



## **Tylopilus alkalixanthus Amtoft & Halling, a new Boletaceae from Costa Rica.**

Wynns, Anja Amtoft; Halling, Roy E.; Mueller, Gregory M.

*Published in:*  
Brittonia

*Publication date:*  
2003

*Document version*  
Early version, also known as pre-print

*Citation for published version (APA):*  
Wynns, A. A., Halling, R. E., & Mueller, G. M. (2003). Tylopilus alkalixanthus Amtoft & Halling, a new Boletaceae from Costa Rica. *Brittonia*, 54(4), 262-265.

## ***Tylopilus alkalixanthus*, a new species of Boletaceae from Costa Rica and Japan**

Author(s): Anja Amtoft, Roy E. Halling, Gregory M. Mueller

Source: *Brittonia*, 54(4):262-265. 2002.

Published By: The New York Botanical Garden

DOI: 10.1663/0007-196X(2003)54[262:TAANSO]2.0.CO;2

URL:

<http://www.bioone.org/doi/full/10.1663/0007-196X%282003%2954%5B262%3ATAANSO%5D2.0.CO%3B2>

---

BioOne ([www.bioone.org](http://www.bioone.org)) is an electronic aggregator of bioscience research content, and the online home to over 160 journals and books published by not-for-profit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Web site, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at [www.bioone.org/page/terms\\_of\\_use](http://www.bioone.org/page/terms_of_use).

Usage of BioOne content is strictly limited to personal, educational, and non-commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

# Tylopilus alkalixanthus, a new species of Boletaceae from Costa Rica and Japan

ANJA AMTOFT, ROY E. HALLING, AND GREGORY M. MUELLER

---

Amtoft, A. (Institute of Systematic Botany, The New York Botanical Garden, Bronx, NY 10458-5126, U.S.A.; email: aamtoft-nielsen@nybg.org), R. E. Halling (Institute of Systematic Botany, The New York Botanical Garden, Bronx, NY 10458-5126, U.S.A.; email: rhalling@nybg.org) & G. M. Mueller (Department of Botany, The Field Museum of Natural History, 1400 S. Lake Shore Drive, Chicago, IL 60605-2496, U.S.A.; email: gmueller@fmnh.org). *Tylopilus alkalixanthus*, a new species of Boletaceae from Costa Rica and Japan. *Brittonia* 54: 262–265. 2002.—**Tylopilus alkalixanthus** is described from the Cordillera Talamanca of Costa Rica. At the present time it is known only from Costa Rica and Japan.

**Key words:** Agaricales, Boletaceae, *Tylopilus*, Central America, Costa Rica, Neotropics, fungi, Japan.

---

Halling (1999) and Halling and Mueller (1999, 2001) have summarized the documentation of members of the Boletaceae of Costa Rica. Continued efforts in recording and analyzing the diversity of macrofungi in the montane Neotropics have uncovered an additional species of *Tylopilus* described below. Results of our work on Costa Rican macrofungi can be found on the World Wide Web at <http://www.nybg.org/bsci/res/hall/costaric.html>.

## Methods

All measurements of microscopic structures are based on dried material revived in 3% KOH. Figure 1 was produced digitally according to the protocol outlined by Huhndorf at [http://www.fmnh.org/research\\_collections/botany/botany\\_sites/imagemanage/intropage.htm](http://www.fmnh.org/research_collections/botany/botany_sites/imagemanage/intropage.htm). The designation “Q” in the description refers to mean length/width ratio of 45 basidiospores measured from the holotype. Color designations (e.g., 4A3) in the description are from Kornerup and Wanscher (1983); color terms (e.g., ochraceous buff) are generalized color approximations. A color image of the basidiomata of our new species can

be viewed at <http://www.nybg.org/bsci/res/hall/alkalixanthus.html>.

## Taxonomic Treatment

***Tylopilus alkalixanthus*** Halling & Amtoft, sp. nov.

TYPE: COSTA RICA. Cartago: Estrella, 5 km E of Km 31 of Interamerican Hwy. nr. town of Estrella, 9°46'4"N, 83°57'19"W, 1685 m, 14 Jun 1996, *Halling 7685* (HOLOTYPE: USJ; ISOTYPE: NY).

Basidiomata conspicua; pileus griseoflavus maturitate sordido-luteus, maculis atrobrunneis, non vere viscosus; contextus albus, immutabilis vel roseitinctus; sa-por mitis vel leviter acerbus; tramae in kali causticum citrinae; stipes pileo concolorus; hymenium pseudocystidiis abundis, hyphae laterales mediostratii concretionibus hyalinis helcis.

