Central Council for Research in Ayurveda & Siddha

AN AUTONOMOUS BODY UNDER MINISTRY OF
HEALTH AND FAMILY WELFARE
(GOVERNMENT OF INDIA)

Annual Report
1983-84

CENTRAL COUNCIL FOR RESEARCH IN AYURVEDA AND SIDDHA

Annual Report, 1983-84

AN AUTONOMOUS BODY UNDER
MINISTRY OF HEALTH AND FAMILY WELFARE
(Government of India)
NEW DELHI

CONTENTS

B. SIDDHA

PREFACE

The Central Council for Research in Ayurveda and Siddha during the year under review carried out research covering the areas of Clinical Research, Drug Research, Research on Screening of Indigenous Contraceptives, Health and Medicare Research including Tribal Health Care Research and Literary and Medico-historical Research. The projects and programmes in the field of biomedical research have been given a new direction modulated to have a rural bias in tune with the new 20 point programme, so that the results of research percolate to the grass root levels. The Council has drawn projects on various clinical conditions keeping also in view the national priorities so that the research work carried out can meet national needs and interests. The Institutes/Centres/Units of the Council carried out research on wide range of clinical conditions like *Pakshaghata, Madhumeha, Apasmara, Parinamasula, Grahani, Medoroga, Ashmari, Switra, Krimiroga, Twakroga, Unmada, Sandhivatasula, Vishama jwara* in addition to conditions like *Sleepada* (Filariasis) and malaria. The work on clinical conditions taken in Siddha like *Putrunoi, Kalanjapadai, Sandhigatavata Soolai, Valigunmam, Manjal Kamalai, Venkuttam, Neerazhivu, Kakkai Valippu* were also reported. The Council has made extensive trials using AYUSH-64 in case of malaria at its Institutes/Centres. It will be seen from the following pages that the studies carried out have been encouraging and have been able to provide useful leads for wider application. In addition to the clinical research, emphasis is also made on health and medicare research and tribal health care research. These programmes envisage a closer scope not only to understand the local health problems and inter-dependent issues but also to identify and apply/advise the methods and measures suitable to surmount them. The teams of these projects maintain close relation with local folk and also educate them on principles of healthful living. It will also be seen from the reports that these teams have held group discussions at various village and community levels to educate the local folk to identify common diseases and the utilisation of the locally available herbals and other resources.

The Council carried out medico-botanical survey, inter-disciplinary research programmes envisaging pharmacognostical, chemical and pharmacological studies and also studies relating to working out standards for the Ayurvedic formulations included in the formulary of Government of India. The Council has laid stress in the field of Family Welfare Research Programme. The research in this field is expected to bring out a suitable, cheap and acceptable oral herbal pill with anti-fertility contraceptive potentiality. The studies have shown promising leads in case of a couple of herbal preparations and the Council considers a long drawn detailed studies are essential before any opinion is advanced particularly on subject of such national interest and importance. The Council has also recently undertaken in-depth studies on one of the folk herbal drug *Banjauri* with a view to assess its effectiveness in the programme since it has been observed to be in use in certain tribals for a long range of anti-fertility effect.

The Council has brought out publication titled "Pharmacognosy of Indigenous Drugs" (2 volumes) containing pharmacognostic and other inter-disciplinary information helpful to scholars and scientists engaged in the field of medico-ethno-botanical research. The scientific workers of the Council participated in the various scientific conferences, seminars and symposia in addition to publishing their work carried out in various journals of repute and also in the Council's periodicals/journals.

The council has been able to intensify commercial exploitation of the preparation of the AYUSH-64 during the current year. The Council has recently released the process of the isolation of solamarine from the leaves of *Solanum trilobatum*. The Council has filed patents for some of the preparations useful in skin disorders and also peptic conditions. The details of the research activities carried out in the different fields are reported in the following pages.

(S.K. MISHRA)
DIRECTOR

July 6, 1985.

ADMINISTRATIVE REPORT

Central Council for Research in Ayurveda and Siddha is a Society registered under the Societies Registration Act, XXI of 1860 on 30th March, 1978. During the period under report ending 31st March, 1984 the memberships of the Society and Governing Body of the Council were as under :

THE C.C.R.A.S. GOVERNING BODY :

1.	President		Shri B. Shankaranand, Union Minister for Health and Family Welfare.
2.	Vice-President	:	Mrs. Mohsina Kidwai, Union Minister of State for Health and Family Welfare.
3-5	Official Members.	:	1. Dr. S.S. Siddhu, Secretary Union Ministry of Health and Family Welfare.
			2. Shri S.K. Sudhakar, Joint Secretary, Incharge of ISM, Union Ministry of Health and Family Welfare.
			3. Shri R.R. Gupta, Joint Secretary (Financial Advisor), Union Ministry of Health and Family welfare (Up to 10.7.83)
			Shri R.M. Bhargava, Joint Secretary (Financial Advisor), Union Ministry of Health and Family welfare (11.7.1983 onwards).

6-16. Non-official Members :	1.	Kvj. Ashutosh Majumdar
	2.	Dr. S.T. Gujar
	3.	Prof. S.N. Tripathi
	4.	Dr. (Mrs.) Sharda Amma
	5.	Vd. A.D. Athawale
	6.	Dr. S. Goshal
	7.	Dr. Y.K. Sarin
	8.	Dr. S.S. Gupta
	9.	Dr. P. Gurusironmani
	10.	Dr. V. Raghupathi
	11.	Vacant
17. Member Director, National Institute of Ayurveda Jaipur.		Dr. Swami Ram Prakash
18. Director, National Institute of Siddha/Central Research Institute (Siddha).		Vacant
19. Member-Secretary.		Dr. V.N. Pandey

The Governing Body did not meet during the year under review. The tenure of the Non-Official Members expired on 4.7.83, and the Governing Body was being reconstituted.

Finance Committee

Under Rule 46 of the Rules, Regulations and Bye-laws of the Central Council, the Standing Finance Committee consisted of the following :

1.	Joint Secretary (Incharge of ISM), Ministry of Health and Family Welfare.	Shri. S.K. Sudhakar
2.	Joint Secretary (Financial Advisor), Ministry of Health & Family Welfare.	Shri R R. Gupta (Upto 10.7.83) Shri R M. Bhargava (11.7.1983 onwards)
3.	One Technical Member to represent Ayurveda	Dr. S.T. Gujar
4.	One Technical Member to represent Siddha.	Dr. V. Raghupathi
5.	Director of the Council.	Dr. V. N. Pandey

The Standing Finance Committee met once and dealt with various financial aspects of the affairs of the Council.

Official Language Implementation Committee.

The official Language Implementation Committee of the C.C.R.A.S. met twice and reviewed the progress made in the use of Hindi for Official purposes and made suitable recommendations for the progressive use of Hindi in the Council.

Scientific Advisory Committee (Ayurveda)

1.	Dr. S.T. Gujar	Chairman
2.	Vd. Sita Ram Mishra	Member
3.	Vd. K.S. Varier	Member
4.	Dr. A.J. Baxi	Member
5.	Dr. Y.K. Sarin	Member
6.	Dr. S.S. Gupta	Member
7.	Dr. R.M. Verma	Member
8.	Director, C.C.R.A.S.	Member-Secretary

Scientific Advisory Committee (Siddha)

1.	Dr. V. Raghupathi	Chairman
2.	Dr. J.R. Krishnamurthy	Member
3.	Dr. S. Ghoshal	Member
4.	Dr. R. Subramanian	Member
5.	Director C.C.R.A.S.	Member-Secretary

The Scientific Advisory Committees did not meet during the period under report as these were due for reconstitution.

Organisational Net work

There are 11 Central/Regional Research Institutes, 10 Regional Research Centres, 34 Research Units, 5 Tribal Health Care Research Projects, one Documentation and Publication Division, 12 Family Welfare Research Units and one Research Project on Amchi System of Medicine besides two Research Institutes, 9 Research Units in Siddha.

Budget Provision

The following table shows at a glance the budgetary provisions made for the Council.

	Actual expenditure 1982-83	Budget estimate 1983-84	Revised estimate 1983-84	Actual expenditure 1983-84
			(Rs. in lakhs)	
Plan	149.31	180.00	171.50	159.60
Non-Plan	130.29	145.88	155.09	142.30
F.W. Research Schemes	7.90	11.40	10.90	8.87

Technical Report-Ayurveda

Abbreviations used for Institutes/Centres/Units

S. No.	*Institutes/Centres/Units*	*Abbreviations*
1.	Central Research Institute (Ay.), New Delhi	CRID
2.	Central Research Institute (Ay.), Bhubaneshwar	CRIB
3.	Indian Institute of Kayachikitsa, Patiala	IIKP
4.	Indian Institute of Panchkarma, Cheruthuruthy	IIPC
5.	Regional Research Institute (Ay.), Calcutta	RRIC
6.	Regional Research Institute (Ay.), Patna	RRIP
7.	Regional Research Institute (Ay.), Lucknow	RRIL
8.	Regional Research Institute (Ay.), Gwalior	RRIG
9.	Regional Research Institute (Ay.), Jaipur	RRIJ
10.	Regional Research Institute (Ay.), Junagadh	RRIJu
11.	Regional Research Institute (DR), Trivandrum	RRIT
12.	Regional Research Centre (Ay.), New Itanagar	RRCI
13.	Regional Research Centre (Ay.), Gauhati	RRCGa
14.	Regional Research Centre (Ay.), Gangtok	RRCG
15.	Regional Research Centre (Ay.), Joginderaagar	RRCJo
16.	Regional Research Centre (Ay.), Jammu	RRCJ
17.	Regional Research Centre (Ay.), Hastinapur	RRCH
18.	Regional Research Centre (Ay.), Jhansi	RRCJh
19.	Regional Research Centre (Ay.), Nagpur	RRCN
20.	Regional Research Centre (Ay.), Vijayawada	RRCV
21.	Regional Research Centre (Ay.), Bangalore	RRCB
22.	Mobile Clinical Research Unit, Jamnagar	MCRUJ
23.	Mobile Clinical Research Unit, Varanasi	MCRUV
24.	Dr. A. Lakshmipati Research Unit in Indian Medicine, V.H.S., Madras	ALURIM
25.	Ayurvedic Research Unit, NIMHANS, Bangalore	ARUB

26.	Clinical Research Unit (Ay.), Hyderabad	CRUH
27.	Clinical Research Unit (Ay.), Kottakal	CRUK
28.	Clinical Research Unit, Ayurvedic and Modern Team under CDRS, Bombay	CDRSB
29.	Clinical Research Unit, Ayurvedic and Modern Team under CDRS, Pune	CDRSP
30.	Clinical Research Unit, Ayurvedic and Modern Team under CDRS, Varanasi	CDRSV
31.	Dietetics Research Scheme, R.A. Podar Ayurvedic College, Bombay	DRSB
32.	Panchakarma Research Scheme, R.A. Podar Ayurvedic College, Bombay	PRSB
33.	Amalgamated Units, Tarikhet	AUT
34.	Captain Srinivasamurthy Drug Research Institute for Ayurveda, Madras	CSMDRIAM
35.	Jawahar Lal Nehru Ayurvedic Medicinal Plants Garden Herbarium and Museum, Pune	JNAMPGHP
36.	Clinical Research Unit under FWRP, Ahmedabad	CRUFA
37.	Clinical Research Unit under FWRP, Trivandrum	CRUFT
38.	Clinical Research Unit under FWRP, Varanasi	CRUFV
39.	Clinical Research Unit under FWRP, Bombay	CRUFB
40.	Pharmacological Research Unit under FWRP, Jamnagar	PhRUFJ
41.	Pharmacological Research Unit under FWRP, Varanasi	PhRUFV
42.	Pharmacological Research Unit under FWRP, Bhubaneshwar	PhRUFB
43.	Pharmacological Research Unit under FWRP, Trivandrum	PhRUFT
44.	Pharmacological Research Unit, Grant Medical College and Haffkine Institute, Bombay	PhRUB
45.	Pharmacological Research Unit, Calcutta	PhRUC

46.	Pharmacological Research Unit, Lucknow	PhRUL
47.	Pharmacological Research Unit, Varanasi	PhRUV
48.	Pharmacological Research Unit, Jodhpur	PhRUJ
49.	Pharmacological Research Unit, Rewa	PhRUR
50	Pharmacological Research Unit, Trivandrum	PhRUT
51.	Toxicity Research Unit, Grant Medical College, Bombay	TRUB
52.	Toxicity Research Unit, Jhansi	TRUJh
53.	Chemical Research Unit, Calcutta	ChRUC
54.	Chemical Research Unit, Varanasi	ChRUV
55.	Chemical Research Unit, Hyderabad	ChRUH
56.	Chemical Research Unit, Lucknow	ChRUL
57.	Pharmacognosy Research Unit, Calcutta	PRUC
58.	Indian Institute of History of Medicine, Hyderabad	IIHM
59.	Ayurvedic Literary Research Unit, Thanjavur	LRUT
60.	Documentation and Publication Division, New Delhi	DPDD
61.	Tribal Health Care Research Project (Ay.) Andaman Nicobar	THCRPA
62.	Tribal Health Care Research Project (Ay.), Ziro	THCRPZ
63.	Tribal Health Care Research Project (Ay.), Palamu	THCRPP
64.	Tribal Health Care Research Project (Ay.), Jhabua	THCRPJ
65.	Tribal Health Care Research Project (Ay.), Dhule	THCRPD
66.	Preliminary Drug Standardisation Research Unit, Jamnagar	PSRUJ
67.	Preliminary Drug Standardisation Research Unit, Varanasi,	PSRUV
68.	Research Project in Amchi System of Medicine, Leh	RPASML
69.	Amla Cancer Hospital Trichur	ACH

Clinical Research

CLINICAL RESEARCH

The Central Council for Research in Ayurveda and Siddha as in the past has undertaken clinical as well as applied research studies using the techniques and technologies of contemporary medical science without ignoring the basic tenets of Ayurveda.

The programmes have been designed to study the therapeutic effectiveness of classical line of approach as well as single drugs and compound formulations for various common ailments. The clinical trials on *Amavata*, *Amlapitta*, *Parinamsula*, *Grahani roga*, *Krimi*, *Svasa*, *Svitra*, *Pama*, *Vicharcika*, *Pradara*, *Apasmara*, *Madhumeha*, *Slipada*, *Visama Jvara*, *Paksaghata*, *Grdhrasi*, *Hrdroga*, *Vrana* and *Arbuda* (Cancer) were taken up to assess the efficacy of the therapeutic regimens mentioned in Ayurveda. The role of Panchakarma therapy in the treatment of various types of *Vatavydhi* (Nervine and neurological disorders) was also studied.

Amavata

The studies were carried out at Central Research Institute for Ayurveda, Bhubaneswar, Regional Research Institute, Calcutta, Indian Institute of Panchakarma, Cheruthuruthy, Indian Institute of Kayachikitsa, Patiala Central Research Institute for Ayurveda, Delhi, Regional Research Institute, Patna and Regional Research Institute, Gwalior. A total of 206 cases using various types of single drugs as well as compound drugs were studied.

The following table provides at a glance results of study :-

S. No.	Therapy	Instt./ Centre	Total cases	C.R.	Mark. rel.	Mod. rel.	Mild rel.	No rel.	Drop out
1.	Sunthi guggulu	CRIB	45	11	—	26	—	—	8
2.	N. guggulu	RRIC	43	5	12	6	2	7	11
3.	(a) Vacadi-ghana Haridradi-ghana Vettumaran gutika	IIPC	35	11	5	2	2	—	15
	(b) Simhanada guggulu	IIPC	10	2	2	3	—	—	3
4.	(a) Vacadighana Indukantaghrta	IIPC	6	1	—	4	1	—	—
	(b) Haridradi-ghana Satpalaghrta	IIPC	5	—	—	1	1	—	3
	(c) Dasmula-rista, Pippalyasava, Vettumaran, Satpalaghrta	IIPC	3	—	—	3	—	—	—
5.	CRIA—6	IIKP	8	—	2	2	3	—	1
	Y.R. Guggulu		5	1	—	1	1	2	—
	Javitimisrana		4	—	—	1	2	1	—
6.	Vatariguggulu Yogarajaguggulu	CRID	32	1	5	6	12	3	5
7.	Sunthi guduchi	RRIP	7	—	—	2	4	1	—
8.	Amavatari ras	RRIG	3	—	—	1	1	—	1
		Total	206	32	26	58	29	14	47

Amlapitta, Parinamsula and other Sula group of diseases and other diseases of Gastrointestinal tract

The studies were carried out at Central Research Institute for Ayurveda, Delhi, Indian Institute of Kayachikitsa, Patiala, Clinical Research Units at Kottakkal and Hyderabad, Central Research Institute for Ayurveda, Bhubaneswar and Regional Research Institute, Jaipur using single and compound preparations utilising available modern techniques. The results of studies are as hereunder :—

S. No	Therapy	Instt./ Centre	Total cases	C.R.	Mark. rel.	Mod. rel.	Mild rel.	No rel.	Drop out
1	2	3	4	5	6	7	8	9	10
1. (a)	Indukanta ghrlta (Sodhana with samana)	CRUK	56	33	—	17	—	6	—
(b)	Mahatiktaka ghrita (Sodhana with Samana)	CRUK	48	33	—	14	—	1	—
(c)	Indukanta ghrita (Samana)	CRUK	12	5	—	5	—	2	—
d	Mahatiktaka ghrita	CRUK	11	7	—	3	—	1	—
(e)	Placebo	CRUK	45	—	—	—	—	45	—
2. (a)	Varuna (Amasaya Sodhana	CRUH	16	7	—	—	3	—	6
(b)	Bilva (Amasaya Sodhana)	CRUH		2	—	—	—	—	—

(Table contd.)

1	2	3	4	5	6	7	8	9	10
	(c) Apamarga (Amasaya Sodhana)	CRUH	76	10	—	—	39	—	27
3.	Sutasekhara rasa	CRIB	39	17	—	8	—	—	14
4.	Narikela lavana	IIKP	30	1	4	6	4	10	5
5.	Pippali Haritaki	RRIT	9	4	3	—	1	—	1
6.	(a) Satavari	CRID	9	2	1	—	1	—	5
	(b) Satavari yoga	CRID	14	3	5	2	1	—	3
	(c) Satavari yoga, Kamdudha rasa and Sutasekhara rasa	CRID	30	15	6	—	6	2	1
7.	(a) Amalaki churna	IIKP	25	6	3	4	2	3	7
	(b) Narikela lavana	IIKP	50	13	6	12	3	4	12
	Total		472	158	28	71	60	74	81

Atisara

The studies were carried out at Central Research Institute, Delhi and Regional Research Institute, Jaipur using *Arka* and *Kutaja* on 25 patients and the results of study are as hereunder.

S. No.	Therapy	Instt./ Centre	Total cases	C.R.	Mark rel.	Mod. rel.	Mild rel.	No rel.	Drop out
1.	Arka	RRCJ	26	16	1	2	—	3	4
2	Kutaja preparation	CRID	2	2	—	—	—	—	—
	Total		28	18	1	2	—	3	4

Pravahika

The studies were carried out at Regional Research Centre, Jammu, Central Research Institute for Ayurveda, New Delhi and Clinical Research Unit, Kottakkal on 25 patients using single as well as compound formulations. The results of study are as below :

S. No.	Therapy	Instt./ Centre	Total cases	C.R.	Mark. rel.	Mod. rel.	Mild rel.	No. rel.	Drop out
1.	Arka	RRCJ	17	4	2	3	—	1	7
2. (a)	Jatiphaladi curna	CRID	5	1	1	2	—	1	—
(b)	Avartini	CRID	2	2	—	—	—	—	—
3.	Kutaja etc.	CRUK	1	1	—	—	—	—	—
	Total		25	8	3	5	—	2	7

Grahani Roga

The studies were carried out at Central Research Institute (Ayurveda), Bhubaneswar, Central Research Institute (Ayurveda), Delhi, Indian Institute of Kayachikitsa, Patiala and Regional Research Centre, Jammu on 69 cases using single drugs and *parpati kalpa*.

The results of study are as below :

S. No.	Therapy	Instt./ Centre	Total cases	C.R.	Mark. rel.	Mod. rel.	Mild rel.	No. rel.	Drop out
1.	Sunthi	CRIB	21	6	—	9	—	—	6
2.	Arka	RRCJ	21	2	—	—	—	—	19
3.	Kutaja preparations etc.	CRID	11	2	2	1	1	1	4
4.	Parpati kalpa	IIKP	16	—	1	1	3	3	8
	Total		69	10	3	11	4	4	37

Krimi (Helminthic manifestations)

The studies have been carried out at Indian Institute of Kayachikitsa, Patiala, Regional Research Centre, Nagpur, Central Research Institute (Ayurveda), Bhubaneswar, Regional Research Centre, Itanagar, Regional Research Institute, Calcutta using the *Krimimudga rasa* and the results are :

S.No.	Therapy	Instt./ Centre	Total cases	C.R.	Mark. rel.	Mod. rel.	Mild rel.	No rel.	Drop out
1.	Kampillaka	IIKP	35	14	3	2	—	4	12
2.	Kampillaka	RRCN	21	9	2	—	4	1	5
3.	Kampillaka	CRIB	23	3	—	15	—	—	5
4.	Krimimudga rasa	RRCI	14	8	—	—	—	6	—
5.	Krimimudga rasa	RRIC	18	—	1	9	6	—	2
	Total		111	34	6	26	10	11	24

Bhagandara/Parikartika

A study to assess the effects of *Ksharasutra* in *Bhagandara* and *Parikartika* was taken up. The study was carried on two patients of *Parikartika* and two of *Bhagandara* . The patients of *Parikartika* showed complete relief. In the patients of *Bhagandara*, one patient showed complete relief and the other discontinued the treatment.

Arsa

The Clinical studies were carried out on 53 patients of *Arsa* to assess the effectiveness of *Arsarivati*. Seven patients reported complete relief, marked relief was reported by five patients and mild relief by two patients. No relief has been noted in three patients and 32 patients discontinued the treatment.

Svasa, Kasa, Pratisyaya and Tamaka Svasa

The studies carried out at Indian Institute of Kayachikitsa, Patiala, Central Research Institute (Ay.), Delhi, Regional Research Institute, Patna, Lucknow, Gwalior, Jaipur, Junagadh, Regional Research Centre, at Vijayawada, and Central Reseach Institute (Ay.), Bhubaneshwar using the single as well as compound formulations on 416 patients showed the following results :

S. No.	Therapy	Instt./ Centre	Total Cases	C.R.	Mark. Rel.	Mod. Rel.	Mild Rel.	No Rel.	Drop out	Death
1	2	3	4	5	6	7	8	9	10	11
1. (a)	Nardiya Lakshmi vilasa Misrana	IIKP	56	1	12	13	7	8	15	—
(b)	Svasa Kuthara Misrana	IIKP	96	1	20	21	17	8	29	—
2.	Pippali Vardha mana Krama	CRID	37	2	16	—	6	6	7	—
3.	Haridra Khanda	RRIP	64	—	13	18	23	2	8	—
4.	Soma latha curna	RRIL	23	—	—	4	12	—	6	1
5.	Vasa curna	RRIG	70	—	8	28	21	10	3	—

(Table Contd.)

1	2	3	4	5	6	7	8	9	10	11
6.	(a) Vasadigna	RRIJ	3	—	—	3	—	—	—	—
	(b) Bharangi Sunthi	RRIJ	10	—	—	2	4	—	4	—
7.	(a) Kantakari Saindhava	RRIJu	5	—	1	—	4	—	—	—
	(b) Placebo	RRIJu	6	—	—	—	2	—	4	—
8.	Lasuna Haridra	RRCV	27	11	6	—	—	—	10	—
9.	Svasa Kuthara rasa etc.	CRIB	19	2	—	12	—	1	4	—
	Total		416	17	76	101	96	35	90	1

Kasa

The studies carried out at Central Research Institute, Delhi on 15 patients of *Kasa* using *Vardhmana Pippali* showed complete relief in two Patients, marked relief in four patients, moderate relief in one patient and mild relief in three patients. No relief was noted in three patients, and two patients discontinued the treatment.

Pratisyaya

The studies were carried out on Pratisyaya at Regional Research Centre, Gangtok and Regional Research Centre, Vijayawada using *Pippali* and *Rasamanikya* with *Madhusunthi*. A total of 63 cases were studied and results of the study are as hereunder :

S.No.	Therapy	Instt./ Centre	Total Cases	C.R.	Mark. Rel.	Mod. Rel.	Mild Rel.	No Rel.	Death
1.	Pippali	RRCG	42	7	12	3	3	—	17
2.	Rasamanikya Madhusunthi	RRCV	21	10	4	—	—	—	7
	Total		63	17	16	3	3	—	24

Tvak Roga

The studies are carried out at Regional Research Institute, Calcutta, Indian Institute of Kayachikitsa, Patiala, Indian Institute of Panchakarma, Cheruthuruthy and C.D.R.S. in Bombay using compound formulations in 189 cases. The results are :

S.No.	Therapy	Instt./ Centre	Total Cases	C.R.	Mark. Rel.	Mod. Rel.	Mild Rel.	No Rel.	Drop out
1.	AYUSH-57	RRIC	113	45	—	12	41	15	—
2.	CRIA 9 and AYUSH-57	IIKP	48	—	6	6	9	8	19
3. (a)	Nimba Pancanga Gajalindajadi vati	IIPC	5	—	—	—	3	—	2
(b)	Dhatryadi curna Avagulbigadi curna	IIPC	12	2	3	1	1	—	5
(c)	Svetari Rasa + Gajalindajadi vati	IIPC	9	—	—	1	3	2	3
4.	Kakudumbara	CDRSB	2	—	—	2	—	—	—
	Total		189	47	9	22	57	25	29

Pama

The studies have been carried out on *Pama* at Regional Research Centre, Itanagar, Indian Institute of Panchakarma, Cheruthuruthy and Central Research Institute (Ay.), Delhi on 124 patients using compound

formulations. The results are as here under :

S.No.	Therapy	Instt./ Centres	Total cases	C.R.	Mark rel.	Mod. rel.	Mild rel.	No rel.	Drop out
1.	Tuvaraka d Gandhaka yoga	RRCI	87	25	15	19	6	2	20
2. (a)	Patolatri phaladi curna+ Rasothamadi lepa	IIPC	6	3	2	—	—	—	1
(b)	Patola-triphaladi curna+ Tambuladi lepa	IIPC	14	4	3	1	1	—	5
(c)	Panchatikta Kasaya + Nalapamaradi lepa	IIPC	11	3	4	3	—	—	1
3.	Kaishore-Guggulu, Gandhakadi Malhara	CRID	6	2	1	1	—	2	—
	Total		124	37	25	24	7	4	27

Vicarcika

The studies have been carried out at Regional Research Centre, Itanagar, Regional Research Institute, Trivandrum, Indian Institute of Panchakarma, Chetuthuruthy and Central Research Institute (Ay.), Delhi on 183 patients using different compound formnlations.

The results of study are tabulated as below :

S. No.	Therapy	Instt./ Centre	Total cases	C.R.	Mark. rel.	Mod. rel.	Mild rel.	No rel.	Drop out
1.	Tuvaraka and Gandhaka	RRCI	57	12	15	13	1	2	14
2.	Aragvadha	RRIT	85	31	—	41	—	4	9
3. (a)	Patol-atri-phaladi curna and Resotamadi lepa or Tambuladi lepa	IIPC	13	3	3	1	—	—	6
(b)	Pancatikta Kasaya Rasothamadi lepa and Tambooladi lepa	IIPC	8	3	1	1	—	—	3
4.	Kaishore-guggulu etc.	CRID	20	13	4	2	—	1	—
	Total		183	62	23	58	1	7	32

Stri Roga (Rakta Pradara)

The studies have been carried out at Central Research Institute (Ay.), Delhi, Indian Institute of Kayacikitsa, Patiala on 72 cases usi the compound formulation. The resnlts are :

S. No.	Therapy	Instt./ Centres	Total Cases	C.R.	Mark- rel.	Mod. rel.	Mild rel.	No rel.	Drop out
1. a)	Dhatryadi curna	CRID	30	9	8	4	2	3	4
b)	Udumbara curna	CRID	11	4	6	1	—	—	—
2.	IIKc	IIKP	31	7	1	5	1	6	11
		Total	72	20	15	10	3	9	15

Sveta Pradara

The studies have been carried out at Central Research Institute (Ay.) Delhi Regional Research Centre, Jammu and Regional Research Centre, Vijaywada using single and compouud preparations on 63 patients and the results are :

S.N.	Therapy	Instt./ Centres	Total cases	C.R.	Mark. rel.	Mod. rel.	Mild rel.	No rel.	Drop out
1.	Vata twak	RRCJ	40	4	10	9	3	1	13
2. (a)	Kukkutanda tvak bhasma	CRID	10	2	—	2	1	2	3
(b)	Pusyanuga curna	CRID	5	—	—	—	1	2	2
3.	Amalaki guggulu Triksri kvatha	RRCV	8	4	3	—	—	—	1
	Total		63	10	13	11	5	5	19

Manasaroga and Apasmara (*Ayush*-56 and *Brahmi Ghrita*)

The studies have been carried out at Regional Research Institute, Calcutta, Indian Institute of Kayachikitsa, Patiala, Central Research Institute (Ay.), Delhi, Central Research Institute for Ayurveda, Bhubaneshwar, Regional Research Centre, Jammu and Ayurvedic Research Unit, Bangalore using *Ayush-56* and *Brahmi Ghrita* on 282 patients and the results are :

S. No.	Therapy	Instt./ Centres	Total Cases	C.R.	Mark. rel.	Mod. rel.	Mild rel.	No. rel.	Drop out
1	2	3	4	5	6	7	8	9	10
1.	Ayush-56	RRIC	173	70	—	56	—	47	—
2. (a)	Ksudra Ayush-56	IIKP	9	7	—	2	—	—	—
	Brahmi-ghrita	IIKP	14	8	—	2	4	—	—

(Table Contd.)

