

Detection of CYP51A mutations in airborne *Aspergillus* spp. isolates from intrahospital environments.

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INTRODUCTION

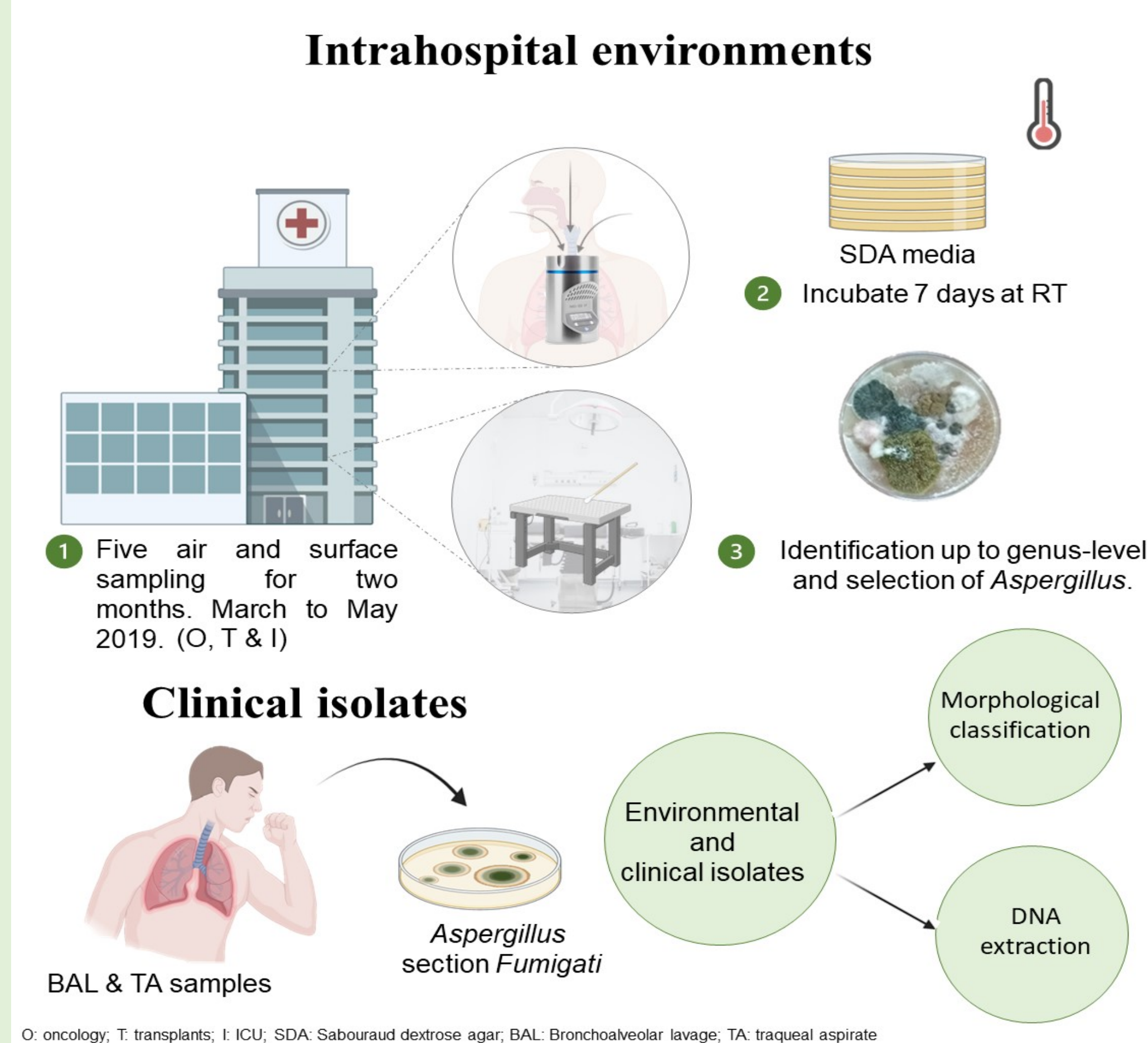
Aerobiological studies have found an increasing number of *Aspergillus* spores in intrahospital environments¹. There is a gap in knowledge on drug-susceptibility in *Aspergillus* circulating intrahospital environments². In this work, we evaluated the CYP51A genome alterations and isolates susceptibility to antifungal drugs.

