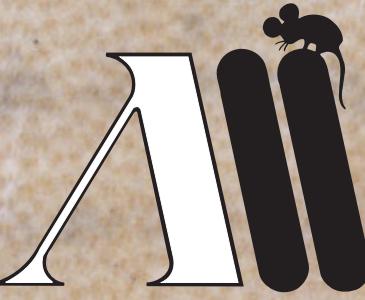


ANNALES



*Analí za istrske in mediteranske študije
Annali di Studi istriani e mediterranei
Annals for Istrian and Mediterranean Studies
Series Historia Naturalis, 30, 2020, 1*



UDK 5

ISSN 1408-533X (Print)
ISSN 2591-1783 (Online)



ANNALES

**Anali za istrske in mediteranske študije
Annali di Studi istriani e mediterranei
Annals for Istrian and Mediterranean Studies**

Series Historia Naturalis, 30, 2020, 1

KOPER 2020

**UREDNIŠKI ODBOR/
COMITATO DI REDAZIONE/
BOARD OF EDITORS:**

Alessandro Acquavita (IT), Nicola Bettoso (IT), Christian Capapé (FR), Darko Darovec, Dušan Devetak, Jakov Dulčić (HR), Serena Fonda Umani (IT), Andrej Gogala, Daniel Golani (IL), Danijel Ivajnšič, Mitja Kaligarič, Marcelo Kovačič (HR), Andrej Kranjc, Lovrenc Lipej, Vesna Mačić (ME), Alenka Malej, Patricija Mozetič, Martina Orlando-Bonaca, Michael Stachowitzsch (AT), Tom Turk, Al Vrezec

**Glavni urednik/Redattore capo/
Editor in chief:**

**Odgovorni urednik naravoslovja/
Redattore responsabile per le scienze
naturali/Natural Science Editor:**

Urednica/Redattrice/Editor:

Lektor/Supervisione/Language editor:

Prevajalci/Traduttori/Translators:

**Oblikovalec/Progetto grafico/
Graphic design:**

Tisk/Stampa/Print:

Izdajatelja/Editori/Published by:

**Sedež uredništva/Sede della redazione/
Address of Editorial Board:**

Darko Darovec

Lovrenc Lipej

Martina Orlando-Bonaca

Polona Šergon (sl.), Petra Berlot Kužner (angl.)

Martina Orlando-Bonaca (sl./it.)

Dušan Podgornik, Lovrenc Lipej

Založništvo PADRE d.o.o.

Zgodovinsko društvo za južno Primorsko - Koper / Società storica del Litorale - Capodistria®

Inštitut IRRIS za raziskave, razvoj in strategije družbe, kulture in okolja / Institute IRRIS for Research, Development and Strategies of Society, Culture and Environment / Istituto IRRIS di ricerca, sviluppo e strategie della società, cultura e ambiente®

Nacionalni inštitut za biologijo, Morska biološka postaja Piran / Istituto nazionale di biologia, Stazione di biologia marina di Pirano / National Institute of Biology, Marine Biology Station Piran SI-6330 Piran / Pirano, Fornače/Fornace 41, tel.: +386 5 671 2900, fax +386 5 671 2901;

e-mail: annales@mbss.org, internet: www.zdj.p.si

Redakcija te številke je bila zaključena 19. 06. 2020.

**Sofinancirajo/Supporto finanziario/
Financially supported by:**

Javna agencija za raziskovalno dejavnost Republike Slovenije (ARRS), Luka Koper in Mestna občina Koper

Annales - Series Historia Naturalis izhaja dvakrat letno.

Naklada/Tiratura/Circulation: 300 izvodov/copie/copies

Revija Annales, Series Historia Naturalis je vključena v naslednje podatkovne baze / La rivista Annales, series Historia Naturalis è inserita nei seguenti data base / Articles appearing in this journal are abstracted and indexed in: BIOSIS-Zoological Record (UK);

Aquatic Sciences and Fisheries Abstracts (ASFA); Elsevier B.V.: SCOPUS (NL); Directory of Open Access Journals (DOAJ).

To delo je objavljeno pod licenco / Quest'opera è distribuita con Licenza / This work is licensed under a Creative Commons BY-NC 4.0.



Navodila avtorjev in vse znanstvene revije in članki so brezplačno dostopni na spletni strani <https://zdp.si/en/p/annalesshn/>
The submission guidelines and all scientific journals and articles are available free of charge on the website <https://zdp.si/en/p/annalesshn/>
Le norme redazionali e tutti le riviste scientifiche e gli articoli sono disponibili gratuitamente sul sito <https://zdp.si/en/p/annalesshn/>



VSEBINA / INDICE GENERALE / CONTENTS 2020(1)

