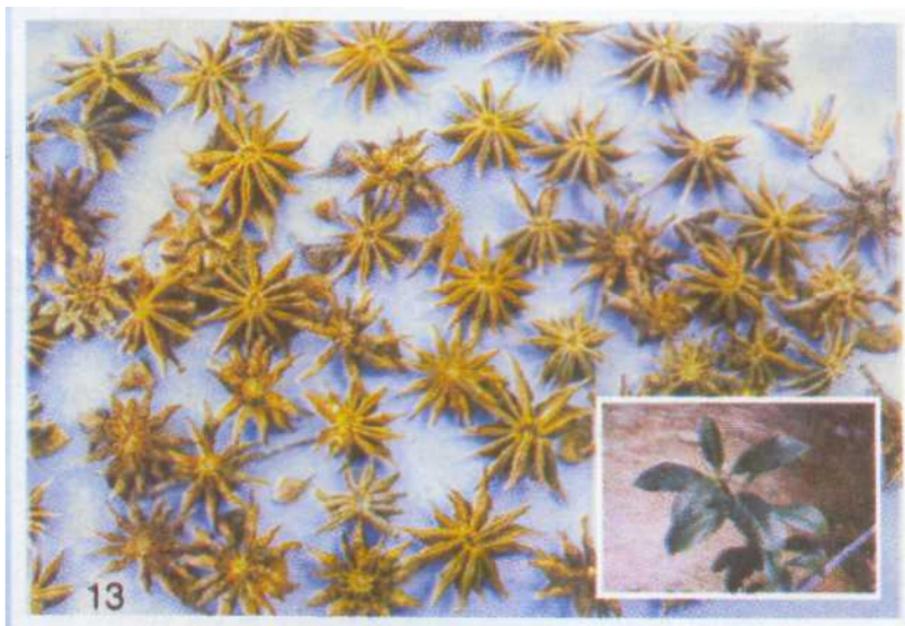


S. F. R. I. INFORMATION BULLETIN NO. 12

ECONOMIC DEVELOPMENT THROUGH

MEDICINAL PLANTS



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Government of ARUNACHAL PRADESH
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Medicinal Plants

There are over 500 species of medicinal plants reported so far from Arunachal Pradesh. They can not only cure our ailments but can also be potential source of economy to the state. It will open up avenues in cultivation, processing, packaging, marketing and industrial application. The medicinal plants are found through out the state. Some of them are much sought after by pharmaceutical companies. Quite obviously it is the rural people, particularly the unemployed woman and children, who would be benefited by these ventures. The demand for medicinal plants are ever increasing as people are more and more fascinated towards herbals. Extraction from wild has its own problems and risks. We need to cultivate for larger production and authenticity. Cultivation will help in conservation of some of our medicinal herbs that are being pushed to the danger of extinction. Cultivation of medicinal plants are not only economical but are ecologically safer too.

Where to cultivate

We have different agroclimatic conditions available in the state depending up on the altitude. Practically any type of land available can be used to cultivate one or the other medicinal plant. Thus they are useful for jhum fallows, wastelands, forest lands, river banks, marshy areas, roadsides, farm yards, home gardens and the like. There could be some species suiting to these conditions. These plants in various combinations can be used to make multitier plantation.

Your Choice

After identifying the land next step is the choice of species. Depending on the altitude of the place it may either be species of low altitude or high altitude. In general it should be economically profitable. For optimum productivity it may be a farm of single species or preferably combinations of trees, shrubs, herbs and climbers. Fortunately we have a number of species to choose. These species combination for low and high altitude are given in table. Some of the most economical plants are *Acorus*, *Andrographis*, *Aquilaria*, *Dioscorea*, *Oroxylum*, *Rauvolfia*, *Tinospora*, *Withania*, etc in low altitudes. While for high altitudes it is *Aconitum*, *Coptis*, *Gymnadaenia*, *Illicium*, *Panax*, *Picrorrhiza*, *Rubia*, *Taxus*, etc. These are described below.

1. *Acorus calamus*

(Boch, Vacha, Vayambu) This perennial herb of marshy habitats is easy to cultivate through rhizome cuttings in tropical and sub-tropical zones. The tubers are traded as it is reputed as brain tonic, coolant and drug for colic. It has high demand in the market. Commercial production from 3rd year.

2. *Andrographis paniculate*

(Kalmegh, Chiraita teeta) This bitter annual herb has hepato protective properties and is an anthelmintic and liver tonic. It is a blood purifier too. The whole plant is used. It is one of the high demand species propagated through seeds and ideal for open or partial shade localities in low altitudes. Crop ready in 4-6 months.

