# BENEFIT SHARING MODEL EXPERIMENTED BY TROPICAL BOTANIC GARDEN AND RESEARCH INSTITUTE (TBGRI), A NATIONAL CENTER OF EXCELLENCE ON TROPICAL PLANT DIVERSITY, MINISTRY OF ENVIRONMENT & FORESTS, GOVERNMENT OF INDIA


## Abstract

A lead provided by a tribal community, Kani tribe, inhabiting the Southern-Western Ghat region of Kerala State in India, relating to the anti-fatigue properties of a wild plant Trichopus zeylanicus has led to bioprospecting and development of a scientifically validated drug "Jeevni" by the Tropical Botanic Garden and Research Institute (TBGRI). The TBGRI in consultation with the tribal community has worked out an arrangement for benefit sharing. According to this arrangement, the TBGRI has agreed to share 50% of the licence fee and royalty with the tribal community.


## Background

The tropical flora of India encompasses a wide array of potential resources such as cane, reeds, bamboos and new sources of value added products, food, cosmetics, drugs, pharmaceuticals and other compounds of chemical, economic and industrial importance. Technology could be developed for the sustainable utilization of these resources for the promotion of location oriented and plant based micro-industries that convert the raw material of these resources to diversified value added products for marketing.

The Ministry of Environment and Forests, Government of India had launched an All India Coordinated Research Project on Ethnobiology (AICRPE) in 1982, with the broad objective of preserving the knowledge system of our tribal communities. The TBGRI is the Coordinating Center of this multi-institutional, multi-disciplinary action oriented research programme.

TBGRI is an autonomous body established by the Government of Kerala in 1979. It has been accorded the status of a Center of Excellence in Conservation and Sustainable Utilization of tropical plant diversity by the Ministry of Environment and Forests, Government of India.

Spread over 300 acres, the Garden System of TBGRI is reckoned as the biggest conservatory garden in Asia with over 50,000 accessions belonging to about 12,000 variants and intra specific taxa belonging to 7000 tropical plant species. The garden system includes an Arboretum, Samboosetum, Palmetum, Orchidarium and field collections of medicinal plants, wild ornamentals and lesser known wild edibles. In addition to these, there are special conservatories for rare, threatened and endemic plants,

special assorted collections of Ficus, Cycads, Ferns, Cactil and Succulents, Aquatic plants etc. The medicinal plant collection includes wild lesser known plants used by the indigenous communities. As one of the National gene bank for Medicinal and Aromatic Plants established under the aegis of the G-15 countries, TBGRI has established a field gene bank, seed bank, tissue repository and cryobank of rare and undangered medicinal and aromatic plants of tropical India.

The R&D activities of TBGRI are integrated and multidisciplinary in nature and are geared to achieve the most tangible results of conservation as well as development of value added and product oriented sustainable utilization of plant genetic resources of the region.

**Discovery of Arogyapacha - Trichopus zeylanicus**

Under the AICRPE project, in 1987, a team of scientists, undertook an ethnobotanical field study in the tribal inhabited Western Ghat region of Kerala. During this expedition, they came across an interesting ethnomedical information on a wild plant Trichophus zeylanicus, locally called as “Arogyapacha” by the Kani tribe.

In one of the field expeditions, the scientists noticed that the Kani tribals accompanying the team frequently ate some fruits which kept them energetic and agile. When asked about the source of the fruits, the Kani men were initially reluctant to reveal the information. The team convinced the Kani men that information would not be misused and that, they would conduct scientific investigation. If any marketable drugs/products got developed, the benefits accrued would be equally shared with the tribe. The Kani tribe then showed the plant from which the fruit was obtained. The plant was identified as Trichopus zeylanicus.

Trichopus zeylanicus (Family name: Trichopodaceae) has distribution in Malay peninsula, Sri Lanka, Thailand and India. In India it is found distributed in southern Western Ghats in the hills of Travancore at Thirunelvelly. The Indian species has subspecies status Trichopus zeylanicus subsp. Travancoricus.

Samples of the plant were collected for scientific investigations. Primary studies were carried out at the Ethnopharmacology Division of Regional Research Laboratory (RRL), Jammu, which was one of the networking institutions under the AICRPE programme. Pharmacological investigations of the fruit confirmed its anti-fatigue properties. Detailed chemical and pharmacological investigations showed that the leaf of the plant contained various glycolipids and some other non-steroidal compounds with profound adaptogenic and immuno - enhancing properties. Since the fruit is very small and the yield is very poor it was felt that it may not be feasible to develop any drug from the fruits. In addition to the classical method in line with modern chemical and pharmacological investigations, attempts were made to investigate this plant from the

"Pasal", "Guna", "Veerya", "Vipaka", "Prabhsra" concept with the help of Ayurvedic scholars and scientists. At the same time the Ayurvedic concepts were integrated with the modern chemical and pharmaceutical knowledge and suitable methodology particularly in evaluation of efficacy and safety of the drug was developed. By modern method of investigation it was possible to isolate an adaptogenic glycolipid compound from the leaves of the plant patent application on which in filed. The study is still continuing to develop an anti fatigue drug based on this compound. Since it will take at least 12 to 15 years to develop a modern drug from such a single compound, the team decided to develop a herbal formulation by Ayurvedic pharmaceutical methods. A number of formulations were experimented with and finally a polyherbal formulation of "Arogyapacha" was developed and it was named "Jeevni". After satisfactory clinical evaluation this herbal drug was reinamed for commercial production. WHO guidelines were followed for verifying therapeutic efficacy, safety, shelf life and fixing standards as well as manufacture of the drug.

**Benefit Sharing Arrangement**

Many pharmaceutical firms approached TBGRI for getting the licenca for the production of "Jeevni". After negotiations with various interested parties, the manufacturing licenca of "Jeevni" was transferred to the Aryavaidya Pharmacy, Colmbatore Ltd. For a licenca fee of Rs. 10 lakhs for a period of 7 years with 2.0% royalty at ex-factory sales price. Council for Scientific and Industrial Research (CSIR) norms were adopted for the technology transfer in November 1995. The TBGRI in consultation with the tribal community has worked out an arrangement for benefit sharing. According to this arrangement, the TBGRI has agreed to share 5o% of the licence fee and royalty with the tribal community.

**Spin-off benefits**

In order to meet the demand of regular supply of plant to the manufacturing unit, it needs to be grown in large quantities. Since, it is a shade loving plant, it has to be cultivated as an understorey vegetation of trees in the forests, local tribals have been encouraged to take up cultivation of "Arogyapacha" with the active cooperation of Integrated Rural Development Programme (IRDP) and Forest Department. Cultivation of these plants provides protection to the associated trees species. In addition to secure economic uplift of the tribal people in terms of employment and additional income. Thus modern economic working of the local knowledge and use of plants leads to conservation of the plant species as well as its associates. This case study clearly establishes that conservation and sustainable utilization are dependent on long-term benefits.

It illustrates the point that sharing of benefits leads to conservation and sustainable utilization of biological resources.