

Epidémiologie et spectre des levures isolées en Tunisie (Etude multicentrique nationale)

Groupe d'étude

CHU Habib Bourguiba (Sfax): Trabelsi H, Neji S, Khemakhem N, Cheikhrouhou F,
Sellami H, Makni F, Ayadi A

CHU Farhat Hached (Sousse): Saghrouni F, Yaacoub A, Fathallah A, Ben Said M

CHU Ia Rabta (Tunis): Fakhfakh N, Kallel A, Kallel K

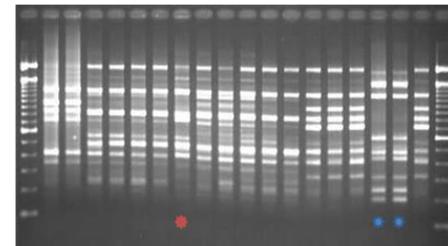
CHU Charles Nicolle (Tunis): Trabelsi S, Khaled S

Institut Pasteur (Tunis): Ben Abda I, Bouratbine A

Hôpital militaire (Tunis): Gargouri S



Mission : Fédérer les compétences, le matériel, les réactifs, la production scientifique



Introduction

➡ Ampleur des infections fongiques à levures

➡ Formes invasives

- ***Candida*** :

> 80% des levures isolées chez l'homme

1^{er} rang des infections fongiques +++

4^{ème} agent infectieux: infections liées aux soins

1^{er}: mortalité (> 40%)

- **Emergence des espèces non albicans et d'autres**

genres: *Geotrichum*, *Trichosporon*, *Rhodothorula*, *Saccharomyces*,

➡ Formes superficielles: motif de consultation fréquent

Résultats globaux

6 centres participants

CHU Habib Bourguiba; CHU Farhat Hached; Hôpital Rabta;
Hôpital Charles Nicolle; Institut pasteur; Hôpital militaire

31576 souches de levures
isolées (5 ans:2011-2015)

Prélèvements profonds:
1460 (4,6%)

Prélèvements superficiels:
30110 (95,3%)

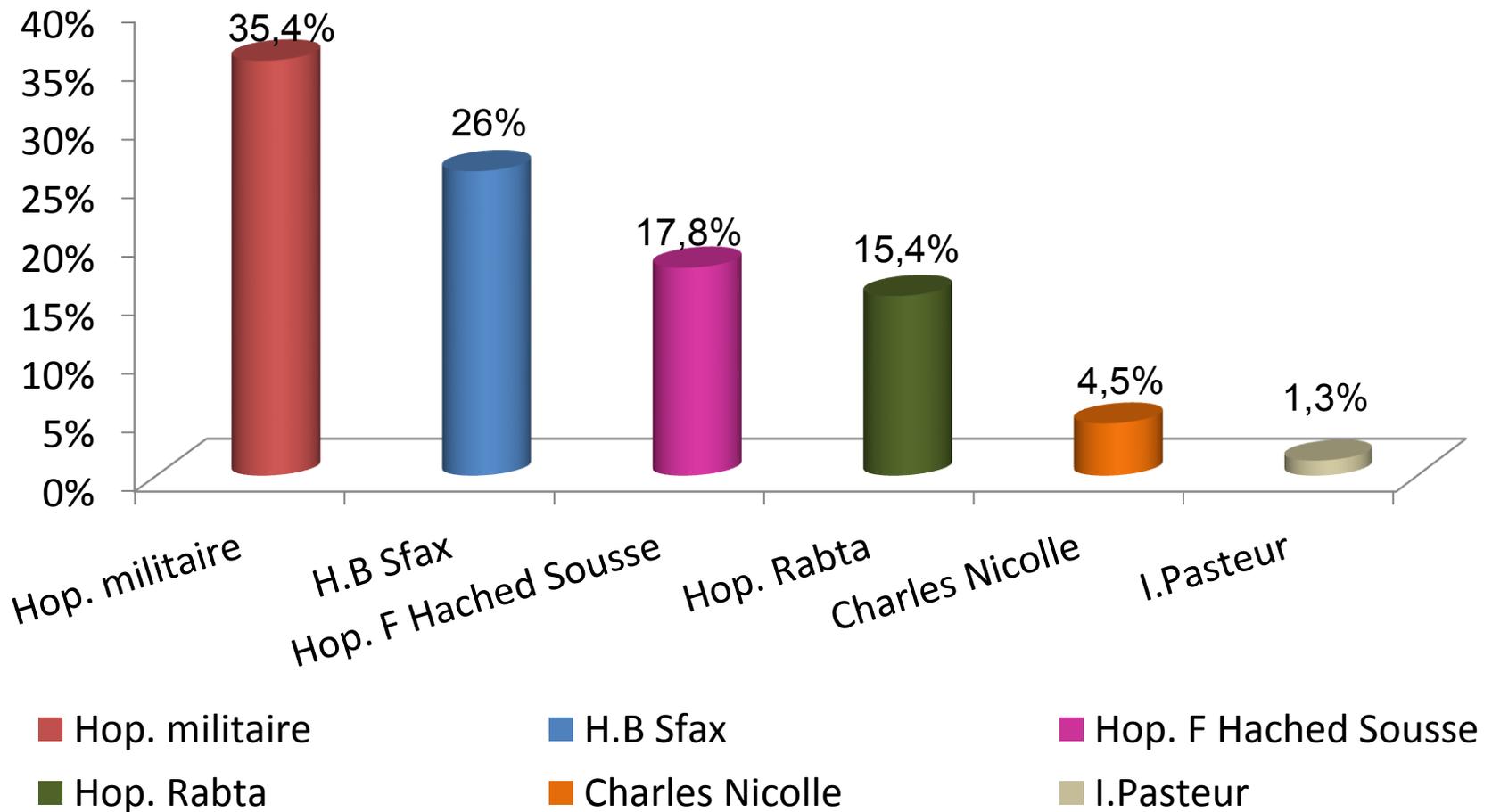
genre *Candida*: 93,4%



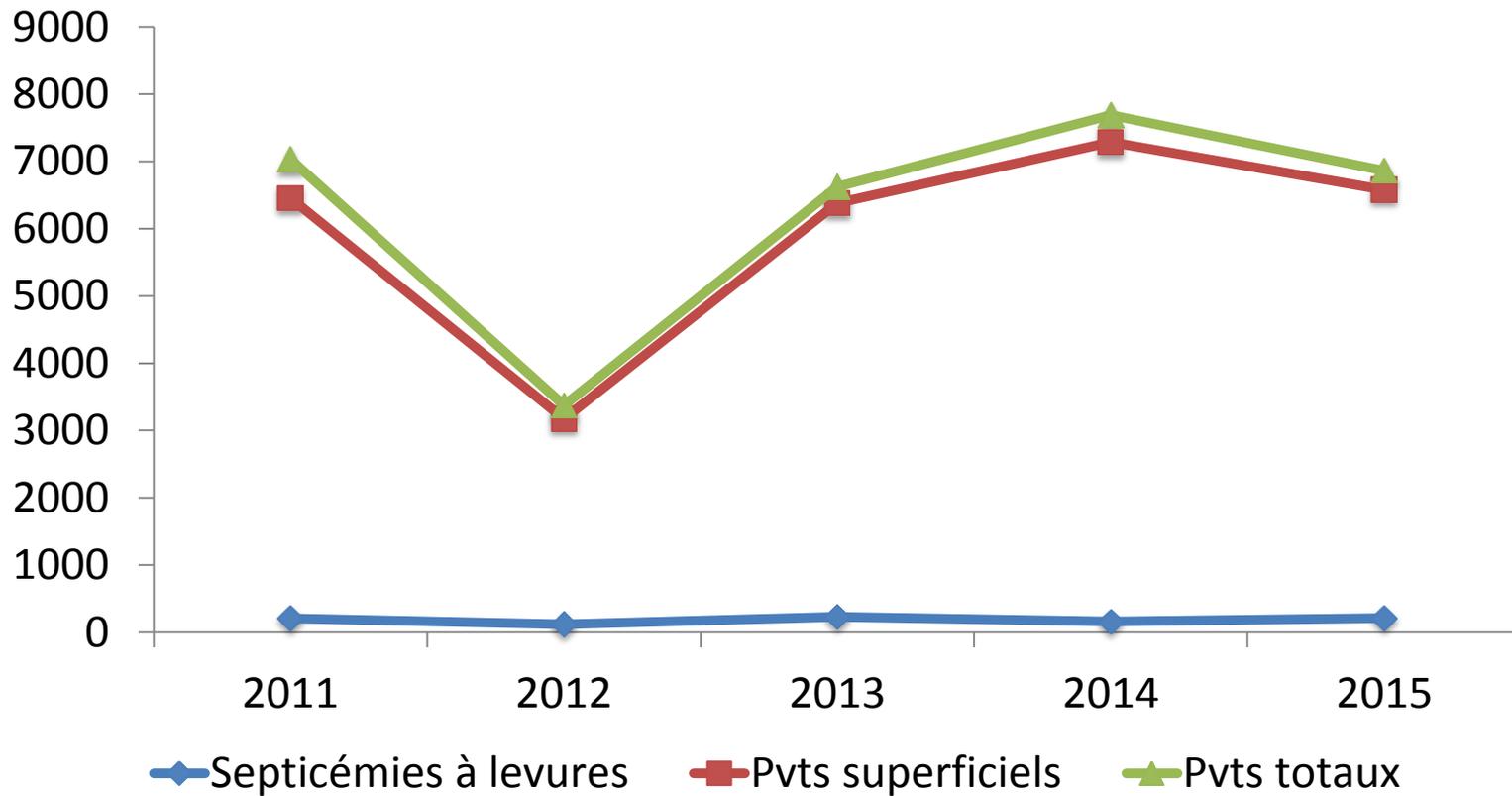
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Candidoses invasives/j

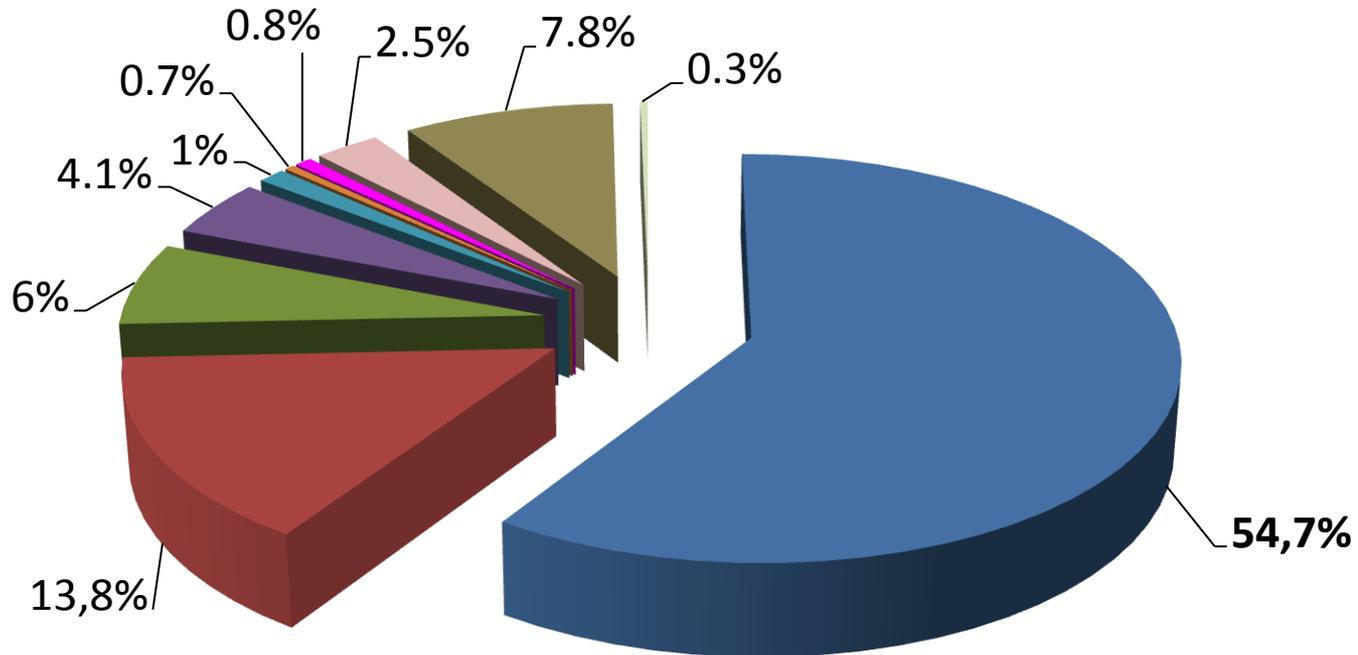
Distribution des levures isolées selon les centres



Evolution du nombre de cas de levuroses selon les années



Distribution globale des levures isolées



■ *C. albicans*

■ *C. glabrata*

■ *C. tropicalis*

■ *C. parapsilosis*

■ *C. krusei*

■ *Trichosporon*

■ *Geotrichum*

■ *Malassezia*

■ *Autres candida*

■ *Autres levures*

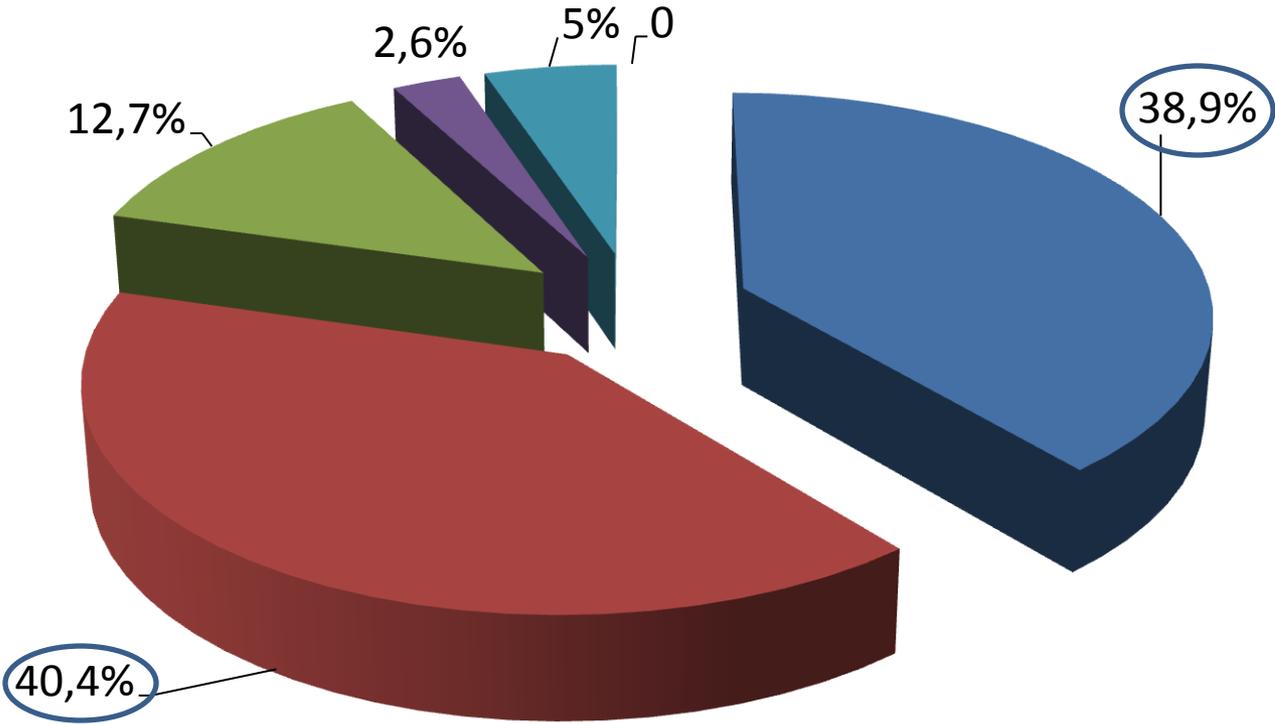
Fréquence des espèces de levures isolées dans les 6 centres

