
BIOPROSPECTING: A NEW WAY FOR PRESERVATION OF BIODIVERSITY

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Abstract: Globally there is a trend where people are moving to traditional medicine. The discover, withdrawal and test of biological diversity and native knowledge for commercially valuable genetic and biochemical resources, is known as bio-prospecting. The subject of bio-piracy is that some companies use these materials for products that they could benefit from. Companies use these resources to produce pharmaceutical drugs which are worth billions, but it is only right that some benefits should come back. According to an estimate, about 25% of the global pharmaceutical products find a significant amount of origin in native communities, which represent more than a 2000 billion dollar share in global market. Several of these medicinal products were discovered in one way or the other by the phenomenon of bioprospecting. The Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) created within the framework of the World Trade Organization (WTO) poses a controversial conflict between developed and developing nations. The criticism that TRIPS is nothing more than a modern medium of western imperialism encapsulates the opinion that the TRIPS is adverse to the importance of developing countries. Through national biodiversity-related laws and regulations, countries have begun to exercise their independent rights over biological resources. Many institutions and professional organizations have decided to implement research policies for natural products for their members, and these policies have legal or contractual status. In this paper we are going to highlight few famous natural products which are exploited under bioprospecting. We also highlight the requirement of a firm legal framework for the protection of biological resources of developing countries.

Keywords: Biopiracy, Bioprospecting, Developing countries, TRIPS,

Introduction : Over the past few years there has been a dramatic resurgence in interest in medicinal plants for their potential to yield useful drugs. And with the increase in global consumer demand for products labelled as 'natural', this trend is fully expected to continue. The lack of balance between providers and users of genetic resources has brought the issue of access to, and benefit-sharing from, genetic resources onto the international stage. In history the majority of the active components in medicines have been natural products [1], and natural products continue to form a productive source of new drugs [2] [3]. A wide international agreement has developed with respect to the need to protect and maintain biodiversity. Biodiversity is a requirement for the traditional medicine that much of the world depends on as well as many pharmaceutical products. Natural resources represent an important source of potential new drugs for patients, hence the preservation of biodiversity is essential in our efforts to cure diseases and save lives. Known that most drug discovery action takes place in companies in the industrial world and that most

biodiversity is found in countries of the southern hemisphere, there needs to be a means whereby access to biodiversity is possible under terms and conditions that are mutually acceptable. The unregulated collection of samples for many different purposes and for hundreds of years the United Nations produced a framework for preserving the world's biodiversity while encouraging the sustainable use of biodiversity. The historical successes in drug discovery based on natural products would suggest that there should be a continued appetite for accessing natural products for use in drug discovery programmes. Despite this, the pharmaceutical industry, in general, has reduced its use of natural products [4] and there are few current examples of large-scale programmes designed to access a wide variety of natural products collected from their native environment. Moreover, advances in techniques for manipulating microbes to produce novel chemicals make the use of locally sourced bacterial samples more attractive to industry [5]. Never-the-less, it is reasonable to ask what an appropriate price might be for biodiversity, its

conservation and its availability for bioprospecting. This is an area with much debate but little consensus [6].

Bioprospecting also includes biopiracy. Biopiracy is a condition where original knowledge of nature, originating with native peoples, is used by others for profit, without permission from and with little or no compensation or recognition to the indigenous people themselves. For instance when bioprospectors obtain a local knowledge of medicinal plants which is later patented by medical companies without identifying the fact that the knowledge is not new, or discovered by the patenter, and depriving the local community to the rights to commercial misuse of the technology that they themselves had developed.

ii. Methodology

The present investigation is based on secondary data. Information was also acquired from various web sites and articles addressing problems related to biopiracy. Additionally, many press notes have been evaluated on a regular basis. Conferences with subject experts and researchers have also been a useful source of information and have provided opportunities for exchanging views.

iii. Results And Discussion

The Maya ICBG controversy: The Maya ICBG (International Cooperative Biodiversity Group) bioprospecting argument took place in 1999-2000, when the ICBG led by Dr. Brent Berlin was blamed of being connected in unethical forms of bioprospecting by several NGOs and indigenous organizations. The ICBG aimed to document the biodiversity of Chiapas, Mexico and the ethno botanical knowledge of the indigenous Maya people in order to determine whether there were possibilities of developing medical products based on any of the plants used by the local Maya groups [7], [8].