SREDOZEMSKI MORSKI PSI
SQUALI MEDITERRANEI
MEDITERRANEAN SHARKS**Deniz ERGÜDEN, Deniz AYAS &
Hakan KABASAKAL**

Provoked Non-Fatal Attacks to Divers by Sandbar Shark, *Carcharhinus plumbeus* (Carcharhiniformes: Carcharhinidae), Off Taşucu Coast (NE Mediterranean Sea, Turkey)
Izzvani napadi sivega morskega psa, Carcharhinus plumbeus (Carcharhiniformes: Carcharhinidae), ob obali Taşucu (SV Sredozemsko morje, Turčija)

1

**Jeanne ZAOUALI, Sihem RAFRAFI-NOUIRA,
Khadija OUNIFI-BEN AMOR, Mohamed
MOURAD BEN AMOR & Christian CAPAPÉ**
 Capture of a Large Great White Shark, *Carcharodon carcharias* (Lamnidae) from the Tunisian Coast (Central Mediterranean Sea): a Historical and Ichthyological Event
Ulov velikega primerka belega morskega volka, Carcharodon carcharias (Lamnidae) ob tunizijski obali (osrednje Sredozemsko morje): zgodovinski in ihtiološki dogodek

9

**Mohamed Mourad BEN AMOR, Marouène
BDIOUI, Khadija OUNIFI-BEN AMOR &
Christian CAPAPÉ**
 Captures of Large Shark Species from the Northeastern Tunisian Coast (Central Mediterranean Sea)
Ulovi velikih morskih psov ob severovzhodni tunizijski obali (osrednje Sredozemsko morje)

15

**Fernando LOPEZ-MIRONES, Alessandro
DE MADDALENA & Ricardo
SAGARMINAGA VAN BUITEN**
 On a Huge Shortfin Mako Shark *Isurus oxyrinchus* Rafinesque, 1810 (Chondrichthyes: Lamnidae) Observed at Cabrera Grande, Balearic Islands, Spain
O opazovanju velikega primerka atlantskega maka Isurus oxyrinchus Rafinesque, 1810 (Chondrichthyes: Lamnidae) v bližini otoka Cabrera Grande, Balearsko otočje, Španija

25

**Okan AKYOL, Tevfik CEYHAN &
Christian CAPAPÉ**

Capture of a Bigeye Thresher Shark *Alopias superciliosus* (Alopiidae) in Turkish Waters (Eastern Mediterranean Sea)
Ulov velikooke morske lisice Alopias superciliosus (Alopiidae) v turških vodah (vzhodno Sredozemsko morje)

31

**IHTIOLOGIJA
ITTOLOGIA
ICHTHYOLOGY****Saul CIRIACO, Marco SEGARICH,
Carlo FRANZOSINI & Spiros KONSTAS**

A Record of Rare Spiny Butterfly Ray, *Gymnura altavela* (Linnaeus, 1758), in the Amvrakikos Gulf (Greece)
Zapis o pojavljanju redkega skata vrste Gymnura altavela (Linnaeus, 1758), v zalivu Amvrakikos (Grčija)

39

**Khaled RAHMANI, Fatiha KOUDACHE,
Nasr Eddine Riad MOUEDDEN, Lotfi
BENSAHLA TALET & Roger FLOWER**
 Spawning Period, Size at First Sexual Maturity and Sex Ratio of the Atlantic Horse Mackerel *Trachurus trachurus* from Béni-Saf Bay (Western Coast of Algeria, Southwestern Mediterranean Sea)
Obdobje drstenja, spolna zrelost in spolni delež šnjurov Trachurus trachurus iz zaliva Béni-Saf bay (zahodna obala Alžirije, jugozahodno Sredozemsko morje)

43

**İnci TÜNEY-KIZILKAYA, Okan AKYOL &
Aytaç ÖZGÜL**

On the Occurrence of *Pseudocaranx dentex* (Carangidae) in the Turkish Aegean Sea (Eastern Mediterranean Sea)
O pojavljanju trnoboka Pseudocaranx dentex (Carangidae) v turškem Egejskem morju (vzhodno Sredozemsko morje)

53

JADRANSKA MORSKA FLORA
 FLORA MARINA ADRIATICA
 ADRIATIC MARINE FLORA

Claudio BATELLI & Neža GREGORIČ

- First Report of an Aegagropilous Form of
Rytiphlaea tinctoria from the Lagoon of
 Strunjan (Gulf of Trieste, Northern Adriatic) 61
*Prvi zapis o pojavljanju vrste Rytiphlaea
 tinctoria v kroglični obliki v Strunjanski
 laguni (Tržaški zaliv, severni Jadran)*

**Sandra BRAČUN, Maximilian WAGNER,
 Kristina M. SEFC & Stephan KOBLMÜLLER**

- Seasonal Growth Patterns of
Cymodocea nodosa and
 Diversity of its Epibionta in the
 Northern Adriatic Sea) 69
*Sezonska rast kolenčaste cimodoceje
 (Cymodocea nodosa) in pestrost njenih
 epibiontov v severnem Jadranu*