	<i>Calbicans</i> (%)	<i>C.tropicalis</i> (%)	<i>C.glabrata</i> (%)	<i>C.parapsilosis</i> (%)	<i>C.krusei</i> (%)	<i>Geotrichum</i> (%)	<i>Trichosporon</i> (%)
H.B. Sfax	38,5	7,7%	11,6%	2,5%	1%	0,7%	0,2%
Rabta	59,8%	6%	18%	6%	2%	0,4%	0,2%
H.militaire	60,9%	4,2%	14,8%	2,1%	0,4%	1%	0,6%
Charles Nicole	71,8%	1,8%	5,6%	3,1%	0,8%	0,07%	0,5%
F.Hached Sousse	58,2%	8,9%	13,7%	8%	1,8%	0,5%	0,1%
I.Pasteur	46,4%	4,2%	2,2%	16%	0,2%	0%	0%

Épidémiologie des levures invasives

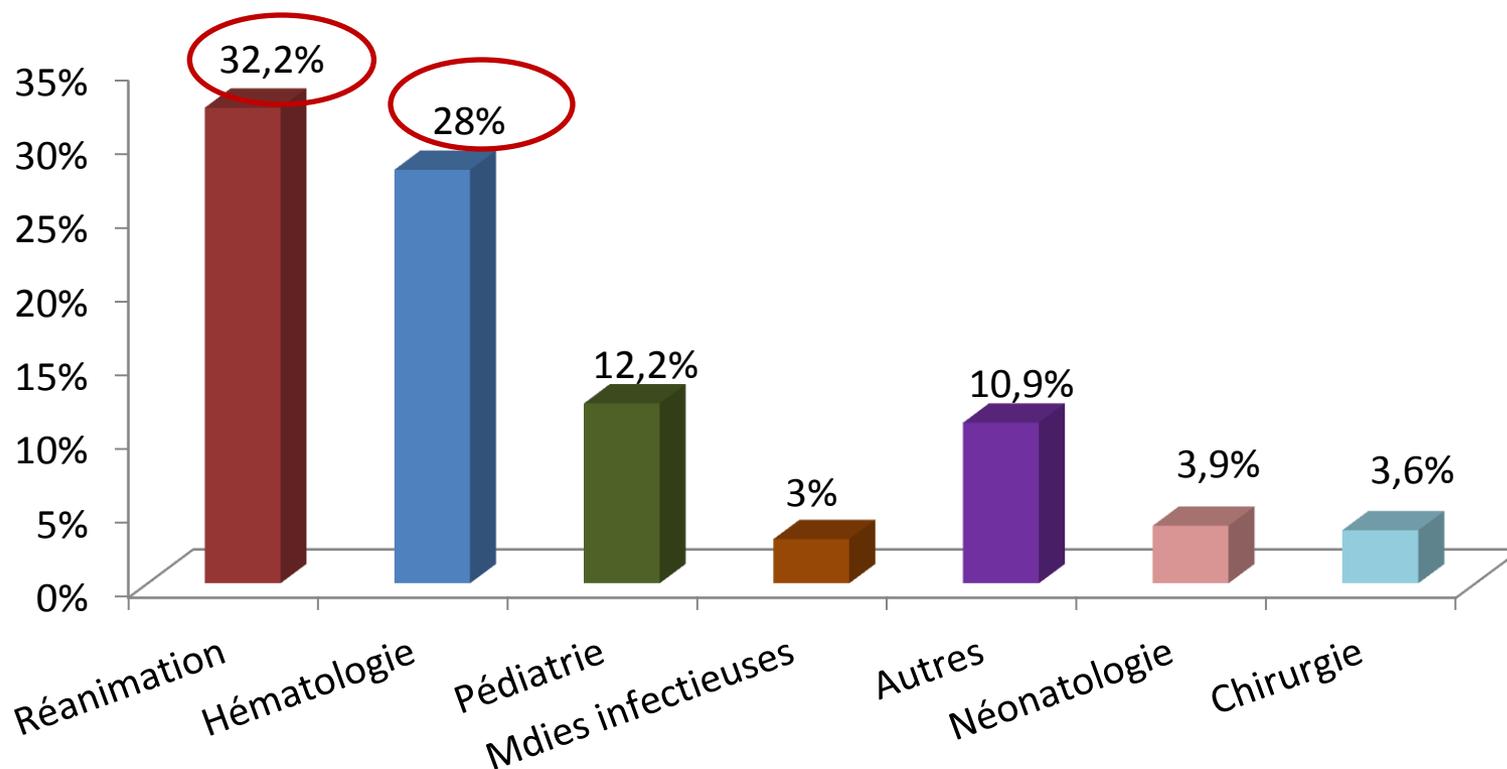
Sites de prélèvement	Pourcentages
Hémoculture	69,8
KT	20,9
LCR	3,2
Liquide péritonéal	2,9
Abcès profonds	2,9%

Distribution des septicémies à levures selon les centres: 935 cas



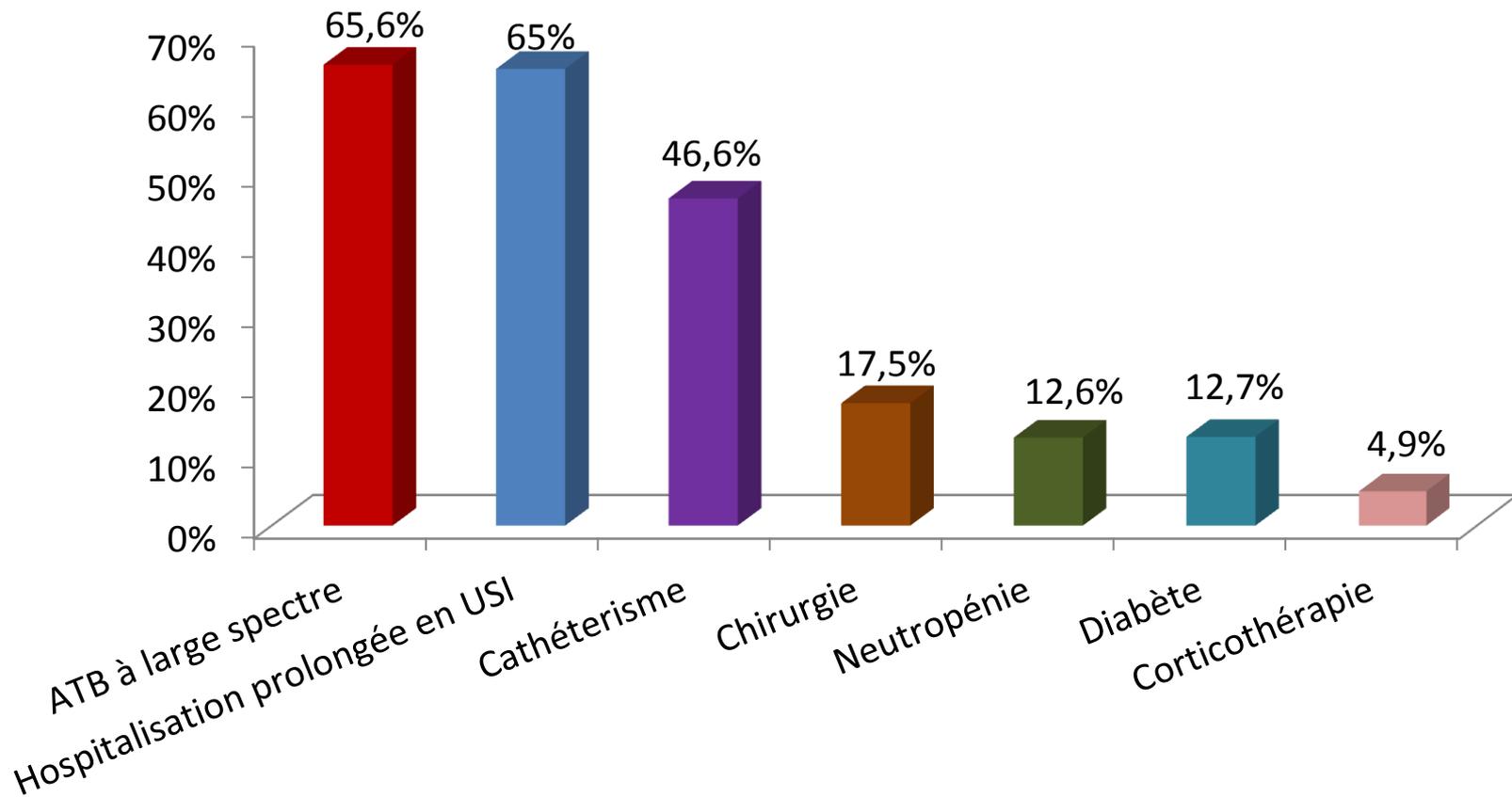
■ HB Sfax ■ Rabta ■ Hop. Militaire ■ Charles Nicolle ■ Farhat Hached sousse

Distribution des levures isolées des hémocultures selon les services



H.B. Sfax, hop. militaire et Charles Nicolle: Réanimation +++
Hop. Rabta: Hématologie (centre de greffe)++
Sousse: Néonatalogie+++

Distribution des septicémies à levures selon les facteurs de risque



Ten-year review of candidemia in a Canadian tertiary care centre: Predominance of non-*albicans* *Candida* species

Ghada N Al-Rawahi MD DTM&H(London) D(ABMM) FRCPC^{1,2}, Diane L Roscoe MD FRCPC^{2,3}



GN Al-Rawahi, DL Roscoe. Ten-year review of candidemia in a Canadian tertiary care centre: Predominance of non-*albicans* *Candida* species. Can J Infect Dis Med Microbiol 2013;24(3):e65-e68.

Une analyse de la septicémie à *Candida* sur dix ans dans un centre de soins tertiaires canadien : la prédominance d'autres espèces que le *Candida albicans*

TABLE 2
Risk factors of patients with candidemia (n=266)

Risk factor	n (%)
Central venous catheter	192 (72)
Total parenteral nutrition	77 (29)
Antifungal therapy	36 (14)
Antibiotic therapy	227 (85)
Malignancy	90 (34)
Neutropenia	31 (12)
Transplantation	29 (11)
Immunosuppressive therapy	37 (14)
Steroid therapy	44 (17)
Intensive care unit admission	101 (38)
Burn	7 (3)
Dialysis	19 (7)
Abdominal/pelvic surgery	83 (31)
Other procedures*	18 (7)

*Other procedures included endoscopic retrograde cholangiopancreatography (n=8), esophagogastroduodenoscopy (n=2), colonoscopy (n=2), cholangiogram (n=1), bilateral nephrostomy tube change (n=1), percutaneous nephrolithotripsy and ureteroscopy (n=1), ultrasound guided drainage (n=1), bladder biopsy (n=1), ureteroscopy, lithotripsy and ureter stent (n=1)



Mycology

The changing epidemiology of healthcare-associated candidemia over three decades ☆

Daniel Diekema^{a,b,*}, Sophie Arbefeville^c, Linda Boyken^b, Jennifer Kroeger^{b,d}, Michael Pfaller^{b,d,e}

^a Division of Infectious Diseases, Department of Medicine, University of Iowa Carver College of Medicine, Iowa City, IA 52242, USA

^b Division of Medical Microbiology, Department of Pathology, University of Iowa Carver College of Medicine, Iowa City, IA 52242, USA

^c Department of Laboratory Medicine and Pathology, University of Minnesota, Minneapolis, MN 55414, USA

^d Department of Epidemiology, University of Iowa College of Public Health, Iowa City, IA 52242, USA

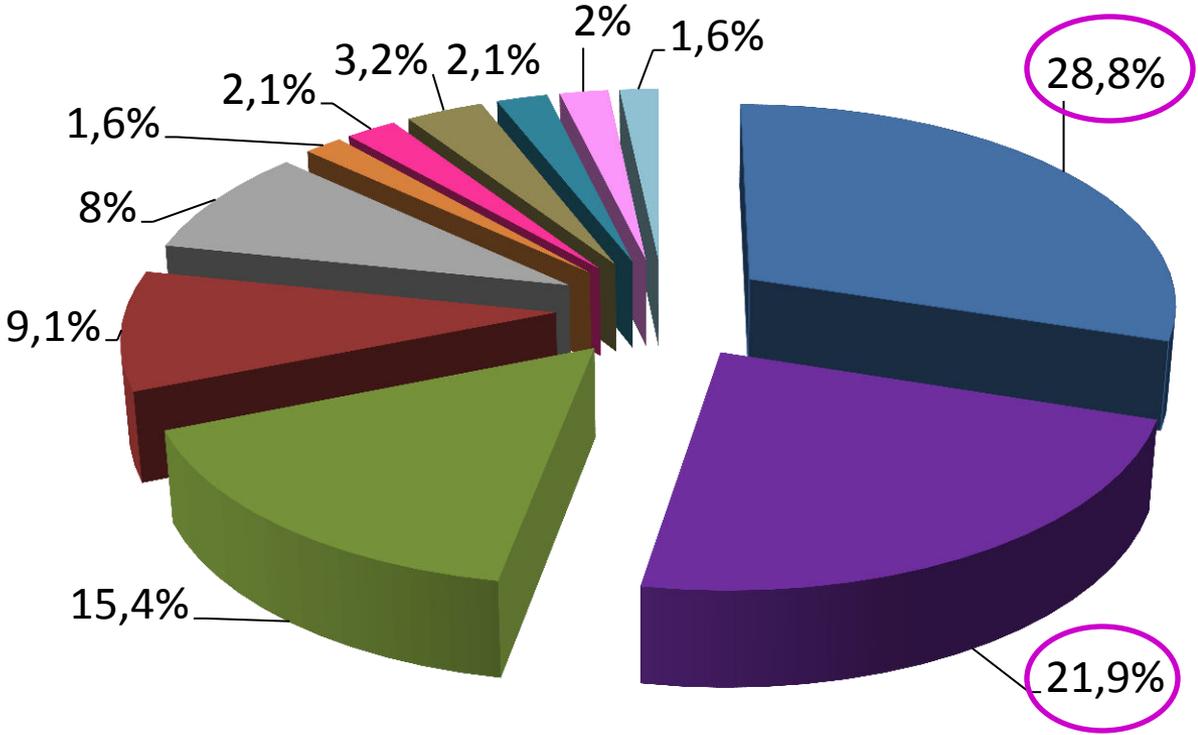
^e JMI Laboratories, North Liberty, IA 52317, USA

Comparison of 3 healthcare-associated candidemia cohorts, 1983–2007.

