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The traditional medicine and its effects on biological diversity: a study of medicinal plant identification and use in four communities in the south of Brazil

Introduction

Nature is not just something exterior to human beings, but a system where integrating elements, although independent from each other, strongly interact among themselves. The human species, during its evolution, became capable of inhabiting, using and exploiting different ecosystems interfering in a more or less significative way in its dynamic structure and composition.

In 1992, in Rio de Janeiro, Brazil, with representatives from 150 countries, the Rio de Janeiro Convention took place. In that event, the focus theme was the search for an equilibrated environment, common inheritance to be utilized by all human beings. In that occasion, the sovereignty rights over the biological diversity belonging to each nation were overridden. However, aspects relating to the use of this patrimony by locals, by national or multinational industries or even by scientists and researchers brought about important ethical considerations.

It is estimated that all over the world approximately 35,000 species of plants are used due to their medicinal properties. It is considered that about 90% of the biological diversity that still exists is concentrated in developing countries. The majority of the medicinal species used have not yet been sufficiently studied and/or characterized. Therefore it is evident that we are still not able to recognize the intrinsic value of this patrimony and the importance of preserving these resources for future generations.

The use of native medicinal species in developing countries constitutes the basis for the popular medicine, and it is intimately connected to the basic health care, mainly in populations with lower income.

It can be observed that many times mankind uses and misappropriates these resources as if he was the last tenant of the planet, disregarding the announcement of future that comes along. How can we make compatible the trends of social and economic progress with preservation of the ecological equilibrium? What is the role of the resources available in the ecosystems in the maintenance of health of the populations?

In all continents, independently of the level of development of their countries, it is possible to observe the effect of aggressions to the nature. The search for satisfaction of the human and social needs, direct and indirectly is generating disastrous reflexes on the environment, even where the human being is not capable of inhabit. Therefore, it is also necessary to analyze the matter in the economical, political, social and ecological level, evaluating the effect of the human being actions on the mentioned system.

What are the real motives that make countries and groups to become interested in the conservation and prospection of genetic resources in places not yet explored?

Is it fair the tireless search of aggregation of economic value to what is maintained as biodiversity?

Will the populations connected to the ecosystems have any benefit or damage?

Multidisciplinary studies based on ethical principals will certainly guide the analysis necessary to minimize the actions, aiming at the protection and the use of natural resources available in our region.

Rio Grande do Sul is a state situated at the extreme South of Brazil and presents a rich and diverse flora of medicinal plants. The use of medicinal species native from the South of Rio Grande do Sul is based on empiric knowledge accumulated over generations and

intimately related to ethnicity of the local people. The conservation and preservation of this patrimony will depend on ethically correct actions that favor the sustainable exploitation of the available resources and the keeping of the stability and integrity of the ecosystems involved.

The geo-economic region polarized by Pelotas/Rio Grande is formed by twenty six municipalities: Aceguá, Amaral Ferrador, Arroio do Padre, Bagé, Caçapava do Sul, Candiota, Capão do Leão, Cerrito, Chuí, Cristal, Herval, Hulha Negra, Jaguarão, Morro Redondo, Pedro Osório, Pelotas, Pinheiro Machado, Piratini, Rio Grande, Santa Vitória do Palmar, Santana da Boa Vista, São José do Norte, São Lourenço do Sul, and Turuçu.

This region also named "Zona Sul", has 45 628 km² of area and approximately one million inhabitants. All municipalities have social-economic links to the polarizing centers: Pelotas and Rio Grande.

Despite presenting a high urbanization rate (89%), the region has its economy based on agriculture, livestock and agro industries. The main crops are the monocultures of rice and soybeans, potato, onion and peach. The main livestock activities are cattle, swine, sheep, milk and wool production.

In the industrial sector the agro-industrial products are predominant, however it is the commerce the main generator of jobs and income.

Methodology

The aim of this study was to analyze the knowledge, the identification capacity and the characteristics of the use of medicinal plants (natives and exotic) in four communities connected to the Universidade Católica de Pelotas, situated in the extreme South of Brazil, and to start awareness programs aiming at education for the sustainable exploitation of the available genetic patrimony.

The data collection was carried out during the period from June 2001 to May 2002, through 838 questionnaires applied in a randomly and stratified way to the members of the academic communities.

Results and discussion

The Rio Grande do Sul flora is rich in medicinal plants that are widely used by the local people and stimulate ethno-botanical studies. It is still observed nowadays that the use of these plants, basis of the popular medicine in the RS, is based on empiric knowledge accumulated by the mixing of the European, indigenous and African cultures, responsible for the ethnicity of the local people. It indicates that ecological economic and social aspects of this way of acting should be analyzed under an ethical point of view.

