

NATURAL BIOINSECTICIDE PEPTIDE

Billions of dollars are annually engaged in crop losses due to pests. Crop and stored food protection are therefore major issues in agriculture. Chemical pesticides in general and insecticides in particular, are increasingly used around the world, but also increasingly stigmatized because of their persistence and their toxicity to non-target organisms (impact on amphibians, aquatic wildlife, beneficial insects such as bee or ladybird or even death for farmers, especially in the South). Nevertheless crop protections rely almost exclusively on chemical treatments.

In this context, in relation with French and European policies, research is performed at UMR Functional Biology, Insects and Interactions (BF2I). It aims to develop efficient insecticide molecule from natural supply, non-toxic to humans and more environmentally friendly. In this perspective, UMR BF2I has uncovered a natural peptide as an alternative to conventional chemical pesticides.

DESCRIPTION

This natural peptide derived from 10 years of research in the BF2I lab and is a natural plant entomotoxin from alfalfa (*Medicago truncatula*). These kind of peptides are legume toxic molecules, protecting them against most insect pests. They could be called venoms plants due to their mode of action. The study of the genome of the model legume, *Medicago truncatula* alfalfa resulted in the discovery of a very effective insecticidal toxin.

STAGE OF DEVELOPMENT

To date, the peptide insecticidal activity was determined using in vitro bioassays (binding tests on cereal weevil membranes and toxicity on insect cell cultures). These experiments revealed a very high toxicity of the natural peptide, ten times more effective than its parent present in pea seeds.

It is now necessary to test entomotoxic peptide on insect pests (weevil, termite, grape worm, codling moth) and vector pests (mosquito and tiger mosquito).

RESEARCH TEAM

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ADVANTAGES / NOVELTY

- This peptide is a natural molecule with low toxicity. Indeed it is present in a plant (alfalfa) regularly consumed by humans and mammals with no known demonstration of toxicity or allergenicity. Its mode of action is unique, active per os. It could also be used in organic farming.

APPLICATIONS

- Farm market and bioinsecticides : foodstuff protection (cereal flour and cereal seeds) with the natural peptide introduction
- Market of biological biocides: protection against mosquito disease vectors, such as the tiger mosquito.

INDUSTRIAL PROPERTY

Patent pending in PCT

Priority date : October 10th 2013 (FR 13 6236)

TYPE DE COLLABORATION

PULSALYS is looking for industrial partners interested in getting a license of this patent to develop a bioinsecticide targeting pests in crops or disease vectors.