1	2	3	4	5	6	7	8	9	10
	(b) Tivra								
	Ayush-56	IIKP	18	10	1	3	2	—	2
	Brahmi-ghrita	IIKP	19	6	2	2	9	—	—
3.	Ayush-56	CRID	41	2	—	19	—	—	20
4.	Ayush-56	CRIB	2	1	—	—	—	—	1
5.	Ayush-55	RRCJ	2	—	—	—	—	—	2
6.	Ayush-56	ARUB	4	4	—	—	—	—	—
		Total :	282	108	3	84	15	47	25

Madhumeha

The studies have been carried out at Central Research Institute (Ay.), Delhi, Indian Institute of Kayachikitsa Patiala and Dr. A. Lakshmipati Unit for Research In Indian Medicine, Madras on 105 patients using coded drugs and Bimbi. The following table provides study results :

S. No.	Therapy	Instt./ Centres	Total cases	C.R.	Mark. rel.	Mod. rel.	Mild rel.	No rel.	Drop out
1.	Ayush-82 Shilajeet	CRID	77	41	3	—	—	6	27
2.	CRIA 81 Babbularisht	IIKP	16	—	—	—	1	3	12
3.	Bimbi	ALURIM	12	—	3	—	1	1	7
		Total	105	41	6		2	10	46

Mutraghata and Mutrakrichha

The studies have been carried out at Central Research Institute (Ay.) Delhi using compound formulations on 30 patients and the results are tabulated below :

S. No.	Therapy	Instt./ Centres	Total Cases	C.R.	Mark. rel.	Mod. rel.	Mild rel.	No rel.	Drop out
1.	Goksuradi guggulu	CRID	12	2	2	3	3	1	1
2.	Kaishore guggulu	CRID	18	1	3	4	7	2	1
		Total	30	3	5	7	10	3	2

Slipada

The studies have been carried out at Regional Research Cenrte, Vijayawada, Regional Research Institute, Patna, Central Research Institute for Ayurveda, Bhubaneshwar using *Ayush-64* and other drugs on 141 cases and the results are :

S. No.	Therapy	Instt./ Centres	Total Cases	C.R.	Mark. rel.	Mod. rel.	Mild. rel.	No rel.	Drop out
1.	(a) Slipada Caps.	RRCV	56	—	11	19	8	9	9
	(b) Ayush-64	RRCV	39	—	4	2	4	11	18
2.	Ayush-64	RRIP	27	—	6	5	5	1	10
3.	Ayush-64	CRIB	8	4	—	4	—	—	—
4.	Sudharshana curna/Ghanvati and Punarnavadi yoga	CRIB	11	—	—	7	—	—	4
		Total	141	4	21	37	17	21	41

Visama Jwara/Jwara

The clinical studies were carried out in various institutes with emphasis on Malaria. The following table presents the results of study.

Vishama Jwara (Positive blood/smear cases for Malaria)

S. No.	Therapy	Instt./ Cases	Total Cases	C.R.	Mark. rel.	Mod. rel.	Mild rel.	No rel.	Drop out
1.	Ayush-64	CRID	7	3	—	2	—	1	1
2. (a)	Ayush-64	IIKP	4	1	—	—	—	2	1
(b)	Chloroquine	IIKP	3	3	—	—	—	—	—
3.	Ayush-64	RRIG	55	32	—	—	2	2	19
4.	Ayush-64	RRIJ	6	1	1	—	1	1	2
5.	Ayush-64	RRIJu	87	—	65	—	—	10	12
6.	Ayush-64	RRCI	10	10	—	—	—	—	—
7.	Ayush-64	RRCI	5	—	—	—	—	1	4
8. (a)	Ayush-64	RRCH	10	7	—	—	—	1	2
(b)	Chloroquine	RRCH	9	6	—	—	—	—	3
9.	Ayush-64	RRCN	11	4	1	2	—	—	4
10.	Ayush-64	ALURIM	91	45	—	—	—	30	16
(b)	Primaquine	ALURIM	5	5	—	—	—	—	—
		Total	303	117	67	4	3	48	64

(Non positive blood group)

S. No.	Therapy	Instt. Centres	Total cases	C.R.	Mark. rel.	Mod. rel.	Mild rel.	No rel.	Drop out
1.	Ayush-64	CRID	2	1	—	1	—	—	—
2.	Ayush-64	IIKP	41	19	—	—	—	5	17
3.	Chloroquine	IIKP	3	3	—	—	—	—	—
4.	Ayush-64	RRIJ	45	20	17	—	5	—	3
	Total		91	43	17	1	5	5	20

Sandhi-Gata-Vata

The studies have been carried out at Regional Research Institute, Calcutta and Gwalior on 48 cases using *Rasna guggulu* and *Amavatri rasa* etc.

The results are—

S. No.	Therapy	Instt. centres	Total cases	C.R.	Mark. rel.	Mod. rel.	Mild rel.	No rel.	Drop out
1.	Rasna guggulu	RRIC	59	7	10	10	4	4	24
2.	Amavatari rasa etc.	RRIG	9	—	1	1	4	1	2
	Total		68	7	11	11	8	5	26

Vrana

The studies have been carried out at Central Research Institute (Ay.), Delhi and Indian Institute of Kayachikitsa, Patiala on 98 patients.

The results are :

S. No.	Therapy	Instt. Centres	Total cases	Comp. rel.	Mark. rel.	Mod. rel.	Mild rel.	No. rel.	Drop out
1.	Kaishore guggulu Arogyavardhini and Jatyadi taila.	CRID	25	15	—	7	—	3	—
2.	Arogyavardhini and Jatyaditaila	IIKP	73	65	—	—	—	—	8
	Total		98	80	—	7	—	3	8

Hridroga

The studies have been carried out using *Pushkarmula* on 65 patients. The results indicated that six patients got complete relief, 25 patients got marked relief, 20 patients got moderate relief, four patients had mild relief and no relief was seen in 4 patients. Electrocardiographic findings were also recorded in these cases.

Kitibha

Sixteen cases of *Kitibha* have been studied at Regional Research Institute, Trivandrum. Nimbidin was administered internally, and *Lajjalu taila* (coconut oil base) was used for externals application. The results showed partial relief in two patients, mild relief in 11 patients and three did not responed.

In another group of seven cases studied at Central Research Institute for Ayurveda, Delhi with the internal administration of *Kaishore guggulu* and *Arogyavardhini* and external application of *Gandhaka Malahara*, three patients showed, complete relief, two patients showed marked and one did not respond.

Vatavyadhi

The beneficial role of *Snehana*, *Svedana*, *Vasti* and *Vireka* in the treatment of *Paksaghata*, *Khanja* and *Pangu* has been extensively studied. Certain combined herbo-mineral medications such as *Yogaraja guggulu*, *Rasna saptaka kvatha*, *Hingutriguna taila* etc. have also been put to the trial in these diseases. The studies on *Gridhrasi* to assess the efficacy of *Pancakarma* procedure consisting of *Snehana*, *Svedana* and *Mutravasti* have also been carried out. Certain other diseases such as *Kampavata* and *Saisaviyavata* have also been taken up for clinical

studies. The results of study are :

S. No.	Therapy	Instt./ Centres	Total cases	C.R.	Mark. rel.	Mod. rel.	Mild rel.	No rel.	Drop out
I. (a)	Nirgundi taila	IIPC	26	—	3	7	9	5	2
(b)	Sahachara taila	IIPC	24	—	4	4	6	3	7
(c)	Bhadradarv-adigan taila	IIPC	30	—	2	6	15	5	2
II.	Hingu trigun taila	CRIB	16	1	—	8	—	1	6
III.	Yograj guggulu and Rasnasaptak-kwath Abhyangadi	IIKP	30	—	4	4	12	5	5
IV.(a)	Vasti	PRUB	13	—	—	6	5	2	—
(b)	Nasya	PRUB	7	—	—	—	3	4	—
(c)	Vamana	PRUB	1	—	—	1	—	—	—
(d)	Virecana	PRUB	3	—	—	3	—	—	—
(e)	Snehana	PRUB	4	—	—	1	1	2	—
		Total	154	1	13	40	51	27	22

Khanja and Pangu

S. No.	Therapy	Instt./ Centre	Total cases	C.R.	Mark. rel.	Mod. rel.	Mild rel.	No rel.	Drop out
1.	Sahacharadi taila	IIPC	8	—	3	—	2	—	3
2.	Nirgundi taila	IIPC	8	—	1	2	1	1	3
3.	Bhadradarvadi gana taila	IIPC	8	—	2	1	1	1	3
		Total	24	—	6	3	4	2	9

Gridhrasi

S. No.	Therapy	Instt./ Centres	Total cases	C.R.	Mark. rel.	Mod. rel.	Mild. rel.	No rel.	Drop out
1.	Bhallataka guggulu	CRID	26	17	1	1	1	4	2
2.	Hingu trigun taila	CRIB	10	3	3	—	—	—	4
3. (a)	Sahachara taila	IIPC	5	1	2	1	—	1	—
(b)	Bhadradar-vadigana taila,	IIPC	6	—	3	3	—	—	—
(c)	Bhadradar-vadi gana taila	IIPC	5	1	—	3	—	1	—
		Total	52	22	9	8	1	6	6

Ardita

Snehana/Svedana

The trial of *Snehana* and *Svedana* (*Pinda* and *Baluka*) has been taken up on 10 cases. The observations indicate marked relief in two patients, moderate relief in four patients and mild relief in three patients while one patient did not show any improvement.

Ahara Chikitsa

The role of *Ahara*-diet in causation of diseases and their cure in very much emphasised in Ayurvedic classics. In addition to the general principle of dietetics, the details of dietetic regimen is also described in Ayurvedic Literature for each disease condition. A projects to assess the effect of dietetic regimen in certain diseases

e. g. *Jalodra,* and *Ghrhani roga* have been taken up earlier. Certain aspects of nomal physiological response to food articles have also been taken up for study. In this programme the gastric response to *Godhuma*, *Mudga* and *Kulatha* has been taken up.

Kulatha **DRUB**

Studies to assess the gastric acid secretion response of *Kulatha* has been further continued. Gastric response to *Kulatha* has been studied in six volunteers by fractional gastric analysis. *Godhuma* and *Mudga* were used as control. Gastric acid secretion was higher with both *Kulatha* and *Mudga* than *Godhuma* in 5 volunteers. Higher protein content seems to be responsible for this response. However, in one volunteer the secretion level was low and the gastric response to all three stimulents was similar and gastric acid curve was almost flat. This show that the stimulating influence of these substances is insufficient to stimulate acid secretion levels in low secretors. Studies were further continued in the hyper secretors having peak acid output ranging between 15 mE/hr to 25 mE/hr.

Arbuda (Cancer)

The malignancies of various types have remained an important killer in spite of extensive research work and technological development. The Ayurvedic treatment of this disease has been attempted sporadically. However, the research trials at clinical level have not been taken up so far. An attempt to assess the clinical efficacy of certain drug formulations in the treatment of leukaemia and certain varieties of cancer have been initiated. The leukaemia appears to affect mostly the male children. The patients were having chronicity ranging from one month to 36 months. It was also noted that most of the patients were in the terminal stage of disease. The victims of other varieties of cancer have been mostly in the age groups of 40 to 60 years. The oral cancer was not common while cancer affecting cervix, breast, phyranx etc. were more frequently observed among the cases studied.

Leukaemia

ACH

The studies to assess the clinical efficacy of *Rohitakarista, Rohitaka ghrta* and *Palasaksara,* have been taken up on 13 patients at IPD level at ACH Trichur. The observation indicate substantial

clinical improvement with this treatment. It was observed that the requirments of blood transfusion was reduced in many cases and their life span was prolonged. Inspite of preliminary encouraging results it may it may be too early to draw any conclusion.

Cancer **ACH**

The effect of a combination of *Varnuadi kvatha, Gomutra-Haritaki, Rassidurum* and *Khadiraristam* was studied on 33 patients at IPD level. The observations indicate the clinical improvement by way of reduction of pain and lessening of oozing. There has not been much change in the swelling. Further studies are in progress.

Amachi Research Unit, Leh

Clinical research in the field of Amachi System of Medicine is carried out on two diseases viz. Patsmook (Peptic ulcer) and Teekdom (Rheumatoid arthritis). Two groups consisting of 30 patients were made for Patsmook (Peptic ulcer), one group receiving Chanji Nerchik and the other receiving Aru-Norna.

Chenji Nerchik appears to be more effective than that of Arunerna. In the Ist group 22 patients got complete relief, 5 got marked relief and 3 got no relief. In the second group complete relief was observed in 15 patients, marked relief in 6 and no relief in 7.

For Teekdom (Arthritis) three groups were made each one receiving three different medicines. Results of treatment with the different drugs are as under :

S. No.	Therapy	Total patients	Com. rel.	Mark. rel.	No rel.
(a)	Sposkhyung	30	11	10	9
(b)	Sendeng Nerna	30	16	7	7
(c)	Mulchu Rinchen Jorwa	30	22	7	1

Muluchu Rinchen Jorwa on cross-therapy appears to be more effective than other two groups in the treatment of Rheumatoid arthritis (Teekdom) The study has been completed. Three more diseases viz. chooser (Eczema) and hypertension, Champa (Flue) are being taken up. Compilation on the literary aspects has been done. Clinical trials on these are being planned.

In addition to the above work 20 more herbal and mineral medicines have been identified. The Thanka has been completed. A museum is also maintained for Amchi System of Medicine. Regarding glossary work on diseases and drugs in Bodhi and Sanskrit about 127 names have been translated. 155 receipts of important drugs have been prepared, which are commonly used in the treatment of various ailments.

Statement indicating the participating projects and diseases studied

S. No.	Institute/Centre/ Unit	Name of the diseases
	1 2	3
1.	IIP, Cheruthuruthy	Amavata, Pandu, Svitra, Pama, Vicharchika, Pakshavadha, Khanja and Pangu, Gridhrasi, Saisaveeyavata.
2.	IIK, Patiala	Amalapitta, Parinamsula, Mucus colitis, Krimi, Kamala, Arsa, Swasa, Svitra, Raktapradara, Kastartava, Apasmara, Madhumeha, Vishamjwara, Pakshavadha Raktachapa, vrana.
3.	CRIA, Delhi	Amavata, Amalapitta, Atisara, Pravahika, Grahani roga, Yakritvridhi, Gulma, Swasa, Kasa, Pama, Vicharchika, Kitika, Vipadika, Raktapradara, Swetapradara, Yonivyapada, Apasmara, Madhumeha, Mutra-ghata Mutrakriccha, Vishamjvara, Gridhrasi Raktacapa, varana.
4.	CRIA, Bhubaneshwar	Amavata, Parinamsula, Grahani roga, Krimi, Apasmara, Slipada, Pakshavadha, Gridhrasi.
5.	RRI, Calcutta	Sandhigatvata, Krimi, Swasa, Svitra, Pama Apasmara, Jwara.
6.	RRI, Jaipur	Parinamsula, Swasa, Vishmajwara.

(Table Contd.)

1	2	3
7.	RRI, Trivandrum	Vicharchika, Kitiba, Vipadika, Visham-jwara.
8.	RRI, Patna	Amavata, Bhagandra, Swasa, Slipada.
9.	RRI, Gwalior	Amavata, Sandhigata vata, Vishamjwara.
10.	RRI, Lucknow	Kamala, Swasa, Raktachapa.
11.	RRI, Junagadh	Swasa, Vishamjwara.
12.	RRC, New Itanagar	Amavata, Krimi, Vicharchika.
13.	RRC, Gangtok	Pratishaya, Twakroga
14.	RRC, Jammu	Atisara, Pravahika, Grahani roga, Sveta-pradara, Apasmara, Vishamjwara.
15.	RRC, Hastinapur	Vishamjwara, Medoroga.
16.	RRC, Nagpur	Krimi, Vishamjwara
17.	RRC, Vijayawada	Swasa, Pratishyaya, Swetapradara, Slipada.
18.	CRU, Hyderabad	Parinamsula
19.	CRU, Kottakal	Parinamsula, Pravahika.
20.	CDRS, Poona	Svitra, Medoroga.
21.	CDRS, Varanasi	Hrdroga
22.	ARU, Bangalore	Apasmara, Unmada, Manasamandata, Kampavata.
23.	ALURIM, Madras	Manodvega, Madhumeha, Vishamjwara.
24.	PRU, Bombay	Pakshavadha, Kampavata, Ardita, Avaba-huka.
25.	DRU, Bombay	Ahara chikitsa
26.	ACH, Trichur	Leukaemia, Cancer.

Statement showing disease groups, number of patients studied and participating projects during the year 1983-84

S. No.	Disease Groups	No. of patients	Participating Projects
1	2	3	4
I.	**Amavata-Sandhi Gatavata :**		
	(a) Amavata	206	CRIB, RRCI, IIPC, CRID, RRIP, RRIG
	(b) Sandhi Gatavata	68	RRIC, RRIG
II.	**Amlapitta Parinamasula :**		
	(a) Amlapitta	128	CRID, IIKP
	(b) Parinamasula	344	CRUK, CRUM, CRIB, IIKP, RRIJ
III.	**Atisara, Pravahika and Grahani roga :**		
	(a) Atisara	28	RRCJ, CRID
	(b) Pravahika	25	RRCJ, CRID, CRUK
	(c) Grahani roga	53	CRIB, RRCJ, CRID
	(d) Mucous colitis	16	IIKP
IV.	**Other Udara roga :**		
	(a) Krimi	111	IIKP, RRCN, CRIB, RRCI, RRIC
	(b) Kamala	5	IIKP, RRIL
	(c) Bhagandara	4	RRIP
	(d) Arsa	53	IIKP

(Table contd.)

1	2	3	4
V.	**Svasa-Kasa-Pratishyaya :**		
	(a) Svasa	416	IIKP, CRID, RRIP, RRIL, RRIC, RRIJ, RRIJu, RRCV
	(b) Kasa	15	CRID
	(c) Pratishyaya	68	RRCG, RRCV
VI.	**Tvak roga :**		
	(a) Svitra	189	RRIC, IIKP, IIPC, CDRSP
	(b) Pama	124	RRIC, IIPC, CRID
	(c) Vicharchika	183	RRCI, RRIT, IIPC, CRID
	(d) Kitibha	23	RRIT, CRID
VII.	**Stri roga :**		
	(a) Rakta pradara	72	CRID, IIKP
	(b) Sveta pradara	63	RRCJ, CRID, RRCV
VIII.	**Manasa roga :**		
	Apasmara	28	RRIC, IIKP, CRID, CRIB, RRCJ, ARUB
IX.	**Madhumeha/Mutraroga :**		
	(a) Madhumeha	105	CRID, IIKP, ALURIM
	(b) Mutraghata Mutrakriccha	30	CRID
X.	**Slipada :**	141	RRCV, CRIB, RRIP
XI.	**Jvara/Vishamajwara :**		
	Vishamajwara	394	CRID, IIKP, RRIG, RRIJ, RRIJU, RRIT, RRCJ, RRCH, RRCN, ALURIM

(Table Contd.)

1	2	3	4
XII. Vatavyadhi :			
	(a) Pakshavadha	154	IIPC, CRIB, IIKP, PRUB
	(b) Khanja and Pangu	24	IIPC
	(c) Gridhrasi	52	IIPC, CRID, CRIB
	(d) Saisaveeya Vata	15	IIPC
	(e) Kampavata	13	ARUB, PRUB
	(f) Ardita	10	PRUB
	(g) Avabahuka	2	PRUB
XIII. Raktacapa/Hrdroga :			
	Hrdroga	65	CDRSV
XIV. Vrana :		98	CRID, IIKP
XV. Ahara Cikitsa :		17	DRUB
XVI. Arbuda :			
	(a) Leukaemia	13	AC H
	(b) Cancer	33	AC H

1	2	3	4	5	6	7	8	9
7.	RRI, Trivandrum	5850	N.I.	5850	4	72	70	6.
8.	RRI, Lucknow	8373	17731	26104	1	46	46	13.72
9.	RRI, Gwalior	7729	7498	15227	6	148	139	43.11
10.	RRI, Junagadh	4310	11398	15708	4	69	68	14.62
11.	RRI, Patna	3772	7260	11032	—	79	73	61.66
12.	RRC, Mandi	6629	9942	16571	Not yet started			—
13.	RRC, Bangalore	1535	3240	4775	Not yet started			—
14.	RRC, Vijayawada	4286	6389	10675	7	77	82	67.5

(Table Continued)

Statement of patients attended at O.P.D/I.P.D., percentage of Bed occupancy during the year 1983-84

S. No.	Institute/ Centre/Unit	No. of patients attended at OPD			No. of Patients attended at IPD			Percentage of Bed occupancy
		New	Old	Total	Carry forwarded from last year	Admitted	Discharged	
1	2	3	4	5	6	7	8	9
1.	CRIA, Delhi	16045	29501	45546	45	528	509	70.21
2.	CRI, Bhubaneshwar	8526	10028	18554	32	229	245	40.10
3.	IIK, Patiala	10051	9913	19964	39	356	342	46.60
4.	IIP, Cheruthuruthy	11105	26377	37482	37	185	190	73.95
5.	RRI, Calcutta	4000	17126	21126	10	74	73	48.95
6.	RRI, Jaipur	4669	5441	10110	13	224	223	72.17

(Table continued.)

1	2	3	4	5	6	7	8	9
22.	ARU, Bangalore	243	685	928	10	13	15	17.5
23.	ALURIM, Madras	389	544	933	—	74	74	No fixed allocation
24.	CRU (AY.), Hyderabed	—	—	—	5	89	67	—do—
25.	CRU (AY.), Kottakkal	—	—	—	15	191	190	82.3
26.	CRU(AT & MT), Varanasi	28	37	65	—	—	—	—
27.	Panchkarma Res. Unit Bombay	—	—	—	17	107	108	—
28.	Dietetics Research Unit Bombay	13	—	13	—	—	—	—
	Total	1,22,112	1,91,079	3,13,191	245	2,581	2,531	

1	2	3	4	5	6	7	8	9
15.	RRC, Nagpur	2187	8558	10745	Not yet started			
16.	RRC, Jhansi	1776	1614	3390	—	—	—	—
17.	RRC, Hastinapur	9250	6428	15678	—	—	—	—
18.	RRC, Jammu	7627	9343	16970	—	17	17	N.I.
19.	RRC, Gangtok	2700	668	3368	—	3	—	I.P.D. just started
20.	RRC, Itanagar	1019	1358	2377	—	—	—	—
21.	RRC, Gauhati				OPD and IPD facilities are not available.			

(Table Continued)

HEALTH CARE RESEARCH PROGRAMME

The health and medicare of the people living in rural/tribal area still remains a big problem inspite off tremendous technological development in our country. The Council has taken up programmes to study the health problemsVis-A-Vis the environment in rural tribal areas. The survey and surveillance programme taken up since the very beginning of the Council has been executed through Mobile Clinical Research Units, subsequently Community Health Care Research Programme has also been initiated in the year 1979. The Tribal Health Care Research Programme has been taken up recently in order to pay specific attention to the health care problems of tribal people. These programmes envisage collection of data on health statistics, collection of folklore medical claims besides providing incidental medical aid and carrying out therapeutic trials on certain selected common diseases.

I. Research Oriented Survey and Surveillance Programme

The Survey and Surveillance Programme was initiated in the year 1978 with the object to study the role of *Prakriti* in relation to socio-economic and demographic factors, food habits and the nature and frequency of prevalent diseases. The work during the entire period was conducted in two stages i.e. initial study and five follow up studies spread through out the year. The data collected up to March 1978 from fifty nine villages on 56,600 individuals have been analysed and is being published in the form of a Monograph on Health Statistics. Further studies in the randomly selected villages have been continued with revised approach wherein data have been compiled according to the revised proforma adopted for the study. The data relating to health status and disease prevalence as well as diet habits were gathered from more than 200 villages covering a total population of about 2 lakhs.

ANDHRA PRADESH

Regional Research Centre (Ay.), Vijayawada

A population of 1612 individuals in village Atmakur located at a distance of about 25 kms. south of Vijayawada was covered. Weavers and agricultural labourers form major part of the popula-

tion. Most of the people are poor and illiterate most of them are vegetarians. The rice is the staple cereal consumed by the villagers. The people generally prefer pungent taste. A total of 507 patients were treated. *Kasa, Netraroga, Tvak roga, Svasa* and *Vatavyadhi* are commonly observed diseases in the patients treated.

ARUNACHAL PRADESH

Regional Research Centre (Ay.), New Itanagar

The studies in this state covers a population of 295 individuals in the five villages Lekhi, Modern, Mahun, Lapanges and Jooly, located within a radius of 25 kms, from New Itanagar. The people living in these villages are mostly tribals of Nise and Apatavi tribe. The people worship 'Verpipale' (sun and moon). The people are habituated to alchhol and tobacco. The people are mostly non-vegetarian and prefer food with salty taste. Rice, maize and wheat are staple cereals of these people. *Kasa, Pama* and *Katisula* are commonly noted among 75 patients observed in the study. A programme to assess the effect of Ayurbala biscuits has also been taken up on school-going children. Fifteen children were administered the drug, they showed improvement in height and weight.

ASSAM

Regional Research Centre (Ay.), Gauhati

The programme has has been taken up in 3 villages-Chakardoh, Garal and Kamakhya around Gauhati covering a population of 520 individuals. The people of Kamakhya are mostly involved in religious rituals. The staple diet of the people of these villages has been usually rice and wheat, and most of them are non-vegetarian. People usually prefer sweet taste. 549 patients were treated during the period under review : *Kasa, Atisara, Amalapitta, Jvara, Pratisaya, Udarasula* and *Vatavyadhi* are common diseases. The medical team has collected 15 folklore medical claims during the tours.

BIHAR

Regional Research Institute (Ay.), Patna

The studies in this State has been carried out in Sultanpur village of Hazipur subdivision of Vaisali distt. The village is located at a distance of 18 kms. from Patna. It is inhabitated by landless

labourers belonging to scheduled caste. Most of the houses in the village have thatched roof. 1004 individuals were covered during the year; most of the people are illiterate and some of them are addicted to certain intoxicants. The wheat, rice and maize are staple cereals; most of the people are non-vegetarians, in their diet habits. The people mostly prefer salty taste. 920 patients were treated. *Kasa, Krimi, Kandu, Tvkaroga, Vrana, Udarasula, Atisara* were common conditiions observed. Tweleve medical folklore claims were also collected.

DELHI

Central Research Institute (Ay), Delhi

The work has been taken up in Alipur and Bakoli villages at a distance o! 19 kms. and 22 kms. respectively from Delhi. The study has been taken up on 476 individuals and it was observed that people are mostly in middle income group with wheat and rice as staple cereals, they are mostly vegetarians. The people generally preferred sweet taste. A total number of 243 patients were provided medical aid and during the course of the study.

GUJARAT

Mobile Clinical Research Unit, Jamnagar

The Padana village located at a distance of 37 kms. from Jamnagar has been taken and a population of 702 individuals have been studied. The people in the village are mostly literate and belongs to the lower income groups. The people use rice, wheat and Bajra as staple cereals and most of them are vegetarians. The pungent taste is generally preferred by these people. Medical aid was provided to 76 patients and a few pathological investigations on blood were also conducted.

HIMACHAL PRADESH

Regional Research Centre (Ay.), Joginder Nagar/Mandi

The Survey and Surveillance Programme has been taken up in villages around Mandi and a total popululion of 1571 individuals has been covered. The observations indicated that out of 1571

individuals, 110 were suffering from one or the other diseases. Most of the people under study were literate and in lower income groups. Smoking has been commonly seen as a habit. The rice, wheat and maize are staple cereals and people generally preferred sweet taste. The medical team treated 1121 patients during the visits to these villages. *Krimi*, *Kamala*, *Sandhisula*, *Kasa*, *Atisara* and *Kandu* were commonly observed among the patients treated by the team.

JAMMU AND KASHMIR

Regional Research Centre (Ay.), Jammu

The Programme has been taken up in Chak Bhalwal and Chak Surla villages near Jammu Tawi. The data collected on 1085 individuals indicated that people were mostly illiterate. Most of the population generally fall in middle income group having non-vegeterian diet habits. They generally prefer sweet and sour taste. Among the 817 patients treated disease like *Atisara*, *Amlapitta*, *Amavata*, *Jvara*, *Kasa*, *Krimi*, *Pratishaya*, *Netraroga* were noted frequently. The laboratory investigations on 78 blood samples were also carried out. The teams visiting also located over 80 herbal drugs of medicinal importance in the village. The school children of primary schools located in these village were examined. The children were anaemic and their oral hygiene was not good. Suitable advice and treatment was given. The *Krimi roga* and *Vicarcika* were commonly noted in these children.

KARNATAKA

Regional Research Centre (Ay.), Bangalore

The Programme of survey and surveillance has been taken in the villages Ezipura/Nagawara near Bangalore and a population of 772 individuals have been covered. The data collected indicated that the people are generally in middle income group with predominantly non-vegetarian diet habits. The millets (Ragi) is the staple cereal used by villagers and they have preference to salty and pungent taste. The team also provided medical relief to 1057 patients and the diseases like *Atisara*, *Jvara Kasa*, *Pradara*, *Tvak roga* and *Vrana* were commonly observed.Most of the patients treated were completely relieved while varying degree of improvement was noted in the remaining. The laboratory investigations on 57 samples of blood, stool and urine were also conducted.

KERALA

Indian Institute of Panchkarma, Cheruthuruthy

The programme has been taken up in Virupakka village located at a distance of 22 kms. from Cheruthuruthy. Out of the total population of 1528 individuals of this village the study has been taken on 290 individuals. The people are generally poor with little education. Rice and wheat were staple cereals with fish and flesh of animals among non-vegetarin diet habits. The people generally preferred sweet taste. Among the 616 patients treated by the team *Vatavyadhi*, *Udarasula*, *Tvakroga*, *Kasa* and *Pandu* were commonly clinical conditions observed.

MADAYA PRADESH

Regional Research Institute (Ay.), Gwalior

The programme covered a population of 2191 individuals in three villages—Ramuna, Bannor and Utila, located near Gwalior. Most of the people are vegetarians with wheat, rice, or maize as staple cereals. *Atisara*, *Jvara*, *Krimi*, *Kandu*, *Pratisyaya* and *Vrana* were most commonly observed. The medical relief has been provided to 2660 patients and 100 samples were also analysed for pathological investigations.

MAHARASHTRA

Regional Research Centre (Ay.), Nagpur

The Programme has been taken in Wadela village near Nagpur cocering a population of 2064 individuals. The population is in middle income group with a substantial percentage of people having lower level of education. Over half of the people were non-vegetarians with rice, wheat and maize as staple cereals and these people generally preferred pungent taste. A total number of 326 patients were treated and a few blood smears have also been examined for malarial parasite. The diseases i.e. *Atisara*, *Kasa*, *Pratisyaya*, *Slipada*, *Tvakroga* and *Kasa* were commonly observed.