3. *Aquilaria agallocha*

(Agar, Sasi, Indian eagle wood) This tropical deciduous tree is very valuable for its transformed wood which on distillation yield Agar oil which has high export value. Cultivation is through seed raised seedlings. Suitable for Both open and partial shade. Artificial induction of agar in live trees is possible. Takes 8-20 years for agar development.

4. *Dioscorea floribunda*

(Kham alu) This is a torpical climber with underground tubers and bulbils. The tubers yield diosgeninan alkaloid used in pharmaceuticals. Propagation is through pieces of tubers and bulbils. Farming of this species is profitable. Inter cropping is also possible. Production from first year.

5. *Oroxylum indicum*

(Bhatghilla, Jigat) This deciduous tree is naturally seen in the secondary forests in the tropics. It is in high demand now a days for its bark used for tanning and as medicine for fever and many other ailments and as tonic. Propagation is through seeds. Bark, ready, by 10 years, can be harvested sustainably through scientific methods.

6. *Piper longum (Pipli),*

Piper brachystachyum, Pmullesua, P. peepuloides (Round Pipli) Climbers or Undershrubs. An important medicinal plants of Ayurveda. Fruits are collected and traded, for which excellent scope of marketing exist. Ideal for under planting and for partially shaded areas. Multiplication through suckers, stem cuttings and seeds. Harvest expected from 2nd to 4th year.



1. *Acorus calamus*



2. *Andrographis paniculata*



3. *Aquilaria agallocha*



4. *Dioscorea floribunda*



5. *Oroxylum indicum*



6. *Piper mullesua*



7. *Rauvolfia serpentina*



8. *Tinospora cordifolia*

7. *Rauvolfia serpentina*

(Sarpagandha) This perennial undershrub can be cultivated in the low altitudes in open as well as shady areas. The roots are reputed for the treatment of blood pressure. Roots ready to harvest form second years' onwards. Propagation through seeds and stem cuttings.

8. *Tinospora cordifolia*

(Amrit lata, Guduchi) This is a tropical climber which is used as a tonic and vitaliser. The stem is used for drug manufacture and traded. Ideal for multitier plantation. It has high demand. Propagated through stem cuttings.

9. *Whithania somnifera*

(Aswagandha) A herbaceous perennial plant, reputed as Indian Ginseng and used for vitality and vigour. Can be cultivated in open and shady areas which are well drained and dry. The roots have great marketing potential. Propagation through seeds.

10. *Aconitum ferox, Aconitum hetero-phyllum*

(Atish, Aconite) Perennial herbs of alpine and sub alpine habitats. Usually in open places. Roots used for medicine. Very good market prospects for the roots and tubers. Multiplication through seeds and tubers.

11. *Coptis teeta*

(Mishmi teeta) This is a temperate herb found only in Arunachal Pradesh. It can be cultivated as under planting. Propagation is through seeds. The roots are sold for treatment of variety of diseases.

12. *Gymnadaenia orchidis*

(Panch hath, Salam pancha) This annual herbaceous orchid produce high value medicinal tubers which are general tonic. Ideal in open places in alpine localities. Propagation through tubers.

13. *Illicium griffithii*

(Lissi) This is a high altitude tree valued for its fruits. The fruits are used as spice and medicine. Multiplication is through seeds and branch cuttings. Ideal for mixed plantations. Has good market potential. (Front cover photo)

14. Panax sikkimensis, Panax spp.

(Ginseng) Perennial herbs with tubers. Grows in temperate and sub temperate zones. Ideal for cultivation as under planting. The tubers are highly priced and has high demand. This is a rejuvenating general tonic. Propagation through seeds and tubers. Harvest by 4-8 years.

15. Picrorrhiza kurroa

(Kutki) This is a stemless perennial herb of alpine habitats. It is in high demand for a variety of herbal medicines. Can be grown in open localities and grasslands. Propagation is through seeds and suckers. Much rare in nature. Rhizome ready by 4th year.

16. Rubia cordifolia

(Manjistha) This is a perennial climber with four leaves at each node. It yields orange/red dye. It is a high demand species in the medicinal plant market. Ideal for sub-tropical and temperate zones. Prefers shady localities but possible to grow in open too, Propagation through seeds. Crop ready for harvest by 3rd year.

17. Taxus baccata

(Yew) is a temperate conifer tree. The leaves yields costly taxol. Ideal for cultivation in high altitudes as mixed planting and propagation is through seeds. Easier to multiply through stem cuttings. Has very high demand in market.

How to cultivate

Medicinal plants can be cultivated through

- Direct seed sowing
- Nursry raised seedlings
- Stem cuttings
- Root suckers
- Tubers and bulbils using appropriate techniques.