BIOINVAZIJA

BIOINVASIONE

BIOINVASION

Ahmet ÖKTENER & Sezginer TUNCER

- Occurrence of *Gnathia* Larvae (Crustacea,
 Isopoda, Gnathiidae) in Three Lessepsian
 Fish Species in the Southern
 Turkish Coast of the Aegean Sea 87
*Pojavljanje ličink vrste iz rodu Gnathia
 (Crustacea, Isopoda, Gnathiidae)
 pri treh lesepskih selivkah v južnih
 turških vodah Egejskega morja*

Raouia GHANEM & Jamila BEN SOUSSI

- Additional Record of the Alien Crab *Actaeodes
 tomentosus* (Brachyura: Xanthidae: Actaeinae)
 from Tunisian Marine Waters 99
*Novi zapis o pojavljanju tujerodne
 rakovice Actaeodes tomentosus
 (Brachyura: Xanthidae: Actaeinae)
 iz tunizijskih morskih vod*

**Sami MILI, Rym ENNOURI, Sihem
 RAFRAFI-NOUIRA & Christian CAPAPÉ**

- Additional Record of Golani Round
 Herring, *Etrumeus golani* (Osteichthyes:
 Dussumieriidae) from Tunisian Waters with
 Comments on its Distribution
 in the Mediterranean Sea 105
*Nov zapis o pojavljanju vrste Etrumeus
 golani (Osteichthyes: Dussumieriidae) iz
 tunizijskih voda s komentarji o njeni
 razširjenosti v Sredozemskem morju*

ONESNAŽEVANJE OKOLJA
 INQUINAMENTO DELL'AMBIENTE
 ENVIRONMENTAL POLLUTION

**Ouassima RIFFI, Jamila FLIOU, Ali AMECHROUQ,
 Mohammed ELHOURRI, Mostafa EL IDRISI,
 Fatimazahra BENADDI & Said CHAKIR**

- Research and Characterization of Determinants
 Controlling the Accumulation of Certain Metals
 in the Leaves of *Dysphania ambrosioides* 113
*Raziskava o dejavnikih, ki vplivajo na
 kopiranje nekaterih kovin v listih
 vrste Dysphania ambrosioides*

DELO NAŠIH ZAVODOV IN DRUŠTEV
 ATTIVITÀ DEI NOSTRI ISTITUTI E SOCIETÀ
 ACTIVITIES BY OUR INSTITUTIONS AND
 ASSOCIATIONS

Valentina TURK

- Srečanje Znanosti o oceanih (Ocean Science
 Meeting - OSM) 123

OCENE IN POREČILA
 RECENSIONI E RELAZIONI
 REVIEWS AND REPORTS

Milena MIČIĆ

- Book review: A Miniature Ocean 129
*Kazalo k slikam na ovitku 130
 Index to images on the cover 130*

received: 2020-06-02

DOI 10.19233/ASHN.2020.12

ADDITIONAL RECORD OF THE ALIEN CRAB *ACTAEODES TOMENTOSUS* (BRACHYURA: XANTHIDAE: ACTAEINAE) FROM TUNISIAN MARINE WATERS

Raouia GHANEM

Laboratoire de Biodiversité, Biotechnologies et Changements climatiques (LR11ES09), Université Tunis El Manar, Tunisia
e-mail: raouia-ghanem@hotmail.fr

Jamila BEN SOUSSI

Laboratoire de Biodiversité, Biotechnologies et Changements climatiques (LR11ES09), Université Tunis El Manar, Tunisia and Institut National Agronomique de Tunisie, Université de Carthage, Tunisia

ABSTRACT

*The occurrence of the Xanthid crab *Actaeodes tomentosus*, an Erythrean species, is recorded for the second time from the Tunisian marine waters. A single female was captured by hand on October 2016 during scuba diving survey carried out in the Marine Protected Area of Zembra. The specimen was caught at 1 m depth anchored to a rock. The carapace length and width were respectively 9.1 mm and 14.3 mm. This record constitutes the northernmost extension range of the species not only in Tunisia but also at a Mediterranean scale. *A. tomentosus* is neurotoxic containing the "Tetrodotoxin", which is widespread in the Indo-Pacific region and considered among the most common intertidal coral reefs species.*

Key words: Marine Protected Area, bioinvasion, decapods, diving survey, extension range, Tunisia

NUOVA SEGNALAZIONE DEL GRANCHIO ALIENO *ACTAEODES TOMENTOSUS* (BRACHYURA: XANTHIDAE: ACTAEINAE) IN ACQUE MARINE DELLA TUNISIA

SINTESI

*La presenza di una specie eritrea di granchi della famiglia Xanthidae, *Actaeodes tomentosus*, è stata registrata per la seconda volta nel mare della Tunisia. Una singola femmina è stata catturata con le mani nell'ottobre del 2016, durante un'indagine subacquea condotta nell'area marina protetta di Zembra. Il granchio è stato catturato a 1 m di profondità, mentre si trovava saldamente aggrappato ad una roccia. La lunghezza e la larghezza del carapace erano rispettivamente di 9,1 mm e 14,3 mm. Questo ritrovamento costituisce la segnalazione più settentrionale delle specie, non solo in Tunisia, ma anche su scala mediterranea. *A. tomentosus* è una specie neurotossica, contenente la tetrodotossina. È diffusa nella regione indo-pacifica ed è considerata tra le più comuni specie di barriere coralline intertidali.*

