Chapter-6

Assessment report of some novel medicinal plants of MP

Result of chemical analysis of

19 novel medicinal plants & their Photographs

(38 Photographs)
Chapter- 6

Assessment of some novel medicinal plants of M.P.

Ethnobotanists are mostly involved in the initial documentation of plant remedies used in traditional and popular domestic medicine. To evaluate the safety and efficacy of herbal medicine as actually practiced requires the recording of the variables that can influence the therapeutic outcome. For pharmacological and toxicological testing, the factors controlling the final amount of active compounds taken by the patient are especially critical.

Mostly topics discussed regarding ethnomedicine are:

(1). the plant common name, scientific name, intraspecific variation, voucher specimen.

(2). preparation of the medicine: plant part; collection; storage, preparation.

(3). therapy: general and adjunct, disorder treated, kind of practitioner, dosage regimen, route of administration, response to therapy, status of use.

(4). The patient.

Among modern medical ethnobotanists there is a useful and growing tendency not to be satisfied with the mere compiling of a list of botanically identified native plant names and their uses. They seek further to assess the evidence pharmacologically and medically or at least to present it with sufficient care to make it open to experimental verification (Croom, 1983).

The ethnobotanical literature generally lacks the relevant dose response data necessary for ascertaining the relative safety and efficacy of an herbal medicine. With the advances in experimental methods in phytochemistry and pharmacology, in course of time, several of the folk medicines were tested for active principles and biological activity; the successful ones were added to Indian Pharmacopoeias (Jain, 1994).

Ethnobotanical data provide us information on plants which have been experimented with for thousands of years by primitive tribes. Most of the plants on the earth are useful for men. The primitive man must have used some of them as therapeutical agents and remedial measure those things which he was able to procure most easily. The knowledge of herbs possessed by aborigines are
transferred from generation to generation. Some of the knowledge about herbs is exact and appears to be the outcomes of intelligent observation and enquiry (Kirtikar & Basu, 1981). While some knowledge of herbs require assessment. Much of the knowledge of medicinal plants by the primitive man was obtained from hunters and shepherds. We should not treat with contempt, the knowledge of herbs possessed by aborigines. There can be little doubt that their medicine men possess a remarkably accurate knowledge of the medicinal uses of the plants around them (Kirtikar & Basu, 1981).

The chemistry of Indian medicinal plants is being investigated by several chemists in different laboratories of India, as is evident from their reports published from time to time in Journals of chemical societies (Kirtikar & Basu, 1981). The medicinal plants reported need to be studied chemically and pharmacologically for their contents and efficacy (Jain & Dam, 1979). Varghese et al. (1993) conducted a case study on the Kharias and determined the quantitative approach to establish the efficacy of herbal remedies, special questionnaires were designed to interview the medicinemen and other health workers to work out the reliability rating of various plants. The biostatistical formula used for getting the reliability rating.

The objective of the present study is to find out sources of the biologically active chemical compounds and simultaneously the moisture content, carbohydrate, protein and fibre content of the part of the medicinal plant which is used as ethnomedicine. For the chemical assessment of the contents of medicinal plant materials and their bio-active principles of the following novel medicinal plants were collected from different parts of Madhya Pradesh (and Chhattisgarh). The samples were collected in the month of October & November 2001 from Jabalpur, Mandla and Hoshangabad of M.P. and Bastar district of Chhattisgarh. The fruits of Bel were collected in month of May 2001. The part of plant, which is used as ethnomedicine was separated, dried in the shade, chopped and pounded. The packets of 100 gm. each were made. The chemical assessment of the plant material was done in the laboratory of Tropical Forest Research Institute, Jabalpur from December 2001 to April 2002. The following ethnomedicinal samples of the medicinal plants were collected and analysed.
Samples of 19 Novel Medicinal Plants
Collected from:
1. Hoshangabad
2. Jabalpur
3. Mandla
4. Jagdalpur (Bastar)
Details of methodology adopted for an assessment is given in chapter 3. Results of the assessment are given on the following pages.

