Table 1. Summary MIC and susceptibility data of *Candida* spp. isolates for all countries combined

		AMB	ANID	FLU	ISA	CASP	MIC	POS	VOR
C. albicans (n=166)	MIC_{50}	0.5	≤0.008	0.25	≤0.004	0.12	0.008	≤0.008	0.008
	MIC_{90}	1	≤0.008	0.5	0.008	0.25	0.015	0.015	0.015
	% Sus	100	100	98.2	NA	100	100	NA	99.4
C. auris (n=12)	MIC_{50}	0.5	0.03	>64	0.12	0.5	0.06	0.03	0.25
	MIC_{90}	0.5	0.06	>64	1	0.5	0.12	0.06	4
	% Sus	NA	NA	NA	NA	NA	NA	NA	NA
C. glabrata (n=131)	MIC_{50}	0.5	0.03	4	0.06	0.25	0.03	0.25	0.06
	MIC_{90}	1	0.03	8	0.25	0.5	0.03	0.5	0.25
	% Sus	100	100	100	NA	0.8	100	NA	NA
C. krusei (n=71)	MIC_{50}	0.5	0.03	16	0.12	0.5	0.12	0.06	0.12
	MIC_{90}	1	0.06	32	0.25	0.5	0.12	0.12	0.25
	% Sus	100	100	NA	NA	12.7	100	NA	98.6
C. lusitaniae (n=53)	MIC_{50}	0.5	0.06	0.25	0.008	0.5	0.06	0.015	0.008
	MIC_{90}	0.5	0.06	1	0.015	1	0.06	0.03	0.015
	% Sus	NA	100	NA	NA	NA	100	NA	NA
C. parapsilosis (n=121)	MIC_{50}	0.5	0.5	0.5	0.015	0.5	0.5	0.03	0.015
	MIC_{90}	1	1	2	0.03	1	1	0.06	0.03
	% Sus	99.1	100	90.5	NA	100	100	NA	92.2
C. tropicalis (n=101)	MIC_{50}	1	0.015	0.5	0.03	0.25	0.015	0.015	0.03
	MIC_{90}	1	0.015	1	0.06	0.5	0.03	0.03	0.06
	% Sus	100	100	100	NA	80.2	100	NA	99

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***In vitro* synergy of combination therapy against antifungal-resistant *Candida* spp. isolated from captive bottlenose dolphins (*Tursiops truncatus*)**

Giorgia Matteucci[1], Barbara Biancani[2], Diana Binanti[1]
[1]AbLab Veterinary Diagnostic Laboratory, Sarzana, Italy
[2]Oltremare, Riccione, Italy

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The study aimed to evaluate antifungal resistance in *Candida* spp. isolated from captive bottlenose dolphins (*Tursiops truncatus*). Due to the need to find a therapy for symptomatic animals and to the presence of azole-resistant isolates, *in vitro* synergy of 3 antifungal combinations has been assayed.

A total of seven captive bottlenose dolphins were examined. Two dolphins showed mild aspecific symptoms, one was receiving nystatin due to gastric candidiasis, and the other four animals were asymptomatic. The presence of *Candida* spp. was investigated in fecal, gastric fluid, and blow samples from each dolphin twice.

Samples were cultured on Sabouraud Dextrose Agar and ChromAgar Candida at 30°C for 5 days. CHROMagar colonies consistent with *Candida* spp. were identified.

Susceptibility tests were performed according to CLSI standard with amphotericin B (AB), 5-flucytosine (FC), itraconazole (IZ), fluconazole (FZ), miconazole (MCZ), posaconazole (PZ), voriconazole (VOR), caspofungin (CAS), anidulafungin (AND), and micafungin (MF). In addition, minimum inhibitory concentration (MIC) for nystatin (NYS) and terbinafine (TER) was determined.

Based on the most common therapies in dolphins, assessment of the interaction between FZ and TER, VOR and TER, and VOR and NYS was carried out determining the fractional inhibitory concentration (FIC) index by checkerboard assay.

