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Notes on the genus *Brachiosphaera* from Taiwan

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Abstract. Two species of the genus *Brachiosphaera*, *B. tropicalis* and *B. jamaicensis*, newly found in Taiwan, are described and illustrated. *B. jamaicensis* was cultured to sporulation in the laboratory.

Keywords: *Brachiosphaera*; Taiwan.

In our study of freshwater hyphomycete fungi we have encountered fungal spores consisting of a large spherical body with several radiate, erect arms in materials collected at Wulai, Taipei county. These spores readily germinated on a water agar plate when incubated at 15 to 25 °C, and pure cultures were obtained. This fungus was identified as *Brachiosphaera tropicalis* Nawawi. We later encountered another species of *Brachiosphaera, B. jamaicensis* (Crane & Dumont) Nawawi, which was observed growing and sporulating on unidentifiable twigs collected from a stream at Inhotong, Taipei county and from a stream at Fusan Forest Branch Station, Ilan county. Both species of fungi are newly found in Taiwan. *Brachiosphaera* is a genus erected by Nawawi in Descals et al. (1976) with *B. tropicalis* as its type, from material collected in Malaysia. This fungus has in the past been mistaken for *Actinospora megalospora* — Goos (1970) reported the collection of this fungus in Hawaii, but named it *Actinospora megalospora* Ingold. Ingold (1974) reported finding it in material from Swaziland, and Miura (1973) in material from Japan. *Actinospora megalospora* is distributed more widely than *B. tropicalis*. Descals et al. (1976) suspected that *Actinospora* is temperate in distribution while *Brachiosphaera* is more common in tropical regions. I describe the isolation, growth, and development of isolates of *B. tropicalis* and *B. jamaicensis*.

Brachiosphaera tropicalis Nawawi in Descals, Nawawi, and Webster, Trans. Brit. Mycol. Soc. **67:** 213. 1976. (Fig. 1, A, B, C, and D)

Colonies effuse, mycelia mostly submerged in culture media (such as half-strength cornmeal agar and water agar). Hyaline at first, turning olivaceous brown when aged. Hyphae varying in width, septate. A few segments of hyphae becoming slightly constricted at septa, and cells enlarged to ellipsoidal or round-shaped conidia in a cluster (Fig. 1, D). Spherical central body of conidium 44–58 μm diameter, conidial arms, mostly 4–5, 82–120 μm, 1–4 septa, mostly 2 for those produced on natural substrates. Central bodies produced on weak cornmeal agar plates covered with water were 35–40μm diameter. Conidia frequently formed chains in half-strength cornmeal agar and in water agar (Fig. 1, C).

Habit. Saprophytic

Specimen examined. Isolate WL0604 (4 June and 10 June, 1986. Wulai, Taipei county)

Conidia of *B. tropicalis* were found in scum and on wet decaying wood collected from a stream at Wulai, Taipei county. Conidia were spread, together with other aquatic hyphomycetous fungal spores, on water agar plate. Using a fine, glass needle, spores of *B. tropicalis* were moved one by one to a separate plate and incubated at 15 °C. After the spores germinated, they were individually transferred to a half-strength cornmeal agar plate to secure a pure culture. Cultures were then transferred onto 2% water agar tube slants. All stock cultures were incubated in a 4 °C incubator and transfered annually.

To examine spore formation, a 2-mm agar block was inoculated in the center of a 6-cm water agar plate and a 6-cm half-strength cornmeal agar plate. All culture plates were incubated for 2 weeks at 25 °C, by which time colonies reached about 3-cm diameter. Two 0.3 x 2.0-cm strips of agar were removed from each colony to make two trenches 2 cm apart on each plate. The mycelial agar strips were cut into 0.3 x 0.3 cm blocks and transferred to a new plate. The new and the old plates were covered with autoclaved distilled water and incubated at 25 °C under cool-white fluorescent light. Twelve hours after incubation, undifferentiated, erect, septate conidiophores with immature spherical conidia were observed under a microscope. When immature conidia developed to a certain size (about one-third to one-half of mature size), 3–5 round protrusions simultaneously emerged radially and continued to develop into mature conidia with full-length, straight, and septate arms. Conidia were usually apical (Fig. 1, A). Frequently, a branching conidiophore developed sympodially just below the mature conidium to produce another conidium (Fig. 1, B).

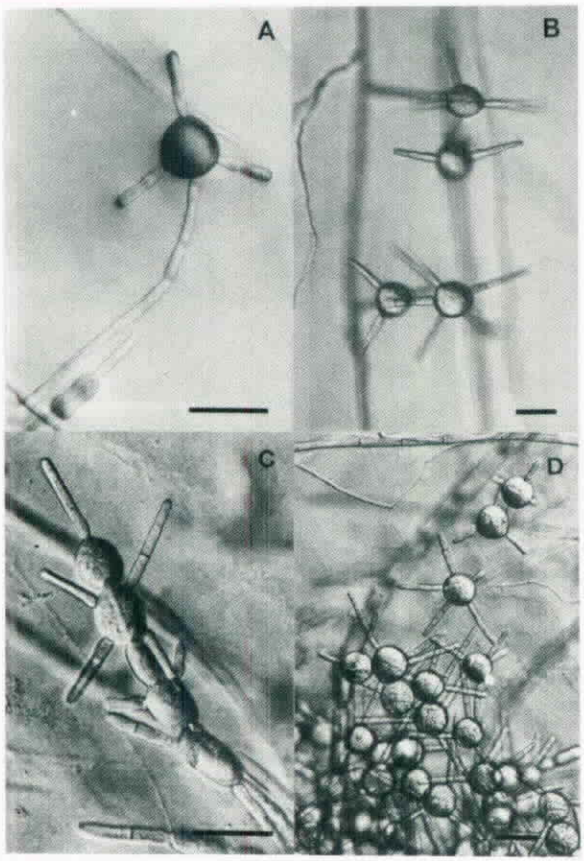

Fig. 1. *Brachiosphaera tropicalis*. **A**) Conidiophore and conidia, **B**) sympodial production of conidia, **C**) conidia formed in succession in cornmeal agar, and **D**) aggregated conidia produced in cornmeal agar. Scale bar = 50 μm.