While Planting we should ensure to

- Use authentic planting materials
- Keep adequate spacing
- Provide shade as per requirement
- Avoid over watering
- Avoid excessive pesticides
- Use minimum fertilizers

The advantages

Cultivation of medicinal plants ensure
Abundance and availability
Authenticity of raw material
Easy management and harvest
Economic sustainability and annual returns
Better land use and better health of people.

Trade inquiries and further information

There is an urgent need of adequate market infrastructure in north east India. However some addresses for correspondence are provided below.

NERAMAC North East Regional Agricultural Marketing Corporation R. G. Baruah Road, Guwahati 781 005 ASSAM.
Kottakal Arya Vaidya Sala, Kottakal, Malappuram, Kerala - 676 503

Nagarjuna Pharmaceuticals, Kottayam, Kerala.

Dabur India Ltd. 8/3 Asaf Ali Road, New Delhi, 110 002.

Natural Drug and Alkaloids Co. Pvt. Ltd. 1677, Kucha Jatmart, II Floor, Dariba kalkar, P.B. No. 9416, Delhi - 51.

Sitaram Ayurvenda Pharmacy Ltd. Round South, Trissur, Kerala-680 001.

Sanjeevani Herbals, No. 1, 6th cross, Maravaneri, Selam-636007, Tamil Nadu.

The Himalaya Drug Co. Makali, Bangalore - 562 123.

Kodis Herb Co. 32, Raji Medicals Buildings, 1128, E.V.N. Road, (Opp. GH), Erode - 638 009, Tamil Nadu.

Viswanathan India Medicals, Amanjikarai, Channai - 600 049, Tamil Nadu.

Eastern and Company, 3, Southern Avenue, Calcutta - 700 026.

Global Export Pvt. Ltd., 55, Stephen House, 4B B-D Bagh East, Calcutta-700 013.

Organon (P) Limited, Himalaya House, 38, Chowringhee Road, Calcutta-700 016.

For further information:

Write to,

The Director,
State Forest Research Institute,
Van Vihar, PB No. 159,
Itanagar - 791 111, Arunachal Pradesh.
Tel. 0360-203523.
0360 - 203566, Fax. 0360 - 203523.
E.mail directorsfri @ hotmail.com

List of selected medicinal plants for multi-tier plantation.

Low altitude (Tropical and Subtropical areas) Below 1000m.

Trees : Aquilaria agallocha
Emblica officinalis
Gmelina arborea
Oroxylum indicum
Terminalia arjuna
Terminalia bellirica
Terminalia chebula
Bixa orellana

Acorus calamus
Andrographis paniculata
Catheranthus roseus
Costus speciosus
Cymbopogon citratus
Piper mullesua
Piper peepuloides
Rauvolfia serpentina
Withania somnifera

Climbers : Dioscorea floribunda
Gloriosa superba
Piper longum
Piper nigrum
Tinospora cordifolia

High altitude (temperate and Alpine areas)
Above 1000 m. Altitude.

Trees : Taxus baccata
Illicium griffithii

Herbs : Aconitum ferox
Aconitum heterophyllum
Coptis teeta
Gymnadaenia orchidis
Panax sikkimensis
Panax pseudoginseng
Panax bipinnatifida
Picrorrhiza kurroa
Podophyllum hexandrum
Valeriana jatamansi

Climbers : Rubia cordifolia



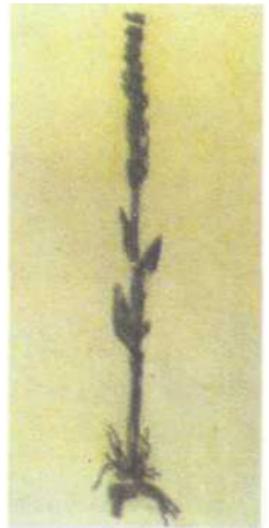
9. *Whithania somnifera*



10. *Aconitum ferox*



11. *Coptis teeta*



12. *Gymnadenia orchidis*



14. *Panax sikkimensis*



15. *Picrorrhiza kurroa*



16. *Rubia cordifolia*



17. *Taxus baccata*

DISTRIBUTION OF SELECTED MEDICINAL PLANTS IN ARUNACHAL PRADESH

- *Aquilaria agallocha*,
- *Dioscorea floribunda*
- *Oroxylum indicum*,
- ★ *Rauvolfia serpentina*,
- T *Tinospora cordifolia*,
- W *Whithania somnifera*,
- ▲ *Piper brachystachyum*,
- Y *Andrographis paniculata*,
- + *Acorus calamus*,
- C *Coptis teeta*,
- G *Gymnadaenia orchidis*,
- P *Panax sikkimensis*,
- ⊗ *Taxus baccata*,
- K *Picrorrhiza kurroa*,
- A *Aconitum ferox*,
- R *Rubia cordifolia*,
- I *Illicium griffithii*.

