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ePoster Viewing
Antifungal drug susceptibility and resistance

Impact of the exposure of clinically relevant yeasts to agricultural azoles in terms of antifungal resistance

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Objectives: Clinically relevant fungal infections became progressively more prevalent during the two last decades and resistance to antifungals became a serious clinical problem. Antifungals similar to those used in human therapy are widely used in agriculture and resistance to such antifungals is also increasing. Among antifungal agents used for crop protection, azoles (e.g. propiconazole, prochloraz, imazalil) are being increasingly used in the European Union. Azoles also represent first line options for human antifungal therapy. The acquisition of azole resistance in nature may thus result in a significant, yet undetermined, impact regarding human health. The main goal was to assess the development of cross-resistance between agricultural and clinical azoles by *Candida spp*. and *Cryptococcus neoformans*.

Methods: *Candida* and *Cryptococcus* isolates were exposure to Prochloraz in an *in vitro* induction assay of resistance. Briefly, clinical isolates of *Candida albicans*, *C. parapsilosis*, *C. glabrata*, *Cryptococcus neoformans w*ith low minimal inhibitory concentrations (MIC) values to both agricultural and clinical azoles were daily incubated in fresh liquid medium supplemented with Prochloraz (PCZ) for a period of 180 days. Susceptibility to PCZ and clinical azoles (Fluconazole, Voriconazole and Posaconazole) were evaluated, according to the Clinical Laboratory Standards Institute (CLSI) M27-A3 protocol, every 5 days. In order to assess the stability of the developed MIC, the induced strains were afterwards sub-cultured for 180 days in the absence of the inducer antifungal.

Results: The MIC of PCZ increased over 32 times for *Candida spp*. and over 500 times to *Cryptococcus neoformans* and for all the tested isolates the new MIC value was stable without the selective pressure either for the agricultural azole, also whenever cross-resistance to clinical azoles was developed. *C. albicans* and *C. parapsilosis* did not exhibit cross-resistance to clinical azoles. *C. glabrata* developed cross-resistance to Fluconazole and Posaconazole but not to Voriconazole. *Cryptococcus neoformans* isolates only displayed cross-resistance to fluconazole.

Conclusion: Our *in vitro* assays suggests that the exposure of clinical relevant fungi to agricultural azole antifungals may be associated to the emergence of cross-resistance to clinical azoles, which may results in serious impact in human health.