

Central Council for Research in Ayurveda & Siddha

**MINISTRY OF HEALTH & FAMILY WELFARE
(GOVERNMENT OF INDIA)**

(17)

Annual Report

1990-91

**CENTRAL COUNCIL FOR RESEARCH
IN AYURVEDA AND SIDDHA**

**ANNUAL REPORT
1990-91**



MINISTRY OF HEALTH AND FAMILY WELFARE
(Government of India)
NEW DELHI

1991--250 Copies

Printed at : **YUGANTAR PRAKASHAN (P) Ltd.**
WH-23, Mayapuri Industrial Area, Phase-I, New Delhi-110 064. Ph : 5435949

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PREFACE

The Central Council for Research in Ayurveda and Siddha an autonomous body under Ministry of Health and Family Welfare, Government of India is an apex body in India for the formulation, co-ordination, development and promotion of research on scientific lines in Ayurveda and Siddha. The Council carries out its objects and functions through the net work of Research Institutes and Centres functioning under its direct control and through a number of Units/Enquiries located in Universities, Ayurveda/Siddha and Modern Medical Colleges etc., in different parts of the country. There has been acute shortage of funds even for committed liabilities like salary and other essential requirements. All IPD's attached to different Institutes/Centres have remained closed for more than ten months for want of sufficient funds for diet and medicine. All programmes were affected for want of funds even for minimum requirements. During the reporting period possible efforts have been made to revive and continue the existing programmes with meagre resources available at the disposal of the council. A brief review of the work carried out under different research programmes during the reporting period is reported hereunder:-

Clinical Research Programme

Clinical conditions studied in Ayurveda during the reporting period include *Amavata* (rheumatoid arthritis), *Paksvadha* (hemiplegia), *Gridhrasi* (sciatica), *Saisaviyavata* (poliomyelitis), *Amlapitta* (hyperacidity), *Parinamasula* (duodenal ulcer), *Annadravasula* (gastric ulcer), *Pravahika* (dysentery), *Grahani roga* (malabsorption syndrome), *Kamala* (jaundice), *Bhagandar* (fistula-in-ano), *Tamaka swasa* (bronchial asthma), *Swetapradara* (leucorrhoea), *Raktapradara* (metrorrhagia), *Madhumeha* (diabetes mellitus), *Mutra Kriccha* (dysuria), *Vyanbalvaishmanya* (hypertension), *Ilridroga* (ischaemic heart diseases), *Slipada* (filariasis), *Visamajwara* (malaria), *Kitibha* (psoriasis), *Pama* (scabies), *Vicarcika* (oozing eczema) and *Arbudavisesa* (cancer). Clinical studies on *Grivastambha* (spondylitis), *Pangu* (paraplegia) and *Kampavata* (parkinson's disease) have also been initiated.

The Council has taken intensive studies on *Visamjvara* (malaria) in collaboration with NMEP, New Delhi, Madras Municipal Corporation and Government of Tamil Nadu for further evaluation of anti-malarial potential of AYUSH-64. Trial of few Ayurvedic formulations Pravala Mukhadi Yoga and Jvarasni in Kalaazar-an endemic disease in Bihar has yielded good response. Field trials of few Ayurvedic formulations have also been attempted in Yaws a problem disease for tribals of Baster (M.P.).

Clinical conditions under Siddha System of Medicine studied during the reporting period include *Valligunnam* (peptic ulcer), *Putrunoi* (cancer), *Manjal kamalai* (infective hepatitis), *Sandhivatha soolai* (rheumatoid arthritis), *Kalanjaga padai* (psoriasis), *Vellainoi* (leucorrhoea), *Gunnam* (intestinal disorders), *Velluppunoi* (anaemia), *Venkuttam* (leucoderma), *Neerazhivu* (Diabetes mellitus), *Oothalnoi* (obesity) and *Karappan noi* (skin diseases).

During the execution of this programme, medical aid to 2,70,148 patients through Out Patient Departments and 1744 patients at In-door Patient Departments functioning at different Institutes/Centres/Units of the council have been provided.

Health Care Research Programme

Health Care Research Programme carried out by the Council include Service Oriented Survey and Surveillance Screening Programme, Community Health Care Research Programme and Tribal Health Care Research Programme. These programmes are modulated to have rural bias so that benefits of the research programme carried out can reach the grass root level. Under these programmes, teams of research personnel visit each and every house in the villages/tribal pockets selected/adopted and provide incidental medical aid besides collecting data pertaining to the nature and frequency of prevalent diseases, food habits with regard to different seasons, socio-economic status, natural resources, the standard and types of treatment available to the rural/tribal folk. During the period under report a population of 97,103 individuals pertaining to 115 villages including 84 tribal pockets have been covered under this programme and incidental medical aid provided to 41,062 patients.

Drug Research Programme

The Drug research programme consists of Medico-botanical Survey, Cultivation of Medicinal Plants, inter-disciplinary research programmes like Pharmacognostic, Chemical, Pharmacological and Toxicological studies besides Drug Standardisation studies. Under Medico-botanical Survey Programme local survey tours were conducted for collection of raw drug material for use in OPD/IPD and supply to other Institutes/Centres/Units and PLIM, Ghaziabad for research purposes. The Survey Units have also taken up maintenance work of their Herbarium and Museum . About 450 medicinal species are presently growing in different Gardens . Pharmacognostical studies of 13 drugs, Chemical studies of 32 drugs and Pharmacological and Toxicological studies of 39 drugs used in Ayurveda and Siddha System of Medicine have been carried out during the reporting period. The council is also maintaining a Musk Deer Breeding Farm at Mehrori in Kumaon Hills and there were 26 animals at the end of reporting period.

Under Drug Standardisation research studies 94 single drugs, 27 finished products and two methods of manufacture have been studied besides laying analytical standards for 22 formulations used in Ayurveda and Siddha.

Literary Research Programme

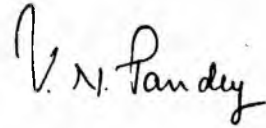
Literary Research Programme broadly covering medico-historical studies, collection and compilation of references relating to drugs and diseases from classical treatises, lexicographic works, contemporary literature and publications of Ayurveda, Siddha and Modern sciences continued further. In the field of revival and publication of ancient literature printing work of Astanga Sangraha -critical edition with Indutika is in progress . Printing work of Sahasra Yoga and Sabdachandrika has been completed during the reporting period. The Council is bringing out "Journal of Research in Ayurveda and siddha", "Bulletin of Medico-Ethno-Botanical Research",

“Bulletin of Indian Institute of History of Medicine” besides the `News letter`. During the reporting period seven books/Monographs were published.

Family Welfare Research Programme

Clinical screening and Pharmacological studies of the oral contraceptive agents are being carried out under this programme. 260 new cases were studied besides old cases carried forward from the previous year for clinical evaluation of oral contraceptive agents like AYUSH-AC IV, K-capsule, Pippalyadi yoga and Vandhyavari (vicoa indica). Pharmacological studies on 10 drugs have been carried out.

The Council's officials were the recipients of Awards from the Council as well as other august organisations for the outstanding research work carried out by them in various field under the aegis of the Council.



