

# Yeasts in the blood of 3 ICU patients...



# CASE N° 1

72 yo woman

-PH: IDDM

Valvular and ischemic heart disease

- PA: AV replacement and by-pass x 2 (14-Mar)

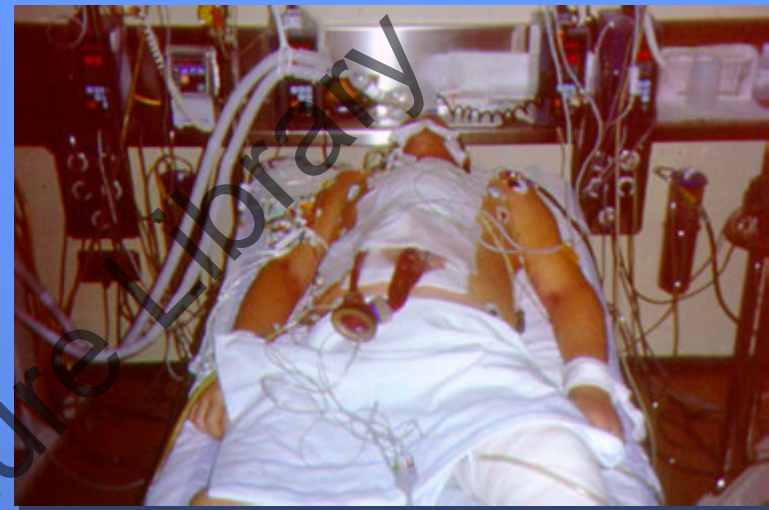
- Complications:

1- *H. influenzae* VAP

2- *E. aerogenes* CA-BSI

3- *C. difficile* AD

4- **15-April:** catheter hub + BC **yeast** ...



# CASE N° 1

## Evolution:

Catheter withdrawn: negative culture

Full recovery. Control BC negative

April 29 ICU discharge

Died due to cardiac arrest 2 days later

Transient fungemia??

## CASE N° 2

74 y-o woman

PH: Asthma

Reumatoid arthritis GC

Mitro-aortic valve replacement October 02

PA: Feb 16 - fever + heart failure

Echo: severe M insufficiency.

Surgery Feb 23: no endocarditis

## CASE N° 2

### Complications:

- 1- Encephalopathy
- 2- Bacteremic MRSA VAP
- 3- *Pseudomonas aeruginosa* ITU
- 4- *Clostridium difficile* AD
- 6- BC 23-April: yeast

### Evolution

**Fluconazole.** Died May 5<sup>th</sup>. *E. faecium* CABSI

No yeast

## CASE N° 3

76 yo woman

- **PH**: Ischemic and valvular heart disease
- **PA**: MV replacement+ by-pass x 4 April 4th
- **Complications**:
  - 1- *M. catarrhalis* tracheobronchitis 10/4
  - 2- *Clostridium difficile* AD 29/4
  - 3- *Acinetobacter Iwoffi* tracheobronchitis 24/4
  - 4- BC 30-4: yeast ????? Fluconazole