Parole chiave: area marina protetta, bioinvasione, decapodi, indagine subacquea, estensione, Tunisia

INTRODUCTION

Invasive species are considered as a major threat (Azzurro *et al.*, 2019) and the second most common cause of species extinction after habitat destruction (Bellard *et al.*, 2016). The Mediterranean is the most invaded Sea in the world (Galil *et al.*, 2014), and of the 821 Non-Indigenous Species (NIS) recorded up to date, more than a half are established (Zenetas *et al.*, 2017). This region is known to support several crab invasions (Swart *et al.*, 2018). Over 39 alien Brachyura species of Red Sea/Indo-Pacific origin have been well documented in the Mediterranean Sea, mainly in the eastern Basin (Klaoudatos & Kapiris, 2014). Decapods are the best known marine invasive crustaceans due

to their easy larvae dispersal (Landeira *et al.*, 2019), their high reproductive rate and wide environmental tolerance allowing an important establishment success (Gothland *et al.*, 2014) and particularly the adverse environmental and socio-economic impacts that can inflict such species. Indeed, some crabs from Portunidae (*Portunus segnis* (Forskål, 1775), *Callinectes sapidus* Rathbun, 1896) or Epialtidae (*Libinia dubia* H. Milne Edwards, 1834) families have strongly affected human health, ecosystems and fishery activities in Tunisian waters (Khamassi *et al.*, 2019; Rjiba *et al.*, 2019; Chaffai *et al.*, 2020).

According to Corsini-Foka & Kondylatos (2015), four alien xanthid crabs occur in the Mediterranean Sea; *Atergatis roseus* (Rüppell, 1830), *Actaea savignii*