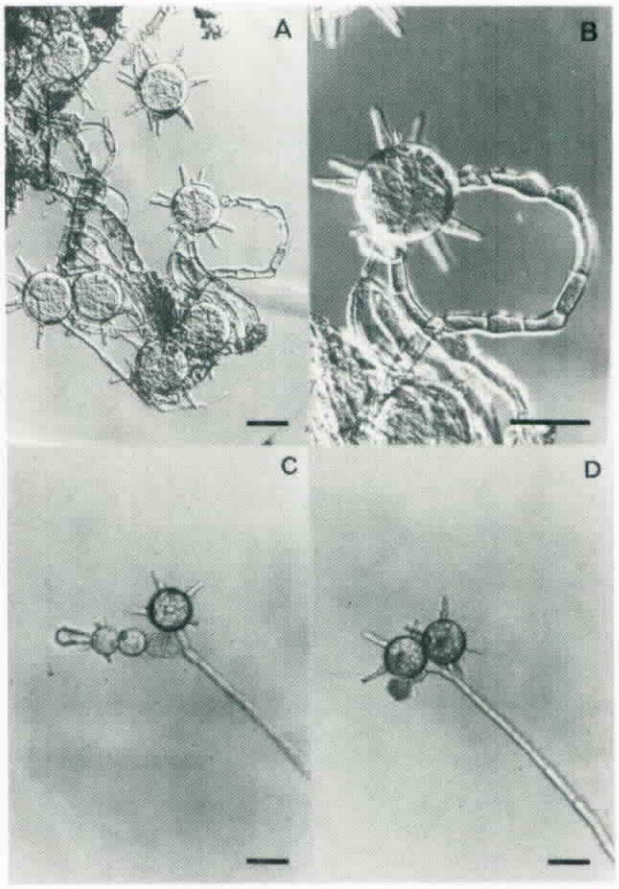

Fig. 2. *Brachiosphaera jamaicensis*. **A**) and **B**) conidia produced on decayed branch, **C**) conidia formed in succession, and **D**) conidia formed sympodially, submerged in water. Scale bar = 50 μm.

Brachiosphaera jamaicensis (Crane & Dumont) Nawawi, Trans. Brit. Mycol. Soc. **67:** 216–217. 1976.

Actinospora jamaicensis Crane & Dumont, Can. J. Bot. **53:** 843–844. 1975.

Colonies effuse on half-strength cornmeal agar. Mycelia immersed, hyphae initially hyaline, becoming olivaceous brown when aged, septate. Conidiophore erect, not well differentiated from hyphae. Conidia produced at the apex of conidiophores, and secondary conidia usually produced sympodially (Fig. 2, D) by renewed growth of conidiophore just below the initial conidium. They were also produced in succession (Fig. 2, C) under laboratory conditions. Conidium comprising a central spherical body and 6–10 bulbous, short, arms, 1 or 2 septate, 20–40 μm long, and 6.8–9.5 μm and 3.4–4.8 μm wide at basal and upper parts respectively (Fig. 2, A, B). Conidia produced on natural substrate were significantly larger than those produced on mycelial agar blocks submerged in water, 54–66 μm versus 50–56 μm diameter, respectively.

Habit. Saprophytic.

Specimens examined. IHT0111Bj (11 Jan, 1990. Inhotong, Taipei county); FS0110Bj (10 Jan, 1991. Fusan, Ilan county)

On natural substrates, conidia scattered on decaying branches and loosely aggregate in small masses. Conidia were transferred onto water agar. After conidia germinated, they were transferred individually onto a new water agar plate, separated by such a distance that the colonies would not intermingle for a week. Subcultures for stock were established on water agar tube slants and kept at 4 °C.

Brachiosphaera jamaicensis has only been reported in Jamaica on wet decayed branches. Nawawi (Descals et al., 1976) failed to find this fungus in Malaysian streams. Our observation of *B. jamaicensis* is apparently the second record of this aeroaquatic hyphomycete fungus. Conidia of *B. jamaicensis* have been observed only on decayed twigs in humid conditions. Both *B. tropicalis* and *B. jamaicensis* sporulated on wet, decayed wood and on suitable agar media, such as water agar and half-strength cornmeal agar.

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兩種 *Brachiosphaera* 屬之台灣新記錄菌

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本文記錄兩種 *Brachiosphaera* 屬之台灣記錄菌， *Brachiosphaera tropicalis* 和 *B. jamaicensis* 。 *B. tropicalis* 一般認爲是水生不完全絲狀菌。 *B. jamaicensis* 的習性應屬水中生長陸上濕氣中產孢的菌。英語稱爲 aeroaquatic 習性。此菌以往僅在牙買加發現過一次。本文並記載這兩種菌的產孢狀況。

關鍵詞：球臂菌屬；台灣。