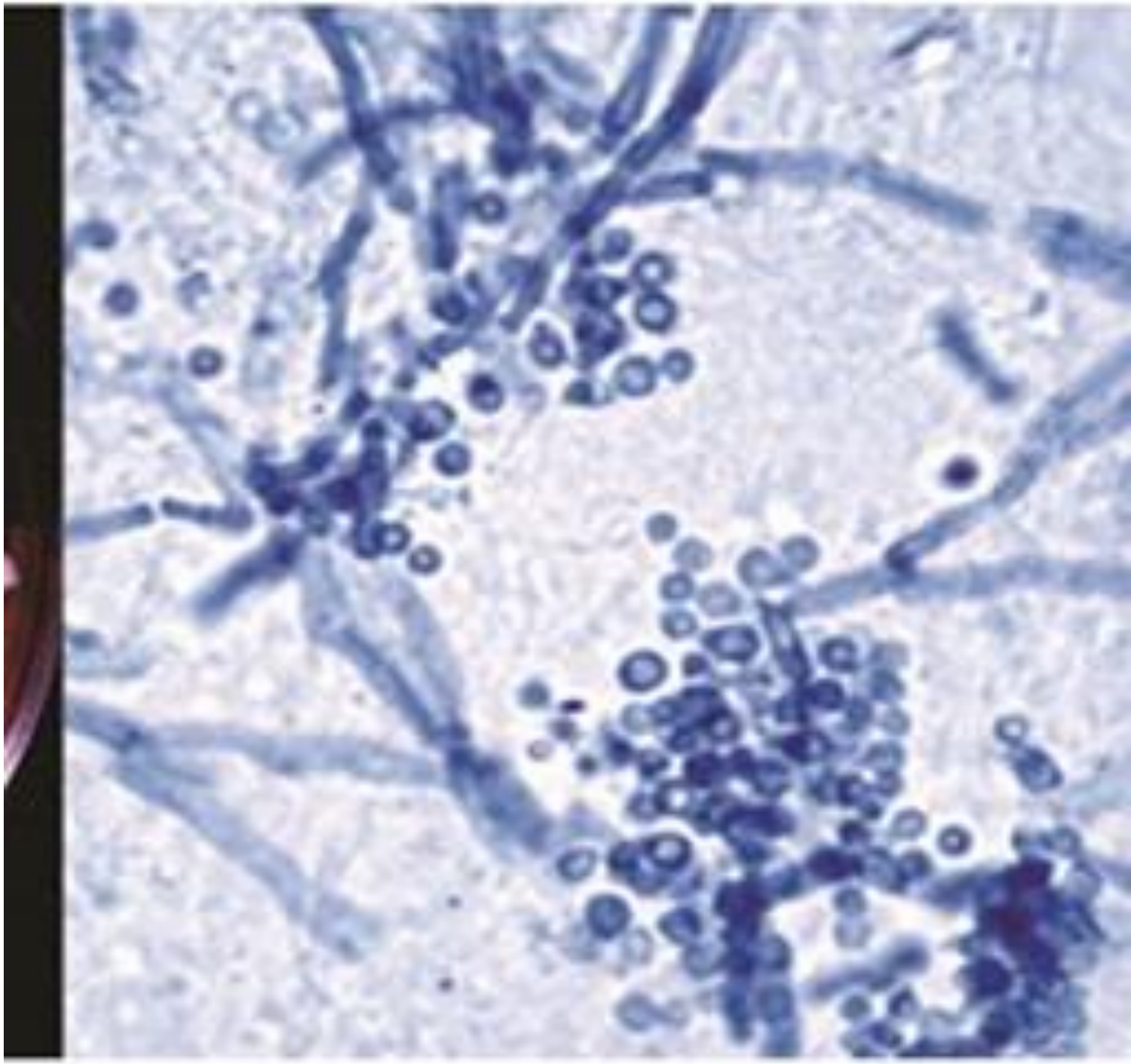
MALASSEZIA

Taxonomy

- Division: *Basidiomycota*
- Class: *Exobasidiomycetes*
- Order: *Malasseziales*
- Family: *Malasseziaceae*
- Genus: *Malassezia*

Malassazia

- Described by Louis -Charles Malassez
- first description of Malassezia by Eichstedt in 1846
- this yeast belongs to the group of Fungi imperfect.
- yeast is not necessarily pathogenic
- *Malassezia* spp. have been found as skin commensals



Malassezia species are basidiomycetous yeasts and form part of the normal skin flora of humans and animals.