(V. N. Pandey)

Director & Member Secretary
Governing Body(CCRAS)

Dated : 19-9-91

ADMINISTRATIVE REPORT

The Central Council for Research in Ayurveda and Siddha is a Society registered on 30th March, 1978 under the Societies Registration Act XXI of 1860. During the period under report ending 31st March, 1991 the membership of the Society and Governing Body of the Council were as under:-

A. From 1-4-90 to 18-2-91.

1. President

Shri Nilmani Rautary
Union Minister for Health &
Family Welfare (upto 25/4/90)

Shri Rashid Masood,
Union Minister of State for
Health & Family Welfare (from 25/4/90)

Prof. Shakilur Rehman,
Union Minister of State for
Health & Family Welfare

3-5 Official Members

1. Shri R. Srinivasan, Secretary
Ministry of Health &
Family Welfare
2. Shri T.K. Das, Joint Secretary,
Incharge of ISM,
Ministry of Health &
Family Welfare
3. Shri M.P. Gupta, Joint Secretary [F.A.]
Ministry of Health and
Family welfare

6-16 Non-Official Members

1. Dr. S.S. Changani
2. Vd. R.P. Trivedi
3. Prof. A.N. Namjoshi
4. Dr. A. Anand Kumar
5. Vd. D.K. Triguna
6. Dr. [Mrs] L. Sharadamma
7. Vd. S.P. Gupta
8. Dr. N.H. Rao
9. Prof. B.N. Dhavan
10. Dr. Rajendra Gupta
11. Dr. C.S. Uthamaroyan

- | | | |
|-----|----------------------|------------------------------------|
| 17. | Director, NIA,Jaipur | Dr. L.N. Sharma |
| 18. | Director, NIS/CRI[S] | Vacant |
| 19. | Member Secretary | Dr. V.N. Pandey
Director, CCRAS |

B. From 19-2-91.

President

**Prof. Shakilur Rehman,
Union Minister of State for
Health & Family Welfare**

**Shri Chandra Sekhar
Prime Minister and
Union Minister for Health &
Family Welfare**

3-5 Official Members

1. **Shri M.S. Dayal,
Add. Secretary
Ministry of Health &
Family Welfare**
2. **Shri T.K. Das,
Joint Secretary,
Incharge of ISM,
Ministry of Health &
Family Welfare**
3. **Shri M.P.Gupta,
Joint Secretary [F.A.]
Ministry of Health and
Family welfare**

6-16 Non-Official Members

1. **Dr. S.S.Changani**
2. **Dr. (Miss.) P.V. Tewari**
3. **Prof. A.N. Namjoshi**
4. **Dr. A.Anand Kumar**
5. **Vd. D.K. Triguna**
6. **Dr. G.V. Satyawati**
7. **Vd. S.P.Gupta**
8. **Dr. N.H. Rao**
9. **Prof. H.H. Siddiqui**
10. **Dr. Y.K.Sarin**
11. **Dr. R. Kannan**

17. Director, NIA, Jaipur

Dr. L. N. Sharma

18.	Director, NIS/CRI[S]	Vacant
19.	Member Secretary	Dr. V.N. Pandey Director, CCRAS

During the period under report the Governing Body could not meet.

Finance Committee

During the year under report the standing Finance Committee consisted of the following :

1.	Joint Secretary[ISM] Ministry of Health & Family Welfare.	Shri T.K.Das	Chairman
2.	Dy. Secretary [IF] Ministry of Health & Family Welfare.	Shri A.K. Joshi	Member
3.	One Technical member to represent Ayurveda.	Vd. B.D. Triguna	Member
4.	One Technical member to represent Siddha.	Dr.A.Ananda Kumar	Member
5.	Director of the Council	Dr.V.N.Pandey Member-Secretary	

No meeting could be held during the reporting period.

Representation of Scheduled Castes/Scheduled Tribes in the Council Services and Welfare Measures for SC/ST

The Council is following the orders and guidelines laid down by the Government of India in respect of reservation and representation of SC/ST in the services of the Council. The recruitment/promotion is done according to the roster points. The Council is having a total staff strength of 1593 employees and no. of SC/ST employees in different groups as on 1.1.1991 is as under(Up to 31.12.1990).

Group	No. of employees	SC	Percentage of total employees	ST	Percentage of total employees
A	114	2	1.75	2	1.75
B	118	7	5.93	1	0.84
C	699	76	10.87	18	2.57
D	662	213	32.17	49	7.40
Total	1593	298	18.70	70	4.39

The Council is having nine Tribal Health Care Research Projects which have been specially located in Tribal pockets. These programmes envisage great scope not only to understand the local health problems and inter-dependant issues but also to identify and apply\advise the methods and measures suitable to surmount them. Besides, some of the research centres are also located in rural areas. Through OPD/IPD of Institutes/Centres and under Mobile Clinical Research Programme and Community Health Care Research Programme, Medical relief and incidental benefit have been extended to a large number of SC/ST population. The budget of the Council stipulates specific allocations for SC/ST component plans.

Official Language Implementation Committee

The Council is having an official Language Implementation Committee under the Chairmanship of the Director, CCRAS to review the position regarding implementation of Official Language Act/Policy/Rules, orders, programmes, etc. and to suggest measures for increasing the pace of Hindi in the Council. During the period under report the Committee could not meet.

Scientific Advisory Committee [Ayurveda]

During the year under report the Scientific Advisory Committee(Ay.) consisted of the following:-

1.	Dr. S.S. Changani	Chairman
2.	Dr. V. Narayanaswamy	Member
3.	Vd. Sitaram Mishra(expired)	Member
4.	Prof. A.N. Namjoshi	Member
5.	Dr. N.H. Rao	Member
6.	Dr. S.P.Gupta	Member
7.	Vd. D.K. Triguna	Member
8.	Dr. N.G. Bandopadhyaya	Member
9.	Dr. P.K. Debnath	Member
10.	Dr. V.M.A.K. Shastri	Member
11.	Dr. S.K. Sharma	Member
12.	Vd. S.K. Mishra(retired)	Member
13.	Dr. L. Sharadamma	Member
14.	Dr. V.N.Pandey	Director & Member Secretary

The Scientific Advisory Committee [Ayurveda] met on 26-7-90 during the period under report and evaluated various research programmes/Schemes of the Council and provided necessary guidance and revised the ongoing programmes and suggested improvements wherever felt necessary.

Scientific Advisory Committee [Siddha]

During the year under report the Scientific Advisory Committee(Siddha) consisted of the following:-

1.	Dr. R. Kannan	Chairman
2.	Dr. J.R. Krishnamurthy	Member
3.	Dr. A. Ananda Kumar	Member
4.	Dr. V.Ramadas	Member
5.	Prof. A.N. Namjoshi	Member
6.	Dr. K.Vaitheeswaran	Member
7.	Dr. V.N.Pandey	Director & Member Secretary

The Scientific Advisory Committee [Siddha] met on 10-7-90 during the period under report and conducted its terms of references and the recommendations were placed before the Finance Committee/Governing Body for consideration and approval.

Organizational Network of the CCRAS

There are 12 Central/Regional Research Institutes, 10 Regional research Centres, 27 Research Units, seven Tribal Health Care Research Projects in Ayurveda, one Documentation and Publication Division, 12 Family Welfare Research Units and one Research Project on Tibetan Medicine besides two Research Institutes, 10 Research Units and two Tribal Health Care Research Projects in Siddha System of Medicine. One time bound Research Enquiry was also in operation.

Budget Provision

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

Scheme	Actual Expenditure 1989-90	Budget Estimates 1990-91	Revised Estimates 1990-91	Actual Expenditure 1990-91
[Rs. in lakhs]				
Plan	116.45	250.00	216.60	114.33
Non-Plan	499.71	502.00	587.00	537.21
F.W.R.S.	15.65	17.15	16.30	15.18

Audited Statement of Accounts

The accounts of the Council for the year 1990-91 for the period from 1st April, 1990 to 31st March, 1991 were audited by the D.A.C.R.

