05. MATERIALS AND METHODS:

Collection of plant materials, recording of field data and their preservation:

Intensive field work has been undertaken between January 1989 and November 1994 covering almost all the seasons of the year so as to gather detail information on each and every species found useful in herbal medicine with special reference to medico-ethnobotany of the most dominant Tribes of Subansiri district (s. l.) of Arunachal Pradesh by conducting survey of nearby 60 tribal localities and adjoining forest areas. As many as 184 field number of plants belonging to Fungi (single species); Pteridophytes (7); Gymnosperms (1) and Angiosperms (145) have been collected. Routine methods of botanical collections and herbarium techniques have been followed as suggested by Jain & Rao (1977).

Plants have been collected in its flowering and fruiting stages from its natural habitat and serially tagged with collection numbers. Plants collected in its vegetative condition have been brought under cultivation transplanted in the experimental Garden of Regional Research Centre (Ay.) Itanagar for their flowers and after studying them made into herbarium specimens. Thorough observations have been made on the spot of collection of the individual plant species and recorded field data as regards to location, natural habitat, ecological adaptations, distribution pattern, growth forms, the nature of roots or tubers, rhizomes, bulbs and corms etc., the colour of the flowers and fruits and other relevant characters which could not be observed after drying the specimens or preserved in preservatives. Smaller herbaceous plants have been collected as a whole whether it is bulbous or rhizomatous and in case of trees,
6. Sri Cheka Tam, a Nishi Medicine man of Nykom Lapang village showing the process of preparation of Medicine from the dry stem of *Indofevillea khasiana* Chatterjee "Yazang pipe" (N.)

7. A Nishi traditional healer- Sri Nabam Singda of A sector Basti, Naharlagun is diagnosing the ailments.
8. The Investigator - Mohan Singh is engaged in collecting information on Ethno-medicine from Nabam Singda.

9. Sri Beri Takik a Nishi informant showing the plant *Chromolaena odorata* used in Ethno-medicine, at A Sector, Itanagar.
shrubs, undershrubs woody herbs and climbers with representative twigs. Some flowering and fruiting twig and even whole of herbaceous plants have been collected and made bottle specimens in FAA (for 100 cc: 5 cc Formaldehyde + 5 cc Glacial acetic acid + 50% 90 cc Absolute Alcohol) preservation for critical morphological studies and for documentation in Museum in the Laboratory.

While collecting information on medico-ethnobotanical aspects, the approaches and methodologies have been followed as suggested by Schultes (1960, 1962), Jain (1964a, 1967a, 1986, 1987, 1989) and Ford (1978). Medico-ethnobotanical informations have been obtained mainly from the village chiefs (Gaon Burahs), medicine men and even from local women and forest dwellers who have the knowledge of utilisation of plants in herbal medicine. As many as several medicinemen and informants have been contacted and all are elderly people in the age group 45-60. In several occasions, a 'Nishi' or an 'Apatani' headmen has been accompanied to the forest areas for collection of medicinal plants. Some medicinal plants have also been procured which are domesticated by the local tribes for day to day use for the treatment of common ailments. Repeated queries have been made to collect the data on herbal medicine but often found the tribals particularly the medicine men or to say the traditional healers are not interested to divulge their secrecy. Arrangement of field studies have been made in such a way to stay with the informants by gaining their confidence. This has enabled to gather detailed information and recorded necessary data on the spot itself. The difficulty was also felt in communication as the inhabitants could not speak other than their own dialects. Several local school children and edu-
10. Investigator along with Apatani informants Sri Lod Tado, village Kalong and interpreter Sri Mr. Nani Challa, teacher, Bulla Middle School Ziro.

11. Sri Hage Tama & Mrs. Hage Punia showing the process of storing dried fruits & seeds of *Zanthoxylum armatum* "Yarkhung" (AP.) stored in bamboo internode for day to day use in Ethno-medicine.
cated persons have been negotiated who acted as interpreters and solved the problems. As far as possible sufficient information has been recorded for the plants as regards to (a) vernacular names (almost all except a few which tribals could not supply) (b) plant/plant parts used, (c) process of preparation of medicine-either individual plant or in combination of other plants, (d) mode of application and doses for the treatment of particular disease or diseases,(e) domestication of such plants used as herbal medicine for their subsistence and livelihood and also (f) commercial exploitation of wild plants based on market survey of selling items.