- These include M. caprae (goat, horse)
- M. cuniculi (rabbit)
- M. dermatis (human)
- M. equina (horse, cow)
- M. furfur (human, cow, elephant, pig, monkey, ostrich, pelican)
- M. globosa (human, cheetah, cow)

The genus now includes 14 species of which 13 are lipid dependent.

- M. japonica (human)
- M. nana (cat, cow, dog)
- M. obtusa (human)
- M. pachydermatis (dog, cat, carnivores, birds)
- M. restricta (human)
- M. slooffiae (human, pig, goat, sheep)
- M. sympodialis (human, horse, pig sheep)
- M. yamatoensis (human)

Malassezia species and main mammalian hosts.

Malassezia yeasts:

- known to form a unique cluster
- consisting of 18 species living almost exclusively on the skin and mucosal sites of warm-blooded vertebrates

Malassezia species	Synonyms	Presence on healthy skin	Presence in lesions
M. furfur	*Pityrosporum ovale*	In humans Sometimes in animals	In humans (PV, FG)
M. pachydermatis	*P. pachydermatis*, *P. canis*	In dogs, cats, many others (mostly canids) Sometimes in humans (dog contact)	In dogs, cats, others (SD, OT) Sometimes in humans (FG)
M. sympodialis	*M. furfur* serovar A	In humans and animals	In humans (AD, SD) Sometimes in cats (OT)
M. globosa	*P. orbiculare* *M. furfur* serovar B	In humans and animals	In humans (PV, SD, AD) Sometimes in cats (OT)
M. obtusa		In humans	In humans
M. slooffiae		In pigs, cats (claws) In humans	In humans
M. restricta	*M. furfur* serovar C	In humans	In humans (SD)
M. dermatis		In humans	In humans (AD)
M. japonica		In humans	In humans (AD, SD)
M. nana		In cats, horses	In cats, cattle (OT)
M. yamatoensis		In humans	In humans (SD)
M. caprae		In goats	
M. equina	*M. equi*	In horses	In horses
M. cuniculi		In rabbits	
M. arunalokei		In humans	In humans
M. brasiliensis		In parrots	–
M. psittaci		In parrots	–

Characteristics

- *Malassezia* yeasts are part of the microbiome of healthy human skin also been associated with dermatological conditions like
  - dandruff
  - Seborrheic Dermatitis
  - Pityriasis Versicolor
- *Malassezia* species are also part of the normal microbiota of animal skin
- *Malassezia* –
  - lack of cytosolic Fatty Acid Synthase (FAS).
  - characterized by lipophilic and lipid-dependent metabolism

