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Review

Review on the importance of documenting ethnopharmacological information on medicinal plants

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This paper reviews and discusses the importance of documenting ethnopharmacological information on medicinal plants. The literature review was done by collecting relevant information from journal articles, workshop proceedings, books and electronic resources. The review sums up the importance of documenting the indigenous traditional knowledge on medicinal plants as being a vehicle for; (i) preserving cultural heritage, (ii) ethnopharmacological bases of drug research and (ii) preserving of biological diversity.

Key words: Ethnopharmacology, indigenous knowledge, medicinal plants, biological and diversity.

INTRODUCTION

Local knowledge of indigenous peoples includes information about the ecosystem in general, but also about specific plants used as medicine, food, building material and the like (Leonti et al., 2003). Establishing the historical depth of medicinal plant use is relevant from a variety of perspectives. Not only would it show definitely that indigenous cultures have an in depth knowledge of certain botanical taxa, which has been transmitted over centuries prior to it becoming important in the context of developing novel pharmaceuticals, but as importantly, such research would demonstrate the historical development of an intricate relationship between a culture and its environment (Posey, 2002).

The ethnophamacological information of medicinal plants is fast disappearing and this is more pronounced in industrialized countries, the erosion of popular information on plants is much faster than in developing ones (Abebe, 1996). In view of the rapid loss of such knowledge, its documentation as well as a better understanding of its botanico-historical roots has become an essential task of ethno-allied disciplines (Leonti et al., 2003). It is against this backdrop that the current paper reviews and discusses the importance of documenting such vital knowledge for the mutual benefit of the current and future generations.

IMPORTANCE OF DOCUMENTING ETHNOPHARMACOLOGICAL INFORMATION

Preserving cultural heritage

People and knowledge of their environment. Peoples around the world possess unique knowledge of the natural resources on which they depend, including tremendous botanical expertise. Indigenous peoples are the "faculty", keepers of the cumulative knowledge of genera-tions; the plants they utilize are the "stockroom" of potential medicines. Less than 1% of indigenous cultures have been surveyed for their knowledge of medical plants and other natural products in the world (Prance, 2000).

Researches show that the indigenous knowledge of medicinal plants by human being is decreasing in alar-ming rate. The main reasons that contribute in the loss of indigenous knowledge are rapid land degradation such as accelerated destruction of forests, people's access to modern medicine and exposure to modern culture, and acculturation (adoption of modern culture) (Kong et al., 2003; Shrestha and Dhillion, 2003). For instance, in the industrialized countries such as Western Europe, this knowledge is disappearing at a high rate, because of accelerated acculturation together with the depopulation of rural zones. This shows that the passing down of cus-toms from generation to generation is now in imminent danger of disappearance (Bonet and Valles, 2003)

Status of indigenous knowledge on medicinal plants in Ethiopia: Indigenous knowledge of medicinal plants in Ethiopia is unevenly distributed among community mem-bers (Asfaw, 2001). The distribution of knowledge and services are hierarchically placed. Services are obtained from the family, the neighborhood, the village or beyond (Fassil, 2005). In Ethiopia, the loss of indigenous knowledge is not too far from developed countries. The vast knowledge on traditional uses of plants is not fully documented and

most of the knowledge is conveyed from generation to generation by word of mouth. This process together with the increasing acculturation, mobility and displacement of communities due to different factors (famine, war etc.), secretive nature of traditional knowledge and skills, and the negligence of the contemporary generation to acquire the knowledge on traditional medicine (TM) due to expansion of modern education and to some extent modern medicine, puts to question the future of the cultural heritage of the country which was known and practiced for centuries (Addis et al., 2001).

Need for knowledge on medicinal plants: Medicinal plants and knowledge of their use are a thread that links education and knowledge institutions, health and population issues, sustainable development, environmental and cultural issues, gender, and rural, urban and private sector strategies (World Bank, 2001) . In order to conserve traditional medicine knowledge, it is necessary that inventories of plants with therapeutic value are carried out, and the knowledge related to their use documented in systemic studies. These studies can have other values too for society besides conserving traditional knowledge, for they can help to identify plants with market potential that can generate incomes for local communities. Generation of incomes for local communities is seen as an important motivation for the conservation of local species (Tabuti et al., 2002). Hence, documentation of cultural heritages as a whole and ethnopharmacological information of medicinal plants of the country in particular is one of the ways in preserving the indigenous knowledge of the people on medicinal plants before it is lost irretrievably.

Ethnopharmacological basis of drug research

The use of plants for health purpose started long time ago, probably at the first moment when a human being got sick. Some 3000 years B.P, humankind was well aware of the medicinal properties of some plants growing around him (Sofowora, 1982) . The use of plants to cure diseases and relieve physical sufferings has started from the earliest times of mankind's history (Hill, 1989). Balick and Cox (1996) observed that in so many cases, the sources of important pharmaceuticals are plants being used by indigenous people. In Cotton (1996), it is more explained that the use of plants as medicine by traditional people has laid basis for the discovery of modern medicine and 'The American Shaman Inc.' is mentioned as an example of company that has focused on traditional medical systems in drug discovery programs.