(A) **ROOT-** *Cyperus rotundus*, Linn. (Cyperaceae), Nagarmotha,

Tubers used in disorders of the stomach and irritation of the bowels, antihelminthic. (Fig. 6.1 & 6.2)

*Acorus calamus*, Linn. (Araceae), Buch,

Rhizome used in colic, remittent fevers, nerve tonic, dysentery of children, Bronchial secretion, asthma, diarrhoea, insectifuge, snake bite, perfumery. (Fig. 6.3 & 6.4)

*Asparagus racemosus*, Willd. (Liliaceae), Satawar, Deobadani,

Tuber is used to relieve fever, ingredient in a preparation for curing impotency, aphrodisiac. (Fig. 6.5 & 6.6)

*Chlorophyllum arundinaceum*, Bak. (Liliaceae), Pandarikand, Musli.

Tuberous roots used in curing impotency. (Fig. 6.7 & 6.8)

*Piper longum*, Linn. (Piperaceae), Pippali, Piplamul.

Roots used in chronic bronchitis, cough & cold antidote to snake bite and scorpion sting. (Fig. 6.9 & 6.10)

*Flacourtia indica*, Merr. (Flacouriaceae), Kakei, Banjogni, Banramtilla.

Roots used as tonic after delivery. (Fig. 6.11 & 6.12)

*Curculigo orchoides*, Gaertn. (Amaryllidaceae), Kalimusli,

Rhizome prescribed in piles, Jaundice, asthma, diarrhoea, gonorrhoea, considered demulcent, diuretic, tonic, aphrodisiac, used as poultice for itch and skin diseases, cuts, wounds, stops bleeding and heals the wounds. (Fig. 6.13 & 6.14)

*Tinospora cordifolia*, Willd., Miers. (Menispermaceae), Giloe, Gulancha,

Root starch is nutrient, used in chronic diarrhoea and chronic dysentery. (Fig. 6.15 & 6.16)

(B) **STEM / BARK-** *Terminalia arjuna*, W & A. (Combretaceae), Koha, Arjun, Kahawa, Kahu, Mangi, Erumaddi.

Bark decoction is used as cardiac tonic and also as astringent, twigs are used to cure blisters or ulcers of mouth, ashes of bark prescribed in scorpion sting. (Fig. 6.17 & 6.18)
(c) LEAF- *Adhatoda vasica*, Nees. (Acanthaceae), Pedavali,

Leaf used in cough, chronic bronchitis, cough & cold, asthma, rheumatism, insecticidal, antiseptic. (Fig. 6.19 & 6.20)

*Andrographis paniculata*, Nees. (Acanthaceae), Chirayata, Nialavema, Karu chirayata. Leaf (with whole plant) powdered with sarso oil (mustard oil) and applied to itching, leaves and stems powdered and made in small pills, two pills are given daily to cure fever. (Fig. 6.21 & 6.22)

*Plumbago zeylanica* Linn. (Plumbaginaceae), Cita, Cittrak,

Leaves are Nutritious & used as appetizer. (Fig. 6.23 & 6.24)

*Eclipta prostrata*, Linn. (Asteraceae), Bhringraj, Kesaraja, Ajagara, Bhangra, Mochkand, Balri. Leaves used as laxative, sources of a black stain, promotes hair growth, tonic, toothache, ulcers, wounds, scorpion sting. (Fig. 6.25 & 6.26)

*Gymnema sylvestre* R.Br. (Asclepiadaceae), Gurmar.

Leaves are used for diabetes, stimulates insulin secretion (blood sugar reducing property). (Fig. 6.27 & 6.28)

(d) FRUIT/SEED- *Aegle marmelos* Corr. (Rutaceae), Bel, Mado,

Fruit pulp is used in dysentery, gum for pasting, nutritious, cooling, digestive, jelly of fruit in amoebic dysentery. (Fig. 6.29 & 6.30)

*Helicteres isora* Linn. (Sterculiaceae), Marorphalli, Alti, Nunikaya, Pitilika, Potekarre, Potum.