Variable	1983–1986	1997–2001	2004–2007
Number of cases (<i>n</i>)	88	108	108
HAC rate (per 10K patient days)		1.4	1.5
Age (mean), years	38.0	45.8	44.0
Male sex	49 (56)	68 (63)	53 (49)
Charlson Index (mean)		3.4	3.0
Central venous catheter present	79 (90)	99 (92)	99 (92)
Total parenteral nutrition	59 (67)	75 (69)	59 (55)
Chronic obstructive pulmonary disease/other lung disease		20 (19)	13 (12)
Coronary artery disease		19 (18)	18 (17)
Diabetes		25 (23)	24 (22)
Dialysis		5 (5)	6 (6)
Cirrhosis		9 (8)	5 (5)
Leukemia or lymphoma	26 (24)	18 (17)	9 (8)
Other malignancy	16 (15)	26 (24)	19 (18)
Surgery	33 (31)	52 (48)	63 (58)

Values are *n* (%), unless otherwise indicated. Blank cells indicate data are unavailable.

Distribution des différentes espèces de levures isolées des hémocultures



- *C. albicans*
- *C. parapsilosis*
- *C. tropicalis*
- *C. glabrata*
- *C. lipolytica*
- *Trichosporon*
- *Geotrichum*
- *Autres Candida*
- *C. krusei*
- *Cryptococcus*
- *Rhodotorula*



Review

The PATH (Prospective Antifungal Therapy) Alliance® registry and invasive fungal infections: update 2012[☆]Nkechi Azie^{a,*}, Dionissios Neofytos^b, Michael Pfaller^c, Herwig-Ulf Meier-Kriesche^a, Shun-Ping Quan^a, David Horn^d^a Astellas Pharma Global Development, Deerfield, IL 60015, USA^b Johns Hopkins Hospital, Baltimore, MD 21287, USA^c JMI Laboratories, North Liberty, IA 52317, USA^d David Horn LLC, Doylestown, PA 18902, USA24 centres médicaux: Amérique du nord (USA et Canada)
2004-2008

Parameter	Isolates, n (%)
Total fungal species isolates	7526 (100.0)
<i>Candida</i> isolates	5526 (73.4)
<i>C. albicans</i>	2639 (47.8)
<i>C. dubliniensis</i>	48 (0.9)
<i>C. glabrata</i>	1381 (25.0)
<i>C. guilliermondii</i>	17 (0.3)
<i>C. krusei</i>	178 (3.2)
<i>C. parapsilosis</i>	725 (13.1)
<i>C. lusitanae</i>	56 (1.0)
<i>C. tropicalis</i>	417 (7.5)
Other <i>Candida</i> species ^b	30 (0.5)
Unknown <i>Candida</i> species	35 (0.6)
Other yeast	467 (6.2)
<i>Cryptococcus</i>	340 (72.8)
<i>Malassezia</i>	7 (1.5)
<i>Pneumocystis</i>	54 (11.6)
<i>Rhodotorula</i>	15 (3.2)
<i>Saccharomyces</i>	24 (5.1)
<i>Trichosporon</i>	9 (1.9)
Other yeast	18 (3.9)

Fréquence des espèces de levures isolées des hémocultures (6 centres)

	H.B. Sfax (%)	H.Rabta (%)	H. Militaire (%)	H.Charles Nicole (%)	H.F. Hached Soussse (%)	I. Pasteur (%)
<i>C.albicans</i>	26,6	24,3	39,5	40	48	-
<i>C.tropicalis</i>	18,1	11,3	19,3	12	18,7	-
<i>C.glabrata</i>	6,3	7,9	23,5	4	6,2	-
<i>C.parapsilosis</i>	10,4	37,5	11,8	20	12,5	-
<i>C.krusei</i>	2,7	1,8	-	-	6,2	-
<i>C.lipolytica</i>	21,1	-	-	-	-	-
<i>Geotrichum</i>	2,4	1,8	3,4	-	-	-
<i>Trichosporon</i>	0,8	1,3	1,7	20	-	-

Les septicémies à *Candida*

■ Incidence des candidoses invasives+++ :

- 6,7 à 54/1000 admissions en USI

(Montagna MT ,2013)

- 3^{ème} cause de septicémie en USI en France

(Quenot J-P, 2013)

- Candidémies : 2 à 8% des épisodes infectieux nosocomiaux à HC positive (Europe vs USA)

(Delaloye J , 2014)

■ Diagnostic: pas facile

■ Pronostic : sévère, malgré nouveaux traitement

■ Mortalité: élevée et coût de prise en charge +++

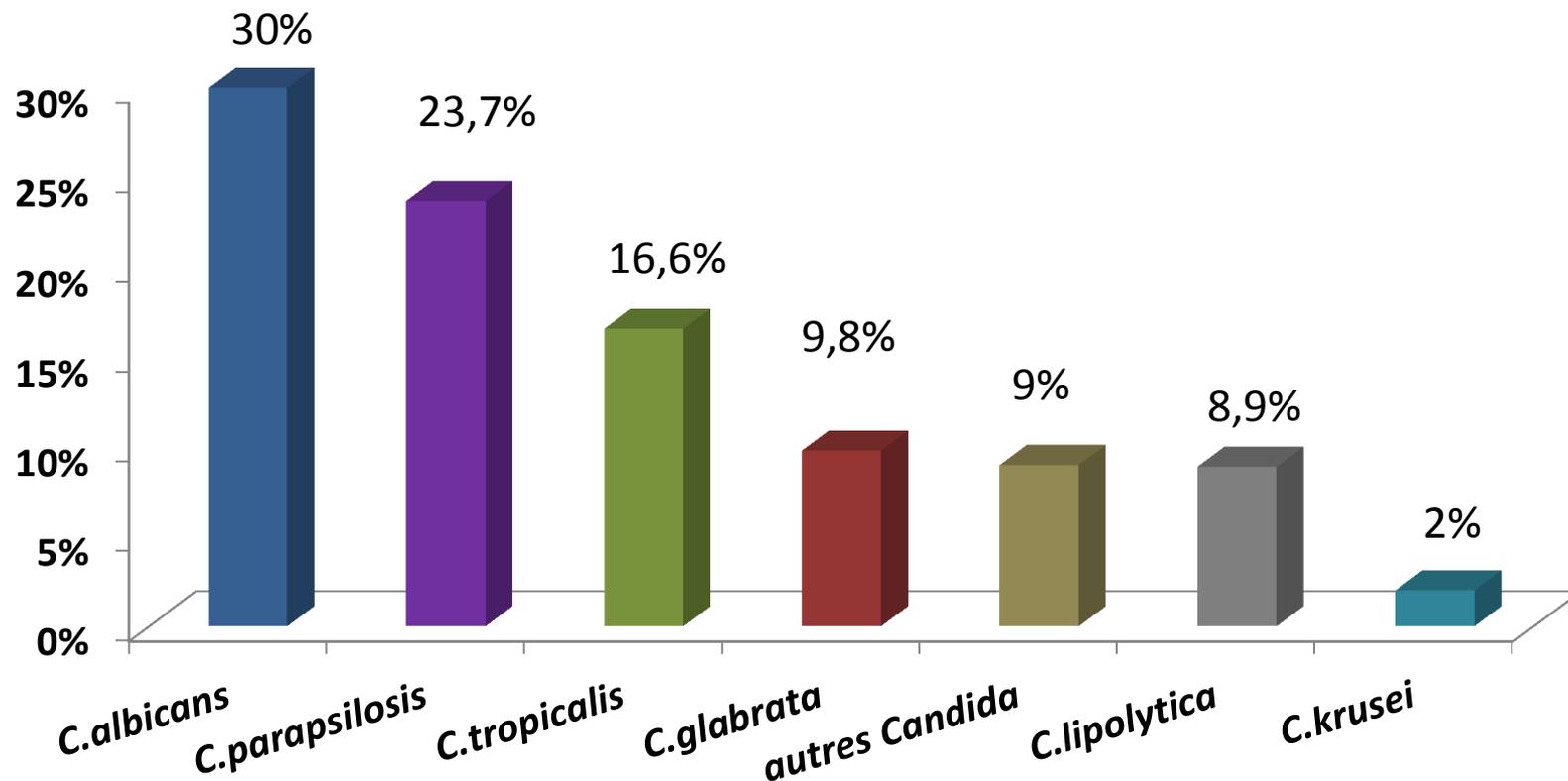


Fréquence des espèces de *Candida* isolées des Hémocultures

Candidémies: 836 cas (92,3%)

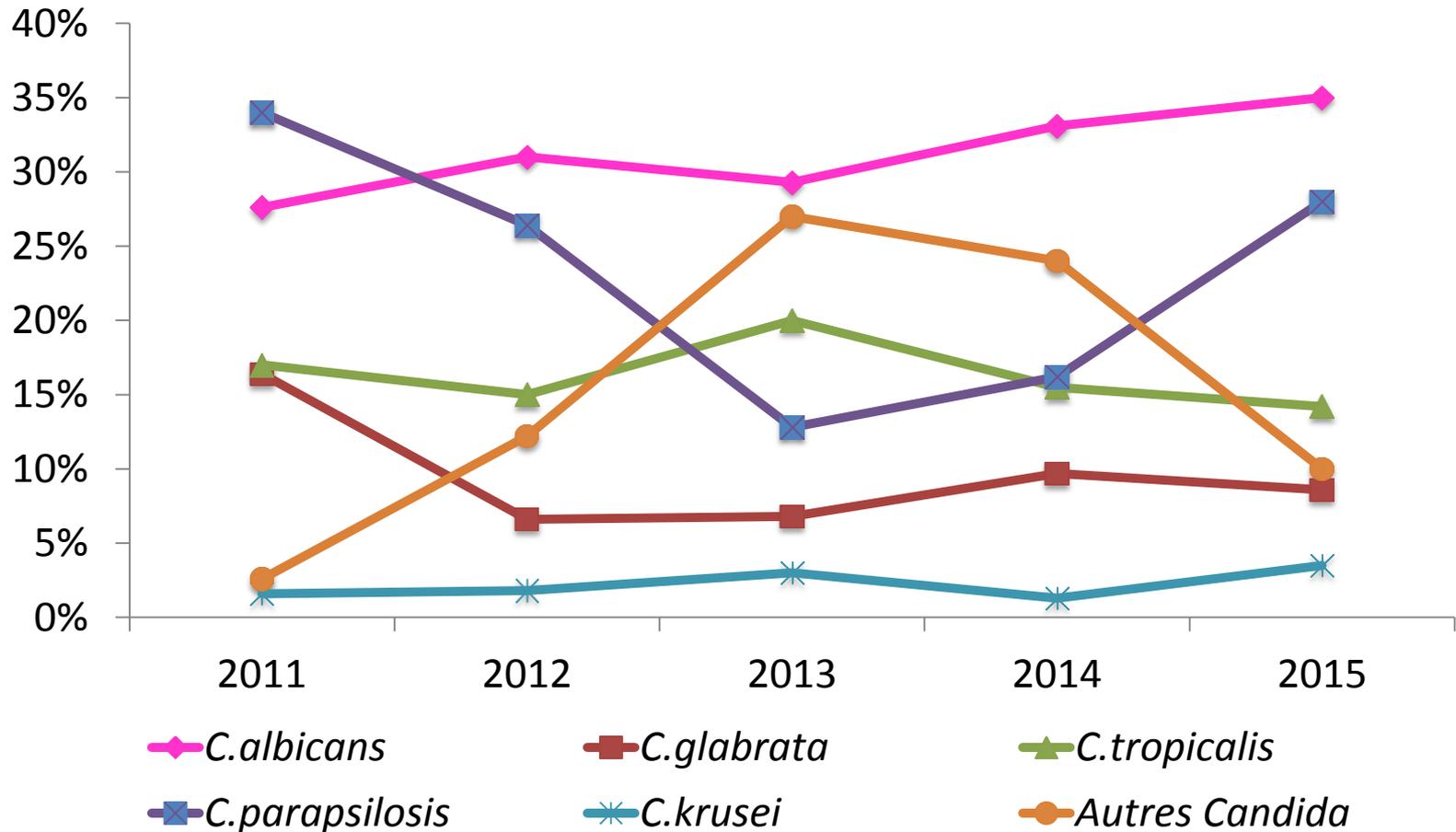
C.albicans: 30%

C.non albicans: 70%



Autres *Candida*: *C.guilliermondii*, *C.lusitaniae*, *C.famata*, *C.kefyr*, *C.dubiniensis*

Evolution des espèces de *Candida* isolées des hémocultures selon les années



Distribution des candidémies selon les espèces et les régions géographiques

Espèces	% des espèces par région		
	Tunis (482)	Sousse (48)	Sfax (331)
<i>C.albians</i>	30,9	48	29,3
<i>C.tropicalis</i>	14,3	18,7	20
<i>C.glabrata</i>	12,2	3,5	7
<i>C.parapsilosis</i>	33,4	12,5	10,5
<i>C.krusei</i>	1,4	6,2	3
<i>C.lipolytica</i>	-	-	23,2