OBJETIVE

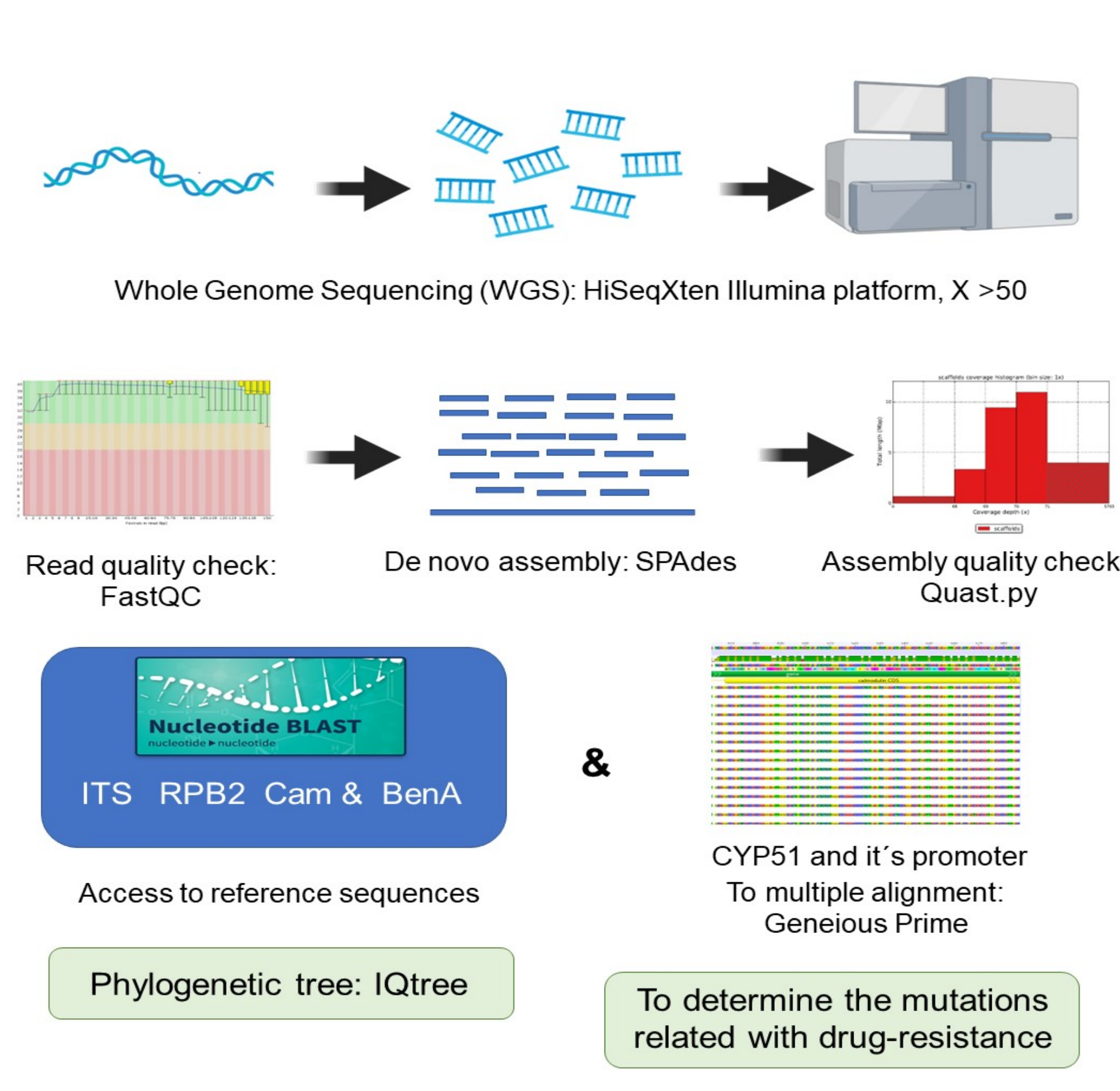
To determinate CYP51A gene mutations and antifungal susceptibility in environmental and clinical *Aspergillus fumigatus* isolates from intrahospital environments in Medellín, Colombia.

