

## The Irregular Echinoids of Sri Lanka

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### Abstract

Irregular echinoids are formally known as Irregularia, a group including forms such as lamp urchins ("cassiduloids", a non-monophyletic assemblage), sand dollars (Clypeasteroidea) and heart urchins (Spatangoida). The group is mainly infaunal and are important components of marine ecosystems as both adults and larvae. The earliest information on irregular echinoids from Sri Lanka (formerly Ceylon) comes from Agassiz (1872). Clark & Rowe (1971) compiled records of 24 species of irregular sea urchins in the "Ceylon area" (some of these localities now belong to Indian Territory). According to the most recent species list assembled by Arachchige et al (2017), 27 irregular echinoids have been recorded from Sri Lankan waters. However, the current knowledge of diversity and distribution of Sri Lankan species belonging to the Irregularia are poorly known. In addition, there are no recent taxonomic studies or biodiversity surveys for Sri Lankan irregular echinoids, and no illustrations or reference collections are available in Sri Lanka. This study was conducted as an island-wide systematic sampling survey. Over 200 echinoid specimens were collected from 21 localities in Sri Lankan coastal waters by snorkelling, skin and SCUBA diving down to 33 m depth. The collected specimens were identified using existing keys and authenticated with specimens available at the Natural History Museum Vienna, Austria. This study recorded 21 irregular echinoid species belonging to four orders, nine families and 15 genera. Among the identified irregular echinoids, five species were new records from Sri Lankan waters. In addition, three unidentified species belonging to the genera *Fibularia* and *Metalia* were reported and were kept as open nomenclature. Also, 13 previously reported irregular echinoids were rediscovered during this study (Table 1). For convenience of identification of all reported irregular sea urchins in Sri Lanka, a dichotomous key was developed using information updated by the current study and published information in the literature.

Table. 1. Identified sea urchin species, their families and orders (\*New records from current study, \*\*species reported from current study but identified only to genus)

Order	Family	Species
Echinoneoidea	Echinoneidae	<i>Echinoneus cyclostomus</i>
Echinoneoidea	Echinoneidae	<i>Koehleraster abnormalis</i>
Echinolampadoidea	Echinolampadidae	<i>Echinolampas alexandri</i>
Echinolampadoidea	Echinolampadidae	<i>Echinolampas ovata</i>
Clypeasteroidea	Astriclypeidae	<i>Echinodiscus bisperforatus</i>
Clypeasteroidea	Astriclypeidae	<i>Echinodiscus truncatus*</i>
Clypeasteroidea	Astriclypeidae	<i>Sculpsitechinus auritus</i>
Clypeasteroidea	Clypeasteridae	<i>Clypeaster humilis</i>
Clypeasteroidea	Clypeasteridae	<i>Clypeaster reticulatus</i>
Clypeasteroidea	Fibulariidae	<i>Echinocyamus megapetalus*</i>
Clypeasteroidea	Fibulariidae	<i>Fibulariella angulipora*</i>
Clypeasteroidea	Fibulariidae	<i>Fibularia sp1**</i>
Clypeasteroidea	Fibulariidae	<i>Fibularia sp2**</i>
Clypeasteroidea	Laganidae	<i>Jacksonaster depressum</i>
Clypeasteroidea	Laganidae	<i>Peronella lesueurii</i>
Clypeasteroidea	Laganidae	<i>Peronella oblonga*</i>
Spatangoida	Brissidae	<i>Brissus agassizii*</i>
Spatangoida	Brissidae	<i>Metalia sternalis</i>
Spatangoida	Brissidae	<i>Metalia sp**</i>
Spatangoida	Loveniidae	<i>Lovenia elongate</i>
Spatangoida	Maretiidae	<i>Nacospatangus alta</i>

Species distribution maps for recorded species are also being prepared using the updated list. In addition to the survey work, a broader study listing all species of irregular echinoids recorded from both the shallow and deep waters of Sri Lanka has also been performed. Therefore, the diversity of reported irregular sea urchins from Sri Lanka now stands at 35 species representing 11 families in four orders.

**Key words:** Diversity; Irregular echinoids; Sri Lanka