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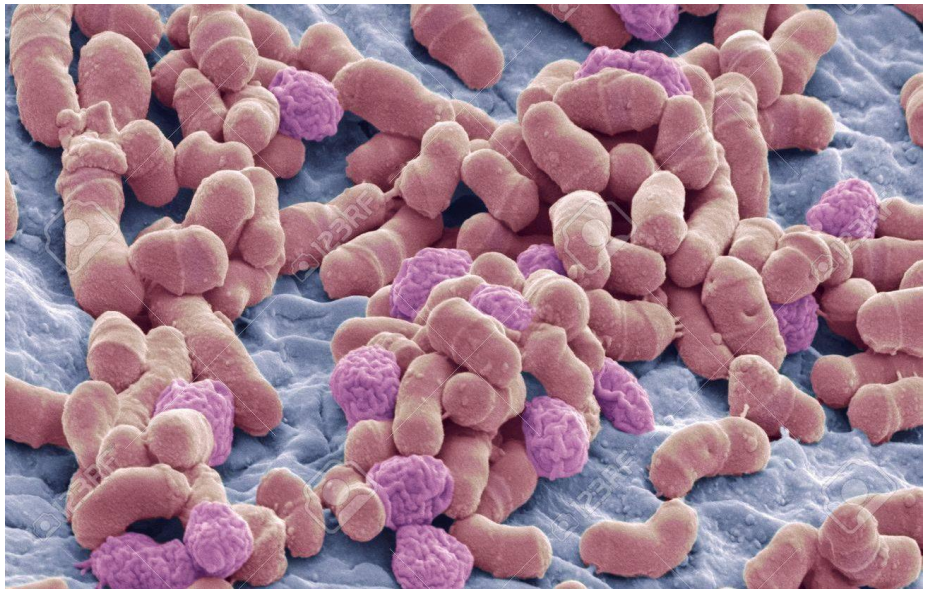
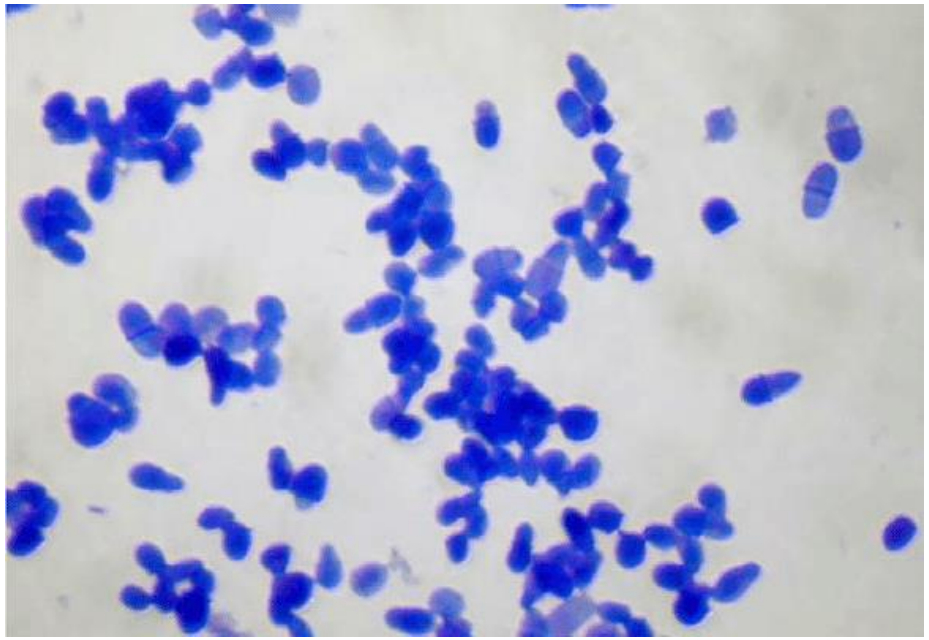
- Malassezia species may cause various skin manifestations including
  - Pityriasis versicolor
  - Seborrhoeic dermatitis
  - Dandruff
  - Atopic eczema
  - folliculitis.
  - *M. Pachydermatis* is known to cause external otitis in dogs.

Morphological Description:

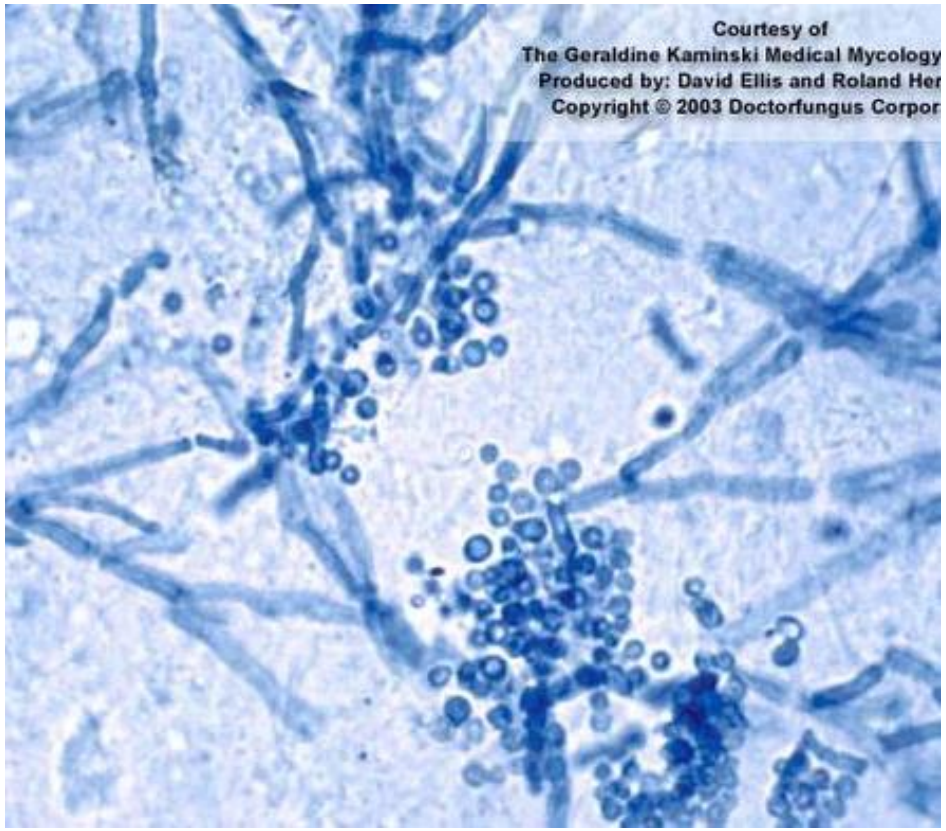


- On media like modified Dixon’s agar
  - colonies are cream to yellowish, smooth or lightly wrinkled, glistening or dull, and with the margin being either entire or lobate.
- Malassezia is characterised by globose, oblong-ellipsoidal to cylindrical yeast cells.
- Reproduction is by budding on a broad base and from the same site at one pole (unipolar).

