2 METHODS OF ETHNOBOTANICAL RESEARCH

Horák, M.

Plant identification in ethnobotany includes methods which the field of investigation borrowed from various disciplines such as botany, anthropology, linguistics, ecology, genetics and economics. Field-work, participant observation, random screening, questionnaire, interview, taxonomic collecting (sampling by botanical family) are the most typical, although the range of methods can be wider (Martin, 2004).

An interdisciplinary approach is the main contribution of ethnobotany in documenting traditional indigenous botanical knowledge. Among the publications where integrative approaches and basic theories are explained, one finds the seminal works of Conklin (1967) and Berlin, and of Breedlove & Raven (1973). Hypotheses linking ethnobotany, ecology and evolution are included in Johns (1996). Some authors (Phillips & Gentry, 1993a, 1993b; Reyes-García *et al.*, 2006; Galeano, 2000) stress the necessity for the use of quantitative techniques. However, the requirement for quantification is a relatively old idea in ethnobotany (Kroeber, 1920; Albuquerque, 2009), and its importance is growing along with the recognition of ethnobotanical research in global strategies of biodiversity conservation.

One study, showing how local knowledge can be measured, analysed documents from ethnobotany (64 articles and reviews and 4 books published between 1995 and 2009 in total) that used quantification. It showed the nature of quantitative research and the use of quantitative indices (a total of 87 different quantitative techniques were recorded based on the two central issues) (Franco *et al.*, 2011: 211–230).

The quantitative approach is needed to address issues such as the species extinction, depletion of natural resources, and impacts of the use of plants. But ethnobotany is also popular among scientists who are interested in ethical and social implications and who prefer qualitative methods because they provide solutions to complex social or environmental problems. A combination of both approaches, strengthening the interdisciplinary character of the discipline, is necessary, if ethnobotany is to respond to the growing demand for highly efficient solutions and generate any general principles. Moreover, the same theme can usually be examined using both methods (de Albuquerque & Hanazaki, 2009: 653–656).

Using a quantitative approach, the researcher can examine the variables (e.g. age, gender, occupation) that influence knowledge about plants in any given community. But this kind of research also has its limitations on the study of sample sizes. Also, the accuracy, reproducibility, and comparability of the results may represent a serious issue (Reyes-García *et al.*, 2006).

Current work in ethnobotany involves three main types of research: descriptive, causality, and diagnostic, each of them based on different techniques. In the first category, the administration of semi-structured interviews is commonly used because in this way data about the plants of a given community can easily be collected (Kadiri, Adekunle & Ayodele, 2010).

A significant factor in descriptive research is the clarity of the inclusion criteria of the interviewees (e.g. age, sex, ethnicity, type and stage of disease, the subject's previous treatment history, and the presence or absence of other medical conditions). Their main advantage is that they allow a rapid inventory of useful flora in the area. However, without an adequate theoretical background, they tend to present relatively weak scientific reflections resulting from generalization.

The second category, causality studies, is focused on the determination of factors that could explain the use and knowledge of plants (Galeano, 2000; Phillips & Gentry, 1993a,b). Although they can be relevant in ecological or anthropological hypothesis testing, causality studies usually suffer from a small number of participants and the application of inadequate analytical tools.

The third category, diagnostic studies, deals with the efficiency and validity of methods and techniques; it is quite new to ethnobotanical investigations (Reyes-García *et al.*, 2006). Safety research is an example of this and is based on the combined information obtained

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from a systematic reading of the literature. It searches for laboratory-based pharmacological studies prioritizing plants for further research, etc. (Willcox *et al.,* 2011). In this kind of research, critical reflections on the methods used and the basic design of the study must be carried out; otherwise the results may be incorrect.

Recent work in ethnobotany has focused on confronting so-called cultural significance indices (CSI) or relative cultural importance indices (RCI), such as "use value" to calcu-late the value of each plant species to human groups.[6] These approaches can provide data amenable to hypothesis-testing, statistical validation, and comparative analysis (Da Silva, 2006). On the other hand, measuring local experience with diversity indices suggests that all species have equal local importance, which can be misleading without accurate data analysis (Hoffman & Gallaher, 2007).

In recent years, there has also been a proliferation of texts focusing on the methodology of ethnobotanical research (Martin, 2004; Cotton, 1996; Alexiades & Sheldon, 1996). Scientific writing manuals recommend authors not to cite second hand references and encourage them to consult the source directly (Kida, 2006). Mcclatchey (2006) warns against the identification of biological material problems; problems originating in contextualization of research; language problems, etc. Theoretical problems on which any project is based must be also considered.

The absence of a coherent and unifying theory in ethnobotanical papers is well known, despite the fact that many are available, e.g. plant apparency theory (Phillips & Gentry, 1993a, b), theory of evolution (Heinrich *et al.,* 2006), etc. Also, simple faults in methodology sometimes spoil very good and inspiring ideas, and together with over-simplified interpretations of results represent one of the most common mistakes of that authors make.

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6 Value is conceived here as a non-monetary concept (A/N).

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