

**Study on important bio-economic aspects of *Aconitum heterophyllum* (Ateech), *Saussurea lappa* (Kuth), *Inula racemosa* (Pushkarmool), *Picrorhiza kurroa* (Kutaki) and *Pistacia integerrima* (Zebrawood, Kakkarsingi)**

*Submitted to*

**HIMACHAL PRADESH STATE BIODIVERSITY BOARD,**  
Vigyan Bhawan, Bemloe Shimla-171 001 (HP)

Presented by

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# Bioeconomic aspects of Medicinal Plants

- Medicinal Plants are an essential source of affordable health care for rural and urban poor
- Management of high demand medicinal plants can yield important environmental benefits – land rehabilitation, soil fertility, soil erosion control
- They are significant component of biodiversity
- The collection and sale of medicinal plants are cultural to many rural household economies
- Medicinal plants are primarily collected and used by women
- They offer a alternative source of employment
- Information regarding source and volumes of supply are generally unknown and incompatible with demand and effective use of these resources.

# Wild and Cultivated Zones of selected species

S. No.	Plant Name	Altitude	Found in HP
1.	<i>Aconitum heterophyllum</i>	1800 to 4500 m	Sissu, Chanshal, Koksar, chatru, Puikar, Katgaon, Nichar, Kalatop, Solangnala, Tokrinala, Rohru, Shilaru
2.	<i>Picrorrhiza kuroa</i>	3000 -5000 m	Grahan (Kullu), holi, kapnu, Mani-Mahesh (Chamba), Pastrutoch, Poikar, Pulga, Rohtang, Sainj, Sispora, Solangnala, Rampur
3.	<i>Inula racemosa</i>	1600 to 4200 m	
4.	<i>Sassura lappa</i>	2600 m to 3600 m	Kelong, Sissu, Udaipur
5.	<i>Pistachia integrimma</i>	600 to 2500 m	

# ***Aconitum heterophyllum***

**Common name** – Atis, avika, ativisha

**Chemical constituents:** **Diterpenoid alkaloid atisine** –major constituent  
**others include** Atidine, hetisine, heteratisine, Diterpene alkaloids,  
heterophylline, heterophylline, heterophyllidine, heterophyllisine,  
hetidine

**Total aconitine alkaloid content: 0.16-0.27 %**

**Traditional uses:** antipyretic, anti-inflammatory, antidiarrheal

**Adulterants/substitutes:** *Cyperous scariosus*, *Cyperous rotundus*,  
*Cryptocorne spiralis*



*Inula racemosa*

**Common name** – Puskarmool

**Chemical constituents:** Alntolactone, Isoalantolactone

**Traditional uses:** antipyretic, anti-inflammatory, antidiarrheal

**Adulterants/substitutes:** *Cyperous scariosus*, *Cyperous rotundus*,  
*Cryptocorne spiralis*

## *Sassurea lappa*

**Common name** – Kuth or kustha

**Chemical constituents:** Hexadectarinol, 2.5- 5%, Dehydrocostus lactone 16.7%, Elemol, 5.84 %, cyclocostunolide, dihydrocostunolide, dehydrocostunolactone

**Traditional uses:** antipyretic, anti-inflammatory, antidiarrheal

**Adulterants/substitutes:**

*Picrorrhiza kuroa*

**Common name – Kutki**

**Chemical constituents: Active Iridoid glycoside content: 1.50 -3.10 %  
others include :**

**Traditional uses:**

**Adulterants/substitutes:**

*Pistachia integrifolia*

**Common name** – Atis, avika, ativisha

**Chemical constituents:** Diterpenoid alkaloid atisine –major constituent  
**others include** Atidine, hetisine, heteratisine, Diterpene alkaloids,  
heterophylline, heterophylline, heterophyllidine, heterophyllisine,  
hetidine

**Total aconitine alkaloid content: 0.16-0.27 %**

**Traditional uses:** antipyretic, anti-inflammatory, antidiarrheal

**Adulterants/substitutes:** *Cyperous scariosus*, *Cyperous rotundus*,  
*Cryptocorne spiralis*



## **Tentative executive plan**

- Foremost requirement for the present work is the identification of zones where the medicinal plant under investigation is wild or cultivated.
- Then meeting or interacting with people who are directly involved so as to understand the trade chain and trade pattern.
- Visiting various industries that manufacture the processed product/drug/formulation will help in analyses of value chain economics from source to user industry.
- Agro-economics (harvesting, cultivation, collection, storage, processing, manufacturing, marketing practices and value addition) part of plant under investigation can also be best understood by interaction with the people who are directly involved in collection/cultivation.

# Methodology

*Aconitum*  
*heterophyllum*  
*Saussurea lappa*  
*Inula racemose*  
*Picrorhiza kurroa*  
*Pistacia integerrima*

Identification of wild/cultivated zones  
of particular species

Meeting and interaction with people in trade and  
commerce at various levels (from cultivation collection  
to the processed product)

Understanding marketing  
System/mechanism involved in trade

Industry  
(Processed  
product/drugs/formulation)

**Analyses of  
trade chain  
and trade  
pattern**

**Analyses of  
demand and  
supply  
pattern**

**Documentation on  
harvesting,  
cultivation,  
collection, storage,  
processing,  
manufacturing,  
marketing  
practices and  
value addition**

## **Interaction with them will also help us in analyses of**

- Economic feasibility of harvesting from wild and the cultivated sources and steps needed for farming of these species in different parts of the State.
- Dependence of local stakeholders on trade of medicinal plants under investigation particular.
- Population status and inventorization of areas supporting stronghold population, and estimates of quantities that can be sustainably harvested from the State.
- Documentation of indigenous uses, quality control measures
- Quality control measures, if any, employed at source as well as at industry level.
- Analyses of the market practices and policies

- Certain standardization aspects (like concentration of marker constituents, their quantification, chemical tests, storage condition etc.) of the medicinal plants under investigation also needs to be understood and disseminated to the people who are in direct/indirectly associated with the agro-economics of the medicinal plants.
- This will help in implementation of quality control measures at source and at industry level.

## **Details of the Expertise available with the Agency/Organization**

### **a) Availability of the Infrastructure (instruments):**

1. Refrigerated Centrifuge Remi CPR24/ 2013
2. HPLC with PDA detector Agilant 1200 / 2010
3. UV Spectrophotometer Thermo/ 2013
4. FTIR Cary 630/ 2013
5. Biosafety hood AMB-4, Waiometra/ 2013
6. HPTLC assembly Linomat IV, CAMAG 6

## **Few Industries in Himachal Pradesh with which We would be interacting**

- Captan international Appliances
- Alexa Biotech pvt Limited
- Him Pharm
- Ayush Herbs
- Indo Phytochem Pharmaceuticals
- Natural himalayan herbs and fruit company
- Shakti Herbs Pharmaceuticals
- Sirmour Herbolife Private limited

## **Acknowledgements**

HIMACHAL PRADESH STATE BIODIVERSITY BOARD

Vice – Chancellor, Shoolini University

Dean, School of Pharmaceutical Sciences, Shoolini University