

PLANT STRESS PROTEINS - DEVELOPMENT OF NATURAL BIOPESTICIDES

Graeme Bradley and Melissa Botha

Plant Stress Response and Signalling Mechanisms Research Group, Department of Biochemistry, Microbiology and Biotechnology, Rhodes University, Grahamstown, South Africa.

Pests inflict damage on stored grains and cereal products, resulting in significant economic losses to farmers, producers and consumers. Traditional chemical control methods are being eliminated because of regulatory policies to environmental hazards, as well as the development of resistance by pests to control products. Therefore, new pesticides are urgently needed.

This project seeks to identify plant stress proteins that may be used as biopesticides for the control of pests of stored grains. These novel biopesticides will minimize the impact on human health and the environment by reducing the amount of sprayed insecticides and fumigants. We report on the functional characterisation of two plant stress proteins, wheat α -amylase/trypsin inhibitor and *Arabidopsis thaliana* plant natriuretic peptide B (AtPNP-B). The cDNA coding for each protein was generated using RT-PCR and the amplified products cloned into an expressing vector, pGEX6P1. The recombinant proteins were over-expressed under the control of IPTG and assessed for *in vitro* inhibitory activity against trypsin (wheat α -amylase/trypsin inhibitor) and for a regulatory role in plant homeostasis (AtPNP-B).

Future work will entail *in vivo* inhibitory activity of the wheat α -amylase/trypsin inhibitor using a bioassay for *Lepidopteran* and *Coleopteran* insects and the role of AtPNP-B in signal transduction mechanisms in plant abiotic and biotic stress responses

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