## CASE N° 3

May 3rd BC remained positive

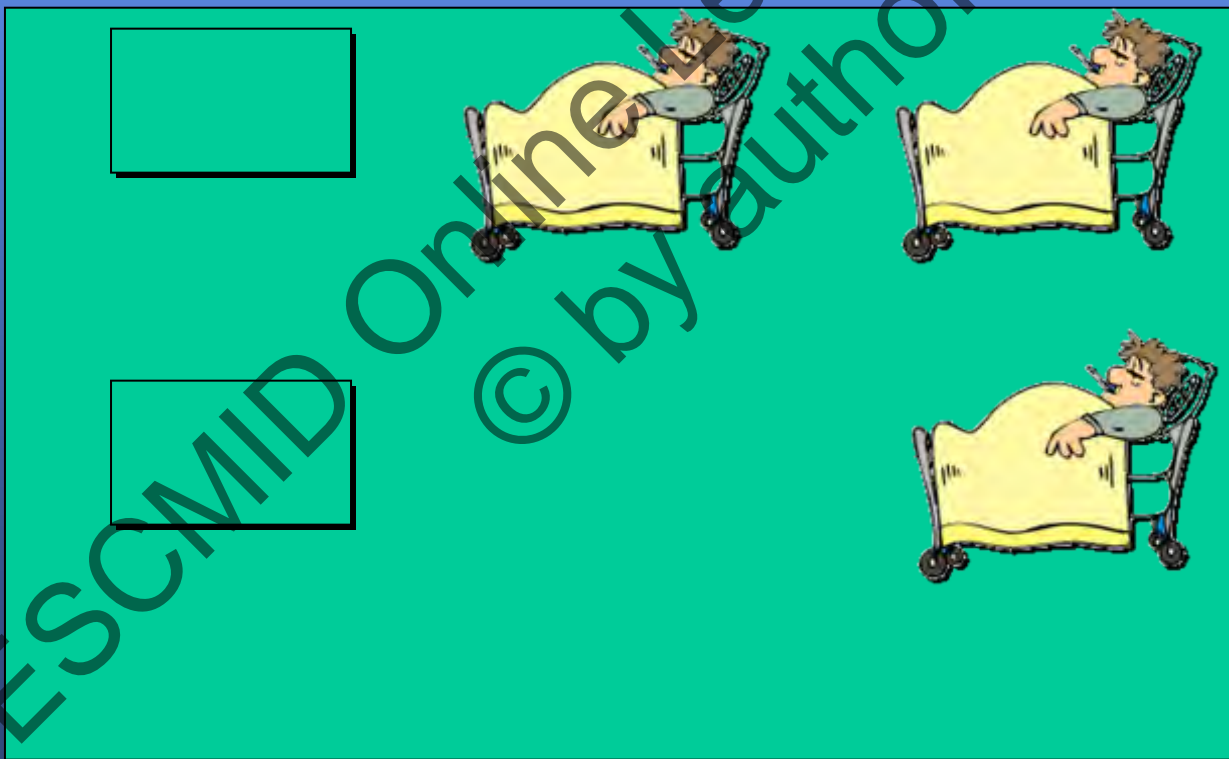
May 12 Echocardiogram: **Possible endocarditis (1 cm)**

No candidate for reintervention

Died June 20 after CVA

## IN SUMMARY....

3 patients from the same unit develop fungemia caused by a «strange» yeast between 15-30 April





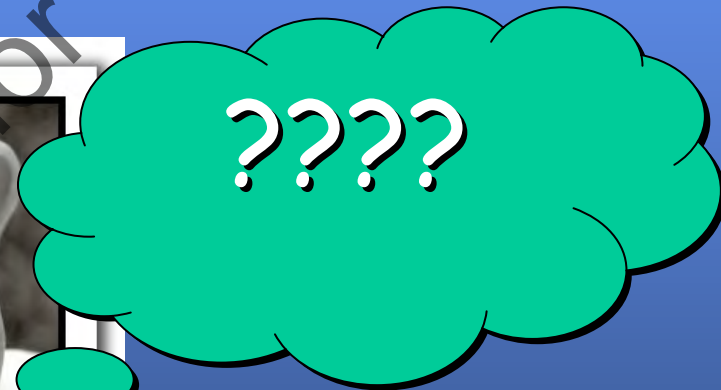
**Ideas?**

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# *S. cerevisiae*



# *Saccharomyces cerevisiae*

- Yeast from the bread and beer
- Rapid growth
- Rose colonies
- Ascospores
- Colonize GIT, vagina, RT



