

Study on the Laboulbeniales (Ascomycetes) of Taiwan (III)

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ABSTRACT

Five species of Laboulbeniales (Ascomycetes), namely *Laboulbenia aristata* Thaxter, *L. flagellata* Peyritsch, *L. japonica* Thaxter, *L. polyphaga* Thaxter, *L. vulgaris* Peyritsch are identified and illustrated. Among these *L. japonica* and *L. polyphaga* are described as new records from Taiwan.

Key words: *Laboulbenia*, Laboulbeniales, Taiwan.

Introduction

The Laboulbeniales (Ascomycetes) are widely distributed throughout the world and are especially abundant in tropical regions. Members of the Laboulbeniales are known as the perithecial obligate exoparasites of Arthropoda. The genus *Laboulbenia* is composed of many species and varieties, the receptacle normally possessing two cells below the third layer and the phialides (antheridium) are chiefly borne on branches of the inner appendages (Tavares, 1985). This paper is a report of our continuous current works (Juan and Chien, 1994, 1995 & 1996).

Materials and Methods

All insect specimens were examined by a binocular dissecting microscope. Their thalli on the body of insects were removed by a watch makers-needle and mounted on slide by adding a drop of glycerol lacto-phenol plus cotton blue for preparation. All specimens and permanent slides are deposited in the Mycological Collections, Department of Biology, National Taiwan Normal University, Taipei, Taiwan, R.O.C.

Results and Discussion

Key to the species of *Laboulbenia*

1. The fifth layer of the receptacle distinctly blackened
 2. Posterior branch of the receptacle usually simple
 3. Perithecium with bulbous tip.....*L. aristata*
 3. Perithecium without bulbous tip
 4. Posterior branch of the receptacle branched at the third or upper cell.....*L. vulgaris*
 4. Posterior branch of the receptacle branched at the second cell.....*L. polyphaga*
 2. Posterior branch of the receptacle branched.....*L. flagellata*
1. The fifth layer of the receptacle concolorous with the thallus, perithecium opaque, wholly blackish.....*L. japonica*

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Laboulbenia aristata Thaxter, Mem. Amer. Acad. Arts & Sci. 13:379, 1908; Terada, Trans. Mycol. Soc. Japan 17:27, 1976. (Figure 4)

Ascoma monoecious, total length 171 μ m. Receptacle consisting of five layers of cells; all layers one-celled except the fourth one, the first layer 45 \times 9-15 μ m, the second layer 33 \times 15-27 μ m, the third layer 21 \times 9-12 μ m, the fourth layer composed of two cells, arranged in antero-posteriorly 27 \times 15-18 μ m, the fifth layer flat and blackish 3 \times 9 μ m. Appendage with anterior (inner) and posterior(outer) branch 135 \times 9 μ m. Outer branch is simple and single, bent towards perithecium, the basal cell more twice longer than broad, inner branch consisting of a small basal cell which bearing a terminal simple type of antheridium. Perithecium straight and less than one half free from the receptacle, the tip well distinguished by rounded and blackish lip-cells, 84 \times 24 μ m.

Host: *Colpodes* sp. (Coleoptera; Carabidae); on the dorsal throax of the host.

Specimens examined : Wulai, Taipei County; JLY-154, Apr. 9, 1995.

Distribution : East Indies, Taiwan.

Note : The fungus is well characterized by simple outer appendage and by the bulbous tip of the perithecium.

Laboulbenia flagellata Peyritsch, sitzungsber. Kais. Akad. Wissensch. Math-Naturwissensch. Klasse 68:247, 1873; Sugiyama, Ginkgoana 2:51, 1973; Lee, Kor. J. Mycol. 9(4):184, 1981. (Figure 1 & 2)

Ascoma monoecious, total length 230 μ m. Receptacle consisting of five layers of cells; all layers one-celled except the fourth one, the first layer 48 \times 18 μ m, the second layer 60 \times 18 μ m, the third layer 30 \times 9 μ m, the fourth layer composed of two cells arranged antero-posteriorly 24 \times 9 μ m, the fifth layer flat, blackish. Appendage consisting of two hyaline filamentous branches 120 μ m long; branches dichotomous, the posterior branch first branched at the distal end of the second cell, similar to the anterior one. Perithecium proper cylindrical, 180 \times 18-36 μ m, tapering towards the apex, more or

less inflated laterally, united to the receptacle on lateral side of the basal one third, the apex more or less projecting, blackened.

