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Dictyostelids in Japan XI. *Dictyostelium giganteum* Singh

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Abstract *Dictyostelium giganteum* was obtained from forest soil samples collected in Bonin Islands and Honshu. This may be the first report of this species in Japan.

Key words: cellular slime mold, dictyostelid, *Dictyostelium giganteum*, Japan, macrocyst.

In the course of my studies on Japanese dictyostelids, *Dictyostelium giganteum* Singh was obtained from Bonin Islands and Honshu. This species had not been reported from Japan except for Hokkaido; it was described by Kanda and Yonezuka (1979) as new to Japan based on the isolate H2 from lakeside soil, Kushiro-city. Judging from the description made by them, however, I doubt that their isolate was *D. giganteum* (Hagiwara, 1989). H2 had been already lost (Kanda, personal communication). Therefore, I will describe *D. giganteum* based on my isolates. Procedures of isolation, cultivation and observation are the same as those reported previously (Hagiwara, 1989). Twenty spores per isolate are used for calculating the mean spore diameter. Range of mean spore diameters of the isolates examined is indicated by MD in the following description.

Dictyostelium giganteum Singh, J. Gen. Microbiol. 1: 17 (1947). (Figs. 1, 2)
=*Dictyostelium magnum* Hagiwara, Bull. Natn. Sci. Mus., Tokyo, Ser. B. 9: 155 (1983).

When cultured at 20°C on non-nutrient agar with *Escherichia coli*, sorocarps solitary (Fig. 2B), rarely branched; sorophores 2.1–7.9 mm in length, with simple, typically capitate but sometimes obtuse tips (Figs. 1A, 2D–2F), sometimes with supporting cells (pointed by arrows in Figs. 1B & 2G), with supporters if prostrate (Fig. 2H), 10–40 μm in diam. at a level 100 μm above the bottom, 2–6 μm in diam. at a level 50 μm below the top; basal disks not well-developed (Fig. 1B), 20–77.5 μm in diam.; sori white, (30–) 60–450 μm in diam.; spores hyaline, oblong to ellipsoid, usually 1.7–2.1 times longer than broad, smooth, mostly 6.3–8.0×3.3–4.1 (MD 6.9–7.2×3.6–3.9) μm, without polar granules (Fig. 2C); pseudoplasmodia with radiate streams (Fig. 2A), –16.5 mm in diam., usually not migrating without sorophore formation, usually producing single sorogens.

Isolates examined: Oga3, from forest soil, Ani-jima, Bonin Islands, Tokyo Pref.,

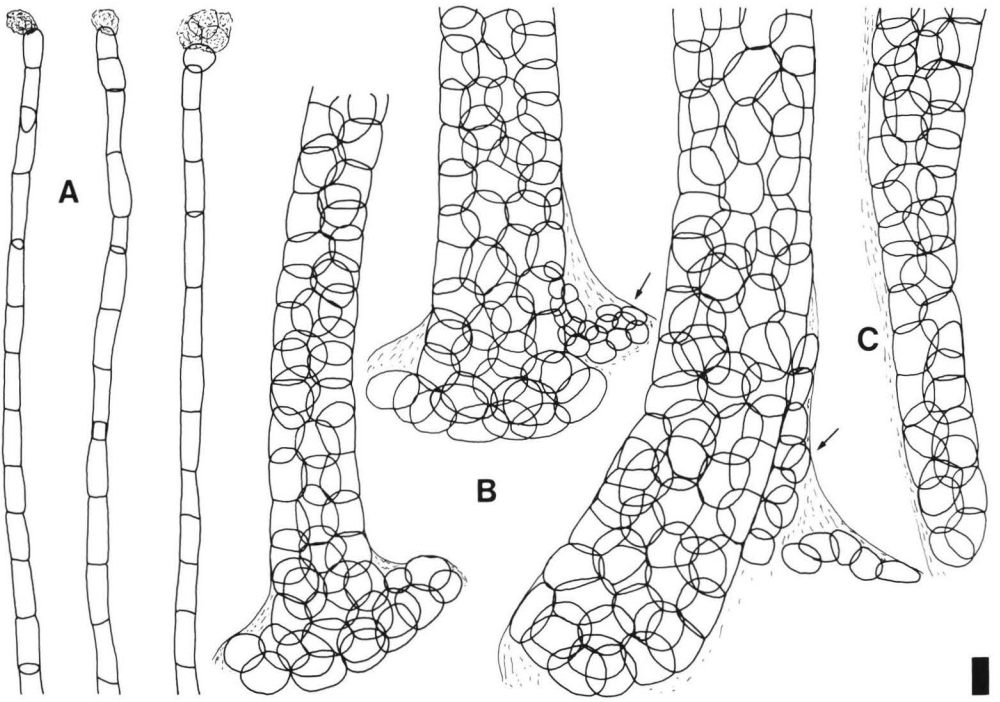

Fig. 1. *Dictyostelium giganteum*. A. Sorophore tips. B. Sorophore bases. Note supporting cells indicated by arrows. C. Sorophore base of a prostrate sorocarp. Scale=10 μm.

10 March 1985; CSB1 and CSB7, from forest soil, Boso-fudokinooka, Sakae-cho, Inba-gun, Chiba Pref., 2 July 1996.

World distribution: Asia; India, Japan, Nepal, Oman, Pakistan, Taiwan. N. America; Alaska to California. S. America; Uruguay. Europe; England, France, Germany, the Netherlands, Switzerland.

Dictyostelium giganteum is characterized by the very large white sorocarps, the simple and capitate sorophores tips, and the short and thick spores without polar granules.