Asca con ascosporas

# *Saccharomyces cerevisiae*

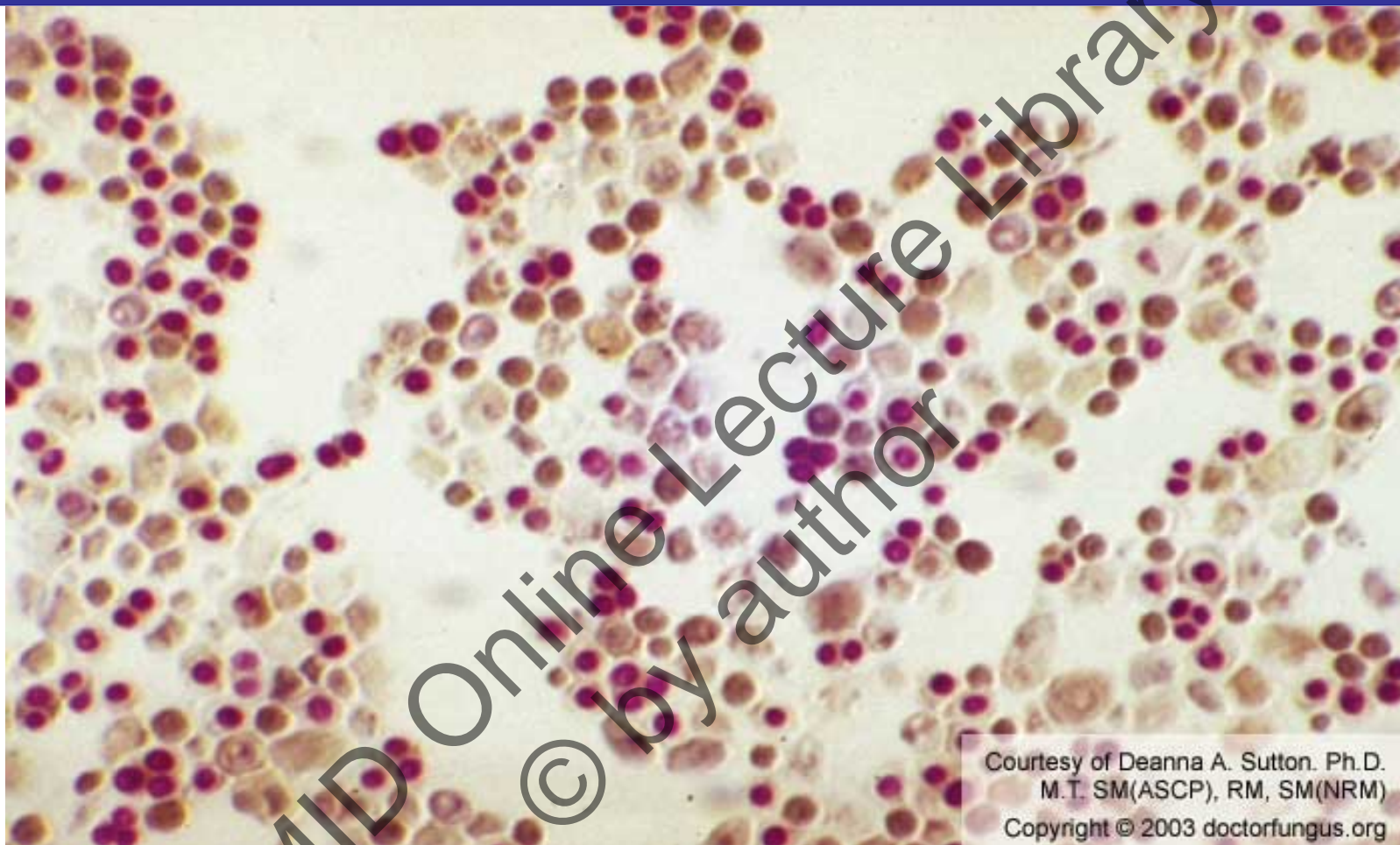
Does not grow at 42°C or with cycloheximide

Nitratos - and Ureasa +



# *Saccharomyces cerevisiae*

<http://www.doctorfungus.org>



Courtesy of Deanna A. Sutton, Ph.D.  
M.T. SM(ASCP), RM, SM(NRM)  
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• **Genus/Species:** *Saccharomyces cerevisiae*

• **Image Type:** Microscopic Morphology

• **Title:** Acid fast stain

• **Disease(s):** Vulvovaginitis ,disseminated infections

• **Legend:** Asci, containing broadly elliptical ascospores  
Color enhanced.