Special Events

- 1. Head Quarters building for CCRAS and other Research Councils as well as CCIM and CCH named as Jawaharlal Nehru Bhartiya Chikitsa Avem Homoeopathy Anusandhan Bhawan which is under construction at Janakpuri Institutional Area is in the final stage of completion and the councils Head Quarters is expected to be shifted to this building by the end of current year. The building was designed by the Design Bureau of DGHS and the construction was entrusted to CPWD at an estimated outlay of Rs.376.85 lakhs.**
- 2. The Council has initiated detailed study of AYUSH-64 in collaboration with National Malaria Eradication Programme at Madras through Dr. A. Lakshmiapati Research Centre for Ayurveda, Madras during the reporting period.**
- 3. In Patient Department of R.R.A. Poddar Central Research Institute(Ay.), Bombay started functioning w.e.f. 22nd May,90.**
- 4. The Staff of the Amalgamated Unit, Tarikhet organised a Medicinal Plants Plantation Programme from 10th July,90 and planted about 1000 locally available Medicinal Plants having Medicinal value in Ayurvedic treatment.**
- 5. Regional Research Centre(Ay.), Gangtok(Sikkim) arranged two Medical Camps one at the village Screng (West Sikkim) on the occasion of Science Exhibition held on 25th-26th October,90 and the other at the village Okhray(West Sikkim) during celebration of World Food Day organised by Sikkim Science Society.**

TECHNICAL REPORT - AYURVEDA

Abbreviations used for Institutes/Centres/Units

SNo.	Institutes/Centres/Units	Abbreviations
1.	Central Research Institute [Ay.], New Delhi	CRID
2.	Central Research Institute [Ay.], Bhubaneswar	CRIBh
3.	Central Research Institute [Ay.], Bombay	CRIB
4.	Indian Institute of Kayachikitsa, Patiala	IIKP
5.	Indian Institute of Panchakarma, Cheruthuruthy	IIPC
6.	Regional Research Institute [Ay.], Calcutta	RRIC
7.	Regional Research Institute [Ay.], Patna	RRIP
8.	Regional Research Institute [Ay.], Lucknow	RRIL
9.	Regional Research Institute [Ay.], Gwalior	RRIG
10.	Regional Research Institute [Ay.], Jaipur	RRIJ
11.	Regional Research Institute [Ay.], Junagadh	RRIJu
12.	Regional Research Institute [Ay.], Trivandrum	RRIT
13.	Regional Research Centre [Ay.], New Itanagar	RRCI
14.	Regional Research Centre [Ay.], Gauhati	RRCGa
15.	Regional Research Centre [Ay.], Gangtok	RRCG
16.	Regional Research Centre [Ay.], Mandi	RRCM
17.	Regional Research Centre [Ay.], Jammu	RRCJ
18.	Regional Research Centre [Ay.], Hastinapur	RRCH
19.	Regional Research Centre [Ay.], Jhansi	RRCJh
20.	Regional Research Centre [Ay.], Nagpur	RRCN
21.	Regional Research Centre [Ay.], Vijayawada	RRCV
22.	Regional Research Centre [Ay.], Bangalore	RRCB
23.	Mobile Clinical Research Unit, Varanasi	MCRUV
24.	Mobile Clinical Research Unit, Jamnagar	MCRUJ
25.	Dr. A. Lakshmi pati Research Centre for Ayurveda, V.H.S., Madras	ALRCAM
26.	Ayurvedic Research Unit, NIMH&NS, Bangalore	ARUB
27.	Clinical Research Unit [Ay.], Hyderabad	CRUH
28.	Clinical Research Unit [Ay.], Kottakkal	CRUK
29.	Clinical Research Unit [Ayurvedic and Modern Team under CDRS], Varanasi	CDRSV
30.	Amalgamated Units, Tarikhet	AUT
31.	Captain Srinivasamurthy Drug Research Institute for Ayurveda, Madras	CMSMDRIAM
32.	Jawahar Lal Nehru Ayurvedic Medicinal Plants Garden, Herbarium and Museum, Pune	JNAMPGHP

33.	Clinical Research Unit under FWRP, Patiala	CRUFP
34.	Clinical Research Unit under FWRP, Bombay	CRUFB
35.	Clinical Research Unit under FWRP, Lucknow	CRUFL
36.	Clinical Research Unit under FWRP, Jaipur	CRUFJ
37.	Clinical Research Unit under FWRP, Calcutta	CRUFC
38.	Clinical Research Unit under FWRP, Ahmedabad	CRUFA
39.	Clinical Research Unit under FWRP, Trivandrum	CRUFT
40.	Clinical Research Unit under FWRP, Varanasi	CRUFV
41.	Pharmacological Research Unit under FWRP, Jamangar	PhRUFJ
42.	Pharmacological Research Unit under FWRP, Varanasi	PhRUFV
43.	Pharmacological Research Unit under FWRP, Bhubaneshwar	PhRUFbh
44.	Pharmacological Research Unit under FWRP, Trivandrum	PhRUFT
45.	Pharmacological Research Unit, Calcutta	PhRUC
46.	Pharmacological Research Unit, Lucknow	PhRUL
47.	Pharmacological Research Unit, Jodhpur	PhRUJ
48.	Pharmacological Research Unit, Varanasi	PhRUV
49.	Pharmacological Research Unit at CRI(Ay.), Delhi	PhRUD
50.	Pharmacological Research Unit, Trivandrum	PhRUT
51.	Toxicity Research Unit, Jhansi	TRUJh
52.	Chemical Research Unit, Calcutta	ChRUC
53.	Chemical Research Unit, Varanasi	ChRUV
54.	Chemical Research Unit, Hyderabad	ChRUH
55.	Chemical Research Enquiry, Lucknow	ChREL
56.	Pharmacognosy Research Unit, Calcutta	PcRUC
57.	Pharmacognosy Research Unit, Pune	PcRUP
58.	Indian Institute of History of Medicine, Hyderabad	IHMH
59.	Literary Research Unit, Thanjavur	LRUT
60.	Documentation and Publication Division, New Delhi	DPDD
61.	Tribal Health Care Research Project [Ay.], Car-Nicobar	THCRPC
62.	Tribal Health Care Research Project [Ay.], Ziro	THCRPZ
63.	Tribal Health Care Research Project [Ay.], Palamau	THCRPP
64.	Tribal Health Care Research Project [Ay.], Jhabua	THCRPJ
65.	Tribal Health Care Research Project [Ay.], Chinchapada	THCRPCh
66.	Tribal Health Care Research Project [Ay.], Jagdalpur [M.P]	THCRPJa
67.	Tribal Health Care Research Project [Ay.], Imphal [Manipur]	THCRPI
68.	Drug Standardisation Research Project, Varanasi	DSRPJ
69.	Drug Standardisation Research Project, Varanasi	DSRPV
70.	Research Project in Tibetan System of Medicine, Leh	RPTSML
71.	Medicinal Plant Garden at RRC, Itanagar	MPGI

CLINICAL RESEARCH PROGRAMME

The Clinical Research involves the study of the patient, his disease and treatment. It is largely directed to develop safe and effective Ayurvedic therapy on scientific lines. Accordingly the clinical research programmes in Ayurveda cover therapeutic evaluation of single drugs, simple herbal and herbo-mineral combinations. In addition, Health Care Research Programmes are also taken through Service Oriented Survey and Surveillance Programme, Community Health Care Research Programme and Tribal Health Care Research in the selected/adopted villages, tribal pockets.

Clinical Trials

While selecting the diseases, priority has been given to the diseases under National Programmes, the diseases where appropriate modern treatment is not available and common ailments affecting the population. The trial methodology has been based on concepts and principles of Ayurveda, while appropriate modern techniques have also been adopted as per the requirement. The trial therapies have been selected with a view to counteract and normalise the Dosas and Dusyas associated with the Samprapati of a particular diseases. Due to Non-availability of laboratory and other necessary facilities at all the centres there has been some variation in the observations. The number of drop outs might have increased due to lack of certain basic amenities and may not necessarily be related to the efficacy of therapies.

