

Candida fermenticarens—a new yeast from arboricole lichen

J. P. VAN DER WALT* and PENELOPE B. BAKER

ABSTRACT

Two strains of an undescribed *Candida* species were recovered from arboricole lichen collected in the eastern Cape. A description of the new species, *Candida fermenticarens*, is given.

RÉSUMÉ

CANDIDA FERMENTICARENS—UNE NOUVELLE LEVURE DU LICHEN ARBORICOLE

Deux souches d'une espèce de *Candida* non décrite étaient recouvertes des lichens arboricoles, qui étaient recueillis à l'est du Cap. Une description de l'espèce nouvelle, qui s'appelle la *Candida fermenticarens*, suit.

INTRODUCTION

During the course of investigations into the occurrence of yeasts on uncommon substrates, two strains of an unidentified *Candida* species were recovered from arboricole lichen collected in the eastern Cape.

The description of the new species is based on the standard methods employed in yeast taxonomy (Van der Walt, 1970; Van der Walt, Johannsen & Liebenberg, 1974; Van der Walt & Hopsu-Havu, 1976).

DESCRIPTION

***Candida fermenticarens* Van der Walt, sp. nov.**
(Torulopsidales, Deuteromycotina)

In medio liquido cum glucoso et extracto levedinis et peptono post dies 3 in 28 °C cellulae spheroidales, ovoidiae ellipsoidalesque 2,0-4,5 × 3,0-6,0 μm, singulae, binae, frequenter in racemis. Sedimentum granulolum et annulus inchoatus. Post unum mensem in aere officinae sedimentum et annulus adsunt. Cultura in agar peptonato cum glucoso et extracto levedinis post unum mensem in aere officinae butyrosa, hebetata, eburna, aliquantum patens, in parte media crispulata vel rugosa. Margo glabrus undulatus vel lobiformis. In agar farinae Zea mais post dies 7 pseudohyphae primitivae. Ultrastructura parietis sicut in fermentis ascomycetoideis. Fermentatio nulla. Glucosum, galactosum, L-sorbosum, ribosum, ethanolum, glycerolum, i-erythritolum, ribitolum, galactitolum, D-glucitolum, D-mannitolum, DL-acidum lacticum, acidum succinicum, acidum citricum et kalium gluconicum assimilantur at non sucrosam, maltosum, cellobiosum, trehalosum, lactosum, melibiosum, raffinolum, melezitolum, inulinum, amyllum solubile, D-arabiosum, L-rhamnosum, α-methyl-D-glucosidum, salicinum, i-inositolum, nec nitras kalii. Assimilatio D-xylosi et L-arabiosi variat. Arbutinum non finditur. Ad crescentiam vitaminae externae necessariae sunt. Crescere non potest in 37 °C. Sebum bovillum non finditur. Holotypus: Cultura Y-854 isolata e lichene dendrophye lecto ad orem fluviuli Kasuka in territorio Port Alfredensi. Deposita in collectione zymotica Turmae Investigationalis Microbiologiae Concilii Investigatione Scientifica et Industriali, Pretoria.

Growth in glucose-yeast extract-peptone water: After 3 days at 28 °C the cells are spheroidal, ovoid or ellipsoidal, 2,0-4,5 × 3,0-6,0 μm, occurring singly, in pairs, usually in clusters (Fig. 1a). A granular sediment and incomplete ring are present. After one month at room temperature a sediment and ring are formed.

Growth on glucose-yeast extract-peptone agar: After 1 month at room temperature the streak culture is

butyrous, dull, cream-coloured, somewhat spreading, crispulate to rugose along the centre. The margin is entire, undulating to lobiform.

Dalmu plate cultures on corn meal agar: Only primitive pseudohyphae are formed (Fig. 1b).

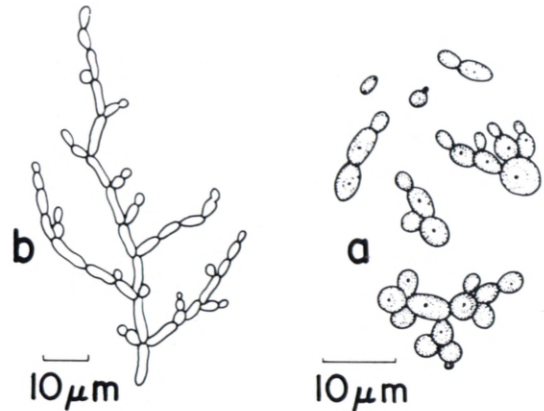


FIG. 1.—*Candida fermenticarens*. a, Vegetative cells in glucose-yeast extract-peptone water (3 days). b, Pseudomycelium on corn meal agar (7 days).

Cell-wall structure by transmission electron microscopy: Sections through cells of a 24 hr-old culture showed the cell-wall to be of the ascomycetous type, consisting of a rather thin, dark outer layer and broader, lighter, inner layer.

Colour reaction with Diazonium Blue B reagent: Absent.

Formation of ascospores: Not observed in the individual strains or mated cultures of the two recovered strains.

Fermentation: Absent.

Assimilation of carbon compounds:

Glucose	+	D-ribose	+
Galactose	+	L-rhamnose	—
L-sorbose	+	Ethanol	+
Sucrose	—	Glycerol	+
Maltose	—	Erythritol	+
Cellobiose	—	Ribitol	+
Trehalose	—	Galactitol	+
Lactose	—	D-glucitol	+
Melibiose	—	D-mannitol	+
Raffinose	—	α-Methyl-D-glucoside	—
Melezitose	—	Salicin	—
Inulin	—	DL-Lactic acid	+
Soluble starch	—	Succinic acid	+
D-xylose	+ (slow) or —	Citric acid	+
L-arabinose	+ (slow) or —	Inositol	—
D-arabinose	—	Potassium gluconate	+

* Microbiology Research Group, Council for Scientific and Industrial Research, P.O. Box 395, Pretoria, South Africa.

Splitting of arbutin: Absent.

Assimilation of potassium nitrate: Absent.

Growth in vitamin-free medium: Absent.

Growth at 37 °C: Absent.

Splitting of fat: Absent.

Habitat: Two strains were recovered from two specimens of arboricole lichen collected at the mouth of the Kasuka River in the Port Alfred district.

Holotype: One of these strains maintained as Culture No. Y-854 in the Yeast Collection of the Microbiology Research Group of the Council for Scientific and Industrial Research is the type for the species.

DISCUSSION

On the basis of its cell-wall ultrastructure as observed by TEM and failure to give a colour reaction with the Diazomium Blue B reagent, *Candida fermenticarens* is related to the ascomycetous yeasts. The failure to demonstrate an ascospore state could be due either to both the recovered strains being representative of a single mating type of an unknown, heterothallic, ascogenous yeast or to the species itself being protosexual (Van der Walt & Johannsen, 1974).

Within the genus *Candida* Berkhout as revised by Van Uden & Buckley (1970), *C. fermenticarens* in its lack of fermentative ability and utilization of mono-

saccharides only, resembles *Candida lipolytica* (Harrison) Diddens & Lodder and *Candida rugosa* (Anderson) Diddens & Lodder. The new species is, however, readily differentiated from *C. lipolytica* by the ability to utilize galactitol, inability to split higher glycerides and lack of true, septate hyphae, and from *C. rugosa* by the ability to utilize D-ribose, i-erythritol, ribitol and galactitol.

UITTREKSEL

Twee stamme van 'n onbeskrewe Candida soort is vanaf boombewonende liggende afkomstig van die oostelike Kaap geïsoleer. 'n Beskrywing van die nuwe soort, Candida fermenticarens, word gegee.

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