*Pileus* (Fig. 1A) 50–100 mm wide, convex to plano-convex, grayish yellow to light ochraceous buff or cream color or warm buff, with dark brown maculae, finely subtomentose even at margins, dry, sticky when wet but not truly viscid. *Contextus* white, unchanging or changing to light pinkish, up to 15 mm thick; odor mild; taste mild or slightly bitter. *Hymenophore* tubu-

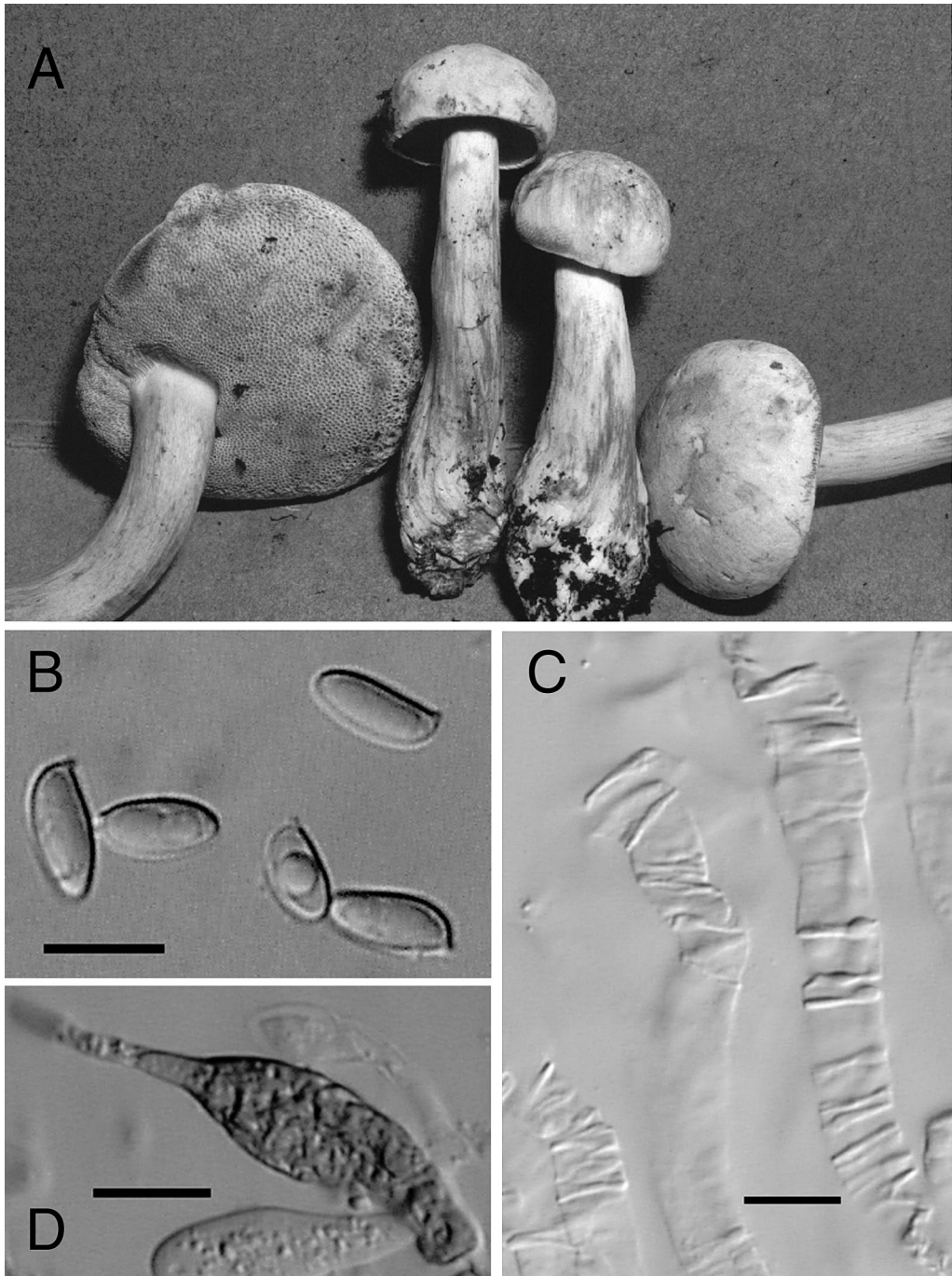


FIG. 1. *Tylopilus alkalixanthus*. A. Habit. B. Basidiospores. C. Hymenophoral trama with helical wall thickenings. D. Pseudocystidia. (From Halling 7685, NY.) Scale bars = 10  $\mu$ m.