The observations on effect of trial therapies on *Amavata* (rheumatoid arthritis), *Paksavadha* (hemiplegia), *Saisaviyavata* (post-polio paralysis), *Amlapitta* (hyperacidity), *Parinamasula* (duodenal ulcer), *Annadrava Sula* (gastric ulcer), *Raktarsa* (bleeding piles), *Tamaka Svasa* (bronchial asthma), *Sveta Pradara* (leucorrhoea), *Rakta Pradara* (dysfunctional uterine bleeding), *Madhumeha* (diabetes mellitus), *Mutrakricchra* (dysuria), *Murasmari* (urolithiasis), *Hridroga* (ischemic heart disease), *Vyanabalavaisamya* (hypertention), *Visamajvara* (malaria), *Kala-a-zar*, *yaws* *Slipada* (filariasis), *Kitibha* (psoriasis), *Vicarcika* (eczema), *Pama* (scabies), *Apasmara* (epilepsy), *Manasa Vikara* (mental disorders) and *Arbuda visesa* (cancer) etc. are presented herewith. In the course of these clinical studies 2,20,645 patients were provided medicate at OP level while 1185 patients have been treated at I.P. level. The description on each of the diseases is provided with details of trial therapy, participating Institutes/Centres/Units, number of patients and results of therapies.

Amavata(rheumatoid arthritis)

The studies on *Amavata* (rheumatoid arthritis) have been taken up at Central Research Institutes Bombay and Bhubneshwar, Regional Research Institutes, Calcutta and Gwalior, Regional Research Centres, Itanagar and Jammu, Indian Institute of Panchakarma Cheruthuruthy and Indian Institute of Kayachikitsa, Patiala. The details of observation on 147 patients treated with different therapies are tabulated herewith alongwith the results.

Table

Results of clinical studies of Ayurvedic preparations on Amavata [rheumatoid arthritis]

S.No.	Therapy	Instt./ Center/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1.a.	Musta Curna Baluka Sveda	RRCI	17	5	4	5	-	3
b.	Sunthi Guggulu Baluka Sveda	RRCI	11	5	3	2	-	1
2.	Musta Curna	RRIG	9	-	0	6	1	2
3.a.	Trikustha Guggulu	RRCJ	3	1	-	-	2	-
b.	Placebo Glucose cap.	RRCJ	8	-	-	-	8	-
4.	Sunthi Guggulu	RRIC	27	8	7	2	1	9
5.a.	Asvagandha Curna Eranda Sneha, Baluka Sveda	CRIB	4	2	1	-	-	1
b.	Yogaraja Guggulu Rasnadi Kvatha, Baluka Sveda	CRIB	14	2	7	-	4	1
6.	Sunthi Guggulu Patra Pinda Sveda	IIKP	30	-	8	10	3	9
7.a.	Sunthi Guggulu	CRIBh	3	1	1	-	-	1
b.	Musta Curna	CRIBh	3	2	-	-	-	1
8.a.	Musta Curna Baluka Sveda	IIPC	7	1	2	-	3	1
b.	Asvagandha curna Baluka Sveda	IIPC	8	2	1	1	4	
c.	Pancakarma with Murchana Taila	IIPC	3	-	1	-	2	
Total			147	29	35	26	28	29

Paksavadha (hemiplegia)

The results of studies on 95 patients of Paksavadha conducted at CRIs Bhubneshwar, Bombay and Delhi and Indian Institute of Panchakarma, Cheruthurthy, Indian Institute of Kayachikitsa Patiala for the study of the effect of some treatments are tabulated herewith :

Table
Results of clinical studies of Ayurvedic preparations on Paksavadha [hemiplegia]

S.No.	Therapy	Instt./ Center/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1a.	Ekangavira Rasa Mahamasa Taila Abhyanga	IIKP	15	-	3	6	1	5
2.	Samira Pannaga Rasa	CRIBh	2	-	1	-	-	1
3.	Ekangavira Rasa	CRID	5	1	1	2	1	-
4.	Ekangavira Rasa, with Sambhalv patra Swarasa Snehana-Mahanara- yana Taila Svedana salidha- nya pind sveda	CRIB	8	-	2	3	2	1
5.a.	Samira Pannaga Rasa, Bhadradarvadi kvatha, Dhanvantara gutika, Snehana Masa Taila, Svedana, Sastikasali	IIPC	21	-	2	12	4	3
b.	Ekanga Vira Rasa Snehana Masa Taila Svedana Sastikasali	IIPC	17	-	-	9	3	5
c.	Pancakarma Therapy	IIPC	27	-	1	10	3	12
Total			95	1	10	42	14	27

Grivastambha [cervical spondilitis]

A number of therapies have been evaluated on 24 patients of Grivastambha in the studies conducted at CRIs Bombay and Delhi. Their results may be seen in the table below :

Table
*Results of clinical studies of Ayurvedic
preparations on Grivastambha [cervical spondilitis]*

S.No.	Therapy	Instt./ Center/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1.a.	Musta Curna	CRIB	8	-	-	-	-	8
b.	Musta Curna & Baluka Sveda	CRIB	3	1	-	1	-	1
c.	Musta curna & Physiotherapy	CRIB	5	2	-	1	1	1
d.	Musta Curna, Snehana,Swedan	CRIB	1	-	1	-	-	-
e.	Musta Curna Physiotherapy, Baluka sweda	CRIB	1	-	1	-	-	-
f.	Maharasnadi ghan vati physiothe- rapy	CRIB	1	-	-	1	-	-
g.	General treat- ment	CRIB	4	-	-	1	-	3
2.	Ekangavira Rasa	CRID	1	1	-	-	-	-
Total			24	4	2	4	1	13

Kampavata [parkinson's diseases]

Some set of therapies have been studied at CRI, Bombay on 6 patients of Kampavata. Their effectiveness is indicated in table below:

Table
*Results of clinical studies of Ayurvedic
preparations on Kampavata [parkinson's diseases]*

S.No.	Therapy	Instt./ Center/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1	2	3	4	5	6	7	8	9
1.	Kampavatari Rasa + Bala+ Aswagandha curna	CRIB	3	-	-	1	2	-

1	2	3	4	5	6	7	8	9
2.	Kampavatari Rasa Balaswagandha+ Mahamasa taila Sveda Abhyanga	CRIB	2	-	-	1	-	1
3.	General treat- ment	CRIB	1	-	-	-	-	1
Total			6	-	-	2	2	2

Saisaviyavata [poliomyelitis]

Some sets of therapies have been studied at CRI, Delhi at IIP, Cheruthuruthy on 29 patients of Saisaviyavata(Khanja). The results may be seen in table below:

Table
*Results of clinical studies of Ayurvedic
preparations on Saisaviyavata [post polio-paralysis]*

S.No.	Therapy	Instt./ Center/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1.	Ekangavira Rasa Masa taila Abhyanga, Sveda Sastikasali	CRID	19	2	10	-	1	6
2.	Gorocanadai vati Ashvagandhaurna Balasvagandhadi taila ext.	IIPC	5	1	-	2	2	-
3.	Ekangavira Rasa Eranda taila Maha Masa Taila ext.	IIPC	5	1	-	1	1	2
Total			29	4	10	3	4	8

Gridhrasi [sciatica]

The clinical trial of Bhallataka and Hingu Triguna Taila has been taken on 15 patients at IIP,

Cheruthurthy and CRI, Bhubneshwar. Out of 14 patients studied with Bhallataka at IIP, Cheruthurthy Three showed poor response and 10 did not show any response and one patient discontinued. The one patient treated with Hingu Triguna Taila at CRI, Bhubneshwar showed fair response.

