

Optimization and preliminary characterization of venom isolated from 3 medically important jellyfish: the box (Chironex fleckeri), Irukandji (Carukia barnesi), and blubber (Catostylus mosaicus) jellyfish.

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OBJECTIVE:

To optimize venom extraction and to undertake preliminary biochemical studies of venom from the box jellyfish (*Chironex fleckeri*), the Irukandji jellyfish (*Carukia barnesi*), and the blubber jellyfish (*Catostylus mosaicus*).

METHODS:

Lyophilized crude venoms from box jellyfish tentacles and whole Irukandji jellyfish were prepared in water by homogenization, sonication, and rapid freeze thawing. A second technique, consisting of grinding samples with a glass mortar and pestle and using phosphate-buffered saline, was used to prepare crude venom from isolated nematocysts of the box jellyfish, the bells of Irukandji jellyfish, and the oral lobes of blubber jellyfish. Venoms were compared by use of sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE) and Western blot test. Toxicity of some venoms was determined by intravenous median lethal dose assay in mice.

RESULTS:

Different venom extraction techniques produced significantly different crude venoms for both box and Irukandji jellyfish. Irukandji and blubber venom SDS-PAGE protein profiles were established for the first time. Analysis of Western blot tests revealed that box jellyfish antivenin reacted specifically with the venom of each jellyfish. Toxicity was found in Irukandji jellyfish venom derived by use of the mortar-and-pestle method, but not in the lyophilized venom.

CONCLUSIONS:

Glass mortar-and-pestle grinding and use of an appropriate buffer was found to be a simple and suitable method for the preparation of venom from each jellyfish species studied. This study contributes to biochemical investigations of jellyfish venoms, particularly the venom of the Irukandji jellyfish, for which there are, to our knowledge, no published studies. It also highlights the importance of optimizing venom extraction as the first step toward understanding the complex biological effects of jellyfish venoms.

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