Journal of Marine Science: Research & Development

Zaccone, J Marine Sci Res Dev 2022, 12:1

Commentry Open Access

Biosynthesis of Agar in Red Seaweeds and Biological Activities of Seaweeds

Giacomo Zaccone*

Department of Animal Biology and Marine Ecology, University of Messina, Italy

Seaweeds or macroalgae are commonly grouped into 3 taxa: green, brown, and red algae. They are important bioresources of the oceans and play a major function in the maintenance of its ecosystem. These marine algae are used for food, fodder, polysaccharide extraction, biofertilizers, cosmetics, papermaking, and biobased fuels. In this chapter, several topics on seaweed biology are included such as: the role in maintenance of ocean ecology, herbivory and predation defense mechanisms, life history of important seaweeds, and their commercial applications [1]. Agar is a jelly-like biopolymer synthesized by many red types of seaweed as their predominant cell wall component. Due to its great rheological properties, it has been exploited commercially for applications in food, cosmetic, pharmaceutical, biomedical and biotechnology industries. Despite its multiple uses, the biosynthesis of this phycocolloid isn't fully understood. The current knowledge on agar biosynthesis is inferred from plant biochemistry and putative pathways for ulvan and alginate biosynthesis in green and brown seaweeds, respectively [2]. Alginate is a naturally occurring acidic linear polysaccharide acquired from marine brown seaweed. Low molecular weights structurally numerous derivatives and oligosaccharides derived from alginate have shown various tremendous biological and pharmacological activities. It has been demonstrated that immuno-inflammation is involved in lots of widely wide-spread human diseases, such as cancer, severe infection and neurodegeneration. Given the sports of marine natural products in the regulation of immune responses, increasing efforts are being made towards the development of low molecular- weight natural compounds that aid in the prevention and treatment of immune- and inflammatory-associated diseases [3]. Seaweeds are some of the most important producers of biomass in the marine environment and are wealthy in bioactive compounds which can be often used for human and animal health. Porphyran and carrageenan are natural compounds derived from red seaweeds. The former is a characteristic polysaccharide of Porphyra, while the latter is well known from Chondrus, Gigartina, and various Eucheuma species, all in Rhodophyceae. The polysaccharides had been observed to have anti-cancer interest with the aid of using enhancing immunity and focused on key apoptotic molecules and consequently deemed as potential chemotherapeutic or chemo preventive agents [4]. A developing attention of role that microbiota can play in mediating the results of pathogens on hosts has given rise to the concept of the pathobiome. Recently, we demonstrated that the Pacific oyster mortality syndrome affecting Crassostrea gigas oysters is due to infection with the Ostreid herpesvirus type 1 (OsHV-1) accompanied with the aid of using contamination with multiple bacterial taxa. Here we increase the concept of this pathobiome beyond the host species and its bacterial microbiota with the aid of using investigating how seaweed residing in association with oysters impacts their reaction to the disorder. We hypothesized that with the aid of using their mere presence in the surroundings, one-of-a-kind species of seaweeds can undoubtedly or negatively impact the hazard of disorder in oysters by shaping their bacterial microbiota and their immune response. Although seaweed and oysters do not have direct ecological interactions, they're related by seawater and likely share microbes. To test our hypothesis, oysters have been acclimated with green, brown, or red algae for 2 weeks after which challenged with OsHV-1. We monitored host survival and pathogen proliferation and performed bacterial microbiota and transcriptome analyses. We observed that seaweeds can alter the bacterial microbiota of the host and its response to the disorder. More particularly, green algae belonging to the genus Ulva spp. brought on bacterial microbiota dysbiosis in oyster and change of its transcriptional immune response main to increased susceptibility to the disease [5].

References

1. Baweja P, Kumar S, Sahoo D, Levine I.A, Fleurence J, et al. (2016) Chapter 3 - Biology of Seaweeds. Academic Press 41-106.
2. Wei-Kang L, Yi-Yi L, Adam TCL, Parameswari N, Janna OA, et al. (2017) Biosynthesis of Agar in Red Seaweeds: A Review. Carbohydr Polym 164:23-30.
3. Zhiwei L, Tianheng G, Ying Y, Fanxin M, Fengping Z, et al. (2019) Anti-Cancer Activity of Porphyran and Carrageenan from Red Seaweeds. Molecules 24:4286.
4. Elyne D, Julien dL, Bruno P, Eve T, Yannick G ,et al. (2022) Seaweeds Influence Oyster Microbiota and Disease Susceptibility. J Anim Ecol 1-14.
5. Olivia L, Paul-Pont I, Ana R, Navneet D, Richard JW, et al. (2020) Detection of Ostreid Herpesvirus-1 in Plankton and Seawater Samples at an Estuary Scale. Dis Aquat Organ 138, 1-15.

***Corresponding author:** Giacomo Zaccone, Department of Animal Biology and Marine Ecology, University of Messina, Italy, Tel: 984805521; E-mail: giacomozaccone@334gmail.com

Received: 5-Jan-2022, Manuscript No: jmsrd-22-54171, **Editor assigned:** 7-Jan-2022, PreQC No: jmsrd-22-54171(PQ), **Reviewed:** 11-Jan-2022, QC No: jmsrd-22-54171, **Revised:** 17-Jan-2022, Manuscript No: jmsrd-22-54171(R) **Published:** 24-Jan-2022, DOI: 10.4172/2155-9910.1000320

Citation: Zaccone G (2022) Biosynthesis of Agar in Red Seaweeds and Biological Activities of Seaweeds. J Marine Sci Res Dev 12: 320.