Pangu [paraplegia]

The Clinical study on Pangu has been conducted at IIP Cheruthurthy on 14 patients to assess the effect of three different approaches of treatment. The result may be seen in table below:

Table
Results of clinical studies of Ayurvedic preparations on Pangu [paraplegia]

S.No.	Therapy	Instt./ Center/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1.a.	Garocanadivati Asvagandha B.A.L Taila	IIPC	8	1	3	3	1	-
b.	Ekangavira Rasa Erandataila Maha Masa Taila Abhyanga	IIPC	2	1	-	1	-	-
c.	Pancakarma with Murchana taila	IIPC	4	1	-	-	2	1
Total			14	3	3	4	3	1

Ardita [facial paralysis]

The effect of Mahavatavaidhvansara Rasa, Rasna Saptaka Kvatha and Sastikasali pinda sveda has been studied on 17 patients on Ardita of IIP, Cheruthurthy. The effect of the treatment has been good, since 13 patients showed good response, 2 patients showed fair response and one patient showed poor response, While one patient discontinued the treatment.

Amlapitta [hyperacidity]

The clinical studies on 177 patients of Amlapitta have been conducted at CRIs, Bhubneshwar and Bombay, RRI, Junagarh, RRC Nagpur and CRU's Hyderabad and Kottakal. The results of treatment alongwith other details may be seen in table below:

Table
*Results of clinical studies of Ayurvedic
preparations on Amalpiita [hyperacidity]*

S.No.	Therapy	Instt./ Center/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop
1	2	3	4	5	6	7	8	9
1.	Avipattikara curna, Kapardika Bhasma	CRUH	41	11	11	-	-	19
2.a.	Avipattikara curna, Sankha Bhasma	CRUK	4	1	2	1	-	-
b.	Amalaki curna Sarjiksara	CRUK	11	4	7	-	-	-
c.	Control	CRUK	4	-	-	-	4	-
3.	Avipattikara curna, Kapardika Bhasma	RRCN	7	4	-	-	1	2
4.a.	Sarjiksara Jahara Mohara Fisti, Amalaki Swarasa	CRIB	10	2	4	-	1	3
b.	Avipattikara Curna, Kaparda Bhasma	CRIB	8	2	2	-	-	4
c.	Sarjikasara Amalaki curna	CRIB	7	-	4	-	-	3
5.	Avipattikara curna, Kaparda Bhasma	CRIBh	6	1	3	-	-	2
6.a.	Sarjikasara Jahara Mohara Fisti, Amalaki svarasa	RRIJu	11	1	5	3	-	2
b.	Control Bland diet	RRIJu	4	-	3	1	-	-
c.	Avipattikara curna, kaparda Bhasma	RRIJu	6	-	2	2	1	1
d.	Sarjikasara Amalaki curna	RRIJu	8	2	1	3	1	1

1	2	3	4	5	6	7	8	9
7.	Avipattikara curna, Kaparada Bhasma	RRCH	50	4	1	2	-	43
Total			177	32	45	12	8	80

Parinamasula(duodenal ulcer)

The clinical evaluation of few Ayurvedic formulations have been conducted at CRIs, Bhubneshwar and Delhi and CRUs. Hyderabad and Kottakal on 32 patients of Parinamasula. The results of treatment may be seen in table below.

Table
*Results of clinical studies of Ayurvedic
preparations Parinamasula (duodenal ulcer)*

S.No.	Therapy	Instt./ Center/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop
1a.	Nimbatiktam	CRID	4	-	2	-	2	-
b.	Suta Sekhara Amalaki svarasa	CRID	4	-	2	-	2	-
2.	Suta Sekhara Rasa Amalaki Svarasa	CRUH	2	-	2	-	-	-
3a.	Indukanta Ghrita	CRUK	5	1	3	1	-	-
b.	Mahatikta ghrita (Graduated)	CRUK	6	3	1	2	-	-
c.	Mahatikta ghrita	CRUK	6	3	2	1	-	-
d.	Nimbatiktam	CRUK	2	-	1	1	-	-
4a.	Suta Sekhara Rasa Amalaki Svarasa	CRIBh	1	-	-	-	-	1
b.	Nimbatiktam	CRIBh	2	-	-	-	-	2
Total			32	7	13	5	4	3

Anndrivasula [gastric ulcer]

The Clinical trial of selected Ayurvedic drugs has been taken up on 17 patients of Annadra-

vasula at RRC,Itanagar. The results of treatment are summarised below:

Table
Results of clinical studies of Ayurvedic preparations on Annadrava Sula (gastric ulcer)

S.No.	Therapy	Instt./ Center/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop
1a.	Praval Pisti Jahara Mohara Pisu	RRCI	6	-	2	2	-	2
b.	Amalaki Curna Madhi curna	RRCI	11	4	1	3	-	3
Total			17	4	3	5	-	5

Kamala [jaundice]

The effect of two sets of Ayurvedic regimen has been studied at IIP Cheruthuruthy and RRCs Jammu and Hastinapur, on 18 patients at Kamala. The results of treatment may be seen in the following table:

Table
Results of clinical studies of Ayurvedic preparations on Kamala [jaundice]

S.No.	Therapy	Instt./ Center/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop
1		3	4	5	6	7	8	9
1.	Punarnava Mandura Arogyavardhini Sveta Parpati	RRCJ	4	2	2	-	-	-
2.	Punarnava Mandura Arogyavardhini Sveta parpati	RRCH	8	3	1	-	-	4
3a.	Punarnava Mandura Arogyavardhini Sveta parpati	IIPC	4	-	4	-	-	-

1	2	3	4	5	6	7	8	9
b.	Kiratatika, Musta Parpata, Katuki and Guduchi kvath with Narasara		2	-	1	-	-	1
Total			18	5	8	-	-	5

Raktarsa [bleeding piles]

The clinical trial of selected therapies have been conducted at IIK, Patiala, CRI Delhi and RRC Nagpur on 48 patients. The following table provides details of the results.

Table
*Results of clinical studies of Ayurvedic
preparations on Raktarsa (haemorrhoids)*

S.No.	Therapy	Instt./ Center/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop
1.	Bola Bhadra Rasa Kasisadi Taila	RRCN	10	3	-	-	-	7
2. a.	Bola Bhadra Rasa kasisadi Taila	IIKP	11	3	2	1	1	4
b.	Suranda Kanda Bhasma Kasisadi Taila	IIKP	9	1	-	2	-	6
3.	Apamarga Ksara Sutra	CRID	18	9	3	-	-	6
Total			48	16	5	3	1	23

Bagandara [fistula-in-ano]

The clinical trial of Ksara Sutra has been conducted on 13 patients of Bhagandara at CRI Delhi and Bombay. The results may be seen in table below:

Table
Results of clinical studies of Ayurvedic preparations on Bhagandara [fistula-in-ano]

S.No.	Therapy	Instt./ Center/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop
1a.	Apamarga Ksara Sutra	CRID	9	6	-	-	-	3
2.	Ksara Sutra	CRIB	4	1	-	-	-	3
Total			13	7	-	-	-	6

Grahani Rogā [malabsorption syndrome]

The trial on Grahani Roga has been taken up at RRC Jammu and CRI Bhubneshwar. All the patients treated with Kutaja Ghana Vati and Sankha Drava at RRC Jammu showed good response, while out of 3 patients treated with Sunthi at CRI Bhubneshwar, 2 showed fair response and one patient discontinued the treatment.

