

## ***Thanatephorus ochraceus*: a saprotrophic and orchid endomycorrhizal species**

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The new combination *Thanatephorus ochraceus* is proposed. *Thanatephorus orchidicola* and *T. pennatus* are placed in synonymy.

Keywords: *Thanatephorus*, *Rhizoctonia*, Orchidaceae, endomycorrhiza

Re-examination of a number of species belonging to the *Ceratobasidiales* has shown that three names in *Thanatephorus* Donk and *Uthatabasidium* Donk are morphologically conspecific and should be synonymized, as follows.

***Thanatephorus ochraceus* (Masse) P. Roberts comb. nov.**– Figs. 1, 2.

- ≡ *Coniophora ochracea* Masse, J. Linn. Soc. Bot. 25: 137. 1889.
- ≡ *Botryobasidium ochraceum* (Masse) Donk, in Rogers, D.P., Stud. Nat. Hist. Iowa Univ. 17: 16. 1935.
- ≡ *Uthatabasidium ochraceum* (Masse) Donk, Fungus 28: 23. 1958.
- ≡ *Thanatephorus orchidicola* Warcup & P.H.B. Talbot, Trans. Brit. Myc. Soc. 49: 432. 1966.
- ≡ *Thanatephorus pennatus* Currah, Can. J. Bot. 65: 1958. 1987.

Basidiome effused, thin, hypochnoid, smooth, ochraceous. – Hymenium comprising one or more layers of basidia on vertically branching, cymose, thin-walled hyphae arising from a subicular layer of wider, thick-walled, basal hyphae. – Hyphae multinucleate (Warcup & Talbot, 1967; Currah, 1987), subhymenial hyphae thin-walled, hyaline, with short hyphal compartments, somewhat swollen, 6–9 µm diam.; basal hyphae ochraceous to brown, with long hyphal compartments, straight, 8–18 µm diam., with walls up to 3 µm thick, often double-laminate. – Clamp-connexions absent. – Basidia ellipsoid to oblong or cylindrical ( $Q = 1.4\text{--}2.8$ ),  $12\text{--}27 \times 7.5\text{--}12$  µm. – Sterigmata (3–) 4,  $7.5\text{--}17 \times 1.5\text{--}2.5$  µm, occasionally producing subsidiary sterigmata and then appearing furcate. – Basidiospores

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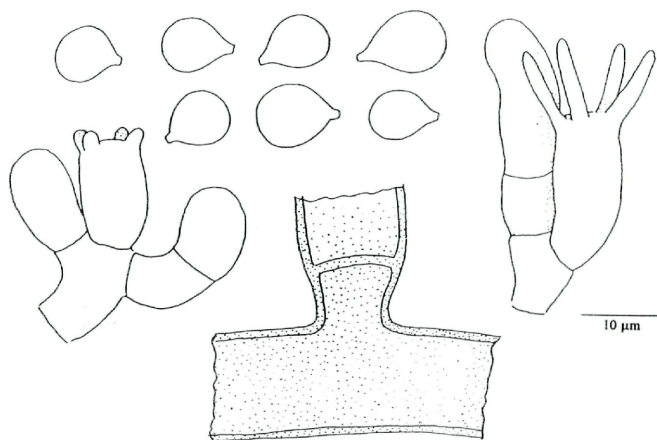


Fig. 1. – *Thanatephorus ochraceus* (England, type of *T. orchidicola*). Basidiospores; basidia; wide, tinted, basal hyphae.

globose to ellipsoid [ $Q = 1.0-1.2 (-1.4)$ ],  $6-10(-12) \times 5-9(-10.5) \mu\text{m}$ , hyaline to ochraceous, thin- to slightly thick-walled, producing secondary spores by replication (illustrated in Warcup & Talbot, 1966).

**Anamorph.** – The *Rhizoctonia* anamorph is unnamed. In culture, growth rate is 'slow' (Warcup & Talbot, 1966; Currah, 1987) and 'sparse' (Warcup & Talbot, 1966; Currah, 1987), producing hyphae which are 'dark brown' (Warcup & Talbot, 1966) or 'camel brown' (Currah, 1987). Loose, white sclerotia with moniliform hyphal compartments are occasionally produced (further details in Currah, 1987).

**Habitat and ecology.** – On fallen wood and dead fern stems. Also isolated from orchid roots, including *Orchis mascula*, *Coe-loglossum viride* (Warcup & Talbot, 1967), and *Calypso bulbosa*.