ORISSA

Central Research Institute, (Ay.), Bhubaneshwar

The Programme has been taken up in three Villages--Bharatipur, Samantarpur patna and Jaggannatha Prasad, located around Bhubaneshwar. A total number of 732 individuals have been covered during the year. The people are generally uneducated and have non-vegetarian diet habits with rice and staple cereals. They preferred sweet taste, *Slipada, Tvak roga, Netra roga* were commonly observed. The team provided treatment to 609 patients and certain pathological investigations on blood, stool and urine were also conducted.

PUNJAB

Indian Institute of Kayachikitsa, Patiala

Three villages Jalalpur, Dharula and Pratapgarh located near Patiala have been taken up for study covering a total number of 1195 individuals. Many people have been found to be addicated to alcohol. People are mostly non-vegetarian with rice, wheat and maize as staple cereals. Mostly people of this area prefer sweet taste.. The team treated 976 patients and the diseases i.e. *Atisara, Jwara, Kasa, Pratisyasa, Raktavikara* were commonly observed. About 400 investigations on blood, stool and urine were also conducted.

RAJASTHAN

Regional Research Institute (Ay.), Jaipur

The programme has been taken in village Dantali near Jaipur covering a population of 314 individuals. The level of literacy of the people in this area is low. The per capita income of the people has been somewhat in middle range. The people were mostly vegetarians with wheat and milletts as their staple cereal and most of them prefer sweet taste. The children in the age range of 10-14 year were mostly affected with *Kasa*, whereas *Karna rogo* were more common in age groups of 5 to 9 years. A total number of patients (1745) were treated *Krimi, Netra roga, Pradara* and *Vrana* were commonly observed.. The health examination of school children of the village indicated moderate degree of anaemia (Hb% between 6-10 gms%). Haemoglobin examination of 36 samples was taken up during survey,

SIKKIM

Regional Research Centre (Ay.), Gangtok

The survey and surveillance programme has been taken up in five villages, Raymindu, Dileng, Sowetch, Yangtain, Marchah, located near Gangtok. The observation on 1688 individuals covered during the study in these villages indicated illiteracy and poor economic status of the people. The people were overwhelmingly non-vegetarian with rice, wheat, barley and maize as as staple cereals and generally preferred sweet taste. Out of the total 96 patients treated during the study *Jvara* and *Krimi* were found to be more common.

UTTAR PRADESH

Regional Research Centre (Ay), Hastinapur

The programme has been taken up in three villages Kanker, Khera and Latifsur located near Hastinapur (Meerut Distt.) covering a population of 803 individuals. Most of the people are illiterate and falls in lower income groups. Addition to alcohol was effected among most of the people. Wheat and rice are staple cereals with non-vegetarian diet habits. Out of 980 patients treated during the period, *Kasa, Jvara Udarasula, Vatavyadhi, Pratisyaya* and *Svasa* were more common.

Regional Research Centre (Ay.), Jhansi

The Programme has been taken up in three villages Garhma, Kot and Khailar, located near Jhansi covering a population of 2117 individuals. The people are mostly with vegetarian diet habit. Wheat and rice are the staple cereals of the people. They prefer to sweet taste. During the course of study 1150 patients were provided incidental medical aid. Two folklore claims were also recorded.

Mobile Clinical Research Unit, Varanasi

The Programme has been taken up in Tikari village located near Varanasi and a population of 467 individuals was covered. Most of the people belong to middle income and higher income groups.

People are mostly vegetarians. ***Atisara, Pravahika, Kasa, Jvara, Pandu*** and ***Pratisyaya*** were commonly noted. Pathological investigations on 115 samples of blood, stool and urine were taken up besides providing incidental medical aid to 301 patients.

The clinical trial of *Kutajadi yoga* has also been taken up on cases of *Atisara* and *Pravahika*. The treatment provided complete relief in over 50% of the cases.

WEST BENGAL

Regional Research Institute (Ay.), Calcutta

The programme has been taken up on 713 individuals in the village Hatiara, located near Calcutta. The people are mostly in lower income range. The people are mostly non-vegetarian with rice as staple cereal. 162 patients were provided incidental medical aid. *Atisara, Krimi, Jvara* and *Kasa* were commonly noted. Pathological investigations on 38 samples of blood, stool and urine were also carried out.

Statement of Work Carried out under Service Oriented Survey and Surveillance Screening Programme

S. No.	Name of the Institute/ Centre/Unit	Name of the villages covered	Population covered	No. of patients treated
1	2	3	4	5
1.	CRI, Delhi	Alipur, Bakoli	476	243
2.	IIP, Cheruthuruthy	Virupakka	1528	616
3.	IIK, Patiala	Jalalpur, Dharamker Partapgara	1195	976
4.	CRI, Bhubaneshwar	Bhartpur Damantra-pur, Patna, Jagannath Prasad	732	609
5.	RRI,Jaipur	Dantali, Sumel	1314	1745
6.	RRI, Gwalior	Ramua, Banner Utila	2191	2660
7.	RRC, Hastinapur	Kankerkhera and Lalifpur	803	980
8.	RRI, Patna	Sultanpur	1004	920
9.	RRC, Sikkim	Raymindu, Dikling, Sowetek, Yangtam, Marchak	1668	96

(Table Contd.)

1	2	3	4	5
10.	RRC, Jhansi	Khailar	2117	1140
11.	RRC, Gauhati	Chakaradah, Garal Kamakhya	520	549
12.	MCRU, Varanasi	Dharahara	467	301
13.	RRC, Jammu	Chakbhalwal 695 Chaksurhe 390	1085	817
14.	RRC, Jogindernagar	11 villages	1571	1121
15.	RRI, Calcutta	Hatiara	713	162
16.	MCRU, Jamnagar	Padana	702	76
17.	RRC, Vijayawada	Atmakur	1612	507
18.	RRC, Bangalore	Nagavar	772	1057
19.	RRC, Itanagar	Lakhi, modern village mukum, Lapang, Jooley	295	75
20.	RRC, Nagpur	Wadoda	2064	326

II. Community Health Care Research Programme

The Community Health Care Research Programme has been taken up since 1979 with a view to further diversify the health care research programme. The object of the programme is to acquaint the village folk about the ways and means of healthful living identifying common disease conditions, utilisation of herbal resources for relief of common ailments besides identifying the role of diet, enviorment, occupation etc. in the causation of illness. Booklets in the regional languages on locally available herbs and their use were brought out. The programme has been taken up in about 100 villages covering a total population of over 70,000 individuals and about 25,000 patients has been treated during the visits. The details of work carried out has been discussed separately for each state.

BIHAR

Regional Research Institute, Patna

The work under community health care research programme has been taken in East Kesapur village at a distance of 9 kms. and Manspur located at a distance of 10 kms. from Patna. The villages are inhabitated mostly by unskilled labourers belonging to the weaker section of the society. During the course of study treatment has been provided to 500 patients. The *Tvak roga*, *Kasa* and *Udararoga* were commonly noted.

GUJARAT

Regional Research Institute, Junagadh

The programme has been taken up in the village Sukhpur located at a distance of about 18 kms. from Junagadh. Efforts have been made to acquaint the villagers about ways and means for maintenance of positive health and motivate them to use certain herbals for treatment of their ailments. A total number of 469 patients were provided incidental medical aid. *Jwara*, *atisara*, *pratisyaya* and *tvak roga* were commonly observed. Ten folk medical claims were also recorded.

HIMACHAL PRADESH

Regional Research Centre, Joginder Nagar Mandi

The study of health status of school children in Primary School of Revaleswar and Gajnaha villages, Middle School of Ran-

dhara Panchayat and Higher Secondary School of Revelwara, all located around. Mandi has been taken up during the year. In addition to the dissemination of knowledge about healthful living, the children in these schools were examined for their general health as well as for any deficiency in their growth. The observations on height, weight, chest measurements, oral hygiene have resulted in recording of important data. *Krimi*, *Kasa* and *Tundikerri* were commonly noted in these children.

KERALA

Indian Institute of Panchkarma, Cheruthuruthy

The programme has been taken up in the village Attoor and Nedumpura located at a distance of 11 kms. from Cheruthuruthy. During the course of study 582 patients were provided incidental medical aid. *Vatavikara Jvara*, *Kasa*, *Udarasula* were commonly noted.

MADHYA PRADESH

Regional Research Institute, Gwalior

The progrmme has been taken up in two villages Ghati Gaon and Bilova near Gwalior. A total number of 2913 patients have been treated during the study. The pathological investigations on 377 blood samples were also conducted. *Atisara*, *Jvara*, *Kosa*, *Kandu*, *Pratisyaya*, *Sandhisula*, *Vrana* were commonly observed.

MAHARASHTRA

Regional Research Institute, Nagpur

The programme covering a total population of 1880 individuals has been taken up in two villages-Lawa and Durgdham located near Nagpur. The team provided treatment to 303 patients including 204 new patients. The *Atisara*, *Kasa*, *Pratisyaya*, *Undarasula* were commonly noted. Clinical trials were also taken up to study the effect of *Ayush-64* in *Slipada* and *Visama jvara*, *Kampilliaka* in *Krimi* and *Rakta rodhaka curna* in *Raktapradara*. The cases of *Slipada* did not show any improvement with Ayush—*64*; cases of *Vishama jvara* responded well to Ayush—64. Similarly one patient of *Raktapradara* treated with *Rakta rodhaka curna* also discontinued the treatment.

ORRISA

Central Research Institute, Bhubaneshwar

The programme has been taken up in two villages-Andharua and Mundamuham, located near Bhubaneshwer. A total number of 177 patients were provided medical relief. *Slipada*, *Krimi*, *Tvak roga* were commonly observed.

PUNJAB

Indian Institute of Kayachikitsa, Patiala

The programme has been taken up in two villages. Chaura and Noorkheri located near Patiala. A total number of 273 patients were treated, during the study. *Jvara*, *Kasa*, *Pratisyaya* were common clinical conditions.

RAJASTHAN

Regional Research Institute, Jaipur

The Programme has been taken up in Siwar and Natata villages near Jaipur. A total number of 1781 patients were treated during the study. Pathological examinations on 76 samples of blood, stool and urine were also taken up. Wheat, barley and milletts (Bajra) are staple cereals of the people. They are vegetarians with preference to sweet taste.

SIKKIM

Regional Research Centre, Gangtok

The Programme has been taken up in two villages Vavey and Chuboa located at a distance of about 35 to 40 kms. from Gangtok. The tream treated 119 patients, mostly suffering from *Krimi*, *Kasa*, *Jvara* and *Udrasula* etc.

TAMIL NADU

Dr A. Laxmipati Unit for Research in Indian Medicine, V.H.S., Madras

The programme has been taken in seven villages consisting of a total population of 10800 individuals. During the year, 833 patients were treated. Certain pathological investigations on blood, stool and urine have also been carried out.

UTTAR PRADESH

Regional Research Centre, Hastinapur

The programme has been taken up in Santpura village located near Hastinapur (Distt. Meerut) and 102 patients were treated for various ailments. *Kasa* and *Jvara* were commonly observed.

Ayurvedic Research Unit, Tarikhet

The programme has been taken in one village near Tarikhet covering a total population of 1459 individuals and 184 patients were treated. *Kasa, Krimi, Jvara, Vatavyadhi, Pradara* were commonly seen.

Regional Research Centre, Jhansi

The programme has been taken in village Buradha, Paratha and Dimen located near Jhansi covering a total population of 2850 individuals and 1142 patients were treated. *Jvara, Kasa, Pama, Tvak roga* were commonly noted. Efforts were made to educate about the *dinacarya, ratri charya, ritucarya,* family welfare, house-hold remedies for certain diseases as well as use of locally available herbs in maintenance of health and treatment of common ailments. 402 patients were provided medical aid during floods of the village Baraths.

WEST BENGAL

Regional Research Institute, Calcutta

The programme has been taken up in Bhagbanpur village located near Calcutta. Most of the people are in lower income range. The staple cereals of the area are rice and wheat with non-vegetarian diet habits. The people preferred sweet and salty tastes. Out of a total population of 1239 individuals covered 1042 patients were treated. *Atisara, Amlapitta, Jvara, Krimi, Kasa* and *Vicharchika* were commonly noted. The pathological investigations on 108 samples of blood, stool and urine were undertaken.

Statement of Work carried out under Community Health Care Research Programme

S. No.	Name of the Institute/ Centre/Unit	Name of the villages	Population of the villages covered	No. of patients
1.	IIP, Cheruthuruthy	Attoor, Nedumpura	4056	582
2.	IIK, Patiala	Chaura, Noorkheri	2300	273
3.	CRI, Bhubaneshwar	Andharua, Mundmuham	150	177
4.	RRI, Calcutta	Bhagabanpur	1239	1042
5.	RRC, Bangalore	Ejipura	129	154
6.	RRI, Junagadh	Sukhpur	1060	469
7.	RRC, Nagpur	Lawa, Durgadham	1800	303
8.	RRI, Jaipur	Siwar and Natata	91	1781
9.	RRC, Hastinapur	Santpura	56	102
10.	RRI, Patna	East Keshapur, Manspur	185	500
11.	RRC, Sikkim	Vavey and chuboa	515	119
12.	ALURIM. Madras	7 villages	10800	833
13.	ARU Tarikhet	one village	1459	184
14.	RRC, Jhansi	Buradha, Dimroni Paratha	2850	1142
15.	RRI, Gwalior	Ghatigaon, Bilova	Not indicated	3913
		Total	26690	11,574

III Tribal Health Care Research Programme

A large section of the people living in tribal areas are deprived of Health and medicare facilities. Several efforts have been made by various agencies to study the problem of the tribal people with a view to plan and provide proper relief measures. The Council through its Health and Medical Research Programmes collected information about the incidence of diseases and prevalent methods of medicare among different tribal pockets of the country. The Tribal Health Care Research Projects recently established by the Council at Car-Nicobar (Andaman Nicobar Inland), Ranka Block (Distt. Palamu, Bihar), Nawapur (Distt. Dhule, Maharashtra), Rama Block (Jhabua, Madhya Pradesh) and Ziro (Arunachal Pradesh) have commenced functioning. There is a paucity in getting suitable staff in these Units.

The aims and objects of these projects broadly are as hereunder:

1. To carry out research and to work out an appropriate strategy for health and medicare practices of backwardly placed areas inhabitated by scheduled castes and scheduled tribes.
   The problems of national interest needing priority of attention are as follows :

   a) To conduct research study on *Vishama jwara* (Malaria), *Kustha roga* (Leprosy) and other communicable diseases.

   b) To conduct research study on *Kuposhan janya vikar* (Malnutrition and its associated diseases).

   c) To undertake research study on allergic manifestations.

   d) To conduct the research study on *Sambhog janya Sansargaj vikar* (Sexually transmitted diseases).

   e) To conduct research study on *Udar krimi* (Intestinal worm infestations).

2. To gather information relating to the traditional customs and beliefs, nutritional habits, occupation, literary levels, socio-economic influence on the ways of living .

3. To identify the kinds of diseases prevalent in the areas.

4. To study the relationship of occupations to the disease proneness/onset.

5. To collect tribal folk medical lore and other practices prevalent among the SC/ST.

6. Assessment of the environmental sanitation, drinking water availability and other factors that have influence on health and causation of diseases.

7. Examination of school going children to provide timely advise that will help in prevention of diseases and promotion of health.

A pilot study was carried out with a view to plan an in-depth research oriented approach.

Car-Nicobar

The Car-Nicobar Island is located in the Nicobar Distt. between Sumatra and Andaman Islands in the Bay of Bengal. The work has been taken up in Malaca village having a total population of 870 individuals. These people are all well known Christians and speak Nicobari language *Virshma jwara, krimi* and *kasa* are commonly observed in this village.

Ziro

Ziro is located in the North Eastern Region in Arunachal Pradesh at a distance of 100 km. from New Itanagar. The preliminary survey of villages around Ziro has been taken to enable to select the villages around Ziro to be coverd under this programme.

Rama (Jhabua)

Rama block is located in Jhabua distt. of Madhya Pradesh most of the area is inhabited by the people of tribal origin. The area of block have been surveyed and a list of 211 plants of medicinal importance have been prepared. Most of them are well known Ayurvedic medicinal plants such as *Satavari, Nirgundi, Bala, Salparni, arka, Sankhpuspi, Vata, Guduchi* etc. The details on 39 folk medical claims practicised for commonly prevalent conditions in the area have also been compiled. The planning of other programmes for medicare and control of diseases is under progress.

Nawapur (Dhule)

The Programme has been taken up in 2 selected villages Chinchapada and Gangapur located near Nawapur in Dhule distt. A total number of 572 patients have been provided incidental medical aid in these two villages. The people of the area are generally non-vegetarian with wheat, rice and millets as their staple cereals. *Jwara, Kasa, Katisula, Pratisyaya, Kasa, Rajyaksma, Vatavyadhi, Udarasula* and *Mutrakricha* have been commonly observed.

Palamu (Bihar)

The programme has been initiated in the Ranka Panchayat distt. Palamu (Bihar) having a population of about 12,000 individuals. In Ranka proper the houses are situated at both sides of the main road covering a length of about 1 km. The tribes are residing in thatched houses located in the innerside of the main road. The people use either the river water or hard water (salty) drawn from the handpumps. Most of the tribal people are illiterate but their children are studying in the schools. Income of the most of the tribal people is below Rs. 100/- per month whereas people of other castes are engaged in business and earn about Rs. 1000/- or more. Tribal people work as labourers or collect woods from the forests for sale and these two are the main sources of their income. Staple diet of the tribal people is rice, wheat and maize. Most of the people of this area are non-vegetarian and eat fish and flesh of animals. They usually prefer salty, bitter and sweet taste. 30 patients suffering with different ailments were also provided incidental medical aid in the village.

DRUG RESEARCH

MEDICO-BOTANICAL SURVEY

The Medico-Botanical Survey programme has played a pivotal role in the Drug Research Programme of the Council. The survey of medicinal plants units have carried out the survey work as in the past to enrich the medico-botanical armamentarium which will help the estimation of medico-botanical potential of the country. The Council has 17 survey units in 16 states of the country and are located at Bangalore, Bhubaneshwar, Calcutta, Gangtok, Gauhati, Gwalior Itanagar, Jaipur, Jammu, Jhansi, Junagadh, Mandi, Nagpur, Patna, Tarikhet, Trivandrum and Vijayawada.

These units are spread over the country with scope to work at different climatic and altitudinal levels. They have extended their work from the Alpine Himalayan ranges to the coastal areas and also penetrating into the arid zones of the country to achieve their objectives of qualitative and quantitative evaluation of the herbal wealth of the different geographical areas. There Units have also been able to provide clues and materials for the identification of drugs which are mentioned in Ayurvedic literature but the botanical identification was hitherto not clear/unknown. A search for the folklore drugs is also being done and steps have been initiated to correctly identify such drugs so that these could be put to scientific trials.

Since inception in the year 1971 the Survey Units have explored 146 forest divisions/areas belonging to different states of the country and collected about one lakh of plant specimens representing a large number of different families, genera and species. A total number of about 90,000 herbarium sheets have been incorporated in the herbaria of different Institutes/Centres. About 2936 drugs samples of plant origin, 127 of mineral origin and 33 of animal origin have been collected and added to the Centres/Institutes Museum.

During the period under report, the work by the different Units include the survey work in the following areas.

ANDHRA PRADESH	Covering Srikakulam, Karim Nagar and Warrangal, distt. forests.

ARUNACHAL PRADESH	Covering Itanagar & Doimukh forests.
ASSAM	Covering Garo Hills and Jaintia hills of Meghalaya, Greater Gauhati and South Kamrup distt.
BIHAR	Covering Sarand forest division.
GUJRAT	Covering Bordevei, Girnar, Dungapur Chirward, Coastal areas of Namnagar and some parts of Kutch.
JAMMU & KASHMIR	Covering Pancheri range of Udhampur Forest Division.
KARNATAKA	Covering Mukut range of Coorg distt.
KERALA	Covering Munnar, Marayoor/Devikolam ranges, Nilambur and Trivandrum.
MAHARASTRA	Covering West Yavatmal Forest Division.
ORISSA	Covering Parlakhemundi Forest Division and Bahrampur sub. Divission.
RAJASTHAN	Covering Bansiwara, Udaipur, Ajmer Forest Division.
UTTAR PRADESH and MADHYA PRADESH	Almora and Kalagarh Forest, Division and areas of Meerut, Bulandshaer, Muzaffar Nagar and Saharanpur Social Forestry areas of Orcha (M P.) and Betwa Basin areas of and Barna Sagar range under Jhansi Forest Division were surveyed under the Joint survey programme of Jhansi (U.P.) and Gwalior (M.P.).

This work covers the exploration of a total number of 39 forest areas in different States indicated above and reports the collection of 7772 plant specimens, 141 drug samples of plant origin and one mineral sample for museum and 607 folklore claims. A total number of 7034 Herbarium sheets have been mounted and 1198 Herbarium sheets incorporated in the different centres/institutes/herbaria. The collection of the plant specimens covers a large number of different families,

genera and species. The survey units have also reported the occurance of some important and rare medicinal species in their respective territories

Besides conducting routine medico-botanical survey work, the survey units have also sudied the economics of the medicinal plants by studying the occurence of drugs in the forest and the data regarding availability etc. A detailed list of such medicinal plants identified by each survey unit in their respective areas have been prepared from availability/economics point of view. Total number of such important medicinal plants available in different states are shown in brackets.

Andhra Pradesh (150), Assam (127), Bihar (72), Gujrat (166), Jammu & Kashmir (176), Karnataka (252), Kerala (144), Madhya Pradesh (132), Maharashtra (26), Orissa (174), Rajasthan (215).

Some of the survey units have also undertaken the market survey of drugs and this has been helpful in the identification of adulterated and substituted drugs.

Drug Supply

The medico-botonical survey programme of the Council has played a vital role in augmenting the supply of drug material both for research and pharmaceutical preparations. The survey units have supplied the following authentic drug samples required by the different units/centres/institutes of the Council as well as to PLIM, Gaziabad.

Name of the Drug and part (s).	Quantity in kg.
Agnimantha (*Clerodendrum pleuricaulis*)	44.00
Aragvadha (*Cassia fistula*) fruit	153.800
Arjuna (*Terminalia arjuna*) stem bark)	8.000
Ark (*Calotropis procera*) root	712.000
Asthisanghar (*Cissus guandrangularis*) stem	0.600
Aswagandha (*Withania somnifera*) root	2.000
Babbula (*Acacia arabica*) Bark	4.000
Babbulla (*Acacia nilotica*) bark	22 00
Bala (*Sida rhombifolia*) root	5.500
Banafsa (*Viola serpens*) whole part	2.000
Bharangi (*Clerodendrum serratum*)	1.000
Bidarikand (*Pueraria tuberosa*) tuber	0.500
Bilva (*Aegle marmelos*) root fruit, stem, bark	145.50
Brahati (*Solanum indicum*) whole plant	0.100
Chabya (*Piper chaba*) stem	0.250
Danti (*Baliospermum montanum*)	0.500
Daruharidra Bhed (*Berberis hispida*)	0.500
Dhataki (*Woodfordia fruticosa*) flower	1.000
Dhatura (*Datura metel*) fruit	5.000

(Contd.)

Name of the Drug and part (s).	Quantity in kg.
Dronpushpi (*Leucas cephalotes*) whole plant	0.500
Eranda (*Ricinus communis*) seed	0.400
root	0.400
Gajapippali (*Scindapsis officinalis*) fruit	0.500
Gambhari (*Gmelina arborea*) root	114.450
Gokshura (*Tribulus terrestris*) whole plant	9.300
Gudmar (*Gymnema sylvestre*) leaves, stem bark.	22.800
Guduchi (*Tinospora cordifolia*) stem	55.100
Guggulu (*Commiphora mukul*) oleo-gum-resin	20.000
Haritaki (*Terminalia chebula*) fruit	10.500
Kantakari (*Solanum surattense*) whole plant	6.000
Karanj (*Pongamia pinnata*) stem	10.000
Katphala (*Myrica esculenta*) fruit	8.250
Khadira (*Acacia catechu*) heart wood	11.000
Khas (*Vetiveria zizanoides*) root	1.700
Kumari (*Aloe barbedensis*) leaves	10.500
Kusmand (*Benincasa hispida*) root	15.000
fruit	2 nos.
Kutaja (*Hollarhena antidysenterica*) stem bark	32.300
Lajjalu (*Mimosa pudica*) root	0.150
Lata Karanj (*Caessapinia arista*)	5.700
Madanphal (*Randia dumetorum*) fruits	17.500
Mahanimb (*Ailanthus excelsa*) bark	16.000

(Contd.)

Name of the Drug and part (s)	Quantity in Kg.
Malkangani (*Celastrus paniculta*) seeds	0.500
Mandukparni (*Centella asiatica*) whole plant	2.600
Manjistha (*Rubia cordifolia*) root	16.000
Mudgaparni (*Phaseolus trilobus*) whole plant	0.200
Mundika (*Spheranthus indicus*)	10.000
Neelika (*Indigofera linnei* whole plant	2.500
Nimba (*Azadirachta indica*) stem bark	3.300
Nirgundi (*Vitex negundo*) leaf	422.000
Palasa (*Butea monosperma*) bark	3.800
Parijata (*Nyctanthes arbortristis*) leaf	10.000
fruit	2.000
Patha (*Cissampelos pariera*) root	0.600
Pippali (*Piper longum*) roat	3.500
Parpata (*Fumaria parviflora*) whole plant	0.500
Prasarni (*Paederia foetida*) whole plant	30.900
Prisniparni (*Uraria picta*) whole plant	6.500
Punarnava (*Boerhaavia diffusa*) whole plant	1.700
Rasna (*Pluchea lanceolata*) whole plant	3.000
Rohitaka (*Tecomella undulata*) stem bark	1.270
Sahachara (*Barleria prionitis*). whole plant	38.500
Sahadevi (*Vernonia cinera*) whole plant	1.000
Salaparni (*Desmodium gangeticum*) root	81.000
Saptaparna (*Alstonia scholaris*)	0.200
Saral (*Pinus roxburghii*) Resin	1.000
Sarapunkha (*Tephrosia purpurea*) whole plant	51.700

(Contd).

Name of the Drug and part (s)	Quantity in Kg.
Sarpagandha (*Rauwolfia serpentina*) root	6.500
Satavari (*Asparagus racemosus*) root	3.500
Sankhapushpi (*Convolvulus pluricaulis*) whole plant	21.000
Syonak (*Oroxylum indicum*) stem bark	2.500
Sirisa (*Albizzta lebbeck*) fruit	25.000
Snuhi (*Euphorbia neriflia*)	0.500
Tagara (*Valeriana wallichii*) root	2.000
Tala (*Borassus flabelifer*) root, spike	5.500
Talisa (*Abies pindrow*) leaves	2.000
Tamalapatra (*Cinnamomum tamala*) leaves	0.300
Trivrit (*Operculina turpethum*) root	3.700
Tulasi (*Ocimum sanctum*) whole plant	0.500
Udumber (*Ficus racemosa*) stem bark	38.000
fruit	9.000
leaves	110.000
Vacha (*Acorus calamus*) rhizome	82.000
Vansha (*Dendrocalamus strictus*) leaves	2.500
Varun (*Crataeva religosa*) stem bark	22.500
Vasa (*Adhatoda vasica*) leaves	173.00
Vata (*Ficus bengalensis*) stem bark	92.000
pro-root	13.500
leaves	2.800
fruit	1.100
Vidanga (*Embelia ribes*) fruit	25.000
Yastimadhu (*Glycyrrhiza glabra*) rhizome	2.800

Central Harbarium at New Delhi

The different survey units of the Council are maintaining their own regional herbaria. But now at CRIA, New Delhi a Central Herbarium has been organised which is being enriched with the collection of specimnes from these regional Herbaria and are being classified according to VARGAS, GANAS of Ayurveda besides Botanically accepted classification etc.

The Central Herbarium is now in the initial stage of its development and with further expansion it is likely to be a reference museum for Ay. Scientists, scholars, and pharmaceutical experts and those engaged in the drug industry.

PHARMACOGNOSTICAL STUDIES

The Council, through its five Pharmacognosy Research Uni s located at Calcutta, Delhi, Lucknow, Jammu and Poona carried out pharmacognostical research investigations on a number of drugs of Ayurveda to help overcome the controversy and confusion that exists regarding their proper identity/authenticity due to synonymy and use of one and the same name for more than one drug. The study also helps in the identification of adulterants and substitutes so that genuine and authentic drug material can be made available for research purposes and pharmaceutical industry. The Pharmacognostical research programmes include the study of source, collection, identification, morphology and commercial aspects (both qualitative and quantitative), diagnostic characters, test of purity etc. Preliminary phyto-chemical studies and fluorescence analysis of the various plant parts including chemistry of cell contents and method of their formation. These chemo-taxonomic studies have helped not only in identification of the genuine drug material, but also to know of spurious and adulterated drugs.

During the previous years pharmacognostic investingations have been carried out on 125 important ayurvedic drugs, 14 drugs which have been studied during the period under review are as follows :

1. Bhumyamalaki (*Phyllanthus niruri* Hook) :

Five species seem to have been included under Bhunyamlaki i.e. ***Phyllanthus niruri*** Hook., ***P. noinaria*** Linn., ***P. simplex*** Retz., ***P. reticultaus*** Poir and ***P. madraspatensis*** Linn. Though almost all the species have gross resemblance and share similar appearance may also differ in properties, constituents, action and therapeutic uses etc., but the genuine drug 'Bhumyamalki' has been identified and accepted as ***Phyllanthus niruri*** Hook., based upon local/vernacular/regional names, various nature, stature, forms of different plant species, on gross morphological similarities and resemblance, with colour variations as ***Rakta***, and ***Krishna*** etc.

In classical literature, the drug is described as deobstruent, diuretic, astringent, ga lactagogue, refrigerant, demulcent, bloodpurifier,

rubefacient in nature and used to cure dropsy (*Udaram sopham*), gonorrhoea (*Sukra pooyameham*), menorrhaea (*Rakta pradara*), dysentry (*Amatisara*), diabetes (*Madhumeha*), dyspepsia (*Agnimandya*), *Amlapitta*, diarrhoea (*Atisara*), jaundice (*Kamala*), opthalmia-eye diseases (*Netraroga*) and erysipelas (*Visarpa*).

2. **Brahmi** (*Bacopa monnieri* Pennel) and

3. **Mandukaparni** (*Centella asiatica* Urban).

