

Monitoring and Enforcement to prevent Gene Piracy

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Background

Gene piracy is a word that became familiarized among the public in the recent past. Therefore we have to analyze the origin of gene piracy. With the development of genetic engineering, scientists can isolate, insert, recombine, snip, re-arrange, edit, programme and produce a new biological and genetic material.

Developing countries which have higher biodiversity are the home for many important genetic materials. The indigenous knowledge on traditional medicine enhances the value of those materials. With the increasing demand, bio prospecting is a good source of revenue for both science and business. Gene piracy occurs as a result of this background.

It is regarded as piracy because the beneficial parties use the indigenous knowledge of the people to locate and understand the uses of medicinal plants etc., and then exploit them commercially, giving back little or no benefits to the source, while retaining the exclusive rights with themselves.

Gene piracy is not just the product of new science and the incorporated greed, but also of new law. The economic



stimulation for bio prospecting was supported in 1980, by a US Supreme court decision.

In 1971, an Indian microbiologist Ananda Mohan Chakraborty, as an employee of General Electric Company (GE), developed a new bacteria that could digest oil, and GE applied for a patent to the US Patent and Trademark Office (PTO) for this new mutant bacteria. After several appeals, the U.S. Supreme courts ruled that a patent should be granted. Since then many bio products have been patented in many countries which supported gene piracy.

According to a report of the World Health Organization (WHO), 70% - 90% of the world population, especially in developing countries, uses plant based remedies for their health problems. About 50% - 60% of Western drugs are derived directly or indirectly from plant materials.

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It has been estimated by American scientists that 12,000–50,000 times of testing is needed for primary isolation part for producing a new medicine. It is a very costly exercise. Development of a new drug involves extraction, isolation, testing for bio-activity, synthesizing the new drug etc. This process takes at least 10 years and costs about US \$ 250 million. But if the researches are

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aware of the particular plant and its curative properties, it will cut-off the cost by 90%. The pharmaceutical company has to follow only the clinical part and the marketing part.

Sri Lanka has a heritage of indigenous knowledge based on traditional medicinal practices, which has come down over thousands of years. The indigenous plants and derivatives that are exported are clearly not materials found by accident but are very selective and based on the indigenous knowledge associated with traditional medicines. There are hundreds of Sri Lankan plants that are subjected to patents in a number of countries such as USA, Japan, India, EU, Australia & etc.

Salacia reticulata (Kothala Himbutu) is one such example where we were able to expose the various facets of gene piracy taking place in Sri Lanka. There are large numbers of patents available on various products of this plant, and in the genus *Salacia* at present.

The number of local plant materials that are victims of bio piracy include, *Cryptolepis buchananii* (wal rukaththana), *Azadirachta indica* (Magosa/Kohomba), *Trichosanthes krilowii* (Snake gourd), *Momordica charantia* (Bitter melon), *Myristica fragrans* (Sadikka), *Nigella sativa* (Kaluduru), *Sida cordifolia* (Heen bevila), *Embelia ribes* (Walangasal), *Pongamia glabra* (Magul karanda), *Strychnos nux-vomica* (Goda kaduru), *Quercus infectoria* (Masakka), *Syzygium aromaticum* (Enasal), *Tephrosia purpurea* (Katupila), *Coscinium*



fenestratum (Weniwel), *Gymnema sylvestre* (Masbedda), *Mormodica cochinchinensis* (Thumba karawila), *Anacardium occidentale* (Kadju), *Aloe vera* (Komarika), *Cinnamomum zeylanicum* (Cinnamon), *Pterocarpus indicus* (Gammalu), *Lagerstroemia speciosa* (Murutha). These are some of the medicinal plants in which products have been patented.

In the field of horticulture, endemic *exacum* (Binara) species have been hybridized and patents obtained in USA, Denmark and Australia with the support of well known local personal. *Chirita moonii* and *Chirita walkeri* have also been pirated by Japanese horticulturists recently.

Not only the flowering plants, but micro-organisms such as *micromonospora*, *sporangium* and lichens like *Usnea barbata* have been subjected to gene piracy.

Hortonia floribunda (Wewiya) which belongs to an endemic genus, has also been pirated by top branded beauty care products under the name of 'clarins'.