Host: *Colpodes* sp. (Coleoptera; Carabidae); on the elytra of the host.

Specimens examined : Kuanwu, Hsinchu county; JLY-44, June 27, 1993; Mucha, Taipei metropolitan, JLY-172, Mar. 23, 1995.

Distribution : Africa, Australia, Europe, China, Japan, Korea, New Zealand, North and South America, Taiwan.

Note : This species is characterized by the pale thalli, equal-sized basal cells of the inner and outer appendages; the appendages are usually highly branched. Numerous variations of this species were found on members of Carabidae of the world.

Laboulbenia japonica Thaxter, Mem. Amer. Acad. Arts & Sci. 13:365, 1908; Sugiyama, Ginkgoana 2:54, 1973 (Figure 5)

Ascoma monoecious, total length 300 μ m long. Receptacle consisting of five layers of cells; each layer one-celled except the fourth one is two-celled, the first layer hyaline, forming basally a blackish foot, the second layer to the fifth one are too blackish to observe. Appendage with fine dichotomous branchlets, 195 μ m. Perithecium proper 138 \times 72 μ m, entirely blackish, cylindrical with blunt apex, often inflated laterally and egg-shaped.

Host : *Brachinus* sp. (Coleoptera; Carabidae); on the legs of the host. The host contains another two species of *Laboulbenia*, namely *L. fasciculata* Peyr. and *L. rougetii* Mont. et Robin.

Specimens examined : Wulai, Taipei county, JLY-183, May. 19, 1996.

Distribution : Japan, Taiwan.

Note : The fungus is characterized by the short receptacle and finely divided dichotomous branches of the receptacle. This species is apparently allied to *L. pusilla* Thaxter and *L. orientalis* Thaxter, because they have similar branches of receptacles. However, it is easily distinguished from *L. pusilla* Thaxter and *L. orientalis* Thaxter by the wholly blackish perithecium.

Laboulbenia polyphaga Thaxter, Mem. Amer. Acad. Arts Sci 13:342, 1908; Sugiyama, Ginkgoana 2:59, 1973; Lee, Kor. J. Plant Tax. 16(2):139, 1986 (Figure 6)

Ascoma monoecious, total length 270-315 μm . Receptacle consisting of five layers of cells; all layers are one-celled except the fourth one; the first layer 60-75 \times 15-21 μm ; the second layer 39-66 \times 27-30 μm , the third layer 45-48 \times 15-21 μm , the fourth layer composed of two cells, arranged in antero-posteriorly, 33-42 \times 18-21 μm ; the fifth layer flat and blackish, 6 \times 15-18 μm . Appendage with anterior (inner) and posterior (outer) branches 420 μm , the outer branch simple and single or branched, the inner branch short and dichotomous. Perithecium cylindrical, 120-183 \times 45 μm .

Host : *Harpalus* sp. and *Bembidion* sp. (Coleoptera, Carabidae); on the elytra of the host.

Specimens examined : Herbarium of specimen, Mucha, Taipei metropolitan, JLY-144, Mar. 23, 1985; Pingshi, Taipei county, JLY-158, Apr. 13, 1995.

Distribution : Cosmopolitan.

Note : The fungus is characterized by the long and simple posterior branch of the receptacle and the branched short anterior branch.

