

P 476 Monitoring Antifungal Resistance in a Global Collection of *Candida* spp. Surveillance Isolates, including *C. auris* - Analysis of Resistance in Antifungals (ARIA) 2020 study



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Introduction

ARIA is a recent longitudinal global surveillance initiative collecting yeast and fungal isolates from hospitals worldwide designed to determine susceptibility profiles and monitor the resistance trends among antifungal agents.

ARIA reports the susceptibility patterns of data concerning echinocandins, second-generation triazoles, and fluconazole against clinical *Candida* spp., and filamentous fungal isolates from worldwide sources.

Material and Methods

Candida spp. isolates (n=662) were collected from hospitals worldwide during 2020 from 13 different sites Argentina (n=1), Panama (n=1), United States (n=2), Australia (n=2), India (n=2), and from Europe [Germany (n=1), Italy (n=1), Spain (n=1), Turkey (n=1) and United Kingdom (n=1)]. The country of origin is given in Fig. 1.

These isolates were collected from different infection sources and were shipped to a central laboratory at IHMA Europe, Switzerland, and re-identified by MALDI-TOF or molecular methods. The infection sources is given in Fig. 2.

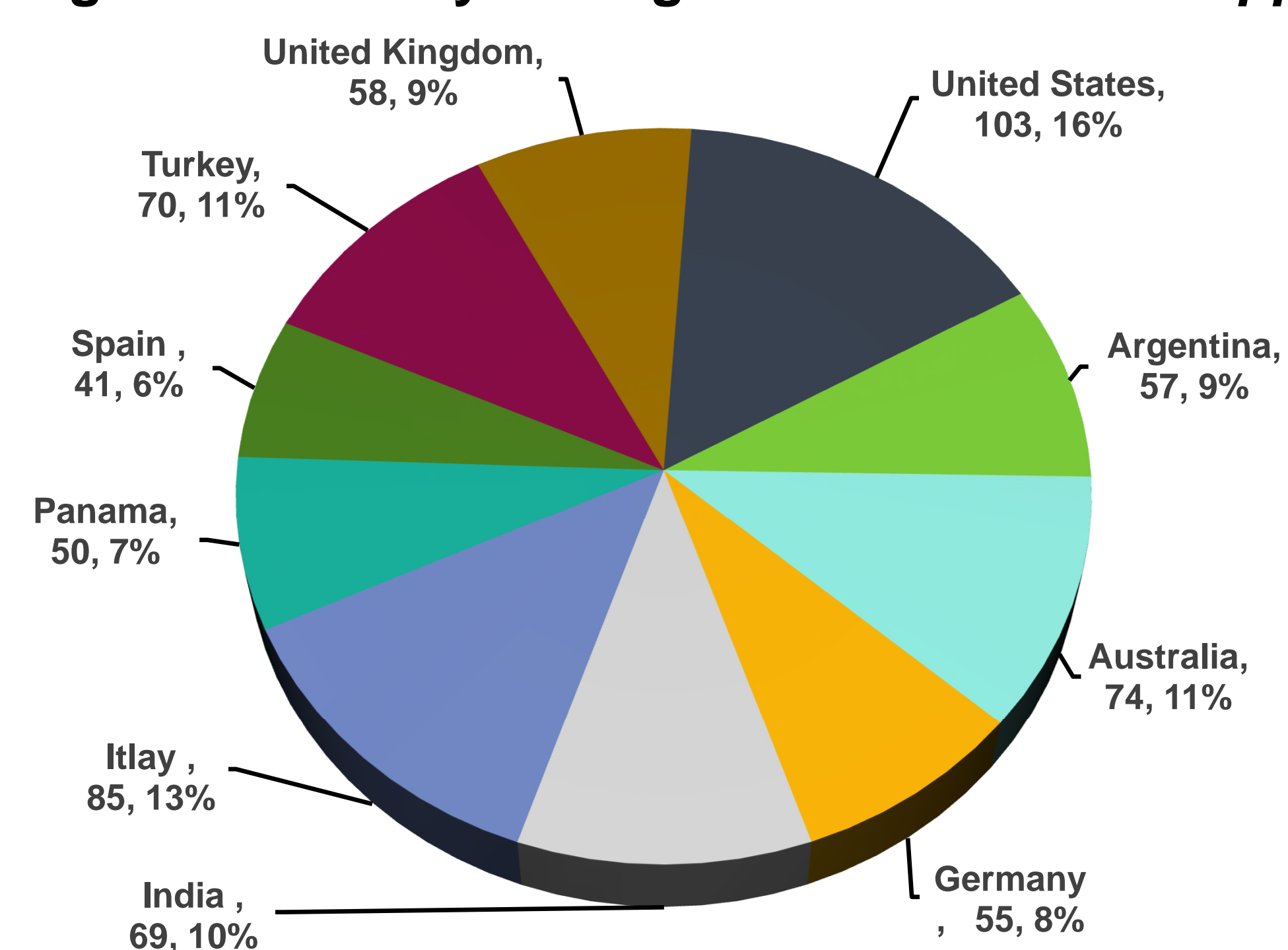
The MICs were performed by broth microdilution method in line with CLSI susceptibility testing standards- CLSI M27-A4 and M60 methodologies and percentage susceptibility (%S) were calculated.