METHODS

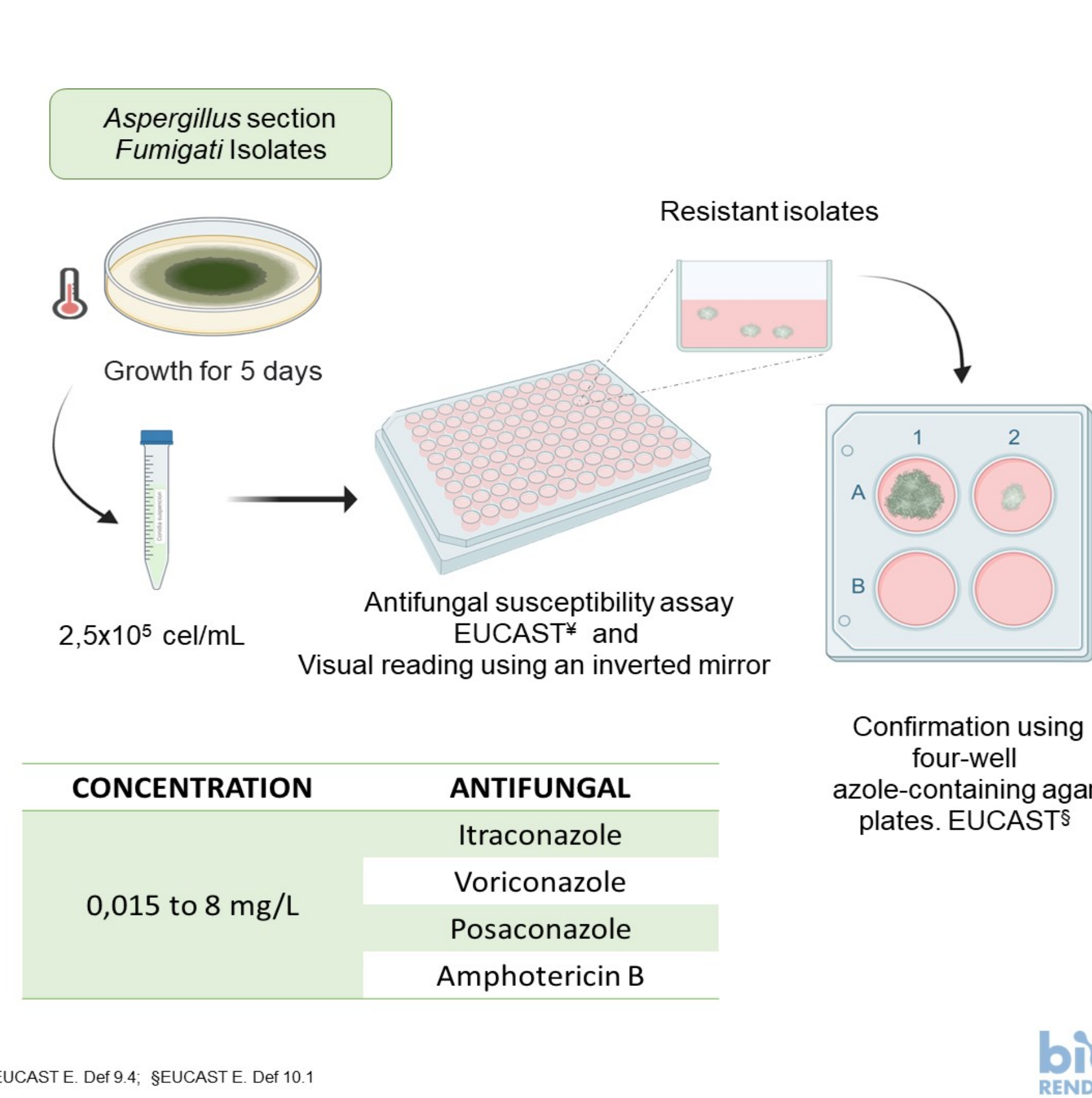
Sampling



Genomic ID



Susceptibility test



RESULTS

40 *Aspergillus* section *Fumigati* isolates: 25 intrahospital, 12 clinical and 3 outdoor environments.

CONCLUSIONS

Identification of *A. fumigatus* at species level was achieved through whole genome sequence.