Fruits are soaked in boiling mustard oil, this oil is applied externally in case of stomach complaints of children, the oil is massaged on the aching body of children. (Fig. 6.31 & 6.32)

*Mucuna pruriens*, Linn. (Papilionaceae), Baidhok, Dimpa, Sellkani, Wakmi, Kawach,

Seeds aphrodisiac, nervine tonic, scorpion sting, Stringing hairs on the pods are scrapped off with a knife, mixed in solidified sugarcane juice and made into pills to kill stomach worm in babies and calves. The worm die and are expelled. Seeds are given for improving retention of semen and for curing night dreams. (Fig. 6.33 & 6.34)
Strychnos nuxvomica Linn. (Loganiaceae), Cil, Iriyakaya, Sillasettu, Kuchiladaru, Seeds used in piles, rheumatism, skin disease, stomachache, snake bite, wounds. (Fig. 6.35 & 6.36)

Solanum indicum Linn. (Solanaceae), Bhattkatiya, Chinchurdi, Dorli., fruits edible, used in curries, seed vapours in toothache, worms. (Fig. 6.37 & 6.38)

The samples of novel ethnomedicinal plants are chemically analysed with the help of scientists of Botany Department of the Tropical Forest Research Institute (TFRI), Jabalpur.

Discussion and Conclusion

Table-6.1
RESULT OF CHEMICAL ANALYSIS

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of Species</th>
<th>Moisture content (%)</th>
<th>Carbohydrate content (%)</th>
<th>Protein content (%)</th>
<th>Fibre content (%)</th>
<th>Bio-active principles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Cyperus rotundus (root)</td>
<td>28.0</td>
<td>12.0</td>
<td>0.5</td>
<td>19.0</td>
<td>Essential present .2%</td>
</tr>
<tr>
<td>2.</td>
<td>Aegle marmelos (fruit pulp)</td>
<td>60.0</td>
<td>25.0</td>
<td>9.0</td>
<td></td>
<td>Contains amino acid, arabinose, galactose, D-galacturonic acid and rhmanose, xanthotoxol, scoparone, scopoletin, umbelliferone, marmesin, skimmim and β-sitosterol.</td>
</tr>
<tr>
<td>3.</td>
<td>Adhatoda vasica (leaf)</td>
<td>11.5</td>
<td>24.5</td>
<td>0.2</td>
<td>11.0</td>
<td>0.1% alkaloids present.</td>
</tr>
<tr>
<td>4.</td>
<td>Acorus calamus</td>
<td>21.0</td>
<td>17.0</td>
<td>2.0</td>
<td>23.0</td>
<td>0.2% essential oil</td>
</tr>
<tr>
<td></td>
<td>(rhizome)</td>
<td></td>
<td></td>
<td></td>
<td>present. Containing α and β asarone.</td>
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</tr>
<tr>
<td>5.</td>
<td><em>Asparagus racemosus</em> (root)</td>
<td>8.0</td>
<td>24.0</td>
<td>-</td>
<td>3.5</td>
<td>IV types of saponin glycosides are present.</td>
</tr>
<tr>
<td>6.</td>
<td><em>Chlorophytum arundinacium</em> (root)</td>
<td>5.7</td>
<td>34.2</td>
<td>-</td>
<td>3.2</td>
<td>Glycoside present</td>
</tr>
<tr>
<td>7.</td>
<td><em>Helicteres isora</em> (fruit)</td>
<td>12.0</td>
<td>17.0</td>
<td>9.5</td>
<td>3.1</td>
<td>The fruit cotain amyrins friedelin, lupeol and taraxerone.</td>
</tr>
<tr>
<td>8.</td>
<td><em>Mucuna pruriens</em> (seed)</td>
<td>23.0</td>
<td>12</td>
<td>19.5</td>
<td>5.2</td>
<td>Sterol and five fatty acids present in seed oil.</td>
</tr>
<tr>
<td>9.</td>
<td><em>Andrographis paniculata</em> (leaf)</td>
<td>8.5</td>
<td>20.0</td>
<td>-</td>
<td>3.5</td>
<td>β- itosterylglucoside present.</td>
</tr>
<tr>
<td>10.</td>
<td><em>Piper longum</em> (root)</td>
<td>7.0</td>
<td>16.0</td>
<td>2.5</td>
<td>4.1</td>
<td>Essential oil, stigmasteroland sterol present.</td>
</tr>
<tr>
<td>11.</td>
<td><em>Flacourtia indica</em> (root)</td>
<td>10.0</td>
<td>14.0</td>
<td>-</td>
<td>5.0</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td><em>Carculigo orchiodes</em> (root)</td>
<td>11.0</td>
<td>27.5</td>
<td>-</td>
<td>3.9</td>
<td>Glycosides present.</td>
</tr>
<tr>
<td>13.</td>
<td><em>Strychnos nuxvomica</em> (seed)</td>
<td>8.0</td>
<td>21</td>
<td></td>
<td></td>
<td>0.1% alkaloids present.</td>
</tr>
<tr>
<td>14.</td>
<td><em>Plumbago zeylanica</em> (leaf)</td>
<td>8.0</td>
<td>21.5</td>
<td>-</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td><em>Eclipta prostrata</em> (leaf)</td>
<td>10.0</td>
<td>25.5</td>
<td>-</td>
<td>3.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gymnema sylvestre (leaf)</td>
<td></td>
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</tr>
<tr>
<td>17</td>
<td></td>
<td>8.0</td>
<td>28.5</td>
<td>-</td>
<td>3.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The leaves contain hentriaphylin, resins, tartaric acid, farric acid, anthroquinone derivative and zymnemic acid. The leaves give positive tests for alkaloids.</td>
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</tr>
<tr>
<td>18</td>
<td>Solanum indicum (fruit)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>12.0</td>
<td>23.0</td>
<td>2.2</td>
<td>2.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fruits contain glycoalkaloid solasonine. 0.2% alkaloids and trace of trypsin, Diosgenin also present in the fruit.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Terminalia arjuna (bark)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.5</td>
<td>13.0</td>
<td>-</td>
<td>6.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The bark contains Friedelin, Arjunetin and glucosides.</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

