m}$  thick, formed on the anterior side of the second layer of the receptacle proper, separated from it by an oblique septum, united to the third layer of receptacle proper in lateral side; perithecium proper ellipsoidal, softly constricted and blackened at subapical portion, about a half of perithecium free from the receptacle proper, 101~118  $\mu\text{m}$  long, 48~60  $\mu\text{m}$  thick.

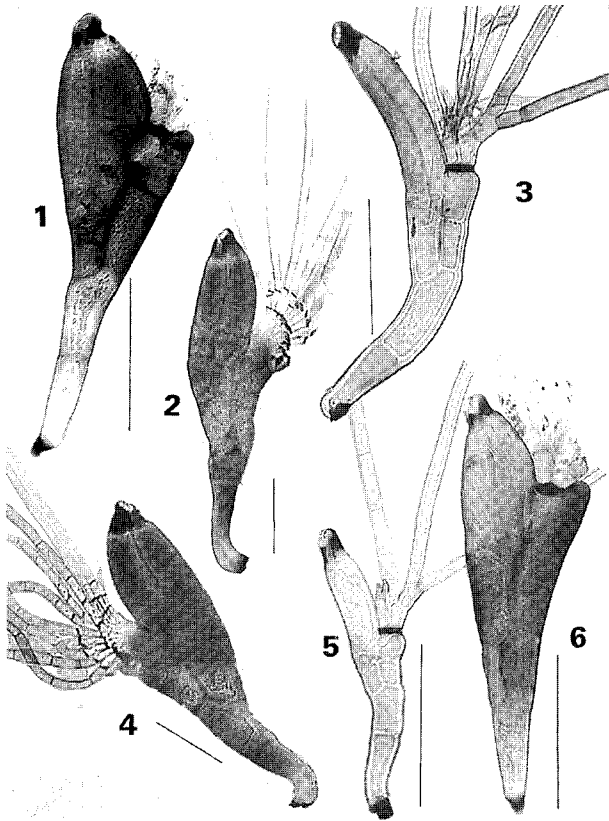
Host genera: *Abacetes*, *Agonoderus*, *Anoplogeni* and *Stenolophus*. (Carabidae, Coleoptera).

Host species in Korea: *Stenolophus quinquepustulatus* Widemann.

Distribution: Madagascar, Ceylon, Formosa, India, Japan, Thailand, U.S.A and Korea (new record).

Specimens examined: Shiheungri, Sungsanub, Cheju Island,

\*Corresponding author <E-mail: yblee@mail.chasun.ac.kr>



**Fig. 1.** 1 & 6: *Laboulbenia anoplogenii* Thaxter on *Stenolophus quinquepustulatus* Widemann. 2 & 4: *Laboulbenia habui* Terada on *Chlaenius variicornis* Bates. 3 & 5: *Laboulbenia pallida* Thaxter on *Anisodactylus signatus* Panzer. Scales: 100  $\mu\text{m}$ .

July 13, 1997. L-Y-1417 and 1418.

There are some taxonomic problems between *L. anoplogenii* and *L. stenolophi* Spegazzini when we identify them. Terada (1976) identified as *L. stenolophi* Spegazzini a fungus form occurring on *Stenolophus quinquepustulatus* Wiedemann taken in Taiwan and Balazuc (1974) identified as *L. anoplogenii* on *Stenolophus mixtus* (Herbst) in France. According to their monographs, above two species were considered to be a same species in forms of thalli. In the specimen of Terada, the fourth layer of receptacle consists of only two cells, while in those of Balazuc, it consists of three-cells. The author collected two kinds of specimens mentioned previously in a same individual host. These specimens coincided with *L. anoplogenii* in monograph of Thaxter (1899). The present author concluded these specimens as *L. anoplogenii*.

**2. *Laboulbenia habui* Terada, Mycoscience 37: 308. 1996. (Fig. 1: 2 & 4).**

Total length to the top of perithecium 369~501  $\mu\text{m}$  long; yellowish opaque brown or yellowish gray brown. Receptacle yellowish gray brown, consisting of the basal portion and appendages; the basal portion cylindrical, composed

of three basal one-celled layers and distal many-celled layers; the first and second layers forming a stalk, the stalk tapering toward the base, forming basally a blackish conical foot; the first layer slightly pale at base, abruptly curved near base, 98~121  $\mu\text{m}$  long, 33~48  $\mu\text{m}$  thick; the second layer shorter than the first layer, 64~92  $\mu\text{m}$  long, 42~61  $\mu\text{m}$  thick, the third layer short-oblong in optical section, shorter than the second layer, 39~55  $\mu\text{m}$  long, 29~45  $\mu\text{m}$  thick; the distal layers composed of 6~7 small cells arranged in a transverse series, decreasing in size from below to upward between insertion cell and perithecial base; appendages composed of primary and secondary ones, 320~624  $\mu\text{m}$  long; the primary appendage produced on small, hyaline, triangular insertion cell; the secondary appendages arising in double row from oblique series of cell consisting of short-cylindrical basal cells; each of appendages branched once or twice from base, more or less constricted at septa; lower septa blackened and often oblique. Antheridia persistent, flask-shaped, tufted, 25~30  $\mu\text{m}$  long, situated on dichotomous or trichotomous branchlets.

