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## A new species of Western Atlantic sea lily in the family Bathycrinidae (Echinodermata: Crinoidea), with a discussion of relationships between crinoids with xenomorphic stalks

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### Abstract

A new species in the family Bathycrinidae is described from abyssal depths from the Bahamas. It is referred to the recently established genus *Discolocrinus*, which formerly comprised a single species *D. thieli* Mironov, 2008 from the Eastern Pacific. *Discolocrinus iselini* n. sp. is characterized by large body size, high tegmen with tube-like upper region, extremely elongated IBr1 and IBr2, large knobby processes on primibrachials, and overgrowth of soft tissue on the pinnules, the tissue containing numerous perforated or imperforate ossicles of varying size and form. Differences between *Discolocrinus* and other bathycrinids may seem to be of taxonomic importance at the family level, but knowledge of the morphology and variability of both species of *Discolocrinus* is incomplete and, until a richer material becomes available, the genus should remain in family Bathycrinidae. Representatives of five families with xenomorphic stalks were examined to characterize the genera on the basis of number or form of knobby processes. These processes occur in two families with differing external morphology: ten-armed Bathycrinidae and five-armed Bourgueticrinidae. They also occur in the comatulid family Atelecrinidae. This similarity might seem to indicate a close relationship between the three families. However, morphological analysis supports the separation of the families Caledonicrinidae and Septocrinidae from Bathycrinidae despite the fact that they share a xenomorphic stalk and IBr2ax. These conclusions are in agreement with results of recent molecular studies.

**Key words:** *Discolocrinus iselini* n. sp., Bahamas, deep-sea, taxonomy, Echinodermata, Crinoidea, Bathycrinidae, knobby processes

### Introduction

The family Bathycrinidae comprises ten-armed stalked crinoids that are widely distributed in the deep sea. Three species in this family have been recorded from the Western Atlantic: *Bathycrinus aldrichianus* Thomson, 1872, *B. australis* A.H. Clark, 1907a and *Monachocrinus caribbeus* (A.H. Clark, 1908) (A.M. Clark, 1977; Gislén, 1938, 1951; Macurda & Meyer, 1976; Meyer *et al.*, 1978; Roux *et al.*, 2002; Eléaume *et al.*, 2012). A new species was collected off the Bahamas at a depth of 4,243–4,558 meters. It is assigned to the recently established genus *Discolocrinus* Mironov, 2008 which formerly comprised a single species *D. thieli* Mironov, 2008 from the deep Eastern Pacific.

*Discolocrinus iselini* n. sp. is characterized by the most well-developed knobby processes on the primibrachials. Presence of knobby processes was reported previously for *Bathycrinus aldrichianus*, *B. complanatus* A.H. Clark, 1907b, *B. mendeleevi* Mironov, 2008 and *Discolocrinus thieli* (Macurda & Meyer 1976, Pl.3.5; Mironov 2008, Fig. 4C). The structures described by Messing (2003, 2013) as “probolus adidas” in unstalked crinoids of the family Atelecrinidae are very similar to the knobby processes observed in bathycrinids.

**Terminology.** Terminology of morphological characters of calyx, arms and stalk, as well as abbreviations, follows that of Roux *et al.* (2002) and Mironov & Pawson (2010). Abbreviation “Br” means a brachial, and “Brs” means several brachials (Mironov, 2000, Mironov & Pawson, 2010).

- slightly elongate (in *Cingocrinus* sp.) columnals in mesistele; maximum ratio height/diameter of columnal < 2.0. Abutting surface of the knobby processes with tiny knobbls . . . . . *Cingocrinus*
- 3b. Articulations between pinnulars beyond the first pair rigid. Elongate columnals in mesistele; maximum ratio height/diameter of columnal > 2.0. Abutting surface of the knobby processes with marked needlelike knobbls . . . . . *Bathycrinus*

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