Medicinal plants are important element of indigenous medicinal systems worldwide. Ethnopharmacological surveys provide the rationale for selection and scientific investigation of medicinal plants, since some of these indigenous remedies have successfully been used by significant numbers of people over extended periods of time (Geerlings, 2001). The importance of traditional knowledge systems in the drug discovery process is exemplified by the isolation of artemisinin from the herb sweet wormwood (*Artemisia annua* or Qing Ho). This plant was used in traditional Chinese herbal medicine for over 2,000 years for the treatment of fever and malaria, and was rediscovered by Chinese scientists in the 1970's (Brouwer et al., 2009). Historically, botanicals have been our most fruitful arena in the search for new medicine. Searching new drug from traditionally used medicinal plants can therefore be the shortest path to success. In the search for new medicines, the average success rate for identifying useful medicines from plants is one in 125 (McCaleb, 1997). The success rate for new drugs from randomly synthesized chemicals is only one in 10,000 (Chadwick and Marsh, 1994). Slish et al. (1999) studied traditionally used vasoactive medicinal plants and based on their result have suggested that ethno-directed collection is more efficient means of drug discovery than random plant screens. So looking for new medicinal compounds from natural sources, especially plants, makes a great deal of sense and leads to savings of both time and money. When native healers from indigenous societies can be recruited to assist in these efforts, the success rates are even higher.

Preserving of biological diversity

Loss of biological and cultural diversity: The loss of biological and cultural diversity is unprecedented global crisis (Wilson, 1992) and the greatest contraction of life since the end of the Mesozoic Era (sixty-five million years ago when the dinosaurs became extinct). Although prehistoric extinction spasms tended to claim mostly animals, plants too are now threatened with extinction on a large scale (Johnson, 2002) . One-fourth of all tropical plants may be wiped out in the next 30 years (John, 1992). Outside the tropics, the greatest concentration of threatened plants is found in southern Africa, where 13% of endemic plants are threatened. In southwestern Australia, a fungal disease carried by humans walking or driving through the bush endangers two-thirds of plant species (WIT, 2003). In the US, about 3,000 plants (nearly one in every eight native species) are considered in danger of extinction and more than 700 are likely to disappear in the next 10 years (Dilley, 1995). According to the 1997 International Union for Conservation of Nature (IUCN) Red List of Threatened Plants compiled by the World Conservation Union, worldwide 13.8% of vascular plants are imperiled. In addition, much of earth's biodiversity is clustered in tropical regions. Indigenous peoples populate many of these "hotspots" of diversity. Today most of the world's indigenous peoples are as imperiled as their homelands, threatened by loss of habitat and westernization. At the current rate of worldwide ecological destruction that includes extinction rate one hundred to a thousand times faster than before the arrival of Homo sapiens we may be forever losing potentially lifesaving new medicines

Johnson, 2002). The loss of biological diversity is closely connected to the loss of cultural diversity, particularly in traditional and indigenous communities (BMZ, 2009). Effects of increased demand for medicinal plants: The increased demand for medicinal plants by the majority of the people in developing countries has been met by indiscriminate harvesting of spontaneous flora including those in forests (Cunningham, 1997). This has resulted into extinction of certain plant species and others becoming endangered. Furthermore, the widespread use of TM, the tremendous expansion of international herbal products markets and the great commercial profits from TMs and plants have brought serious problems of global biodiversity loss. Enormous quantities of raw materials of medicinal plants are required by the pharmaceutical herbal production needs. As a consequence, many plants have been over collected and become endangered species. In 1997 research was conducted on African potato which indicates a slowing viral replication rate thereby slowing disease progression. After two years, this particular spe-cies has completely disappeared in the Democratic Republic of Congo (Singh, 2001).

Status and conservation of biological knowledge in Ethiopia: In Ethiopia, deforestation is occurring at an alarming rate and this is threatening much of the country's unique biodiversity (Teketay and Bekele, 1995). Approximately about 87% of the total land area above 1500 m was originally covered by dense forest, but now only 3% of the country's fully stocked natural forest remains, and that forest is disappearing at a rate of 7.5% per annum - the fastest rate of any country in the world (Gamachu, 1988). The major reasons are the increasingly intensive use of land for agricultural and livestock production, and tree cutting for fuel wood and construction materials (Teklehaimanot, 2001). In the country religious believes have played and continue to play a crucial role in biodiversity conservation. Sacred trees, groves and forests exist throughout Ethiopia, and receive various degree of protection by relatively modern religions (that is Orthodox Christians and Muslims) and traditional religions. These sites have been important to People of various ethnic groups for centuries and their main role is to provide a gathering place and a focus of unity for people of various religions and cultures. These various belief systems have contributed to the con-servation of these wooded sites through the preservation of various plant species, many of them with important socio-cultural values (Desissa et al., 2003). Hence, documenting of the ethnopharmacological information could trigger in undertaking conservational activities of these highly threaten endemic plants by the governmental or non-governmental bodies based on their potential source in seeking new medicinal active compounds.

Conclusion

In conclusion this review point out that documentation of ethnopharmacological information on indigenous knowledge of medicinal plants has broader importance. The review could trigger in undertaking ethnopharmacological surveys and conservational activities of these highly threaten endemic plants by the governmental or non-governmental bodies based on their potential source in seeking new medicinal active compounds.

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