

Sample A*Candida norvegensis* (anaomorph), *Pichia norvegensis* (teleomorph)

Strain was previously part of QC-sending SKML 02-2005. Score at that time was 18%, now it is 28%. Strain is not scored due to the low identification percentage. Next time it will be scored.

Pathogenicity:

This species is now encountered as a rare and emerging causative agent of opportunistic mycoses that are isolated from immunocompromised patients or cases with other predisposing factors, such as prematurely, low birth weight, long duration of hospital stay, and prosthetic valve endocarditis.

Distribution:

Worldwide.

Lab diagnosis:

1. Macroscopic morphology:
On Sabouraud agar at 30°C: white to cream colored, smooth, glabrous.
2. Microscopic morphology :
Ovoid, budding yeast-like cells or blastoconidia. Filaments, none or simple pseudohyphae.

Difference between *C. norvegensis* and other species are shown below.

Strain	Macroscopic morphology	Microscopic morphology	Supplementary test(s)
<i>Candida norvegensis</i> ¹⁾	White to cream, smooth, glabrous	Pseudomycelium	Cellobiose: usual + Maltose: -
<i>C. inconspicua</i>	White to cream, butyrous	No pseudomycelium	Cellobiose: -
<i>C. krusei</i>	Cream, dry	Pseudomycelium	Cellobiose: -
<i>C. lipolytica</i>	Tannish-white, butyrous	Pseudomycelium	Cellobiose: - or weak +
<i>C. kefyr</i>	White to cream, butyrous	No pseudomycelium	Cellobiose: v
<i>S. cerevisiae</i>	Cream, butyrous	Some psuedomycelium may be present	Cellobiose: -

¹⁾ Smell of overripe pears

Subjoined information from evaluation SKML Mycology 2005-2

The bioprofiles of *C. inconspicua*, *C. krusei*, *C. lipolytica* en *C. norvegensis* are quite similar. *C. norvegensis* is recognizable because of the smell of overripe pears. It is also important to check the microscopic morphology on rice cream agar. To identify the above mentioned *Candida* species use the subjoined tests:

Glucose fermentation	Microscopic morphology	Growth on medium with cycloheximide		Cellobiose	Identification
	Pseudomycelium	0.01%	0.1%		
+,-	+	-	-	+	<i>C. norvegensis</i> ¹⁾
+	+	-	-	-	<i>C. krusei</i>
-	+	+	+	-	<i>C. lipolytica</i>
-	-	-	-	-	<i>C. inconspicua</i>

¹⁾ Smell of overripe pears

Sample B

Aspergillus hollandicus (anamorph), *Eurotium amstelodami* (teleomorph)

Eurotium species are the sexual states of *Aspergillus* species, notably the *Aspergillus glaucus* group among others. Fungi belonging to the *A. glaucus* group are *E. repens* (*A. reptans*), *E. amstelodami*, *E. herbariorum* (*A. glaucus*), *E. chevalieri* (*A. chevalieri*).

Score is 91%.

Pathogenicity:

Occasional reports of sinusitis, otitis, cerebral, orofacial and pulmonary infections.

Distribution:

Subtropical regions in soil, on plants, dried foods, leather.

Lab diagnosis:

1. Macroscopic morphology
On Sabouraud agar at 30°C: grey green to dull green. Reverse is pale yellow to pale brown. (Fig. 1).
2. Microscopic morphology
Conidiophore smooth-walled, uncolored to pale brown. Vesicles subglobose to spathulate, uncolored to pale brown, uniseriate. Conidia spherical to ellipsoidal, surface texture rough to spiny (Fig. 2).

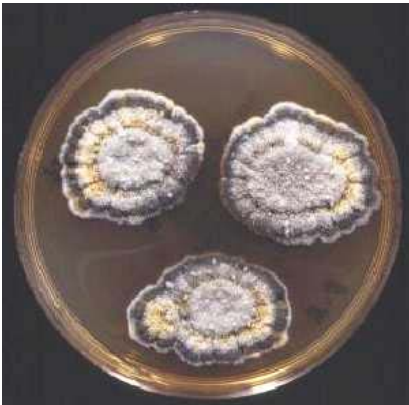


Fig. 1 Macroscopic morphology on Sabouraud agar (front)

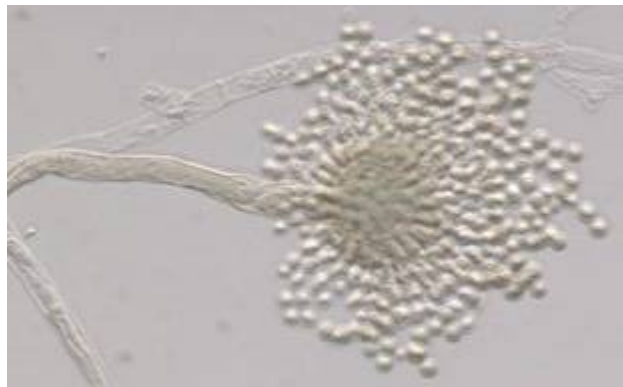


Fig. 2 Microscopic morphology

Difference between *A. hollandicus* and other species are shown below.