lose, adnexed to deeply depressed; tubes to 20 mm long, white to off white at first, becoming pinkish vinaceous to grayish red (7B–C4) with age; pores concolorous, staining brownish. *Stipe* 60–170 mm long, 10–15 mm wide, elongate-subclavate, strict to curved, concolorous with pileus to slightly more yellow with age, staining slightly reddish brown with handling, the surface even to slightly ridged, glabrous to finely subpruinose, whitish at base; context white to olive yellow, with olive yellow stains in base, unchanging when exposed. *Basidiospores* (Fig. 1B) (7.7–)9.1–11.9  $\times$  4.2–4.9  $\mu\text{m}$ , mean  $Q = 2.25$  ( $n = 45$ ,  $L^m = 10.46$ ,  $W^m = 4.62$ ), subfusiform to ellipsoid, smooth, hyaline to slightly pale melleous in KOH, inamyloid to weakly pseudoamyloid with only a few scattered spores reacting reddish brown. *Basidia* (22.4–)25.2–30.1 (–31.5)  $\times$  9.1–11.9(–12.6)  $\mu\text{m}$ , clavate, 4-sterigmate, hyaline in KOH, inamyloid. *Hymenial cystidia* (Fig. 1D) 53.2–86.2  $\times$  7–12.6  $\mu\text{m}$ , pseudoamyloid, highly abundant, predominantly present as smooth, ventricose-rostrate pseudocystidia with a melleous amorphous to granular content, or present as smaller and hyaline, cheilocystidia and pleurocystidia without amorphous content. *Hymenophoral trama* (Fig. 1C) divergent from mediostratum, releasing a lemon yellow pigment in KOH; lateral hyphae (4.9–)5.6–8.4(–9.8)  $\mu\text{m}$  wide, with scattered hyaline helical wall thickenings (these rarely present in mediostratum). *Pileipellis* a trichoderm of contorted hyphae 3–6.3(–7.0)  $\mu\text{m}$  wide; individual hyphae light yellowish brown, pseudoamyloid. *Stipitipellis* a hymeniform layer of hyaline, clavate, obclavate, ventricose, or filiform caulocystidia, 11.9–30.8  $\times$  4.9–9.1  $\mu\text{m}$ , with a few scattered hymenial pseudocystidia-like elements, pseudoamyloid. *Clamp connections* absent.

*Distribution and Ecology*.—Solitary to gregarious on soil of montane forests dominated by *Quercus oocarpa* Liebm. in Costa Rica and *Quercus/Pinus* forests in Japan. Infrequent and with a trans-Pacific distribution in the northern Cordillera Talamanca of Costa Rica and in Japan.

Additional specimens examined: COSTA RICA.

**Cartago:** Estrella, ca. 5 km E of Interamerican Hwy. at Km 31, nr. town of Estrella, 9°46'4"N, 83°57'19"W, 1685 m, 6 Jun 1997, *Halling 7700* (NY, USJ); 24 Jun 2000, *Halling 7919* (NY, USJ).

**JAPAN. Yamanishi:** Kitakoma-gun, Hakushu, Nakayama, 16 Sep 2001, *Oosaku* (NY).

Twenty-three species of *Tylopilus* have been recorded from Mexico and Central America (Singer et al., 1991; Halling and Mueller, 2001; Halling, pers. obs.). Of these, none have the following characteristics of *T. alkalixanthus*: a uniform, ochraceous pigmentation, a mild taste, and a sometimes mutable context that releases a lemon yellow pigment in KOH. In addition, the helical wall thickenings on hyphae in the hymenophoral trama appear distinctive (see Fig. 1C). *Tylopilus alkalixanthus* appears to be allied to those taxa placed in sect. *Oxydabiles* as outlined by Singer (1986). Because there are at least a half dozen taxa that remain to be described (Halling, pers. obs.) from Costa Rican *Quercus* forests, and some of the known ones need revision, a key to species is premature at this time.

After nearly a decade of collecting boletes in Costa Rica, I (R. Halling) have found the new species only at the type locality. Unfortunately, that site is threatened by encroaching land development.

A specimen recently forwarded to us by Mr. Koichi Oosaku from Japan agrees in all respects with the Costa Rican material. However, the quantity of lemon yellow pigment released in KOH is slightly less.

### Acknowledgments

The work of the two junior authors was initially supported by National Science Foundation Grants DEB-9300798, DEB-9972018, and DEB-9972027. A NSF REU grant (DBI-9876747) supported the senior author. We thank our colleagues Dr. J. Caranza, Dr. A. V. Lizano (Universidad de Costa Rica, San José), and L. D. Gómez (Wilson Botanical Garden and Las Cruces Biological Station, San Vito, Costa Rica) for their advice, guidance, and support. Our collaboration with Costa Rica's National Institute of Biodiversity (INBio), M. Mata,

and L. Umaña in particular, have materially aided our investigations. The senior author would like to thank Barbara M. Thiers for making her internship possible, and Dr. Roy E. Halling for his time and patience in teaching her about boletes.

### Literature Cited

- Bessette, A. E., W. C. Roody & A. R. Bessette.** 2000. North American Boletes: a color guide to the fleshy pored mushrooms. Syracuse University Press, New York.
- Halling, R. E.** 1999. New *Leccinum* species from Costa Rica. Kew Bull. 54: 747–753.
- & **G. M. Mueller.** 1999. New Boletes from Costa Rica. Mycologia 91: 893–899.
- & ———. 2001. *Tylophilus bulbosus* sp. nov. from Costa Rica. Harvard Pap. Bot. 6: 109–112.
- Kornerup, A. & J. H. Wanscher.** 1983. Methuen Handbook of Colour. Ed. 3. Eyre Methuen, Ltd., London.
- Singer, L. D. Gómez & J. Garcia.** 1991. The Boletineae of Mexico and Central America. III. Beih. Nova Hedwigia 102: 1–99.
- Singer, R.** 1986. The Agaricales in Modern Taxonomy. Ed. 4. Koeltz Scientific Books, Koenigstein, Germany.