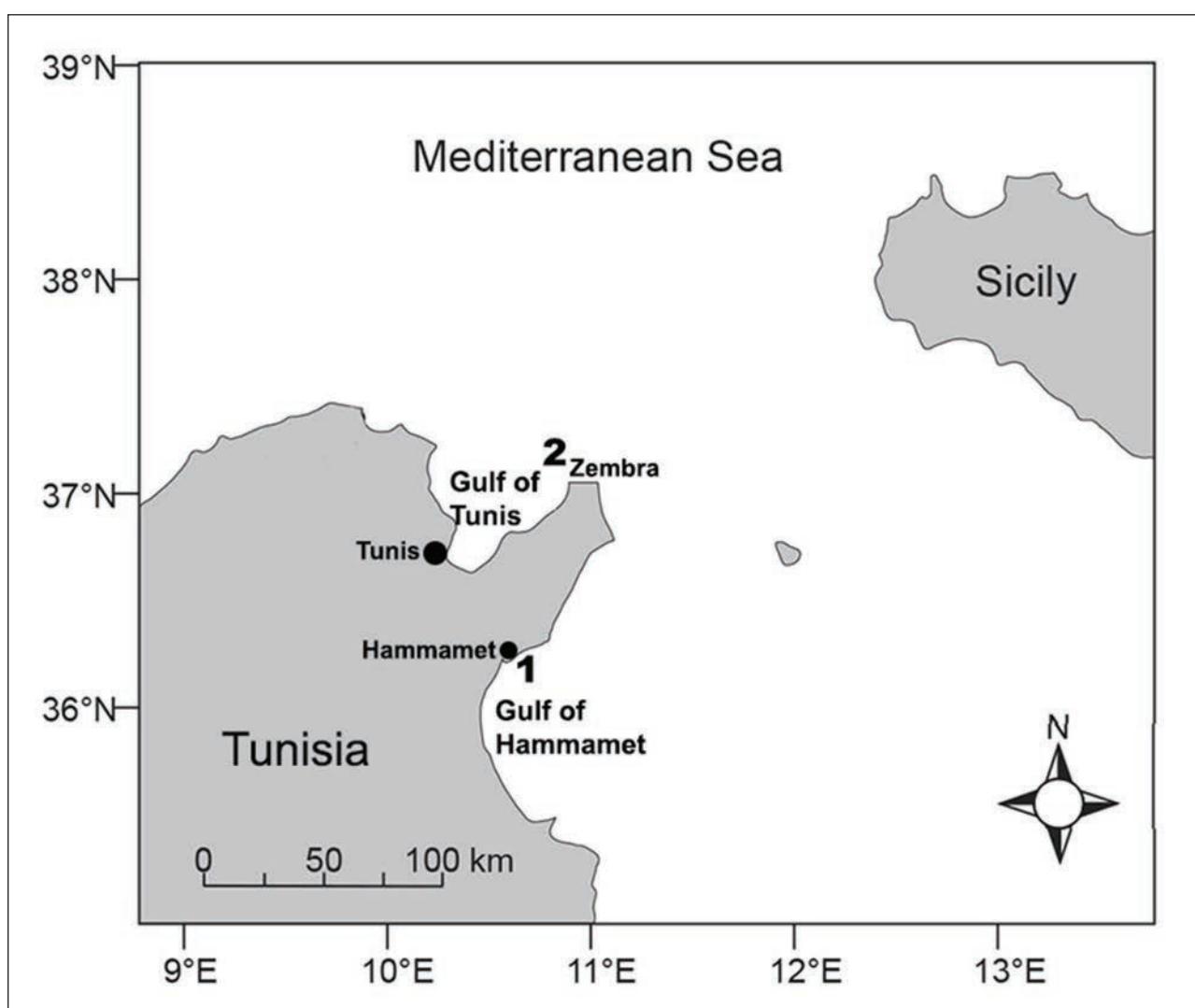


Fig. 1: Map of northern Tunisia (redrawn from Capapé *et al.*, 2020) indicating the capture sites of *Actaeodes tomentosus* (ref. INAT-IXAN-Ac-tom0) from the Tunisian waters. 1. Marina of Hammamet. 2. Zembra Island.
Sl. 1: Zemljevid severne Tunizije (prerisan iz Capapé in sod., 2020) z lokaliteto, kjer je bila najdena rakovica vrste *Actaeodes tomentosus* (ref. INAT-IXAN-Ac-tom0) v tunizijskih vodah. 1. Marina v Hammametu. 2. Otok Zembra.

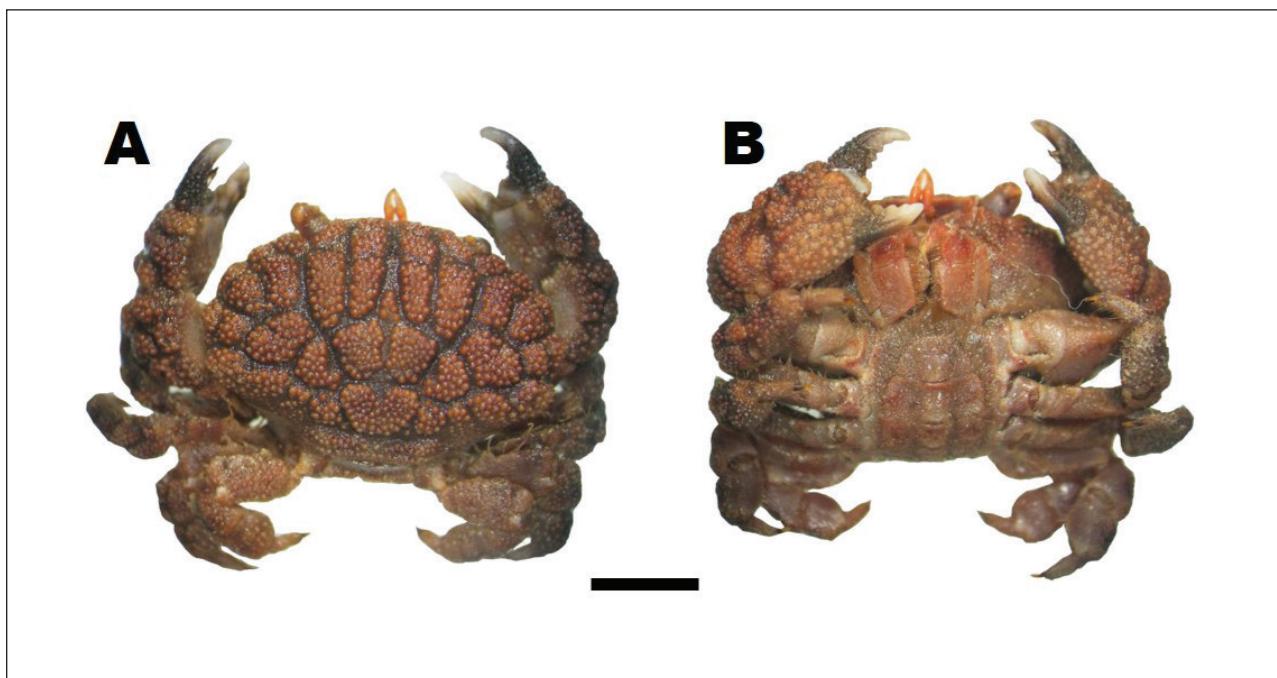


Fig. 2: *Actaeodes tomentosus* (ref. INAT-XAN-Ac-tom01). A. Dorsal view. B. Ventral view. Scale bar = 5 mm.
Sl. 2: *Actaeodes tomentosus* (ref. INAT-XAN-Ac-tom01). A. Hrbtna stran. B. Trebušna stran. Merilo = 5 mm.