Perithecium yellowish brown, becoming blackish brown with age, elliptical, four fifth of perithecium free from the receptacle, 160~229  $\mu\text{m}$  long, 76~98  $\mu\text{m}$  thick; apical part of perithecium narrowed and projecting, sometimes broad; basal cell of perithecial stalk larger than the third layer of receptacle, situated nearly beside the third layer of receptacle. Ascospores hyaline, subfusiform, 1-septate, 64~80  $\mu\text{m}$  long, 6~8  $\mu\text{m}$  thick.

Host genus: *Chlaenius* (Carabidae, Coleoptera).

Host species in Korea: *Chlaenius variicornis* Bates.

Distributions: Japan and Korea (new record)

Specimens examined: Kwangneung, Kyeonggi Prov., July 13, 1995. L-Y-1206, 1207, 1208, 1209, 1210, 1212, 1226, 1227, 1228, 1230, 1231 and 1232

This species is near to *L. fasciculata* Peyritsch (Terada, 1996), but differs in the following characters: the basal cells of the secondary appendages of *L. habui* are short-cylindrical and alternately arranged on a double row, whereas in *L. fasciculata* those cells are more or less cubical and arranged in a single row. The specimens were collected from the elytra and anterior abdomen of hosts.

**3. *Laboulbenia pallida* Thaxter, Proc. Acad. Arts Sci. 35: 193. 1899; Mem. Amer. Acad. Arts Sci. 13(6): 340. 1908. (Fig. 1: 3 & 5).**

Total length to the top of perithecium 191  $\mu\text{m}$ . Receptacle hyaline, yellowish, composed of the basal and distal portions; the basal portion cylindrical, composed of four layers and insertion cell, 109  $\mu\text{m}$  long, 22  $\mu\text{m}$  thick, all layers one-celled except for the fourth one; the first layer large and broad, longer than the second layer, 41  $\mu\text{m}$  long, 19  $\mu\text{m}$  thick; the second layer 30  $\mu\text{m}$  long, 22  $\mu\text{m}$  thick;

the third layer parallel with the basal cell of the perithecial stalk, similar in shape and size, 16  $\mu\text{m}$  long, 14  $\mu\text{m}$  thick; the fourth layer consisting of two cells arranged antero-posteriorly; the inner cell smaller, subtriangular, 9  $\mu\text{m}$  long, 8  $\mu\text{m}$  thick; the outer cell inflated posteriorly, 19  $\mu\text{m}$  long, 16  $\mu\text{m}$  thick; the insertion cell blackish, 5  $\mu\text{m}$  long, 15  $\mu\text{m}$  thick; the distal portion of receptacle consisting of two appendages; the inner appendage consisting of a basal cell much smaller than that of the outer one, bearing one or two branches which may be short or elongate; the outer appendage consisting of a large, pentagon basal cell, distally enlarged, producing two branches arranged antero-posteriorly; the inner branch simple; the outer branch once branched on the subbasal cell, very elongated and attenuated, 348~578  $\mu\text{m}$  long.

Perithecium composed of a stalk and perithecium proper; perithecium proper cylindrical, slightly blackish yellow, 84  $\mu\text{m}$  long, 23  $\mu\text{m}$  thick, nearly free from the receptacle, with subapical dark spots; posterior lips rounded, protruding; the stalk composed of a large basal cell and a few cells; the basal cell similar to the third layer (cell) in shape and size.

Host genera: *Harpalus* and *Anisodactylus* (new record) (Harpalidae, Coleoptera).

Host species in Korea: *Anisodactylus signatus* Panzer.

Distribution: Java and Korea (new record).

Specimens examined: Mt. Halla, Youngsil, Cheju Island, July 13, 1997. L-Y-1447 and 1448.

According to Thaxter's description, this species was collected from a *carabid* allied to *Harpalus*. The present species was collected from *Anisodactylus signatus*. This species is very closely related to *Laboulbenia lepida* Thaxter and *L. melanaria* Thaxter, but differs in the following features: the tip of perithecium of the former consists of angles, while it is rounded in *L. pallida*. The outer appendage of the latter is branched on the subbasal cell, while it is branched on the basal cell in *L. pallida*. The thalli were produced on the posterior elytra of host.

## 적 요

본 연구는 우리나라에서 총생자낭균류의 자원을 발굴하

고, 동정하여 새로운 생물자원을 확보하기 위하여 1996년 10월부터 1997년 9월까지 연구한 결과이다. 현재까지 우리나라의 총생자낭균류는 16속 59종이 기록되어 있으며, 본 연구를 통하여 동정된 총생자낭균류의 미기록 3종을 다음과 같이 보고하고자 한다.

*Laboulbenia anoplogenii* Thaxter는 *Stenolophus quinquepustulatus* Widemann으로부터 발견되었다. 이 균체의 특징은 탁의 4번층의 세포수가 2~3개로 되어 있으며, 상부를 향하여 돌출하고 있다. *Laboulbenia habui* Terada는 *Chlaenius variicornis* Bates에서 채집되었다. 이 종의 특징은 2차 부속지의 기부세포들이 교대로 2열로 배열된 짧은 원통형으로 되어있다. *Laboulbenia pallida* Thaxter는 *Anisodactylus signatus* Panzer에서 채집되었다. 이 종은 *Harpalus* sp.에서 발견되어 왔지만, *Anisodactylus signatus* Panzer에서는 처음으로 발견되었다. 이 종의 특징은 자낭각의 정단부가 둥글며, 외부속지는 기부세포에서 가지쳐 있다. 본 연구로 우리나라의 총생자낭균류는 16속 62종이 기록된다.

## 감사의 글

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