Pravahika [dysentary]

A regimen of Jatiphaladiurna, Mahasankha vati, citrakadi vati and Hingvastakaurna, has been studied on 103 patients of Pravahika at RRC Gangtok. The results indicated good response and fair response in 28 patients each and poor response in 21 patients. The remaining 26 patients discontinued the treatment.

Tamaka svasa [bronchial asthma]

The clinical studies on Tamaka svasa were conducted at RRI Patna, Junagarh and Gwalior and IIK Patiala, to assess the effect of two therapeutic approaches on 99 patients. The following table presents the results at a glance.

Table
Results of clinical studies of Ayurvedic preparations on Tamaka svasa [bronchial asthma]

S.No.	Therapy	Instt./ Center/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop
1	2	3	4	5	6	7	8	9
1a.	Bhagottara gutika	RRIP	10	2	1	-	1	6

1	2	3	4	5	6	7	8	9
b.	Somalatadi Yoga	RRIP	11	-	2	-	-	9
2.	Somalata, Kantakari,Kustha Narasara	RRIG	34	-	7	10	6	11
3a.	Bhagottara Gutika	IIKP	10	-	3	1	-	6
b.	Somalatadi Yoga	IIKP	8	-	1	5	-	2
4a.	Bhagottara Gutika	RRIJu	15	-	2	6	-	7
b.	Somalata,Kustha Kantakari, Narsara	RRJu	11	-	-	6	-	5
Total			99	2	16	28	7	46

Pratisyaya [Upper respiratory infection]

The evaluation of the effect of Pathyadi Kasaya, has been taken up on 55 patients of Pratisyaya at CRI Bombay. Out of 55 patients good response was observed in 12 patients, fair response in 10 patients and no response in 10 patients. The remaining 23 patients discontinued the treatment.

Sveta Pradara [leucorrhoea]

The clinical studies on Svetapradara were conducted at CRIs Delhi and Bhubaneshwar, RRIJ Junagarh and Calcutta and RRC Nagpur on 80 patients. The results obtained on the trials of different approaches are summarised below.

Table
*Results of clinical studies of Ayurvedic
preparations on Svetapradara (leucorrhoea)*

S.No.	Therapy	Inst./ Center/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop
1	2	3	4	5	6	7	8	9
1.a.	Svarna Vanga Kukkutandata Bhasma,Punarnava Mandura	CRID	12	3	3	1	2	3

1	2	3	4	5	6	7	8	9
b.	Asvagandha curna Lodhrasava or Patrangasva	CRID	8	2	2	2	1	1
2.	Asvagandha curna Patrangasava or Lodhrasava	RRIC	12	6	-	-	-	6
3a.	Svarna Vanga Kukkutanda tvak Bhasma	RRCN	12	-	5	-	3	4
4.	Svarna Vanga Kukkutanda tvak Bhasma	CRIBh	4	1	2	1	-	-
5a.	Punarnava Mandura Pancavalkala Uttara Vasti	RRIJu	15	5	5	2	-	3
b.	Asvagandha Patrangasava Lodhrasava Nirgundi Taila	RRIJu	17	4	6	1	-	6
Total			80	21	23	7	6	23

Raktapardara [metrorrhogia]

The clinical studies on Rakta Pradara were taken up on 36 patients at CRIs Delhi and Bhubneshwar and at RRI Calcutta and Junagadh on 55 patients. The data on the effect of treatment are tabulated below:

Table
*Results of clinical studies of Ayurvedic
preparations on Raktapradara (metrorrhogia)*

S.No.	Therapy	Instt./ Center/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop
1	2	3	4	5	6	7	8	9
1.a	Bola Bhadra Rasa	CRID	28	-	11	5	1	11
b.	Kamadudha Rasa	CRID	4	-	-	-	1	3

1	2	3	4	5	6	7	8	9
2.	Bolabhadra Laksa Rasa	RRIC	2	1	-	-	-	1
3.	Kamadudha Rasa	CRIBh	2	2	-	-	-	-
4.	Kamadudha Rasa	RRIJu	14	-	6	-	-	8
b.	Drava Svarasa Bolabhadra Rasa Laksadi Kvatha	RRIJu	5	-	2	-	-	3
Total			55	3	19	5	2	26

Kastartava [dysme norrhea]

The effect of a combination of Pusyanugaurna and Pratapa Lankeswara Rasa was studied on 27 patients of Kastartava at IIK, Patiala. The good response was observed in 25 patients while 2 patients showed fair response.

Madhumeha [diabetes mellitus]

The CRIs Delhi and Bombay and IIK Patiala and RRI Calcutta, have taken up clinical studies on 76 patients of Madhumeha (diabetes mellitus). The results of treatment are tabulated below:

Table
*Results of clinical studies of Ayurvedic
preparations on Madhumeha [diabetes mellitus]*

S.No.	Therapy	Instt./ Center/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop
1	2	3	4	5	6	7	8	9
1.	Ayush 82 Sudha silajita	CRID	14	3	-	7	2	2
2.	Ayush 82	ALRCAM	4	-	2	-	-	2
3a.	Nygrodhadiurna Bhumyamalaki	RRIC	7	1	3	1	-	2
b.	Rastinon		2	-	1	-	-	1
4.	Chandra Prabha Vati Trivanga Bhasma Vijaya Sara kvath	CRIB	9	-	-	5	1	3

1	2	3	4	5	6	7	8	9
5a.	Nisadi Yoga Vijaya Sara kvath	IIKP	38	-	6	7	2	23
b.	Nygrodhadi kvath	IIKP	2	-	-	1	1	
Total			76	4	12	21	6	33

Mutrakriccha [dysuria]

The effect of Trina Pancamula kvatha and Sveta Parpati were studied on 39 patients of Mutra Kricchra at RRI, Gwalior and RRCs, Itanagar and Hastinapur. The results may be seen in table below:

Table
Results of clinical studies of Ayurvedic preparations on Mutrakriccha [dysuria]

S.No.	Therapy	Instt./ Center/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop
1.	Sveta Parpati Trina Pancamula Kvatha	RRCI	32	13	6	7	-	6
2.	Sveta Parpati Trina Pancamula Kvatha	RRIG	7	-	2	4	-	1
3a.	Sveta Parpati Trina Pancamula Kvatha	RRCH	25	3	3	2	-	17
b.	Sveta Parpati Goksuradi Guggulu	RRCH	18	2	4	-	-	12
Total			82	18	15	13	-	36

Mutrasmari [urolithiasis]

The combination of Sveta Parpati with Kvath of Pasana Bheda, Goksuru and Kulattha has been put to clinical trial on 26 patients of Mutrasmari at CRI, Delhi, and RRC Jammu. The table below provides relevant data on the effect of treatment.