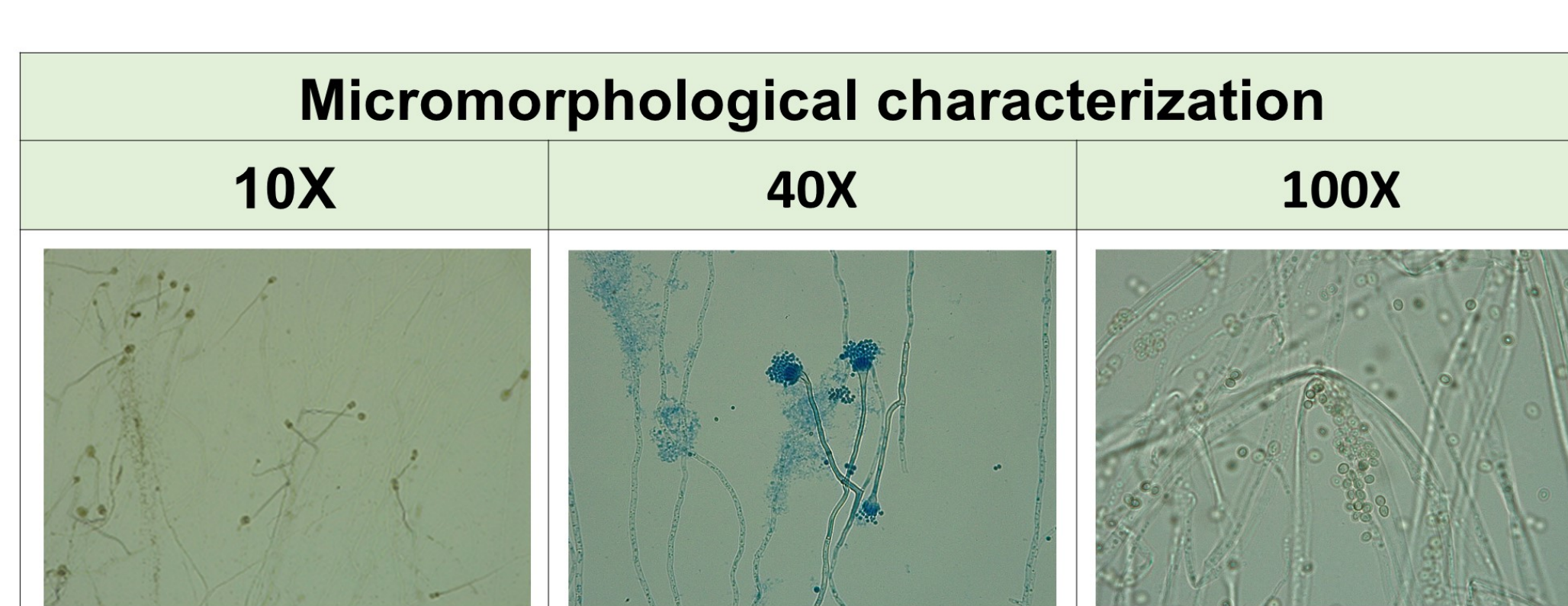
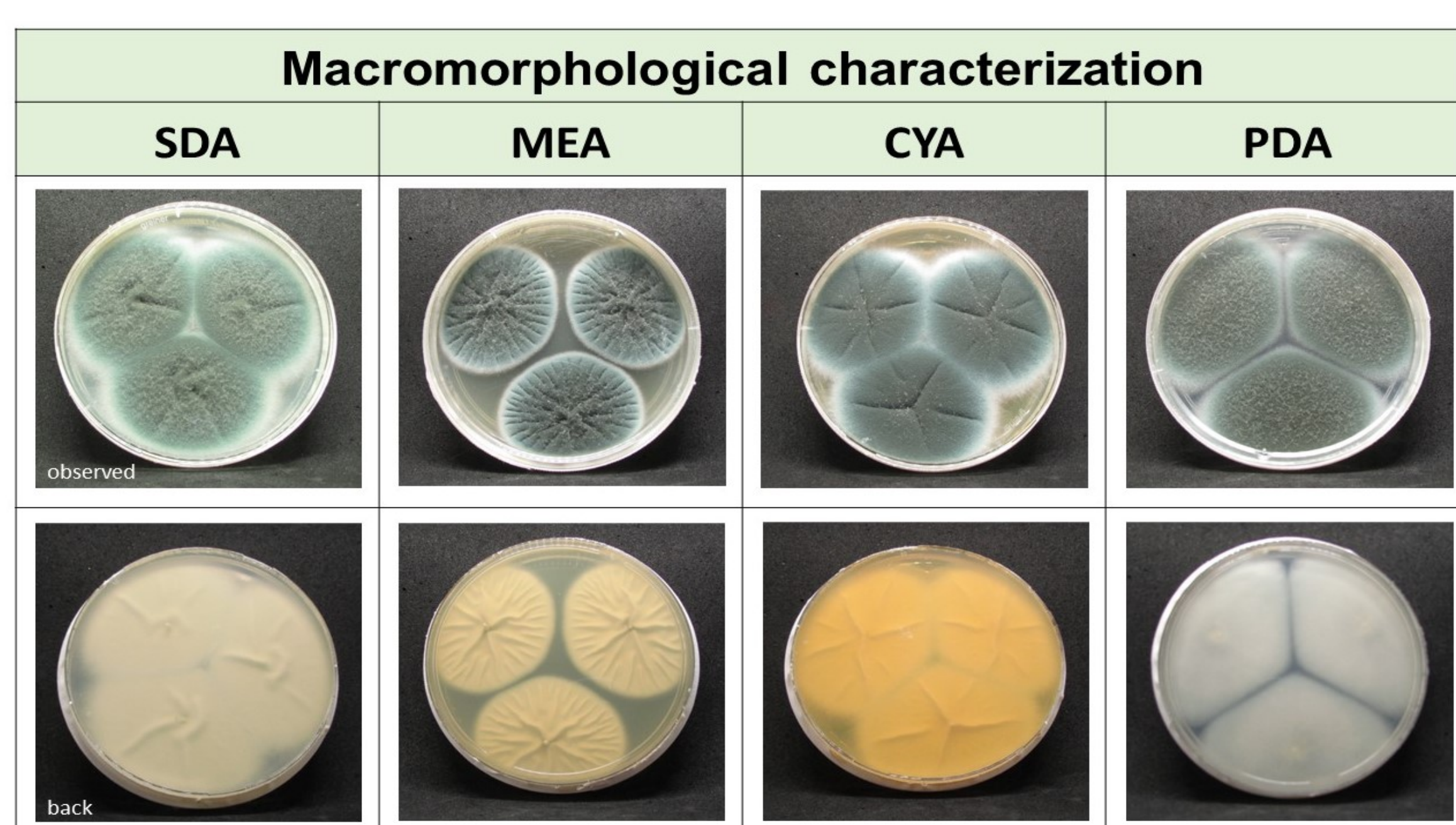


Figure 1. Morphological characterization of *Aspergillus* section *fumigatus* isolates. Culture in Sabouraud Dextrose Agar ; SDA, Malta Extract Agar; MEA and Czapek Yeast Agar; CYA and Potato Dextrose Agar; PDA. The images are representative of 40 isolates.

