Journal of Ecology and Toxicology

Commentary Open Access

An Overview on Life Science of Ecology

Youseph Yazdi*

Cary Institute of Ecosystem Studies Box AB, Millbrook, USA

Commentary

Ecology is the study of the relationships between living organisms, including humans, and their physical environment; it seeks to understand the vital connections between plants and animals and the world around them. Ecology also provides information about the benefits of ecosystems and how we can use Earth's resources in ways that leave the environment healthy for future generations. The many specialties within ecology, such as marine, vegetation, and statistical ecology, provide us with information to better understand the world around us. This information also can help us improve our environment, manage our natural resources, and protect human health [1]. The following examples illustrate just a few of the ways that ecological knowledge has positively influenced our lives. Lyme disease is a potentially serious bacterial infection that is transmitted to humans by certain ticks. Ecological studies have found that people are more likely to get Lyme disease when acorns are plentiful. Why? Because mice and deer, which carry the disease and the ticks, feed on acorns. More acorns usually mean more mice and deer, providing a favorable environment for large populations of ticks to flourish [2]. Knowing the connections between acorns, deer, mice, and ticks, ecologists are able to predict the likelihood of infection and let people know when they need to be more careful when outdoors. Some of our nation's most cherished species, such as the bald eagle and peregrine falcon, as well as countless other less familiar species, like the Virginia Big-Eared Bat and the American Burying Beetle, have either been brought back from the brink of extinction or their populations have been stabilized. These successes are the result of successful captive breeding efforts, reintroduction methods, and a greater understanding of species, in part because of ecological research. Biological control is a technique that uses the natural enemies and predators of pests to control damage to crops [3]. It is based in part on knowing the ecology of pests, which is used to understand when and where they are the most vulnerable to their enemies. Biological control alleviates crop damage by insects, saves money, and decreases problem associated with pesticides. Ecological research has shown that estuaries are nursery grounds for fish populations that live in coastal waters, an important reason to protect these areas. Ecological research has also identified obstacles, such as dams, that fish encounter when returning to their breeding areas. This information has been used to help design structures for fish so they can move around these obstacles to reach their breeding areas. An ecosystem is any geographic area that includes all of the organisms and nonliving parts of their physical environment. An ecosystem can be a natural wilderness area, a suburban lake or forest, or a heavily used area such as a city [4]. The more natural an ecosystem is, the more ecosystem services it provides. These include cleansing the water and air, pollinating crops and other important plants, and absorbing and detoxifying pollutants (soils and plants). Short for biological diversity, biodiversity is the range of variation found among microorganisms, plants, fungi, and animals. Some of this variation is found within species, such as differences in shapes and colors of the flowers of a single species of plants. Biodiversity also includes the richness of species of living organisms on earth. Many environmental organizations have developed educational materials that focus on species and ecosystems, and offer tips on becoming involved in community activities that relate to the environment. Finally, professional ecological organizations can connect you with scientific experts in all types of ecological study, from those that specialize in wetland ecology, to those that focus on endangered species, to those whose work emphasizes city environments. We offer unequivocal evidence that is biologically inspired, interactive robotic predators can selectively control the behavior of invasive mosquitofish when cohabiting with tadpoles of native frogs [5]. The robotic predator triggers antipredator responses in mosquitofish but not in tadpoles, and it mitigates the impact of mosquitofish on tadpoles' behavior and space use. Brief exposures to the robotic predator have long-term consequences on mosquitofish behavior altering their routine activity and feeding rate weeks after exposure. Remarkably, these behavioral changes are accompanied by a loss of energy reserves, change in body shape, and impairment of fertility and reproductive traits in both sexes. Different responses of mosquitofish and tadpoles to the robotic predator can be explained by their diverse sensitivity to visual stimuli and opposing evolutionary adaptations to the predator species that inspired the design of the robot. Because tadpoles do not share an evolutionary history with such a predator, it is plausible that they do not recognize it as a threat. Our predator-mimicking robot enabled us to overcome these challenges through targeted vision- and motion-based predatory cues, and to precisely quantify the consequences of non-lethal exposures on fish behavior weeks after exposure. Our results revealed that behavioral changes of mosquitofish in the experimental arena while in the presence of the robot carried over to influence their routine behavior in the mesocosm tanks brief and non-lethal exposures to the robotic predator translate into increased antipredator behaviors and feeding rates in mosquitofish in the long term. The risk of an early death is indeed expected to favor cautious behaviors low activity levels and maximize energy intake when predators are absent moderating the trade-off between reducing predation risks and fueling growth and reproductive fitness. Life science is the study of living things, and ecology is the branch of life science that deals with the relations between living creatures and their environment. These topics are closely intertwined and play an important role in early elementary science classrooms. In this series, readers will discover essential life science concepts, including adaptations, migration, natural selection, and much more. The treatment of these topics is designed to allow readers to build on prior science knowledge and abilities. Photographs and diagrams of Earth's creatures and habitats are sure to make these books both educational and enjoyable.

References

1. Kiessling W, Simpson C, Foote M (2009) Reefs as cradles of evolution and sources of biodiversity in the Phanerozoic. Sci 327 (5962): 196-198.

***Corresponding author:** Youseph Yazdi, Cary Institute of Ecosystem Studies Box AB, Millbrook, USA, E-mail: yazdi@jhuedu.com

Received: 01-Mar-2022, Manuscript No. jety-22-54839; **Editor assigned:** 03-Mar-2022, Preqc No. jety-22-54839 (PQ); **Reviewed:** 23-Mar-2022, QC No. jety-22-54839; **Revised:** 25-Mar-2022, Manuscript No. jety-22-54839 (R); **Published:** 05-Apr-2022, DOI: 10.4172/jety.1000122

Citation: Yazdi Y (2022) An Overview on Life Science of Ecology. J Ecol Toxicol, 6: 122.

2. Levins R (1969) Some demographic and genetic consequences of environmental heterogeneity for biological control. Bull Ent Soc Amer 15 (3): 237-240.

3. Schoener TW (1975) Presence and absence of habitat shift in some widespread lizard species. Ecol Monogr 45 (3): 233-258.

4. Aguirre AA (2009) Biodiversity and human health. Eco Health 6: 153-156.

5. Berryman AA (1992) The origins and evolution of predator-prey theory. Ecolo 73 (5): 1530-1535.