Table
Results of clinical studies of Ayurvedic preparations on Mutrasmari [urolithiasis]

S.No.	Therapy	Instt./ Center/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop
1.	Sveta Parpati Pasana Bheda Goksuru	RRCJ	10	6	3	1	-	-
2.	Sveta Parpati Pasana Bheda Goksuru, Kulattha Kvatha	CRID	16	2	4	3	-	7
Total			26	8	7	4	-	7

Medoroga [obesity]

The clinical trial of Navaka guggulu and Ayush 55 has been taken up on 32 patients of Medoroga at RRI, Junagarh. The results are tabulated below:

Table
Results of clinical studies of Ayurvedic preparations on Medoroga (obesity)

S.No.	Therapy	Instt./ Center/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop
1a.	Navaka guggulu	RRIJu	21	-	1	9	-	11
b.	Ayush-55 Low caloric diet	RRIJu	11	-	1	4	-	6
Total			32	-	2	13	-	17

Vyanabalavaishmanya (hypertension)

The clinical trial to study the effect of few therapeutic approaches has been taken up on 47

patients of Vyanabalavaisamya at CRIs Delhi and Bombay, IIK Patiala and RRI Calcutta. The results are tabulated below:-

Table
Results of clinical studies of Ayurvedic
preparations on Vyanabalavaishmnya(hypertension)

S.No.	Therapy	Instt./ Center/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop
1a.	Tagaradi Churan	RRIC	10	2	1	-	3	4
b.	Usiradi Churan	RRIC	12	4	-	-	1	7
2.	Usiradi Churan	IIKP	3	-	-	1	-	2
3.	Arjunatvak Kwath Tagaradicurna	CRID	17	9	2	2	-	4
4.	Arjuna, Jata- mansi Kwath Sarpagandha, Misrana, Punarnava, Kvatha, Sveta, Parpati Goksuru Guggulu	CRIB	5	2	1	2	-	-
Total			47	17	4	5	4	17

Tridosaja Hridroga [ischaemic heart diseases]

The clinical trial of Puskara Guggulu, was taken up at CRU(AT/MT) Varanasi on 19 patients of *Tridosaja Hridroga* (ischaemic heart diseases). The results indicated good response in 12 patients, fair response in 3 patients, poor response in 2 patients and no response in two patients. The electrocardiographic and biochemical improvements were also observed alongwith clinical improvement.

Visamajwara [malaria]:

A clinical trial of Ayush 64 has been executed in certain areas of Madras in collaboration with National Malaria Eradication Programme and Directorate of Public Health, Govt. of Tamil Nadu. A total number of 113 patients with positive blood smear for malarial parasite P-pivax, were studied. 65 patients responded to the treatment with elimination of parasite while 21 patients did not respond and 27 patients discontinued the treatment.

Visamajvara [malaria clinical diagnosis]

The trial of Ayush-64 on clinically diagnosed cases of Visamajvara (without blood examina-

tion) has been taken at CRI, Delhi, RRIs Junagadh and Jaipur and RRCs Itanagar, Mandi,Nagpur,Hastinapur and Gangtok. The results may be seen below:-

Table
*Results of clinical studies of Ayurvedic
preparations on Visamajvara(symptomatic cases)*

S.No.	Therapy	Instt./ Center/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop
1.	Ayush-64	CRID	12	7	3	2	-	-
2.	Ayush-64	RRIJ	15	8	2	2	3	-
3.	Ayush-64	RRCI	12	7	-	-	3	2
4.	Ayush-64	RRCM	7	1	2	4	-	-
5.	Ayush-64	RRCN	6	1	-	-	-	5
6.	Ayush-64	RRIJu	19	19	-	-	-	-
7.	Ayush-64	RRCG	37	18	7	6	-	6
8.	Ayush-64	RRCH	9	7	-	-	1	1
Total			117	68	14	14	7	14

Kalaazar

The clinical studies on Kalaazar has been taken up on 58 patients in selected villages near Patna by RRI, Patna. The therapy consisting of Mukta Vidrumanjana Rasa, Loka Natha Rasa provided good response to the treatment. Most of the signs and symptoms were relieved. Out of 58 patients under study good response was observed in 45 patients, fair response in 9 patients and poor response in three patients while one patient didnot respond to the treatment.

Slipada [filariasis]

The clinical studies on 26 patients of Slipada haavae been conducted at CRI, Bhubneshwar, RRI, Patna and RRC, Nagpur. The result of treatment are tabulated below:-

Table
Results of clinical studies of Ayurvedic preparations on Slipada [filariasis]

S.No.	Therapy	Instt./ Center/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop
1a.	Ayush-64	RRIP	13	11	1	-	1	-
b.	Sudarsana ghan- vati, Mahaman- jisthadi Kvatha	RRIP	2	-	-	-	-	2
2.	Sudarsana ghan- vati, Arogya- vardhini	RRCN	1	-	-	-	-	1
3.	Sudarsana ghan- vati, Arogyavar- dhini, Punarnava rista	CRIB	10	4	1	3	1	1
Total			26	15	2	3	2	4

Kitibha [psoriasis]

The clinical studies have been taken up at CRI, Delhi and RRIs, Junagarh and Trivandrum to assess the effect of few combinations of Ayurvedic drugs on 90 patients of Kitibha. The details of Results of these treatment may be see in table below:

Table
Results of clinical studies of Ayurvedic preparations on Kitibha [psoriasis]

S.No.	Therapy	Instt./ Center/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop
1	2	3	4	5	6	7	8	9
1.	Arogyavardhini Chakramarda Taila	CRID	1	-	-	1	-	-
2a.	Arogyavardhini Cakramarda Taila	RRIT	31	7	16	6	-	2

	2	3	4	5	6	7	8	9
1.	Kaishora guggulu Visvamitrakapal taila	RRIT	19	2	6	6	3	2
3.	Nimbidine Lajjalu keram	RRIT	38	6	20	8	-	4
4.	Arogyavardhini Cakramarda kera	RRIJu	9	-	-	5	-	4
	Total		98	15	42	26	3	12

Vicarcika [oozing eczema]

A few combinations on Ayurvedic drugs have been taken up for trial on 129 patients of Vicarcika at RRI, Trivandrum and RRC, Itanagar. The results may be seen in the table below:-

Table
*Results of clinical studies of Ayurvedic
preparations on Vicarcika [oozing eczema]*

S.No.	Therapy	Instt./ Center/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop
a.	Cakramarda Kvatha and Cakramarda Kera	RRIT	58	28	11	10	3	6
	Manjisthadi Kvatha, Arkapatra Kera	RRIT	50	26	12	7	-	5
2a.	Cakramarda Kvatha, Cakramardakera	RRCI	11	3	1	6	1	-
b.	Mahamanjisthadi Kvath Arkapatra Svarasa Taila	RRCI	3	1	1	-	1	-
	Arogyavardhini Aragvadhani Kera	RRCI	7	1	-	4	1	1
	Total		129	59	25	27	6	12

Pama [scabies]

The RRC Itanagar has taken up clinical trials on few combinations of Ayurvedic drugs on 37 patients of Pama. The results of trial may be seen following table:-

Table
Results of clinical studies of Ayurvedic preparations on Pama [scabies]

S.No.	Therapy	Instt./ Center/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop
1.	Tuvaraka Suddha Gandhaka Mahamaricyadi Taila	RRCI	17	3	2	7	3	2
b.	Arogyavardhini Kaishora Guggulu Mahamaricyadi Taila	RRCI	20	2	6	4	4	4
Total			37	5	8	11	7	6

Other Tvak Roga [skin diseases]

A combination of Suddha Gandhaka, Haridrakhanda, Arogyavardhini and Khadirarista alongwith external application of Gandhaka Druti has been clinically tried on 67 patients of Tvak Rogas at RRC, Gangtok. The results indicated good response in 15 patients and fair response in 10 patients and poor response in 10 patients while 32 patients discontinued the treatment.

Switra [vitiligo]

The clinical trial of Ayush-57 has been taken up on 23 patients of Switra at RRI, Trivandrum and RRC Hastinapur. The results showed good response in one case and fair response in one case and poor response in two patients while 16 patients discontinued.

Apasmara [epilepsy]

The clinical trials of Ayush-56 has been taken up at CRI, Delhi and ARU, Bangalore. The programme registered 30 new cases for trial and continued follow up of 23 old patients at CRI, Delhi while ARU Bangalore registered 6 new cases alongwith follow up of 10 old cases. The results may be analysed after completion of full course of treatment.