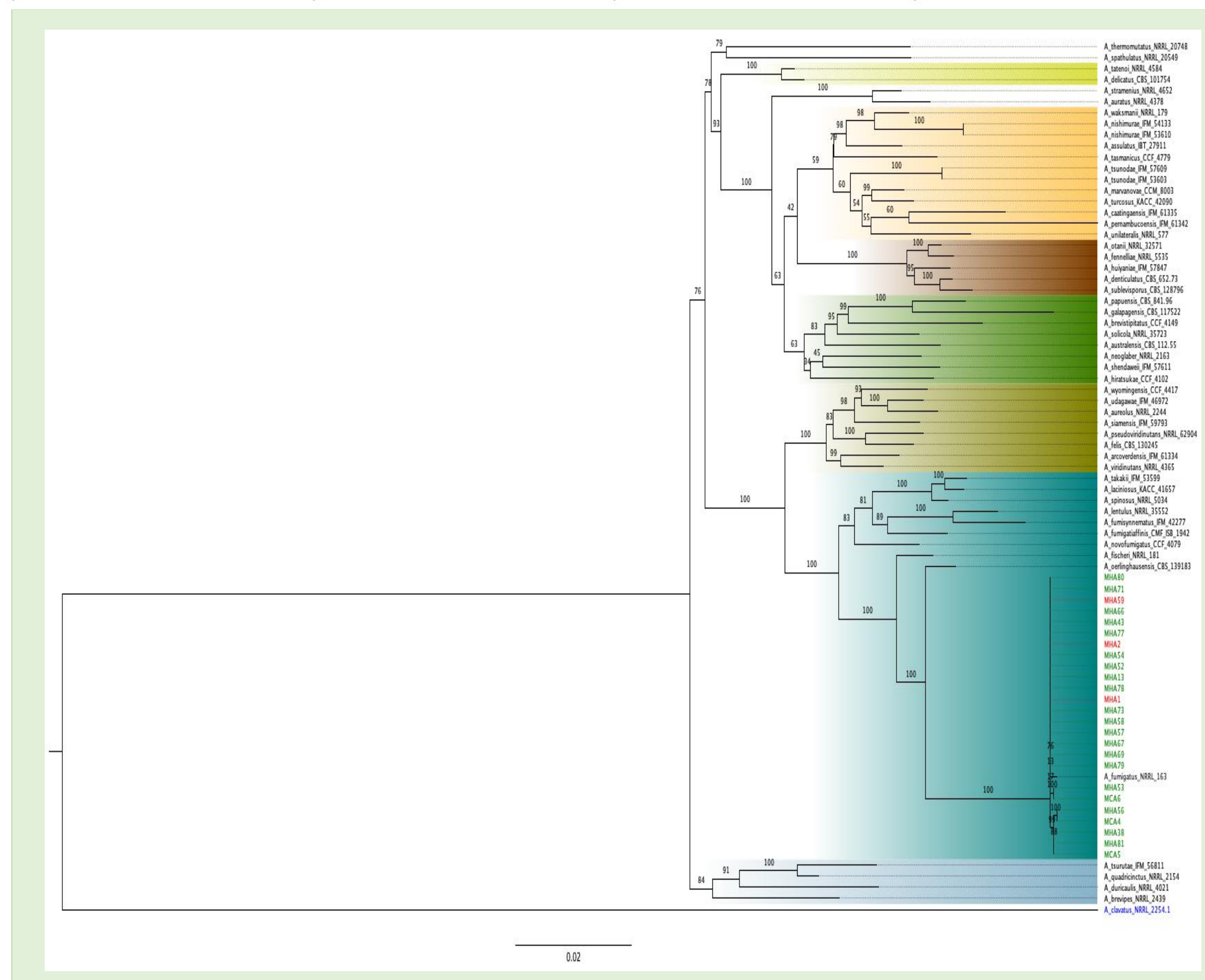


Figure 2. Phylogenetic tree based on combined data set of ITS, BenA, CaM and RPB2 sequences showing the relationship of *Aspergillus* section *Fumigati*. The probability values and bootstrap percentages of the maximum likelihood analysis are represented at the branches. *A. clavati* was used as outgroup. Isolates from this study are colored in green (susceptible) and red (resistance).