In all the samples analysed belonged to different families the moisture content varies from 5.7% to 60%. The fruit pulp of Aegle marmelos Corr. contains 60% moisture while the roots of Chlorophytum arundinaceum Bak contains 5.7% moisture. The Carbohydrate content varies from 12% to 34.2%. The tubers of Chlorophytum aruninaceum Bak. contain 34.2% carbohydrate. Out of 19 samples, 8 samples contain protein. The seeds of Mucuna pruriens contain 19.5% protein. The fibres are found in almost all the samples. The fibre content varies from 2.8% to 23%. The highest fibre content i.e. 23% is found in Acorus calamus Linn. (Rhizome). The bio-active principles also determined which are shown in the Table No. 6.1. The bio-active principles are responsible for the efficacy of the drugs.

It is concluded that the ethnomedicinal properties should be verified chemically so that the efficacy of the drugs can be improved and effect of environment on the medicinal plants occuring in a particular region can be determined. Further more efficient combination of drugs can be prepared to cure
different aliments. The data about bio-active principles will also help in improving cultivation techniques of medicinal plants. The growers of medicinal plants get the price as per the percentage of ingredients in them. The international price of plant or its part is decided not only on its availability but also by the percentage of bio-active principles in it.
Fig. 6.1 Plant of *Cyperus rotundus*, Linn. (Cyperaceae), Nagarmotha

Fig. 6.2 Roots of *Cyperus rotundus*, Linn. (Cyperaceae), Nagarmotha
Fig. 6.3 Plant of *Acorus calamus*, Linn. (Araceae), Buch

Fig. 6.4 Roots of *Acorus calamus*, Linn. (Araceae), Buch
Fig. 6.5 Plant of *Asparagus racemosus*, Willd. (Liliaceae), Satawar

Fig. 6.6 Roots of *Asparagus racemosus*, Willd. (Liliaceae), Satawar
Fig. 6.7 Plant of *Chlorophytum arundinaceum*, Bak. (Liliaceae), *Safed Musli*.