By analyzing the data obtained it was noted that 82% of the people interviewed frequently use medicinal plants, what is close to the State average, which is about 76%.

The majority of the people interviewed were female with up to 39 years of age. It is believed that the frequency of use and the knowledge about medicinal plants by women are historically connected to the basic health care and important role of the mother in the family's health.

The most cited species by all four communities were: **marcela** (*Achyrocline satureoides*) native herbaceous, **woodwaxen** (*Baccharis sp*) native herbaceous, guaco (*Mikania sp*) native, chamomile (*Matricaria chamomilla*) exotic herbaceous, balm (*Melissa officinalis*) exotic herbaceous and **boldo** (*Peumus boldus*) exotic herbaceous. It was observed the preferences varied among communities (Table 1)

Table 1 – Frequency of use of four species in communities connected to the UCPel from Pelotas, Piratini, Arroio Grande and Santa Vitória do Palmar (2001/2002).

Place/Species*	marcela(%)	woodwaxen	quaco	boldo	chamomile
Pelotas	46	40	43	43	54
Piratini	60	46	43	43	54
Arroio Grande	36	45	45	36	36
Sta. Vitória do Palmar	78	45	57	70	61

Although the most used species are the same in the four communities, the frequency of use varied from one community to another. This is probably related to the ecosystem of the region, to cultural differences and possibly to the specific needs of each community.

The use of teas elaborated by simple infusion of fresh or dried leaves was the most frequently way of use mentioned. This fact indicates that phytotherapy is often used without any kind of control. However syrups, ointments and personal hygiene products, also mentioned in the study, probably have some kind of control over the quality of the substance used. In these cases the plants used are not necessarily obtained in their own communities.

The source of the medicinal plants is related to the community and its connection to the rural area, as well as with the ecosystem where these communities are located. However, cultivation of the plants at home and collection from the environment are the predominant sources in communities connected to the rural area, whereas in Pelotas (a city with 350,000 inhabitants) acquisition from commercial establishments is the main source (Table 2).

Table 2 – Sources of medicinal plants in four communities connected to the UCPel from Pelotas, Piratini, Arroio Grande and Santa Vitória do Palmar (2001/2002).

Place/Source (%)	Cultivation	Collection from the environment	Commercial establishment
Pelotas	3	3	19
Piratini	40	29	>2
Arroio Grande	18	18	>2
Santa Vitória do Palmar	48	35	>2

In Pelotas, a predominantly urban city, collection from the environment and cultivation at home are not significant. The main source is the commercial establishment through the “ervateiro”. The “ervateiro” is the person who has the empiric knowledge, and who collects, dries, prepares and sells to the community native or exotic medicinal plants cultivated in the region. The “ervateiro” does not have scientific knowledge, rarely refers to a plant by its scientific name, nor uses any kind of quality control in order to guarantee the safety of the plant used. Other important sources are supermarkets and specialized pharmacies, preferred by young people and persons more than 40 years old, respectively.

The communities of Piratini and Santa Vitória do Palmar have more knowledge about medicinal plants, using preferably cultivation at home and collection from the environment. The municipalities are smaller and connected to agriculture activities. This way, although the ecosystem where the communities are located varies, the characteristics related to the sources of the medicinal plants are similar.

Medicinal plants are used by the communities studied regardless of group of age, gender and activity (students, employees and faculty members) and contribute in a significative way for prevention of diseases and for maintenance of many basic health necessities in the population studied.

From this study, it was possible to evidence the need for environment educational programs in order to solve and prevent environment damage by the indiscriminative exploitation of plant resources in the region. Discussion groups and seminars were immediately organized with the aim of bringing more knowledge to the communities involved. The importance of the Universidade Católica de Pelotas as an institution that is actively helping people to become citizens, ethical professionals and socially inserted into the regional context must be emphasized. It is expected that students that took part in the program act in order to spread the knowledge acquired and that they collaborate for the conservation of the biological diversity still available.

Conclusion

To recover and to retrieve the old values, thinking in a critical way the inclusion of nature in the ethical scope is to promote a new urban culture, capable of preserving it as a reference and to recognize the real importance of the equilibrium of the environment. Only this way it will be possible to protect the natural patrimony still available, leaving it as a legacy to future generations. This is the major challenge of the environmental bioethics. This is our challenge for the XXI century.

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