ARTICLE ORIGINAL / ORIGINAL ARTICLE

Évolution de la flore des levures isolées au CHU de Sfax, Tunisie

Yeast species isolated in the CHU of Sfax, Tunisia

F. Makni, A. Sellami, H. Trabelsi, H. Sellami, F. Cheikhrouhou, S. Neji, A. Ayadi*

Espèces	Nombre (%) des prélèvements profonds		
	1993–1999	2000–2006	<i>p</i>
<i>Candida</i> sp.	101 (100)	225 (100)	
<i>Candida albicans</i>	41 (40,5)	70 (31,2)	0,09
<i>Candida non-albicans</i>	60 (59,4)	155 (68,8)	0,094
<i>Candida tropicalis</i>	35 (34,6)	69 (30,6)	0,47
<i>Candida glabrata</i>	15 (14,8)	40 (17,7)	0,51
<i>Candida parapsilosis</i>	5 (5)	38 (17)	0,0032
<i>Candida krusei</i>	4 (4,9)	2 (0,8)	0,054
Autres	1 (0,1)	6 (2,6)	

Espèces	Hémoculture <i>n</i> (%)
<i>Candida albicans</i>	67 (29,6)
<i>Candida tropicalis</i>	83 (36,7)
<i>Candida glabrata</i>	40 (17,6)
<i>Candida parapsilosis</i>	26 (11,5)
<i>Candida inconspicua</i>	2 (0,8)
<i>Candida krusei</i>	4 (1,7)
<i>Candida famata</i>	2 (0,8)
<i>Candida kefyr</i>	1 (0,4)
<i>Candida norvergensis</i>	1 (0,4)
Total	226 (69,3)



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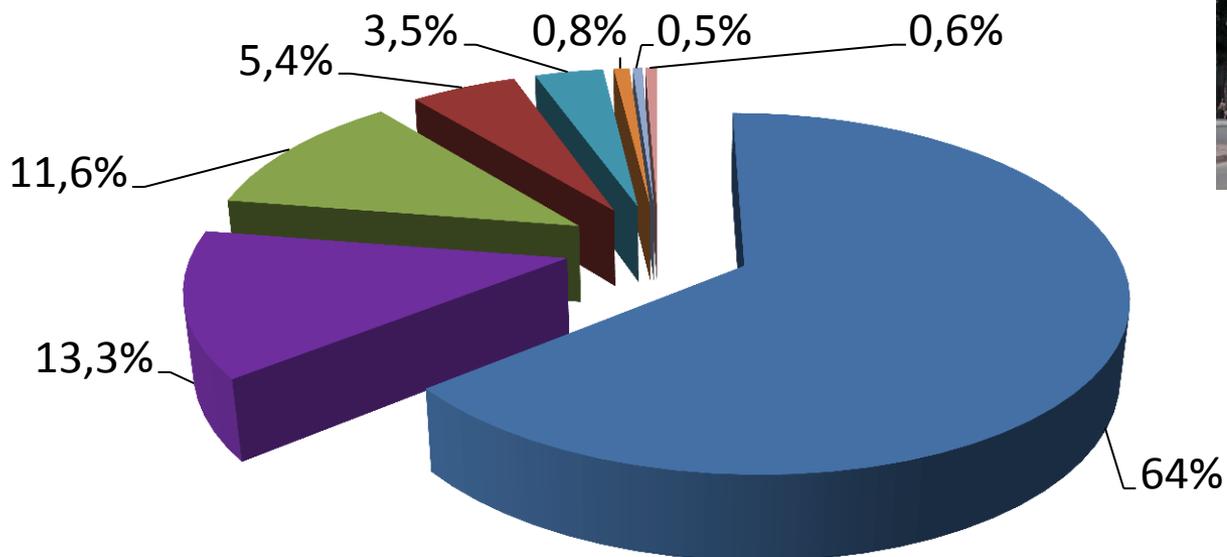
Epidemiological trends in invasive candidiasis: Results from a 15-year study in Sousse region, Tunisia

Aspects épidémiologiques des candidoses invasives : résultats d'une étude de 15 ans dans la région de Sousse, Tunisie

F. Saghrouni^{a,*}, I. Bougmiza^b, J. Ben Abdeljelil^a, A. Yacoub^a, I. Khammari^a,
 A. Fathallah^a, A. Mtiraoui^b, M. Ben Saïd^b

^a Laboratory of parasitology-mycology, Farhat-Hached teaching hospital, 4000 Sousse, Tunisia

^b Department of community medicine, faculty of medicine, Sousse, Tunisia



■ *C. albicans*

■ *c. parapsilosis*

■ *C. tropicalis*

■ *C. glabrata*

■ *C. krusei*

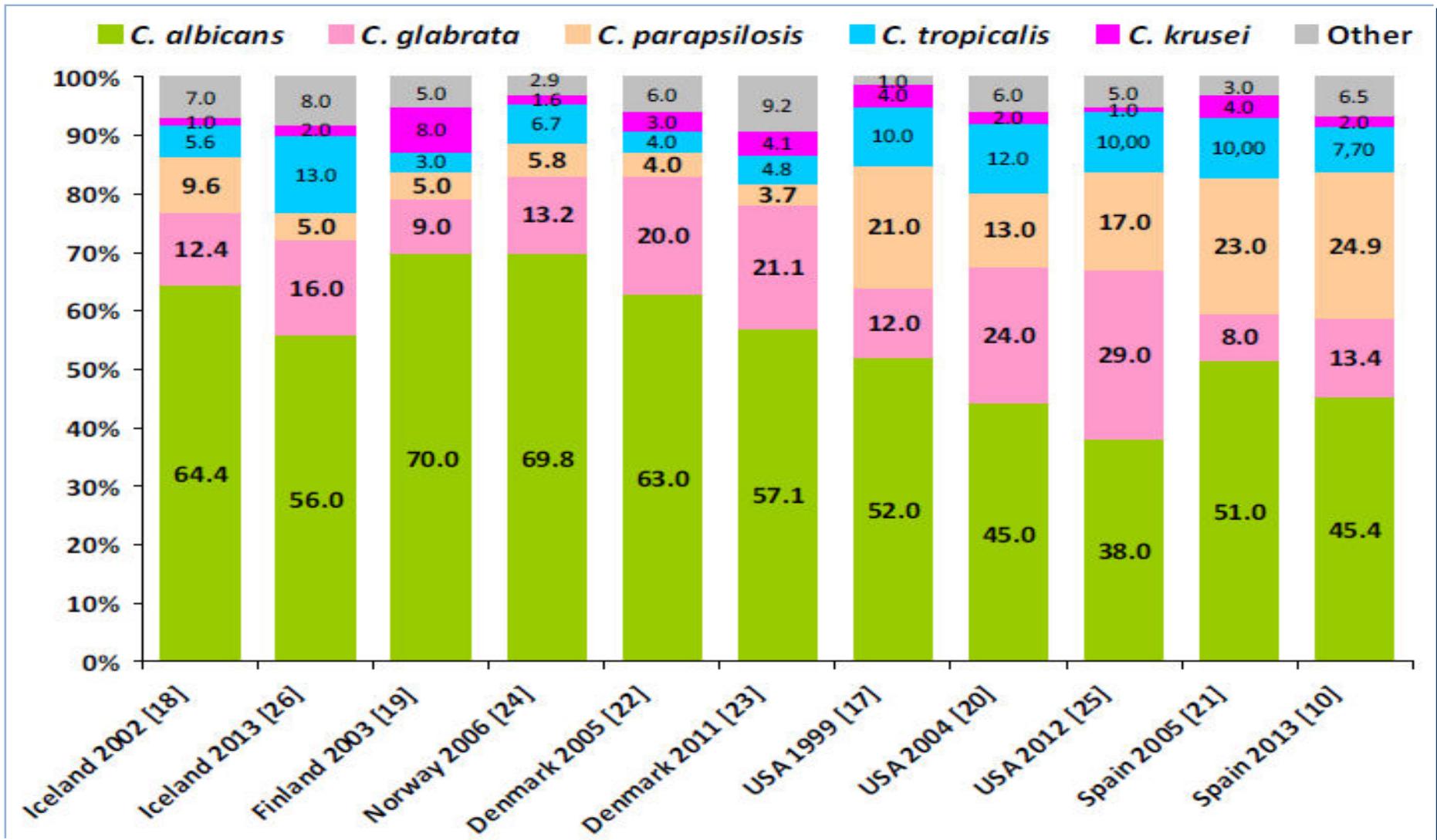
■ *C. pelliculosa*

■ *C. famata*

■ *Autres Candida*

Modification de la répartition des espèces en fonction des pays et du temps

127 centres, 39 pays. Guinea, *Clin microbiol Infect* 2014;2056





***Candida* bloodstream infections: comparison of species distribution and resistance to echinocandin and azole antifungal agents in Intensive Care Unit (ICU) and non-ICU settings in the SENTRY Antimicrobial Surveillance Program (2008–2009)**

Michael A. Pfaller^{a,b}, Shawn A. Messer^a, Gary J. Moet^a, Ronald N. Jones^{a,c}, Mariana Castanheira^{a,*}

^a JMI Laboratories, 345 Beaver Creek Centre, Suite A, North Liberty, IA 52317, USA

^b University of Iowa College of Medicine, Iowa City, IA 52242, USA

^c Tufts University School of Medicine, Boston, MA 02111, USA

79 medical centres : Asia-Pacific (16 centres, 51 isolates), European (25 centres, 750 isolates), Latin American (10 centres, 348 isolates) and North American (28 centres, 936 isolates) regions.

Species distribution of *Candida* bloodstream infection isolates from Intensive Care Unit (ICU) and non-ICU locations.

Species	n (%) of each species according to origin	
	ICU (N = 779)	Non-ICU (N = 973)
<i>C. albicans</i>	393 (50.4)	461 (47.4)
<i>C. glabrata</i>	136 (17.5)	176 (18.1)
<i>C. parapsilosis</i>	118 (15.1)	184 (18.9)
<i>C. tropicalis</i>	82 (10.5)	93 (9.6)
<i>C. krusei</i>	16 (2.1)	20 (2.1)
Miscellaneous ^a	34 (4.4)	39 (4.0)

^a Miscellaneous species including *C. lusitanae* (31 isolates), *C. dubliniensis* (16 isolates), *C. guilliermondii* (8 isolates), *C. kefyr* (6 isolates), *C. famata* and *C. lipolytica* (3 isolates each) and *C. rugosa*, *C. sake* and *C. pelliculosa* (2 isolates each).



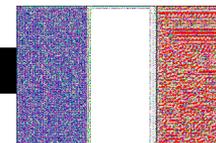
Historical trends in the epidemiology of candidaemia: analysis of an 11-year period in a tertiary care hospital in Brazil

Marcos Paulo Wille¹, Thaís Guimarães^{1/+},
Guilherme Henrique Campos Furtado², Arnaldo Lopes Colombo¹

¹Laboratório Especializado em Micologia ²Comissão de Controle de Infecção Hospitalar,
Departamento de Doenças Infecciosas, Universidade Federal de São Paulo, São Paulo, SP, Brasil

Species distribution of *Candida* isolated from 388 cases candidaemia

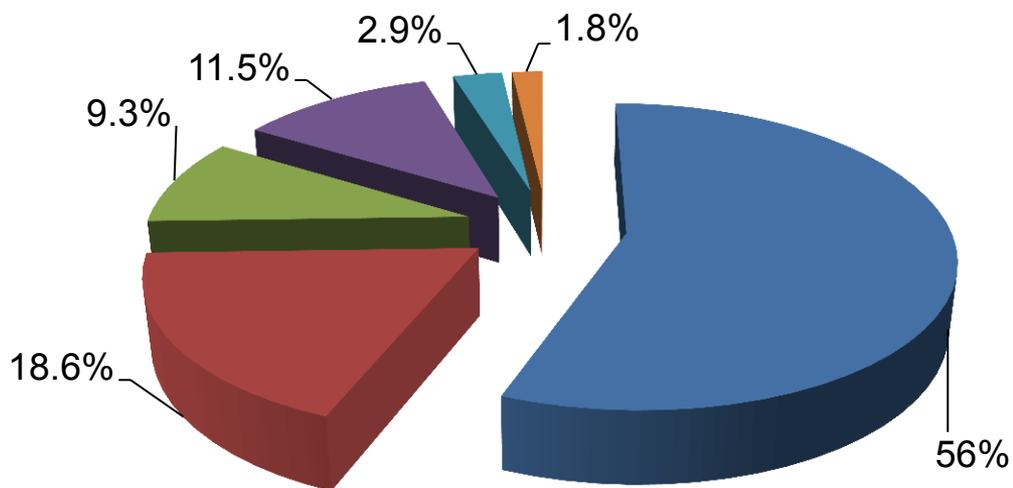
Species	n (%)
<i>Candida albicans</i>	165 (42.5)
<i>Candida tropicalis</i>	106 (27.3)
<i>Candida parapsilosis</i>	85 (21.9)
<i>Candida glabrata</i>	17 (4.4)
<i>Candida guilliermondii</i>	6 (1.5)
<i>Candida krusei</i>	4 (1)
<i>Candida peliculosa</i>	1 (0.3)
Others	4 (1)
Total	388 (100)



Olivier Lortholary
Charlotte Renaudat
Karine Sitbon
Yoann Madec
Lise Denoeud-Ndam
Michel Wolff
Arnaud Fontanet
Stéphane Bretagne
Françoise Dromer
The French Mycosis Study Group

Worrisome trends in incidence and mortality of candidemia in intensive care units (Paris area, 2002–2010)

24 tertiary care hospitals in the Paris area, France
(October 2002 – September 2010)



