MEDWIN PUBLISHERS
Committed to Create Value for Researchers

International Journal of Oceanography & Aquaculture
ISSN: 2577-4050

Are Non-Native Species Invasions A Cause or Effect of Ecosystem Degradation?

Lenzi M*

Lagoon Ecology and Aquaculture Laboratory, Italy

***Corresponding author:** Lenzi M, Lagoon Ecology and Aquaculture Laboratory (LEALab; OPL Company) via G. Leopardi 9, 58015 Orbetello (GR) Tuscany, Italy, Email: Lealab1@gmail.com

Editorial

Volume 8 Issue 2

Received Date: March 27, 2024

Published Date: April 17, 2024

DOI: 10.23880/ijoac-16000302

Keywords: Ecosystem; Non-Native Species; Crab; Allochthonous Species; Environmental Conditions

Editorial

To still claim that the problem of non-native species invasion is a false problem is undoubtedly considered an "apostasy." Because, the harm by allochthonous species to me seems more like dogma than scientific evidence. The bulk of the scientific community is, in fact, bent on combating the invasion of alien species, studying ways to prevent their arrival and spread and to counteract the damage to native communities.

As much as I cannot deny that some alien species have truly problematic characteristics, I also have to wonder why only in the last 15-20 years have they become a serious problem. Yet commercial traffic, the artificial transfer of species from one place to another, bilge and ballast water discharged into the harbors of distant places is not a thing of today.

It can be argued that these elements have taken on a remarkable character in the last 50 years, but it can still be argued that all these human activities have taken a very long time in human history to achieve the same results that we are talking about today. There has been plenty of time for a species of concern today not to have come before and found good fortune.

I believe that the problem needs to be looked at from a different perspective and some questions need to be asked: why is a particular alien species capable of producing damage or otherwise altering an ecosystem? Is it possible for an ecosystem to be so fragile that it collapses because of the arrival of an alien species? Also, is it possible that all these allochthonous species have never arrived before?. It should also be added that an initial alarmism for some species was later proven to be excessive or even wrong.

Consider *Caulerpa cylindracea*, which appeared to destroy infralittoral algal stands - Boudouresque CF, et al. [1], Ceccherelli G, et al. [2], Piazzi L, et al. [3], Piazzi L, et al. [4] and Cebrian E, et al. [5] - and was even feared to attack *Posidonia oceanica* meadows - Ceccherelli G, et al. [6] - and then is shown to expand into stands rarefied by nutrient excesses - Piazzi L, et al. [7] and Piazzi L, et al. [8] - and retrogress when environmental conditions return to previous values [9]. But still recently this species continues to be considered a threat to native communities [10]. More recently, in the Mediterranean, there is alarm over the blue king crab *Callinectes sapidus*, a species that has arrived in the Mediterranean since 1949 - Aslam H, et al. [11]- but which only recently destroys everything it finds in its passage, ruining shellfish crops and attacking fish [12]. But why in its place of origin, the Atlantic coast of America, is it not so harmful? In contrast, the green crab *Carcinus maenas* that lives quietly in the Mediterranean area, especially populating lagoons and estuaries, becomes a voracious predator along the American coasts, both Atlantic and Pacific [13,14].

Serious scientific work must necessarily shed light on any exaggerations and speculations [15]. The problems must be viewed in their totality. Many coastal areas are subject to blooms of native species, which show opportunistic character, developing as a result of eutrophication, global warming, depletion of other species [16-21].

The hypothesis is that damage to coastal ecosystems due to human activities - eutrophication, overfishing, hydraulic and construction works, contaminant discharges, etc. - constitutes the essential reason for some opportunistic

species, whether native or non-native, to overgrow. Allochthonous species, as well as native opportunistic species, are not a cause of environmental disruption, but an effect.

The change of perspective is not so much to combat opportunistic species, but to work toward ecosystems restoration by eliminating the anthropogenic causes -when these are direct- that have led to ecosystem disruption. More difficult to work on indirect anthropogenic causes, such as ocean acidification and global warming, for which we must only try to foster new balances, the most beneficial for us, because going back to the origins of what is in our memory will be impossible [22,23].

References

1. Boudouresque CF, Verlaque M (2002) Assessing Scale and Impact of Ship-transported Alien Macrophytes in the Mediterranean Sea. In: CIESM Alien Marine Organisms Introduced by Ships in the Mediterranean and Black Seas. CIESM Workshop Monographs 20: 53-61.

2. Ceccherelli G, Piazzi l, Balata D (2002) Spread of introduced Caulerpa species in macroalgal habitats. Journal of Experimental Marine Biology and Ecology 280(1-2): 1-11

3. Piazzi L, Meinesz A, Verlaque M, Akçali B, Antolić B, et al. (2005) Invasion of *Caulerpa racemosa* var. cylindracea (Caulerpales, Chlorophyta) in the Mediterranean Sea: An Assessment of the Early Stages of Spread. Cryptogamie Algologie 26(2): 189-202.

