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First record of Bugula neritina (Bryozoa: Bugulidae), in the mediolittoral zone of Ibn Hani Lattakia, eastern Mediterranean sea (Syria)

iD Izzat W. Arabia[*1] , iD Izdihar A. Ammar[1] and Abdel-latif Sh. Ali[2]

1- Department of Marine Biology, High Institute of Marine Researches (HIMR), Tishreen University, Latakia, Syria
2- General Commission for Fisheries Resource and Aquatic Organisms, Ministry of Agriculture & Agrarian Reform, Syria
[*]Corresponding Author: e-mail: azezchill@gmail.com

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Abstract - The species *Bugula neritina* (Linnaeus, 1758) of the Bugulidae family was observed on the artificial reefs at a depth of 15 meters, (from February to May 2021) in the mediolittoral waters of Ibn Hani site (north Lattakia City, Syria). The morphological and characteristics have been used to confirm the new Bryozoa. It is the first record of this species in the Syrian marine waters. *B. neritina* colonies abundance are 3 colonies in 1200cm^2, and they were found with coralligenous macroalgae, *Codium sp* (green algae), *Polysiphonia* sp. (red algae), Balanus and Tunicates, attached to hard substrate (artificial reefs), in salinity 39%.

التسجيل الأول للنوع *Bugula neritina* (Bryozoa: Bugulidae) ، في المنطقة الشاطئية الوسطى لشاطئ ابن هاني اللاذقية ، شرق البحر الأبيض المتوسط (سورية)

عزت وحيد عربية[1] ، ازدهار علي عمار[1] ، عبد اللطيف شعبان علي[2]
1- قسم البيولوجيا البحرية ، المعهد العالي للبحوث البحرية، جامعة تشرين ، سوريا
2- الهيئة العامة للثروة السمكية. وزارة الزراعة والإصلاح الزراعي. سورية

المستخلص: تمت ملاحظة النوع *Bugula neritina* التابع لعائلة Bugulidae على الشعاب المرجانية الاصطناعية عند عمق 15 مترًا ، خلال الفترة من شهر شباط حتى شهر أيار 2021 في المياه الساحلية في موقع ابن هاني (شمال مدينة اللاذقية، سوريا). تم استخدام الخصائص المورفولوجية لتشخيص النوع المسجل لأول مرة في المياه البحرية السورية. كانت غزارة مستعمرات *Bugula neritina* هي 3 مستعمرات ضمن مساحة 1200 سم٢ ، وقد تم العثور عليها مع الطحالب الكبيرة المرجانية *Codium sp.* العائدة لمجموعة الطحالب الخضراء وكذلك النوع *Polysiphonia* sp. العائد لمجموعة الطحالب الحمراء بالإضافة إلى Balanus و Tunicates، المرتبطة بالركيزة الصلبة للشعاب المرجانية الاصطناعية ، في مستوى ملوحة بلغت 39 psu.

الكلمات المفتاحية: النوع *Bugula neritina* ، شعبة Bryozoa, Bugulidae، شرق المتوسط ، الأحياد الاصطناعية.

Introduction

Bryozoa are the marine ecosystem engineers that constitute the basic and main base for the formation of benthic communities in the littoral zone (Cocito, 2004), for their role in increasing the diversity of habitats and species for both invertebrates and fish. *B. neritina* larvae are eaten by fish, and some nudibranchs feed on adult colonies. (Cocito, 2004). They act as 'bafflers' reducing current velocity on the framework surface, enhancing sediment deposition and cavity filling within the framework(Cocito, 2004),. In the Mediterranean, bryozoans make up about 9.6 % of the world's biodiversity of bryozoans (Rosso and Di Martino, 2016). Researches on Bryozoa were few, but in recent years there has been an increase in research that added important information about the biodiversity of bryozoans (Koçak and Aydın Önen, 2014; Harmelin *et al.*, 2016; Bailly *et al.*, 2016; Gerovasileiou and Rosso, 2016). Bryozoans. *B. neritina* was first described from the Mediterranean Sea (Linnaeus, 1758). Since then, it has been identified as a species of tropical-warm-temperate origin. This species was found in Lebanon coast by (Harmelin *et al*., (2016) throughout 1999- 2003.

Because of the climatic changes a lot of species can introduce new habitats and success in breeding and making changes in the native bio diversity (Ammar and Arabia, 2018; Zarghami et al., 2019)

B. neritina was first reported on the Pacific Coast ranging from southern California to Monterey Bay in 1905 (Robertson, 1905) and it was a known immigrant to southern Britain and northern France (Brest and St-Malo) in the mid-20th century (Ryland 1960; Prenant and Bobin 1966). Then it has been reported as an invasive species in the world (Ryland et al., 2011).

