

Filling a Levantine Gap: First Record of *Dactylonida curvimana* (A. Milne-Edwards & Bouvier, 1894) in Lebanese Waters (Levantine Eastern Mediterranean Sea)

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Abstract

The squat lobster *Dactylonida curvimana* (A. Milne-Edwards & Bouvier, 1894) is a rare and poorly documented species in the Mediterranean Sea, with only sporadic records in the Levantine Basin. The present study reports the first occurrence of this species in Lebanese waters (Levantine Eastern Mediterranean Sea) based on a specimen collected at 70 m depth off Amchit (northern Lebanon) in September 2025. The specimen was identified based on distinctive morphological characters, particularly its extremely elongated chelipeds. This finding extends the known distribution of the species within the Mediterranean, especially in the eastern Levantine region, and highlights the importance of citizen science-based biodiversity monitoring programs in documenting rare deep-water taxa.

Introduction

Dactylonida curvimana (A. Milne-Edwards & Bouvier, 1894) is a rare squat lobster belonging to the genus *Dactylonida* Macpherson & Baba, which currently comprises two accepted species. The genus is placed within the family Munididae Ah Yong, Baba, Macpherson & Poore, 2010, a diverse group that includes 40 accepted genera and more than 536 accepted species [1,2]. The species exhibits an Atlanto-Mediterranean distribution, being primarily recorded in the eastern Atlantic [3,4] including north-west Africa [5,6], as well as throughout the Mediterranean Sea [4,7]. Within the Mediterranean basin, *D. curvimana* has been reported from the western, central, and eastern regions, including the Aegean and Levantine Seas [3,8,9,10]. However, records remain scarce, particularly in the Levantine Basin, where only a few occurrences have been documented from Turkey [9,11], Cyprus [8,12], and the southern Levant [5,13].

In Lebanese waters, members of the family Munididae remain poorly documented. Only *Munida tenuimana* G.O. Sars, 1872 and *Munida rugosa* (Fabricius, 1775) have been mentioned in regional literature, but without confirmed records or detailed descriptions; both are merely illustrated in a single figure in [14, Fig. XIV.23, p. 335] and still require confirmation through photographic or video evidence. In addition, unidentified representatives of the genus *Munida* have been reported as *Munida* sp., reflecting the difficulty of species-level identification within this group [15].

To date, the rare squat lobster *Dactylonida curvimana* (e. *Munida curvimana*) has not been reported from Lebanese waters. The present study aims to document the first record of this rare species from deep Lebanese waters in the eastern Levantine Mediterranean Sea.

Materials and methods

On 16 September 2025, a specimen of *Dactylonida curvimana* was obtained as bycatch by a local fisherman (© Captain Jean Saad), using the jigging fishing method, off Amchit (northern Lebanon). The specimen was retrieved from a submerged boot (locally known as “sobat”) deployed at approximately 70 m depth over a muddy substrate.

During the fishing operation, the submerged boot was recovered,

within which fine sediment had accumulated, forming a microhabitat. The specimen was found inside this structure, suggesting that it had colonized the object after prolonged submersion.

The material was initially examined onboard, and photographic and video documentation were obtained. These were subsequently shared with one of the authors (SF), and identification was confirmed based on diagnostic morphological characteristics.

This record forms part of a national participatory marine biodiversity monitoring framework. In 2022, two Marine Protected Areas (MPAs) in Lebanon—the Tyre Coast Nature Reserve (TCNR) and the Palm Islands Nature Reserve (PINR)—initiated a collaborative monitoring program involving fishers, divers, and other marine stakeholders to document biodiversity, detect non-indigenous species, and record rare taxa [16]. This approach follows standardized steps, including observation, documentation, data collection, and reporting, as illustrated in (Figure 1).

Results

The examined specimen (Figure 2) measured approximately 8 cm in total length and exhibited the typical slender and elongated morphology characteristic of *Dactylonida curvimana*. The specimen is primarily distinguished by its extremely elongated and gracile chelipeds (P1), which clearly exceed the body length and represent the most diagnostic feature of the species [1,3].

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Figure 1: Schema illustrating the citizen-science initiative launched in 2022 by the Marine Protected Areas (MPAs) of Lebanon: Tyre Coast Nature Reserve (TCNR) and Palm Island Nature Reserve (PINR). (C) Ali BADREDDINE.



Figure 2: The caught specimen of *Dactylonida curvimana* in the Lebanese waters. Image extracted from video footage provided by J.Saad.

The chelipeds are narrow, slightly curved, and armed with fine marginal spines, with elongated fingers consistent with previously reported proportions exceeding three times the length of the palm [9]. The carapace is moderately spiny, and the rostrum bears three well-developed anterior spines, accompanied by strong lateral spines and additional dorsal ornamentation, in agreement with Mediterranean descriptions [8,9].

The specimen displays a reddish to pink coloration, along with long antennae and slender walking legs adapted to benthic environments. Overall, the combination of elongated chelipeds, rostral armature, and general body proportions is fully consistent with published descriptions of the species from the Mediterranean basin [8,9,3].

Discussion

The present record represents the first confirmed occurrence of *Dactylonida curvimana* in Lebanese waters, contributing to the known distribution of this rare species in the Mediterranean Sea, particularly within the Levantine Basin, where records remain scarce [9].

The specimen was collected from muddy-sand sediment within an artificial substrate (a discarded boot).at 70 m depth, confirming the species ability to inhabit a range of substrates, including muddy, silty, and rocky bottoms, as previously reported in other Mediterranean countries [9,8,10]. The occurrence within a submerged object suggests opportunistic use of artificial or transient microhabitats.

Previous observations indicate that the species may be encountered in unusual contexts, including within predator stomach contents or associated with fishing gear. For example, a specimen was recovered from the mouthparts of *Octopus vulgaris* in Cyprus [8], and another was reported from the stomach of *Scorpaena scrofa* in Turkish waters [11]. These findings suggest that the species may play a role in benthic food webs while remaining difficult to detect through conventional sampling methods.

The rarity of records likely reflects sampling limitations rather than true absence, particularly in deep benthic habitats of the Levantine Sea.

The present finding highlights the importance of further investigation of the Levantine deep sea, particularly Lebanese deep-sea ecosystems and their associated taxa. Previous deep-sea explorations in Lebanese waters [15] have revealed the presence of vulnerable marine ecosystems, including coralligenous assemblages and submarine canyons, highlighting the high biodiversity of these habitats, with several taxa of particular ecological interest and some newly reported for science. These findings underscore the ecological significance of Lebanese deep-sea environments. In this context, continued marine biodiversity assessment and long-term monitoring in Lebanese waters are essential.

Furthermore, citizen science initiatives constitute effective tools for marine biodiversity monitoring, as demonstrated by programs implemented by TCNR and PINR, and significantly contribute to the detection of rare and unusual species, as well as to the protection and conservation of important habitats and their associated biodiversity. Strengthening such collaborative monitoring efforts, alongside the implementation of existing national marine biodiversity programs [17], is crucial for improving our understanding of marine biodiversity in Lebanon and the wider Levantine Basin, particularly under ongoing environmental and geopolitical pressures.

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