Some difference of opinion .about the exact botanical identity of *Brahmi* and *Mandukparni* exists. These two drugs are also being used as a substitute for one and another inspite of their having different and opposing therapeutic actions in certain cases. An analytical study of Ayurvedic literature has revealed that the drugs *Brahmi* and *Mandukparni* are independent drug entities, with unique and in major part opposing therapeutic properties. It is concluded, based on the literature studies that *Brahmi* is *Bacopa monnieri* and *Mandukaparni* is *Centella asiatica*. Available literature on the phytochemistry and pharmacology of these two drugs was found to be corroborative of what has already been told in the treatises of Ayurveda. It is, therefore, not correct to consider *Brahmi* and *Mandukaparni* as synonyms or that these (*Bacopa* and *Centella*) could be reciprocally substituted in formulations. Where *Garbhasthapana* is required, *Bacopa* (*Brahmi*) is the drug and *Centella* (*Mandukaparni*) as its substitute is bound to produce abortion. Where *Apasmara* is to be treated, *Bacopa* (*Brahmi*) is the drug, *Centella* (*Mandukparni*) in its place would precipitate grave consequence. Where *Kandu* is to be counteracted *Bacopa* (*Brahmi*) is to be employed. Indication of *Centella* (*Mandukaparni*) under this condition will result in flares.

The pharmacognostic studies carried out on these two drugs have been compiled in a form of comprehensive monograph which incorporates a detailed analytical study of Ayurvedic literature, therapeutic properties, comparative pharmacognostic studies and available literature and bibliographic reference etc. on these two drugs. The findings will be helpful in resolving the controversy that exists about *Brahmi* and *Mandookparni*.

4. **Dhamayasa** (*Fagonia cretica* Linn.)

In classical texts the plant is described as bitter, astringent, tonic, cooling, febrifuge, prophylatic against small pox, useful in dropsy, delirium and in disorders which arise from poisoning.

The pharmacognostic investigations carried out on the commerical stem sample of the drug *Dhamayasa* have revealed important diagnostic characters. The preliminary chemical studies have shown presence of coumarins, phenols and flavonoids among the various groups of chemical compound screened.

5. **Jayanti** (*Sesbania sesban* Linn.)

In Ayurvedic system of medicine it is used in the treatment of *Vatik* and *Kaphapittajanya roga*. Seeds are used in anorexia, diarrhoea, dysmenorrhoea, amonorrhea, chickenpox, and splenomogaly. Its leaves are considered to be efficacious in ulcer, hydrocele, itching, leprosy, inflammation of joints, baldness, greying of hairs, hoarsesess of voice, coryza, goitre and urinogenital disorders. The bark of the plant is used in the treatment of anorexia, diarrhoea and goitre where as the roots are prescribed in fever, leprosy leucoderma in general debility and blood diseases. The flowers are used for abortion and in fever.

Different parts of the plant like root, stem and leaf have been exhaustively studied pharmacognostically and the morphological and histological data can be of help in choice of authentic drug specimen.

6. **Jalapippali** (*Lippia nodiflora* Mich.)

The drug is demulcent, febrifuge, resolvent, diuretic, antidiarrhoeal and antinflammatory in nature. The leaves are given to children and diarrhoea, dysuria and indigestion in the form of infusion or decoction, also given in lithiasis and to women after lying in state. In the cases of gonorrhoea with burning sensation in the urine it is given combined with cumin seeds or surv chutney made from its leaves and fruit is eaten to relieve the irritation of internal piles.

Macroscopic and microscopic investigations (qualitative and quantitative) of different parts of the drug *Jalapippali* have been

carried out to identify diagnostic characters helpful for obtaining authentic drug material from its commerical sample.

The Hindi synonyms for drug *Jalapippali* has been cited as *'Gorakhumiundi'-'Bhukan'*. The drug samples obtained from the local market of poona and those procured from different Ayurvedic crude drug dealers have been identified as *Sphaeranthes indicus* belonging to the natural order Asteraceae.

7. Kadali (*Musa paradisica*)

The root of the drug *Kadali* is acrid, anthelmintic, tonic, increases appetite and also useful in *Kapha* and biliousness, pain in the ear, menstrual disorders, diseases of the blood, diabetes, acid dyspeosia and leprosy. The juice of stem is anti dysenteric Flowers are anthelmintic and useful in *Vata* and bronchitis. The unripe fruit is acrid, cooling, tonic, astringent to the bowels. The ripe fruit is sweet, acrid, antiscorbutic, aphrodisiac, and excites appetie. It is useful in leprosy, thirst, bronchitis, consumption, uraemia, nephritis burning sensations, urinary concreations, biliousness, it also improves the complexation, sap of the stem is often used in nervous effections like hysteria and epilepsy.

The pharmacognostic studies have been carried out on different pars of the drug like root, rnizome, stem, flower and fruit. Besides reporting important morphological and histological characters, the chemical studies carried out on these parts of the plant report the presence of alkaloid, tannin, anthraquinone, saponin, sugar, starch, fat, protein, calcium oxalate, mucilage, lignin, cutin and suberin in all the parts with a few exceptions.

8. **Narikela** (*Cocos nucifera* Linn.)

The drug has been fully studied from pharmacognostic point of view. Some important cell structures have been observed in the flower and fruit of the drug which help in laying out important pharmacopoieal standards. Different chemical studies carried out on flower and fruit also reported presence of important chemical groups of compound.

The fluorescence analysis studies, different tests of purity and specific gravity, total sugar content, pH value of coconut water in different phases of growth are of some specific diagnostic value to identify the authentic sample.

9. **Nyagrodha** (*Ficus bengalenis* Linn.)

Bark of the plant is tonic, astringent, cooling, dry and diuretic. Young buds and milky juice are astringent. Quality of curing ***daha, thrishna, moorcha, raktapitta, kapha*** and *pitta* has been described in Ayurvedic Nighantus and it is distributed in sub-himalayan tract and western penincula.

Histological studies have been carried out on the root samples of the authentic drug, *Nyagrodha* as well as commercial samples of the drug. The study revealed important diagnostic characters.

10 **Padmaka** (*Prunus cerasoides*)

The stem is antipyretic, refrigerant, cures leprosy, leucoderma, hallucinations. The kernal is used in stone and gravel.

Different parts of the plant such as leaf, stem, bark and fruit have been investigated. The quantitative study of the crude drug and its behaviour with different reagents are quite charactheristic. Non--protoplasmic cell contents like alkaloid, tannin, saponin, sugar, starch, fat, protein, calcium oxalate, mucilage, resin, lignin, cutin and suberin are prasent in the crude drug. Preliminary observations on fluorescence analysis of ethanol extract of different materials showed some significant values that would help in the identification of genuine samples available commercially.

11. **Talispatra** (*Taxus baccata* Linn.) and

12. **Talispatra** (*Abies pindrow* Spach.)

The drug *Talispatra* of Ayurveda is considered as ***tikshna laghu*** and ***ushna***. Leaves of *Abies webbiena* are considered carminative,

expectorant, stomachic, tonic, astringent and antispasmodic while the levaes of *T.baccata* are considered emenagogue, sedative, antispasmodic, carminative, expetorant, stomachic and tonic.

Commercial samples of the drug *Talispatra* as well as stem samples of *Taxus baccata* and leaf and stem samples of *Abies pindrow* have been examined histologically and important diagnostic characters identified. Preliminary chemical studies on *Abies pindrow* have shown the presence of alkaloid, flavanoid, coumarin, steroid and terpenoids, whereas the market samples have shown absence of alkaloid in addition revealed the presence of phenole.

13. **Tajovati** (*Zanthoxylum alatum*)

In the classical texts the plant is described as aromatic and carminative, used in anorexia, dyspepsia, gastro-intestinal, liver and spleen diseases.

The transverse section of the bark sample of the drug *Tejovati* showed the presence of important characters e.g. uni-triseriate medullary rays, prismatic crystals of calcium oxalate and numerous schizogenous oil glands.

14. **Udumbara** (*Ficus racemosa* Linn.)

The bark, leaves and unripe fruit of the plant *Ficus racemoso)* are astringert, carminative, stomachic and vermicidal. According to Ayurvedic Nighantus the bark is cooling, sweet and astringent and fruits are aspecially cooling. The plant is distributed throughuout India.

The mib rip of leaf, petiole and fruit of the drug Udumbara have been studied histologically and certain important diagnotic findings have been observed.

MUSK DEER BREEDING PROGRAMME

As in the past the Council has continued the effort to breed the Musk deer in captivity with the ultimate aim of obtaining Musk without sacrificing the animal at its breeding farm at Kotumomyoi about 183 km away from Tarikhet situated at an altitude of 2500 mt. (8,000 ft.) m.a.s.l.

The diet habits have been studied and acclimatisation levels have been identified and this perhaps may be of help in animal captivity study programme; there are at present 8 animals.

In course of time, the Council will be able to provide conidera-ble useful information relating to problems likly to be faced in musk deer breeding, the kind and nature of living and dietitic habits, acclimat-isation profile and the way of obtaining musk without sacrificing the animal.

CULTIVATION

The Council has taken up cultivation of medicinal plants on experimental scale in different regions such as Jhansi (U.P.), Mangliawas (Rajasthan), Pune (Maharashtra), and Ranikhet (U. P.). The aim of this programme is to study the adoptability, growth, flowering, fruiting and also to assess the yield at different altitudinal levels and other ecological conditions etc. This programme also aims to provide quality drug material in adequate quantity for research/pharmaceutical purposes. The plantation includes the tropical, sub-tropical, temperate regions besides exotic ones. These different herbal gardens also provide suitable agro technicques for successful growth of scarcely distrubited/threatened plants species so that scientific work gets due to sustenance. Propagation of saffron at Tarikhet is a noteworthy feature in view of its non-habitance to that region. The experimental cultivation of *guggulu* in Mangliawas provided adequate impetus to consider mass scale cultivation for the procurement of oleo-gum resion.

A few of the important medicinal Plants under cultivation that are either extensively or largely used or sparingly available are listed hereunder :

Amalaki (*Embellica officinalis*)

Amboli (*Elaeagnus conferta*)

Apamarga (*Achyranthes aspera*)

Aragvadha (*Cassia fistula*)

Arjuna (*Terminalia arjuna*)

Arista (*Sapinduslaurifolius* Var. *emarginatus*)

Arka (*Calotropis procera, Calotropis gigantea*)

Asoka (*Saraca asoca*)

Asthisanghara
(*Cissus quadran gularis*)
Asvagandha (*Withania somnifera*)
Atibala (*Abution indicum*)
Atmagupta (*Mucuna prurita*)
Babbula (*Acacia nilotica and Acacia senegal*)
Badari (*Zizyphus jujuba*)
Bakuchi (*Psoralea corylifolia*)
Bala (*Sida cordifolia*)
Balabhed (*Sida acuta*)
Banaspshah (*Viola serpens*)
Banduka (*Ixora coccinena*)
Barahikand Bheda
(*Dioscorea deltoidea*)
Bhallataka
(*Semecarpus anacardium*),
Bhanga (*Cannabis sativa*)
Bharangi (*Clerodendrum serratum*)
Bhringaraja (*Eclipta alba*)
Bhustrina (*Cymbopogon citrata*)
Bibhitaka (*Terminalia belerica*)
Bilva (*Aegle marmelos*)
Bimbi (*Coccinia indica*)
Brahmi (*Bacopa monnieri*)
Brihadela (*Amomum subulatum*)
Chakramarda (*Cassia tora*)
Champa (*Michalia champaca*)
Changeri (*Oxalis corniculata*)
Chhagulkuri (*Ipomoea pescaprae*)
Chirbilva
(*Holoptelea integrifolia*)

Chitraka (*Plumbago zeylanica*)

Dadima (*Punica granatum*)

Damanak (*Artemesia nilgarica*)

Danti (*Baliospermum montanum*)

Daruharidra (*Berberis aristata*)

Dhataki (*Woodfordia floribunda*)

Datura
(*Datura metel, Datura stramonium*)

Dhavala barua
(*Rauwolfia conescens*)

Eranda (*Ricinus communis*)

Gambhari (*Gmelina arborea*)

Gandha prasarni

(*Paederia foetida*)

Ghritakumari
(*Aloe barbadensis,*
Aloe vera, Aloe indica)

Goksura (*Tribulus terrestris*)

Gristhika Ban

(*Dioscorea bulbifera*)

Guduchi (*Tinospora cordifolia*)

Guggulu
(*Commiphora mukul,*
Commiphora beryii)

Gunja (*Abrus precatorius*)

Haridra (*Curcuma longa*)

Haritaki (*Terminalia chebula*)

Hritpatri (*Digitalis purpurea*)

Hritpatri Bhed (*Digitalis lanata*)

Ingudi (*Balanites roxburghii*)

Isabgol (*Plantago ovata*)

Jambu (*Syzygium cumini*)

Japa (*Hibiscus rosa-sinensis*)

Jati (*Jasminum sp.*)

Jayanti (*Sesbania sesban*)

Jeevak/Risvak
(*Microstylis wallichii*)

Kadali (*Musa paradisica*)

Kakoli/Ksir/Kakoli
(*Roscoea procera*)

Kakodumbara (*Ficus hispida*)

Kalamegha
(*Andrographis paniculata*)

Kamala (*Nelumbo nucifera*)

Kampillak (*Mallotus stneanthus*)

Kanchanar
(*Bauhinia variegata, Bauhinia racemosa*)

Kantakari (*Solanum xanthocarpum*)

Kapittha (*Feronia limonia*)

Karpur Tulsi
(*Ocimum killimandascharium,*)

Karanja (*Pongamia pinneta*)

Karavira
(*Nerium indicum, Nerium odorum*)

Kareer (*Capparis decidua*)

Karamarda (*Carissa congesta*)

Karnasphotak
(*Cardiospermum halicacabum*)

Korpass (*Gossypium herbaceum*)

Karpura Haridra (*Curcuma amada*)

Kemuk (*Costus speciosus*)

Kuberakshi (*Caesalpinia bonduc*)

Ksirasukla (*Ipomoea digitata*)

Kum-Kum (*Crocus sativus*)

Kumari (*Aloe barbadensis*)

Kutaja (*Holarrhena antidysenterica*)

Kutajabheda (*Wrightia tomentosa*)

Lajjalu (*Mimosa pudica*)

Langali (*Gloriosa superba*)

Lata kasturi (*Hibiscus abelmoschus*)

Madan (*Keromophis spinosa*)

Madayanti (*Lawsonia inermis*)

Madhunasani (*Gymnema sylvestre*)

Madhurika (*Foeniculum vulgare*)

Madhuyasti (*Glycyrrhiza glabra*)

Mahabala (*Sida rhombifolia*)

Malkangani (*Swietenia macrophylla*)

Mahameda
(*Polygonatum verticillatum*)

Mahanimba (*Melia azadarach*)

Mamajjaka (*Enicostenma littorale*)

Mandookparni (*Centella asiatica*)

Meda (*Polygonatum cirrifolium*)

Medak (*Litsea umbrosa*)

Muramansi (*Selinum sps.*)

Nimba (*Azadirachta indica*)

Nirgundi (*Vitex negundo*)

Nagabala (*Sida spinosa*)

Nagadamani (*Artemesia nilagarica*)

Nagbala
(*Malva verticillata, Urena lobata*)

Narikela (*Cocus nucifera*)

Palandu (*Asphodelus tenuifolius*)

Papaya (*Carica pappaya*)

Parnayavani (*Coleus aromaticus*)

Parpata (*Oldenlandia corymbosa*)

Parpataka (*Fumaria parviflora*)

Pashanbheda
(*Bergenia ciliata, Bergenia ligulata*)

Patala (*Stereospermum suaveolens*)

Pithori (*Glossocardia bosvallia*)

Pippali (*Piper longum*)

Peetkarvira (*Thevetia peruviana*)

Prisneparni (*Uraria picta*)

Priyala (*Buchanania lanzan*)

Priyangu (*Callicarpa macphylla*)

Pudina Bheda (*Mentha piperata*)

Pudina
(*Mentha arvensis, Mentha sylvestris, Mentha virdis*)

Pusitba (*Euphorbia hirta*)

Pyrethrum
(*Chrysanthemum cinariaefolium*)

Rajabala (*Sida veronicaefolia*)

Rajinigandha
(*Polianthes tuberosa*)

Raktapunarnava
(*Boerhaavia diffusa*)

Rasna
(*Pluchea lanceolata, Vanda roxburghii, Vanda cristata*)

Rohisa
(*Cymbopogon citratus, Cymbopogon martinii*)

Rudraksha (*Elaeocarpus ganitrus*)

Sadabahar
(*Vinca rosea* white and pink)

Sahachara (*Barleria prionitis*)

Sahadevi (*Vernonia cinerea*)

Salaki (*Boswellia serrata*)

Salamlai (*Salmalia malabaricum*)

Salaparni
(*Desmodium gangeticum*
Desmodium laxiflorum)

Sankhapuspi
(*Evolvulus alsinoides, Convolvulus*
pluricaulis, Clitoria ternatea)

Sephalica (*Nyctanthes arbortristis*)

Sarala (*Pinus langifolia*)

Sarpagandha (*Rauwolfia serpentina*)

Sarpunkha (*Tephrosia purpurea*)

Satavari
(*Asparagus racemosus, Asparagus*
curillus)

Salmali (*Bambax ceiba*)

Satala (*Origanum vulgare*)

Sati (*Hedychium spicatum*)

Sheeshmantaka (*Cordia myza*)

Shirsh (*Albizzia lebbeck*)

Sigru (*Moringa oleifera*)

Sinisapa (*Dalbergia sissoo*)

Snuthi
(*Euphorbia nurvula, Euphorbia acaulis*)

Sombhed (*Ceropegia juncea*)

Sukdarasar (*Crinum zeylanicum*)

Surabhinimba (*Murraya koenigii*)

Svetchandan (*Santalum album*)

Svetasalmali (*Ceiba pentandra*)

Sveta sariva (*Hemidesmus indicus*)

Swarnaksiri (*Argemone mexicana*)

Swarnapatri (*Cassia angustifolia*)

Swetakanta (*Clitoria ternatea*)

Syonaka (*Oroxylum indicum*)

Tagara (*Valeriana wallichii*)

Talmulika (*Curculigo orchioides*)

Tamakhu (*Nicotiana tabacum*)

Tinduka (*Diospyros peregrina*)

Tintidi (*Tamarindus indica*)

Tintini (*Rhus mysorensis*)

Tulsi (*Ocimum sanctum*)

Vaca (*Acorus calamus*)

Vajradanti Bheda
(*Potentilla fragroides*)

Vanpalandu (*Urginea indica*)

Vanajmod (*Thymus serphyllum*)

Varuna (*Cretaeva nurvala*)

Vasa (*Adhatoda vasica*)

Vishnukanta (*Clitoria ternatea*)

These experimental studies while providing means and leads of obtaining better and larger yields have incidentally also helped in

getting the following produce, quantities indicated against each of them :

Name of the drug	Quantity and part (s)	Name of the Centre/ Institute
1	2	3
Amalaki (*Embellica officinalis*)	fruits 7 kg.	JNAMPG&H, Poona
Aragvadha (*Cassia fistula*)	fruit 70 kg.	RRC, Jhansi
Arani (*Clerodendrum phlomidis*)	whole plant (fresh) 46 kg.	RRC, Jhansi
Ashwagandha (*Withania somnifera*)	root 3 kg.	RRC, Jhansi
Bakuchi (*Psoralea corylifolia*)	seed 50 kg. seed 0.7 kg.	RRC, Jhansi JNAMPG&H, Poona
Vibhitaka (*Terminalia belerica*)	fruit 10 kg.	RRC, Jhansi
Bilwa (*Aegle marmelos*)	fruit 50 kg. stem bark 31 kg. leaves 2 kg.	RRC, Jhansi
Chitraka (*Plumbago zeylanica*)	root 150 kg.	RRC, Jhansi
Devadaru (*Cedrus deodara*)	bark 5 kg. wood 5 kg. resin 340 gm.	Amalgamated Units, Tarikhet
Dhataki (*Woodfordia fruticosa*)	flowers 1 kg.	JNAMPG&H, Poona
Durva (*Cynodon dactylon*)	whole plant 2.5 kg.	RRC, Jhansi

(Table Contd.

1	2	3
Erand (*Ricinus communis*)	root 15 Kg. seeds 650 gm.	RRC, Jhansi Guggulu Herbal Farm, Mangliawas
Gajapippali (*Scindapsus officinalis*)	fruit 500 gm.	RRC, Jhansi
Gandhaprasarni (*Paederia foetida*)	whole plant 1.5 kg.	RRC, Jhansi
Goksura (*Tribulus terrestris*)	seed 8 kg. whole plant 52 kg.	RRC, Jhansi
Guduchi (*Tinospora cordifolia*)	stem (fresh) 50 kg.	RRC, Jhansi
Guggulu (*Commiphora wightii*)	oleo-gum-resin 23.59 kg.	Guggulu herbal farm, Mangliawas
Hingot (*Balanitis roxburghii*)	fruits 13.5 kg.	—do—
Isabgol (*Plantago ovata*)	2.00 kg.	JNAMPG&H, Poona
Jeevak (*Microstylis wallichii*)	root 2.5 kg.	Amalgamated Units, Tarikhet
Kakatundu (*Asclepias curassavica*)	root 200 gm.	—do—
Kantakari (*Solanum xanthocarpum*)	whole plant (fresh) 45 kg. whole plant 30 kg.	RRC, Jhansi Guggulu Herbal Farm, Mangliawas
Karpuratulsi (*Ocimum kilimandascharicum*)	whole plant 18 kg.	RRC, Jhansi
Krishanb beej (*Anomoes coplica*)	seeds 4 kg.	JNAMPG&H, Poona

(Table contd.)

1	2	3
Kuberakshi (*Caesalpinia bonduc*)	seeds	4.5 kg. Guggulu Herbal Farm, Mangliawas.
Kum-Kum (*Crocus sativus*)	stigma	34 gm. Amalgamated Units, Tarikhet.
Madhunasani (*Gymnema sylvestres*)	leaves	1 kg. RRC, Jhansi
Madhuyasti (*Glycyrrhiza glabra*)	root	4 kg. RRC, Jhansi
Mandukparni (*Centell asiatica*)	whole plant	1 kg. JNAMPG&H, Poona
Neem (*Azadirachta indica*)	Stem bark Seed leaves	36 kg. RRC, Jhansi 3 kg. 5 kg.
Nirgundi (*Vitex negundo*)	leaves (Fresh)	488 kg. RRC, Jhansi
Palas (*Butea monoperma*)	Stem bark Flowers fruits	0.7 kg. JNAMPG&H, Poona 2.00 kg. 1.00 kg.
Parpata (*Fumaria parviflora*)	whole plant	300 gm. Amalgamated Units, Tarikhet
Patha (*Cissampelos pariera*)	whole plant	23 kg. RRC, Jhansi
Prisniparni (*Uraria picta*)	whole plant seed	4 kg. RRC, Jhansi 2.5 kg.
Punarnava (*Beorhaavia diffusa*)	Whole plant root (fresh) root	56 kg. RRC, Jhansi 48 kg. —do— 5 kg. Guggulu Herbal Farm, Mangliawas.
Rasna (*Pluchea lanceolata*)	root	1.5 kg. RRC, Jhansi

(Table Contd.)

1	2	3
Sahachar (*Barleria prionitis*)	whole plant 2.75kg. whole plant 35.5 kg.	JNAMPG&H, Poona RRC, Jhansi
Sahadevi (*Vernonia cineria*)	whole plant 1.25 kg.	JNAMPG&H, Poona
Salmali (*Salmalia malabaricum*)	flower 7.00 kg.	RRC, Jhansi
Salparni (*Desmodium gangeticum*)	whole plant 8.5 kg.	RRC, Jhansi
Sarpukha (*Tephrosia pupurea*)	whole plant 10.00 quintals Ash of who plant 20.3kg.	RRC, Jhansi Guggulu Herbal Farm, Mangliawas
Satavari (*Asparagus racemosus*)	root 7.5 kg. root 7.5 kg.	RRC, Jhansi Guggulu Herbal Farm, Mangliawas
Shankhapuspi (*Convolvulus pluricaulis*)	whole plant 30.00 kg. (fresh)	RRC, Jhansi
Sirish (*Albizzia lebbeck*)	seeds 1.5 kg.	Guggulu Herbal Farm, Mangliawas
Swasagnia (*Tylophora indica*)	leaves 4 kg.	RRC, Jhansi
Ullatkambal (*Abroma augusta*)	leaves 2.5 kg. seed 3.00 kg.	RRC, Jhansi
Vanpalandau (*Urginea indica*)	Bullbs 23.00 kg.	JNAMPG&H, Poona
Vasa (*Adhatoda vasica*)	leaves (fresh) 127 kg.	RRC, Jhansi
Vijaya (*Cannabis sativa*)	root 500gm.	Amalgamated Units, Tarikhet.

CHEMICAL STUDIES

The Chemical Research Units earlier carried out studies on *205* drugs which includes about 185 drugs mentioned in Ayurvedic works. The teams have isolated active principles and made efforts to characterise and work out structure function relationship. These eflorts have contributed to the development of certain active constituents from Araghvada, Satavari, Sirisha, Haridra, Guggulu and Yastimadhu which were studied at experimental and Pharmacological and Chemical levels. The Council through its units located at Varanasi, Calcutta, Hyderabad, Trivandrum, Madras, Delhi, Lucknow carried out research studies on 21 plant drugs.

Amlavetasa *(Garcinia pedunculata* Roxb.) **ChRUC**

Isolation of a compound, m.p. 242-44° from the chloroform extract of G. pedunculata has been reported earlier. Special data of the compound were recorded and their analysis show that it appears to be a zanthone derivative. Structure elaboration of the compound is in progress.

Amra *(Mangifera indica* Linn.*)* Unripe Seed Kernal **ChRUC**

Chromatographic resolution of the concentrated ethyl acetate fraction of *M. indica* (obtained from alcoholic extract) yielded a compound (M_1) m.p. 148-50°. A fraction of compound (M_1/A) further yielded a pure solid, m.p. 128-30°. Examination of the spectral data indicate the compound to be ethyl gallate and later confirmed through m.m./Co. TLC and superimposable IR spectra of authentic sample.

Atibala (*Abutilon Indicum*) (Linn) Sw. **ChRUH**

Petroleum ether extract of root of *Abutilon Indicum* yielded an oil. Pharmacological studies showed that the oil has analgesic activity. Further studies are in progress.

Bakuchi (*Psoralea Corylifolia* Linn.) **CRID**

Seeds of the plant were subjected to solvent extraction with benzene at the room and boiling temperature respectively. Column chromatography afforded from compounds which were found to be mixture of various compounds. Their purification, separation and identification is in progress.

Banjauri (*Vicoa indica*) **CSMDRIAM**

The chloroform extract of the plant on chromatographic studies gave a gum which was found to be different from other vicolids already isolated.

Bhurjapatra (*Betula utilis* Don.) **CRID**

The extraction work to find out the different chemical constituents is under progress.

Chebira (TEL) (*Peristrophe bicalyculata* Nees) **CSMDRIAM**

The chloroform extract of the plant on investigation yielded a triterpene, m.p. 81°, β-sitosterol, m.p. 132°, and sitosterol glucosides m.p. 284°.

Ratanjot (*Clausena Wildenewii*) **CSMDRIAM**

The chloroform extract of stem and bark of the plant subjected to routine investigation showed the presence of octacosanol, m.p. 82°, sitosterol, m.p. 132° and a compound whose indentity is yet to be ascertained.

The hexane extract of leaves gave two low melting point triterpenes, (m.p. 72° and m.p. 75°), whose characterisation is underway.

Bharnagi (*Clerodendron splendence* **CRID**

The three (4,5,6) fractions collected on column chromatography showed the presence of a flavanoid. Further studies were taken up for assigning its structure.

Binda (*Colebrookea oppositifolia*) **CSMDRIAM**

The hexane extract of leaves of the plant yielded 5,6,7,4 - tetramethoxy flavone, m.p. 140-42°, while stem and stem bark gave β-sitosterol.

Dhataki (*Woodfordia fruticosa* Kurz.) **ChRUC**

Isolation of two compounds, A(W_1), m.p. 256-57° and B(W_2), m.p. 268-70°, from the petrol ether extract of *W. fruticosa* has been reported earlier. W_1 and W_2 were mixed and acetylated. It yielded a solid, m.p. 240-250° and its purification is in progress.

A pure fraction m.p. 260-62°, was obtained from the benzene extract of *W. fruticosa*. It gave a positive Liebermann Bacharde test.

Two more compound, m.p. 260° and 236-38°, have been obtained from the flowers of the plant.

Dronapuspi (*Leucas cephalotes* Spreng.) **CRID**

Benzene extract of the *Dronapuspi* on repeated chromatography yielded phytosterol which was identified as β-sitosterol by Co T.L.C., m.p., Co-IR etc. A minor quantity of another sterol was also isolated which was purified by the chromatographic techniques. Identification is in progress.

Eranda (*Ricinus communis* Linn.) **CSMDRIAM**

It has yielded germanicol, m.p., 160° from the chloroform extract of the leaves gave a phenolic acid, m.p. 232° It was identified as gallic acid.

Gajapippali (*Scindapsus Officinalis* Schott.) **ChRUC**

Petroleum ether extract of the powdered material gave a compound (SO-1), m.p. 80-85°, The characterisation of the compound is in progress.

Guggulu (*Commiphora mukul*) (Hook ex Stock) Engl. **ChRUL**

The extraction of the *C. mukul* resin was continued and ethyl acetate soluble material was prepared.

Kamini (*Murraya exotica* Linn.) **ChRUC**

Petrol ether extract of the plant yielded a compound m.p. 108-10°. On the basis of spectral data of the compound, structure was designated as murrayatin, a new coumarin and later confirmed by its partial synthesis as osthal epoxide.

Kapittha (*Feronia limonia Inn.* Swingle) **ChRUH**

Triacontane, m.p. 68-70° was isolated from the petroleum ether extract of the root of the plant. The methanol extract of the root gave a yellowish crude semi-solid, a mixture of 3-4 compounds. The separation in single form is in progress. The methanol extract of the bark gave a brown crude semi-solid which shows the test of coumarins, alkaloids and glycosides. Isolation of components in single form is under progress.

Kharjura (*Phoenix dactylifera* Linn.) **CRID**

Qualitative identification of the free amino acids was carried out in the ethanolic extract of the fruits of the plant. Thin layer chromatography showed the presence of glycerine, alkaline and aspartic acid as free amino acids.