(H. Milne Edwards, 1834), *Xanthias lamarckii* (H. Milne Edwards, 1834) and *Actaeodes tomentosus* (H. Milne Edwards, 1834), this latter is the most frequent species, worldwide distributed particularly in the Indo-Pacific region, from the Red Sea, Aden, Somalia, Kenya, Tanzania, Mozambique and S. Africa to the Western Indian Ocean islands up to Australia, Japan and Hawaii Islands (Serène 1984).

A. tomentosus was recorded for the first time in the Mediterranean Sea in the shallow coastal waters of Rhodes Island (Corsini-Foka & Kondylatos, 2015). In January 2015, three specimens, two non-ovigerous females and one male, were collected from the marina of Hammamet, located in eastern Tunisia among biofouling (Ounifi Ben Amor et al., 2016).

A larger trend in recorded alien species in the last decades have been locally reported as a main consequence of a heavy biological invasion of mixed origins. More than 150 NIS fauna have been recorded at present. Among them crustacean decapods constitute the main group of alien fauna, more than 50% according to Ounifi-Ben Amor et al. (2016) and Ben Souissi et al. (2019).

In order to implement effective management plans for marine ecosystems, an accurate and updated spatio-temporal data on species biogeography is required (Katsanevakis et al., 2020). Records of “New-Comers” should not be limited to their first observation. In fact, species distribution knowledge constitute a prerequisite to assess their invasion potential and its progress and

therefore the establishment of the best conservation measures.

MATERIAL AND METHODS

During a periodic assessment of climate change impacts on marine biodiversity carried out mainly in Tunisian Marine Protected Areas (MPA's), a single female of *Actaeodes tomentosus* specimen was collected by hand at 1 m depth anchored to a rock during scuba diving survey on 15 October 2016 performed in Zembra MPA ($37^{\circ}04'645''N$ and $11^{\circ}02'960''E$) (Fig. 1). The crab was identified as *A. tomentosus* following Serène (1984) and was subsequently preserved in 95% alcohol, and deposited in the Collection of crustacean species at the Institut National Agronomique de Tunisie under the catalogue number: INAT-XAN-Ac-tom01.

RESULTS AND DISCUSSION

The collected specimen was a female exhibiting the typical morphological characters of *A. tomentosus* following Serène (1984). The crab was easily identified by numerous dark granules throughout the carapace and appendages, especially on the outer face of both movable and fixed dactyls. (Fig. 2). The carapace length (CL) and width (CW) were respectively 9.1 mm and 14.3 mm. The ratio CW/CL= 1.58 is near the value (1.55) reported for the species by Serène (1984).

A. tomentosus has been reported in the marina of Hammamet on 2015 (Ounifi-Ben Amor *et al.*, 2016), suggesting that the possible pathway of introduction was maritime traffic. Since this species has now been found in two localities from eastern (Central Mediterranean) and northeastern Tunisia (Western Mediterranean) for a short time, this record constitutes the northernmost extension range of the species not only in the area but also in the wide Mediterranean Sea. Such patterns suggest that viable populations are progressively establishing although it is small and cryptic, and probably escaped to notice.

The arrival of poisoning species is increasingly noted in Tunisian waters (Yahia *et al.*, 2013; Ben Souissi *et al.*, 2014; Ounifi-Ben Amor & Ghanem In Dailianis *et al.* (2016). Indeed, cases of intoxication by Tetradotoxin (TTX), present in Tetraodontiformes fish (pufferfish) were observed in western Tunisia during year 2013 (Ben Souissi *et al.*, 2014) and also identified in some *A. tomentosus* from Taiwan (Ho *et al.*, 2006), and Saxitoxin and related compounds (STXs) were found in specimens from Japan (Deeds *et al.*, 2008). Several scientific studies confirm the increasing spread and abundance of invasive marine species of human health concern, however, information on their impacts remains unequally and poorly known (Galil, 2018).

Regular monitoring programs in and around MPAs enhance NIS detection to an early invasion stage probably allow their eradication (Otero *et al.*, 2013). However, the risks that NIS can have in these particular habitats are very significant and even harmful (Galil, 2019). Several Non-Indigenous species have been reported the waters surrounding Zembra Island MPA, and such habitat constitute a kind of refuge, where NIS do not face to fishing pressure occurring in these unprotected sites (Giakoumi *et al.*, 2019). In fact, and according to Ounifi-Ben Amor *et al.* (2016) and Ounifi-Ben Amor & Ghanem In Dailianis *et al.* (2016), of the 137 non-indigenous faunal species recorded in Tunisia, 25 species were listed around Zembra MPA and six species have been observed in its surrounding waters. Therefore, in total agreement with Galil (2019), it appears that MPAs with an abundance of Non-Indigenous populations could be considered as seed banks leading to a spill-over effect to neighboring areas.

ACKNOWLEDGEMENTS

The authors would like to warmly thank anonymous Referees for their valuable comments and their suggestions for improving the manuscript. This work was partially funded by the French Research program BIODIVMEX/MISTRALS.

