

***Waltonia* gen. nov. (Helotiales, Dermateaceae) found on *Pinus* spp.**

Haruyoshi SAHO\* and Ikuo TAKAHASHI\*\*

佐保春芳\*・高橋郁雄\*\*：マツ属樹木で発見された子囊盤菌類の新属 *Waltonia*

In 1967, a fungus having black apothecia and fusiform septate ascospores with a long appendage on each end was found in the plantation of *Pinus strobus* of the Tokyo University Forest in Hokkaido. Since then, this fungus has been found on *Pinus densiflora*, *P. pentaphylla*, *P. strobus*, *P. sylvestris* and *P. thunbergii* at various places in Japan. This was first thought to be a *Pragmopora*, because the morphological characters were very close to the genus except for the long appendage<sup>6)</sup>.

The apothecia of this fungus are erumpent from the bark and sometimes in clusters of two to four (Fig. 1). Under dry condition and when immature, apothecia are dark brown to black and globose to undulate. They are horny to cartilaginous in consistency. In mature apothecia, yellowish brown to yellowish orange hymenium is observed by hand lens. When moist, apothecia are fleshy, soft and a cleft appears on the top of the swollen globose apothecia (Fig. 2). The hymenium is plane to slightly concave, yellowish brown, and is surrounded by the blackish elevated margin of the subglobose dark thick-walled cells. The medullary excipulum is 'textura intricata' composed of subhyaline hyphae. The asci are variable in size from 80 to 210  $\mu$  in length and 10 to 14  $\mu$  in width. They are cylindric-clavate with a slightly flattened top, eight-spored and the pore is not blued by iodine. Ascospores are 12-17  $\times$  4-5  $\mu$  and non-septate to several septate, rarely with longitudinal septa (Fig. 4). The ascospore is hyaline and fusiform with a long appendage at each end (Fig. 5). The appendages are usually longer than the fusiform part of the ascospores, and 20-40  $\mu$  in length. No septum is found between the

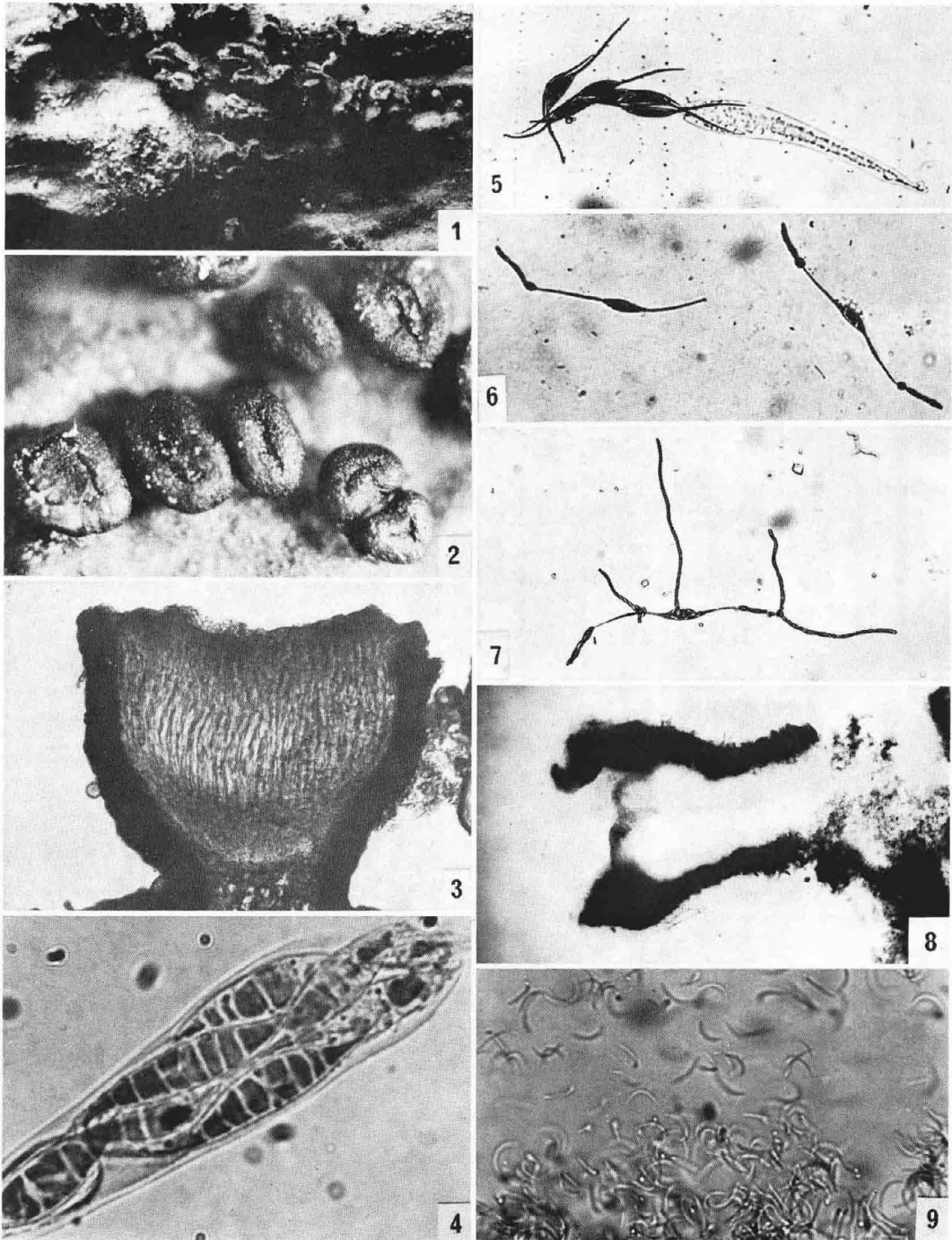
end cell and the appendage. Upon germination, a swollen point appears on the tip of the appendage and the germ tubes arise from the swollen points (Fig. 6). When spore has septa, the germ tubes originate from the tip of the appendages and also from the intermediate cells (Fig. 7). Therefore, the appendage is actually an elongated part of the end cell. Paraphyses are numerous, filiform, hyaline, septate, and about 2  $\mu$  in diameter. The tips of the paraphyses are slightly swollen, exceeding the asci.