Those examples show how expansion of gene-piracy has taken place in new areas of beauty culture, horticulture, agriculture etc. Unlike the general wildlife trade or bio -theft, the owner of the genetic resources loses not only the due revenue, but also the rights and the ownership in gene piracy. In cases of *Exacum*, Bitter Melon, Snake Gourd, the pirates have taken exclusive rights for the productions which have not been invented by them so far.

The issue of Jasmine rice of Thailand, Basmati (Taxamati) rice of India and Pakistan, neem issue raised by India, Agroyapatha issue of Kani tribe of India, the story of Ethiopian Endod, *Prunus africanus* of Africa, *Hoodia* issue in Africa, human cell line and *Canarium* issue in Solomon Islands, are some of the well known issues which brought the world's attention on gene piracy.



Monitoring and Enforcement

Monitoring and enforcement mechanism is based on the existing legislation. The protected plants are listed under the schedule VIII of the amended Fauna and Flora Protection Ordinance {(FFPO) Amend Act 22-2009}. Under this same legislation no plant or animal can be removed from any protected area. No animal or their parts can be exported as per the provisions under Section 40 of FFPO. Regulations may be made under Section 45 of FFPO for prohibiting or regulating the exportation of any plant.

No forest produce can be exported without a permit from the Conservator General of Forests as per the Gazette notification No. 1161/6 of 05.12.2000, published under the Forest Ordinance (Ord. No. 16 of 1907).

Certain species of fish are restricted or prohibited under the Gazette notification issued as per the provisions of section 3 of Fisheries

and Aquatic Resources Act (Act No. 02 of 1996).

Under the provisions of section 12 and schedule B of Customs Ordinance (Ord. No. 17 of 1869), Customs can enforce at entry and exit points any material which is listed as prohibited or restricted under any enactment. Customs Department as the front-line and the end-barrier organization, Custom officers have a special role to enforce the existing legislation. Biodiversity Protection Unit of Customs (BPU), is the first of its kind among the world's Customs institutions established in 1993 to control the illegal disposal of Fauna and Flora including gene-piracy.

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There are many international trade agreements which support gene-piracy. But there are reasonable approaches that can be observed in certain conventions such as Convention on Biological Diversity (CBD).

There are provisions under Article 8 of CBD for access and benefit sharing. Article 15 states "recognizing the sovereign right of states over their natural resources, the authority to determine the access to genetic resources

rests with the national governments and is subject to national legislation", access on mutually agreed terms,

Challenging patents is another option to control gene piracy. India's Turmeric case and Taxamathy rice case are such examples that can be used. Controlling the exportation of raw materials and semi raw materials (extractions) which could be subjected to gene piracy is another method. Vigilance, education, awareness and publicity among the officials and public, also can be useful in controlling gene piracy. In co-operation with certain International conventions such as CBD, Kancoon Agreements which fight for "Biodemocracy", are also useful in monitoring gene piracy.

subject to prior informed consent etc. Article 16 says that access for the transfer, fair and most favourable terms to developing countries should be on mutual agreed terms subject to patents and intellectual property rights. Article 19 of CBD states about the handling of biotechnology and distribution of its benefits, and refers to the participation in biotechnological research within developing countries which provide genetic resources. Regulations have not been formulated to legalize any of those conventions in our country.

There are many gaps in the existing local rules and regulations. There is no proper mechanism for access, benefit sharing or conservation of those resources. As a result various forms of gene piracy take place without generating the due revenue to the country.

The monitoring and enforcement will not be successful until those loopholes are filled.

It can be observed that large scale exploitation of the genetic resources is on the increase. Those who are in

the exploitation exercise take the mean advantage of the absence of proper legislation or such procedure.

Therefore it is high time to formulate legislation for access and benefit sharing of genetic resources on Mutually Agreed Terms (MAT) and Prior Informed Consent (PIC). Establishing and promoting local productions on biological resources is the best remedy to prevent gene piracy. This should be supported with fully equipped modern laboratory facilities. The second option is to have collaborative projects on proper legal agreements for the access and benefit sharing.

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Writer feels that the most important controlling mechanism is that every citizen of this country should have an idea and real patriotism on

the natural heritage of our country. People should be motivated on this.

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