■ *C. albicans*

■ *C. glabrata*

■ *C. tropicalis*

■ *c. parapsilosis*

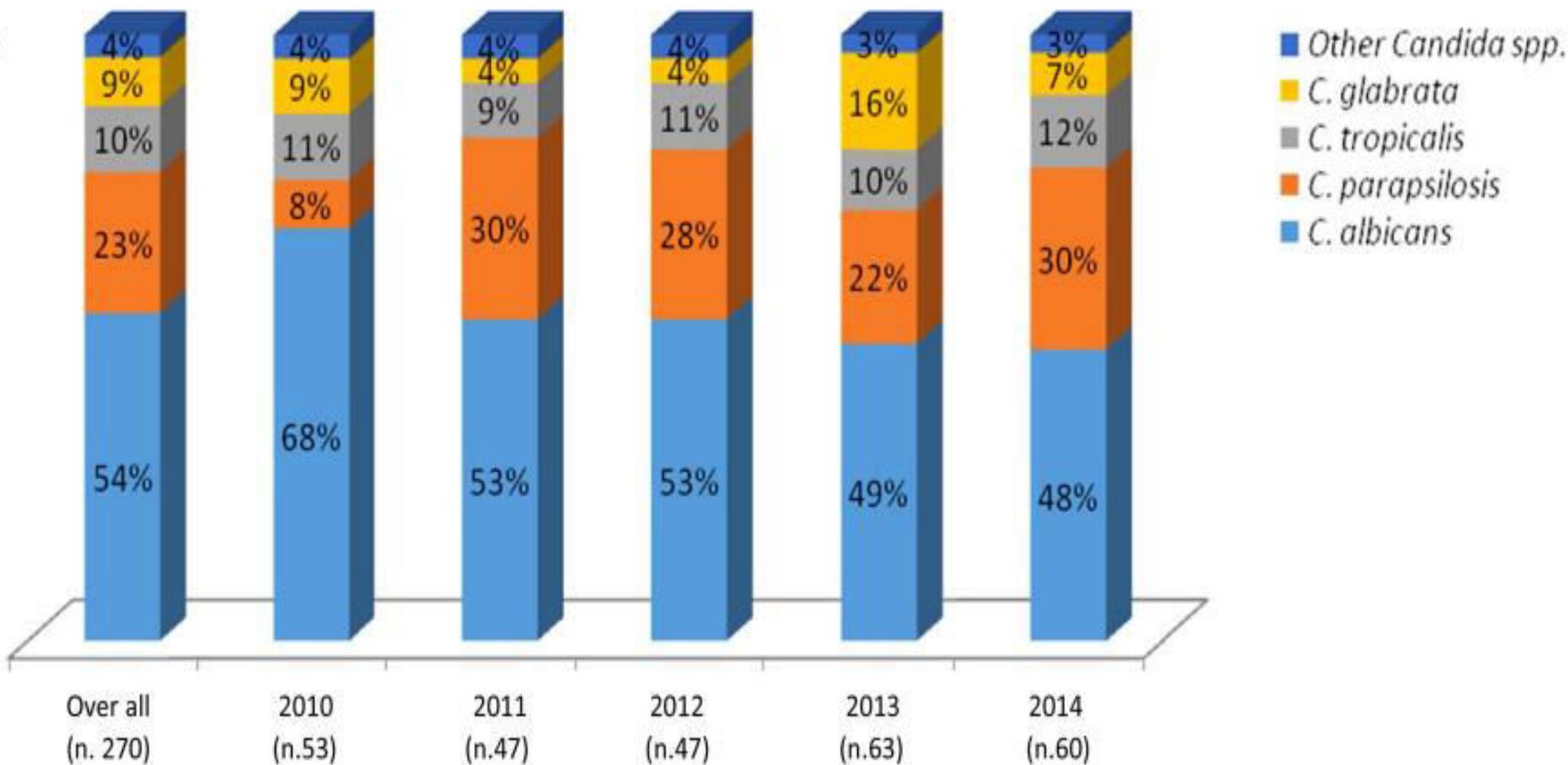
■ *C. krusei*

■ *C. kefyr*



Epidemiology, clinical characteristics, and outcome of candidemia in a tertiary referral center in Italy from 2010 to 2014

Francesco Barchiesi¹ · Elena Orsetti¹ · Rosaria Gesuita² · Edlira Skrami² · Esther Manso³ · The Candidemia Study Group





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journal homepage: www.elsevier.com/locate/ijid

Candidemia: incidence rates, type of species, and risk factors at a tertiary care academic hospital in China



Zengbin Wu^a, Yingbin Liu^b, Xiaobo Feng^c, Ying Liu^d, Shuyun Wang^a, Xiaodong Zhu^e, Qiqi Chen^a, Shuming Pan^{a,*}

^aEmergency Department, Xinhua Hospital, Shanghai Jiaotong University Medical College, 1665 Kongjiang Road, Shanghai, China

^bDepartment of Surgery, Xinhua Hospital, Shanghai Jiaotong University Medical College, Shanghai, China

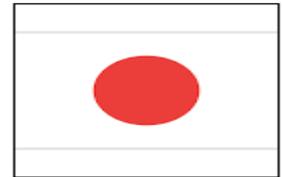
^cDepartment of Dermatology, Xinhua Hospital, Shanghai Jiaotong University Medical College, Shanghai, China

^dDepartment of Clinical Microbiology, Xinhua Hospital, Shanghai Jiaotong University Medical College, Shanghai, China

^eDepartment of Pediatrics, Xinhua Hospital, Shanghai Jiaotong University Medical College, Shanghai, China

The 3-year trend in candidemia and distribution of various *Candida* spp, 2009–2011^a

<i>Candida</i> spp	2009	2010	2011	Total
<i>C. albicans</i>	31	25	15	71 (29.8)
<i>C. tropicalis</i>	3	12	12	27 (11.4)
<i>C. parapsilosis</i>	10	15	41	66 (27.7)
<i>C. glabrata</i>	3	5	3	11 (4.6)
<i>C. guilliermondii</i>	3	8	28	39 (16.4)
Others	11	6	7	24 (10.1)
Total	61	71	106	238 (100)



Original article

Distribution of *Candida* species isolated from blood cultures in hospitals in Osaka, Japan

Daiichi Morii*, Masafumi Seki*, José N. Binongo, Ryoichi Ban, Atsuko Kobayashi, Makoto Sata, Shigeki Hashimoto, Junzo Shimizu, Shunji Morita, Kazunori Tomono

Division of Infection Control and Prevention, Osaka University, 2-15 Yamadaoka, Suita, Osaka 565-0871, Japan

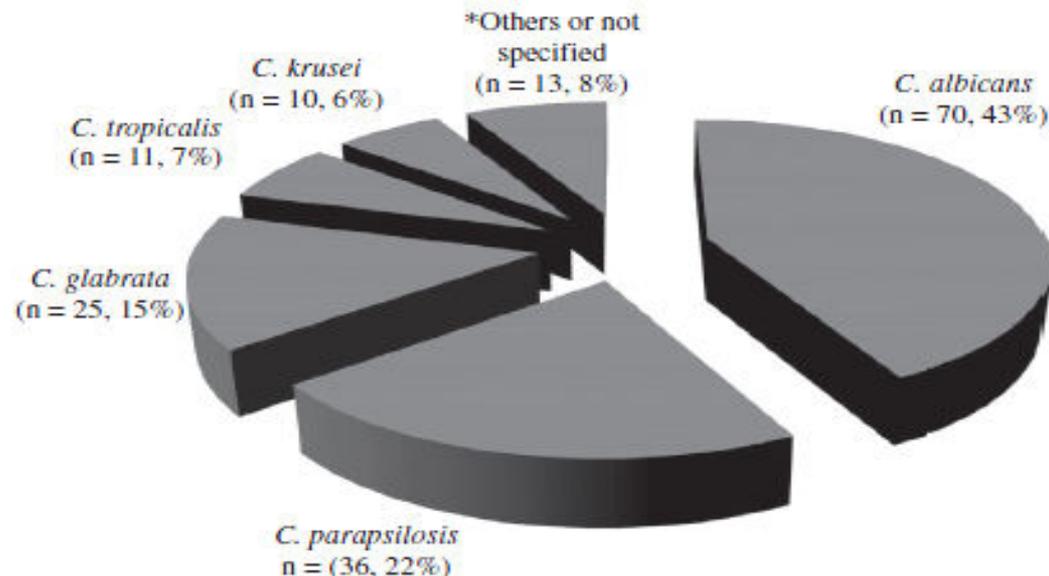


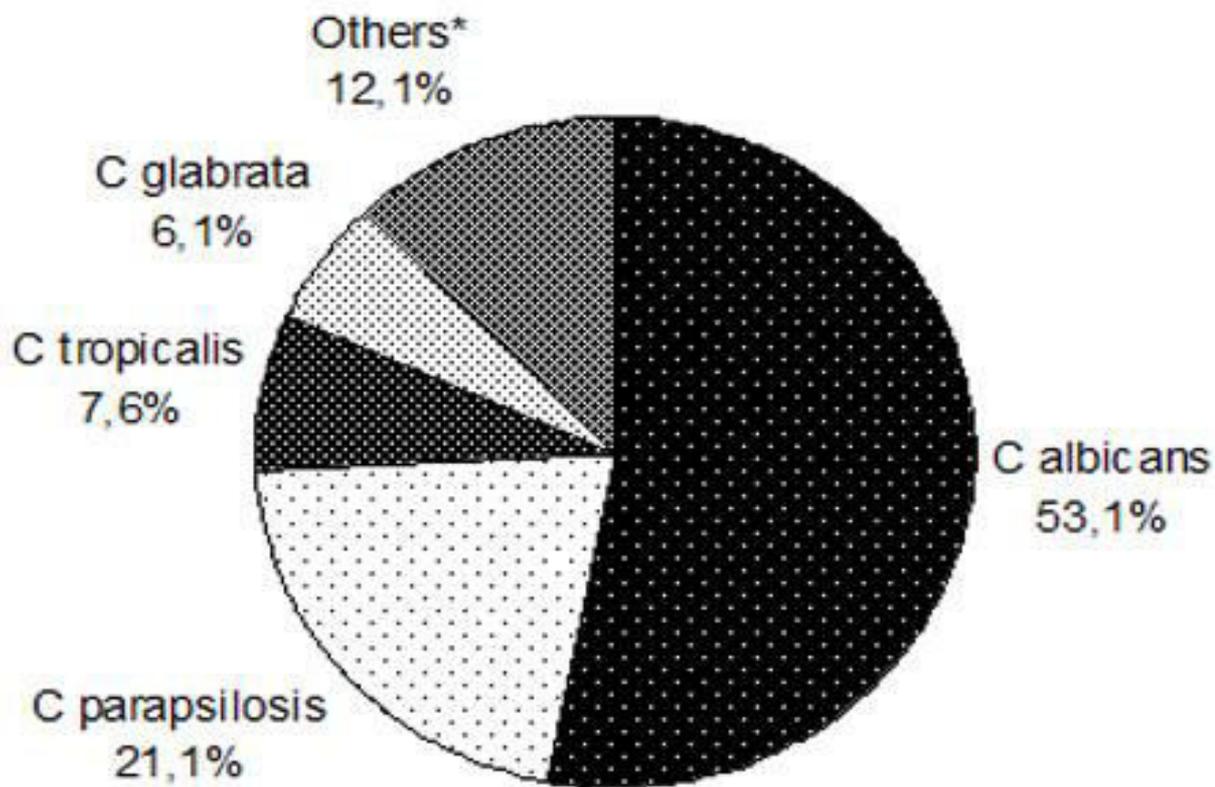
Fig. 1. Overall distribution of *Candida* species ($n = 165$). * One case of *Candida famata*, one case of *Candida lusitanae*, and 11 cases of undetermined *Candida* species. *C. albicans* is the most frequently isolated, and *C. parapsilosis* follows.



Risk factors, incidence and outcome of candidemia in a Turkish intensive care unit: a five-year retrospective cohort study

Nur Yapar, Mert Akan, Vildan Avkan-Oguz, Cem M. Ergon, Munir Hancer, Mine Doluca,

Anaesth Pain & Intensive Care 2014;18(3):265-71





Characteristics and risk factors of candidemia in pediatric intensive care unit of a tertiary care children's hospital in Egypt

Moustafa A Hegazi^{1,2}, Alaa M Abdelkader², Maysaa E Zaki³, Basem S El-Deek^{4,5}

¹ Department of Pediatrics, Faculty of Medicine in Rabigh, King Abdulaziz University, Jeddah, Saudi Arabia

² Department of Pediatrics, Mansoura University Children's Hospital, Mansoura, Egypt

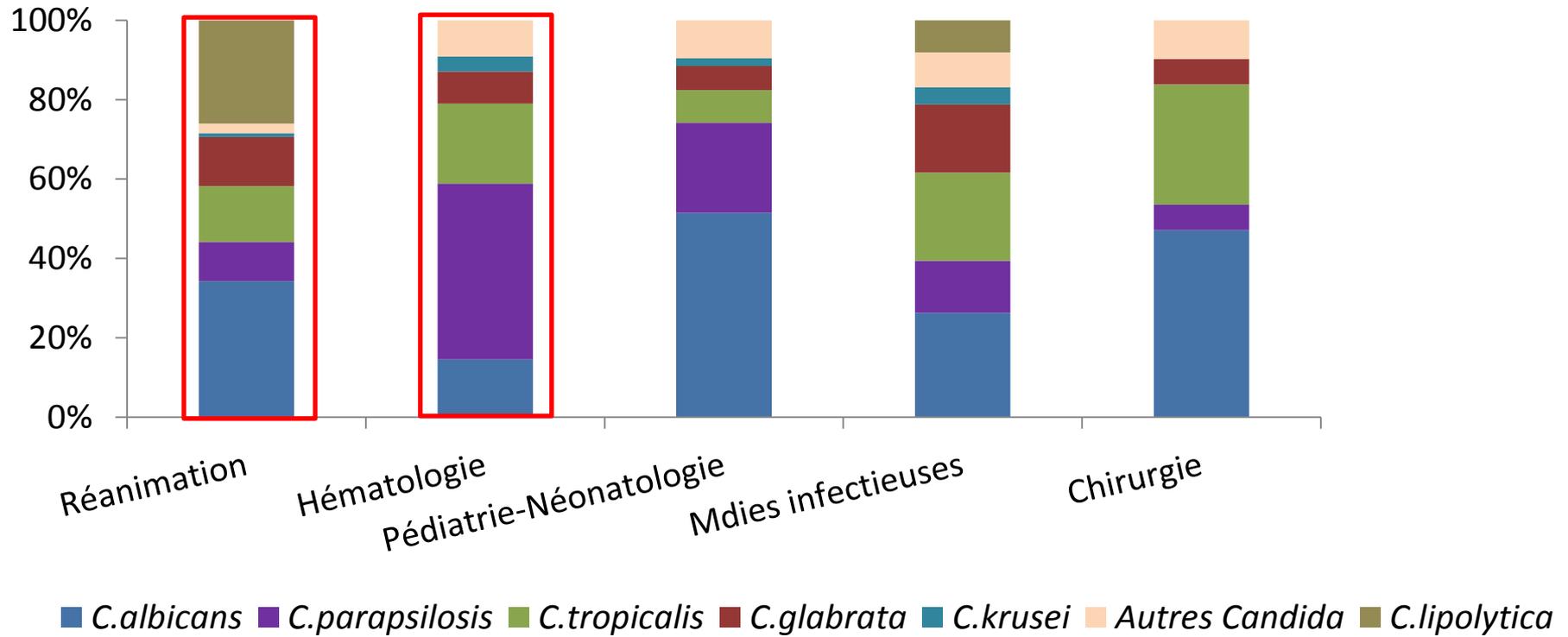
³ Department of Clinical Pathology, Faculty of Medicine, Mansoura University, Mansoura, Egypt