Laboulbenia vulgaris Peyritsch, Sitzungsber. Kais. Akad. Wissensch. Math-Naturwissensch. Klasse 68:245, 1873; Thaxter, Mem. Amer. Acad. Arts Sci. 12:318, 1896; Terada, Trans. mycol. Soc. Japan 19:59, 1978 (Figure 3)

Ascoma monoecious, total length 255-315 μm . Receptacle consisting of five layers of cells; all layers are one-celled except the fourth one, the first layer 60 \times 21-30 μm , the second layer 48-78 \times 27-33 μm , the third layer 18-21 \times 15-18 μm , the fourth layer composed of two cells, arranged in antero-posteriorly, 21-24 \times 24-27 μm , the fifth layer flat and blackish 9 \times 15 μm . Appendage with anterior (inner) and posterior (outer) branches 120 μm , the outer branch simple or branched, the inner branch usually shorter than the outer one. Perithecium elliptical, 120-150 \times 36-45 μm . Ascospore bicellular, 96 \times 6 μm .

Host : *Bembidion* sp. (Coleoptera, Carabidae); on the elytra of the host.

Specimens examined : Pingshi, Taipei county, JLY-157, Apr. 13, 1995.

Distribution : Cosmopolitan.

Note : The main character of this species is the blackish perithecium and blackish upper portion of the receptacle.

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References

- Juan, L.Y. and C.Y. Chien. 1994. Study on the Laboulbeniales (Ascomycetes) of Taiwan: Five New Record Species. *Biol. Bull. NTNU*. 29(2):71-78.
- Juan, L.Y. and C.Y. Chien. 1995. Study on the Laboulbeniales (Ascomycetes) of Taiwan. *Biol. Bull. NTNU*. 30(1):11-22.
- Juan, L.Y. and C.Y. Chien. 1996. Study on the Laboulbeniales (Ascomycetes) of Taiwan (II). *Biol. Bull. NTNU*. 31(1):5-11.
- Lee, Y. B., and J. Y. Lee. 1981. Studies on the Laboulbeniomycetes in Korea (I). *Kor. J. Mycol.* 9(4):177-192.
- Lee, Y. B. 1986. Taxonomy and geographical distribution of the Laboulbeniales in Asia. *Kor. J. Plant Tax.* 16(2):89-185.
- Peyritsch, J. 1873. Beiträge zur Kenntnis der Laboulbenien. *Sitzungsber. Kaiserl. Akad. Wissensch. Math-naturwissensch. Klasse* 68(1): 227-254.
- Sugiyama, K. 1973. Species and genera of Laboulbeniales (Ascomycetes) in Japan. *Ginkgoana* 2:1-97.
- Tavares, I. I. 1985. Laboulbeniales (Fungi, Ascomycetes). *Mycol. Memoir.* 9. J. Cramer, Germany.

Terada, K. 1976. Some species of the Laboulbeniales from Taiwan. *Trans. Mycol. Soc. Japan.* 17:23-34.

Terada, K. 1978. Additions to the Laboulbeniales of Taiwan, with descriptions of two new species. *Trans. Mycol. Soc. Japan.* 19:55-64

Thaxter, R. 1896. Contribution towards a monograph of the Labouleniaceae. *Mem. Amer. Acad. Arts Sci.* 12:187-429.

Thaxter, R. 1908. Contribution towards a monograph of the Labouleniaceae. Part II. *Mem. Am. Acad. Arts Sci.* 13:217-469.