The Maya ICBG argument was among the first to draw notice to the problems of distinguishing between benign forms of bioprospecting and unethical biopiracy, and to the difficulties of securing community participation and earlier informed approval for would-be bioprospectors [9].

The rosy periwinkle; The rosy periwinkle case dates from the 1950s. The rosy periwinkle, while native to Madagascar, had been widely introduced into other tropical countries around

the world well before the discovery of vincristine. This meant that researchers could obtain local knowledge from one country and plant samples from another. The use of the plant as a cure for diabetes was the original stimulus for research, but potential for cancer treatment were also explore. Various countries are reported as having obtained different beliefs about the medical properties of the plant [10]. The Hodgkin's lymphoma chemotherapeutic drug vinblastine is also derivable from the rosy periwinkle[11].

The neem tree: In 1994, the U.S. Department of Agriculture and WR Grace received a European patent on methods of controlling fungal infections in plants using a composition that included extracts from the neem tree (*Azadirachta indica*), which grows throughout India and Nepal [12], [13]. In 2000 the patent was successfully opposed by several groups from EU and India including the EU Green Party, Vandana Shiva, and the International Federation of Organic Agriculture Movements (IFOAM) on the basis that the fungicidal activity of neem extract had long been known in Indian traditional medicine[13]. WR Grace appealed, and lost that appeal in 2005 [14].

The Enola bean: The Enola bean is a variety of Mexican yellow bean. It is also called as after the wife of the man who patented it in 1999 [15]. The allegedly unique trait of the variety is seeds of a specific shade of yellow. The patent-holder subsequently charged a large number of importers of Mexican yellow beans. As a result export sales of these beans instantly dropped over 90% among importers that had been selling these beans for years, causing economic damage to more than 22,000 farmers in northern Mexico who depended on sales of this bean [16]. A court case was filed on behalf of the farmers, and on April 14, 2005 the US-PTO ruled in support of the farmers. An appeal was heard on 16 January 2008, and the patent was withdrawn in May 2008. An appeal to the court against the revocation was unsuccessful (Decided October 2009) [17].

Basmati rice: In 2000, the US corporation Rice Tec (a subsidiary of Rice Tec AG of Liechtenstein) attempted to patent certain hybrids of basmati rice and semi dwarf long-grain rice [18]. The Indian government gets involved and numerous claims of the patent

were invalidated. Meanwhile, the European Commission has agreed to protect basmati rice under its regulations concerning to geographical indications.

The succulent Hoodia: Hoodia, a succulent plant, originates from the Kalahari Desert of South Africa. For generations it has been known to the traditionally living San people as an appetite suppressant. In 1996 South Africa's Council for Scientific and Industrial Research began working with companies, including Unilever, to develop dietary supplements based on hoodia [19] [20]. Originally the San people were not planned to receive any benefits from the commercialization of their traditional knowledge, but in 2003 the South African San Council made an agreement with CSIR in which they would receive from 6 to 8% of the revenue from the sale of Hoodia products [20]. In 2008 after having invested €20 million in R&D on hoodia as a potential ingredient in dietary supplements for weight loss, Unilever

terminated the project because their clinical studies did not show that hoodia was safe and effective enough to bring to market [21].

Future prospects

Bioprospecting has been proposed as a probable means to support the conservation and sustainable use of biodiversity. The legal framework under the support of the United Nations is slowly being implemented by biodiversity-rich countries, but much still needs to be done if there is to be a genuine facilitation of bioprospecting. In spite of the drawbacks and allegations of bio-piracy, the bioprospecting with its potential as a rich and significant resource of new therapeutic instruments is an important tool for drug discovery and research. On the other hand, the cooperation between the pharmaceutical companies and the countries supplying the indigenous knowledge and medicinal resources should be regulated for equally beneficial relationship.

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