Conidial fruit bodies are erumpent scattered or occasionally single, blackish brown to black, subcylindrical, sometimes laterally flattened, ca. 0.2 mm in diameter, and ca. 0.5 mm in height. At first, the conidial state is appearing more or less convoluted, then tearing open by a cleft at the top (Fig. 8). The conidial fruit body has a blackish excipulum of 'textura intricata' and is a little softer than the apothecium in consistency. The conidiophores line the cavity, and are hyaline, cylindric, septate and 8-20  $\times$  1-4  $\mu$ . Conidia are elongated fusiform, hyaline, one-celled, sickle-shaped, pointed at the ends and 8-16  $\times$  0.5-1  $\mu$  (Fig. 9). These conidial fruit bodies are very close to those of the genus *Chondropodium* in gross appearance but differ in the shape of conidia and of the conidial cavity. The conidial cavity of the genus *Chondropodium* is deeply concave<sup>4)</sup> and its shape in the new fungus is only shallow. Conidial fruit bodies produced by this fungus in culture are yellowish brown.

As stated before, this fungus was thought to be a *Pragmopora*. Nannfeldt discussed the genus *Pragmopora*, but this genus was not studied by him in detail<sup>5)</sup>. Groves discussed *Pragmopora* more fully<sup>4)</sup> and Dennis placed it in the Dermateaceae<sup>1)</sup>. In the Dermateaceae, there are three genera which have erumpent blackish apothecia and fusiform hyaline ascospores. They are *Dermea*, *Durandiella* and *Pragmopora*. *Dermea* has rather

\* Faculty of Agriculture, University of Tokyo, Tokyo  
東京大学農学部

\*\* Tokyo University Forest in Hokkaido, Furano,  
Hokkaido 東京大学北海道演習林



**Explanation of figures**

Fig. 1. Mature apothecia in dry condition of *Waltonia pinicola*. ( $\times 10$ ).

Fig. 2. Young apothecia in wet condition having a cleft on the top of the apothecium. ( $\times 30$ ).