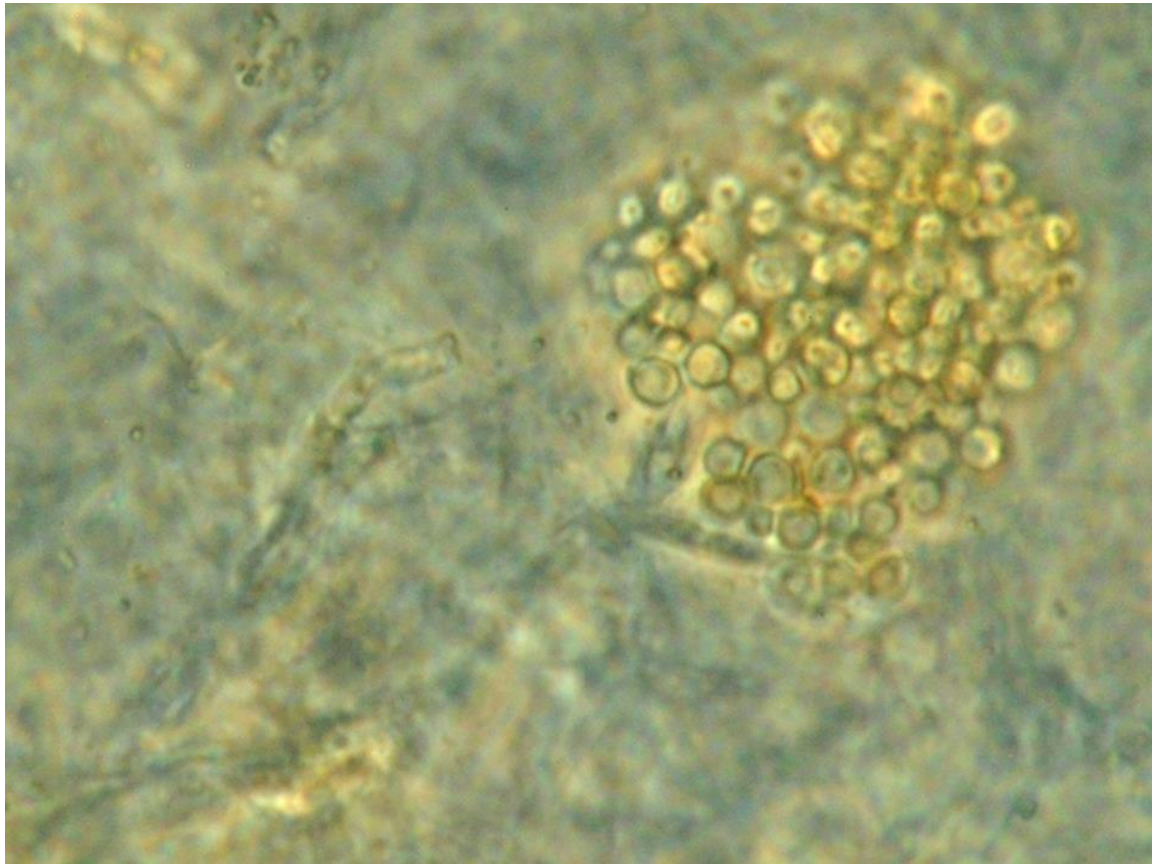


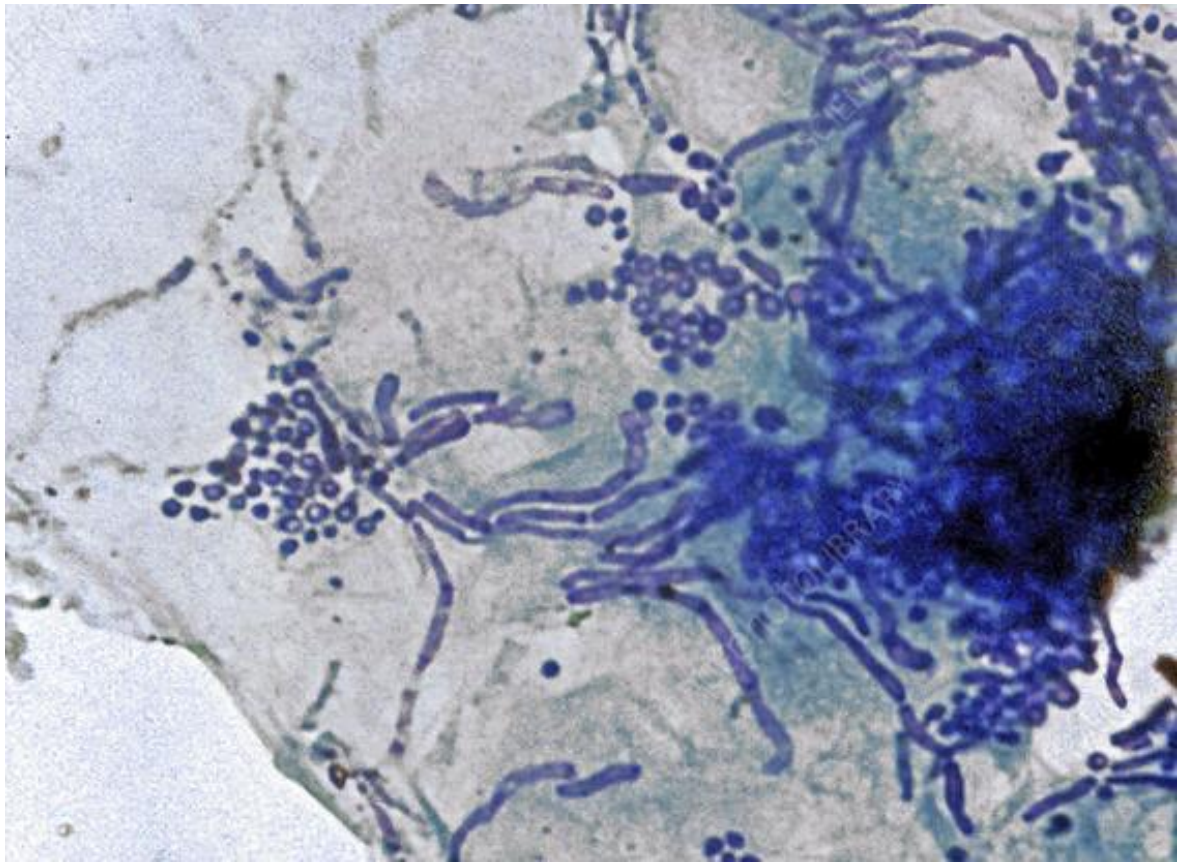
Charecteristics

- *Malassezia* is characterised by globose, oblong-ellipsoidal to cylindrical yeast cells.
- Reproduction is by budding on a broad base and from the same site at one pole (unipolar).
- Previously known as *Pityriasis*
- *Malassezia* species, are basidiomycetous yeasts
- Only species as a part of the normal skin flora of humans and animals.
- Melanin - fungal pathogenicity factors



Morphology





Medium used for isolation of *Malassezia*

- Czapek's dox medium
- Corn meal medium
- Rose bengal medium
- Nutrient medium
- Potato dextrose medium
- Malt extract medium
- Sabouraud's dextrose medium
- Sabouraud's maltose medium (both solid and liquid media)