⁴ Department of Public Health and Community Medicine, Faculty of Medicine, King Abdulaziz University, Jeddah, Saudi Arabia

⁵ Department of Public Health and Community Medicine, Faculty of Medicine, Mansoura University, Mansoura, Egypt

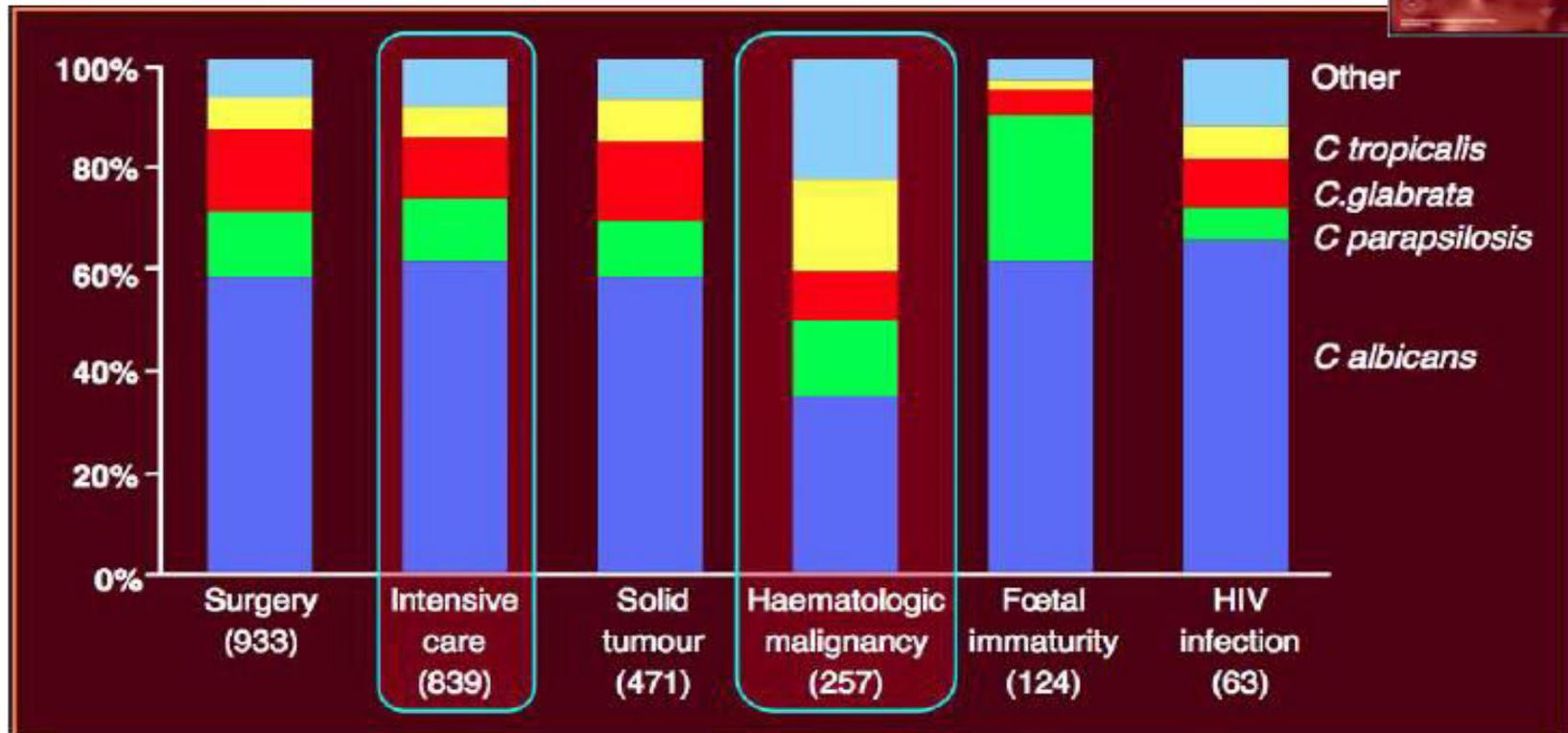
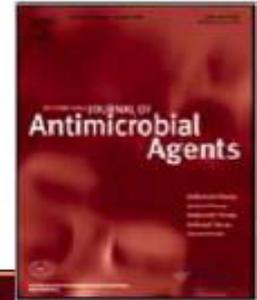
Isolated <i>Candida</i> species	No. (N=88)	(%)
<i>C. albicans</i>	35	40
<i>C. parapsilosis</i>	22	25
<i>C. tropicalis</i>	15	17
<i>C. glabrata</i>	7	8
<i>C. krusei</i>	5	6
<i>C. famata</i>	3	3
<i>C. lusitaniae</i>	1	1

Fréquence des espèces de *Candida* isolées des hémocultures selon les services



	Réanimation	Hématologie	Mdies infectieuses	Ped-néonat	Chirurgie
<i>C. albicans</i>	34%	14,4%	26%	51,3%	43,7%
<i>C. non albicans</i>	66%	85,6%	74%	48,7%	56,3%

Candidémies en europe



Tortorano 2006



Review

Epidemiology and outcomes of candidemia in 3648 patients: data from the Prospective Antifungal Therapy (PATH Alliance®) registry, 2004–2008

Michael Pfaller ^{a,*}, Dionissios Neofytos ^b, Daniel Diekema ^c, Nkechi Azie ^d, Herwig-Ulf Meier-Kriesche ^d, Shun-Ping Quan ^d, David Horn ^e

^a JMI Laboratories, North Liberty, IA 52317, USA

^b Johns Hopkins Hospital, Baltimore, MD 21287, USA

^c University of Iowa, Iowa City, IA 52242, USA

^d Astellas Scientific and Medical Affairs, Northbrook, IL 60062, USA

^e David Horn LLC, Doylestown, PA 18902, USA

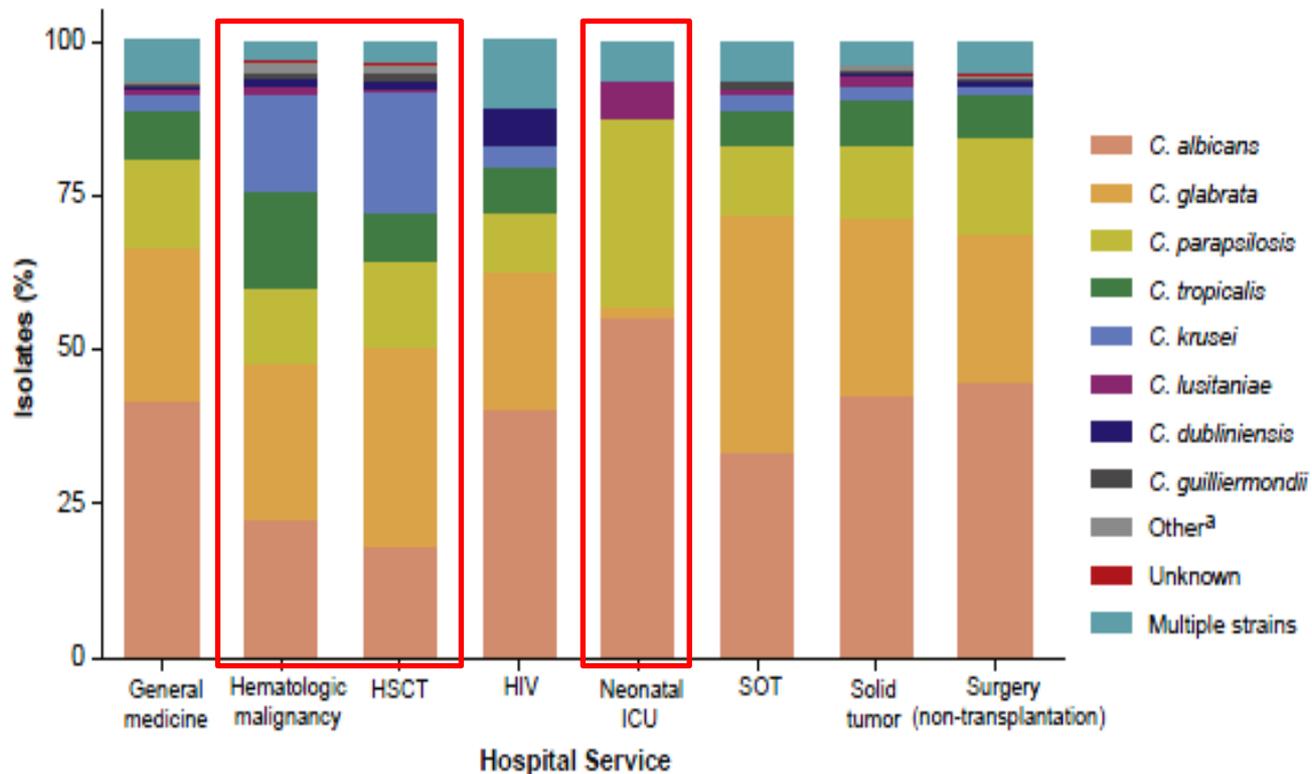
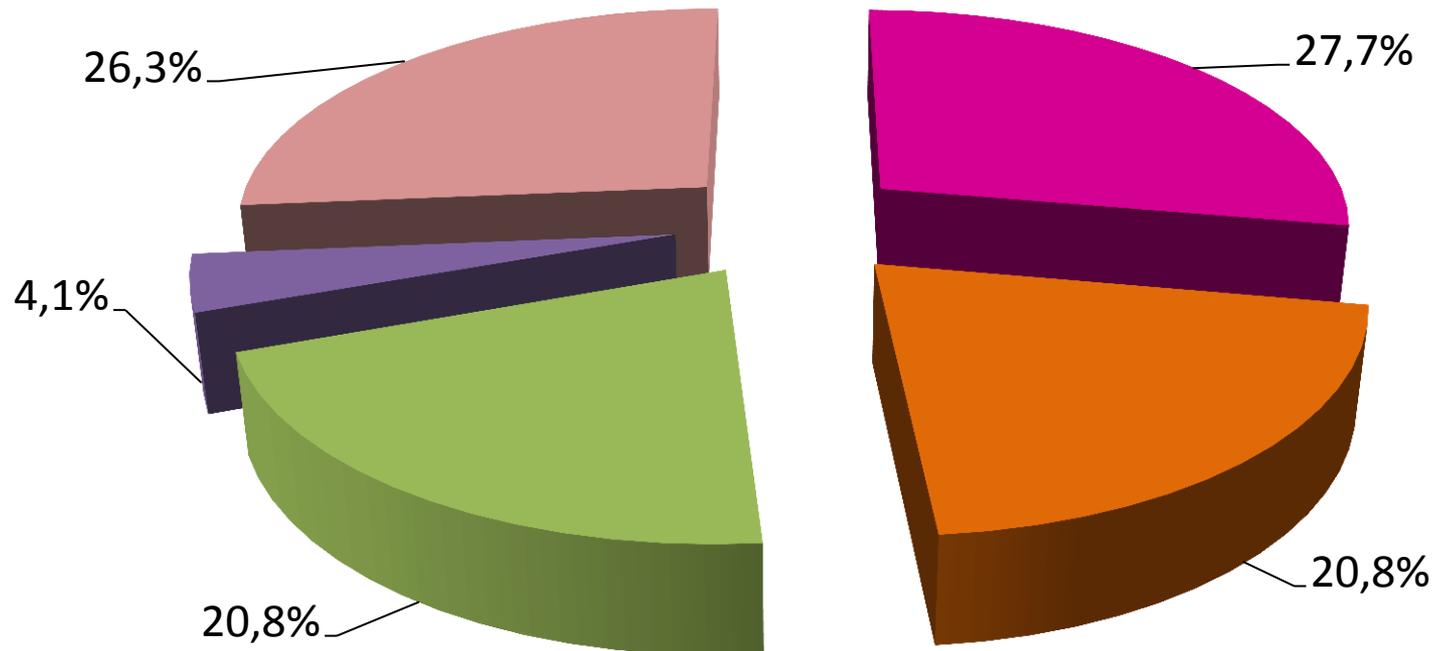


Fig. 2. Distribution of species by hospital service. ^aIncludes *C. utilis*, *C. fermentati*, *C. kefyr*, *C. rugosa*, *C. famata*, *C. fennica*, *C. lambica*, and *C. lipolytica*. HSCT = hematopoietic stem cell transplantation; ICU = Intensive care units; SOT = solid organ transplant.

Les septicémies à levures autres que *Candida*: 72 (7,7%)



■ *Geotrichum*

■ *Trichosporon*

■ *Rhodotorula*

■ *Saccharomyces*

■ *Cryptococcus*

ESCMID[†] and ECMM[‡] joint clinical guidelines for the diagnosis and management of rare invasive yeast infections

M. C. Arendrup¹, T. Boekhout^{2,3,4}, M. Akova⁵, J. F. Meis^{6,7}, O. A. Cornely⁸, O. Lortholary^{9,10} and on behalf of the ESCMID EFISG study group and ECMM[‡]

TABLE 3. Summary of rare yeast isolates collected during the national surveillance programme in Denmark 2004–2011 and the surveillance programme in Paris hospitals, France October 2002–May 2012. Only unique isolates are included. For comparison and representing other parts of the world data from a US cancer centre, the Artemis study and a Brazilian study are included

	DK (national) [26,27]	Paris Hosp. ^a	US (cancer centre) [28]	Artemis study 1997–2007 [29]	Sao Paulo Brazil [30]
Fungaemia isolates (total)	3982	3668	3382	NA	1195
Rare yeasts other than <i>Candida</i>	44 (1.1%)	188 (5.1%)	94 (2.8%)	11,240	174 (14.5%)
<i>Cryptococcus neoformans</i>	13 (29.5%)	137 (72.8%)	NA	3,512 (31.2%)	79 (45.4%)
<i>Cryptococcus</i> spp.	1 (2.3%)	1 (0.5%)	NA	113 (1.0%)	NA
<i>Geotrichum</i> spp.	2 (4.5%)	19 (10.1%)	2 (5%)	NA	NA
<i>Rhodotorula</i> spp.	4 (9.1%)	5 (2.7%)	21 (51%)	462 (4.1%)	28 (16.1%)
<i>Saccharomyces</i> spp. ^b	22 (50.0%)	14 (7.4%)	8 (20%)	1,321 (11.8%)	NA
<i>Trichosporon</i> spp.	2 (4.5%)	11 (5.9%)	8 (20%)	1,196 (10.6%)	NA
<i>Malassezia</i> spp.	0	1	1 (2%)	NA	NA
<i>Pichia anomala</i>	0	NA	1 (2%)	28 (0.2%)	32 (18.4%)
<i>Saprochaete capitata</i>	0	NA	NA	109 (1.0%)	NA

NA, Not available.

