

Nematocysts of the Cubozoa

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Abstract

Nematocysts (stinging organelles) are an important part of cnidarian identification, but the cnidomes of many species remain poorly known because of identification difficulties and confusing nomenclature. Currently, the cnidomes of 20 cubozoan species are documented in whole or in part (including four undescribed species and five newly described species); 18 of these are re-examined in detail, and the cnidomes of 13 species are newly presented. Type material was used for these studies where possible. A new category of nematocyst is designated, namely ‘*p*-rhopaloid’, characterized by having a v-shaped notch in the undischarged shaft, as in *p*-mastigophores, but having a lobed discharged shaft, as in rhopaloids; this type of nematocyst is found in both the Carybdeida and Chirodropida. Measurements, shape descriptions, and photographs are presented for all cnidomes studied. Also presented are a glossary to nematocyst terminology, descriptive sections on nematocyst nomenclature and preparation, and a key to the nematocysts of the

Cubozoa. Special remarks sections for taxonomists and forensic specialists are given, along with a summary of phylogenetic patterns. This catalogue will be useful to taxonomists, envenomation physicians, and toxinologists, as well as anyone wishing to identify cubozoan specimens or stings.

Key words: Box jellyfish, Irukandji, sea wasps, cnidomes, cnidae, stinging organelles, stinging cells, Cnidaria, Cubomedusae, Carybdeida, Chirodropida, morphology, taxonomy, forensics

Ode to the nematocyst

*Wondrous little organelle of death;
O to know your mysteries.
A coiled harpoon of lightning speed,
Revealing species' histories.*

*Banana-shaped or ovoid,
Large or small, or spheres.
Measured in tens of microns,
Powerful microns of fear.*

*Forty thousand G's of force,
Drilling into flesh;
Bathed in a golden toxin,
Spiny hypodermic of death.*

*Designed to conquer prey or foe,
But if you longer linger,
Fascinating capsules of beauty,
These treasures of St. Inger.*

.....St. Inger, the Patron Saint of Marine Envenomation

Introduction

Cnidomes have been used as diagnostic taxonomic tools for many years in the Anthozoa and Hydrozoa (Östman, 1983; Gravier-Bonnet, 1987; Östman et al. 1987; Zamponi & Genzano, 1990; Hidaka, 1992; Acuna & Zamponi, 1997; Bouillon & Boero, 2000), but comprehensive data are lacking for the Cubozoa. To date, the cnidomes of only a few species are documented (Berger 1900; Cleland and Southcott 1965; Calder and Peters 1975; Rifkin and Endean 1983; Kinsey 1986; Moore 1988; Avian et al. 1997; Marques et al. 1997; O'Reilly et al. 2001; Carrette et al. 2002; Currie et al. 2002; Yanagihara et al. 2002; Oba et al. 2004). Several attempts at linking fatalities to species via nematocysts recovered from victims have been of limited utility due to lack of comparative knowledge