Amongst the collected plants, the delicate ones were pressed in the field itself and the rest brought to camp in plastic bags and put in in press for drying. Rainy seaons collections were pressed by spraying 10% formaldehyde on drying paper or sprinkled with Para Dichlorobenzene (PDB). Succulent plants and bulbous, rhizomatous and cormous were boiled in water till the plants turned yellow and then kept under pressure. Utmost care has been taken for drying the specimens and then poisoned with saturated solution of Mercuric chloride dissolved in Absolute Alcohol and mounted on standard Herbarium sheets (48x28 cm) with the help of just warmed glue. The printed label is affixed at right hand corner of the bottom of the sheet before mounting of specimen and later transferred field data with the collection number, date of collection, locality, distribution, short description as recorded in the field as also characters of dissected flowers made in the laboratory particularly for specimens brought under cultivation and flowered here, vernacular names and uses alongwith photographic notes and collector’s name and made the herbarium sheets ready for identification.
Identification:

Critical morphological studies have been made of the collected plant specimens. The specimens have been studied by making dissection of a number of flowerss both live and preserved. For authentic identification, a number of flora and monographs have been consulted especially of Flora of British India Vol.1-7 (Hooker 1872-1887), Flora of Assam, Vol. 1-4 Kanjilal et al, 1934-40) and Vol. 5 (Bor,1940) alongwith neighbouring floras viz. Flora of Jowai, Vol.1 & 2 (Balakrishanan, 1981 & 1983), Flora of Nongpoh (Joseph,1982); Flora of Tripura state, Vol.1 & 2(Deb, 1981 & 1983), Forest Flora of Meghalaya, Vol 1 & 2 (Haridasan & Rao 1985) etc. and finally confirmed the identification by consulting herbaria viz. Gauhati University Herbarium, Botanical Survey of India, Itanagar and Kanjilal Herbarium, Shillong (ASSAM).

One set each of identified herbarium sheets has been deposited in Gauhati University Herbarium for future studies.

Enumeration of species with their utilisation in Ethnomedicine.

The species of plants enumerated here belongs to single species of Fungus; Pteridophyte (7) ; Gymnosperm (1) and Angiosperm (145). Informations about their utilisation in Ethnomedicine has been gathered during the field trips in Subansiri district of Arunachal Pradesh by way of contacting several medicine men of the indigenous Tribes particularly Apatani & Nishi and also with their neighbouring tribe ‘Adi’.

Alphabetical arrangement of all the medicinal plants has been made providing correct nomenclature followed by the names of the Families given in
parenthesis and invariably mentioned the vernacular names which are indi-
cated with the abbreviation of the Tribes viz. ‘Nishi’ as (N.), ‘Apatani’ as
(Ap.) alongwith names found if any in Hindi (H.) and Sanskrit (S.) literature.

A brief description for easy identification of each plant species has been
provided for the present collection and followed by phenollogical data, local-
ity, date of collection and field number only as all the collections have been
made by the investigator Mohan Singh unless otherwise specified and pro-
vided also Ecological adaptation with their nature of distribution. This is fol-
lowed by the detailed usage in Ethno-medicine of the plant/plant part(s),
methods of preparation of drugs and doses applied for curing ailments by the
natives alongwith provided established reports of utilisation. And also re-
corded other information including taxonomical, New, or additional new uses
if any at the end in a ‘NOTE’.

Whereas the established reports of utilisation in medicine have been com-
piled from a number of accounts published by viz. Bentley & Trimen(1880),
Kirtikar & Basu(1935); Dastur (1952); Nadkarni (1954); Chopra et al.
(1956,1969); Wealth of India Series (1948-1976); Jain(1985); Nayar et
al.(1989) and Asolkar et al. (1992).

Moreover while collecting, a few plants which escaped attention of the
present investigator but reported elsewhere under various titles [Hynniewta
Pal (1987)] have also been incorporated with their application in Ethno-medi-
cine only, so as to bring out the total number of plant species that are found
to be in use in herbal medicine by the Tribes ‘Apatani’ and ‘Nishi’ in par-
ticular of the district of Subansiri in Arunachal Pradesh.