**Azole resistance?**

**How it all ended?**

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# Diagnostic approach

- Outbreak?
- Case definition



# REVISIÓN DE LOS 3 CASOS

Years/G	Undelying	Nutrition	Cat IV	Supp.	Days	ABS	Cultures	Infection	TT	Dead
76/M	Diabetes, CCV, ICU setting	NTP y E	Y	Y	9	Ceftriaxone, Metronidazole	Catheter	EVP	Flu	Y
72/M	CCV, ICU setting	NTP y E	Y	Y	7	Vancomycin, Meropenem, Metronidazole	Conection	Fungemia	No	Y
74/M	Arthritis. CCV, ICU setting	NTP y E	Y	Y	8	Vancomycin, rifampicine Meropenem, ciprofloxacin, Metronidazole	-	Fungemia	Flu	Y

## In summary....

	Ultralevura initiated	<i>S. cerevisiae</i> BC
Case 1	8 April	15 April
Case 2	16 "	23 "
Case 3	22 "	30 "

	Catheter	BC
Case 1	+	+
Case 2		+
Case 3	+	+

# *Saccharomyces boulardii*

- Commercial probiotic **Ultralevura®** since 1962
- Each capsule: 1 billion lyophilized microorganisms
- Therapy and prophylaxis of CDAD
- Dose: 1-2 gr/día



# Attitude

1. Cultured **Ultralevura®** capsules (*Saccharomyces boulardii*) from the unit
2. *S. cerevisiae* clinical samples and capsule samples sent to a Reference laboratory
3. Probiotics banned in the unit
4. Case control study (3 vs 41)
5. Rectal and pharyngeal swab to all patients of the unit
6. Literature review