**Specimens examined.** – CANADA: isol. ex roots of *Calypso bulbosa*, Obed, Alberta, 24 Jul. 1985, R. Currah 1126, UAMH 5405 (HOLOTYPE of *Thanatephorus pennatus*); isol. ex *Calypso bulbosa*, R. Currah, UAMH 5404 (as *T. pennatus*); on *Alnus*, McLeod Lake, British Columbia, 26 Jun. 1969, J. Eriksson 12180, K(M) 30005. – ENGLAND: isol. ex roots of *Orchis mascula*, Widgham Woods, Cambridgeshire, 1963, S.E. Harley, ADW 15844 (HOLOTYPE of *Thanatephorus orchidicola*). – GERMANY: on *Quercus*, Westphalia, Aut. 1907, W. Brinkmann (Westfälische Pilze 155, as *Corticium flavesces*), K(M) 30008. – ITALY: on *Cistus monspesulensis*, Isole San Nicolo, Tremiti Islands, 31 Oct. 1981, R.W.G. Dennis,

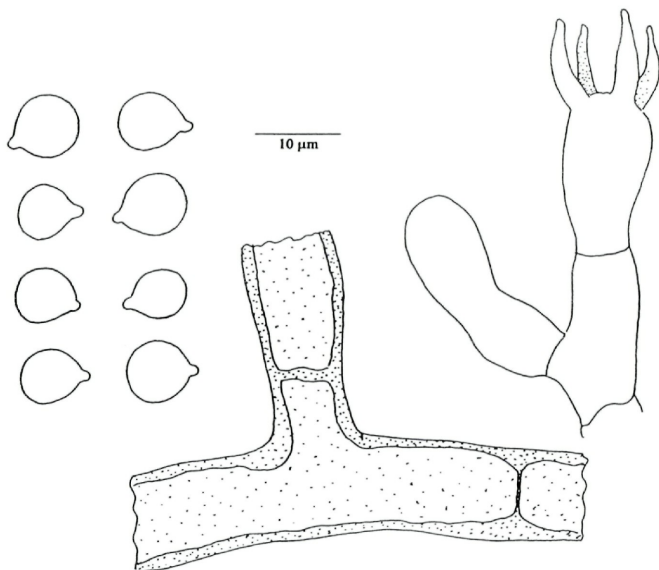


Fig. 2. – *Thanatephorus ochraceus* (Canada, type of *T. pennatus*). Basidiospores; basidium; tinted, basal hyphae.

K(M) 15658. – RUSSIA: on *Hippophaea rhamnoides*, Telezkoie Lake, Montano-Altaica, 8 Sep. 1959, E. Parmasto (Cortic. USSR I: 90), K(M) 30007. – SWEDEN: on fallen *Populus* trunk, Tjolöholm, Halland, 2 Sep. 1965, Å. Strid & J. Eriksson, K(M) 30006.

*Thanatephorus ochraceus* is distinguished by its more or less globose basidiospores and exceptionally wide basal hyphae. Hyphae in culture are said to be sparse, brown, slow-growing, and multinucleate. The type specimen (ENGLAND: on inside of *Ulmus* bark on fallen trunk, Kew, Surrey, G. Massee) has long been lost (Donk, 1958), however the original type description (Massee, 1889) specified subglobose basidiospores ' $8 \times 6-7 \mu\text{m}$ ' and hyphae 'very thick and coloured, measuring up to  $18 \mu\text{m}$  diam'. The illustration showed candelabra-like, subhymenial hyphae arising from thick-walled subicular hyphae. The basidia were illustrated as having unusually short sterigmata, but Massee's basidia drawings were often highly stylized, as noted elsewhere (Roberts, 1997). Since *Thanatephorus ochraceus* is the only European effused basidiomycete which typi-

cally has unswollen hyphae up to 18  $\mu\text{m}$  wide (few others exceed 10–12  $\mu\text{m}$  diam.), Masee's name is accepted for the taxon, as it was by Donk (1958), although Donk's genus *Uthatabasidium* has now been synonymised with *Thanatephorus* (Hauerslev & Roberts in Knudsen & Hansen, 1996). A colour photograph of a specimen from Switzerland was published in Breitenbach & Kränzlin (1986).

