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Protein Quality Improved Waxy Maize Varieties for South East Asia

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Abstract

Waxy maize (*Zea mays*) is an important food source among ethnic minorities in South-East Asia. The soft grains are very popular for preparing traditional dishes such as porridge or for the direct consumption of the ears as a vegetable. The cultivation of waxy maize takes place mainly in marginal regions in a micro-scattered way. In waxy maize, starch basically consists 100 % of branched high-molecular amylopectin; this trait is controlled by the recessive allele of the waxy gene (wx, located on chromosome 9).

Waxy maize contains reduced amounts of essential amino acids such as lysine, tryptophan and threonine. This represents a major problem in regions where animal protein is scarce and expensive and maize represents a major food source, often leading to infant malnutrition.

QPM (quality protein maize) arose from a mutation controlled by the recessive opaque–2 gene, which leads to a reduction in the synthesis of the highly indigestible storage protein zein and in an increase in the levels of lysine and tryptophan.

The main goal of our project is the development of protein quality improved waxy maize of acceptable agronomic and organoleptic properties, and well adapted to marginal regions of South-East Asia.

The way to achieve this goal will consist of the introgression of pre-selected QPM material into pre-selected waxy maize material, which was collected from several ethnic minority groups in Viet Nam, Thailand and China. The introgression of QPM into waxy maize will rapidly be achieved by the *in vivo* gynogenesis technique, a method which allows the rapid gain of double-haploid, and therefore, homozygous lines. For this step, the in vivo gynogenesis inducer lines RWS and RWK76 from University of Hohenheim will be used. Double recessive (wx and opaque–2), double haploid lines will be selected according to their agronomic and organoleptic characteristics, and will serve as core material for the production of experimental varieties

Keywords: Inducer lines, *in vivo* gynogenesis, opaque2, waxy

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