Antifungals tested were amphotericin B (AMB), anidulafungin (ANID), fluconazole (FLU), isavuconazole (ISA), caspofungin (CASP), micafungin (MIC), posaconazole (POS), and voriconazole (VOR).

Results

- C. albicans* were >90% susceptible to all agents tested (Table 1, Fig. 3).
- C. auris* were susceptible to all agents tested except reduced susceptibility to FLU, which was consistent in all countries (Table 1).
- C. glabrata* were susceptible to all agents tested except CASP where 0.8% were susceptible (Table 1). Low CASP susceptibility was observed in all countries (Fig. 4).
- C. krusei* were >90% susceptible to all agents tested except CASP where 12.1% were susceptible (Table 1). Low CASP susceptibility was observed in all countries (Fig. 5).
- C. tropicalis* were >90% susceptible to all agents tested except CASP where only 80% isolates were susceptible (Table 1). The CASP susceptibility rate were lowest, 60% and 78.3, in India and Europe, respectively (Fig. 6).
- C. parapsilosis* were >90% susceptible to all agents tested in all countries (Table 1).

Figure 1. Country of Origin of ARIA *Candida* spp.



Results Continued

Table 1. Summary MIC and susceptibility data for all isolates

	AMB	ANID	FLU	ISA	CASP	MIC	POS	VOR	
<i>C. albicans</i> (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
<i>C. auris</i> (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
<i>C. glabrata</i> (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
<i>C. krusei</i> (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
<i>C. lusitaniae</i> (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
<i>C. parapsilosis</i> (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
<i>C. tropicalis</i> (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

The highlighted values denoted reduced susceptibility of the antifungal agent.

Figure 2. Infection source of *Candida* spp.

