

## SHORT COMMUNICATION

### **First record of the spotted sea hare *Aplysia dactylomela* Rang, 1828 in the south Mediterranean coast (Kuriat Islands, Tunisia)**

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#### **Abstract**

The spotted sea hare *Aplysia dactylomela* Rang 1828 was recorded for the first time in the Mediterranean Sea in 2002. This non-native species then spread rapidly eastwards from the waters surrounding Lampedusa Island to reach the Levantine coast, following the main Mediterranean current movement. Despite the colonization of the eastern Mediterranean basin in numerous localities, no sightings were reported from the western Mediterranean basin. In July 2017, two specimens of this species were sighted about 1 m depth surrounding the future MPA of Kuriat Islands. The observation was made during the implementation of the national Integrated Monitoring and Assessment Programme (IMAP) in Tunisia related to the biodiversity component.

**Keywords:** Spotted sea hare, Kuriat Islands, Tunisia, coastal MPA, IMAP, Ecosystem Approach process

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Based on the Marine Mediterranean Invasive Alien Species database (a.k.a MAMIAS database, <http://mamias.org/>), Mollusca are considered the dominant group in terms of non indigenous species (NIS) richness in the Mediterranean (Zenetos *et al.* 2012). An opisthobranch species, spotted sea hare *Aplysia dactylomela* Rang 1828 (Family: Aplysiidae), is well established in the Mediterranean since 2002 (Trainito 2003; Scuderi and Russo 2005; Çinar *et al.* 2011; Crocetta and Galil 2012; Zenetos *et al.* 2012; Ayas and

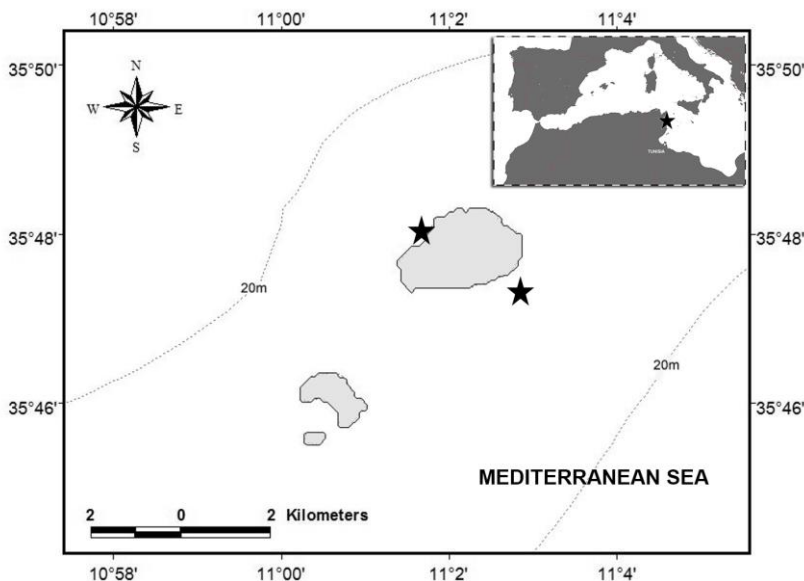
Ağilkaya 2017). The most intriguing aspect of the colonization process by the spotted sea hares in the Mediterranean is the unusual sequence of events. Indeed, records start around the island of Lampedusa in the central Mediterranean, followed by a very rapid dispersal between 2005 and 2008 into the eastern Mediterranean and the Adriatic, and a slower spread in the central basin in 2009-2012 (more details can be found in Valdés *et al.* 2013).

This species of Opisthobranchia, however, was never recorded in the Tunisian waters despite the species long-term colonisation of the basin and the patchy distribution that ranges from Lampedusa Island to the Levantine basin (through the Adriatic Sea). This paper highlights a first record of the spotted sea hare in Tunisia, particularly in the future marine protected area (MPA) of the Kuriat islands.

The Ecosystem Approach lists 11 Ecological Objectives (EO) among them the ecological objective 2 for non-indigenous species (NIS), which specifically expresses the objective: “Non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystems”. Yes indeed, the NIS are considered one of the major threats to global marine ecosystems for impacting their structure and function.

