TITLE: EFFECT OF PHENOTYPIC SWITCHING ON OSMOTIC STRESS RESPONSE IN *Candida tropicalis*

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ABSTRACT:

In fungi, phenotypic switching drives variable changes, leading to the emergence of colonies with altered morphologies. This epigenetic event has been suggested to contribute to *Candida* pathogenesis by providing variability within colonizing populations that allows for the organism to adapt to different challenging environments. The aim of the present study was to evaluate the effect of phenotypic switching regarding adaptative response to osmotic stress in *C. tropicalis*. For this, we employed strains of the system 49.07 that consist of five morphotypes (parental, crepe variant, rough variant, crepe revertant and rough revertant). Unlike the parental phenotype that exhibit smooth dome colony both switched variant strains exhibit structured colonies morphologies characterized by the presence of high percentage of filamentous forms. Morphotypes were grew in YPD medium supplemented with 1M NaCl following analysis of viability, colony morphology and filamenting ability among cells of the colonies. Switched morphotypes exhibited distint responses to hyperosmotic stress. Colony-forming units (CFUs) were measured relative to growth on standard YPD medium. The crepe variant was the most resistant strain to osmotic stress. For this strain, the number of CFUs reduced about 25.4% compared to that observed in the absence of osmotic stress, while for the parental strain the reduction of CFUs reached 93.4% in the presence of 1M. The revertant of crepe also exhibited low reduction of CFUs (25.6%) despite its smooth morphology. On the other hand, the rough variant and its revertant strain exhibited reduction of viability at same extent that observed for the parental strain. Both variants (crepe and rough) exhibited smooth colonies with loss of structured morphologies after growth in the presence of high concentrations of salt; besides, they showed reduced percentage of filamenting cells compared to that observed on YPD medium. However, the structured morphologies of variants were restored when cells were re-cultivated in standard YPD medium as well as their filamenting abilities. In contrast, for morphotypes with smooth dome surface (parental and revertants strains) the osmotic stress did not affect either colonies morphologies or morphogenesis. In conclusion, switching can raise strains with high osmotic stress resistance. Colonies morphologies and morphogenesis are affected by osmotic stress in a switched-strain dependent manner.

Keywords: *Candida tropicalis*, phenotypic switching, osmotic stress, colony morphology, filamentation

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