^aYEASTS Network, National Reference Centre for Invasive Mycoses and Antifungals, Paris, France (unpublished data).

^bTaxonomically also a *Candida* species (*C. robusta*).

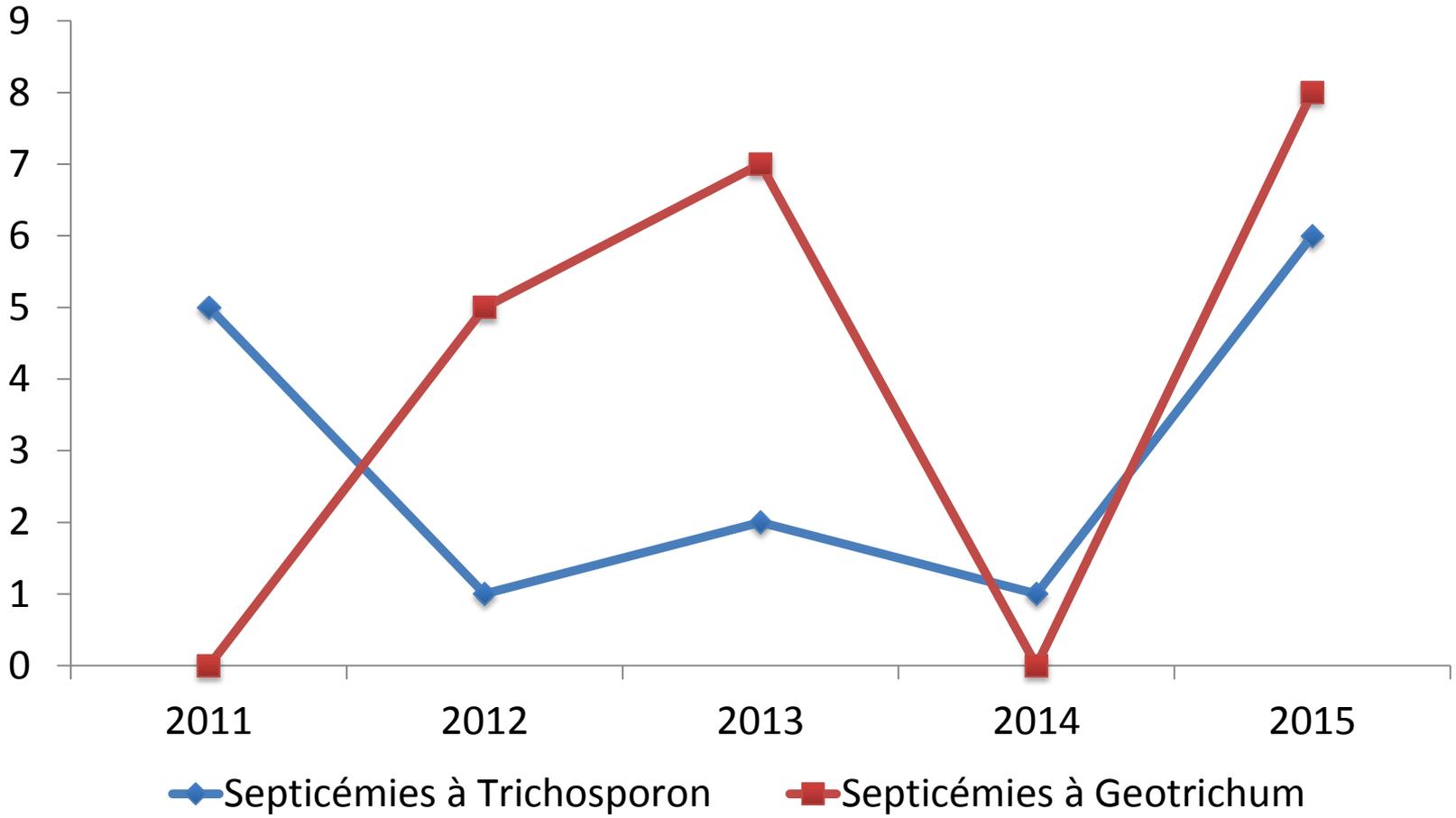
Distribution des levures rares selon les services

Service espèce	Réanimation	Hématologie	Chirurgie	Autres
<i>Geotrichum</i> (n=20)	5	13	0	2
<i>Trichosporon</i> (n=15)	8	1	2	4
<i>Rhodotorula</i> (n=15)	0	12	0	3
<i>Saccharomyces</i> (n=3)	2	0	0	1

Les levures du genre *Trichosporon* et *Geotrichum*

- ➡ Virulence : *Geotrichum* >>, *Trichosporon*
ID profonde et persistante +++
1^{ers} cas : 1965-1970 ➡ augmentation
- ➡ Mauvais pronostic : Mortalité élevée >70%
 - Maladie sous jacente et son traitement
 - Profil de sensibilité des souches
- ➡ Sensibilité aux antifongiques : Etudes parcellaires:

Evolution des cas de septicémies à *Geotrichum* et à *Trichosporon* selon les années



Septicémie à *G.capitatum*

- ➡ Fréquence des septicémies à *Geotrichum* : variable selon les pays: - USA, Danemark: 5%
 - France, Italie :10% - 0,5%

(Arendrup MC et al, 2014; Girmenia C et al, 2005)

- ➡ Patients d'onco-hématologie +++: LA (0,5% des infections)
 - ➔ neutropénie (>90% des cas)

- ➡ ~ 186 cas:

↪ Europe +++ > Amérique du nord: 85% / 10%:
Espagne: 26 cas/10 ans, Italie: 52 cas/20 ans

(Özkaya-Parlakay A et al, 2012)

Septicémie à *Trichosporon* sp

- ➡ Fréquence des septicémies à *Trichosporon* :
France (5,8%) , Danemark (4,5%) et USA (20%)
<1%: Italie
- ➡ ~ 287 cas: Amérique du Nord ++++ (33,9%), Asie (32,9%)
et Europe (27,6%) (Colombo AL et al, 2011)
- ➡ *Trichosporon* : responsable 0,4% des infections chez les patients d'hématologie (leucémie aiguë profondément neutropéniques) (Liao et al, 2015; Chitasombat et al, 2012)

Sensibilité des levures isolées des hémocultures

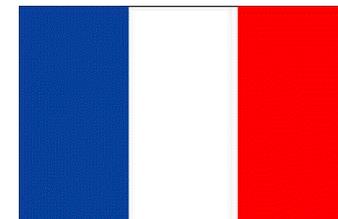
	AMB S(%)	FLZ S(%)	VRZ S(%)	Caspo
<i>C.albicans</i>	100%	97%	97%	100%
<i>C.tropicalis</i>	96,6%	96,2%	95%	96%
<i>C.glabrata</i>	100%	93%	94%	88%
<i>C.parapsilosis</i>	99%	97,5	98,2%	100%
<i>C.krusei</i>	90%	-	100%	87,5%
<i>Geotrichum</i>	93%	80%	100%	0%
<i>Trichosporon</i>	100%	88,8%	100%	0%

Epidemiology, Species Distribution, Antifungal Susceptibility, and Outcome of Candidemia across Five Sites in Italy and Spain

Matteo Bassetti,^a Maria Merelli,^a Elda Righi,^a Ana Diaz-Martin,^b Eva Maria Rosello,^c Roberto Luzzati,^d Anna Parra,^e Enrico Maria Treçarichi,^f Maurizio Sanguinetti,^g Brunella Posteraro,^h Jose Garnacho-Montero,^b Assunta Sartor,ⁱ Jordi Rello,^j Mario Tumbarello^f

Species (n)	Antifungal agent	No. (%) of isolates resistant, intermediate, or SDD to the antifungal agent in ^a :					strains (% SDD, intermediate, or resistant)
		U	T	B	R	S	
<i>C. albicans</i> (558)	Amphotericin B	NA	NA	NA	NA	NA	NA
	Caspofungin	0	0	0	0	0	0
	Fluconazole	2 (3.8)	1 (1)	0	5 (1.8)	0	8 (1.4)
	Itraconazole	2 (6)	1 (1)	18 (23.1)	5 (1.8)	0	26 (4.7)
	Voriconazole	2 (3.8)	1 (1)	0	4 (1.5)	0	7 (1.2)
<i>C. parapsilosis</i> complex (186)	Amphotericin B	NA	NA	NA	NA	NA	NA
	Caspofungin	1 (4.5)	0	2 (10)	2 (2.3)	1 (4.3)	5 (2.7)
	Fluconazole	1 (4.5)	1 (3)	0	3 (3.4)	0	5 (2.7)
	Itraconazole	NA	NA	NA	NA	NA	NA
	Voriconazole	2 (9)	0	0	0	0	2 (1)
<i>C. glabrata</i> (79)	Amphotericin B	NA	NA	NA	NA	NA	NA
	Caspofungin	0	0	0	0	0	0
	Fluconazole	1 (10)	7 (50)	16 (48.5)	9 (27.3)	3 (42.8)	36 (45.6)
	Itraconazole	NA	NA	NA	NA	NA	NA
	Voriconazole	NA	NA	NA	NA	NA	NA
<i>C. tropicalis</i> (89)	Amphotericin B	NA	NA	NA	NA	NA	NA
	Caspofungin	0	0	0	0	0	0
	Fluconazole	0	0	1 (6.7)	2 (5.3)	1 (4.8)	4 (4.5)
	Itraconazole	NA	NA	NA	NA	NA	NA
	Voriconazole	0	0	0	1 (2.6)	2 (9.5)	3 (3.4)

Pourcentage d'isolats ayant une sensibilité diminuée aux antifongiques (ODL France)



	FCZ ≥ 8 µg/ml	VRZ ≥ 1 µg/ml	5FC ≥ 16 µg/ml	CAS ≥ 1 µg/ml
<i>C. albicans</i> (911)	2	1	2.2	4
<i>C. glabrata</i> (305)	87	16	1.7	13
<i>C. tropicalis</i> (179)	7	7	34	18
<i>C. parapsilosis</i> (239)	7	1	-	50
<i>C. krusei</i> (n=49)	98	10	2.7	41
<i>C. kefyr</i> (38)	-	-	12.5	-
<i>Cr. neoformans</i> (88)	36	-	2.7	99
<i>P. guilliermondii</i> (18)	83	5	-	11



Nosocomial Candidemia; Risk Factors and Prognosis Revisited; 11 Years Experience from a Norwegian Secondary Hospital

Jan-Erik Berdal^{1*}, Rolf Haagensen², Trond Ranheim³, Jørgen V. Bjørnholt⁴

1 Department of Infectious Diseases, Akershus University Hospital, Nordbyhagen, Norway, **2** Department of Anaesthesiology, Akershus University Hospital, Nordbyhagen, Norway, **3** Department of Microbiology, Akershus University Hospital, Nordbyhagen, Norway, **4** Department of Infectious Disease Epidemiology Norwegian Institute of Public Health, Oslo, Norway

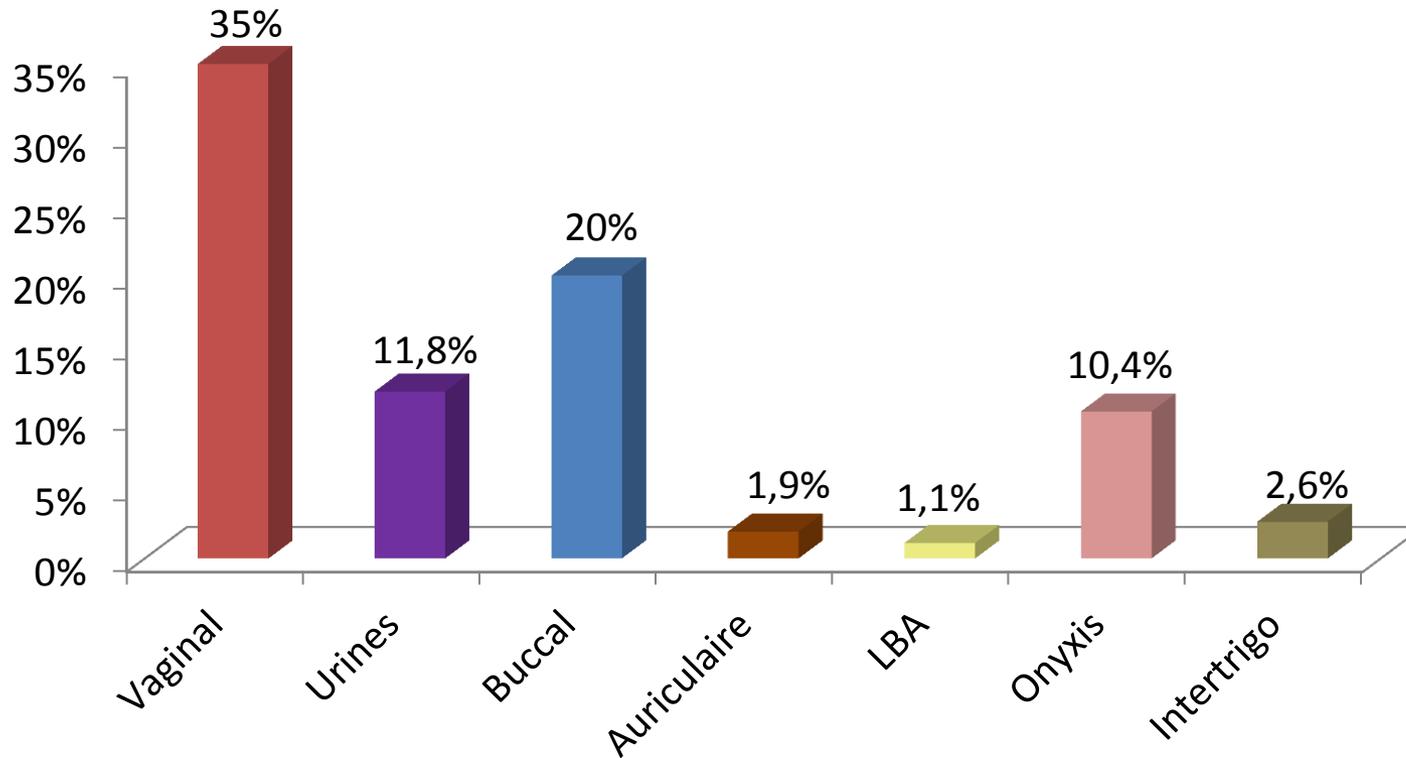
Table 1. Species distribution and in vitro antifungal susceptibility in 112 *Candida* blood culture isolates 2002–2012.

