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Mini Review

MARINE BACTERIA ROLES IN ECOSYSTEMS AS DECOMPOSERS AND ITS AFFECT ON ANIMALS

Arina Dalton*

Department of Biology, Durham University, Durham, United Kingdom

INTRODUCTION

All animals on Earth interact with microorganisms, such as viruses, protists, bacteria, fungus, and archaea. Single host-symbiont systems in the ocean have historically been used to study animal-microbial connections. The discipline is evolving toward research that address interactions between the animal host and a more diversified microbiome, nevertheless, as a result of new investigations on the diversity of microbes interacting with diverse marine animal hosts. Prokaryotes are key decomposers and recyclers of nutrients in ecosystems. Prokaryotes can be pathogenic, which means they can harm or even kill plants and animals. Major amounts of the ocean's photosynthesis and significant carbon and other nutrient cycles are carried out by marine prokaryotes.

Prokaryotes are among the airborne microorganisms that circle the world below commercial air lanes but above weather systems [1]. While some peripatetic microorganisms are picked up by dust storms on land, the majority are marine microorganisms in sea spray. The majority of marine viruses are bacteriophages, which are not harmful to plants or animals but are crucial for controlling ecosystems in both freshwater and saltwater. They are the most significant mechanism of recycling carbon in the marine environment and infect and kill bacteria and archaea in aquatic microbial communities. Fresh bacterial and algal development is sparked by the organic compounds that are produced from deceased bacterial cells.

A significant portion of prokaryotic microorganisms are bacteria. Bacteria come in a variety of shapes, ranging from spheres to rods and spirals, and are typically only a few micrometres long. The majority of the habitats on Earth contain bacteria, which were among the first life forms to inhabit the planet. Bacteria can be found in soil, water, hot springs that are acidic, radioactive waste, and even deep inside the crust of the Earth. Additionally, bacteria coexist with plants and animals in parasitic and symbiotic ways [2]. Binary fission, an asexual method of reproduction, is the method used by bacteria to reproduce after reaching a set size. The first creatures to develop the ability to convert sunlight into chemical energy were cyanobacteria. They belong to a phylum of bacteria that includes colonial species as well as unicellular and filamentous bacteria.

There are bacterial fossils, such as stromatolites, but because they lack a characteristic appearance, they cannot be utilised to determine when a particular bacterial species first appeared or to study the history of bacterial evolution. The bacterial phylogeny may be reconstructed using gene sequences, and these findings show that bacteria diverged from the eukaryotic branch earliest. Additionally, bacteria contributed to the second major evolutionary split between archaea and eukaryotes. Eukaryotes emerged as a result of ancient bacteria forming endosymbiotic relationships with the earliest eukaryotic cells, which may have been related to the Archaea themselves [3]. This involved the incorporation of alphaproteobacterial symbionts into proto-eukaryotic cells to create either mitochondria or hydrogenosomes, which are still present in all known Eukarya. Later, cyanobacterial-like creatures were also ingested by some eukaryotes that already had mitochondria.

Initially, archaea were categorised as bacteria, but this categorization is no longer valid. The characteristics of archaeal cells set them apart from the bacterial and eukaryotic kingdoms of life. The Archaea are further broken down into numerous acknowledged phyla [4]. The majority have not been isolated in a lab and have only been identified by the examination of their nucleic acids in samples taken from their environment, making classification challenging. Although some archaea have extremely odd shapes, including the flat and square-shaped cells, bacteria and archaea are often similar in size and shape. Despite having a similar morphology to bacteria, archaea have genes and a number of metabolic pathways that are more similar to those of eukaryotes, particularly the transcription and translational enzymes. Other distinctive features of archaeal biochemistry include their reliance on ether lipids like archaeols for the membranes of their cells [5]. Archaea employ a wider variety of energy sources than eukaryotes, including organic substances like sugars, ammonia, metal ions, and even hydrogen gas.

Gas vacuoles, which are nanocompartments that are freely permeable to gas and are found in some marine prokaryotes, allow marine bacteria and archaea to regulate their buoyancy. They appear as membrane-bound vesicles with a spindle structure, and some planktonic prokaryotes contain them. In order for the cells to maintain their position in the upper levels of the water column and continue to engage in photosynthesis, positive buoyancy is required. The protein shell that makes up gas vacuoles has an inner surface that is extremely hydrophobic, making it impervious to water but permeable to most gases.

***Corresponding author:** Arina Dalton, Department of Biology, Durham University, Durham, United Kingdom, E-mail: arinadalton@unid.uk

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REFERENCES

1. Treseder, K.K., Kivlin, S.N., and Hawkes, C.V., 2011. Evolutionary trade-offs among decomposers determine responses to nitrogen enrichment. *Ecol. Lett*., 14: 933-938.

2. Benbow, M.E., Barton, P.S., Ulyshen, M.D., Beasley, J.C., DeVault, T.L., Strickland, M.S., and Pechal, J.L., 2019. Necrobiome framework for bridging decomposition ecology of autotrophically and heterotrophically derived organic matter. *Ecol. Monogr*., 89: e01331.

3. Manzoni, S., Schimel, J.P., and Porporato, A., 2012. Responses of soil microbial communities to water stress: results from a meta-analysis. *Ecology*., 93: 930-938.

4. Newell, S.Y., 1994. Ecomethodology for organoosmotrophs: prokaryotic unicellular versus eukaryotic mycelial. *Microb. Ecol*., 28: 151-157.

5. Potapov, A.M., Tiunov, A.V., and Scheu, S., 2019. Uncovering trophic positions and food resources of soil animals using bulk natural stable isotope composition. *Biol. Rev*., 94: 37-59.