***Torulopsis castellii* sp.nov., a Yeast Isolated from a Finnish Soil**

By A. CAPRIOTTI*

*Istituto di Microbiologia Agraria e Tecnica dell'Università di Perugia, Italy,
and Institut de Microbiologie, Helsinki University, Helsinki, Finland*

(Received 10 January 1961)

SUMMARY

A new species of *Torulopsis* is described; it was isolated from a Finnish soil. This species is named *T. castellii* in honour of Professor Tommaso Castelli of the Agricultural University of Perugia, Italy.

INTRODUCTION

In a microbiological study of 32 samples of Finnish soil taken in August 1957, 22 species of yeasts were isolated; 15 of them were referred to an already described species, while 7 had to be considered as new species or varieties. The present paper describes a new species belonging to the genus *Torulopsis* for which the author proposes the name *Torulopsis castellii* in honour of Professor Tommaso Castelli, Director of the Istituto di Microbiologia Agraria e Tecnica of Perugia University, Italy.

METHODS

Origin of strains. Seven strains were studied, all isolated from a soil sample from Hyttiala in the Province of Tavastia Australis, Finland. The soil was from a pine bog with underbrush taken at a depth of 2–10 cm. It was tan coloured, humiferous, without CaCO₃ and at pH 3.7. The methods used to study the characters of the yeasts were those of Lodder & Kreger-van Rij (1952). In examining the utilization of sugars, the boiled and washed agar method described by Capriotti (1955) was used.

RESULTS

Growth in grape must. After 3 days at 25°, the cells oval; 1.8–3.5 × 2.2–4 μ ; single or in pairs or in chains of 3–10 cells. After 1 month at 17°: a thin ring, more or less limpid liquid, and sediment well developed.

Growth in malt extract. After 3 days at 25°, the cells oval; 2.3–5 × 2.3–4.3 μ ; single or in pairs or in chains of 7–16 cells. After 1 month at 17°: a trace of ring, limpid liquid, and sediment well developed (Fig. 1).

Growth on malt agar. After 3 days at 25°, the cells oval, elliptical to long narrow 1.3–5 × 2–5 μ , single or in pairs. Streak culture white gray, glistening, smooth, flat, waxy, rather thin, with smooth margin. After one month at 17°, streak culture white-yellowish, glistening, smooth, rather flat, not well developed, with smooth margin.

* Present address: Marine Laboratory, Miami University, Virginia Key, Miami 49, Florida, U.S.A.

Grape must+gelatine stab. After 60 days, at 18–20°, superficial growth only of colony, white-ochraceous, expanded, flat; gas bubbles formed; no liquefaction.

Sporulation. Ascospores not formed.

Giant colony on grape must+gelatine. After 1 month at 18°, the giant colony appeared round with large and smooth cavity, and slightly lobate crown.

Pseudomycelium. In slide culture, pseudomycelium not formed.

Fermentation. Glucose well fermented; galactose, maltose, sucrose, lactose, trehalose, raffinose, inulin, dextrin not fermented.

Assimilation of carbon compounds. Glucose, trehalose (slowly), D-ribose (very slowly), glycerol well assimilated. Not assimilated: galactose, maltose, sucrose, raffinose, lactose, L-sorbose, cellobiose, melibiose, melezitose, inulin, soluble starch, D-xylose, L-arabinose, D-arabinose, L-rhamnose, D-glucosamine HCl, i-erythritol, adonitol, mannitol, D-sorbitol, α -methylglucoside, salicin, potassium-D-gluconate, potassium-5-keto-D-gluconate, potassium sodium-saccharate, pyruvic acid, D-lactic acid, succinic acid, citric acid, ethyl acetoacetate, i-inositol.

Assimilation of nitrogen compounds. Ammonium sulphate assimilated; potassium nitrate not assimilated.

Splitting of arbutin. Negative.

Fermentative power in grape must. Ethanol produced 5.3–7.8% (v/v).

DISCUSSION

The isolated strains are referred to the genus *Torulopsis* because the cells are oval and form no spores, pseudomycelium or carotinoid pigments. Lodder & Kreger-van Rij (1952) reported in the genus *Torulopsis* only one species with good fermentation and assimilation of glucose, namely, *T. glabrata* (Anderson) Lodder & De Vries, which was originally isolated by Anderson from human faeces, with the name of *Cryptococcus glabratus*. However, this species also fermented trehalose. More recently other species have been described which ferment only glucose; but these species are different from *T. castellii* in the following characters: *T. pintolopesii* Van Uden (1952) assimilates only glucose, does not assimilate glycerol, D-ribose or trehalose; does not grow at 24°; *T. nitratophila* Shifrine & Phaff (1956) ferments glucose (latent); assimilates glucose, galactose, sorbose, trehalose, xylose, L-arabinose, D-arabinose, mannitol, sorbitol, adonitol, glycerol; does not split arbutin; *T. wickerhamii* Capriotti (1958) ferments glucose well; assimilates glucose, galactose, potassium nitrate; splits arbutin.

Two strains of *Torulopsis castellii* sp.nov. have been sent to the Centraalbureau voor Schimmelcultures, Delft, Netherlands; 7 strains have been put in the yeast collection of Istituto di Microbiologia Agraria e Tecnica dell'Università di Perugia, Italy.

TORULOPSIS CASTELLII SP.NOV.

Maltato in musto cellulae ovales 2–3.5 $\times$ 2.3–4.3 μ , singulae, binae. Ruento mense (17°) sedimen, medium nitidum et annulum.

Maltato in agaro trium dierum (25°) cellulae ovatae, ellipticae etiam angustae 1–3.5 $\times$ 2–5 μ , singulae aut binae. Elapso mense fit patina albaflava, cerea, lucida, laevigata, non copiosa. Nulla sporificatio observatur. Pseudomycelium deest.

Glucosum fermentatur. Assimilantur glucosum, glycerina, trehalosus (lente) et D-ribosum (lente). Nitras kalicus non assimilatur.

Minerali in medio cum alcohole aetilico ut unum carbonii pabulum, non augescit. Alcohole aetilicus gignit 5.3–7.8 %. Arbutinum non finditur. E terra Finnica sejuncta fuit. Typus: cultura 211 iacens in C.B.S., Delft, Holland.

Fig. 1. *Torulopsis castellii* nov.spec. ($\times 700$) (after 3 days on malt extract).

REFERENCES

- CAPRIOTTI, A. (1955). Intorno al saggio di assimilazione degli zuccheri da parte dei lieviti. *Biochimica Applicata*, **2**, 31.
- CAPRIOTTI, A. (1958). *Torulopsis wickerhamii* nova spec. a new yeast from silage. *Arch. Mikrobiol.* **30**, 385.
- LODDER, J. & KREGER-VAN RIJ, N. J. W. (1952). *The Yeasts*. Amsterdam: North-Holland Publ. Comp.
- SHIFFRINE, M. & PHAFF, H. J. (1956). The association of yeasts with certain bark beetles. *Mycologia*, **48**, 41.
- VAN UDEN, N. (1952). Zur Kenntnis von *Torulopsis pintolopesii* sp.nov. *Arch. Mikrobiol.* **17**, 199.