<i>Candida</i> species	Number	Fluconazole S/I/R	Voriconazole S/I/R	AmphotericinB S/I/R	Anidulafungin S/I/R	Micafungin S/I/R
<i>C. albicans</i>	85	85/0/0	81/0/0	85/0/0	40/0/1	27/0/3
<i>C. tropicalis</i>	10	0/10/0	7/0/1	9/0/1	2/0/0	-
<i>C. parapsilosis</i>	10	7/2/1	9/0/1	9/0/1	0/5/0	0/5/0
<i>C. glabrata</i>	7	0/6/1	-	7/0/0	4/0/0	4/0/0

S/I/R categorisation according to EUCAST clinical breakpoints (v 6.1, available 2013-03-11) www.eucast.org. Some patients yielded more than one isolate, see text. All isolates are not tested for all antifungals.

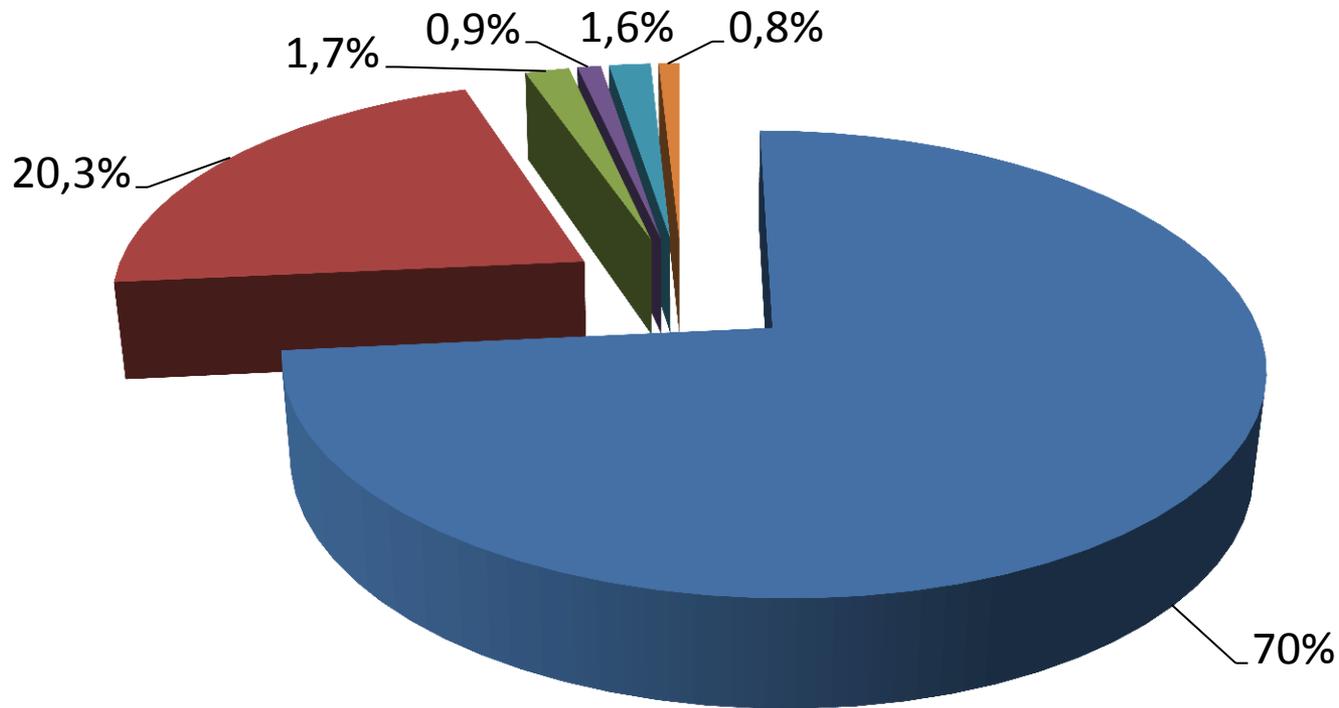
doi:10.1371/journal.pone.0103916.t001

Levures superficielles



**Distribution des levures superficielles
selon les prélèvements**

Candidoses vulvo-vaginales



■ *C. albicans*

■ *C. glabrata*

■ *C. tropicalis*

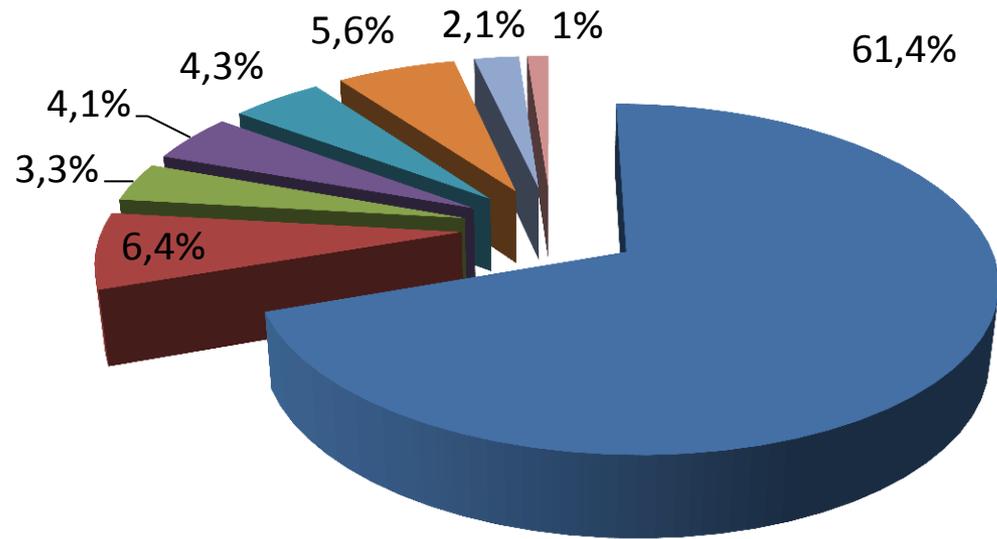
■ *C. krusei*

■ Autres Candida

■ *Saccharomyces*

Gynécologie ++: 69,4%

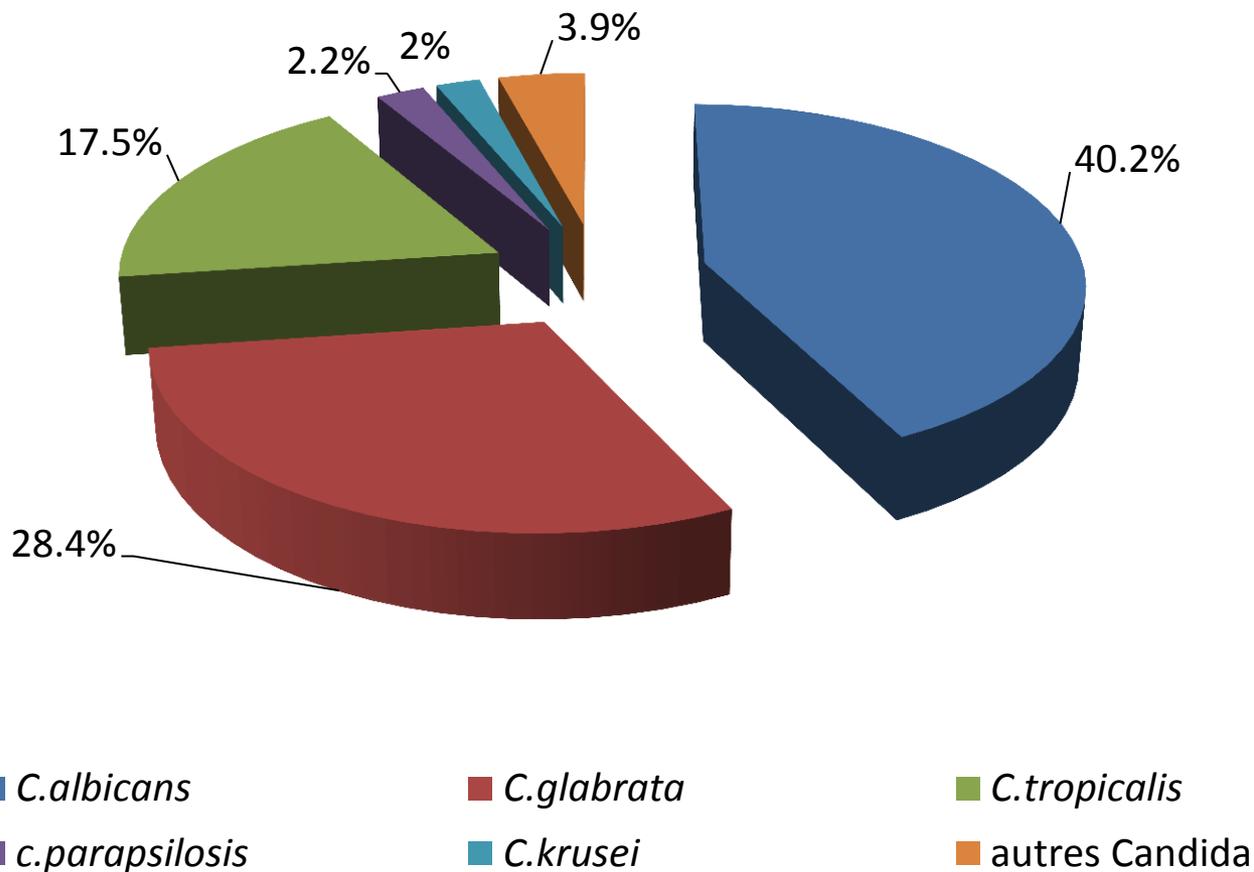
Candidoses buccales



- *C. albicans*
- *C. glabrata*
- *C. tropicalis*
- *C. albicans* + *C. tropicalis*
- *C. albicans* + *C. glabrata*
- Autres Candida
- *C. albicans* + *Geotrichum*
- *Geotrichum*

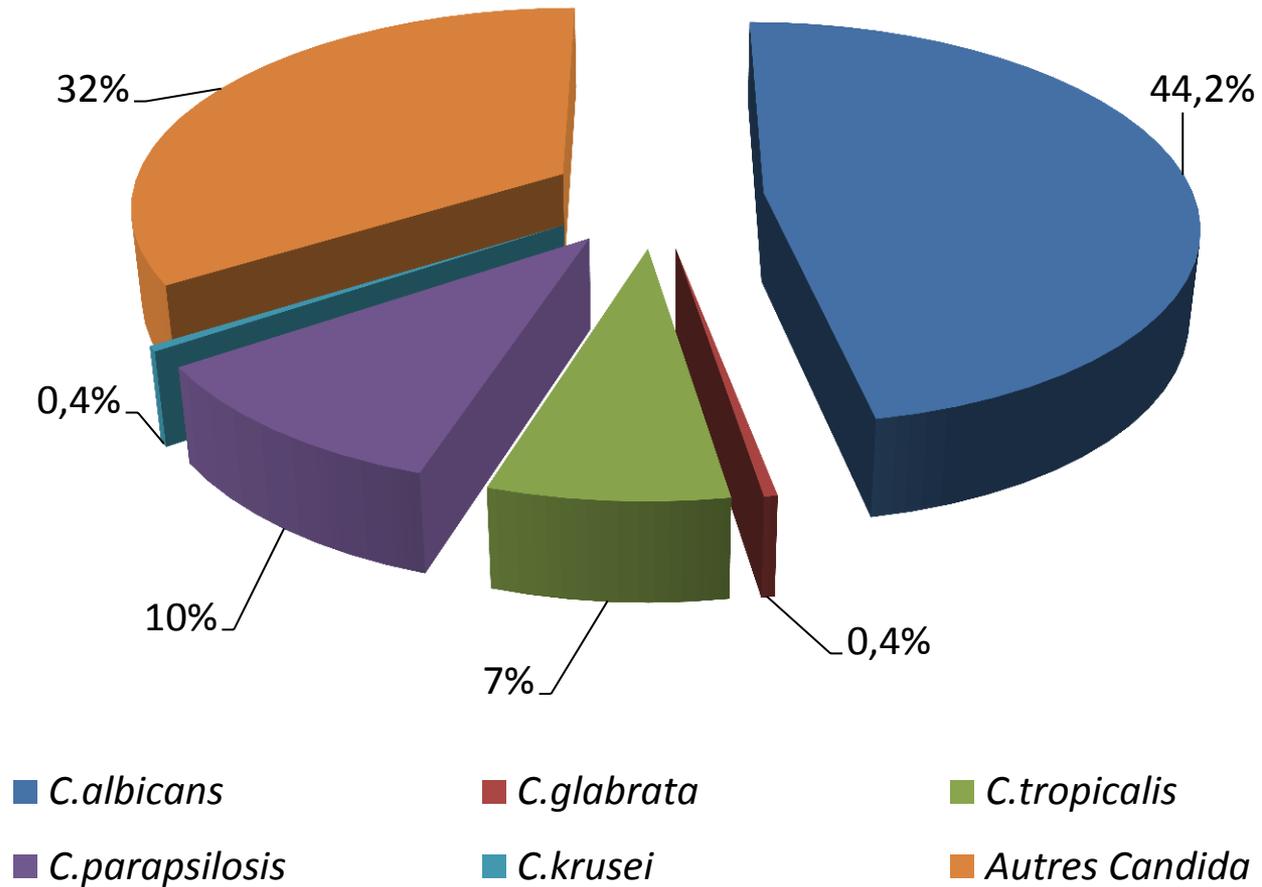
Stomato. +++: 43,2%
Réanimation: 35,6%

Candidoses urinaires



Réanimation++: 25,6%

Onyxis candidosiques



Conclusion

- Réseau des infections fongiques est né et une dynamique est lancée
- Groupe synergique
- Levures : spectre évolutif



4 espèces majeures

Émergence d'autres genres

C.albicans
C.parapsilosis
C.glabrata
C.tropicalis



Geotrichum
Trichosporon
Rhodotorula

Conclusion

➡ Champignons filamenteux

➡ Retombées :

- protocoles de consensus thérapeutiques nationaux,
- recommandations : collègues, rationalisation et adaptation des prescriptions, prévention
- administration

➡ Production scientifique



