NEUROBIOLOGY OF RHINELLA ICTERICA TOAD VENOM IN MICE AND CHICKENS

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Toads are venomous animals with biotechnological interest. The aim of this work was to study the Rhinella ictérica venom (RIV) activity at mice and chickens nerve preparations. Adult Swiss mice (25 - 30 g) and Hyline chicks (1 - 10 days) use and care were approved by the local Animal Care Committee. Venom collection was made by milking toads obtained at Derrubadas region, Rio Grande do Sul northwest state. RIV was previously treated by methanol extraction followed by lyophilization, before the biological assays. The MTT colorimetric assay was performed as described by Dal Belo, (2013). The in vitro biventer cervicis muscle preparation was mounted as described by Ginsborg and Warriner (1960). Incubation of RIV (5, 10, 20, 40 µg/mL) at mice hippocampal brain slices, induced a dose-dependent effect on cell viability. Thus, only the concentration of RIV 5 µg/mL induced a corresponding increase in cell viability (36 ± 10%), when compared to the control HEPES (n=6, p<0.05). At chiken nerve muscle preparations RIV (5, 10, 20 µg/mL) produced a facilitatory effect prior to a neuromuscular blockade in 120min recordings. At 5 µg/mL RIV induced a maximum increase in the twitch tension (58 ± 12%, p<0.05) and the maximum blockage was obtained with 10µg/ml (80 ± 7%, p<0.05, n=8). At this set of experiments, the incubation of the muscles with digoxin (0,5 nM) or ouabain (0,7 nM) mimicked the venom activity by increasing the amplitude of the twitches by 19 ± 3% and 30 ± 2% and caused a depression of the muscle contraction of 86 ± 2% and 91 ± 5%, respectively (p<0.05, n=5). The venom of Rhinela ictérica induced central and peripheral neurotoxicity in vertebrates. The similarities between the biological activity of R. ictérica and ouabain or digoxin in nerve-muscle preparations, suggests cardiotonic-like activity.

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