Strain	Macroscopic morphology	Microscopic morphology	Supplementary test(s)
<i>A. hollandicus</i>	Gray green to dull green. Reverse: yellow to pale brown.	Smooth-walled, uncolored to pale brown. Vesicles subglobose to spathulate, uncolored to pale brown, uniseriate. Conidia spherical to ellipsoidal, surface texture rough to spiny.	
<i>A. flavus</i>	Yellowish-green	Vesicle radiate, uni- and biseriate, conidiophore rough-walled.	
<i>A. candidus</i>	Slow growing, white to pale yellow	Vesicle radiate, conidiophore smooth-walled to finely roughened, uni- or biseriate depending on size vesicle	
<i>A. nidulans</i>	Green, cream-buff of honey-yellow. Reverse: dark purplish	Short vesicle, biseriate	
<i>Neosartorya sp.*</i>			

* Species in this genus

- ***Neosartorya fischeri***
This species is a teleomorph of *Aspergillus fischerianus*
Aspergillus fischeri is an obsolete synonym of this species.
- ***Neosartorya fischeri* var. *spinosa*** (obsolete)
This obsolete name is a synonym of *N. pseudofischeri*
- ***Neosartorya pseudofischeri***
N. fischeri var. *spinosa* is an obsolete synonym of this species.

Sample C

Candida glabrata

Pathogenicity:

C. glabrata is after *C. albicans* one of the most common yeast species. It is often isolated as an incidental finding from skin and urine. It has been implicated as an "opportunistic" cause of both superficial and systemic infections, especially in immunocompromised patients, and it has been isolated from patients with septicemia, pyelonephritis, pulmonary infections, endocarditis and hyperalimentation.

C. glabrata is known for its decreased susceptibility for azoles but good susceptibility to echinocandins.

Score is 96%

Distribution:

Worldwide in man and other mammals, birds, fruit juice and insects.

Lab diagnosis:

1. Macroscopic morphology
On Sabouraud agar at 30°C: white, smooth and glistening (Fig. 3)
2. Microscopic morphology
Ovoid, budding yeast-like cells or blastoconidia. No pseudomycelium produced.
Yeast cells are quite small compared to *C. albicans* (Fig. 4. Clin. Microbiol. Rev. 1999;12:80-96).



Fig. 3 Macroscopic morphology on Sabouraud agar

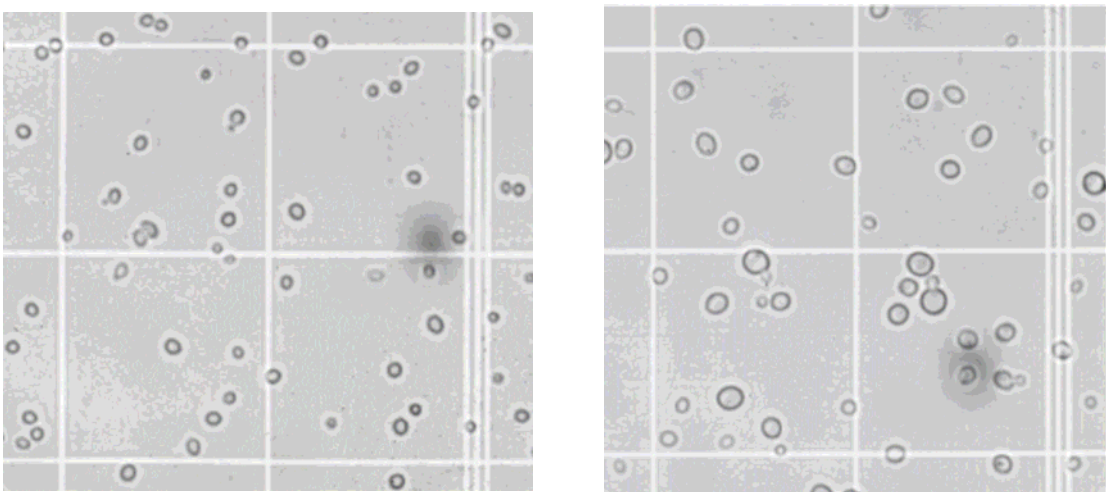


Fig. 4. Size differential of *C. glabrata* and *C. albicans*. Shown are wet-mount slide preparations of *C. glabrata* (left) and *C. albicans* (right) on a hemocytometer. Magnification, 400x.

Difference between *C. glabrata* and other species are shown below.