Fig. 6.8 Roots of *Chlorophytum arundinaceum*, Bak. (Liliaceae), *Safed Musli*. 
Fig. 6.9 Plant of *Piper longum*, Linn. (Piperaceae), Pipamul.

Fig. 6.10 Roots of *Piper longum*, Linn. (Piperaceae), Pipamul.
Fig. 6.11 Small tree of *Flacourtia indica*, Merr. (Flacourtiaceae), Kakei

Fig. 6.12 Root of *Flacourtia indica*, Merr. (Flacourtiaceae), Kakei
Fig. 6.13 Plant of *Curculigo orchoides*, Gaertn. (Amaryllidaceae), *Kalimusli*

Fig. 6.14 Roots of *Curculigo orchoides*, Gaertn. (Amaryllidaceae), *Kalimusli*
Fig. 6.15 Plant of *Tinospora cordifolia*, Willd., Miers. (Menispermaceae), Giloe

Fig. 6.16 Roots of *Tinospora cordifolia*, Willd., Miers. (Menispermaceae), Giloe
Fig. 6.17 Plant of *Terminalia arjuna*, W & A. (Combretaceae), Arjun

Fig. 6.18 Barks of *Terminalia arjuna*, W & A. (Combretaceae), Arjun
Fig. 6.19 Plant of *Adhatoda vasica*, Nees. (Acanthaceae), Pedavali

Fig. 6.20 Leaves of *Adhatoda vasica*, Nees. (Acanthaceae), Pedavali
Fig. 6.21 Plant of *Andrographis paniculata*, Nees. (Acanthaceae), Chirayata, Kalmegh

Fig. 6.22 Powered leaves of *Andrographis paniculata*, Nees. (Acanthaceae), Chirayata, Kalmegh
Fig. 6.23 Plant of *Plumbago zeylanica* Linn. (Plumbaginaceae), Citrak

Fig. 6.24 Powdered leaves of *Plumbago zeylanica* Linn. (Plumbaginaceae), Citrak
Fig. 6.25 Plant of *Eclipta prostrata*, Linn. (Asteraceae), Bhringraj

Fig. 6.26 Leaves of *Eclipta prostrata*, Linn. (Asteraceae), Bhringraj
Fig. 6.27 Plant of *Gymnema sylvestre* R.Br. (Asclepiadaceae), Gurmar

Fig. 6.28 Leaves of *Gymnema sylvestre* R.Br. (Asclepiadaceae), Gurmar
Fig. 6.29 Tree of *Aegle marmelos* Corr. (Rutaceae), Bel

Fig. 6.30 Fruit pulp of *Aegle marmelos* Corr. (Rutaceae), Bel
Fig. 6.31 Plant of Helicteres isora Linn. (Sterculiaceae), Marorphalli

Fig. 6.32 Fruits of Helicteres isora Linn. (Sterculiaceae), Marorphalli
Fig. 6.33 Plant of *Mucuna pruriens*, Linn. (Papilionaceae), Baidhok, Kawach,

Fig. 6.34 Seeds of *Mucuna pruriens*, Linn. (Papilionaceae), Baidhok, Kawach
Fig. 6.35 Small tree of *Strychnos nuxvomica* Linn. (Loganiaceae), Cil, Kuchla

Fig. 6.36 Seeds of *Strychnos nuxvomica* Linn. (Loganiaceae), Cil, Kuchla
Fig. 6.37 Plant of *Solanum indicum* Linn. (Solanaceae), Bhatkaiya

Fig. 6.38 Fruits & Seeds of *Solanum indicum* Linn. (Solanaceae), Bhatkaiya