Re-examination of the type specimen of *T. orchidicola* (Fig. 1) shows that it is indistinguishable from *T. ochraceus*. Warcup & Talbot (1966) depicted the basidiospores as subglobose, measuring '9–12  $\times$  7–9.5  $\mu\text{m}$ ' and the basal hyphae 'up to 17  $\mu\text{m}$  in diameter'. The species, isolated from orchids in England (cited above) and Scotland (Warcup & Talbot, 1967), was not compared with *T. ochraceus*. Finnish collections on living and dead leaf stalks of *Pteridium* have been published under the name *T. orchidicola* (Kotiranta & Saarenoksa, 1993). Basidiospores were of similar size (see Table 1) and the basal hyphae were described as '(12 –) 14–17 (–19)  $\mu\text{m}$  wide'.

Re-examination of the type specimen of *T. pennatus*, isolated from Canadian orchids (cited above), shows that this too is a synonym of *T. ochraceus*, having hyphae up to 18  $\mu\text{m}$  wide. It was said to differ from *T. orchidicola* only in its smaller basidiospores, given as '5.9–6.8  $\mu\text{m}$  diam.' (Currah, 1987). However, basidiospores up to 8.5  $\mu\text{m}$  diam. were found on re-examining the type (Fig. 2), and even the smaller dimensions originally published are within the overall range of *T. ochraceus*.

Self-replicating basidiospores were not found in the type of *T. pennatus*, nor were they noted in the original description of *T. ochraceus* (Masee, 1889). They were, however, illustrated for

Tab. 1. – *Thanatephorus ochraceus*. Comparison of basidiospore size and shape in type and other collections.

Collection	Basidiospore range ( $\mu\text{m}$ )	Q (spore length ÷ width)
England (type of <i>T. ochraceus</i> )*	8 $\times$ 6–7	1.1–1.3
England (type of <i>T. orchidicola</i> )**	7–9.5 $\times$ 6.5–8.5	1.0–1.2
Canada (type of <i>T. pennatus</i> ***)	6.5–9 $\times$ 6–8.5	1.0–1.1
Sweden, K(M) 30006	6–8.5 $\times$ 5.5–7	1.0–1.1
Canada, K(M) 30005	7.5–9.5 $\times$ 6.5–8	1.0–1.2
Finland, Saarenoksa 13192‡	8–11.9 $\times$ 7–10.6	1.0–1.3
Finland, Saarenoksa 28191‡	8.9–12 $\times$ 7–10	1.1–1.4

\* Basidiospore range is that given by Masee (1889) in the type description.

\*\* Original published basidiospore range was '9–12  $\times$  7–9.5  $\mu\text{m}$ ' (Warcup & Talbot, 1966). \*\*\*Original published basidiospore range was '5.9–6.8  $\mu\text{m}$ ' (Currah, 1987).

‡figures for spore range and Q are taken from Kotiranta & Saarenoksa (1993), sub *Thanatephorus orchidicola*.

*T. orchidicola* (Warcup & Talbot, 1966). As suggested by Currah (1987), 'expression of this character in some isolates may be dependent on a specific set of environmental conditions'.

## References

- Breitenbach, J. & F. Kränzlin (1986). *Fungi of Switzerland* 2. – Lucerne: Verlag Mykologia, 412 pp.
- Currah, R. S. (1987). *Thanatephorus pennatus* sp. nov. isolated from mycorrhizal roots of *Calypso bulbosa* (Orchidaceae) from Alberta. – *Can. J. Bot.* 65: 1957–1960.
- Donk, M. A. (1958). Notes on resupinate hymenomycetes V. – *Fungus* 28: 16–36.
- Knudsen, H. & L. Hansen (eds) (1996). Nomenclatural notes to Nordic Macro-mycetes vol. 1 & 3. – *Nordic J. Bot.* 16: 211–222.
- Kotiranta, H. & R. Saarenoksa (1993). Rare Finnish *Aphylllophorales*. – *Ann. Bot. Fennici* 30: 211–249.
- Massee, G. (1889). A monograph of the *Thelephoraceae*, Part 1. – *J. Linnaean Soc., Botany* 25: 107–155.
- Roberts, P. (1997). *Aldridgea* (Fungi: Boletales): a synonym of *Coniophora*. – *Kew Bull.* 52: 505–506.
- Warcup, J. H. & P. H. B. Talbot (1966). Perfect states of some rhizoctonias. – *Trans. Brit. Mycol. Soc.* 49: 427–435.
- & — (1967). Perfect states of rhizoctonias associated with orchids. – *New Phytologist* 66: 631–641.

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