Strain	Macroscopic morphology	Microscopic morphology	Supplementary test(s)
<i>C. glabrata</i>	White, smooth and glistening	Ovoid, budding yeast-like cells or blastoconidia. No pseudomycelium.	Growth on medium with 0.01% cycloheximide: +,- Growth on medium with 0.1% cycloheximide: +,-
<i>C. krusei</i>	Cream, dry	Pseudomycelium	Growth on medium with 0.01% cycloheximide: - Growth on medium with 0.1% cycloheximide: -
<i>C. lipolytica</i>	Tannish-white, butyrous	Pseudomycelium	Growth on medium with 0.01% cycloheximide: + Growth on medium with 0.1% cycloheximide: +

Sample D

Natrassia mangiferae (teleomorph), *Scytalidium dimidiatum* (synanamorph)

Pathogenicity:

Natrassia mangiferae (formally known as *Hendersonula toruloidea*) is a recognized agent of onychomycosis and superficial skin infections, especially in tropical regions. However, isolates are sensitive to cycloheximide (actidione) which is commonly added to primary isolation media used for culturing skin scrapings. Recently, *H. toruloidea* has been transferred into a new genus as *Natrassia mangiferae* (arthric synanamorph = *Scytalidium dimidiatum*), however this name is not yet in current medical use.

Strain is not scored due to contamination of several samples with a Zygomycete.

Distribution:

Worldwide

Lab diagnosis:

1. Macroscopic morphology
Colonies are hairy, dark grey to blackish-brown, or white to grayish, then with a cream-colored to deep ochraceous-yellow colony reverse (Fig. 5).
2. Microscopic morphology
Black, ostiolate pycnidia containing numerous hyaline, flask-shaped phialides. Phialoconidia are at first 1-celled and hyaline, later becoming 3-celled, brown, with the centre cell darker than the end cells and are ovoid to ellipsoidal in shape (Fig. 6). Colorless mutants (*Scytalidium hyalinum*) often occur.



Fig. 5 Macroscopic morphology



Fig. 6 Microscopic morphology

Difference between *Scytalidium dimidiatum* and other species are shown in subjoined table.

Strain	Macroscopic morphology	Microscopic morphology	Supplementary test(s)
<i>S. dimidiatum</i>	Hairy, dark grey to blackish-brown, or white to grayish, then with a cream-coloured to deep ochraceous-yellow colony reverse	Black, ostiolate pycnidia containing numerous hyaline, flask-shaped phialides. Phialoconidia first 1-celled and hyaline, later 3-celled, brown, with darker centre compared to end cells, ovoid to ellipsoidal shape.	
<i>S. hyalinum</i> *			
<i>S. lignicola</i>	Cottony to woolly, whitish, finally becoming dark grey to black	Chlamydo-spore-like conidia single or in chains, dark brown, thick-walled and swollen	
<i>Aureobasidium sp.</i>	Smooth, cream or pink, later mostly becoming brown or black	Hyaline hyphae. Locally converting into blackish-brown, thickwalled chlamydo-spores	
<i>Bipolaris sp.</i>	Hairy, expanding, black	Conidia produced in sympodial order, dark brown, straight or curved, compartmented by distosepta	
<i>Curvularia sp.</i>	Hairy, expanding, black	Conidia produced in sympodial order, dark, curved, 3-4 septa	
<i>Exophiala sp.</i>	Slimy, yeast-like, later becoming velvety, olivaceous-black		
<i>Geotrichum sp.</i>	Hairy or butyrous, usually dry, white	Hyphae hyaline, falling into arthroconidia	
<i>Saccharomonospora sp.</i> **			

* Colorless mutant of *Natrassia mangiferae*. *N. mangiferae* has a *Scytalidium* synanamorph in culture. This species is black, but its melanin synthesis is easily blocked, leading to whitish colonies with an ochraceous-yellow colony reverse. This mutant is known in the medical literature as a separate *Scytalidium* species, *S. hyalinum*.

** Belongs to the *Actinomycetes*

Literature

1. de Hoog GS, Guarro J, Gené J, Figueras MJ. Atlas of clinical fungi. 2nd ed. Nederland: Centraal bureau voor schimmelcultures, 2000
2. Andreoni S., Farina C., Lombardi G. Medical mycology atlas. GRAFIK@rt srl – Paderno Dugnano, 2004
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5. <http://www.doctorfungus.org>
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The macroscopic descriptions are according to the literature above. This may differ from your results that can depend on the composition of the Sabouraud agar plates.

Brun S, Bouchara JP, Bocquel A, Basile AM, Contet-Audonneau N, Chabasse D. Evaluation of five commercial Sabouraud gentamicin-chloramphenicol agar media. Eur. J. Clin. Microbiol. Dis. 2001; 20:718-723