

# Excess Boron Reduces Polyphenol Oxidase Activities in Embryo and Endosperm of Maize Seed during Germination

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The effects of increasing concentrations of boron (0, 0.1, 1, 10 and 20 mM) as boric acid on the rate of germination and polyphenol oxidase activities in embryo and endosperm tissues of maize seeds (*Zea mays* L. cv. Arifiye) were studied. The germination percentage of maize seeds was not affected by boron concentrations up to 10 mM, and decreased by 20 mM. Distilled water and lower boron concentrations (0.1 and 1 mM) increased polyphenol oxidase activities at the beginning of germination up to 12 h whereas its excess levels (10 and 20 mM) decreased polyphenol oxidase activities in embryos and endosperm during germination. Polyphenol oxidase activities with *o*-diphenolic substrates (caffeic acid, catechol and dopa) were found to be higher than with a monophenolic substrate (tyrosine) in both embryos and endosperms. Further, caffeic acid oxidizing polyphenol oxidase was found to show more activity in embryos of the seeds germinating in distilled water when compared to other substrates.

*Key words:* Boron, Maize Seed Germination, Polyphenol Oxidase Activities