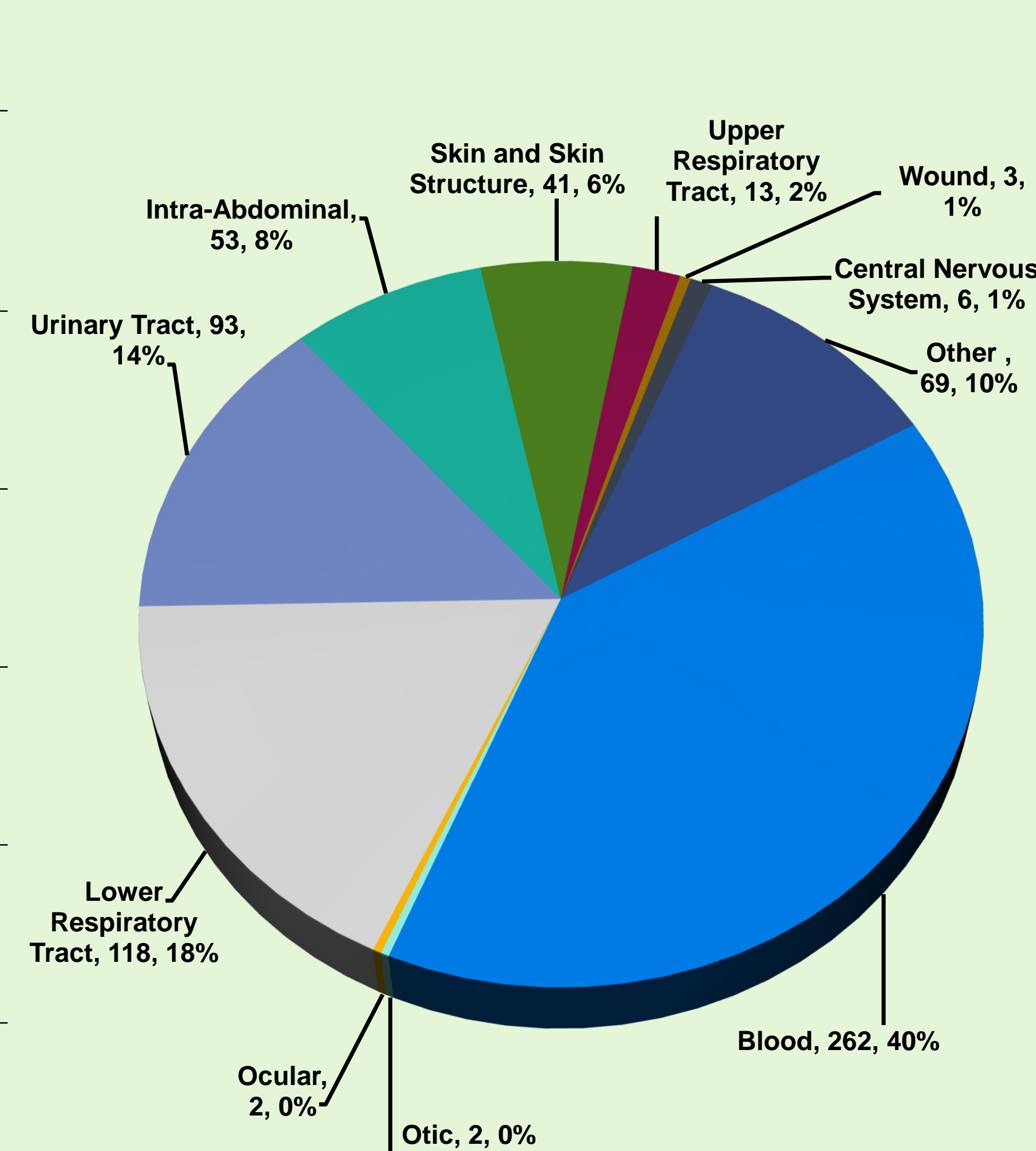


Figure 3. Antifungal susceptibility of *C. albicans*

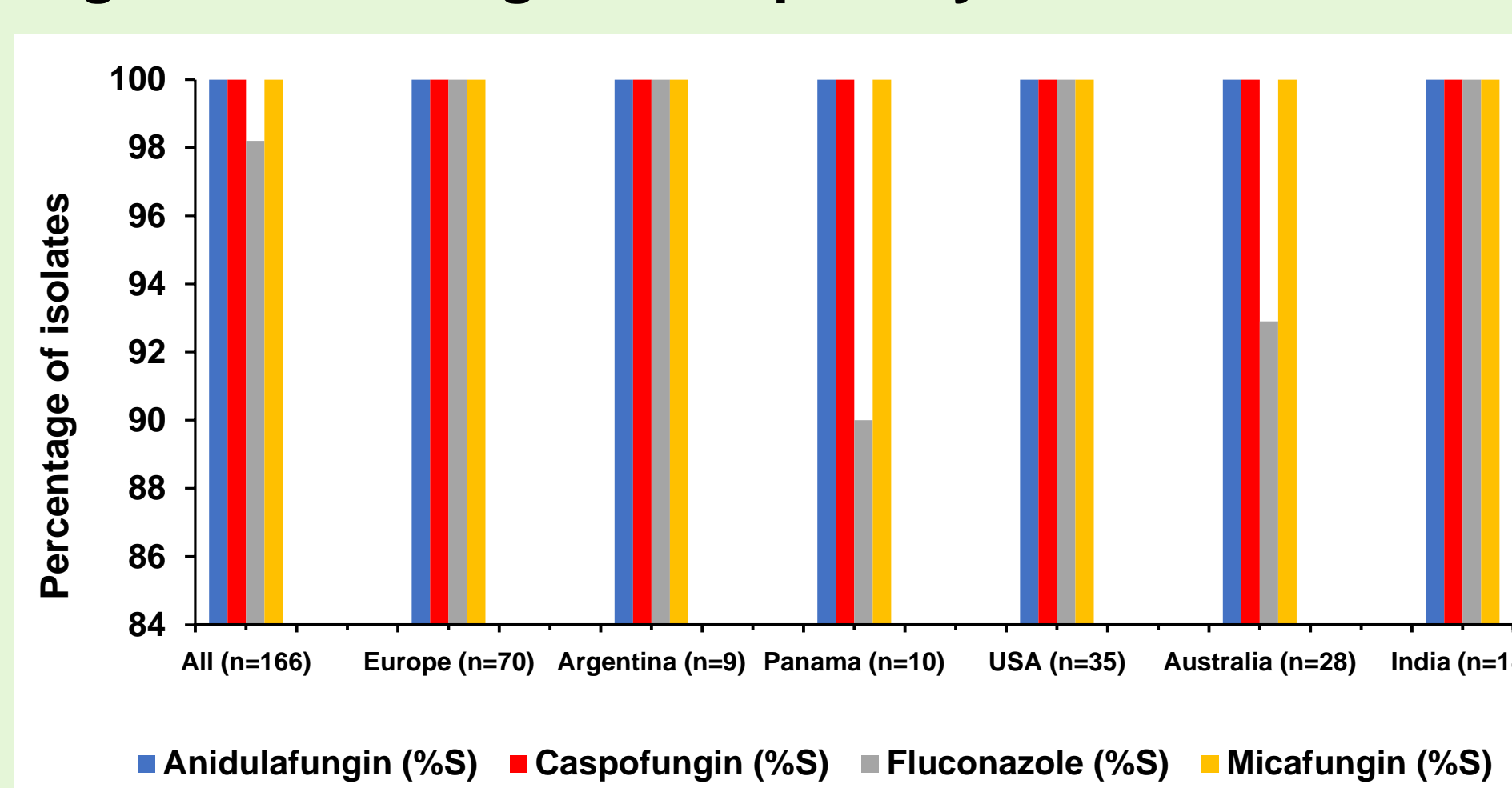


Figure 4. Antifungal susceptibility of *C. glabrata*

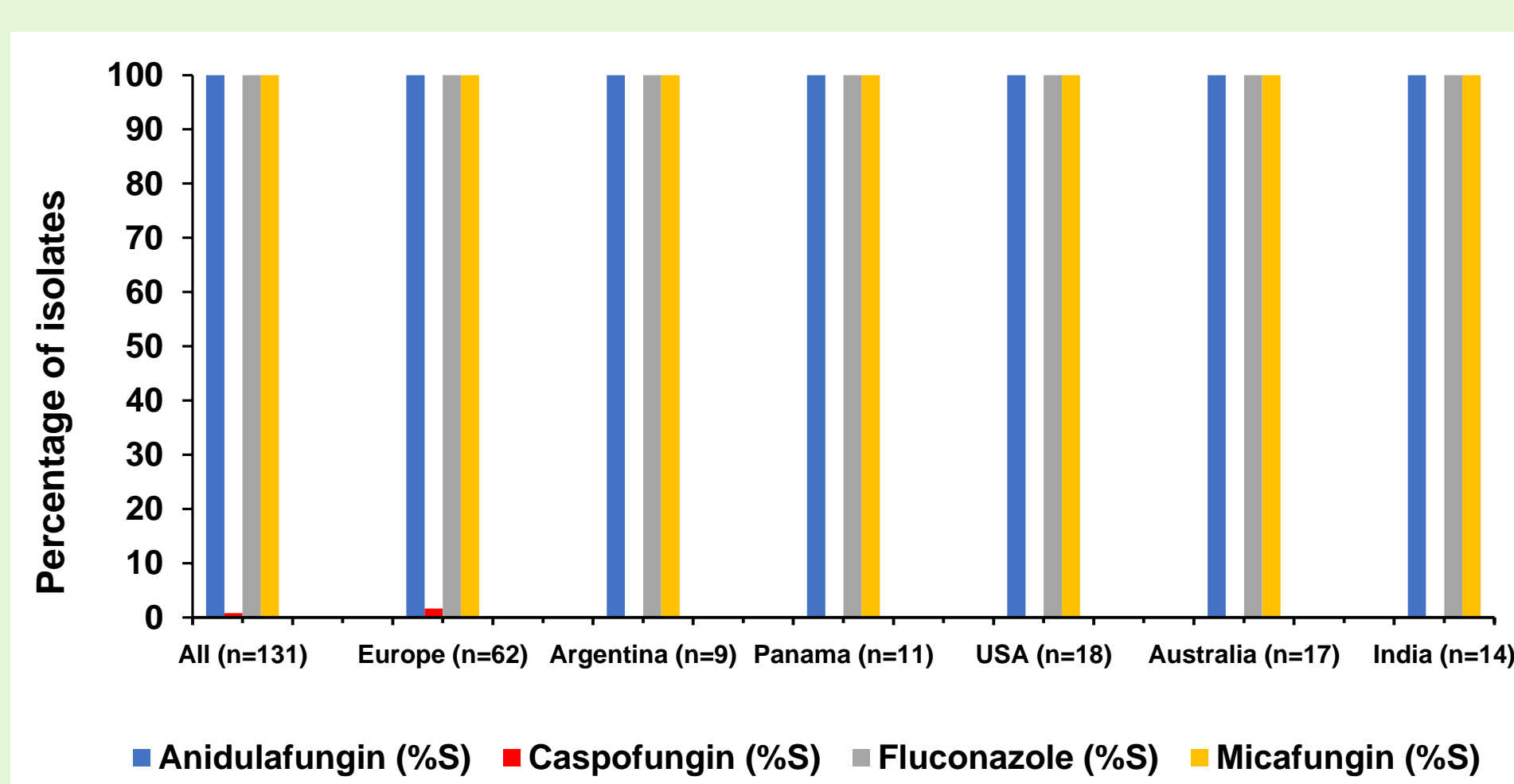


Figure 5. Antifungal susceptibility of *C. krusei*

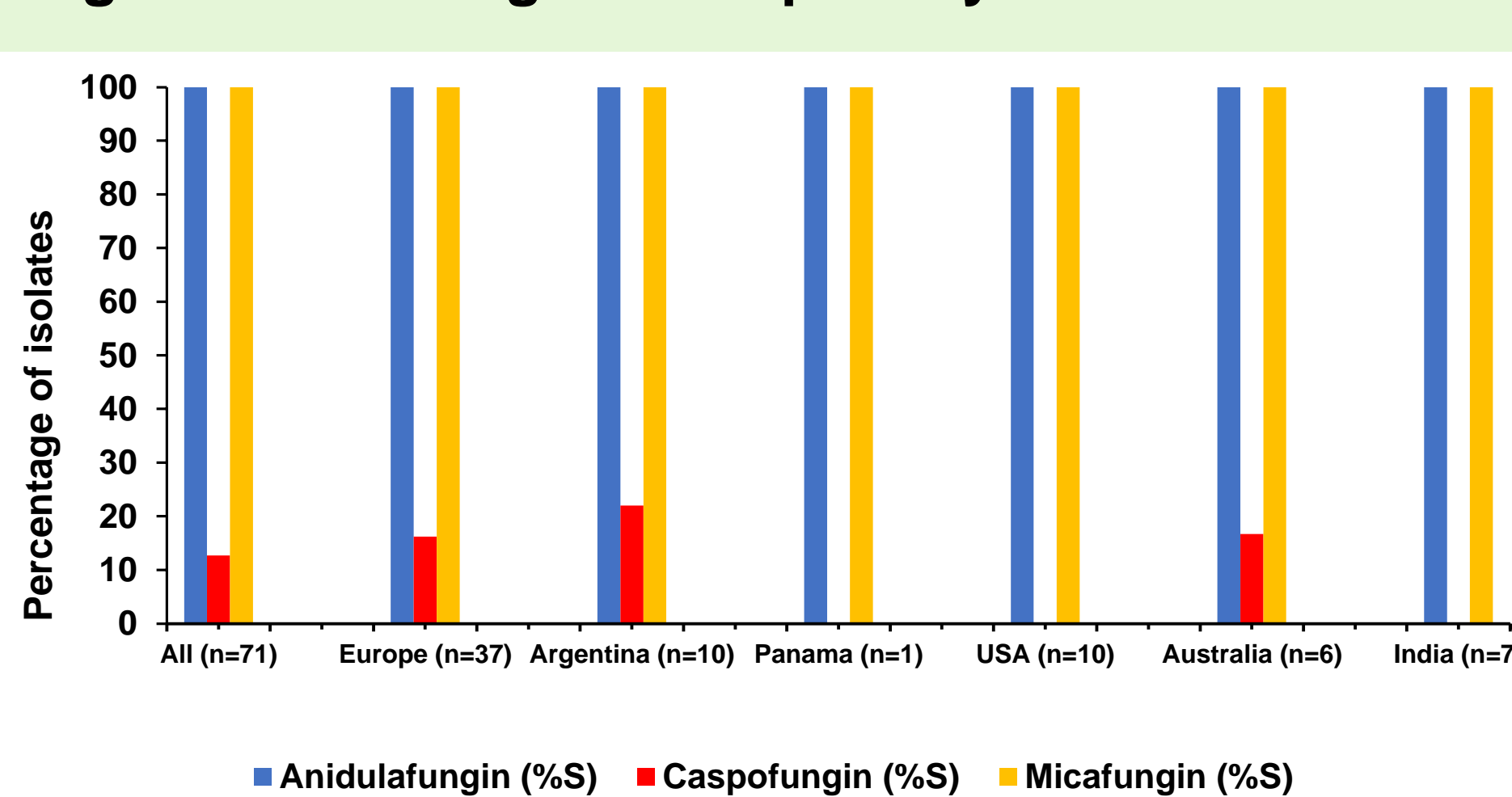