Krishna Sariva (*Cryptolepis buchnani*) **CSMDRIAM**

The plant besides β-sitosterol has yielded three compounds A, B, C and m.p. 230°, m.p. 206-10° m.p. 206-901. The compound A has been identified as sarveregenin. The compound C is one glucose unit attached to the sugar unit of A. Characterisation of 'B' is in progress.

Madayantika (*Lawsonia inermis* Linn.) **ChRUH**

The petroleum ether extract of shade dried coarsely powdered roots yielded β-sitosterol. The chloroform extract of the root yielded β-amyrin and another white crystalline compound having m.p. 79-80°. The characterisation is under progress.

Nanja (*Lasiosiphon eriocephalus*) Stem Bark **ChRUC**

The structure elucidation of the biscoumarin (reported earlier) obtained from the *L. eriocephalus* is under progress.

Parijata (*Nyctanthes arbortristis* Linn.) **CSNDRIAM**

The new iridoid glucosides known as arbortrisides A and B have been isolated from the seeds. Further studies are in progress.

Kasi (*Physalis peruviana* Linn.) **ChRUC**

Three withanolides has been isolated from the roots of *Physalis peruviana*, They are provisionally designated as PRS—7, PRS—8—3 and PRS—8—4. PRS—7 was characterised as 4—B—hydroxy withanolide E, a compound reported earlier. PRS—8—3 is characterised as anhydrous withaperuvine E and it is a new withanolide.

Saka (*Tectona grandis* Linn. f.) **ChRUV**

Ethanolic extract of defiatted bark of *T. grandis* furnished β-sitosterol, β-sitosterol glycoside and betulinic acid. Other fractions are under study.

The petroleum ether extract of the root of the plant yielded a yellow crystalline compound m.p. 140°, which gave, positive test of quinones.

Symplocos spicata **ChRUV**

The sterol isolated earlier was provisionally designated as SYB—6—1, was characterised as X-spinasterol from its physicochemical properties. The work on butanol extract of this plant is under progress.

Vitex pubescens Vahl. **RRIT**

Two neutrals, friedelin and β-sitosterol were isolated from the flowers. Two flavonoid, compound, vitexin and isovitexin have been isolated and identified.

Rauwolfia densiflara **RRIT**

The presence of four alkaloids in the chloroform extract and two flavonoids - kaempferal and kaempferol—3 glycoside were identified in the methanol extract.

Qyasti Madhu (*Glycyrrhiza glabra* Linn.) **ChRUL**

A method for the isolation of glycyrrhizin was developed. Ammonium glyrrhizin, prepared with liqurice powder and ammonia solution was treated with 2% sulphuric acid in cold and was filtered and the solid mass, dried. It was concentrated to dryness under vacuum to give glycyrrhizin m. p. 198°.

Chemical work on (*Aphanamixais polystachya*) **W.&A. ChRUC**

Column chromatography of the concentrated chlorofrom extract of the defatted fruits of *A. polystachaya* on silica gel and elution of the column with benzene ethyl acetate mixture afforded aphananin, a C_{30}-tetracyclic triterpene with a hemiacetal system.

PHARMACOLOGICAL STUDIES

The pharmacological studies and animal experimentation form an essential aspect of drug research leading to the development of newer drugs. Such studies have been largely limited to pharmacological studies on single herbal drugs and their various isolates. The studies to assess the biological activity of Ayurvedic compound formulations, in the form they are clinically used, have been taken rather recently. In recent past such studies have been taken up in respect of certain compound formulations clincally studied. The studies on twenty one single herbal drugs in the form of traditional uses e.g. decoction and their various extractives including certain compounds isolated from them have been continued. The pharmacological studies on a few compound formulations have also been taken up. The main thrust have been to assess . : adaptogenic anti-stress effect of these drugs. The details of work a: briefly discussed hereafter.

Arjuna (*Terminalia arjuna*) **PhRUL**

The ethanolic extract was investigated for its effect on respiration and coronary circulation on mongorel dogs. Doses varying from 10 mg/kg intraperitoneally were used. Doses upto 40 mg/kg caused no change in the amplitude of respiration however, it caused some decrease in blood pressure. With 100 mg/kg dose, there was increase in the rate of respiration but decrease in the amplitude. The effect on blood pressure was more or less the same as observed with lower doses. Marked increase in the rate and amplitude of respiration, severe hypotension has been observed in does of 500 mg/kg.

The extract reduces the coronary resistance even in small dose of 2 mg. when given by intracoranary injection. Further work in this direction is being continued.

Aswagandha (*Withania somnifera*) **PhRUL**

The study was carried out to evaluate its anti-rheumatic and anti-pyretic effect as an extension of its anti-stress profile. A comparative evaluation with aspirin and Panex ginseng, a known "adaptogen" plant antistress was also done. Similar studies were also conducted on Tulasi (*Ocimum sanctum*), Silaras (*Altingia excelsa*,) Tindika (*Diospyros perigerina*), Katukirohni (Picrorrhiza kurroa).

The results of these studies show that anti-stress plant drugs are also anti-rheumatic agents and antipyrexial since the anti-stress activity has a normalising action on the pathophysiology of organism, these drugs could be effective in all types of rheumatic disorders, which are known to be stress diseases.

Bhumyamalaki (*Phyllanthus niruri*) **PhRUB**

Acute toxicity studies were carried out in male mice weighing between 18-20 gm by administering orally Pet. ether, Benzene, Acetone and Ethyl alcohol extracts of the plant as suspension in tween—80 and water in two doses viz. 1gm/kg and 2.00 gm/kg. None of the extracts showed any toxicity and mortality. None of the extracts in a oral dose of 250 mg/kg. showed any analgesic effect by writhing method. Aspirin in dose of 100 mg/kg orally was used as a standard drug. None of the extracts showed anti-inflammatory activity in carrageenin induced oedema. Acetone extract of the plant showed some hepatoprotective activity on the basis of change in the S.G.P.T. level. Ayurveda use this drug in infective hepatitis.

Gandaamarjara Virya (*Civet*) **IIPC, PhRUT**

30.128 gm. civet was collected from two animals kept in captivity during this period. Its effect on different isolated tissues and on anaesthetised dogs was studied. It blocked the action of acetylcholine and 5-HT on rat fundus, of acetylcholine on guinea pig ileum and of oxytocin on rat uterus. No significant effect on blood pressure and respiration in anaesthetised dogs was observed.

Karnaspotaka (*Cardiospermum halicacabum*) **PhRUT**

Whole plant decoction did not produce any mortaility in mice up to a dose level of 30 gm./kg. orally. It did not exhibit any effect on the gross behaviour of the animals, failed to produce any anti-convulsent effect, but it showed analgesic and anti-inflammatory effect in rats with 10 gm/kg and 20 gm/kg dosages. On perfused frog heart a dose of 100 mg onwards produced bradycardia and 500mg produced transisent cardiac arrest with recovery with in 5-7 minutes, which was not blocked by atropine.

Kapittha (*Feronia limonia*) **PhRUB**

Five extract of the plant (I) BM/FLR/Total, BM/FIR/A, BM/FLR/C, BM/FLR and BM/FLR/SB/1 were studied None of the extracts showed any behavioural change or mortality upto a dose of 2.5 gm/kg in mice weighing 18-20gm. None of the extracts in an oral dose of 250 mg/kg showed any analgesic activity by writhing method. None of the extracts in an oral doses of 250-mg/kg showed any anti-inflammatory activity in male rats weighing from 150-180 gm using carrageenin induced oedma method. In Ayurveda the plant is used for external application in insect and snake bites and is also prescribed for biliousness.

Lodhra (*Symplocos spicata*) **PhRUU**

The pharmacological action of α-spinasterol, which was isolated from Lodhra are being reported. The drug did not produce any mortality within 24 hours with a dose of 800mg /kg intra-peritoneally. It also did not affect the exploratoty behaviour or potentiation of pentobarbitone sleeping time.

The drug indose of 5gm/kg produced significant anti-inflammatory effect which was more potent than phenylbutazone 100mg/kg though less effective than betamethasone 0.25mg/kg. The anit-inflammatory effect was unaffected by metyrapone pretreatment. This suggests that anti-inflammatory effect of α-spinasteroli s not corticosteroid mediated. It is likely that the apeutic utility of Lodhra in Ayurvedic medicine as anti-ulcerogenic agent might be due to this active constituent. Further studies are in progress. In Ayurveda it is used in gestrointestinal disorders, eye diseases and for bleeding gum.

Latakaranja (*Pongamia pinnata*) **PhRUT**

Ayurveda refers latakaranja as useful in skin diseases, rheumatism, piles etc. The decoction of *P. Pinnata* was evaluated for its pharmacological actions on various isolated tissues and in certain in vivo studies. The decoction blocked the spasmogenic action of acetylcholine and histamine on guinea pig ileum in doses of 46-200/ ml bath fluid. Transient bradycardia in dose of 500 mg was observed in dog blood pressure studies. Dose above 50 mg/kg produced hypotensive effect in anaesthetized dogs. No hypothermic effect was observed. However, it demonstrated some anti-pyretic effect with 5mg/kg 10mg/kg doses. Analgesic studies are in progress.

Madayntika (*Lawsonia inermis*) **PhRUT**

The decoction of this plant was screened for its analgesic, anti-inflammatory and its effect on liver injury. Doses varying from 1gm to 3gm/kg were used during these studies. The decoction showed good analgesic effect, but failed to demonstrate any anti-pyretic effect. It also showed anti-inflammatory efiect on mouse ear oedema, formaline induced ascites and on granuloma pouch studies. In a dose of 1gm/kg it was found to be effective in liver injury in carbon tetrachloride treated rats. The drug is indicated in Ayurveda in cases of jaundice, enlargement of spleen, skin diseases; leprosy, spermatorohoea etc.

Tulasi (*Ocimum sanctum*) **PhRUT**

Anti-stress effect of Tulasi (***Ocimum sanctum***) and other plants like ***Panex gingeng, Pseudo ginseng, Heddra helix*** claimed for the potential have been studied. 40/60 ethanol distilled water extract obtained for these plants are being fed to different groups of mice (25 in each group) of similar age and weight group daily orally in doses of 20gm/kg. At different time intervals abilities of these drugs to combat stress induced changes in adrenal weight, gastric ulcer, thymus weight and heart changes were observed and compared using Eleutherococcus, a Russian Siberian plant, as reference standard drug. The result show that Tulasi (***Ocimum Sanctum***) was more potent

than Eleutherococcus. The swimming time (Survival time) ocimun sanctum 20mg/kg. orally treated mice was 10 hours 34 minutes and of Eleutherococcus 9 hours and 17 minutes. The mean normal control was 6 hours and 2 minutes, thus both these drugs enhanced the survival time in mice during swimming stress.

Stress-induced pin point haemorrhages in the stomach were also prevented by both these druges. Thus both drugs prevented ulcerogenic effect of stress. Histological studies on the cardiac tissue is in progress.

Nimba (*Melia azadirachta*) **PhRUT**

The study on the effect of Nimbidin on gastric secretion on albino rates, and its protective effect on CCl_4 induced liver injury in rats was taken up. The gastric secretion studies with Nimbidin have been completed and are now being compared with that of Cimetidine. Nimbidin (20, 40 and 80 mg/kg orally) showed promising results in liver injury by carbon tetrachloride in rats. The drug was given for 28 days and on 29th day animals were sacrificed and various biochemical parameters were studied, An increase in liver weight, volume and glycogen content were noted in Nimbidin treated group as compared with CCl_4 treated group. There was decrease in G.O.T. G.P.T. and alkaline phosphatase of serum and liver of Nimbidin' treated rats as compared to carbon tetrachloride treated rats. In Ayurveda it is used as anthelmintic, diuretic, and in rheumatism, leprosy, scrofula etc.

Nirgundi (*Vitex negundo*) **IIPC**

Pharmacological evaluation of ***Vitex negundo*** (root and leaves) extracts was continued.

Petroleum ether (PE) of VNDL depressed SMA, ETE of VNDR, PE of VNDR and VNDL and BE, (ETE) of VNDL prolonged pentabarbitone sleep and BE of VNDR produced marked antagonism of exotremorine effects indicating the antiparkinsonian effect. BE of VNDL showed moderate anticonvulsant effect (3/5 mice protected) against electroconvulsions. Chloroform extract of VNDL produced analgesic effect when tested by radiant heat method. TLE, PE of

VNDL and CAI, DE and CHE of VNDR antagonised acotic acid induced writhing indicative of its aspirin like analgesic effect. None of the extracts possess antipsychotic (did not effect d-amphetamine stereotype and CAR), antidepressant (failed to antagonise reserpine effect and shorten duration of mice immobility) and Muscle relaxant effect (no effect of FMA). They also did not protect mice against chemoconvulsions (strychnine and pentyleneterrazol convulsions).

Orthosiphon stamineous **PhRUT**

The effect of the decoction of the plant was studied on isolated tissue preparations as well as to determine its analgesic, anti-pyretic, anti-convulsant and hypoglyceamic effects. Doses upto 4g/kg did not show any toxic manifestations or motality in mice within 24 hours of its oral administration.

The decoction showed partial blockade of the action of Acetylcholine on guinea pig ileum and temporary stoppage of frog heart. It failed to potentiate pentobarbitone indueed hypnosis and to produce hypothermic and anti-pyretic actions. It also failed to show analgesic action but demonstrated hypoglycaemic action as well as slight hypotensive effect in an anaesthetised dogs. In Ayurveda it is used in kidney and bladder disorders.

Risbhaka (*Microstylis Wallichii*) **PhRUL**

The crude drug was extracted with 70 percent alcohol in soxhlet appratus. The residue so obtained was suspended in normal Saline for use in these studies. The extract in doses of 50mg/kg to 100mg/kg significantly (0.001) reduced the inflammation response. Its effect on chronic inflammation (Cotton pellet implantation method) is being assessed. Other general pharmacological studies are also in progress.

Raktacandana (*Pterocarpus santalinus*) **PhRUL**

Decoction of this plant in doses varying from 10mg to 15mg were generally used to study its effect on isolated smooth and skeletal muscle, analgesic, anti-pyretic, anti-inflammatory, anti-convulsant and local anaesthetic effect etc. The decoction in doses of

10 to 50 mg blocked the action of Acetylcholine, Histamine 5—HT and oxytocin in various smooth muscle preparations. It also produced antagonistion action against Acetylcholine on isolated frog rectus abdominis muscle. In a dose of 200 mg it completely stopped frog heart. It failed to reduce hypothermic, anti-pyretic anti-analgesic effects, but it potentiated pentobarbitone induced hypnosis, blocked in trained rats, showed mild anti-inflammatory hypogly caemic and antidiabetic activities. But it failed to produce any local anaesthetic action. According to Ayurveda it is useful against implantation, bilious effections and skin diseases etc.

Rasanjana (Rasont) **CRID**

The acute toxicity studies and inflammatory studies were conducted in rats and mice with aqueous decoction.

The drug did not produce any mortality of toxic manifestation upto a dose of 2gm/kg body weight during the first 24 hours. The anti-inflammatory studies (by cotton pellet granuloma pouch method) in rats are being continued.

Sahacha (*Strobilanthes heyneanus*) **IIPC**

Extracts of leaf, stem and root possess interesting pharmacological activities. CAI of leaf, petroleum ether and Aqueous extract of root and stem and CHE of stem produced (CNS) followed by depression. Ethanol extract of root produced CNS stimulation. CAI of leaf showed moderate anagonism of d-amphetamine stereotype indicating mild antipsychotic effect. Others did not antagonise d-amphetamine stereiotype CHE of root produced analgesic effect when tested by radiant heat method. Petroleum ether of stem, ethanol extract and CAI of leaf suppressed carrageenin induced rat hind paw oedema indicating its anti-inflammatory effect. Other extracts had no effects.

None of the extracts could antagonise prochlorperazine catatonia, exoprenerine tremors, strychnine, pentylene tetrazole and electroconvulsions and shorten duration of mice immobility indicating lack of antiparkinsonian, anticonvulsant and anti-depressant effects.

Sati (*Hedychium spicatum*)

The rhizomes were dried, powdered and sequentially extracted in soxhlet apparatus with petroleum ether, chloroform and alcohol. The petroleum ether extract was used for in vitro and vivo studies. In vitro various tissues were studied e.g, guinea pig ileum, tracheal chain, rat uterus and frog rectus abdominis. These studies indicate that the extract has a nonspecific antagonistic action which is dose-dependent and reversible. In vivo studies the extract was tested on cat blood pressure. It produced hypotensive effect which was also dosedependent. It is commonly used in liver disorders, vomitting, diarrhoea, inflammation and pains etc.

Shilajit **PhRUV**

Studies were conducted in albino mice to determine its effects on general behaviour using different parameters.

Shilajit in the dose of 50 to 200 mg/kg had no significant effect on the general behaviour of mice. It had slight analgesic activity ($P<0.001$) in the dose 200 mg/kg intraperitoneally. The effect was significant during the first 60 min. and reduced at 90 min. The effect of sub-hypnotic dose of pentobarbitone (20 mg/kg, i.p.) in mice was not significantly affected by Shilajit (50 mg/kg) pre-treatment. Shilajit in the dose of 200 mg/kg did not modify either maximal electroshock seizures or maximal metrazol seizures in albino rats. Shilajit in dose of 50 mg/kg reduced carrageenin oedema by 76.4%. The degree of anti-inflammatory activity of Shilajit was found to be nearly similar to that of 100 mg/kg of phenylbutazone and 0.24 mg/kg of beta-methasone. In order to assess the role of adrenal gland in the anti-inflammatory activity of Shilajit studies were conducted in metyrapene (20 mg/kg i.p. given twice, 8 hr. and 4 hr. before) treated rats. Metyrapene treatment was found to significantly (60,01%) increase the pedal oedema. Even in these rats, Shilajit markedly reduced pedal oedema which was not different from that seen with Shilajit in metyrapene untreated rats. Shilajit in the dose of 50 mg/kg, i. p. daily for 7 days produced significant reduction in both the exudate and granuloma pouh weight. The effect was however, much more on the exudate than on the granuloma formation. Shilajit in the dose of 50 and 200 mg/kg i.v.

produced a transient and slight fall in blood pressure (10 mm Hg) with no significant change in heart rate and respiration of anaesthetised dogs. Nicotine (50mg/kg, IV), adrenaline (10mg/kg, IV) and acetylcholine (5μg/kg, IV) responses were unaffectedb y Shilajit pretreatment (2min.)

Shilajit (1mg) had a positive inotropic effect in both normodyamic and hypodynamic perfused frog heart. The positive inotropic action of Shilajit could not be modified by propranolol pretreatment or pre-incubation of Shilajit with EDTA (0.1 mg) in normodynamic and hypodynamic heart respectively.

The effect of Shilajit on gastric secretion in pylorus ligated rats was studied and it was observed that it reduced the protein content and ulcer index significantly. The ratio of total carbohydrate and protein was significantly increased with both 50 mg and 200 mg/kg doses. At both the dose levels there was decrease in volume and acid and peptic activity but the difference is not statistically significant. Shilajit did not produce any mortality in albino mice for 24 hours up to a dose of 1gm/kg intraperitoneally.

Udumbara (*Ficus racemosa*) **PhRUB**

The water soluble portion of the alcohol extract of Udumbara was found to cause depression on contractile response of heart in the dose of 200 mg and caused cardiac arrest in the dose of 800 mg in smaller doses like 1 mg-80 mg it did not cause any depressive effect and only heart rate decreased. The depressive effect of Udumbara is blocked with atropine suggesting that it may be mediated through cholenergic system.

Vata (*Ficus bengalensis*) **IIKP**

Aqueous extract of fruits, bark and root in various concentration i.e. from 2.5 to 20 percent were studied for local anaesthetic activity (infiltration method) in guinea pigs. All the extracts were found to be devoid of this property. The decoction also did not influence the movement of guinea pig ileum.

Pharmacological studies were also carried out on the coded drugs AC-4, Ayush-64 as well as formulations Rasnasaptak kwath and bilvadigutika etc.

AC-4

The acute toxicity study was carried out in rats. The drug was given in aqueous suspension in graded dosages varying from 100 mg to 900 mg/kg. No mortality was observed during this period. The acute toxicity in mice was also studied and the LD-50 was found to be more than 2 mg/kg body weight. It showed significant spasmogenic action on isolated rabbit ileum which was does-dependent. The drug failed to show any anti-inflammtory, hypnotic and ulcerogenic activity.

Sub-acute toxicity studies in rats were carried out for a period of twelve weeks. With a dose of 500 mg/kg of AC-4 administered during this period, no toxicity was detected through the tests conducted during and after the conclusion of these studies e.g. change in food and water intake, behaviour and mortality rate, change in body weight, change in haematological, SGOT, SGPT, Glucose, Cholestrol, Urea and no change in urine out put were observed. At the end of study the animals were sacrificed by decapitation and the following organs e.g. heart, liver, spleen, kidney, adrenals were observed for gross pathological changes and their weights etc.

Ayush-64 **TRUJh and TRUB**

Acute toxicity studies were carried out on Ayush-64 in rats and rabbits. In both the species no mortality was observed during the first 24 hours after drug administration. Graded doses from 500 mg/kg. kg to 2 gm/kg were used. The acute toxicity in mice by oral route was also studied and the LD-50 was found to be more than 2 gm/kg.

Sub-acute studies in rats by oral route were carried out for twelve weeks. 500 mg/kg of Ayush-64 was administered orally during this period. After the conclusion of studies no changes in food and water intake, behaviour and mortality rate, change in body weight, change in haematological, SGOT, SGPT, Glucose, Cholesterol, Urea and in urine out put etc. were observed. At the end of study the animals were sacrificed by decapitation and the heart, liver, spleen, kidney and adrenals were observed for any gross pathological changes and their weights.

Ayush-64 was found to possess significant cardiac depressant activity on frog's heart and dose dependent anti-spasmodic effect on guinea pig ileum.

It failed to show any hypnotic, anti-inflammatory or ulcerogenic activity and no hypoglyceamic effect was observed.

Rasna Saptaka Kvatha **IIKP**

The local anaesthetic activity of this drug was compared with lignocaine infilteration anaesthesia in guinea pigs. The drugs in concentrations of 2.5, 5, 10 and 20 per cent showed an anaesthesic score of 2.7, 14.8, 16.6, and 18.8 respectively. The percent failure of pricks was not dose-dependent.

Bilvadigutika etc **IIPC**

Effect of Bilvadigutika (VG) and Jeevarakshaka gutika (JRG) are two important Ayurvedic formulations which are reputed to be effective as antidote against snake-bite. Bilvadigutika and Jeevarakshaka gutika failed to afford protection to mice against cobra venom.

STANDARDISATION RESEARCH

The results of research - be it in clinical medicine or applied research largely depend upon the availability of genuine and authentic drug material and medicines. With a view to maintain the quality and uniformity of the medicinal preparations that are used in clinical and other areas, there is an imperative need for evolving suitable working standards so that proper medicines can be obtained. As such the research in the area of standardisation assumes a significant place. Major thrust was laid on standardisation of single drugs, finished products, method of manufacture and fixing of analytical values for various types of formulations, besides some ancillary studies. The work was carried out at RRI, Trivandrum, RRC, Bangalore, AU, Tarikhet, CSMDRIA, Madras, Gujarat Ayurved University, Jamnagar and IMS, Banaras Hindu University, Varanasi as in the past.

The details of the aspects of research covered are enumerated hereunder ;

Analytical Standards (*Pharmacopoeial standards*)

1.	Shatamulyadi lauh	CSMDRIAM
2.	Rakta Pittantaka lauh	CSMDRIAM
3.	Shothari mandoora	CSMDRIAM
4.	Tamra mandoora	CSMDRIAM
5.	Nagarjunabhra rasa	CSMDRIAM
6.	Laghusutasekhara rasa	CSMDRIAM
7.	Gandhaka rasayana rasa	CSMDRIAM
8.	Hinguleshwara rasa	CSMDRIAM
9.	Tarakeshwara rasa	CSMDRIAM
10.	Navayasa lauh	CSMDRIAM

11.	Shilajitvadi lauh	CSMDRIAM
12.	Guduchi lauh	CSMDRIAM
13.	Pudinaarka	CSMDRIAM
14.	Madhusnuhi rasayana	PSRUJ
15.	Dasamula kwatha churna	PSRUJ
16.	Maharasnadi kwatha churna	PSRUJ
17.	Kutajaghana vati	PSRUJ
18.	Pancha tikta Guggulu ghrita	PSRUJ
19.	Gangadhara churna	PSURJ
20.	Visagarbha taila (Laghu & Brhat)	PSRUJ
21	Panchaguna taila	PSRUJ
22.	Kambudha rasa	PSRUJ
23.	Hridayarnava rasa	PSRUJ
24.	Lepa gute	PSRUJ
25.	Punarnava mandoora	PSRUJ
26.	Yavaksara	PSRUJ
27.	Punarnava guggulu	PSRUJ
28.	Sudarsanghana vati	PSRUJ, PSRUV
29.	Astanga lavana	PSRUJ
30.	Satavaryadi churna	PSRUJ
31.	Swadistavirecana churna	PSRUJ
32.	Navajivana rasa	PSRUJ
33.	Visatinduka vati	PSRUJ
34.	Lavanga taila	PSRUJ
35.	Mahasankha vati	PSRUJ
36.	Kukkutandatvak bhasma	PSRUJ, PSRUV
37.	Sphatika bhasma	PSRUJ
38.	Godanti mishrana	PSRUJ,PSRUV
39.	Gandhaka misrana	PSRUJ, PSRUV
40.	Satavari mandura misrana	PSRUJ, PSRUV

41.	Sukha virecena misrana	PSRUJ, PSRUV
42.	Pratapalankeshvara rasa	PSRVJ
43.	Arogyavardhini misrana	PSRUJ, PSRUV
44.	Tribhuvankirti misrana	PSRUJ, PSRUV
45.	Kamdudha misrana	PSRUJ, PSRUV
46.	Tankara bhasma	PSRUJ, PSRUV
47.	Jaha mohar bhasma	PSRUJ
48.	Sangeyahud pisti	PSRUJ
49.	Mayurapiccha bhasma	PSRUJ
50.	Arsakuthara rasa	PSRUJ
51.	Garbha pala rasa	PSRUJ
52.	Bolabaddha rasa	PSRUJ
53.	Smrtisagara rasa	PSRUJ
54.	Brahmi vati	PSRUJ
55.	Sarivadi vati	PSRUJ
56.	Arshoghni vati	PSRUJ
57.	Asthisandhanakao epa	PSRUV
58.	Gandhaka rasayana	PSRUJ, PSRUV
59.	Jvaranuksha rasa	PSRUV
60.	Manikya rasa	PSRUV
61.	Nidrodaya rasa	PSRUV
62.	Satavaryadi ghrta	PSRUV
63.	Sarpagandha mishrana	PSRUV

Single Drugs

1.	Vibhitaki (*Terminalia belerica*)	RRI, PSRUJ
2.	Ajamoda (*Trachyspermum ammi*)	RRIT
3.	Krishna jiraka (*Carum bulbocastanun*)	RRIT
4.	Patanga (*Caesalpinia sappan*)	RRIT
5.	Kutuki (*Picrorhiza kurroa*)	RRIT

6.	Katuka (*Merrina tridantata*)	RRIT
7.	Raktachandana (*Pterocarpus santalinus*)	RRIT, A.U.T., CSMDRIAM
8.	Gunja (*Abrus precatorius*)	RRIT, CSMDRIAM
9.	— (*Vitex sp.*)	RRIT
10.	Nimba (*Melia azadirachta*)	RRIT, RRCB
11.	— (*Vigna sp.*)	RRIT
12.	— (*Ipomea prestrogridis*)	RRIT
13.	Shigru (*Moringa olifera*)	RRIT
14.	— (*Pimpinella anisum*)	RRIT
15.	Punarnava (*Boerhaavia diffusa*)	RRIT
16.	— (*Piper sp.*)	RRIT
17.	Yasti (*Glycyrrhiza glabra*)	RRIT, CSMDRIAM, PSRUJ
18.	Eranda (*Ricinus communis*)	RRIT, CSMDRIAM
19.	— (*Alpina calcarata*)	RRIT
20.	Ashwagandha (*Withania somnifera*)	RRIT
21.	Patha (*Cyclea peltata*)	RRIT
22.	Dadima (*Punicum granatum*)	RRIT
23.	— (*Garcinia comboja*)	RRIT
24.	Jiraka (*Cuminum cyminum*)	RRIT, PSRUJ
25.	Kutaja (*Holarrhena antidysenteriea*)	RRIT, PSRUJ
26.	Kamala (*Nilumbo nucifera*	RRIT, PSRUJ
27.	Haritaki (Galls of *Terminalia chebula*)	RRIT
28.	Jatiphala/kosha (*Myristica fragrans*)	RRIT, PSRUJ
29.	Khadira (*Acacia catechu*)	RRIT, RRCB, AUT
30.	— (*Peucocanum graveolens*)	RRIT
31.	— (*Berberis aristata*)	RRCB
32.	Bilva (*Aegle marmelos*)	RRIT
33.	Atibala (*Abutilon indieum*)	RRCB
34.	Daruharidra (*Berberis aristata*)	RRCB
35.	Kirata tikta (*Swertia chirata*)	RRCB, PSRUJ

36.	Agnimantha (*Clerdondrum phlomidis*)	RRCT, PSRUJ
37.	Twak (*Cinnamomum zeylanicum*)	RRCB
38.	Shalparni (*Desmodium gangeticum*)	RRCB, PSRUJ
39.	Brihati (*Solanum indicum*)	RRCB
40.	Patala (*Stereospermum tetragonum*)	RRIT
41.	Vajradanti (*Barleria prioinitis*)	RRCB
42.	Vacha (*Acorus calamus*)	RRCB
43.	Guggulu (*Commiphora mukul*)	RRCB, CSMDRJAM, PSRUJ
44.	Ativisa (*Aconitum heterophyllum*)	CSMDRIAM, PSRUJ
45.	Tulasi (*Hyptes suaveolens*)	CSMDRIAM
46.	Pashana behai (*Coleus aromaticus*)	CSMDRIAM
47.	Karabha (*Capparis zeylanica*)	CSMDRIAM
58.	Nagadamani (*Artimesia vulgaris*)	CSMDRIAM
49.	Sitaphala (*Anona squamosa*)	CSMDRIAM
50.	Sahachara (*Strobilanthus hyneanus*)	CSMDRIAM
51.	Kundali (*Asina tetracantha*)	CSMDRIAM
52.	Vidara (*Opuntia diffenie*)	CSMDRIAM
53.	Sirisa (*Albizzia leobbeck*)	CSMDRIAM
54.	Chandana (*Santaluw album*)	CSMDRIAM, PSRUJ
55.	Kshira kakoli	CSMDRIAM
56.	Tambula (*Piper betel*)	CSMDRIAM, PSRUJ
57.	Kakoli	CSMDRIAM
58.	Kasturilatika (*Hibisus abelmoschus*)	CSMDRIAM
59.	Koshataki (*Luffa acutangula*)	CSMDRIAM
60.	Mulaka (*Raphanas sativus*)	CSMDRIAM
61.	— (*Curcubita pora*)	CSMDRIAM
62.	Karavellaka (*Mamordica charantia*)	CSMDRIAM
63.	Matsyakshi (*Alternthera triandra*)	CSMDRIAM
64.	Surasa (*Vitex trifolia*)	CSMDRIAM
65.	Surasa (*Woodfordia fruitcosa*)	CSMDRIAM