There are eight species of Bryozoa belonging to six families recorded on the Syrian coast *Carbasea papyrea, Cryptosula pallasiana, Hincksinoflustra octodon, Margaretta cereoides, Retepora jermanensis, Idmonea serpens, Hippodiplosia foiacea, Hornera frondiculata, Tubulipora flabellaris* (Ammar, 1995, 2002; Arabia, 2011; Ammar, 2013)

The aim of this paper is recording *B. neritina* species of Bryozoa for the first time on the Syrian coast.

Materials and Methods

Artificial square-shaped cement reefs were installed at a depth of 15 m in Ibn Hani station (35°35'44.7"N 35°45'15.8"E) fig1 in spring 2021. The samples were collected 6 months later (from February to May 2021) with hand by free diving. The samples were preserved in a 4 % formalin-seawater solution in marine lab of High Institute of Marine Researches (Latakia, Syria).

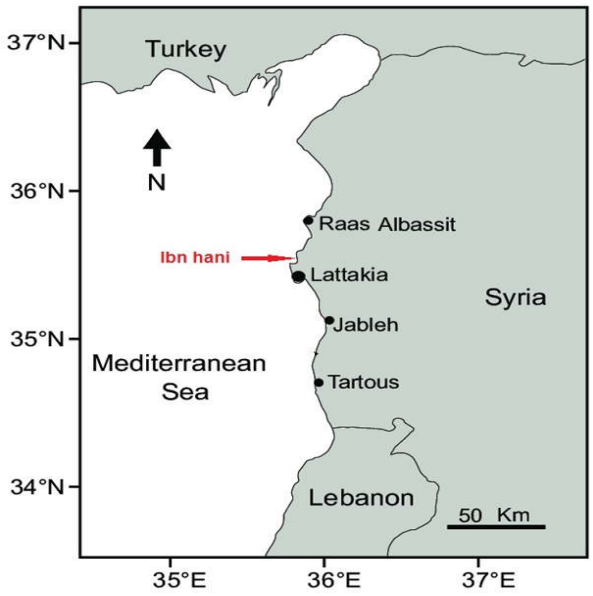

Figure 1. Map of the sampling site

Results

The specimens identified as *B. neritina* (Linnnaeus, 1758) According to the following references (Gordon and Mawatari, 1992; Mackie et al., 2006; Vieira et al., 2012)

Species Description:

Brown bryozoan
Kingdom Animalia
Phylum Bryozoa
Class Gymnolaemata
Order Cheilostomata
Family Bugulidae
Genus *Bugula*
Species*: B. neritina* (Linnaeus, 1758)

B. neritina is Flexible dense colonies, 7 cm high, pinkish-brown, branched in pairs. Zooids are white, spherical, and has a pointed outer corner. Zooids average 0.90 x 0.25 mm (Figs. 2, 3, 4).

Figure 2. *B. neritina colony*

Figure3. *B. neritina* colony on the artificial reef

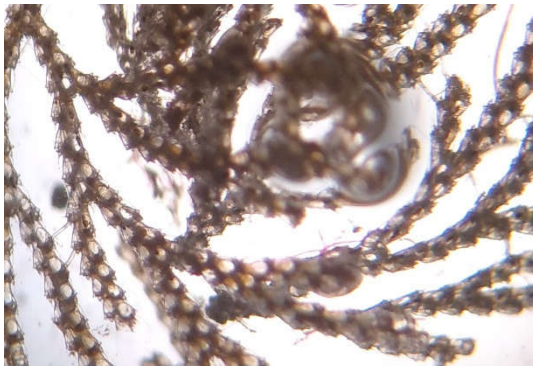

Figure 4. Zooids of the *B. neritina* colony

Discussion

The difference between the species *B. neritina* and other species for the same genus is the absence of avicularia and spines**.**

B. neritina is found with coralligenous macroalgae, Balanus and Tunicates, Codium sp (green algae) in 15 m, attached to hard substrate (artificial reefs), in salinity 39 psu.

B. neritina has a widespread distribution in warm temperate water. It can stick to oyster shells and to the sides of ballast tanks or on floating material inside the ballast tanks (Cohen, 2005; Mackie, 2006; Ryland, 2011).

Bryozoan *B. neritina* has an important environmental role because of the filter feeding, it works to purify the water and filter it from the fine particles suspended in it, in addition to its important medical value in the production of different anticancer Bryostatins (Davidson and Haygood, 1999).

Other researches indicated that it was located in the oil terminal port to the north of Tartus (under publication), which means that it is endemic to the Syrian coast, and it may have been some time since it entered the Syrian marine environment and was not revealed until later.

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References

Ammar, I. 1995. Quantitative and qualitative study of zoobenthos in Lattakia coast. Master thesis, Tishreen University Lattakia, Syria. 173 p. (In Arabic). https://scholar.google.com/scholar?cluster=6516765013775322061&hl=ar&as_sdt=2005&sciodt=0,5.