Fig. 3. Cross section of an apothecium. ( $\times 200$ ).

ellipsoid ascospores and large septate conidia about  $50\ \mu^2$ . *Durandiella* has fusiform septate ascospores more than  $40\ \mu$  in length and filiform curved septate conidia<sup>33</sup>. *Pragmopora* has filiform septate ascospores, but its conidia are not well known. The present new fungus is distinctive because it has a characteristic

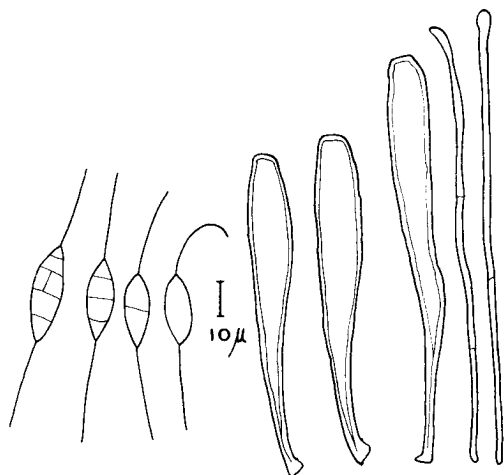


Fig. 10. Ascospores, asci and paraphyses.

long appendage on each end of fusiform septate to non-septate ascospores, together with small, curved, one-celled conidia. Another distinctive feature is that the germ tubes usually arise from swollen points on the tip of the ascospore appendage. Therefore, this fungus is proposed as *Waltonia* Saho gen. nov. and *Waltonia pinicola* Saho spec. nov. in the honour of Dr. J. Walton Groves, Plant Research Institute, Ottawa, Canada.

#### Inoculation experiment 'in vitro' on auto-claved twigs

Two to three pieces of twigs each about 1 cm in diameter and 10 to 15 cm in length were put into a glass jar with water 2 cm in depth, and were auto-

Fig. 4. Ascospores showing cross and transverse septations, stained by aniline blue. (ca.  $\times 1500$ ).

Fig. 5. Ascus and ascospores, stained by aniline blue. ( $\times 450$ ).

Fig. 6. Germinating ascospores showing swollen points on the tip of appendages and germ tubes. (ca.  $\times 300$ ).

claved. After the treatment, small pieces of the isolated fungus mycelium with agar were put on the twigs. Plastic tape was used to seal the jar. These jars were placed at room temperature. Inoculated tree species were *Abies sachalinensis*, *Pinus strobus*, *P. sylvestris* and *Larix leptolepis*. The inoculations were made on October 15, 1969; November 18, 1969; November 24, 1969 and January 7, 1970 at the Laboratory of Forest Botany, University of Tokyo, Tokyo. The growth of the whitish to yellowish mycelia was very good on the bark of all the inoculated tree species. Two months later, the imperfect state of this fungus was found. The color was more yellowish than the conidial state in the natural condition. The conidial state was recognized on all inoculated twigs. Neither the apothecial nor the conidial states of this fungus have been found in the plantations of *Abies* and *Larix* as yet, but from the results of the inoculation experiment the fungus might be expected to occur on these species.

#### Host ranges and parasitism

The evidence presented in this study indicates that *Waltonia* is specific to the plants in the Pinaceae. Very little is known concerning the parasitism of this fungus, but it seems to be a weak parasite because of its habitat on recently killed twigs and branches. The fungus found on *Pinus densiflora*, *P. pentaphylla*, *P. strobus*, *P. sylvestris*, and *P. thunbergii* in the plantations.

#### Taxonomy

*Waltonia* Saho gen. nov. (Helotiales, Dermateaceae)

Apotheciis erumpentibus, solitariis vel 2-4 congregatis, sessilibus, versus basim attenuatis, undulatis, brunneis vel nigris, coriaceis; hymenio concavo, fulvo, margine elevato, exipulo medullari textura intricato; ascis cylindraco-clavatis, stipitatis, octosporis, apice Jodo non coerulescente; ascosporis hyalinis, fusiformi-

Fig. 7. Ascospore and germ tubes. This ascospore is two septate and a germ tube arises from the intermediate cell. (ca.  $\times 300$ ).

Fig. 8. Conidial fruit body of *Waltonia pinicola*. ( $\times 200$ ).

Fig. 9. Conidia of *Waltonia pinicola*. ( $\times 600$ ).

bus, utrinque apice setula unica ornatis; paraphysisbus hyalinis, filiformibus, simplicibus, raro paniculatis, septatis.