Isolation & Identification

Isolation

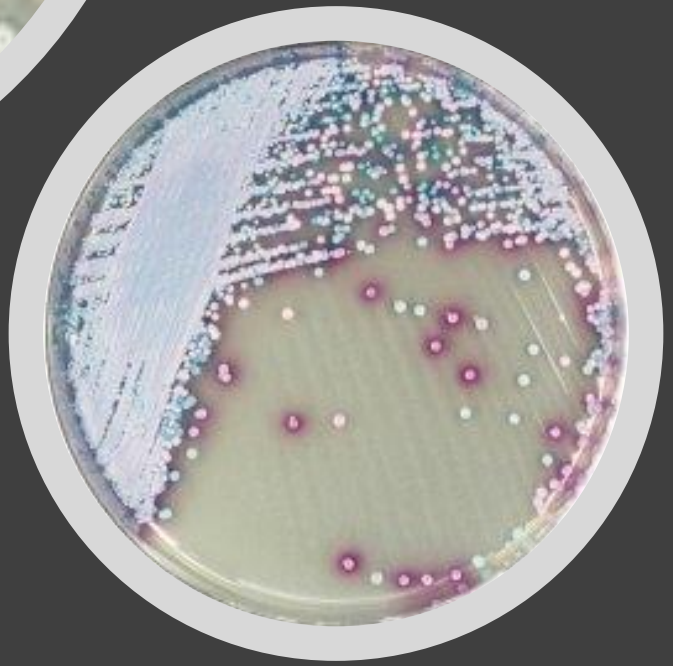
- modified Dixon agar support *Malassezia* growth
- also grow on Sabouraud Agar

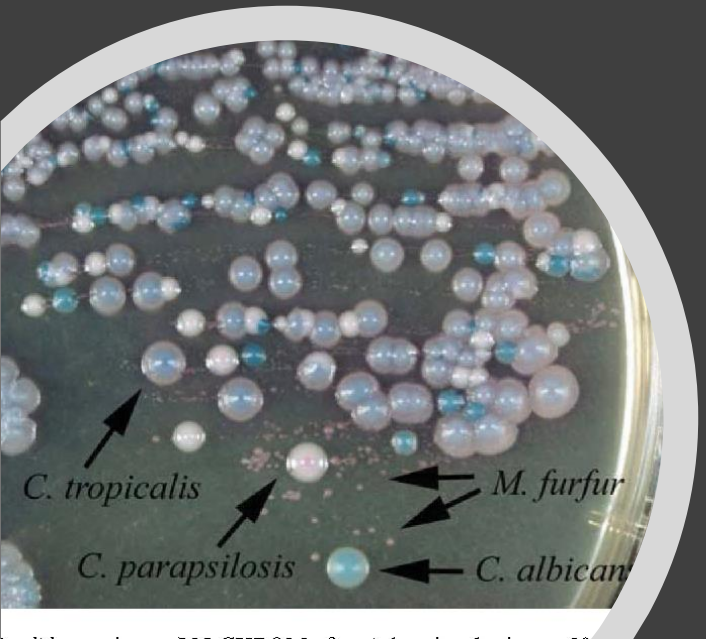
Identification mainly based on

- morphological characteristics
- biochemical tests - catalase, urease, and β-glucosidase activity

Molecular tools include

- pulsed field gel electrophoresis of chromosomes
- PCR-based methods (RAPD, PCR-RFLP, AFLP)
- DNA sequence based methods of D1/D2 domains of the large subunit rDNA





Growth of Malassezia in CHROMagar medium

- large, pale pink and wrinkled colonies on CHROMagar
-
- Other Malassezia spp including *M. globosa & M. restricta* → mostly pink to purple

Infection in animals

- *M. pachydermatis*- normal flora of skin and in the ear canal of dogs and cats
- causes dermatitis and otitis in mammals.
- Predisposing factors
  - atopic or seborrheic dermatitis
  - parasitic infestation
  - diabetes mellitus in dogs
  - feline immunodeficiency virus
  - feline leukaemia virus infections
  - long-term antibiotic use associated with glucocorticoid treatment
  - may predispose to Malassezia overgrowth, usually leading to development of lesions

CLINICAL SIGNS AND SYMPTOMS

- Pruritus and Erythematous lesion
- Otitis externa
- Shaking of head/ear
- Licking and chewing the site
- Scratching ear
- Dry or greasy hair coat and malodor
- Lichenified , hyperpigmented and alopecic skin

DIAGNOSIS

Microscopic exam of impression smear, dry skin scraping, cotton ear swab, adhesive tape etc.

Cytologic evaluation and staining with Leishman staining of I/S

Dark blue-purple Peanut/8 shape budding yeast	Culturing on Sabouraud agar