4. Piazzi L, Balata D (2008) The Spread of *Caulerpa racamosa* var. cylindracea in the Mediterranean Sea: An example of How Biological Invasion Can Influence Beta Diversity. Marine Environmental Research 65(1): 50-61.

5. Cebrian E, Ballesteros E (2009) Temporal and spatial variability in shallow- and deep-water populations of the invasive *Caulerpa racemosa* var. cylindracea in the Western Mediterranean. Estuarine Coastal and Shelf Science 83(4): 469-474.

6. Ceccherelli G, Piazzi L (2001) Dispersal of *Caulerpa racemosa* Fragments in the Mediterranean: Lack of Detachment Time Effect on Establishment. Botanica Marina 44(3): 209-213.

7. Piazzi L, Balata D, Bulleri F, Gennaro P, Ceccherelli G (2016) The invasion of *Caulerpa cylindracea* in the Mediterranean: the known, the unknown and the knowable. Marine Biology 163: 161.

8. Piazzi L, Ceccherelli G (2017) Eutrophication affects the resistance of fucoids to an introduced alga. Marine Environmental Research 129: 189-194.

9. Lenzi M, Birardi F, Finoia MG (2013) Can the marine ecosystem of a *Posidonia oceanica* barrier reef react and defend itself against the spread of *Caulerpa racemosa* var. cylindracea?. International Journal of Marine Science 3(20): 158-165.

10. Alomar C, Deudero S, Andaloro F, Castriota L, Consoli P, et al. (2016) *Caulerpa cylindracea* Sonder invasion modifies trophic niche in infralittoral rocky benthic community. Marine Environmental Research 120: 86-92.

11. Aslam H, Polito MJ (2021) Trophic ecology of the Atlantic blue crab *Callinectes sapidus* as an invasive non-native species in the Aegean Sea. Biological Invasion 23: 2289-2304

12. Mancinelli G, Chainho P, Cilenti L, Falco S, Kapiris K, et al. (2017) The Atlantic blue crab *Callinectes sapidus* in southern European coastal waters: Distribution, impact and prospective invasion management strategies. Marine Pollution Bulletin 119(1): 5-11.

13. Jamieson GS, Grosholz ED, Armstrong DA, Elner RW (1998) Potential ecological implications for the introduction of the European green crab, *Carcinus maenas* (Linnaeus), to British Columbia, Canada, and Washington, USA. Journal of Natural History 32(10-11): 1587-1598.

14. Behrens Yamada S, Dumbauld BR, Kalin A, Hunt CE, Figlar-Barnes R, et al. (2005) Growth and persistence of the recent invader *Carcinus maenas* in estuaries of the northeastern Pacific. Biological Invasions 7: 309-321.

15. Katsanevakis S, Moustakas A (2018) Uncertainly in Marine Invasion Science. Frontiers in Marine Science 5(38).

16. Lavery PS, McComb AJ (1991) The nutritional ecophysiology of *Chaetomorpha linum* and *Ulva rigida* in Peel Inlet, Western Australia. Bot Mar 34(3): 251-260.

17. Sorce C, Persiano Leporatti M, Lenzi M (2017) Growth and physiological features of *Chaetomorpha linum* (Müller) Kütz. in high density mats. Marine Pollution Bulletin 129(2): 772-781.

18. Liu F, Pang S, Chopin T, Gao S, Shan T, et al. (2013) Understanding the recurrent large- scale green tide in the Yellow Sea: temporal and spatial correlations between multiple geographical, aquacultural and biological factors. Marine Environment Research 83: 38-47.

19. Gubelit YI (2015) Climatic impact on community of

filamentous macroalgae in the Neva estuary (eastern Baltic Sea). Mar Pollut Bull 91: 166-172.

20. Lenzi M, Gennaro P, Renzi M, Persia E, Porrello S (2012) Spread of Alsidium corallinum C. Ag. in a Tyrrhenian eutrophic lagoon dominated by opportunistic macroalgae. Marine Pollution Bulettin 64(12): 2699-2707.

21. Lenzi M, Leporatti Persiano M, Gennaro P (2022) Invasive behavior of the marine Rhodophyta *Sphaerococcus coronopifolius* Stackhouse, in a hypereutrophic Mediterranean lagoon. Marine Pollution Bulletin 181: 113885.

22. Chapman PM (2012) Management of coastal lagoons under climate change. Estuarine Coastal and Shelf Science 110: 32-35.

23. Chapman PM (2012) Global climate change and risk assessment: invasive species. Integrated Environmental Assessment and Management 8(1): 199-200.