Type species: *Waltonia pinicola* Saho on twigs of *Pinus strobus*.

***Waltonia pinicola* Saho spec. nov.**

Apotheciis erumpentibus, solitariis vel 2-4 congregatis, sessilibus, versus basim attenuatis, undulatis, 0.3-0.8 mm diam., 0.2-0.7 mm altis, brunneis vel nigris, coriaceis, in humido carnosio-coriaceis; hymenio concavo fulvo, margine elevato, excipulo medullari textura intricato, hyphis 2-4  $\mu$  diam., hyalinis vel brunneis; ascis cylindraco-clavatis, stipitatis, 80-210  $\times$  10-14  $\mu$ , octosporis, apice Jodo non coerulescente ascosporis hyalinis, fusiformibus, 0-7 septatis, saepe muriformibus, 12-17  $\times$  4-5  $\mu$ , utrinque apice setula unica ornatis, setula 20-40  $\mu$  longo; paraphysisbus hyalinis, filiformibus, simplicibus, raro paniculatis, 2  $\mu$  diam.

**Specimens examined:**

On *Pinus densiflora* Sieb. et Zucc.: TUFH-3945, I. Takahashi, Tokyo Univ. Forest in Chiba, Maezawa Arboretum, March 19, 1968.

On *Pinus pentaphylla* Mayr: TOFO-M49, H. Saho, Tokyo Univ. Forest Tanashi Exp. Station, Tokyo, May 29, 1969; TOFO-M93, H. Saho, Ditto, March 13, 1970.

On *Pinus strobus* L.: TUFH-3647, H. Saho and I. Takahashi, Comp. No. 74, Tokyo Univ. Forest in Hokkaido, Aug. 30, 1967 (*Type* !); TUFH-3589, H. Saho and I. Takahashi, Ditto, June 9, 1967; TUFH-3767, H. Saho and I. Takahashi, Ditto, Oct. 12, 1967; TUFH-3887, H. Saho and I. Takahashi, Ditto, Dec. 27, 1967; TUFH-3941, H. Saho and I. Takahashi, Ditto, Feb. 16, 1968; TOFO-M24, H. Saho, Asakawa Exp. Forest, Tokyo, Sept. 20, 1969; TOFO-M56, H. Saho, Ditto, Sept. 20, 1969; TOFO-M60, H. Saho, Ditto, Oct. 25, 1969; TOFO-M70, H. Sato, Tokyo Univ. Forest in Hokkaido, Oct. 5, 1969.

On *Pinus sylvestris* L.: TUFH-3653, H. Saho and I. Takahashi, Comp. No. 74, Tokyo Univ. Forest in Hokkaido, July 17, 1967; TUFH-3754, H. Saho and I. Takahashi, Ditto, Oct. 26, 1967; TUFH-3920,

H. Saho and I. Takahashi, Ditto, Dec. 27, 1967; TOFO-M42, H. Saho, Ditto, April 18, 1969; TOFO-M67, H. Saho, Ditto, Oct. 5, 1969.

On *Pinus thunbergii* Par.: TUFH-3968, I. Takahashi, Arboricultural Research Institute, Shizuoka, March 27, 1968; TUFH-3977, I. Takahashi, Tokyo Univ. Forest in Aichi, March 30, 1968; TOFO-M80, H. Saho, Tokyo Univ. Forest Tanashi Exp. Station, Tokyo, Nov. 11, 1969.

The type specimen is deposited in the Mycological Herbarium, Tokyo Univ. Forest in Hokkaido, Japan.

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**摘 要**

1967年、東京大学北海道演習林内の約10年生のストローブマツおよびヨーロッパアカマツ林内で発見された子囊盤菌類の1種を新属 *Waltonia* Saho 及び新種 *Waltonia pinicola* Saho として報告する。近縁の属と比較すると次の点が異っている。すなわち1本の長い細毛を紡錘形の子囊胞子の両端に持ち、胞子は隔膜のないものから数個の隔膜を持つものまでである。本菌の分生胞子は小形で1室、少し曲った長い紡錘形をしている。本菌の発芽は細毛の先端がふくらみ、そこから太い発芽管を伸ばして行なわれる。従って細毛は胞子の細胞の延長したものである。