THE SCIENCE WORLD
A Monthly e Magazine
ISSN:2583-2212
Popular Article
December, 2025 Vol.5(12), 11335-11337

# Genetically Evolved Kuruma Shrimps

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DOI:10.5281/ScienceWorld.18182765

***Abstract***

The Kuruma shrimp (*Penaeus japonicus*) is a highly valued commodity in the worldwide aquaculture sector. It is native to the Indian and western Pacific Ocean. Recent genetic research has shed new light on the classification of this species. Specifically, a study by Vinay et al. (2019) used mitochondrial DNA analysis to identify cryptic species of *Penaeus japonicus* inhabiting Indian waters.

**Keywords:** Kuruma shrimp, cryptic species, mitochondrial DNA analysis

**Introduction:**

The Kuruma shrimp (*Penaeus japonicus*) is a prized asset in the global aquaculture industry, driven by its high market value in Japan, where prices can reach US$200 per kilogram. However, traditional farming of this species faces several hurdles: disease outbreaks, slow growth, and high production costs. These challenges have pushed researchers to look deeper into shrimp genetics to find a sustainable solution (Shrimp News International).

**Distribution:**

It is native to the **Indian and western Pacific Ocean:** Japan in the north to Australia in the south through South-East Asia, and extending to east Africa and Red Sea. In India, it is distributed in both **East (Bay of Bengal) and West (Arabian Sea) coasts, including the Andaman Sea** (Chanda, 2018).

**Identification of Cryptic Species:**

Genetic research has provided new insights into the species' classification. Specifically, a study by Vinay et al. (2019) used mitochondrial DNA analysis to identify cryptic species of *Penaeus japonicus* inhabiting Indian waters.

**What are cryptic species?**

**Cryptic species** are distinct biological groups that possess such strong morphological similarities that they appear visually identical. Due to these physical resemblances, these separate species are often difficult to distinguish and have historically been or continue to be classified as a single species (Bickford et al., 2007).

**Materials and methods:**

**70 wild specimens** were collected from **Mumbai and Chennai,** with pleopod fragments preserved for DNA analysis and morphology studied. DNA extraction, PCR amplification, and sequencing were performed using universal primers for **COI & 16S rRNA genes.** Phylogenetic analysis was conducted using **Maximum Likelihood (ML)** and **Bayesian methods,** comparing Indian specimens with *P. japonicus* form-I and form-II sequences from GenBank (Vinay et al., 2019).

**Two types of kuruma shrimps:**

**Morphological Description of the Indian Species:**

| ***Penaeus japonicus* form-1** | ***Penaeus japonicus* form-II** |
|---|---|
|  |  |

**Coloration and Pattern:** The specimens typically display a cream or yellowish base color. They are distinguished by angled stripes ranging from dark brown to maroon, which create a "wheel-like" banding pattern. Notably, these bands do not extend to the lower portion of the carapace in Indian Species (Vinay et al., 2019).

**Taxonomic Consistency:** Beyond these color variations, all other physical characteristics align perfectly with the established taxonomic descriptions for *P. Japonicus* (Vinay et al., 2019).



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Published 28/12/2025

**Conclusion:**

**Misidentification of species** has many negative implications, and accurate identification is the basic corner stone of biology. Kuruma shrimp aquaculture failures have been reported several times and were attributed to acclimatization problems. Now it is known that the existence of two cryptic species may be the reason for failure due to unrecognized differences in environmental adaptations in introduced places (Vinay et al., 2019).

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