According to the terminology in Hagiwara (1989), *Dictyostelium giganteum* is a "gigantic" species, namely, its non-prostrate large sorophores usually exceeds 6 mm in length. Five gigantic species of *Dictyostelium* have been reported from Japan; *D. firmibasis* Hagiwara, *D. pseudo-brefeldianum* Hagiwara, *D. purpureum* Olive, *D. robustum* Hagiwara and *D. septentrionalis* Cavender. Of them, *D. firmibasis* is the most similar to *D. giganteum* in appearance of sorocarps under a dissecting microscope, but it differs from *D. giganteum* in the slender spores, which are usually 2.0–2.7 times longer than broad (Hagiwara, 1989). *D. pseudo-brefeldianum* is different from *D. giganteum* macroscopically in the thin sorocarps and microscopically in the

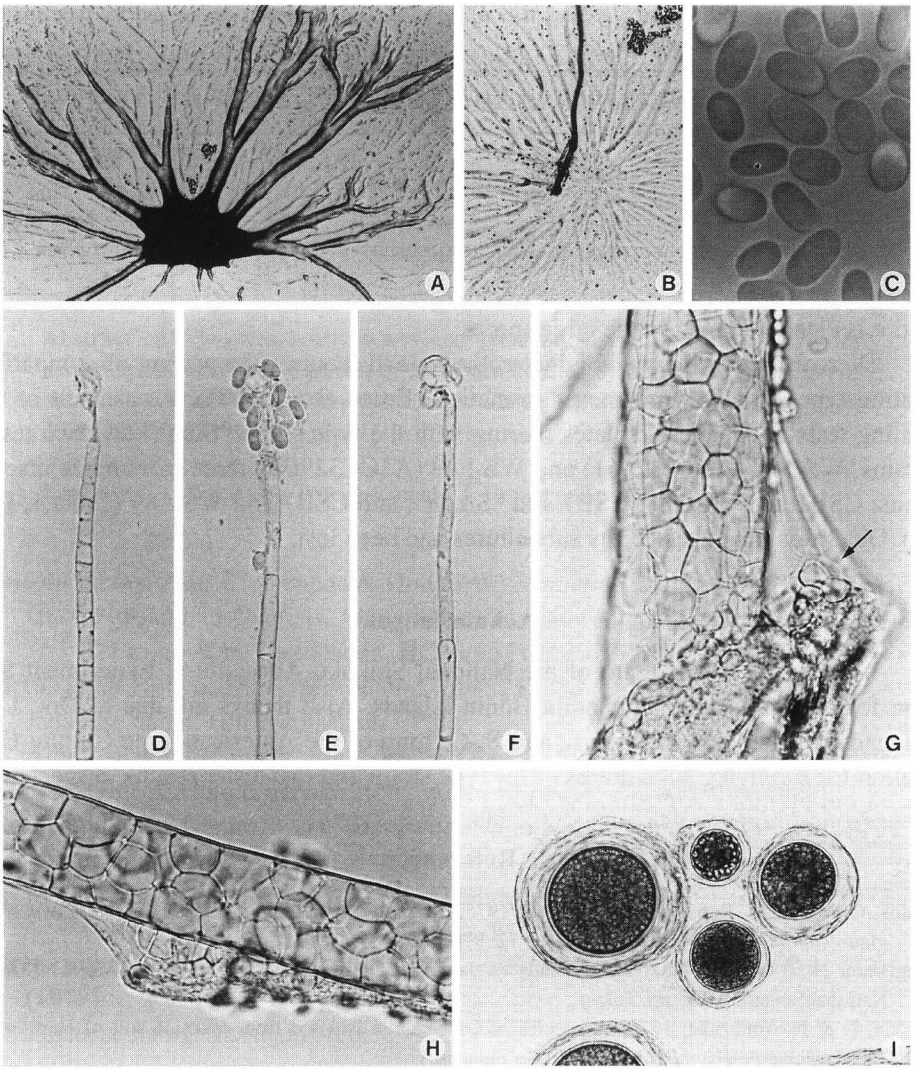

Fig. 2. *Dictyostelium giganteum*. A. Pseudoplasmodium. ×24. B. Growth habit of a sorocarps. Note that one sorocarp was produced from one pseudoplasmodium. ×24. C. Spores. ×1200. D–F. Sorophore tips which are simple and typically capitate. ×480. G. Supporting cells (arrow) surrounding a sorophore base. ×480. H. Supporter. ×480. I. Macrocysts made by the pair of a Japanese isolate CSB7 and the tester strain WS-589. ×240.

clavate tips of sorophores. *D. purpureum* distinctly differs from *D. giganteum* in the purple sorocarps. *D. robustum* are easily distinguishable from *D. giganteum* by the larger sorocarps with very thick sorophores. *D. septentrionalis* may be not misidentified with *D. giganteum* by the thicker sorophores with well-developed basal disks,

Table 1. Macrocyst formation among pairs of Japanese isolates, tester strains and the type strain of *Dictyostelium giganteum*.

	WS-588	WS-589	"Singh"	CSB1	CSB7
CSB1	+	−	−	−	±*
CSB7	−	+	±*		−

* Macrocyst formation was recognized but the macrocysts scored were less than 10 per plate.

and it is clearly distinct in the large spores.

Dictyostelium giganteum is heterothallic and requires the pairing of compatible mating types to effect macrocyst formation (Erdos *et al.*, 1975). As a result of the mating tests of Japanese isolates pairing with the type strain "Singh" and two tester strains, WS-588 (ATCC32961) and WS-589 (ATCC32962), three pairs made macrocysts; CSB1 and WS-588, CSB7 and "Singh", and CSB7 and WS-589 (Table 1, Fig. 2I). Oga3 was not tested for its subcultures had been lost.

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