# Capsules culture

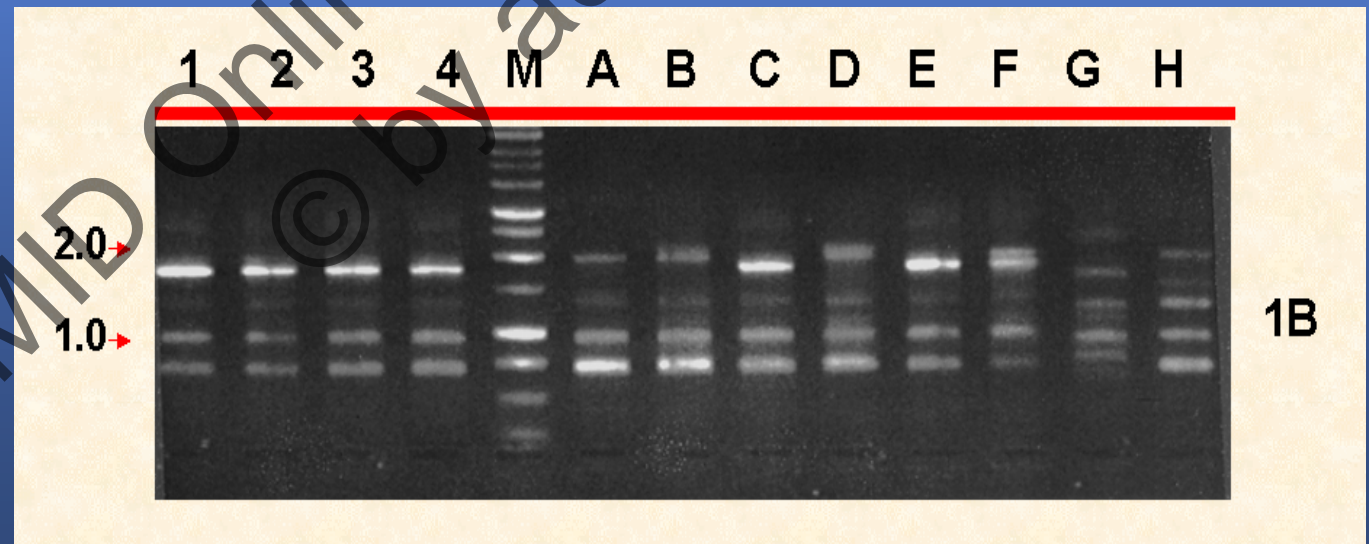
*S. boulardii* = *S. cerevisiae*



Registered as *S. cerevisiae* CBS 5926

# Molecular study

Identical



Dr. Manuel Cuenca Estrella

# Susceptibility

strain	AMB	FC	Fluco	Itra	Vori
<b>1</b>	<b>0.50</b>	<b>0.25</b>	<b>8.0</b>	<b>2.0</b>	<b>0.12</b>
<b>2</b>	<b>0.50</b>	<b>0.12</b>	<b>8.0</b>	<b>1.0</b>	<b>0.12</b>
<b>3</b>	<b>0.50</b>	<b>0.12</b>	<b>8.0</b>	<b>1.0</b>	<b>0.25</b>
<b>Capsules</b>	<b>0.50</b>	<b>0.12</b>	<b>8.0</b>	<b>2.0</b>	<b>0.12</b>



# Other results

**Colonization study:** negative

**Case control study:** Ultralevura 3/3 cases  
(media 8 d) and 2/41 controls

**Outcome:** no further case

MAJOR ARTICLE

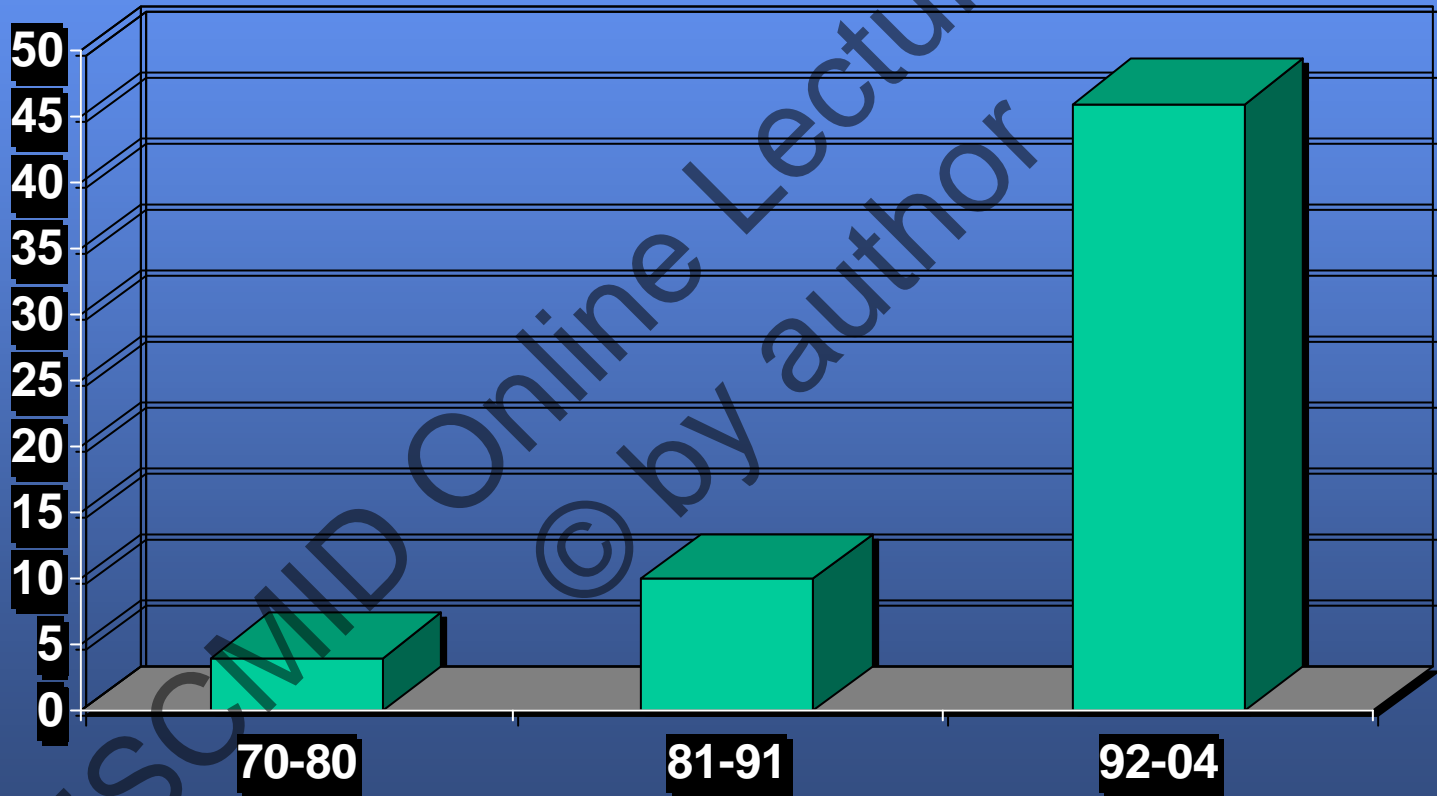
# *Saccharomyces cerevisiae* Fungemia: An Emerging Infectious Disease