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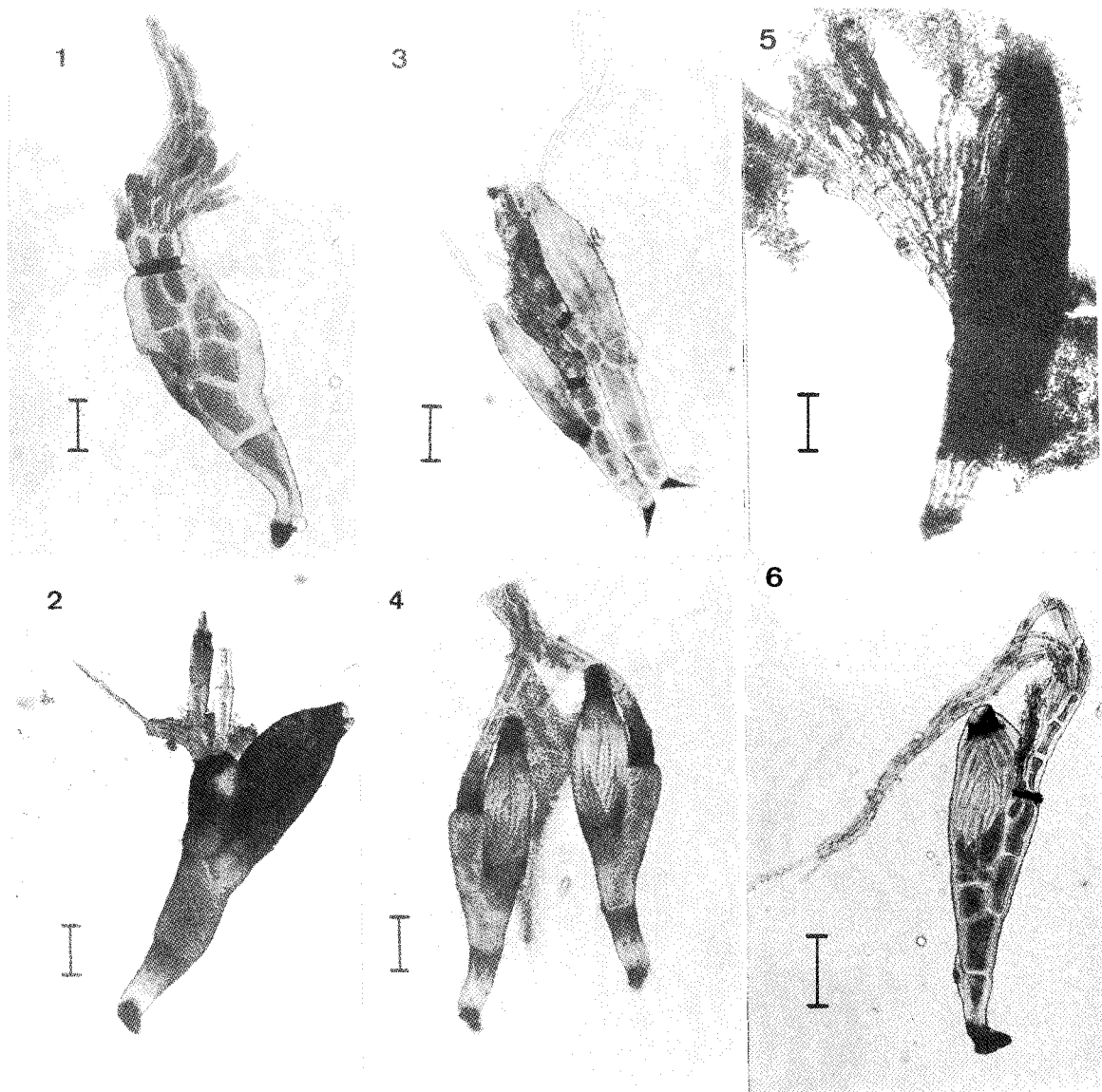


Figure 1. & 2. *Laboulbenia flagellata* Peyritsch.(bar=25 μ m)

Figure 3. *Laboulbenia vulgaris* Peyritsch.(bar=50 μ m)

Figure 4. *Laboulbenia aristata* Thaxter.(bar=25 μ m)

Figure 5. *Laboulbenia japonica* Thaxter.(bar=50 μ m)

Figure 6. *Laboulbenia polyphaga* Thaxter.(bar=50 μ m)

臺灣產蟲囊真菌研究(III)

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摘 要

本文報導, *Laboulbenia aristata* Thaxter、*L. flagellata* Peyritsch、*L. japonica* Thaxter、*L. polyphaga* Thaxter 及 *L. vulgaris* Peyritsch 等五種蟲囊菌鑑定並做形態及分類學上的記述。其中 *L. japonica* 和 *L. polyphaga* 為臺灣新記錄種類。

關鍵詞：蟲囊菌屬(*Laboulbenia*), 蟲囊菌目(Laboulbeniales), 臺灣