NOVI ZAPIS O POJAVLJANJU TUJERODNE RAKOVICE ACTAEODES TOMENTOSUS (BRACHYURA: XANTHIDAE: ACTAEINAE) IZ TUNIZIJSKIH MORSKIH VOD

Raouia GHANEM

Laboratoire de Biodiversité, Biotechnologies et Changements climatiques (LR11ES09), Université Tunis El Manar, Tunisia
e-mail: raouia-ghanem@hotmail.fr

Jamila BEN SOUSSI

Laboratoire de Biodiversité, Biotechnologies et Changements climatiques (LR11ES09), Université Tunis El Manar, Tunisia and Institut National Agronomique de Tunisie, Université de Carthage, Tunisia

POVZETEK

Avtorji poročajo o drugem zapisu o pojavljanju rakovice *Actaeodes tomentosus*, eritrejske vrste, v tunizijskih morskih vodah. Samica te vrste je bila ujeta z roko oktobra 2016 med potapljanjem z avtonomno potapljaško opremo v morskem zavarovanem območju Zembra. Primerek je bil ujet na 1 m globine, tesno pritrjen na skalo. Dolžina oklepa je bila 9,1 mm, njegova širina pa 14,3 mm. Ta zapis predstavlja najsevernejši primer pojavljanja vrste v Tuniziji in tudi v Sredozemskem morju. A. tomentosus je nevrotoksična vrsta, ki vsebujestrup tetrodotoxin. Je široko razširjena vrsta v Indo-Pacifiku in pogosta vrsta v bibavičnem pasu na koralnih grebenih.

Ključne besede: morsko zavarovano območje, bioinvazija, raki deseteronožci, potapljaški pregled, širjenje areala, Tunizija

REFERENCES

- Azzurro, E., V. Sbragaglia, J. Cerri, M. Bariche, L. Bolognini, J. Ben Soussi, G. Busoni, S. Coco, A. Chrysanthi, E. Fanelli, R. Ghanem, J. Garrabou, F. Gianni, F. Grati, J. Kolitari, G. Letterio, L. Lipej, C. Mazzoldi, N. Milone, F. Pannacciulli, A. Pešić, Y. Samuel-Rhoads, L. Saponari, J. Tomanić, N.E. Topçu, G. Vargiu & P. Moschella (2019):** Climate change, biological invasions, and the shifting distribution of Mediterranean fishes: A large-scale survey based on local ecological knowledge. Global Change Biol., 25, 2779-2792.
- Bellard, C., P. Cassey & T.M. Blackburn (2016):** Alien species as a driver of recent extinctions. Biol. Lett., 12, 1-4.
- Ben Souissi, J., R. Ghanem, K. Ounifi-Ben Amor, E. Soufi-Kechaou, J. Ferrario, A. Occhipinti-Ambrogi & J. Zaouali (2019):** Alien invasive fauna spreading via biofouling on marinas in Tunisian waters. XVIIIèmes Journées Tunisiennes des Sciences de la Mer. Kelibia, 26-28 octobre, p. 35.
- Ben Souissi, J., M. Rifi, R. Ghanem, L. Ghozzi, W. Boughedir & E. Azzurro (2014):** *Lagocephalus sceleratus* (Gmelin, 1789) expands through the African coasts towards the Western Mediterranean Sea: a call for awareness. Manag. Biol. Invasions., 5(4), 357-362.
- Capapé, C., S. Rafrafi-Nouira, Y. Diatta & C. Reynaud (2020):** First record of *Physiculus dalwigki* (Actinopterygii: Gadiformes: Moridae) from the Tunisian coast (central Mediterranean Sea). Acta Ichthyol. Piscat., 50(2), 223-226.
- Chaffai, A., W. Rjiba-Bahri, A. Abidi, F. Denis & J. Ben Souissi (2020):** Trophic habits of the invasive crab *Libinia dubia* H. Milne Edwards, 1834 from the Gulf of Gabès (Tunisia). Medit. Mar. Sci., 0. doi:<https://doi.org/10.12681/mms.22001>.
- Deeds, J.R., J.H. Landsberg, S.M. Etheridge, G.C. Pitcher & S.W. Longan (2008):** Non-traditional vectors for paralytic shellfish poisoning. Mar. Drugs., 6, 308-348.
- Galil, B. (2018):** Poisonous and venomous: marine alien species in the Mediterranean Sea and human health. Invasive species and human health, pp. 1-15.
- Galil, B. (2019):** No MPA is an island-conservation in the world's most invaded sea. p 51. In: Proceedings of the 1st Mediterranean Symposium on the Non-Indigenous Species, 15-16 January, 2019. Antalya, Turkey.
- Galil, B.S., A. Marchini, A. Occhipinti-Ambrogi, D. Minchin, A. Narščius, H. Ojaveer & S. Olenin (2014):** International arrivals: widespread bioinvasions in European Seas. Ethol. Ecol. Evol., 26(2-3), 152-171.