Ammar, I. 2002. Study of zoobenthos in Banias coast and effect of petroleum hydrocarbon on there. Doctoral thesis, Tishreen University, Lattakia, Syria. 336 p. (In Arabic). https://scholar.google.com/scholar?cluster=16812046461836993928&hl=ar&as_sdt=2005&sciodt=0,5.

Ammar, I., Hassan M., Arabia I. and Dib, F. 2013. Assessment of the actual state of zoobenthos in the sublittoral area on the north of Lattakia. Technical Report. High Agency of Scientific Research. 62 p. (In Arabic).

Ammar, I. and Arabia, I . 2018. First record of themoon crab Ashtoret lunaris(Forskål, 1775)from Syrian coasts. Mesopotamian Journal of Marine Sciences, 33(2): 65 -70. https://doi.org/10.58629/mjms.v33i2.49

Arabia, I. 2011. A study of changing of marine benthic communities along the Syrian coast using classical and newly developed benthic indices. Master thesis, Tishreen University, High Institute of Marine Research, 46-52. https://scholar.google.com/scholar?cluster=13430231042630350038&hl=ar&as_sdt=2005&sciodt=0,5.

Bailey, P., Chang, D., Nones, K. and et al. 2016. Genomic analyses identify molecular subtypes of pancreatic cancer. Nature 531: 47–52. https://doi.org/10.1038/nature16965.

Cocito, S. 2004. Bioconstruction and biodiversity: their mutual influence. **Scientia Marina**, 68: 137–144. https://doi.org/10.3989/scimar.2004.68s1137.

Cohen, A.N. 2005. Guide to the Exotic Species of San Francisco Bay. San Francisco Estuary Institute: Oakland, USA. http://www.exoticsguide.org/.

Davidson, S.K., Haygood M.G. 1999. Identification of Sibling Species of the Bryozoan *Bugula neritina* That Produce Different Anticancer Bryostatins and Harbor Distinct Strains of the Bacterial Symbiont "Candidatus Endobugula sertula". The Biological bulletin. 196: 273-280. https://doi.org/10.2307/1542952.

Gerovasileiou, V., Rosso, A. 2016. Marine Bryozoa of Greece: An annotated checklist. Biodiversity Data Journal 4(4):e10672. https://doi.org/10.3897%2FBDJ.4.e10672.

Gordon, D.P., Mawatari, S.F. 1992. Atlas of marine-fouling Bryozoa of New-Zealand ports and harbours. Miscellaneous publication New Zealand Oceanographic Institute 107: 1-52. https://www.vliz.be/imisdocs/publications/ocrd/267657.pdf.

Harmelin, J.G., Bitar, G. and Zibrowius, H. 2016. High xenodiversity versus low native diversity in the south-eastern Mediterranean: Bryozoans from the coastal zone of Lebanon. Mediterranean Marine Science .17(2):417-439. https://dx.doi.org/10.12681/mms.1429.

Kocak, F. and Onen, A.S. 2014. Checklist of Bryozoa on the coasts of Turkey.Turkish Journal of Zoology. 38(6):880-891. https://doi.org/10.3906/zoo-1405-85.

Mackie, J.A., Keough, M.J. and Christidis, L. 2006. Invasion patterns inferred from cytochrome oxidase I sequences in three bryozoans, *Bugula neritina*, *Watersipora subtorquata*, and *Watersipora arcuata*. Marine Biology, 149: 285–295. https://doi.org/10.1007/s00227-005-0196-x.

Robertson, A. 1905. Non-incrusting Chilostomatous Bryozoa of the West Coast of North America. University of California Publications in Zoology 2(5): 235-322 (p. 266).URL.

Rosso, A., and Di Martino, E. 2016. Bryozoan diversity in the Mediterranean Sea: an update. Mediterranean Marine Science,. 17: 567–607. http://dx.doi.org/10.12681/mms.1474.

Ryland, J.S., Bishop J.D.D., De Blauwe H., Nagar A.E. and Minchin D. , Wood, C. A. and Yunnie, A.L.E.. 2011. Alien species of *Bugula* (Bryozoa) along the Atlantic coasts of Europe. Aquatic Invasions, 6(1): 17–31. https://dx.doi.org/10.3391/ai.2011.6.1.03.

Vieira, L. M., Winston, J. E. and Fehlauer-Ale K. H. 2012. Nine New Species of Bugula Oken (Bryozoa: Cheilostomata) in Brazilian Shallow Waters. PLOS ONE 7(7): e40492. https://doi.org/10.1371/journal.pone.0040492.

Zarghami, M., Fatemi, M., Al-Maliky, T., Mollayousefi, M.and Nazarhaghighi, F. 2019. Distribution and diversity of Meiobenthos insouthern Caspian Sea (Mazandaran-Iran). Mesopotamian Journal of Marine Sciences, 3, 34(1): 43 -62. https://doi.org/10.58629/mjms.v34i1.46