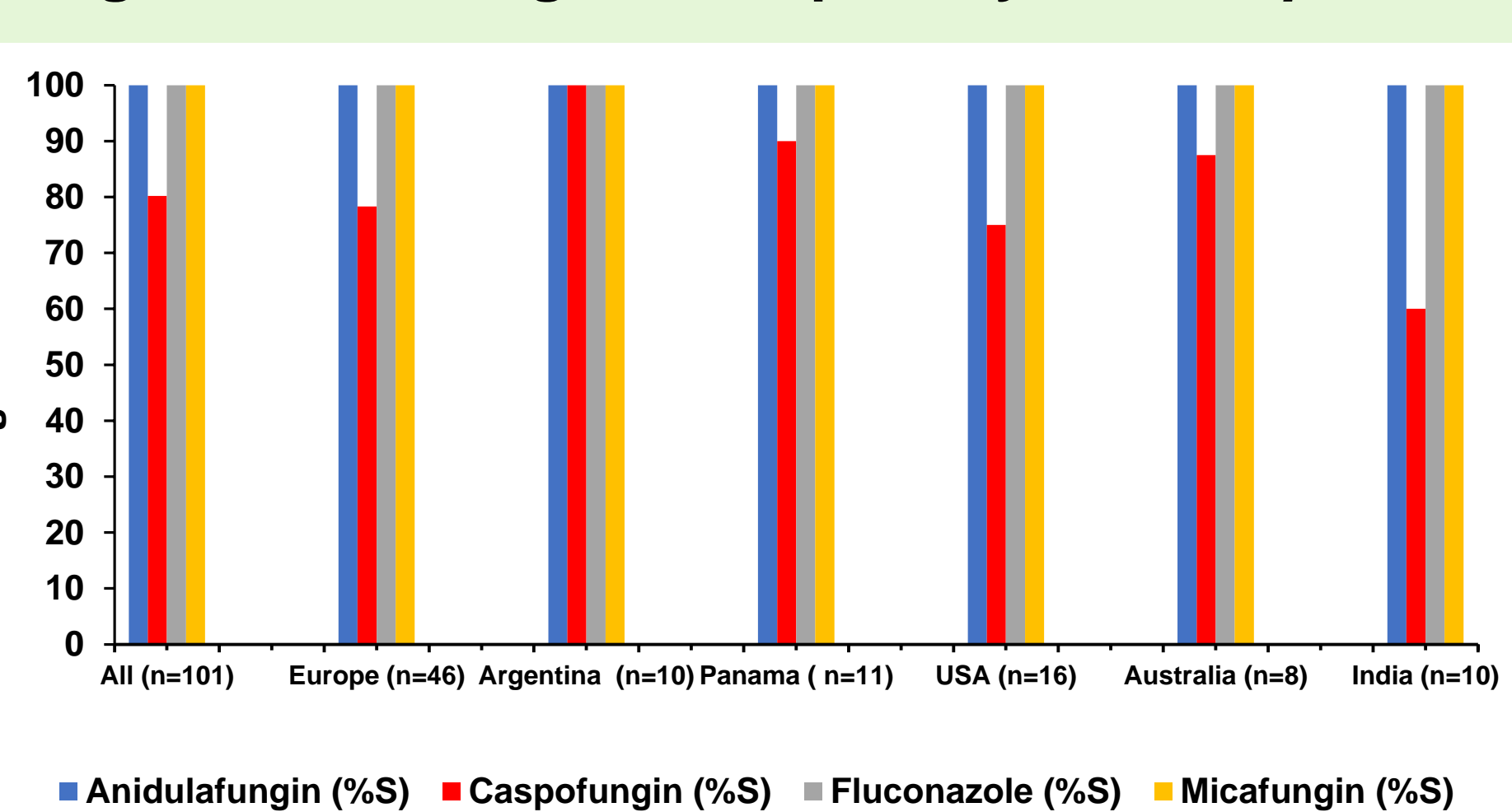


Figure 6. Antifungal susceptibility of *C. tropicalis*



Conclusions

- The data from the ARIA 2020 study indicate that overall antifungal resistance is low among the *Candida* spp. isolates except for *C. glabrata* and *C. krusei* where resistance to one or more antifungal agents was observed.
- There was no significant difference in susceptibility pattern was observed when susceptibility data of *C. glabrata* and *C. krusei* from different continents were compared. The emergence of resistance was evident among *C. auris* isolates as they have shown reduced susceptibility to azoles in this study.
- Antifungal resistance surveillance and investigation into resistance mechanisms are of paramount importance. The ongoing ARIA surveillance study will provide resources to monitor antifungal resistance trends, provide key information to caregivers and provide essential information with respect to the development of novel antifungal agents.

References

- Clinical Laboratory Standards Institute (CLSI), 2012. Methods for Broth Dilution Antifungal Susceptibility Testing of Yeast; Forth Information supplement. Vol. 32(17); CLSI standard M27-S4. CLSI, 950 West Valley Road, Suite 1400, Wayne, Pennsylvania 19087 USA.
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