Editorial

ETHNOBIOLOGY AND CONSERVATION

What is evolutionary ethnobiology?

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Ethnobiology and Conservation 2013, 2:6 (07 August 2013)
ISSN 2238-4782

doi: 10.15451/ec2013-8-2.6-1-04

ethnobioconservation.com

There are many definitions and interpretations of ethnobiology**.** The beginner often feels trapped in a maze of concepts and assumptions that generate more questions than explanations. This is commonplace for a discipline that is growing, defining its nature**,** and assessing its interests, research designs**,** and connections or areas of overlap with other sciences. No science matures without questioning its own bases and premises in its search for identity**.** Ethnobiology does not have a single identity. The field brings together researchers with various theoretical and epistemological backgrounds. This complexity allows for a wide diversity of viewpoints.

Anderson (2011:1) understands ethnobiology as "the study of the biological knowledge about certain groups of plants and animals and their interrelationships." To contemplate the prospect of inter-relationships, we must consider the ecological component. Hurrell and Albuquerque (2012) stated that ethnobotany can also be understood as a part of ecology[1]. The same applies to ethnobiology. This science is concerned with interrelationship between people and their biological resources (plants, animals and other organisms). It deals with interactions between different components of the ecosystem and dynamic relationships established in time and space. It is not unusual for us to consider the relationships between people and biological resources from an ecological perspective. Traditional ecology (the academia) still does not consider humans as of theoretical interest. The classic notion of ecology, dissociated from human beings, may constitute a source of bias, given that humans interfere directly in ecological and evolutionary processes.

Ethnobiology sometimes seems to be limited to concerns about the utilitarian role of plants and animals (Toledo and Alárcon-Chaires 2012). Although concerns about utilitarian aspects are undoubtedly part of ethnobiology, they do not define this science. The most common approach in ethnobiology today is to focus on lists of useful plants and animals, which leaves out attempts to understand the complex

relationships between people and biological resources and fails to detect patterns in the use of such resources. This approach belongs to the history of ethnobiology (strongly influenced by an economic and perhaps taxonomic perspective because of the preoccupation with the listing of organisms). It is important because it records knowledge that may otherwise soon be lost by communities and because it aids in the search for "new products". This approach on the other hand contributes little for the theoretical foundations of ethnobiology, that are indispensable for any scientific field. The broad concept presented at the beginning of this text does not fully meet the current need for concepts of ecology and evolution in ethnobiology. Although some researchers advocate that it is redundant to address ecology and evolution in ethnobiology, we doubt whether these researchers are using these perspectives in their work at all. On the one hand, these concepts are used extensively as theoretical scenarios for interpreting and guiding research (as in the case of plant management and domestication studies; see, for example, Casas et al. (2007)). On the other hand, they appear to be completely forgotten in many studies. For example, Johns (1990) presents interesting ideas and approaches, from an ecological and evolutionary perspective, for understanding the use of medicinal plants and foods by humans. Unfortunately, very few researchers consider this perspective in their investigations. Even so, Johns (1990) strongly influenced the construction of a theoretical scenario accounting for an evolutionary view on health and disease (see Fabrega Jr. 1997).

What may then justify this lack of ecology and evolution in ethnobiology studies, especially in countries where the science is practically performed by professionals from the natural sciences, as is the case of Brazil? We are not arguing for the exclusion of the humanities and social sciences, given that humans are a cultural species. Belonging to a cultural species does not eliminate our biological-evolutionary trajectory. Our social behavior is a product of biological evolution, and our cognitive, social and cultural components were primarily responsible for our dominance over most other species. What we are and how we act are influenced by a biological-cultural complex. Biology and culture influence each other and constitute human nature. We do not want to rekindle here the debate about human behavior, i.e., whether our choices and tendencies are biologically determined or whether they are the result of the culture in which we find ourselves. We have already outgrown this debate by accepting that, in the case of our species, biology and culture are strongly linked to our evolutionary trajectory. We will not advance in our understanding of the relationship between people and nature by ignoring either the animal (biological) nature of humans or their cultural nature. Not wishing to sound exclusivist, we can nevertheless advance much as a science by drinking at the fountains of different areas that have been busy understanding human beings from an ecological and evolutionary perspective**.**

The ecological approach seeks to account for the current aspects that explain the relationship between people and nature, considering the inter-relationships people establish with different natural resources in space and time. This approach asks how people behave in different environments and how they deal with diversity, in addition to asking what determines the properties of socioecological systems. The evolutionary approach also studies current behaviors, but with the intent of trying to unravel which pressures have shaped us, i.e., how and why certain traits or characteristics emerged.

Thus, we have a challenge ahead of us: to define the field of ethnobiology that seeks to combine ecology and evolution in understanding how people from different cultures cope with (influencing and being influenced by) the natural resources in

different environments given the ecological, evolutionary and cultural pressures to which our species is subject. It is important to point out that the evolutionary branch of ethnobiology may consider two aspects of evolution: the biological evolution and the cultural evolution. Although they may follow similar trajectories, the first one requires genetic and/or epigenetic changes while the second can be performed in a single generation, by means of environment-influenced behavioral changes. Thus, we call evolutionary ethnobiology the branch of ethnobiology that studies the evolutionary histories of human behavioral patterns and human understanding about biological resources (about both cognition and behavior), considering the historical and contemporary aspects that influence these behaviors at both the individual and societal levels[2]. An ethnobiology that adopts this perspective will routinely address concepts such as adaptation, adaptability, traits, and phylogeny.

The first two basic premises are clear[3]: a) that human behavior, variable between pairs of the same group and related to the use of natural resources, evolves by means of the selection of traits that confer adaptive advantages; and b) that large behavioral variability should be inherited, not necessarily on a genetic basis, but primarily by cultural transmission. In a same population, distinct individuals may have different strategies for dealing with natural resources and different ways of interacting with other members of the same population that influence their decisions and their behavior. Our understanding of the relationship between people and natural resources can very much benefit from the incorporation of all concepts built over the years in other areas and from methodological approaches that assess the role of an individual and the influence of different socio-environmental contexts in structuring our ecological understanding.

Examining the interrelationships between people and nature and considering the forces that helped shape this complex relationship will no doubt help us move forward in building theories in ethnobiology.

Notes

This text is a modified and abbreviated English version of Albuquerque and Medeiros (2013).

[1]More specifically, the authors discuss a biocultural ecology to account for the human dimension in the traditional ecological approach.

[2]This perspective makes sense in light of Niche Construction Theory, which is still neglected and not well known. All living beings (including humans), through their activities and decisions, modify their own niches and those of other organisms. In altering niches, organisms would also be altering natural selective pressures (see Odling-Smee et al. 2003).

[3]These premises are inspired by the fundamental ideas of behavioral ecology (see Jeanne 1998). However, in behavioral ecology, a behavior is considered adaptive when it generates a positive impact on the fitness of its descendants. It is difficult, but not impossible, to measure such an impact when we work through the issues of interest in ethnobiology.

Acknowledgements

To CNPq for the financial support and research productivity scholarship granted to the first author. The authors would like to thank the reviewers for their comments that help improve the manuscript.

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