Being aware of these impacts on marine ecosystems, the Mediterranean contracting parties to the Barcelona Convention adopted since 2003 the first UN Environment-MAP-SPA/RAC Action Plan Concerning Species Introductions and Invasive Species in the Mediterranean Sea as an effective way of guiding, coordinating and stepping up the efforts made by the Mediterranean countries to safeguard the region’s natural heritage (UNEP-MAP-RAC/SPA 2005). In 2016, the Contracting Parties adopted the updated Action Plan on Introduction and spread of invasive species. The main objective of the 2016 Action Plan is to promote the development of coordinated efforts and management measures throughout the Mediterranean region in order to prevent as appropriate, minimize and limit, monitor, and control marine biological invasions and their impacts on biodiversity, human health, and ecosystem services taking into account IMAP Ecological Objectives, Operational Objectives, GES and related targets (UNEP-MAP-SPA/RAC 2017).

Within this context, the UN Environment-MAP-SPA/RAC developed training sessions on NIS monitoring techniques, dedicated to the southern Mediterranean countries, among them the training elaborated on July 2017 in the coastal future MPA of the Kuriat islands (south east Tunisia, 35°47'50"N 11°01'23"E).



**Figure 1:** The Kuriat Islands showing the locations where *Aplysia dactylomela* were sighted

The training session of the EcAp, involved rapid assessment techniques to record and identify marine species during a period of SCUBA/snorkelling random transects. Trainees were asked to snorkel/dive following a random transect lines in the shallow waters surrounding the future MPA, while they are accompanied by the trainers. The trainees were equipped with recording pads, underwater guide for species of interest and underwater photography camera. The species was observed during the transect and was photographed for later confirmation with field guides and through consultancy with NIS experts. Nomenclature adopted in this paper follows the World Register of Marine Species (WoRMS <[www.marinespecies.org](http://www.marinespecies.org)>) and contributing databases (AlgaeBase, CLEMAM, FishBase, etc.).

During this training, two specimens of *Aplysia dactylomela* were sighted and photographed in a shallow *Cymodocea nodosa* meadow of about 1 m depth surrounding the future MPA of Kuriat Islands. Two specimens was collected later for confirmation. The first specimen was recorded in the West part of the Big Kuriat Island (35.797865°N, 11.022974°E) in dense *C. nodosa* meadow among photophilic algae (including *Penicillus capitatus*, *Caulerpa prolifera*) and two NIS Algae (*Caulerpa cylindracea* and *Caulerpa taxifolia*). Within these observations, *C. taxifolia* is recorded for the first time in the Kuriat Islands as well.



**Figure 2.** *Aplysia dactylomela* collected in the Kuriat Islands

The second specimen was recorded in the southeastern side of the Big Kuriat Island (35.795116°N, 11.043512°E) in a mixed *C. nodosa* and *Posidonia oceanica* meadow in sandy bottom with some rocks covered by photophilic algae such as *Cystoseira* sp, *Padina pavonica* and *Dasycladus vermicularis*. This second specimen is fixed in 4% formaldehyde and deposited at the Animal Biology and Evolutionary Systematic Unit (Biology Department at the Science Faculty, University of Tunis) for reference.

Despite the close distance from Lampedusa Island and the intensity of surveys focused on non-indigenous species along the Tunisian coasts in the last decade (Antit *et al.* 2011; Ounifi-Ben Amor *et al.* 2016), the spotted sea hare has not been recorded previously. In this observation, only two adult specimens were observed, which implies the recent introduction of this species in Tunisia. The arrival from the European coast of Italy or Malta to Tunisia can best be explained by its own means of dispersal, as such light-bodied nudibranchs cannot only disperse as larvae but also drift as adults.

This might be an indicator for a need to establish continuous and regular monitoring programme for NIS in the MPAs of Tunisia to assess the expansion, new arrival and impact of NIS in these conservation areas. It is also recommended that monitoring should examine nearby hubs where targeted NIS are likely to occur, using rapid assessment methods in order to balance methodological practicality and cost effectiveness.

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