AQUATIC ETHNOBIOLOGY

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Contents

Summary

Aquatic Ethnobiology (AE) is the study of the evolving interrelationship between people and aquatic organisms. AE can be further subdivided into Ethnoichthyology, the study of people's interactions with large aquatic animals, and Ethnophycology, the study of people's interactions with aquatic autotrophic producers, including algae and aquatic vascular plants. Humans have long interacted with-, depended upon-, and developed knowledge systems about aquatic organisms. We begin this chapter by discussing how people's interaction with the aquatic environment itself shapes their experience and perceptions of aquatic life, followed by a discussion some key anthropological and ecological evidence of people's use of aquatic resources through time. The explicitly ethnobiological study of aquatic organisms is relatively recent, dating to the 1960's. However it now comprises a quite vast and growing body of ethnobiological knowledge. We discuss two of the major overarching themes of aquatic ethnobiology, 1) the ecological knowledge held by aquatic resource users, and 2) the study of folk classification systems about aquatic organisms and what they tell us about human cognition of the biological environment. We finalize with a discussion of some of the environmental problems and challenges faced by aquatic resources and the people who depend on them, as well as how ethnobiology can help in solving them.

1. Introduction

Aquatic Ethnobiology is the study of the evolving interrelationship between people and

aquatic organisms- organisms that live underwater-. Humans have long interacted, depended on, and known about aquatic representatives of the major kingdoms and phyla, such as algae, plants (seagrasses, mangroves), invertebrate animals (e.g. sponges, jellyfish and corals, arthropods, worms, mollusks, echinoderms), and vertebrate animals (fishes, reptiles, birds, and mammals). Thus, for example, the study of human societies' relationship with fish could be called both an exercise in ethnozoology as a venture in aquatic ethnobiology. Focusing, however, on the *human* experience in interacting with the aquatic environment and aquatic life, it makes more sense to talk about the field of *aquatic ethnobiology* than about, for example, ethnoichthyology as a subfield of ethnozoology. This is because the interaction with the aquatic environment itself is a highly salient feature of people's interactions with aquatic life.

Within aquatic ethnobiology we can talk about the study of human interaction with aquatic animals (Ethnoichthyology) and human interaction with aquatic plants and algae (Ethnophycology). The above groupings do not follow Western scientific taxonomic classification exactly. We chose these names for the groupings because we feel that they reflect the majority of folk classification systems across the world, while avoiding potentially confusing repetition with terms currently used to sub-classify terrestrial ethnobiology (e.g. ethnozoology vs. aquatic ethnozoology, ethnobotany vs. aquatic ethnobotany etc).

Ethnoichthyology- For the purposes of this chapter, Ethnoichthyology deals with people's interactions with relatively large, mobile, aquatic metazoans. Thus ethnoichthyology deals with people's relationships with underwater animals including crustaceans, echinoderms, mollusks, cetaceans, birds, and of course cartilaginous and bony fish.

Ethnophycology- We use Ethnophycology to refer to the study of people's interactions with aquatic autotrophic producers, including algae and aquatic vascular plants.

There are several reasons for drawing the lines around ethnoichthyology and ethnophycology around broader taxonomical lines than their Western science counterparts (Ichthyology and Phycology). The main reason comes from ethnobiology's overarching focus on human-ecosystem interactions. People who interact with aquatic ecosystems generally do not base on or limit their interaction to animals belonging to what Western science classifies as Fishes or Algae, but rather interact with a wide variety of taxa. This is evident even in the Western field of Fisheries Science, where "Fisheries" refers to human extractive activities of "fish" as well as other vertebrate and invertebrate taxa (for example, shrimp fisheries, lobster fisheries, squid fisheries, etc.). For fisheries researchers, a "fish" is any metazoan that is subject to fishing.

People are terrestrial animals. We are, thus, much better adapted to survive, move about, and use our senses on dry land (or air) than underwater. The mere fact that we cannot breathe, unaided, underwater limits to a few minutes the amount of time that most people can spend directly observing aquatic organisms in their habitats. Although we are fairly good swimmers for a terrestrial mammal and excellent swimmers when compared to other primates, people cannot really move very far or very fast over (and specially under) water without the aid of technology. The immense pressures

experienced by organisms visiting waters deeper than about 30 meters (a significant amount of the space occupied by aquatic organisms) are a strict limiting factor to where humans can go without the aid of heavy technology and a significant investment of money or resources. Even the most technologically advanced forays into deep oceanic and lake waters are fraught with danger and only available to relatively few people.Thus, the vast majority of aquatic life observations made by people happen after the aquatic organism has been extracted from the water where it lives, either by active extractive technology, or by the retrieval of the whole organisms or body parts of them. Diving-based aquatic resource-use has existed for centuries, as is the case for example with Ama pearl divers in Asia and sponge divers in the Mediterranean (e.g. Bernard 1967). However, extended direct *in situ* observations of aquatic life are a relatively recent phenomenon. An important possible exception can be made for aquatic organisms that frequent clear shallow streams or ocean/lake shorelines, such as spawning salmon, crayfish, intertidal harvestable algae and others.

The constrains posed by the difficulty of directly observing aquatic life do not by any means imply that the observations made by traditional aquatic resource users are any less accurate or reliable than those made by terrestrial resource users. In fact, those constrains have at least sometimes had the indirect effect of forcing fishers and others to think in terms of correlations and inferences about aquatic resources based on limited samples of captured/observed organisms, thus yielding profound insights about aquatic life behavior and ecology.

2. People and Aquatic Resources

People have depended on aquatic resources since early in human evolution. For example, fish remains have been found in association with H. Habilis and H. erectus near an ancient shallow lake in Olduvai, East Africa (Stewart 1994). Practically all modern human societies that have existed have utilized aquatic (ocean, lake or stream) resources to some degree. Archaeological, historical, and ethnographic data show that aquatic-based subsistence has in fact been crucial in the establishment of human populations in broad geographic areas of the world, such as the Caribbean and the insular Pacific \. Large populations along the coasts of continents have depended on the harvesting aquatic organisms for thousands of years. Often, like for example in the Basque Region of the Iberian Peninsula, the Pacific Northwest coast of North America, and what is presently northern Peru, dependency on productive coastal ecosystems supported large, politically complex societies where aquatic organisms figured importantly in economic, religious, and kinship systems.Although most utilization of aquatic resources has consisted of capturing wild resources (fishing, hunting, gathering), aquatic resources have also formed part of sophisticated agricultural systems, such as for example the Mesoamerican Chinampas and in the Zhujiang Delta of China (Ruddle and Zhong 1988).Both wild aquatic resource use and aquaculture exist in modern times as industrialized, large scale, capital-intensive billionaire industries. However, most of the aquatic resources directly used for human consumption still come from small-scale resource use activities that depend on local knowledge. Thus aquatic ethnobiology deals with a rich, diverse universe of human activities and knowledge that are important for food and human well-being across cultures worldwide.

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Biographical Sketches

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