66.	Ketaki (*Pandanus odoratissima*)	CSMDRIAM
67.	Bhallataka (*Semecarpus anacardium*)	CSMDRIAM
68.	Shveta punernava (*Triantema portulaucastrum*)	CSMDRIAM
69.	Kushmanda (*Benincasa hispida*)	CSMDIRAM, PSRUJ
70.	Ervaru (*Cuminus sativa*)	CSMDRIAM
71.	Bimbi (*Coccinia indica*)	CSMDRIAM
72.	Paribhadra (*Erythrina indica*)	CSMDRIAM
73.	Shyonaka (*Droxylum indicum*)	CSMDRIAM
74.	Briugaraja (*Eclipta alba*)	CSMDRIAM, AUT
75.	Pippali (*Piper longum*)	CSMDRICM
76.	Perumaram	CSMDRIAM
77.	Narikela (*Cocos nucifera*)	CSMDRIAM
78.	Ushira (*Lippa nodiflora*)	CSMDRIAM
79.	Durva (*Cynodon dactylon*)	CSMDRIAM
80.	Haremuka (*Vvtex negundo*)	CSMDRIAM, AUT
81.	Saptaparna (*Alstonia scholaris*)	COMDRIAM, PSRUJ
82.	Krishna sariva (*Cryptolepis buchnani*)	CSMDRIAM
83.	Kramuka (*Areca catechu*)	CSMDRIAM
84.	Atasi (*Linun usitatissimum*)	CRMDRIAM
85.	Aragvadha (*Cassia fistula*)	CSMDRIAM
86.	Lashuna (*Allium sativum*)	CSMDRIAM
87.	Visha (*Aconitum ferox*)	CSMDRIAM
88.	— (*Aconitum ferox*)	CSMDRIAM
89.	Madan phala (*Randia dumetorum*)	CSMDRIAM
90.	Bhumyamalaki (*Phyllanthus urinaria*)	CSMDRIAM
91.	Kulinjana (*Alpinia galanga*)	AUT
92.	Vyaghranakhi (*Martynia annua*)	AUT
93.	Anisuna (*Pimpinella anisum*)	AUT
94.	Rumimastaki (*Pistacia tenenscens*)	AUT
95.	Danti (*Baliospermum montanum*)	AUT

96.	Musta (*Cyperus rotunaus*)	AUT
97.	Tila (*Sesamum indicum*)	AUT
98.	Kankola (*Piper cubeba*)	AUT
99.	Priyangu (*Calicarpa macrophylla*)	AUT
100.	Bhringaraja (*Eclipta alba*)	AUT
101.	Agaru (*Aquilaria agallocha*)	AUT
102.	Ardraka (*Zingiber officinalis*)	AUT PSRUJ
103.	Chitraka (*Plumbago zeylanica*)	AUT PSRUJ
104.	Saindhava lavan	AUT
105.	Manashila	AUT
106.	Haratala	AUT
107.	Mriddara shringa	AUT
108.	Sankha jiraka	AUT
109.	Ambar	AUT
110.	Vanshalochana	AUT
111.	Lime powder	AUT
112.	Aragwadha (*Cassia fistula*)	PSRUJ
113.	Devadaru (*Cedrus deedara*)	PSRUJ
114.	Langali (*Gloriosa superba*)	PSRUJ
115.	Palash (*Butea monosperma*)	PSRUJ
116.	Lajjalu (*Mimosa pudica*)	PSRUJ
117.	Vijaya (*Cannabis sativa*)	PSRUJ
118.	Lodhra (*Symplocos racemosa*)	PSRUJ
119.	Tagar (*Valeriana wallichii*)	PSRUJ

120.	Sarpandha (*Rauwolfia serpentina*)	PSRUJ
121.	Macarasa (*Salmalia serpentina*)	PSRUJ
122.	Kapikachu (*Mucuna pruriens*)	PSRUJ
123.	Mayaphala (*Quercus infectoria*)	PSRUJ
124.	Musali (*Asparagus adscendes*)	PSRUJ
125.	Elavaluka (*Prunu avium*)	PSRUJ
126.	Syonaka (*Oroxylum indicum*)	PSRUJ
127.	Hapusa (*Juniperus communis*)	PSRUJ
128.	Saileyaka (*Parmelia perlata*)	PSRUJ
129.	Chakramarda (*Cassia tora*)	PSRUJ
130.	Draksha (*Vitis vinifera*)	PSRUJ
131.	Bakuci (*Psoralia corylifolia*)	PSRUJ
132.	Trayamana (*Gentiana kurroa*)	PSRUJ
133.	Amalaki (*Emblica officinalis*)	PSRUJ
134.	Haritaki (*Terminalia chebula*)	PSRUJ
135.	Madhuka (*Madhuka latifolia*)	PSRUJ
136.	Kulatha (*Dolichos biflorus*)	PSRUJ
137.	Ela (*Elettaria cardamomum*)	PSRUJ
138.	Chavya (*Piper chaba*)	PSRUJ
139.	Katphala (*Myrica nagi*)	PSRUJ
140.	Jatamansi (*Nardostachys jatamansi*)	PSRUJ
141.	Sringi (*Pistacia integerrima*)	PSRUJ
142.	Lavanga (*Syzygium aromaticum*)	PSRUJ
143.	Krisnajiraka (*Carum carvi*)	PSRUJ

144.	Puskara mula (*Inula racemosa*)	PSRUJ
145.	Marich (*Piper nigrum*)	PSRUJ
146.	Nagakesara (*Mesua ferrea*)	PSRUJ
147.	Talisapatra (*Taxus baccata*)	PSRUJ
148.	Sariva (*Hemidesmus indicus*)	PSRUJ
149.	Jivanti (*Leptadenia reticulata*)	PSRUJ
150.	Rasna (*Pluchea lanceolata*)	PSRUJ
151.	Yava (*Hordeum vulgare*)	PSRUJ
152.	Prasniparni (*Uraria picta*)	PSRUJ
153.	Babbula (*Acacia arabica*)	PSRUJ
154.	Gambhari (*Gmelina arborea*)	PSRUJ
155.	Rudraksa (*Eleocarpus ganitrus*)	PSRUJ
156.	Kantakari (*Solanum xanthocarpum*)	PSRUJ
157.	Patala (*Stereospermum suaveolons*)	PSRUJ

Method of Manufacture

1.	Asavarista	CSMDRLAM
2.	Rasa	AUT
3.	Lauh	RRIT
4.	Shodhana	AUT

Finished Products (Detailed standards)

1.	Dhanwantara gutika	PSRUJ
2.	Khadiradi gutika (Kasa)	PSRUJ
3.	Dasamula taila	PSRUJ

4.	Brihat marichyadi taila	RRCB
5.	Krimikuthara rasa	RRCB
6.	Amavatari rasa	RRCB
7.	Tarake hwara rasa	RRCB
8.	Paraedi lepa	RRCB
9.	Chandanasava	CSMDRIAM
10.	Tamra bhasma	AUT
11.	Pravala bhasma	AUT
12.	Shringa bhasma	AUT
13.	Manikya bhasma	AUT
14.	Kaharua pisti	AUT
15.	Akika bhasma	AUT
16.	Lauh bhasma	AUT
17.	Mukta bhasma	AUT
18	Naracha rasa	AUT
19.	Raktapittantaka lauh	AUT
20.	Navayasa lauh	AUT
21.	Guduchi lauh	AUT
22.	Shatamoladga lauh	AUT
23.	Sindooradya malahar	AUT
24.	Paradadi lepa	AUT
25.	Madhyama narayama taila	RRIT
26.	Mahalakshadi taila	RRIT
27.	Kutaja ghana vati	RRIT

28.	Ashvagandhya churna	RRIT
29.	Dadimastake churna	RRIT
30.	Ashwagandhya churna	RRIT
31.	Lavangadi churna	RRIT
32.	Agnimukh churna	RRIT
33.	Gangadhar churna	RRIT
34.	Abhaya vati	RRIT
35.	Sarpagandha ghanvati	RRIT
36.	Pippalyadi taila	RRIT
37.	Kshara taila	RRIT
38.	Hingvadi taila	RRIT
39.	Arsha kuthara rase	RRIT
40.	Lakshmvilasa rasa	AUT

Others Miscellaneous studies

The Standardisation Research Projects in addition carried out the ancillary studies like shelf life of finished products effect of preservatives on the ingredients, the efect of containers on the content, and identification of the major alkaloid (s) in the finished products.

The study related to antipyretic effects of Dhatakipushpa and Antibacterial activity of plumbagin were carried out.

Besides above, the standardisation studies were also carried out on some of the basic drugs like sugar, honey, taila and ghrita.

LITERARY RESEARCH INCLUDING MEDICO-HISTORIOGRAPHY

Literary Research

The Literary Research in Ayurveda occupies a pivotal position as interpretation of the concepts and contenrs have a crucial role in the entire programming be they in the area of clinical studies, drug studies or any others. The medico-historical studies related to Ayurveda are also equally important to acquaint the scientific communtity about the evolution of theories, concepts and ideas of Ayurvada and their impact, if any on the contemporary periods. The study in this area encompasses examination of various sources e.g. rock edicts, inscriptions, contemporary archaeological findings, oriental literature etc. The Council through its Documentation and Publication Division, New Delhi has taken up programmes involving collection of information of drugs and diseases from various clinical treatises and other sources to provide assistance to scientists and research workers. Medical references available in Padmapurana from sections of Bhumikhanda, Svargakhanda and Brahmakhanda have been completed. Study of Yogadipika of Gorakharnath was compared and a note on the work and author is prepared. Further studies on the 15th, 16th and 17th volumes of Al-Haw by Abui Bakar Mohammed Bin Zakaria have been continued and the names of Physicians appearing therein were collected. The biological details of Physicians who flourished during Nizam dynasty have also been compiled from fifteen Arabic, Persian and Urdu books.

Collection of current references on over 300 drugs of first volume of Ayurvedic Formulary from Ayurvedic and other published journals/bulletins have been gathered. The research monographs and the four periodicals-Journal of Research in Ayurveda and Siddha, Bulletin of Medico-Ethno Botanical Research, Bulletin of Indian Institute of History of Medicine and News Letters of Central Council for Research in Ayurveda and Siddha were brought out. Certain classical works of Tamil are being translated into Sanskrit and Hindi and vice-versa. The publication of Sanskrit version of Sahasaryayoga is under process.

Medical inscriptions of 13th century AD located at Malkapura of Kakatiya Queen Rudramma were examined. It revealed the existance of ageneral hospital and maternity hospital.

The translation of Chikitsamritasagara from Sanskrit to Hindi has been taken up and about 1187 Slokas have been translated. Press copy of Satasloki has been finalised. A critical edition of Astanga Samgraha is being processed for publication.

The works relating to the collection and compilation of references in respect of Eranda, Karanja, Karkatasrinigi chtraka, Tintidika, Pippali, Bakuchi, Mahameda, Raktacandana, Vidari from Vrahattrayi, Laghutrayi and other important classical literature and journals have been taken up. The references from Journals have been updated in respect of Ashoka, Iksu, Kustha, Dadima, Khadira, Manjistha and Salmali; selected bibliography on Palandu, Murva, Saptaparna, Guggulu, Guduchi and Kathuki have been prepared. Additional references for Chavya, Jatamansi, Karavellaka, Nagavalli, Nagakaesar, Nimba, Vrihatgoksuru, Sariva, Sigru have been completed.

Textual references in respect of Kasa, Svasa, Apasmara and Madhumeha were gathered.

The details of Post-Graduate and doctoral theses have been completed from Universities of Mysore, Kerala (Trivandrum), Pune, Bombay, Madras (Madurai), Lucknow, Banaras Hindu University, Varanasi, Gujarat Ayurvada University, Jamnagar and National Institute of Ayurveda, Jaipur.

Steps to update the union catalogue of Ayurveda and Siddha manuscripts have been taken up. Information or the availability of manuscripts at Rajasthan, Madhya Pradesh, Orissa, Delhi, Uttar Pradesh and Gujarat have been obtained and a consolidated list covering medical manuscripts is under preparation. Folk medical claims gathered by different Institutes/Centres/Units etc. are being ledgered.

A total list of 300 research papers in Ayurveda and Siddha published in Journals, besides the reprints from published works have been indexed and abstracted.

The microfilming of certain rare books etc. Majul Affal, (Persian), Qerabadame Massoris (Persian), Maha Yogamurta Kalparalli (Telugu), and Basvarajeeyam (Sans.) has also been done and Siddha works from Agastyar Painkarya Nighantu, Siddha raruday Pathineu Siddhar Nadisastra, Karvoorar Palathinvati and Karvoorur Sothuram (Palm leaf) were also prepared.

Publications

The efforts were further intensified to update the publication of Council's periodicals Vol. II No. 2 of Journal of Research in Ayurveda and Siddha (JRAS) and Vol. II No. 3 of Bulletin of Medico-Ethno-Botanical Research (BMEBR) were released bringing the publication level to June and September, 1982 respectively. The compilation and editing of further issues of JRAS and BMEBR of Vol. III (No. 3 & 4) were taken up. The nine issues of Central Council for Research in Ayurveda and Siddha's Newsletter have been completed upto June, 1983. The volume XII (1982) of Bulletin of Indian Institute of History of Medicine has been released and the publication of Vol. XIII (1983) is under finalisation.

The booklet entitled Common healing Herbs from Central Research Institute (Ay.), Bhubaneshwar was Published during the year.

The Council has arranged exhibitions highlighting the research activities during the 51st Session of All India Ayurvedic Congress. The exhibition was attended by Hon'ble Union Minister of Health and Family Welfare and Home Minister and other dignitories.

FAMILY WELFARE RESEARCH PROGRAMME

FAMILY WELFARE RESEARCH PROGRAMME

The Council has been carrying out research studies for evaluation of anti-fertility potential of certain herbs and herbal combinations. The Cuncil has 9 units to carry out clinical evaluation and 5 units for pursuing chemico-pharmacologlcal research studies on anti-fertility drugs. Thcevaluation studies at clinical level are being carried out at Lucknow, Varanasi, Bombay, Jaipur, Ahmedabad, Calcutta, Patiala, Madras and Trivandrum. The chemico-pharmacological units are located at Bhubaneswar, Madras, Trivandrum, varanasi and Jamnagar. The studies have been carried out on certain combinations of Ayurvedic drugs like Pippalyadi yoga, Talisadi yoga and coded perparations like AYUSH-AC4, J-capsules and K-capsules. The trial with Talisadi youga was discontinued since results were not encouraging. The studies with Pippalyadi yoga, AC4 and K capsule are continuing during the period under review. The studies have been carrieed out at the clinical level utilising the whole drug without going for extraction and fractionation.

The studies have been carried out during the reporting year on AC4, K capsule and Pippalyadi yoga.

The Centres at Patiala, Trivandrum, Calcutta. Bombay, Madras and Lucknow carried out studies on AYUSH-AC4. A total number of 789 cases were covered during the period under review, of which 272 subjects were the old ones continning, 517 cases included in the current year. The total number of subjects at the end of the year under review in the different cycle ranges is 277 (35.10%). The drop outs due to pregnancy is 14 (1.77%). A large number of subjects (197) could not be included in the trial since they did not continue the drug after 2 or 3 cycles.

The study to assess effectiveness of K capsules as an anti-fertility drug was taken up at Varanasi. A total of 195 cases were covered during the year under review, which includes 174 cases of the

previous years. 180 (92.31%) subjects continued K capsules. The study covered different cycle ranges. The drug appears to be a potential one for further pursuing.

The Unit at Ahmedabad took up study on Pippalyadi yoga. The number of cases under this group is 179 which includes 67 subjects of the previous period, 119 subjects are continuing the drug during the year, 60 subjects discontinued the drug and 3 dropped out due to pregnancy.

The Chemico-pharmacological studies have been taken up on Banjouri, a drug claimed to be in use in the tribal pockets of Bihar. The experimental studies on Madyantika (*Lawsonia inermis*), Apamarga (*Achyranthes aspera*), Palash (*Butea frondosa*) and Vidanga (*Embelia ribes*) were also carried out. Further studies are required to advance specific opinion on the efficacy or otherwise of these drugs.

The Council identified a list of 20 drugs considered to possess anti-fertility potentital, for taking up chemical as well as experimental studies on suitable models.

PUBLICATIONS/PARTICIPATIONS

PUBLICATIONS/PARTICIPATIONS

Clinical Research

S. No.	Name of the Author (s)	Title of the Paper	Name of the Journal/Bulletin/ Conference	Date of Publication
1	2	3	4	5
1.	Bikshapathi, T.	Clinical observations on Etiology and Classification of Slipada.	5th Annual Function of Ayurveda Sastrajna Parishad.	28th - 29th Feb., and 1st March, 1984.
2.	Jha, S.D.	Psoriasis	Gujarat Ayurved University, Jamnagar.	Fed., 84
3.	Jain, P.K, Verma, R., Kumar Anil, Kumar Naresh.	Preliminary Clinical Trial of Arka Mula Tvaka Curnaon Grahani.	Souvenir of All India Ayurvedic Conference held at Jammu.	Dec., 1983
4.	Kumari, K.K.	Clinical study of Swetka Pradara.	Vth Annual Function of Ayurveda Shastrajna Parishad.	28–12–1983
5.	Nair, C.P.R.	The effect of certain single drugs on Skin.	Vagbhata.	March, 1984

1	2	3	4	5
6.	Nair, P.K.S.	Mukha dushika.	Vagbhata.	Feb., 84
7.	Ramu, M.G., Mukundan Hemalata, Janakiramaiah, N., Chaturvedi, D.D., Narasimha Murthy, N.S.	A pilot study on role of Brahmyadi Yoga in patients suffering from chronic Unmada (Schizophrenia).	'Ancient Science of Life' Journal.	April, 1983
8.	Rao, T.S.	Study of Trimarmas with special reference to Vasti.	5th Annual Function of Ayurveda Sastrajna Parishad.	28-12-83
9.	Sand, B.N., Sharma, B.B., (Mrs.) Sharma, H.B.	Narikel lavana in Amala pitta A Clinical Study.	Published in Nagarjun.	June,1983
10.	Sharma, B.B., (Mrs.) Sharma, H.B., Sand, B.N.	Effect of CRIA and Ayush-57 in the treatment of Switra.	Presented in the Seminar organised by Gujarat Ayurvedic University, Jamnagar.	28-2-84
11.	(Mrs.) Sharma, H.B., Sharma, B.B., Sannd, B.N.	Treatment of Psoriasis-A case report with review of literature.	Presented in the Seminar organised by Gujarat Ayurvedic University, Jamnagar.	28-2-84

1	2	3	4	5
12.	Padhi, M.M., Prem Kishore.	Study of the effect of Hingutriguna Tailla in the management of Pakshghata (Haemeplegia) and Gridhrasi (Sciatica).	All India Ayurvedic Seminar on Vatavyadhis at Akola.	11-2-84 to 13-2-84
13.	Pandey, T.N., Rajagopalan, S.S. and Pandey, V.N.	Paper on Amlapitta.	Paper prested in first National Seminar on Research Strategy.	Feb., 83
14.	Pandey, T.N.	Amlapitta, Annadrava Sula and Parinama Sula.	—do—	Feb., 83
15.	Pillai, N.G.K.	Ropanaguna of Nimbidin in Dushta Vrana— A case report.	Vagbhata.	July,1983
16.	Pillari, N.G.K.	Ayurvedic Methodology for diagnosis and research of Skin diseases.	Seminar, on Skin disease, Jamnagar.	Feb.,1983
17.	Pillai, N.G.K.	Disease connected with Ear.	Vagbhata.	Jan., 84

1	2	3	4	5
18.	Prem Kishore and Padhi M.M.	Clinical observation on Analgesic/Anti-rheumatic effect of certain herbal and herbomineral preparation in the patients of Rheumatoid Arthritis and Sciatica.	1984 Scientific conference on Indian Medicine at B,H.U., Varanasi.	15-2-84 to 17-2-84
19.	Rajagopalan, S.S. et al	Serum cholesterol (A study of 115 normal healthy male adults in the age group 50-59 in Madras).	Anti-septic.	1983
20.	Ramu, M.G., Venkataram. B.S., Mukundan Hemalata, Janakiramaiah. N., Ramachandra. M., Shankara. M.R., Mrs. Leglavathy., S.	A double blind controlled study on the role of Bramyadi yoga in Unmada (Chronic Schizophrenia).	Submitted to Gujarat Ayurveda University, IPGIR, Jamnagar for the award of Sh. Hari Om Ashram Gold Medal.	Sept., 1983
21.	Shetty, G.R. Seshadri, C. Sitaraman, R. Rajagopalan. V; Janaki. K., Venkataraghavan, S.	Treatment of Tropical Eosinophilia with an Ayurvedic Compound-A Clinical Trial.	Ancient Science of Life.	April, 1983

1	2	3	4	5
22.	Singh, D.N.	A clinical study of Poliomylitis (Askandapsmar) on the basis of Rural practices.	Held in I.M.S. (B.H.U.) Varanasi	Feb., 1984
23.	Uniyal, M.R.	Vata Janit Nanatajam avum upchar.	Sachitra Ayurveda Vatavyadhi Visheshanka.	Oct., 1983
24.	Venkataraghavan. S., Seshagiri Rao. T., Kuppurajan. K., Rajagopalan. V., Janaki. K., Revathi. R.	Effect of external application of Ayush-57 on Vitiligo cases-6 months treatment.	Nagarjun.	Aug., 1983

Health Care Research

1.	Kumar Anil, Kumar Naresh and Kumari Krishna	Smoking hazard to health.	Vagbhata.	June. 1983
2.	Shah., D.C., Srivastava. T.N. and Rajesekharan, S.	Medicinal plants of Jammu and Kashmir and their application in Primary Health Care - 1.	All India Ayurvedic Conference, Jammu.	Dec., 1983
3.	Uniyal, M.R.	Bhartiya Gramin Jeevan avum Ayurvedic Jadhi-Bution se upchar.	Sachitra Ayurveda.	July, 1983.

1	2	3	4	5
1.	Audichya, K.C., Billore, K.V., Joseph, T.G., Chaturvedi, D.D.	Role of Indigenous folk remedies for certain acute illness in primary health care.	Nagarjun, Vol. XXVI.	May, 1983
2.	Bhat. A.V., Nesamany. S.	*Cassia fistula* Linn. (Article)	Vagbhata (both English and Malayalam).	June, 1983
3.	Billore, K.V.	Transfer of *Moghania* Mudd. et. Hemadri to *Flamingia* Roxb. ex. Ait.	Indian Medicine.	1983
4.	Mishra, Ratan, Billore, K.V.	Some ethno-botanical lores from Banswara District.	Nagarjun.	Sep., 1983
5.	Nair, C.A.A., Nair, K.V., Nesamany, S., Bhat, A.V.	Some medicinal plants of Kottoor forest in Trivandrum division (In two parts).	Vagbhata.	Aug., 1983
6.	Nair, K.V., Simhan, S.N.Y., Murthy, K.R.K. and Shantha, T.R.	Studies on some South Indian market samples of Ayurvedic drug-II.	Ancient Science, Life 3 (2) : 60-66,	Aug., 1984

1	2	3	4	5
7.	Nair, K.V., Simhan, S.N.Y., Murthy, K.R.K. and Shantha, T.R.	Medico-botany of Andaman and Nicobar Islands III-Ayurvedic drugs-I.	Ancient Science Life	July, 1984
8.	Nair, K.V., Gopakumar, K., Simhan, S.N.Y., Shantha, T.R. and Murthy, K.R.K.	Medico-botany of Andaman and Nicobar Islands -IV-Ayurvedic drugs-2.	Ancient Science Life	Sept., 1984
9.	Shah, D.C., Srivastava, T.N., Rajasekharan, S.	Medicinal Plants Jammu & Kashmir and their application in Primary health care-I.	Presented the paper in All India Ayurvedic conference, Jammu.	17-18 Dec., 1983
10.	Sharma, B.N., Majumdar, R., Tiwari, K.C. and Bhattachajee, S.	Our Field observations on *Embelia ribes* Burm. f. (Sanskrit Vidanga).	Jour. Sci. Res. Pl. and Med. Yogi,Pharmacy Hardwar-4.	-do-
11.	Shetty, J.R.P., Simhan, S.N.Y. and Mary, Z.	Comparative studies *Valeriana arnottiana* and Jatamansi (Tagara).	Indian J. Pharm. Sc.	1983
12.	Uniyal, M.R.	Ladakh & Sikkim ki Parampragat vanoaushadhi Vaisakha.	Arogya Vikasa.	June, 1983

1	2	3	4	5
13.	Uniyal, M.R.	Medicinal Plant of India-need for their preservation.	Jr. of Himalaya man and nature, Himalaya Sangha, New Delhi.	Dee., 1983
14.	Uniyal, M.R.	Uttrakhand Himalaya ki van sampada avum Anusandhan.	Gandhi Memorial Hall, New Delhi.	25th & 26th Sept., 1983
15.	Uniyal, M.R.	A Preliminary study on medicinal plant from Savuru valley in Ladakh.	Medico Ethno Botanical Research Vol. II No. 3	Sept., 1981
Pharmacognosy				
1.	P. Brindha, Satikal, B., Purushothaman, K.K.	Comparative Pharmacognostic studies on the leaves of *Solanum* sp.	National Symposium on the economic value and properties of the plants.	August, 1983.
2.	Bhima Rao. R. and Purushothaman, K.K.	Studies on Standardisation and quality control of Solanaceus drugs.	National Symposium on the economic value and properties of the plants.	August, 1983.

1	2	3	4	5
3.	Purushothaman, K.K. and Brindha, P.	The taxonomic significance of alkaloids and steroids in solanaceae.	National Symposium on the economic value and properties of the plants,	August, 1983.
4.	Sasikala, E., Brindha, P., Bhima Rao, R. and Purushothaman, K.K.	Pharmacognostical studies on *Scoparia dulcis.*	Indian Pharmacognosy.	Dec., 1983.
5.	Purushothaman, K.K. and Kalyani Duraiswamy	Terpenes from *Eleagnus latifolia* Linn (Eleagnaceae).	Department of Chemistry, I.I. T., Madras.	3rd & 4th March, 1984
6.	Purushothaman, K.K., Kalyani, D , and Connolly, J.D.	Triterpenoids from *Walsura piscida* Linn.	-do-	-do-
7.	Purushothaman, K.K., Sarada, A. and Kalyani Duraiswami.	Structure of a new Sesquiterpene.	-do-	-do-
8.	Purushothaman, K.K., Mathuram Venkatanarasimhan, and Sarada. A.	Structure of two new iridoid-arbortistisides A & B	Indian Pharmaceutical Congress.	December, 1983.

1	2	3	4	5
9.	Purushothaman, K.K., Mathuram venkatanarasimhan and Sarada, A.	Structure of two iridoids, arbertristisdes.	Department of Chemistry I.I.T., Madras.	3rd and 14th March, 1984
10.	Purushothaman, K.K., Sarada, A. and Saraswathy, A.	Triterpenoides of *Lansium anamallyanum* Bodd.	Indian Pharmaceutical Congress.	Dec. 1983.
11.	Purushothaman, K.K. and A. Sarada,	Structure of Pogepyrenes A and B.	Indian Pharmaceutical Congress.	Dec. 1983.
12.	Purushothaman, K.K., Sarada, A. and Saraswathy,	Structure of some rare plant steroids.	Indian Pharmaceutical Congress.	Dec. 1983.

Pharmacology

1.	Hamsaveni Gopal, Purushothaman, K.K.	Anti-miceobial studies of Solanaceous drugs in Indian Medicine.	National symposium on econopromic value and perties of the plants.	Aug., 1983.
2.	Purushothaman, K.K.	*Solanum trilobatum* Linn. as an adjuvant in Cancer treatment.	National symposium on economic value and properties of the plant.	Aug., 1983.
3.	Ravishankar, B., Sasikala, C.R.	Pharmacological Evaluation of Compound Ayurvedic preparation-Part C Vettumaran Gutika (VTG).	Ancient Science of Life, International Institute of Ayurveda, Coimbatore.	July, 1983.

1	2	3	4	5
4.	Ravishankar, B., Sasikala, C.K.	Pharmacological studies on *Strobilanthes heyneanus* Nees (Leaves).	XVI th Annual Conference of the Indian Pharmacological Society.	Dec., 1983.

Standardisation Research

1.	Bhima Rao, R., Natarajan Meenakshi, and Purushothaman, K.K.	On the standardisation of Apamarga taila.	Indian Pharmaceutical Congress.	Dec., 1983.
2.	Muzaffer Alam and Purushothaman, K.K.	on the role of *Dhataki* pushpa in Asavas and Arishtas.	-do-	-do-
3.	Muzaffer Alam., Rukmani, B., Shanmughadasan, K.K. and Purushothaman, K.K.	Effect of time in the fermentation and storage of Candanasava.	-do-	-do-
4.	Ramiah, N., Palu Lizzy and Nair, G.A.	Effect of purification on Gum guggulu.	Nagarjun, Calcutta.	

