

**Title** Antiaflatoxigenic property of food grade antioxidants under different conditions of water activity in peanut grains

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### Abstract

Analytical grade (AG) and industrial grade (IG) of three-food grade antioxidants butylated hydroxyanisole (BHA), butylated hydroxytoluene (BHT) and propyl paraben (PP) were analyzed to prove their fungitoxic effect on *Aspergillus* section *Flavi* strains. The effect of interactions among 10 antioxidant treatments at water activity levels (0.982, 0.955, 0.937  $a_w$ ) for 11 and 35 days of incubation and at 25 °C in peanut grains on mycelial growth (CFU g<sup>-1</sup>) and aflatoxin B<sub>1</sub> (AFB<sub>1</sub>) accumulation were evaluated. Both antioxidant grade treatments had a significant effect ( $P < 0.001$ ) on fungal count. All antioxidant treatments showed the highest effectiveness on control of growth of peanut aflatoxigenic strains at 0.937  $a_w$  and at 11 days of incubation. Overall, AG and IG binary mixtures M3 (20 + 10 mM), M4 (20 + 20 mM) and ternary mixtures M5 (10 + 10 + 10 mM), M6 (10 + 20 + 10 mM), M7 (20 + 10 + 10 mM) and M8 (20 + 20 + 10 mM) were the treatments most effective at inhibiting growth of *Aspergillus* section *Flavi* strains. Industrial grade BHA 10 and 20 mM, binary mixtures M1 (10 + 10 mM), M2 (10 + 20 mM), M3 (20 + 10 mM), M4 (20 + 20 mM) and ternary mixtures M5 (10 + 10 + 10 mM), M6 (10 + 20 + 10 mM), M7 (20 + 10 + 10 mM) and M8 (20 + 20 + 10 mM) completely inhibited AFB<sub>1</sub> production. The studied results suggest that IG antioxidant mixtures have potential for controlling growth of these mycotoxigenic species and prevent aflatoxin accumulation at the peanut storage system.