Giakoumi, S., A. Pey, A. Di Franco, P. Francour, Z. Kizilkaya, Y. Arda, V. Raybaud & P. Guidetti (2019): Exploring the relationships between marine protected areas and invasive fish in the world's most invaded sea. *Ecol Appl.*, 29(1), e01809.

Gothland, M., J.C. Dauvin, L. Denis, F. Dufossé, S. Jobert, J. Ovaert, J.P. Pezy, A. Tous Rius & N. Spilmont (2014): Biological traits explain the distribution and colonisation ability of the invasive shore crab *Hemigrapsus takanoi*. *Estuar. Coast. Shelf Sci.*, 142, 41–49.

Ho, P.H., Y.H. Tsai, C.C. Hwang, P.A. Hwang, J.H. Hwang & D.F. Hwang (2006): Paralytic toxins in four species of coral reef crabs from Kenting National Park in southern Taiwan. *Food Control.*, 17(6), 439–445.

Katsanevakis, S., D. Poursanidis, R. Hoffman, J. Rizgalla, SB-S. Rothman et al. (2020): Unpublished Mediterranean records of marine alien and cryptogenic species. *BiolInvasions Records*, 9(2), 165–182.

Khamassi, F., R. Ghanem, S. Khamassi, F. Dhifallah & J. Ben Souissi (2019): Socio-economic impacts of the alien invasive Crab *Portunus Segnis* (Forskål, 1775) in the Gulf of Gabès, Tunisia. *Rapp. Comm. Inter. Mer Médit.*, 42, 253.

Klaoudatos, D. & K. Kapiris (2014): Alien crabs in the Mediterranean Sea: current status and perspectives. Crabs: Global Diversity, Behavior and environmental threats, 101–159.

Landeira, J.M., J.A. Cueta & Y. Tanaka (2019): Larval development of the brush-clawed shore crab *Hemigrapsus takanoi* Asakura & Watanabe, 2005 (Decapoda, Brachyura, Varunidae). *J. Mar. Biol. Assoc. U.K.*, 99, 1153–1164.

Otero, M., E. Cebrian, P. Francour, B. Galil & D. Savini (2013): Monitoring marine invasive species in Mediterranean Marine Protected Areas (MPAs): A strategy and practical guide for managers. IUCN Edit., Malaga, 136 pp.

Ounifi-Ben Amor, K. & R. Ghanem (2016): New record of the lionfish *Pterois miles* in Tunisian waters. In: Dailianis, T., O. Akyol, N. Babali, M. Bariche, F. Crocetta, V. Gerovasileiou & Julian, D. et al. *New Mediterranean Biodiversity Records* (July 2016). *Medit. Mar. Sci.*, 7(2), 608–626.

Ounifi-Ben Amor, K., M. Rifi, R. Ghanem, I. Draeif, J. Zaouali & J. Ben Souissi (2016): Update of alien fauna and new records from Tunisian marine waters. *Medit. Mar. Sci.*, 17(1), 124–143.

Rjiba Bahri, W., F. Khamassi, E. Soufi Kechaou, A. Chaffai & J. Ben Souissi (2019): Morphological and Biological Traits, Exoskeleton Biochemistry and Socio-Economic Impacts of the Alien Invasive Crab *Libinia dubia* H. Milne Edwards, 1834 from the Tunisian Coast (Central Mediterranean). *Thalassas.*, 1–11.

Serène, R. (1984): Crustaces Decapodes Bra- chyures de l'Océan Indien Occidental et de la Mer Rouge, Xanthoidea: Xanthidae et Trapeziidae. Avec un addendum par Crosnier A.: Carpiliidae et Menippidae. *Faune tropicale*, 24, 1–243.

Swart, C., V. Visser & T.B. Robinson (2018): Patterns and traits associated with invasions by predatory marine crabs. *NeoBiota*, 39, 79.

Yahia, M.N.D., O.K.D. Yahia, S.K.M. Gueroun, M. Aissi, A. Deidun, V. Fuentes & S. Piraino (2013): The invasive tropical scyphozoan *Rhopilema nomadica* Galil, 1990 reaches the Tunisian coast of the Mediterranean Sea. *BiolInvasions Rec.*, 2(4), 319–323.

Zenetas, A., M. Çinar, F. Crocetta, D. Golani, A. Rosso, G. Servello, N. Shenkar, X. Turon & M. Verlaque (2017): Uncertainties and validation of alien species catalogues: The Mediterranean as an example. *Estuar. Coast. Shelf Sci.*, 191, 171–187.

Zenetas, A., M.E. Çinar, M.A. Pancucci-Papadopoulou, J.G. Harmelin, G. Furnari, F. Andaloro, N. Bellou, N. Streftaris & H. Zibrowius (2005): Annotated list of marine alien species in the Mediterranean with records of the worst invasive species. *Medit. Mar. Sci.*, 6(2), 63–118.