Out of 42 samples analyzed, 30 were positive for *Candida* spp. identified as *C. albicans* (*n*=21), *C. tropicalis* (*n*=6), and *C. glabrata* (*n*=3).

All the isolates showed resistance to azoles. A total of 50% of the isolates showed resistance to FC and 23.3% to AMB. No isolate showed resistance to echinocandins.

MIC values ranged from 16 to 128 μg/ml for TER (arithmetic mean 107.8 μg/ml) and from 8 to 128 μg/ml (arithmetic mean 51.8 μg/ml) for NYS.

The FIC index value for FLU and TER showed a synergistic effect on 71.4% and an additive effect on 28.6% of the tested isolates.

For VOR and TER an additive effect on 71.4% and a synergistic effect on 28.6% of the isolates were detected.

For VOR and NYS an antagonistic effect on 71.4% and an additive effect on 28.6% of the isolates were detected.

According to the results, combination therapy with FLU and TER was started. Symptoms resolved completely.

Candida spp. has been isolated from mucous membranes of free-living asymptomatic dolphins. However, a high load of *Candida* spp. may cause clinical signs.

As azoles are the most used antifungals in dolphins, azole-resistance is increasing. Since the tested dolphins had no recent history of azole treatment, it could be speculated that resistance might come from the environment. Thus, further studies and screening of multidrug-resistant *Candida* spp. in animals and their environment are needed to better understand resistance transmission in a One Health approach.

Moreover, susceptibility testing is important to select the appropriate therapy. In case of azole-resistant *Candida* spp., antifungals other than azoles alone or in combination should be considered.

Our study demonstrates that fluconazole exhibits *in vitro* synergistic antifungal activity with terbinafine against azole-resistant strains of *C. albicans, C. tropicalis* and *C. glabrata* isolated from captive bottlenose dolphins.

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Identification of clinical *Candida* isolates using maldi-tof-ms and their antifungal susceptibility profile—a study from tertiary care pediatric hospital in noida

Naz Perween[1], Sumi Nandwani, Nikhil Verma, Sumit Rai, M.R. Shiva Prakash, Krati Saxena, Niharika Dwivedi
[1]Post Graduate Institute of Child Health, Noida, India
[2]Postgraduate Institute of Medical Education and Research, Chandigarh, India
[3]All India Institute of Medical Sciences, Mangalagiri, India

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Introduction

- *Candida* species are ubiquitously present as commensals in the human body. In immunocompromised and hospitalized patients, they can cause various types of infections ranging from cutaneous to bloodstream infections and hence are capable of causing morbidity and mortality in patients[1].
- Increase in the prevalence of infections caused by non-*albicans Candida* (NAC) has been reported in many parts of the world.
- Candidemia incidence varies from 0.24 to 34.3 patients/1000 ICU admissions and with a high mortality rate of 35%–75% early antifungal treatment is essential for survival[2].
- Accurate species identification is important for the treatment of the *Candida* infections as the NAC continues to be increasingly documented with decreased susceptibility to antifungal agents[3].

Objectives

- To identify *Candida* species in various clinical samples using Matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF MS)
- To study *in vitro* antifungal susceptibility profiles of the identified candida species, using VITEK-2 compact system (Biomeriux, France)

Material and Methods: The study was conducted in Department of Microbiology during the period of August 2018 to August 2021.

- Various clinical samples of pediatric patients from both genders from outpatient and inpatient departments suspected for candidiasis were included in the study.
- Initially the samples, with probable yeast were inoculated on Saboraud Dextrose agar (SDA) with chloramphenicol incubated at 37^{0}C.
- Gram stain was done from the culture growth look for yeast cells.
- The MALDI-TOF MS-based identification of all yeast isolates to the species level was performed according to …… (malti name and software version) using the ethanol (EtOH)/formic acid (FA) extraction protocol.
- Antifungal susceptibility was performed using the VITEK-2 system (bioMerieux Pvt. Ltd., France). The following antifungal drugs were tested: fluconazole, caspofungin, micafungin, amphotericin B, flucytosine, and voriconazole.