Peptides from Amaranth controlled the NF-κB pathway activation on epithelial cells and suppressed intestinal inflammation

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Introduction & Aim

Biological, nutritional and health benefits of amaranth have been highlighted in the last years. Proteins from amaranth exert anti-inflammatory, anti-oedematous, anti-thrombotic and anti-proliferative effects. The aim of this study was to analyze the anti-inflammatory effect of peptides from amaranth on NF-κB intracellular pathway activation in intestinal epithelial cells, and in experimental intestinal inflammation, such as colitis and food allergy. Previously, we characterized peptides with anti-inflammatory properties in vitro.

Results

In vitro assays: Immunomodulation of Caco-2/Harasser cell line

Mouse model: a choicy-fed-driven Th2 specific immune response was promoted in Balb/c mice by gavage, and hypersensitivity reactions were evidenced immediately after the oral challenge with CMP. A colitis mouse model, Balb/c were intracutaneously administered with TNBS or ethanol (EOH) at day 2, mice were sacrificed at day 7

Materials & Methods

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In vivo parameters: clinical score, skin test were analyzed, weight

In vitro parameters: serum specific IgE, cytokines, mucosal Th2 and cytokines, were assessed.

Therapeutic strategies: synthetic peptides of amaranth were orally administered.

Conclusions

- The peptide P2 from Amaranth controlled the Th2-mediated allergic response, decreasing clinical score and cutaneous test in vivo, serum IgE levels and Th2 profile cytokines in vitro.
- The peptide P2 from Amaranth ameliorates weight loss, clinical score and mucosal inflammation in a TNBS-induced mouse colitis model.

These findings led us to propose that this peptide might be included in the composition of a functional food.