RESUMO TOXILATIN 2025 - PAOLA

**Title**: THERAPEUTIC POTENTIAL OF RED QUINOA HYDROLYSATE ON HYPERTENSION AND VASCULAR DYSFUNCTION IN RATS EXPOSED TO CADMIUM

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**INTRODUCTION:** Red quinoa hydrolysate (RQH), a plant-based functional food with antioxidant and antihypertensive properties, shows promise in counteracting cadmium-induced cardiovascular damage highlighting the need for natural therapies in cardiovascular toxicology. **OBJECTIVE:** Investigated the effects of supplementation with novel RQH on cardiovascular damage induced by cadmium chloride ($CdCl_2$) exposure in rats. **METHOD:** Three-month-old male *Wistar* rats were divided and treated for 14 days (N=10 each): Control (Ct): intraperitoneal (i.p.) injections of distilled water and tap water by gavage; Cadmium (Cd): 1mg/kg/day i.p and tap water by gavage; RQH - 1g/kg/day by gavage and distilled water i.p; CdRQH - Hydrolysate plus cadmium. Systolic blood pressure was measured weekly by noninvasive tail plethysmography. At the end of treatment, rats were euthanized, and the aorta and mesenteric resistance artery reactivity was performed in an isolated organ bath and concentration-response curves to acetylcholine (ACh), sodium nitroprusside (SNP) and phenylephrine (Phe) or norepinephrine (NE) were conducted in the presence and absence of endothelium, nitric oxide synthase inhibitor, selective COX-2 inhibitor, scavenger of superoxide anion and superoxide dismutase were analyzed. Also, biochemical parameters of vascular reactive oxygen species and antioxidant capacity were measured in MRA and aorta immunofluorescence was analyzed for NOX-1 and COX-2. Results were expressed as mean ± SEM, compared by two-way ANOVA followed by Bonferroni test ($P<0.05$). Ethics Approval 010/2023 - Unipampa. **RESULTS**: RQH prevented: a) the increased SBP after Cd exposure; b) the increased vasoconstrictor response to Phe or NE; c) restored the endothelium vasoconstrictor modulation and nitric oxide bioavailability; d) prevented the contractile prostanoids from COX-2; e) inhibited the increased vasells ROS production as well as the imbalance in antioxidant capacity after Cd exposure; f) corroborating the functional data, it reduces the fluorescence intensity of NOX-1 and COX-2 in the aorta, increased by exposure to Cd, demonstrating antioxidant and anti-inflammatory action. **CONCLUSIONS**: RQH counteracts the vascular toxic effects after Cd exposure, highlighting a novel therapeutic agent based on functional vegetable food against environmental contaminants.

**Keywords:** Cadmium; Red Quinoa; Hydrolysis; Antioxidant; Anti-inflammatory; Cardiovascular

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