A. fumigatus Isolate code	Gene		Susceptibility profile			
	Δnucleotide/ aminoacid cyp51_A	cyp51_B	VCZ	ITZ	PCZ	AmB
MHA1	A1147G N248K	NA	S	S	S	R
MHA43	A1147G N248K	NA	S	S	S	S
MHA59	NA	NA	S	S	S	R
MHA71	A1147G N248K	NA	S	S	S	S
MHA73	A1147G N248K	NA	S	S	S	S
MHA77	A1147G N248K	NA	S	S	S	S
MHA78	T1167A I242V	NA	S	S	S	S
MHA79	T1167A I242V	NA	S	S	S	S
MHA80	A1147G N248K	NA	S	S	S	S
MHA81	T1167A I242V	NA	S	S	S	S
MHA13	A1147G N248K	NA	S	S	S	S
MHA2	NA	NA	S	S	S	R

Figure 3. Antifungal susceptibility profile of cyp51A mutant isolates.

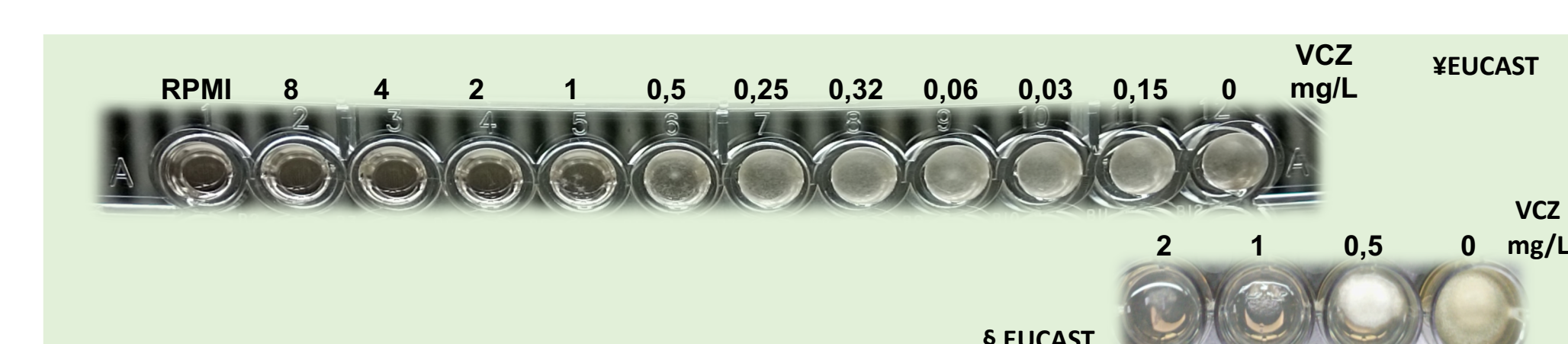


Figure 4. CMA14 clinical isolate, antifungal susceptibility profile showed resistance to VCZ.

Described mutations had been related with resistance to voriconazole, itraconazole and had not been tested with posaconazole. In this work, Isolates presenting non-synonymous mutations were susceptible to all tested azoles with breakpoints >1 mg/L.

Mutation N248K³ was previously described only in isolates from clinical samples. **Mutation I242V⁴** was found in clinical and environmental samples from agricultural lands. Here we described these SNPs in isolates from intrahospital environments.

Amphotericin B resistance was observed in 4 isolates from intrahospital environments.

This work is the first one describing mutations and elucidating its role in the drug-resistance of airborne *Aspergillus fumigatus* in Medellín, Colombia.

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