Literary

1	2	3	4	5
1.	Kapoor, M.K.	Integration of three system of medicines Ayurveda, Acupuncture and Western Medicine.	World Congress of Holisitic Medicine, Sri Lanka.	During 19th-24th Sept., 1983
2.	Kumar Naresh and Kumar Anil	Role of Ayurveda in achieving the aim of health for all by 2000 A.D.	Seminar held at Jammu by All India Ayurvedic Conference	Dec., 1983
3.	Lal, V.K., Pandey, K.K., Kapoor, M.K.	Literary support/ vegetable origin of Silajatu.	17th Conference on Indian Medicine held at Banaras Hindu University, Varanasi.	Feb, 1984
4.	Mishra, K.P., Billore, K.V.	Ayurvedeeya Aushadh Mankikaran evam vanaspati Vigyan.	Ayurved Vikas.	August, 1983
5.	Nair, P.K.S., Nair, S.S.	The concept of tvacha in Ayurveda.	Vagbhata.	March, 1984
6.	Trivedi, V.P. and Singh, J.	A study of the contribution of Ayurvedic Formulary in the field of Cosmetics.	Scientific Seminar of Akhil Bhartiya Vanaushadhi Abhyas Mandal Ahmedabad	During 11 th March 1984

1	2	3	4	5
7.	V.P. Trevedi, and Pandey, V.N.	Ayurveda ke Vikas. mein Bhaishaj Nirman Shastra Ka.	Ayurveda Vikas.	Jan., 1984
8.	Trivedi, V.P.	A study of some para Medical Treatments prevalent in the Himalayan Region of Indian Sub-Continents	World Congress of Holistic Medicine, Sri Lanka.	Sep., 1983
9.	Uniyal, M.R.	Tibetan Chikitsa Pranali Mein Upyogi Prampragat Aushadhiyan.	Mavalankar Auditorium.	20th Nov., 1983
10.	Uniyal, M.R.	Khandit Chandrama Pradesh Ladakh ic Paramparik, avum Amchi Chikitsa.	All India Ayurvedka Congress, New Delhi.	20th June, 1983

Family Welfare

1.	Kumar Anil., Kumar Naresh	Role of Ayurveda in Family Planning.	Seminar held at Jammu by All India Ayurvedic Congress.	Dec., 1983
2.	Singh Maurya DP., Goyal, S.R., Saroop Ram,	Cestrogenticity of seeds of Kalajaji (*Nigelia Sativa*) in female albino rats.	Published in Nagarjun.	May, 1983

TECHNICAL REPORT
SIDDHA

TECHNICAL REPORT—SIDDHA

Abbreviations used for Institutes/units

S.N.	Institutes/units	Abbreviations
1	Central Research Institute (Siddha), Madras	**CRISM**
2	Regional Research Institute (Siddha), Pondicherry	**RRISM**
3	Clinical Research unit (Siddha), Palayamkottai	**CRUSP**
4	Clinical Research unit (Siddha), New Delhi	**CRUSD**
5	Mobile Clinical Research unit (Siddha), Madras	**MCRUS**
6	Drug Research Scheme (Multi-disciplinary), Madras	**DRS(MD)M**
7	Drug Standardisation unit (Siddha), Madras	**DSUSM**
8	Drug Standardisation unit (Siddha), Trivandram	**DSUST**
9	Drug Standardisation unit (Siddha), Bangalore	**DSUSB**
10	Survey of Medicinal plants, unit, Palayamkottai	**SMPUSP**
11	Literary Research and Documentation Department. Madras	**LRDM**

CLINICAL RESEARCH

The Clinical Research in Siddha System of Medicine has been taken up through Institutes/Units functioning under the Council. The primary aims is to develop definite course of treatment and to evolve certain new formulations for the treatment of certain selected Clinical conditions. The clinical studies carried out were able to provide a rational interpretation of the effects of the single drugs, simple combinations and compound herbo-mineral formulations. Efforts have also been made to bring out new combinations and have been put on trial as coded drugs. The efficacy of Tambira chendooram in *Valigunmam* (Peptic Ulcer) has been established To study the effect of RGX, SKX, STG, VK_2 Linga Chendocram in *Putrunoi* (Cancer), Amanaku elai and Kovai elai Kalkam in *Manjal Kamalai* (Infective hepatitis), Gouri Chintami and Linga chendooram in *Sandhivatha soolai* (Rheumatoid arthritis), 777 oil in *Kalanja padai* (Psoriasis), Padikara parpam in *Vellainoi* (Leucorhoea), Parangipattai Pathangam in *Karappan* (skin diseases), Annabedi chendooram in *Velluppunoi* (Anaemia), Pachonodi suder thailam in *Kakkai Valippu* (Epilepsy) *Padioa Linga* thuvar in *Kazhichae* (digestive disorders), Ponnimilai Chendooram, Kandan Kathiri Pazhachoornam, in *Venknttam* (Leucoderma), Kadalazhinjil chendooram in *Neerazhivu* (Diabetes mellitus) in both the compound formulations and coded drugs are being studied.

During the year under review, the programme on evaluation of standard therapies, drugs for the treatment of *Valigunman*, *Putrunoi*, *Manjal Kamalai*, *Sandhivatu Soolai*, *Kalanjapadai*, *Vellai noi*, *Karppan*, *Vellupunoi*, *Kakkai vallipu*, *Kazhihal*, *Venkuttam*, *Neerazhiu* have been further pursued. The application/utilisation of modern biochemical and Pathological investigations, X-ray, ECG, EEG, etc. have been carried out wherever considered necessary. The results of treatment and other observations made are reported here under :—

Valigunmam :

Valigunmam equated to Peptic ulcer is one among the eight *gunmams* described in the Siddha literature.

The selection of the cases was done on the parameters described in the Siddha literature i. e. *Envagaithervu*, *Mukkuttram*, *Thinai*, *Kalam* etc. It was further supported by routine biochemical and pathological investigations such as blood, urine, stools and special tests like barium meal X-ray and fractional meal test. These parameters are applied to confirm the clinical assessment in these cases. Evidence of ulcer was noticed in the majority of the cases. The cases studied include cases of partial obstruction, pyloric obstruction with dilated stomach and anastamotic ulcer,

The results were compared and clinical assessment was made on the basis of these results.

Thambira Chendooram **CRISM**

Thambaram (Copper) has been selected since it is said to be Yama for *Gunmam*. Thambaram in the form of chendooram prepared drug using *Karuthulasi charu* (Juice of *Ocimum basilicum* Linn). was tried as a coded drug P6. The final product of brownish black powder was chemically analysed and it was seen that Thambaram (Copper was present in the form of cupric oxide besides other elements. On admission, all the patients received the treatment of *Vallai ennal* as a laxative before starting the treatment. The trial drug was administered in the dose of 45 mg. two times a day after food with honey for five days. *Omam* bath and oil bath was given on 6th and 7th day respectively in all the cases. The treatment was continued for such two more courses and at the end of 21st day the cases were discharged.

During the period under review, 50 cases of *Valigunmam* between the age group of 20 to 60 were admitted. Out of the 50 cases, 47 cases got complete relief and other three cases left against medical advice. As per the clinical assessment, 94% of the cases got complete relief. The assessment of research was made on standard known parameters i.e. signs and symptoms, barium meal X-ray, and fractional meal test, occult blood and other investigations. The criteria adopted was disappearence of the signs and symptoms in cases labelled as complete relief. The follow-up of the cases was carried out after 45th day and 90th day. No recurrence of the symptoms have been noticed in cases studied so far where follow up studies were done. No toxic or side effects were found during the treatment and also at the time of follow up of these cases.

II. Putrunoi (Cancer) :

Agasthiyar Virana Nool, Agasthiyar Guna Vagadam, Pullppani Theriyar 1001 contain various kinds of *virananoigal* and various stanzas about the disease *Putru* can be seen. While classifying and codifying the various kinds of *viranagal* there are notable differences of opinion among the authors.

The medicines used in this condition contains Rasam (Mercury) Gandhagam (Sulphur), Serankottai (*Semecarpus anacardium*), Thunthuvalai (*Solanum trilobatum*), Vankodivali (*Plumbago zeylanica*) etc. The medicines like Rasagandhi mazhugu, Gandhaga Guru, Chandrasaparpam, Linga parpam, Thurusu Guru, Navarathina Kalpam, Nithiyakalayani Karkam, Samb ornananda choornam are described in the Siddha Literature. The Cancer cases affecting different parts of the body like *Na, Kannam, Uthadu, Thondai, Vayeeru Mulai* etc. are admitted in the In Patient Department of the Institute. The cases having malignant conditions affecting thyroid, nasopharynx, liver, maxillary antrum were also admitted. The cases admitted generally are in the age group of 20 to 70 years. The selections of the cases was based on the parameters described in Siddha literature. Investigations utilising X-ray, Biopsy and other Biochemical and pathological tests were also carried out wherever necessary.

RGX **CRISM**

RGX, a coded drug formulated by th e Institute was administered in all the cases admitted in IPD. The coded drug has mercury and sulphur with Serangottai (*Semecarpus anacardium*) as main ingredient. The clinical response has been promising. *STG*, a coded drug was used to reduce the agonizing pain in the cases. This combination helped in the regression of the disease to a considerable extent. Apparent clinical improvement was observed. There has been rapid reduction of seromucoid levels initially. After certain improvement this seromucoid level remained static. In order to accelerate the process of regression and to help in cure another drug VK_2 which has Venkodiveli (*Plumbago zeylanica*) as main ingredient was added. In addition to that the fried and powdered serankottai (*Semecarpus anacardium*) coded as SKX is also introduced. These coded drugs were administered in suitable doses according to the severity of the

symptoms. In addition to this Linga chendooram (chendooram prepared using cinnabar) has also been used as analgesic. The external ulcers, wounds, tumours are being dressed with *Pachaiannai* with *Thurusu* (an oil prepared using *Umaththai* (*Datura alba* L) *elai Charu*, Coconut oil and copper sulphate) and *Nithiyakalyani elai Kalkam* (a paste made out of the leaves of *Nithiyakalyani* (*Vinca rosea*),

During the period under review, 54 cases were admitted in the I.P.D. of the Institue. The Putrunoi affected on the parts like mouth, cheek, tongue, throat, breast, penis, Maxilliary antrum, oesophagus, cervix uteri, osteosarcoma etc., are some of the cases admitted.

Nithyakalyani Kalkam, Linga Chendooram, Thriphals chooranam and *Pachai ennai* are also used as supporting therapies. Pain was reduced in most of the cases of cancer. There has been reduction in the size of the ulcer in case of external cancers. There has been reduction in the discharge in cases of cancer uteri.

Manjal Kamalai (*Infective hepatitis*)

Manjal Kamalai or Manjal noi equated to infective hepatitis is described as one of the 13 varieties of Kamalai in Siddha Literature. The cases selected based on the tenets of Siddha System or medicines i.e. *Envagai Thervu, Mukkutoram, Kalam, Thanai*. The special investigations like Serum Bilurbin, serum cholesterol, Thymol Turbidity, Icteric Index were performed to assess the extent of the ailment besides the routine blood and urine examinations.

K—3 **CRISM**

K—3 a coded drug consists of *Keezhanelii* and *Karisalai* in equal parts grounded into a paste form called *Kalkam*. It was administered at the does level of 5 gm. twice a day with water. Salt and fat free diet was advised. The drug was administered for 21 days/30 days as per the severity of the cases. During the period under review, 39 cases were admitted in the I.P.D. Out of which, 28 cases got complete relief. 11 cases were discharged against medical advice. No side effects were noticed during the trial.

Sandhi Vatha Soolai (Rheumatoid arthritis)

Sandhi Vath Soolai (Rheumatoid arthritis) is one of the 80 vatha diseases described in Agasthiyarnadi. The vitiated vatha and kaba humours after being dislodged from their places affects the normal circulation of Kezhnookungal and Paravoogal and causes this problem. In this condition there will be joint stiffness, pain all over the body, difficulty in walking, excessive secretion of saliva, dryness of throat, feeling of thirsty, giddiness and loss of grip etc.

The selection of the cases was based on the methods described in Siddha literature. Each patient was subjected for routine biochemical and pathological investigations like Blood for Hb, TLC, DLC, ESR etc. Urine for sugar, albumin, deposits etc, stools for ova cysts etc. The Rheumatoid factor (RF were also carried out in all the cases. These investigations were carried out at regular intervals for proper assessment.

Gowri Chinthamani and Linga Chenduram **CRISM**

The trial drugs *Gowri Chinthamani* and *Linga Chenduram* both are compound preparations having mercury as main ingredient. These were administered in a dose of 200 mg. each twice a day mixed with honey. *Kukkil thailam* or *Mynathailam* (both compound preparations) are used externally on the affected parts.

During the period under review 23 cases were registered. Out of which, 14 cases got complete relief, nine cases were discharged against medical advice. No side effects/toxic effects were noticed.

Kalanjapadai (Psoriasis) **CRISM**

Kalanjapadai known as Psoriasis in modern medical science is described in Siddha texts. The selection of the cases was done according to the Siddha Methodology. The Institute evolved a formulation with *Vetapalai-elai chru* and coconut oil in ratio of 1 : 1½ and prepared as oil. It is used under a coded formula 777 oil. This oil is used both internally and externally in all the cases. The criteria followed for assessment of the results are as 100% relief for disappearance of

signs and symptoms, 75% relief of the signs and symptoms disappeared were called as 75% relief and non-cooperative cases were labled as (OWD).

During the period under review, 33 cases were admitted. Out of which 23 cases were discharged as complete relief and 10 cases discharged against medical advice. No toxic/side effects were noticed during the study.

Vellainoi (Leucorrhoea) **RRISP**

Vellai noi or *Vellaitheetu* (Leucorrhoea) is one of the Magalir-noigal (female diseases) described in Siddha literature.

Padigaram (Alum) into the form of perpam mixed with white portion of an egg was used. The drug was administered in doses of 300 mg three times a day with milk.

Kudukkai Kudineer was used as *Peechu* (*douche*) in all the selected cases.

During the period under review a total of 69 cases were studied. Out of which, 31 cases got complete relief, 18 cases showed moderate relief, and 11 cases reported mild relief, 9 cases left against medical advice. The diseases is more common between the age group of 21 to 30. It is also observed that the major signs and symptoms are itching in vagina, discomfort, white discharge and burning micturition.

Karappan (Eczema) **RRISP**

Karappan is the variety of the skin diseases described in Siddha literature.

The drug parangipottai pathangan was administered in the doses of 200 mg. two times daily in all the selected cases. *Karappanthailam* was used for external applications on the affected parts of the body. The discharged cases were advised to attend Out Patient Department for follow up purposes.

During the period under review, a total number of 85 cases were admitted in the I.P.D. Out of which, 40 cases got complete relief, 16 cases got moderate relief, 29 cases were discontinued due to non-cooperation/no response.

Gunmam (Peptic disorders) **RRISP**

The *Gunmam* was classified in 8 varieties i.e. *Vatha gunmam, Pitha gunmam, Kaba gunmam, Mukkutra gunmam, Kal gunmam, Eri gunmam, Vanthi gunmam* and *Vali gunmam.* The criteria adopted for evaluation was as mentioned in Siddha literature supported by the use of modern investigations

The *Gumma kudori mezhughu* in doses of one gram three times a day was administered in all the selected cases. 4 cases were studied during the period under review out of which 1 case got complete relief and 2 cases got moderate relief and one case left against medical advice.

Oothalnoi **RRISP**

The *Oothal noi* was described as four varieties in Siddha literature. They are *Vatha Oothal noi, Pitha oothal noi, Kaba Oothal noi* and *Mukkutra Oothal noi.* The criteria followed according to the Siddha methlodology supported by use of relevant modern techniques.

The trial drug *Mandoorathi kudineer* in doses of 60 mg 3 times a day was administered. During the period under review, only one case was studied.

Veluppunoi (*Anaemia*)

Veluppunoi or *Pandu* (Anaemia) is described in Siddha literature. There are five varieties. They are *Vatha, Pitha, kapha, mukkuttra* and *veda Vellappu* noigal. The criteria adopted for assessment of results is as mentioned in Siddha System of medicine supported by the use of modern RRISP techiniues.

Annabedhi Chendooram : **RRISP**

Anaabedhai Chendooram was administered in doses of 250 mg 3 times a day with honey. During the period under ceview 94 cases

were admitted. Out of which 58 cases got complete relief, 21 cases got moderate relief, 9 eases left against medical advice, and remaining 6 cases continuing werethe treatment. The selection of the cases was on the basis of the methodology described in Siddha literature; laboratory investigations such as blood, urine, stool etc., relevant to the study are being conducted. The progress was assessed by periodical check up of the cases. It is observed that the trial drug Annabedhi Chendooram is effective in iron deficiency anemia (Anemia due to Hypochromic Microcytic anaemia).

Ayabrinkaraja Karpam **RRISP**

Ayabrinkaraja Karpam in doses of 260 mg three timesa day followed by honey was administered in all the selected cases. during the period under review, only 4 cases were admitted. Out of which, three of them got complete relief and remaining one left against medical advice. No toxic/side effects were noticed during the trial.

Kakkai Valippu (*Epilepsy*)

Kakkai valippu equated to Epilepsy is described in the Siddha literature. The Kakkai valippu occurs suddenly or gradually. The selection of the cases was done according to the parameters described in Siddha literature.

Pachondhi sudar thailam **CRUSP**

Onan is used either as *Onan nei* or as *Onan ennai* in *valippa nei*. The head of a *Onan* is cut and removed from the body and is filled with Rasam (Mercury), Ganthagam (Sulphur) and Rasa Karpooram and bandaged with a cloth soocked in neem oil and an iron rod is inserted and the whole mass is burnt. The oil drops falling from the mass is collected and preserved. The drug was administered at the dose level of 5 to 10 drops two times daily with milk. It was observed that the frequency of the fits is considerably reduced. The follow up was carried out after discharge and it was noticed that 90% of the cases did not have recurrence. No toxic or side effects were noticed. During the period under review 8 cases were admitted. Most of the cases got moderate relief.

Kazhichal (Dysentric disorders)

Kazhichal is identified in modern parlance with digestive disorders. In the Siddha literature Kazhichal is described as Perum Kazhichal and divided into four varieties on the basis of Mukkuttra verupedugal (humoural changes). The selection of cases was done in accordance with Siddha methodology. The necessary investigations were done at regular intervals. Assessment of the result was based on Siddha Methodology.

Padiga Linga Thuvar **CRUSP**

Padiga Linga Thurar was administered in a dose of 500 mg thrice a day followed by *Elumicham Pazha Charu* (fruit juice of *Citrus aurantifolia*) and *Amai odu parpam* at the dose level of 100 mg in children.

During the period under review, only 7 cases were admitted in I.P.D. and all of them got complete relief. The trial drugs is effective for bacillary dysentry.

Murai Jwaram (Periodic fever)

Murai Jwaram was diagnosed on the basis of Siddha texts.

Linga Chendooram **CRUSP**

Linga Chendooram at the dose level of 250 mg in adults and 125 mg in children was administered three times a day with honey. Only one case could be studied during this period.

Venkuttam (Leucoderma)

Venkuttam equated to Leucoderma is one of the 18 varieties of the *Kuttams*. The selection of the cases was done as per Siddha methodology; the modern investigations like blood sugar, cholesterol, skin biopsy, VDRL for STD etc were done whenever found necessary. These investigations were carried out before starting the treatment, during the treatment at regular intervals and also at the end of the treatment. Clinical assessment were made in accordance with the findings.

Ponnimilai chendooram **CRUSMDM**

The trial was conducted on the following three combinations of *Ponnimilai chendooram* :—

	Combinations	Cases Studied
1.	*Ponnimilai Chendooram* (alone)	5
2.	*Ponnimilai chendooram* + *Chirattai thailam*	24
3.	*Ponnimilai chendooram* + *Karbogji* paste	11

Out of these the combination of *Ponnimilai chendooram* with *Chirattai thellum* workes well. Out of the 24 cases treated with this combination, 2 of them got complete relief, 2 got marked relief, 2 had moderate relief and 6 had mild relief. 5 cases had no response to the treatment, remaining 7 cases left against medical advice. The other two groups did not show much response to the treatment. No side/toxic effect were noticed.

Aya chendooram **CRUSMDM**

The trial drug *Aya Chendooram* was administered in only 3 cases. All the three cases got mild relief.

Kandankathiri. **CRUSMDM**

The trial drug *Kandan Kathiri* was studied in the form of *Choranam* and *ennai* in the cases of *Venkuttam*. 29 cases were studied during the period under review. Out of which only 6 cases showed mild relief and 16 cases did not show any relief. 7 cases were discharged against medical advice. No toxic/side effects were noticed.

Neerazhivu (*Diabetes mellitus*)

Neerazhivu (Diabetes mellitus) is described as one of the *seruneer Peukkunoigal* in Siddha literature. The selection of the cases were done on the concept of Siddha medicine. The parameters descri-

bed specially for the ailment in modern medicine such as Blood Sugar, GTT, blood, for Urea, Cholestrol and urine for sugar and albumin were carried out in all the cases taken for study. An ideal diet (i.e.). 1800 calories was suggested for all the cases taken for study. The investigations were done before starting the treatment, during the course of the treatment and also at the end of the treatment.

Thirisala Tablets **CRUSMDM**

The trial drug *Thirisala* tablets at the dose level of 500 mg three times a day was administered in all the cases taken for study. 13 cases were studied during this period. Out of which one case showed moderate relief and 3 cases showed mild relief and 7 cases did not respond to the treatment. Remaining two cases were discharged against medical advice. No toxic/side effects were observed.

Koyyia elai **CRUSMDM**

The trial drug *Koyyia elai* in the form of Choornam was administered in all the cases taken for study. 18 cases were taken for study during the period under review. Out of which 3 cases showed mild relief and 10 cases did not respond to the treatment. 5 cases were discharged against medical advice. No side effects were noticed.

Avarai **CRUSMDM**

The whole plant of *Avarai* was administered in the form of *Choornam* in all the cases taken for trial. During the period under review, 19 cases were taken up for study. Out of which 3 cases showed mild relief while 11 cases did not respond to the treatment. 5 cases left against medical advice (LAMA). No side/toxic effects were noticed.

Abraga Chandooram **CRUSD**

The trial drug *Abraga Chandooram* was tried on the cases of *Neerazhivu* (Diabetes mellitus) attended at the O.P.D. of C.R.U. (S) New Delhi. The study was also compared with Tab. Tolbutamide. Out of

the 84 cases registered, 11 cases were dropped from the study since they were non-cooperative. 16 cases were controlled on diet. The cases were treated with Abraga Chandooram at the dose level of 200 mg. daily and 21 cases with Tab. Tolbutamide 500 mg. two times a day. Out of the 22 cases with Abraga Chandooram, 7 cases showed marked relief, 4 cases showed moderate relief and 11 cases no relief. Out of the 21 cases treated with Tab. Tolbutamide, 5 cases showed marked relief, 7 cases showed mild relief, 3 cases showed no relief and 6 cases discontinued the treatment against medical advice. This showed that the Abraga Chandooram at the dose level of 200 mg daily has comparatively better results than that of Tab. Tolbutamide at the dose level of 1000 mg daily. To arrive at a conclusion it is necessary to study more number of cases, and the study is in progress.

1	2	3	4	5
8.	Kakkai Vallippu	8	1	C R U (S) of D R S (M D) Madras
9.	Kazhichal	7	1	-do-
10.	Murai Jwaram	1	1	-do-
11.	Venkuttam	72	5	-do-
12.	Neerazhivu	134	4	-do-
13.	Karappan	85	1	CRU (S), New Delhi
14.	Gunmam	4	1	R R I (S), Pondicherry
15.	Oothal noi	1	1	-do-

Table showing the details of Clinical Ressarch Programmes at a glance.

S. No.	Disease	Total No. of patients	No. of trials	Participating Projects
1	2	3	4	5
1.	Valigunmam	60	1	C R I (S) Madras
2.	Putrunoi	61	1	-do-
3.	Manjal Kamalai	44	1	-do-
4.	Sandhi Vatha Soolai	26	1	-do-
5.	Kalanja Padai	39	1	-do-
6.	Vellai noi	69	1	R R I (S) Pondicherry
7.	Velluppu noi	92	2	-do-

(Table Contd.)

1	2	3	4	5	6	7
7.	Karappan	85	40	16	19	75
8.	Gunmam	4	1	2	1	4
9.	Oothai noi	1	—	1	—	1
10.	Velluppunoi	92	61	21	10	92
11.	Kakkai Vallippu	8	—	8	—	8
12.	Kazhichal	7	7	—	—	7
13.	Murai Jwaram	1	1	—	—	1
14.	Venkuttam	72	2	26	44	72
15.	Neerazhivu	134	—	33	101	134

Table showing cases treated together with Results of various Clinical conditions

S. No.	Diseases	No. of cases admitted	Complete relief	Moderate relief	LAMA	Total cases completed
1	2	3	4	5	6	7
1.	Valigunmam	60	47	—	3	50
2.	Putrunoi	61	—	54	—	54
3.	Manjal Kamalai	44	28	—	11	39
4.	Sandhi Vatha Soolai	26	14	—	9	23
5.	Kalanja padai	39	23	—	10	33
6.	Vellai noi	69	31	18	20	69

(Table Continued)

Table showing the number of Patients attended at O.P.D /I.P.D. during the Year 1983-84

S. No	Institute/Unit	No. of patients attended at O. P. D.			No. of patients admitted in I. P. D.
		New	old	Total	
1.	C R I (S) Madras	10,969	14,811	25,780	199
2.	R R I (S) Pondicherry	5,183	12,182	17,365	204
3.	C R U (S) Palayamkottai	1,127	4,547	5,674	104
4.	C R U (S) of D R S (M D) Madras	—	—	122	—
5.	C R U (S) New Delhi	84	—	84	—

HEALTH CARE RESEARCH

This programme was taken up by the Central Research Institute (S) Madras and Regional Research Institute (S), Pondicherry.

This programme broadly emphasis the collection of data relating to the nature and frequency of prevalent diseases, food habits with regard to different seasons, customs and beliefs, natural resources, the standard and kinds of treatment available to the rural population, folklore claims prevalent in the zone of operation, medicinal plants available in the area and identifying them for utilisation for common ailments besides door to door survey to assess the health status and disease proneness and to provide incidental medical aid.

Mobile Clinical Research Unit (Siddha) Madras MCRUM

During the year under review the village Chinnasekkadu (near Madras) was covered. A total number of 98 visits were made and a population of 3354 inmates was covered. Incidential medical aid was provided to needy individuals. Most of the cases suffered from the diseases like Moolam, Erigunam, Veppunoi, Kazhichial, Irumal, Soori, Kundarpuzhu noigal Neerkovai, Veluppunoi, Muttuvali etc. The data of age. sex, marital status, per capita income, occupation and educational status were properly maintained and analysed.

Veluppunoi (Anaemia) MCRUM

A total No. of 105 cases of *Veluppunoi* has been treated in two groups. Annabhedhi Cheenduram and Ayabringaraja Karpam were administered in 200 mg. twice daily for three months. Necessary parameters for the assessment of results were followed. The study is in progress.

Padar-Thamarai **MCRUM**

A total No. of 47 cases were studied during the period under review. The cases of *Padar-thamari* were divided in three groups. Sivanaramithan, Akasakarudan Kizhangu chooranam and Sanguparpam were administered in suitable doses for 45 days respectively. It is observed that the cases treated with *Sivanaramirtham* showed better results than the other trial drugs.

Karappan **MCRUM**

A total No. of 10 cases of Karappan were studied in different groups to prove the efficacy of certain Siddha drugs. Most of the cases attended were in the age group of 20 to 60 years. Study is in progress.

Regional Research Institute (Siddha) Pondicherry **RRISP**

Survey and Surveillance work carried out in two villages i.e. Embalam and Sembiyanpalayam. The total population of 3947 individuals belonging to 99 families were covered in 23 visits by the survey team. 500 individuals were given incidental medical aid during the survey. There have been no medicare facilities in these villages. All the people had to come to Pondicherry for the medical relief. The team has collected the required data in respect of sex, age, per capita income, martial status, educational status, food habits, etc. from the inmates of the villages. It is observed that most of the villagers are agricultural labourers. They are cultivating the paddy, ragi, groundnut and sugarcane, coconut etc.

In the village Karikalam Pakkam 1052 individuals were contacted and necessary information gathered.

During the period under review the team has visited Elagiri hill. This tribal area is about 3200 ft. above the sea level. There is a cluster of 13 villages namely 1. Athanavoer 2. Punganoor 3. Muththanur 4. Kottaiyur 5. Kottur 6. Pallakaniyur 7. Meettukaniyur 8. Puttur 9. Paduvanur 10. Thayaloor 11. Mangalam 12. Nilavoor and 13. Royaneri.

The tribal area has a total population of 4091 individuals. There are 943 families approximately. The tribal people are called Malayalies. The following are the natural resources available in these hills :

1. Kadukkai, 2. Etti, 3. Nelli, 4. Sandanamaram, 5. Equalipts, 6. Palamaram, 7. Puli, 8. Pungan, 9. Koiya, 10. Madulai, 11. Elumichai, 12. Sceththa, 13. Seekai, 14. Honey 15. Kalpaasi. 16. Marapaasi.

The wild animals found in these areas are :
Bear, Spotted Deer, Black Buck, Mouse, Deer, Rabbit, common Monkey, Mangoose, Porcupine and Grouse.

DRUG RESEARCH

MEDICO-BOTANICAL SURVEY

The Medico-Botanical Survey occupies a pivotal position in the research work of Siddha System of Medicine. The survey work of medicinal plants used in Siddha System of Medicine, is being done by survey of medicinal plants unit located at Palayamkottai. The study of quantitative and qualitative availability of medicinal plants used in Siddha System of Medicine has been taken up since 1971. Since inception the unit has undertaken 169 survey tours in the different forest areas/divisions of Tamil Nadu state. Some of the forest areas explored by the survey team include Shencottai Alagarkovil hills, Palani hills, Kanyakumari F.D., Papanasam hills, Niligiri Hills, Ramanathapuram Tanjere, Dharmapuri, Harur range and Morappur range etc. Plants specimens numbering 2888 and 3 samples of mineral origin and 7 of Animal origin were collected. 2,960 Herbarium sheets and 1, 108 index cards were also prepared. 399 crude drug samples were added to the Museum. About 1500 unmounted specimens were identified and confirmed.

During the reporting year the following survey tours were conducted :—

1. Papanasam hills, Tirunelveli district.
2. Kalikesam forest areas, Kanyakumari district.
3. Upper Kotnayan and Kakkachi forest areas, Tirunelveli district.
4. Botanical Survey of India, Coimbatore, Coimbatore district.
5. Radhapuram and Surrounding, Tirunelveli forest areas, Tirunelveli district.
6. Naraikadu forest areas, Tirunelveli district.

