

Opinion

THE REMARKABLE RESILIENCE OF ROTIFERA: SURVIVING IN EXTREME ENVIRONMENTS

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INTRODUCTION

Rotifera, also known as wheel animals, are tiny multicellular organisms that belong to the phylum Rotifera. Despite their small size, they are incredibly diverse and can be found in a variety of freshwater and terrestrial habitats, including ponds, rivers, lakes, and even damp soil. These tiny creatures are a crucial component of aquatic food webs and play an important role in maintaining the health of freshwater ecosystems. Rotifers are characterized by their wheel-like appearance, which is the result of cilia that cover the anterior part of their bodies. These cilia are used for locomotion and help to create water current that brings food towards the organism's mouth. They have a variety of feeding modes, including filter feeding, herbivory, and even carnivory, which allows them to occupy a wide range of ecological niches.

Despite their small size, rotifers are incredibly resilient and can survive in a wide range of environmental conditions [1]. Some species are able to survive in water that is extremely acidic or salty, while others are able to survive in water that is very cold or hot. This remarkable adaptability makes them an important component of many freshwater ecosystems and allows them to play a crucial role in the food webs of these environments. In addition to their ecological importance, rotifers have also been the subject of numerous scientific studies due to their unique biology. For example, some species are capable of reproducing both sexually and asexually, which makes them ideal models for studying the evolution of reproduction [2]. Additionally, rotifers have a complex life cycle that involves multiple stages of development, including a dormant cyst stage that allows them to survive during unfavorable environmental conditions. Despite their small size, rotifers are also capable of remarkable feats of survival. For example, some species can survive for extended periods of time without food or water, which allows them to persist in environments that would be inhospitable to other organisms. This ability to survive in challenging conditions makes rotifers an important part of the global food web and helps to maintain the health of freshwater ecosystems [3].

Rotifers are a fascinating group of organisms that are known for their small size, diverse range of habitats, and remarkable resilience. Here are some additional details about these tiny creatures: Taxonomy: Rotifers belong to the phylum Rotifera, which is part of the animal kingdom. There are over 2,000

described species of rotifers, which are divided into several different classes based on their anatomy and reproductive strategies. Anatomy: Rotifers are small, usually less than 1 millimeter in length, and have a simple, cylindrical body shape. They are covered in cilia that are used for locomotion and feeding. The anterior part of the body is typically wider and more spherical, while the posterior part tapers into a slender tail. Some species also have specialized appendages, such as tentacles, that are used for feeding or sensing their environment [4].

Feeding: Rotifers are typically filter feeders, using their cilia to create a water current that brings food particles towards their mouth. Some species are herbivorous, feeding on algae, while others are carnivorous and feed on small invertebrates. Rotifers are also capable of absorbing dissolved organic matter directly through their bodies [5]. Reproduction: Rotifers reproduce both sexually and asexually, depending on environmental conditions. Some species reproduce asexually through parthenogenesis, while others reproduce sexually with fertilization. Some species are also capable of producing dormant cysts, which allow them to survive during unfavorable environmental conditions and then resume development when conditions improve. Habitats: Rotifers can be found in a wide range of freshwater and terrestrial habitats, including ponds, rivers, lakes, and damp soil. Some species are also able to tolerate extreme environmental conditions, such as high temperatures, low oxygen levels, or high levels of salinity.

Importance: Rotifers are an important component of freshwater food webs, serving as both consumers and prey for other aquatic organisms. They are also important indicators of water quality, as changes in rotifer populations can indicate changes in the health of freshwater ecosystems. Additionally, rotifers have been the subject of numerous scientific studies, providing insights into the evolution of reproduction, the complexity of the life cycle, and the resilience of life in extreme environments. In conclusion, rotifers are small but mighty multicellular organisms that play a crucial role in freshwater ecosystems. Despite their tiny size, they are incredibly diverse and can be found in a variety of habitats, from freshwater ponds and rivers to damp soil. These tiny creatures are resilient and adaptable, making them important components of the food webs of these environments. Furthermore, their unique biology and remarkable abilities have made them the subject of numerous scientific studies, providing insights into the evolution of reproduction, the complexity of the life cycle, and the resilience of life in extreme environments.

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Received: 30-Jan-2023, Manuscript No. IJPAZ-23-88244; Editor assigned: 01-Feb-2023, PreQC No. IJPAZ-23-88244(PQ); Reviewed: 15-Feb-2023, QC No. IJPAZ-23-88244; Revised: 17-Feb-2023, Manuscript No. IJPAZ-23-88244(R); Published: 24-Feb-2023, DOI: 10.35841/2320-9585-11.2.168

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