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# Reports increasing



# Review of the literature: 60 cases

**Age:** 43 y-o (5 < 1 yr)

**Sex:** 52% male

## **Underlying conditions:**

3: None (2 self inflicted, 1 massive ingestion of beer yeast)

12: **GIT disease**

9: **Cardiac surgery**

9: **Hematological disease**

7: **Prematures**

Trauma (4), HIV, CNS, Respirat insuf (3 each), corticosteroids, SOT, burn, RF (2 each) e MI

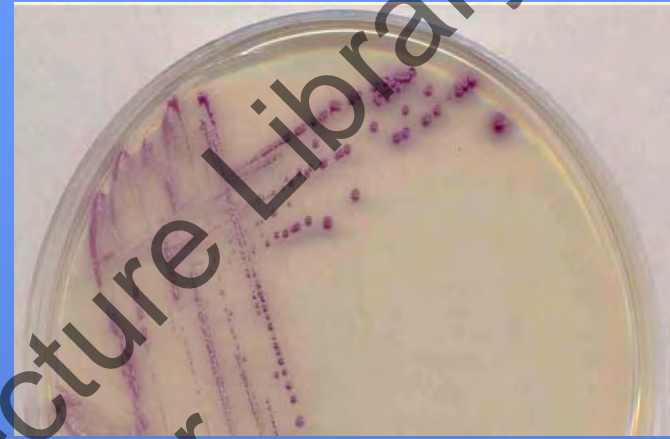
# Review of the literature: 60 cases

## ■ ICU 60%

- 71% P or E nutrition
- 92% central IVC
- 88% Antimicrobials

## ■ PROBIOTICS 55% (PTE OR near) or NR

- 10 d before (4-300)
- ICU (70 vs 41%,  $p < 0.05$ )
- P/E NT (84 vs 50%,  $p < 0.01$ )



## **Ultralevura® in the ICU**

**Capsules are opened and solved**

**Administered through the NG tube**

**Viable yeast recovered at 1 meter 2 hours later**

**Persist in the hands of HCWs even after washing**

# Review of the literature

## ■ Clinical presentation 60 casos

- Fungemia (49; 82%)
- Endocarditis or periaortic abscess (5)
- Disseminated disease (4)
- Liver abscess, esophageal ulcer (1 each)

## ■ Also

- Empyema, pneumonia, vaginitis, peritonitis, UTI, cellulitis, FUO, septic shock
- Crohn (S 50%, E 90%), asthma, ulcerative colitis, diarrhea

# Review

- **Antifungals 80%**
  - Fluconazole 16
  - AMB 28
- Azole resistance described (50%)
- Breakthrough fungemia in fluconazole treated patients
- First line therapy: AMB, vori, posa.



# Review of the literature

- **Mortality 29.5% (18 ptes)**
  - No all attributable
    - RF advanced age  
(60 vs 36 a,  $p < 0,001$ )

- 1.** *S. cerevisiae* is ubiquitous yeasts (environment, foods) and can colonize mucosae and GI tract of human and animals
- 2.** Please, be aware, not is always saprophyte and never contaminat
- 3.** Dietary supplements (Ultralevura...)
- 4.** Nosocomial infection and outbreaks.
- 5.** Fungemia. Catheter removal, antifungal agents and control supplements administration