During these survey tours about 230 Herbarium specimens (Field book numbers 2889 to 3126) were collected. Some of the important Medicinal Plants collected during the survey tours are as follows:—

Malai Vembu (*Melia composita* Willd) Karuvagai (*Albizzia odoratissima Benth*) Poovam, (*Schleichera trijuga* Willd) Pazhupagal (*Momordica dioca Roxb.)* Amalpori No. II (*Rauwolfia canescens* Linn), Amalpori (*Reuwolfia serpentina* Benth), Aanai norunjil (*Pedalium murex* Linn.), Thangarali (*Thevetia nerifolia* Juss.), Malampooarasu (*Ipomoea carnea* Jacp.), Pulluruvi (*Loranthus tomentosus* Heyne), Pambu kazha (*Rauwolfia densiflora* Benth.), Kaamatachipul (*Ericcaulen ensiforme* Fischer), Malai Vallarai (*Hydrecotyle javanica* Thunb) (*Physalis peruviana* Linn.) Seemaisudukku Thakkali, Kattusundai (*Selanum laeve* Dunal.), Kattumullai (*Jasminum flexile* Vahl.) Muttanari (*Acronychia laurifolia* Blume.) Pinnakkupoonau (*Melochia corchorifolia* Linn.) Thiruneetrupathifai (*Ocimum basilicum* Linn.), Manjal Kanakamparam (*Barleria prionitis* Linn.), Panipayar (*Phaseolus trilobus* Ait), Vishunukaranthai (*Evolvulus alsinoides* Linn), Shenkaththari (*Capparis Sepiaria* Linn.). Uga, (*Salvadora persica* Linn.), Kodipasalalkeerai (*Basella rubra* Linn.), Kanam (*Dolichos biflorus* Linn.), Charanaiver (*Trianthema decandra* Linn.), Panadaippan (*Cissus vitiginea* Linn.), Nilambari (*Ecobolium pinneanum* Kurz) Tura (*Molluqo oppositifolia* Linn.), Ponmusuttai (*Cissampeles pariera* Linn.), Chinni (*Acalypha fruticosa* Forsk), Pilavaram (*Mundulea suberosa* Benth), Sarkarainilavembu, Mulaipalvidai (*Gassia absus* Linn.), Orithalthamarai (*Ionidium suffruticosum* Ging.) Kodikkallai (*Euphorbia tiruculli* Linn.), Pavazhamalli (*Nyctanthes arbortristis* Linn.), Somokodi (*Ceropegia juncea* Roxb.), Portulaca Sp, Kozhikal pasali, (*Portulaca tuberose* Roxb,) Minnipayar (*Phaseolus aconitifolius* Jacq.) etc.

During the reporting year 771, herbarium shets were added to the herbarium raising the total to 3671. These 711 herbarium sheets were falling under 238 species of 172 Genera of 84 families. 17 crude drug samples were collected and added to the Museum.

This include Amalpori (*Rauwolfia serpentina* Benth.), Amalpori No. II, Pambukazha (*Rauwolfia densiflora* Benth.), Poomisarkarai Kizhangu (*Cycas circinalis* Linn.), Vellai mookkarattai (*Boerhaavia verticillata* poir), Maiyilai (*Vitex altissima* L.F.), Uchiellu (*Gulzotia abyssinica* Cass.), Manathakkli (*Solanum nigrum* Linn.) Punnai (*Calophyllum inophyllum* Linn.), Santhanavembu (*Cedrela toona* Roxb.) Vellelumbu, Kodampuli (*Garcinia admbia* Desu.), Thellukai (*Entada scandens* Benth).

16 different parts of the plants of the drugs weighing 34 kg. were collected during the reporting period and supplied to various institute/ Centre/Units under the Council.

PHARMACOGNOSTICAL STUDIES

The pharmacognostic research studies have been carried out on the following drugs by the siddha Units.

1. **Katthu jeeragam** (*Centrtherum anthelminticum* Kuntze *Syn. Vernonia anthemintica* Willd).

Kattu jeeragam is a large erect annual leafly plant distributed through out India. Medicinally the fruit of the plant is used, which is acrid, astringent to the bowels, anthelmintic and used to cure skin diseases.

Stem of the plant is branched pubescent. Leavks lanceolate and pubsecent on both sides, heads subcorymbose, many flowered, outer involucre bract linnear hairy herbaceous, shorter than those of the inner ones. Innermost bracts usually the longest, linnear, subacute, often tipped with purple, pappus reddish, the exterior row very short and persistant. Fruit is achenes and oblong-cylindric 10 ribbed and pubescent.

Macroscopically, the fruit is pubescent and tapering towards the lower portion and upper portion is broader with a short pappus. The transverse section shows two planoconvex cotyledons. Microscopically the fruit shows three distinct regions. The outer fruit wall, the middle integument or the seed coat and central huge cotyledons. The fruit wall shows thick cuticle. There are more than one type of red coloured trichomes (i) the unicellular clothed hairs (ii) the unciellular branched hairs and (iii) the unicellular sessile balloon type. The circular structure of the sphere is protruded to form these small and large ribs which are ten in number and are of almost similar size and texture followed by epidermis with 8-10 layers of thick walled parenchymatic cells in the larger ribs. Whereas in the smaller ribs two rows of large epiderms cells are present. Next to the parenchymatic layer there is a thick and compact zone of non-lignified fibres, among there unlignified fibres here are tightly packed

red-coloured scleroids arranged in W or U fashion like a fountain or a triangular mass.

The middle integumen or the seed coat portion is compressed and distintegrated to different parts. Next to integumentory portion a thick layer of cuticle followed by a layer of rectangualr cells is present.

2. **Sirukurinjan** (*Gymneme sylevestre* R. Br.)

Sirukurinjan is a large woody branched climber distributed abundantly in Deccan peninsula. The roots and leaves are used in biliousness, cough and sore eyes.

Young stems and branches of the plant are pubescent and often dense; leaves ovate or elliptic. Petiole long, pubescent and often dense. Flowers yellow in umbellate cymes. Calyx divided to at the base, and obtuse, corolla campanulate and very small. Style thick and white. Fruit is follicle, rigid and often suppressed. Seed narrowly, ovoid-oblong, flat with thin broad marginal wing brown glabrous.

3. **Kovai** (*Coccinia indica*)

The studies relating to the pharmacognostic features of **Kovai** are also taken up.

CHEMICAL STUDIES

The Chemical studies were carrtied out on the following drugs by the Chemistry Wing of Drug Research Scheme, Madras.

1. **Kadal Pazhinchil** (*Olax scandens* Roxb)

3 kgs. of the plant leaves were extracted into haxane in the cold (48 hrs.). The extract answered for steroid, triterpene and quinone. The extract was chromatographed over silica gel. Initial elution with hexane & benzene 4 : 1 gave a compound crystallised from acetone m.p. 79-80°. The compound was identified as Octacosonol. Further elution with benzene Ethylacetate 9 : 1 gave β. sitosterol ; crystallised from acetone (m.p. 131°). Elution with the same solvent gave an other amorphous compound which could not be identified.

2. **Pisonia** :

Dried and powdered plant was extracted into haxane and chloroform. The extracts were found to be similar and hence mixed together and chromatographed over silica gel. Inital elution with benzene gave two triterpens which covld not be identified due paucity of the material. Further elution with benzene gave two steroids. The compounds were indentitied as β-sitosterol and spinosterol by comparisons with authentic specimen.

Pisonia (Alchohol extract : The alcoholic extract answered for steroid, flavonoid and glycoside. The total extract was chromatographed over silica gel. Elution with hexane & benzene 1:1 gave Octacosanol (m.p. 82°). Further eluction with benzene gave β-sitosterol. ethylacetate & alcohol 4:1 elusion gave a steroidal glucoside m.p. 204° identified as β-sitosterol B (D) glucopyoranoside.

3. The Chemical analysis of seeds ***Kattu Jeeragam*** have been studied in acid radicals, basic radicals. Phosphate, chloride, flouride

and carbonote as acid and iron, aluminium, calcium and magnesium as basic radicals are present.

4. The chemical analysis of ***Pooversu choornam*** (root) have been studied. Phosphate, chloride, sulphate and carbonate as acid radicals and iron, calcium and magnesium as basic rodicals are present.

5. The qualitative chemical analysis of Seenthil (leaves) have been studied for acid and basic radicals. Phosphate, chloride, sulphate, oxalate and carbonate as acid and iron, calcium, sodium and magnesium as basic radicals are found present.

6. The qualitiative analysis of ***Gymnema sylvestre*** (leaves) shows the presence of sodium, magnesium, calcium, potasium, iron and manganese.

PHARMACOLOGICAL STUDIES

The Pharmacological research teams of Central Research Institute (Siddha) and Drug Research Scheme (MD) carried out work on Abraka Chenduram, 777 oil, Venkodiveli, Kandankathiri, Ponnimilai Chenduram and Karbogarisi Paste.

1. **Abrak Chenduram :**

Healthy albino rats and mice of either sex were selected and divided into groups of six animal each. The animals were deprived of food for four hours, prior to the experiment. Abraka chenduram, a Siddha medicine was suspended in 0.5% Carboxy-methylcellulose and administered in mice in the doses of 25, 50, 100, 250, 500, 1000, 2000, 3000, 4000, 5000, 6000, 7000, 8000, 9000 and 10,000 mg/kg body weight orally once. The same suspended drug was also administered in rats in the doses of 25, 50, 100, 250, 500, 1000, 2000, 3000, 4000, 5000, 6000 and 7000 mg/kg body weight orally once One group received orally the vehicle (0.5% Carboxy-methyl-cellulose) and served as untreated control. The animals were observed for any abnormal signs and mortality for 72 hours. The drug did not show any adverse effects or mortality in all the dose levels employed.

2. **Gowri Chinthamani :**

a) Sub-acute toxicity study :

The drug Gowri Chinthamani was suspended in honey and administered orally once a day for thirty consecutive days. The drug was administered in the doses of 250, 2000 and 3000 mg/kg body weight. Daily observation for body weight, feed and water intake and abnormal signs were recorded. One group received only the vehicle (honey) in appropriate amount to serve as untreated control. All animals were sacrificed on 31st day. Heart blood was collected for haematological observations and tissues of vital organs like heart, lungs, liver, kidney were collected for histopathological findings. The study is in progress.

b) Anti-inflammatory study :

(i) The test drug Gowri Chinthamani was studied for sub-acute phase of inflammation by cotton pellet granuloma technique. The drug was suspended in honey and administered in the doses of 100, 250 and 500 mg/kg body weight orally daily for seven days. One group of animals received only the vehicle (honey) and served as untreated control. Another group was fed with phenylbutazone in a dose of 100 mg/kg body weight and served as standard control.

Sterilized cotton pellets were placed subcutaneously one in each groin and one in each axilla surgically. On the eighth day, the animals were sacrificed. The pellets were dissected out and dried at 60°C temperature till the pellets weighed constant. The pellets were weighed in a monopan balance. The results are being analysed.

(ii) Granuloma pouch in albino rats weighing between 90 and 120 gm were induced on the dorsal side of the animal by injecting 25 ml of air and 1 ml of 0.5% croton oil subcutaneously after clipping the hairs on the dorsal aspect of the body. The necessary aseptic precautions were taken during the procedure. The drug Gowri-Chinthamani was suspended in honey and administered in the doses of 100, 250 and 500 mg/kg body weight orally daily for seven days, whereas the other groups of animals received phenylbutazone in the dose level of 100 mg/kg orally and the vehicle in appropriate quantity respectively for comparison purposes. The animals were sacrificed and the results were recorded on eighth day.

(c) Analgesic study

Male mice weighing between 20 and 30 gm body weight were selected. The drug was suspended in honey and administered in the doses of 100 and 250 mg/kg body weight orally once to one group. Another group received only the vehicle (honey) and served as untreated control. Analgin, was suspended in distilled water and administered in the dose of 500 mg/kg body weight orally which served as standard control. The writhing syndrome was induced by intraperitoneal injection of 3% solution of acetic acid in a dose of 300 mg/kg body weight. All the animals were administered the test drug or standard or vehicle orally thirty minutes prior to the injection of acetic

acid. After injection, each mouse was kept separately and the total number of stretching episodes for a further period of thirty minutes were recorded. The results are being analysed statistically.

The drug Gowri Chinthamani was suspended in honey and administered orally in the dose of 100 mg/kg body weight in male mice weighing between 20 and 30 gm, particularly those were quick in response on hot plate. Initially, before the administeration and at every half an hour after drugging, the reaction time was recorded on hot plate maintained at 55°C+O.5°C. Analgin was administered in the dose of 500 mg/kg body weight orally and served as standard control for the purpose of comparison. The study is still continuing.

3. 777 oil

(a) Acute toxicity study

Albino mice of either sex were selected and divided in groups of six animals each. The animals were deprived of food for four hours prior to the experiment. 777 oil, a coded Siddha drug was administered in the dose of 6 ml and 70 ml/kg body weight in different groups of animals with an untreated control which received only the vehicle (coconut oil) orally once. The animals were observed upto 72 hours for any abnormal signs and mortality. The drug showed 83.86% of mortality in the dose level of 60 ml/kg body weight and 100% mortality at the dose level of 70 ml/kg body weight.

(b) Sub-acute toxicity study

The drug as such was administered in the dose levels of 5 ml and 10 ml/kg body weight once a day for thirty consecutive days. Daily observation for body weight, water feed intake and abnormal signs were recorded. One group received only the vehicle (coconut oil) in appropriate amount to serve as untreated control.

(c) Anti-inflammatory study

Oedema of right hind paw of albino rats weighing between 80 and 100 gm body weight were induced by injecting 0.1 ml of 1% carrageenin in 0.5% carboxy methyl cellulose in the plantar aponeurosis of hind paw. Paw volume was measured by Plethysmography. The drug was administered oraly in the doses of 0.3 ml and 0.6ml/

100 gm body weight. Another group received only coconut oil and served as untreated control while another group received phenylbutazone in a dose of 100 mg/kg which served as standard control. The drug showed highly significant ($P<0.001$) anti-inflammatory effect in both the dose levels employed.

The test drug 777 oil was studied for sub-acute phase of inflammation by cotton pellet induced granuloma technique. The drug as such was administered in the dose level of 3 ml/kg body weight orally for seven days. One group of animals received only the vehicle (coconut oil) and served as untreated control. Another group was fed with phenylbutazone in a dose of 100 mg/kg body weight and served as standard for comparison. Sterilized cotton pellets were placed subcutaneously eonsnal in each groin and one in each axilla surgically. On the eighth day, the animals were sacrificed. The pellets were dissected out and dried at the temperature till the pellets weighed constant. The drug did not show significant anti-inflammatory activity in the dose level of 20 ml/kg body weight.

4. Venkodi Veli (*Wrigthtia tinctoria*)

Albino rats and mice of either sex were selected and divided in groups of six animals each. The animals were deprived of food for four hours prior to the experiment. The powdered root bark was suspended in 0.5% Carboxy methyl cellulose and administered in mice in the doses of 50 and 100 mg/kg weight orally once. The same suspended drug was administered in rats in the doses of 50, 100, and 250 mg/kg body weight orally once. One group received only the vehicle (0.50% Carboxy methyl cellulose) and served as untreated control. The animals were observed for any abnormal signs and mortality for 72 hours. The drug did not show any adverse effects or mortaliiy in all the doses employed.

5. Kandakanthiri

a) Anti-inflammatory studies

1) Formalin induced arthritis in rats

The drug was suspended in distilled water and was administered in a dose of 1000 mg/kg. One group of animals consisted of 6

numbers. One group which was fed only the vehicle served as a control and another group receiving Wysolone served as a standard group. Arthritis was induced by injecting formalin solution subcutaneously in the right hind paw on first and third day. The drug was given orally once till 10th day. The body weight and linear cross section of ankle joint of animals were recorded till 11th day. The study is in progress.

ii) Granuloma pouch in rats

Albino rats weighing between 120 to 150 gm body weight were selected and granuloma pouch was induced on the dorsal side of the animal by injecting 25 ml of air and one ml of 0.5% croton oil subcutaneously after removing the hair. The necessary aseptic precautions were taken durnig the procedure. The drug *Kandankathiri* was suspended in distilled water and administered to the rats in a dose of 50, 100, 500 and 1000 mg/kg body weight orally once daily for 7 days. Other two groups of animals received phenylbutazone in a does level of 100 mg/kg body weight and distilled water orally once daily for 7 days as standard and the vehicle control respectively for the purpose of comparison. On the 8th day the animals were sacrificed for removing the pouch and other vital organs like thymus, spleen and adrenals. The pouch removed was punctured and the volume of exudate was recorded. The vital organs of the animals weighed and recorded. The study is in progress.

b) Analgesic study

Male mice between 20-30 gm. body weight were selected and used for the experiment. The drug was suspended in distilled water and administered in a dose of 50 mg., 100 mg and 500 mg/kg body weight orally once to each group. Another group received only distilled water and served as an untreated control.

Analgin was suspended in distilled water and administerad in a dose of 500 mg/kg body weight orally which served as standerd control. The writhing was induced by intraperitioneal injection of 3% solution of acetic acid in a dose of 300mg/kg.

All the animals were administered with test drug or standard or vehicle orally thirty minutes prior to the injection of acetic acid. After injection each mouse was kept separately and the total number of stretching episodes for a further period of thirty minutes were recorded.

6. Ponnimilai Chendooram

(a) Toxicity studies

Fresh samples of Ponnimilai Chendoaram in fine powder form, collected and suspended with milk.

The drug was administered in albino mice weighing between 20 to 30 gm in the doses of 3000, 4000, 5000, 6000, 7000, 8000, 9000 and 10,000 mg /kg. body weight. The animals were observed for toxic symptoms and mortality upto 72 hours. The drug was found to be non-toxic in all the above doses employed.

(b) Anti-inflammatory study

(I) Carrageenin induced paw oedema in rats

Albino rats weighing between 80 to 100 gm. were selected. Oedema of right hind paw were induced by injecting 0.1 ml. of 1% carrageenin (in 0.5% CMC) in the planter aponeurosis of the hind paw. The drug was suspended in milk and administered in the doses of 250,500 and 1000 mg/kg body weight. One group received phenylbutazone in a dose of 100 mg/kg which acts as a standard and another group received only vehicle which acted as a control. Initial paw volume was measured. After three hours of carrageenin injection, paw volume readings were taken again. The study is in progress.

(II) Cotton pellet granuloma method

The drug suspended in milk and studied for sub-acute phase of inflammation by cotton pellet technique. The test was carried out in Albino rats of either sex weighing between 100 to 120 gm body weight. The above prepared drug was administered in the dose of 100 mg/kg body weight for the test group, orally for seven days.

Similarly two more groups were taken. One group received only vehicle which served as a untreated control, whereas another group received phenylbutazone in the dose of 100 mg/kg to serve as standard for the purpose of comparison. On the 8th day all the animals were sacrificed for removing the cotton pellets and other vital organs like spleen, thymus and adrenals. The vital organs and the cotton pellets were weighed and recorded. The study is in progress.

(III) **Formalin arthritis**

The drug suspended in milk was subjected to screening for arthritis induced by formalin in rats. The drug was administered in a dose of 100 mg/kg body weight to one group of animals which consisted of six numbers. One group which received only vehicle served as a control and another group received wysolone served as a standard for the purpose of comparison. Arthritis was induced by injecting 0.1 ml of 2% formalin solution subcutaneously in the right hind paw on the first and third day. The drug was given orally till tenth day. The body weight and cross section of the ankle joint of the animal measured and recorded till the 11th day. The study is in progress.

(IV) **Granuloma pouch**

Albino rats weighing between 120 to 150 gm body weight were selected and granuloma pouch was induced on the dorsal side of the animals by injecting 25 ml of air and one ml of 0.5% croton oil subcutaneously after removing the hair. The necessary aseptic precautions were taken during the procedure. The drug was administered to the rats in a doses of 100, 250 and 500 mg. of body weight, and distilled water orally once daily for 7 days as standard and the vehicle control respectively. On 8th day the animals were sacrificed for removing the pouch and other vital organs like thymus, spleen and adrenal. The pouch removed was punctured and the volume of exudate recorded. The vital organs of the animals were weighed and recorded. The study is in progress.

7. **Karbogarisi paste**

The drug Karbogarisi paste was suspended in butter milk (1 gm in 4 ml of butter milk). Albino rats weighing betwcen 100-120 gm body weight were selected. After clipping the hair on the back of the animals the skin between the shoulder girdles was marked.

Every morning the prepared drug was applied to the skin to one group of animals. Another group of animals which was applied only with vehicle acted as a control. All the animals were exposed to sunlight for 10 minutes. This procedure was continued for 60 and 90 days duration for two test groups. On the 61st and 91st day all the animals were sacrificed and the skin was removed for histopathological examinations with special reference to toxic manifestations and pigmentation. All the vital organs were weighed and sent for histopathological examination. The haematological investigations were also carried out. The study is in progress.

STANDARDISATION RESEARCH

The Drug Standardisation Research Unit, Madras, Preliminary Standardisation Research Units at Regional Research Centre, Bangalore and Regional Research Institute (DR), Trivandrum have taken up the research programme in standardisation of drugs.

These projects have taken up steps to lay down analytical standards for single drugs from vegetable, mineral and animal origins and various types of compound formulations such as *Parpam, Thailams, Lehiyam, Podi Chooranam, Thean, Kuzhambu, Kalimbu, Paneer, Ennai Chendooram* etc.

The studies were taken up on single drugs i.e. *Peykkumatti, Avilthol, Niradimuthu, Marukkarai*, Valmilaku, *I bural, Kottam, Kudasppalai, Maramanial Alinjil*, method of manufacture of *Elathi-choornam* and *Lingachendooram* besides on finished products i.e. *Soombuthineer, Omattineer* and *Padikaraneer*. Besides this the units have taken up the programme of laying analytical standards for formulations included in the National Formularly of Siddha-Part I. The Units have also been engaged on pharmacognostical studies of the single drugs that enter into formulations. Uniformity in the method of analysis and the data collection were maintained. The raw drug requirement for these units for preparing the various types of compound formulations are being met by the Survey of Medicinal Plant Unit of the Council and also from the market. The preparation of the formulation is done strictly according to the texts as authorised by the formulary.

The work carried out by the Standardisation Units are as below :

I. Analytical chemistry of the following plants were done :

1. Poykkumatti (*Citrullus colocynthes*) DSUSM .
2. Avil thol (*Pongamia glabra*) ,,

3.	Marukkari	(*Randia dumetorum*)	(DSUSM)
4.	Valmilaku	(*Piper cubeba*) Fruit	(DSUSB)
5.	Imbural	(*Oldenlandia umbellata*)	,,
6.	Kottam	(*Costus speciosus*) Rhizome	,,
7.	Kudasappaallai	(*Holarrhena antidysenterica*) Seed	,,
8.	Maramanjal	(*Coscinium fenestratum*) Stem	,,
9.	Marakkaraikai	(*Randia dumetorum*) Fruit	,,
10.	Alinjil	(*Alangium salvifolium*) Seed	,,
11.	Paykumatti	(*Citrullus colocynthes*) Fruit	,,

II. Method of manufacture relating to the following formulation were studied :

1.	Sinbuttineer	(DSUSM)
2.	Omattineer	,,
3.	Patikaraneer	,,

The Pharmacognostical identifications of the following single drugs that enter into the formulation of National Formulary of National Formulary of Siddha Part-I, have been analysed and reported :

1.	Kandubarangi	*Clerodendrum serratum*	DSUSM
2.	Chembaruthi	*Hibiscus-rosa sinensis*	,,
3.	Marudani	*Lawsonia alba*	,,
	Leaves and flowers		
4.	Sonpagappumottu	*Michelia champaca*	,,
5.	Surakkodi	*Lagenaria vulgaris*	,,
6.	Kattu milagu	—	,,
7.	Koohai neer	*Manihot utilissima*	,,
8.	Imbural	*Oldenlandia umbellata*	,,

9.	Ammannacharisi	*Eupharbia hirta L*	DSUSM
10.	Ilavangapattai	*Cinnamomum zeylanicnm*	,,
11.	Marukarai	*Randia dumetorum*	,,
12.	Niradimuthu	*Hydnoocarpus coneata*	,,
13.	Kudasapalai	*Holarrhena antidysenterica*	,,
14.	Sadipattiri	*Myristica fragrans (Mace)*	DSUSB
15.	Valmilaku	*Piper cubeba (Fruit)*	,,
16.	Kottam	*Costus speciosus (rhizome)*	,,
17.	Talicum	*Abies webbiana (leaves)*	,,
18.	Imbural	*Oldenlandia umbellata (root)*	,,

Pharmacognosy :—

The Pharmacognostical detail of the single drugs have been carried out and reported.

1.	Ishvaramuli	*Aristolochia indica*	DSUSM
2.	Akasagarudan	*Corallocarpus epigaeus*	,,
3.	Chembaruthi	*Hibiscus-rosa-sinensias*	,,
4.	Ammanpachcharisi	*Euphorbia hirta*	,,
5.	Puykkumatti	*Citrullus Colocynthes*	,,
6.	Kudasappaalai	*Holarrhena antidysenterica*	CSMDRIA
7	Kudesappaalai	*Holarrhena antidysenterica (Seed)*	CSMDRIA

8.	Maremanjal	*Coscinium fenestratum* (*Stem*)	DSUSB
9.	Alinjil	*Alangium salvifolium* (*Seed*)	"
10.	Markkaaraikai	*Xeromphis spinosa* (*Root*)	"

Monograph on Pharmacognostical and Phyto-chemical studies on *Moringa Olifera* Lamb was prepared.

PHARMACY

Realizing the importance of the Pharmacy, the Central Council for Research in Ayurveda and Siddha has established a Pharmacy to prepare Siddha medicines in the Central Research Institute for Siddha.

The Pharmacy is engaged in the preparation of classical preparations mentioned in the Siddha literature and chosen for clinical trials in the Institutes/Units of Siddha Medicine under the Council.

The drug requirements of the Pharmacy are met by the Medico-Ethno-Botanical Survey Projects and through purchase from the local market. The material obtained is confirmed for its identity, authenticity and genuiness before use.

The preparation of the medicines is according to the method given in the classical literature.

The Pharmacy attached to Central Research Institute (S), Madras prepared 63 preparations, both for research and general use. The Pharmacy is engaged in the preparations mentioned in the classical Siddha literature. Parpam chendooram, chooranam, podi, thailam, lehiyam, thean, pattru, manappagu, mathiraigal kuligai, ennai, vennai, kuzhanbu and panneer are a few formulations prepared at Pharmacy.

The Pharmacy has supplied medicines to the following Units/ Institutes besides C.R.I. (S), Madras.

1. R.R.I. (S), Pondicherry,
2. M.C.R.U. under C.R.I. (S). Madras
3. D.R.S. (Multi-Disciplinary (S), under C.R.I. (S.), Madras.
4. C.R.U. (S), Palayamkottai.
5. D.S.R.U. (S), Madras.

LITERARY RESEARCH

LITERARY RESEARCH

The Literary Research is being conducted by the Literary Research and Documentation Department (Siddha), Madras. The work done during the reporting year is as under :

The department has completed the annotation work on *Agathi yar Sowmya Sagaram*-1200 and *Agathiyar Pooranam* —205. These works deal with fundamental principles of Siddha System of Medicine such as *Nathavindhu Jananam, Thathuva Vagai Imbootham, Ganga Kanma, Inthiriyangal Iymbulan Anthakkaranam, Vaidya thathuvam, Imbootha kuri, Dasanadi Dasavavu Vasa Nadi, Mukkunam, Vaku nangu Utkarivi, Purakaruvi Sivakooru* and *Udal kooru* etc.

The typing work of *Agthiyar Sowmiya Sagaram* has been completed and correction work have been carried out upto 1050 stanzas. The remaining are under progress.

The microfilming work of the following books and manuscripts were completed during the period under review,

S. No.	Name of the Book/Manuscript	No. of pages covered.
Books :		
1.	Panja Kaviya Nigandu	203
2.	Pathinen Sidhar Nadi Sasthiram	205
3.	Siddhararudam	88
Manuscripts :		
4.	Karuvoorar Soothram	74
5.	Karuvoorar Palathirattu	120

The Literary Research Unit functioning at CRI (S) has collected references from its sources and also from the local libraries attached to Indian Institute of Technology, Connemara Library and the Library of General Hospital, Madras. A list of useful Journals dealing with medicine, phytochemistry, pharmacognosy, pharmaceutical chemistry etc was prepared from these sources.

A sum of Rs. 1,435/- was collected by the sales of the Council's publications.

ACKNOWLEDGEMENT

The Directorate of the Council places on record its grateful thanks and deep appreciation to scientists and scholars of various disciplines of medical systems and other ancillary sciences and Universities and Governmental agencies who are directly or indirectly associated with this Council, and to the officials of all the Research Projects and Officers and Staff of the Headquarters. The Directorate is grateful to the Union Ministry of Health and Family Welfare and Members of the Governing Body, Finance Committee and Scientific Advisory Committees for their whole-hearted cooperation for achieving the aims and objects of the Council and hope their continued support and cooperation in future also for the over-all development of Ayurveda and Siddha.

Padar-Thamarai **MCRUM**

A total No. of 47 cases were studied during the period under review. The cases of *Padar-thamari* were divided in three groups. Sivanaramithan, Akasakarudan Kizhangu chooranam and Sanguparpam were administered in suitable doses for 45 days respectively. It is observed that the cases treated with *Sivanaramirtham* showed better results than the other trial drugs.

Karappan **MCRUM**

A total No. of 10 cases of Karappan were studied in different groups to prove the efficacy of certain Siddha drugs. Most of the cases attended were in the age group of 20 to 60 years. Study is in progress.

Regional Research Institute (Siddha) Pondicherry **RRISP**

Survey and Surveillance work carried out in two villages i.e. Embalam and Sembiyanpalayam. The total population of 3947 individuals belonging to 99 families were covered in 23 visits by the survey team. 500 individuals were given incidental medical aid during the survey. There have been no medicare facilities in these villages. All the people had to come to Pondicherry for the medical relief. The team has collected the required data in respect of sex, age, per capita income, martial status, educational status, food habits, etc. from the inmates of the villages. It is observed that most of the villagers are agricultural labourers. They are cultivating the paddy, ragi, groundnut and sugarcane, coconut etc.

In the village Karikalam Pakkam 1052 individuals were contacted and necessary information gathered.

During the period under review the team has visited Elagiri hill. This tribal area is about 3200 ft. above the sea level. There is a cluster of 13 villages namely 1. Athanavoer 2. Punganoor 3. Muththanur 4. Kottaiyur 5. Kottur 6. Pallakaniyur 7. Meettukaniyur 8. Puttur 9. Paduvanur 10. Thayaloor 11. Mangalam 12. Nilavoor and 13. Royaneri.