Cittodvega [anxiety neurosis]

The ALRCA Madras taken clinical trial of Ayushman 15 and Ksira Bala in 12 patients of Cittodvega. The results may be shown in the table below:

Table
*Results of clinical studies of Ayurvedic
preparations on Cittodvega [anxiety neurosis]*

S.No.	Therapy	Instt./ Center/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop
1.	Ayushman 15	ALRCAM	8	1	3	1	-	3
	Ksira Bala	ALRCAM	4	1	1	-	-	2
Total			12	2	4	1	-	5

Manasmandata [Mental retardation]

The clinical trial of Ayushman 8 alongwith other suportive treatment is being further continued on 10 patients (9 new and 1 old) at ARU Bangalore. The follow up studies are continuing in 6 patients while one patient discontinued the treatment.

Rasayana [prevention of aging]

A combination of Satavari, Punarnava, Bala, Guduchi, Amalaki and Yasti has been put to clinical trials in 16 elderly human volunteers at ALRCA, Madras. The results indicate fair response in 3, poor response in 1 and no response in two volunteers. The remaining 10 volunteers discontinued the treatment.

Arbuda visesh [cancer]

The Clinical trials of STG and Plumbagin two phytochemical isolates has been taken up on 10 patients at CRI, Delhi. The results are summarised in the following table.

Table
Results of clinical studies of Ayurvedic preparations on Arbuda visesh[cancer]

S.No.	Therapy	Instt./ Center/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop
1a.	S.T.G.	CRID	8	-	2	-	-	6
b.	Plumbagin	CRID	2	-	-	-	-	2
Total			10	-	2	-	-	8

Marmacikitsa [acupuncture]

The traditional chinese therapy is being adopted by every medical systems through out the world. Accordingly the Council has also initiated steps to develop this treatment in its Institutes. The clinical application of acupuncture treatment has been taken up on 150 patients of Vatavyadhis and Svasa at CRI Delhi and Bhubneshwar. The response is reasonably good.

Galaganda [goitre]

A combination of Kancanara Guggulu, Godanti Bhasma and Punarnava Mandura have been clinically tried on. 11 patients of Galaganda at RRC Gangtok. The results indicate fair response in 5 patients and poor response in 3 patients while 3 patients discontinued the treatment.

Yaws

The team of Doctors from CRI, Delhi and THCRP Jagdalpur, has taken up special survey cum relief programme for treatment of Yaws in Abujhmad tribal areas of Bastar Distt.(M.P.). The observations on the effect of Arogyavardhini, Kaishore Guggulu and Rasamanikya on 24 patients has shown relief to the patients.

*Statement showing disease group, number of patients included
and participating projects during 1990-91*

SNo.	Disease groups	No. of patients	Participating projects
1	2	3	4
1.	Vatavyadhi		
	a. Amavata	147	CRIBh, IIKP, IIPC, RRIC RRIG,RRCJ,RRCI, CRIB

1	2	3	4
	b. Paksvadha	95	IIKP, IIPC, CRID, CRIBh CRIB
	c. Grivastambha	24	CRIB, CRID
	d. Kampavata	6	CRIB
	c. Saisaviyavata	29	CRID, IIPC
	f. Gridhrasi	15	IIPC, CRIBh
	g. Pangu	14	IIPC
	h. Ardita	17	IIPC
2.	Amlapitta, Parinamasula		
	a. Amlapitta	177	RRCN, RRCH, RRIJu CRUK, CRUH, CRIB, CRIBh
	b. Parinamasula	32	CRID, CRIBh, CRUH, CRUK
	c. Annadravasula	17	RRCI
3.	Other G.I. Diseases		
	a. Kamala	18	RRCJ, RRCH, IIPC
	b. Raktarsa	48	IIKP, CRID, RRCN
	c. Bhagandara	13	CRIB, CRID
	d. Grahniroga	10	CRIBh, RRCJ
	e. Pravahika	103	RRCG
4.	Tamaka svasa etc.		
	a. Tamaka Svasa	99	IIKP, RRIJu, RRIP, RRIG
	b. Pratisyaya	55	CRIB
5.	Stri Roga		
	a. Swetapradara	80	CRID, RRIC, RRCN, RRIJu, CRIBh
	b. Raktapradara	55	CRID, RRIC, CRIBh, RRIJu
	c. Kastartava	27	IIKP
6.	Mutra Roga		
	a. Madhumcha	76	CRID, CRIB, IIKP RRIC, ALRCAM
	b. Mutrakriccha	82	RRCI, RRCH, RRIG
	c. Mutrasmari	26	RRCJ, CRID
7.	Medo Rog	32	RRIJu
8.	Hrid Roga	19	CDRSV
9.	Vyanabalvaismaya	47	RRIC, CRID, CRIB, IIKP
10.	Visamajwara		
	a. Visamajwara [malaria]	113	ALRCAM
	b. Visamajwara	117	CRID, RRIJ, RRCN, RRCI RRCM, RRIJu, RRCH
11.	Kalaazar	58	RRIP

1	2	3	4
12.	Slipada	26	CRIBh, RRCN, RRIP
13.	Tvak Roga		
	a. Kitibha	98	RRIJu, RRIT, CRID
	b. Vicarcika	129	RRIT, RRCI
	c. Pama	37	RRCI
	d. Switra	23	RRCH, RRIT
	e. Other Tvakroga	67	RRCG
14.	Manasa Roga		
	a. Apasmara	69	CRID, ARUB
	b. Cittodvega	12	ALRCAM
	c. Manasamandata	10	ARUB
15.	Others		
	a. Rasayana	16	ALRCAM
	b. Arbudavisesa	10	CRID
	c. Marmacikitsa	150	CRID, CRIBh
	d. Galaganda	11	RRCG
	e. Yaws	24	THCRPJ

Statement of the patients attended at OPD and admitted/discharged in the IPD during 1990-91

SNo.	Instt./ Center/ Unit	Number of Patients attended					% of Bed Occupancy
		O.P.D.		I.P.D.		Total	
		NEW	Old	Admitted	Discharged		
1	2	3	4	5	6	7	8
1.	CRI, Bhubaneswar	4308	4996	9304	137	127	21.30
2.	CRI, Delhi	9619	8264	17883	205	185	33.86
3.	IJK, Patiala	6127	5095	11222	81	80	12.00
4.	IIP, Cheruthuruthy	7955	31503	39458	161	140	66.30
5.	CRI, Bombay	2225	6919	9144	133	126	-
6.	RRI, Lucknow	3733	4295	8028	-	-	-
7.	RRI, Calcutta	3898	13793	17691	34	30	-
8.	RRI, Junagarh	4027	8205	12232	30	30	5.56
9.	RRI, Patna	1982	2668	4605	-	-	-
10.	RRI, Gwalior	5200	4437	9637	60	58	16.77
11.	RRI, Trivandrum	1679	6892	8571	68	66	77.00

1	2	3	4	5	6	7	8
12.	RRI, Jaipur	2564	2292	4856	102	102	30.06
13.	RRC, Nagpur	1308	4752	6060	Not yet started		
14.	RRC, Bangalore	825	2139	2964	Not yet started		
15.	RRC, Jammu	4772	6739	11511	-	-	-
16.	RRC, Mandi	3266	2512	5778	10	10	-
17.	RRC, Hastinapur	4402	5473	9875	25	24	8.84
18.	RRC, Gangtok	4546	2335	6881	-	-	-
19.	RRC, Jhansi	1052	823	1877	Not sanctioned		
20.	RRC, Itanagar	4424	7843	12267	74	72	34.84
21.	RRC, Vijayawada	2531	6120	8651	2	-	-
22.	CRU, Kottakal	-	-	-	73	71	-
23.	ALRCA, Madras	272	440	712	-	-	-
24.	ARU, Bangalore	268	483	751	14	11	-
25.	CRU, Hyderabad	-	-	644	45	41	-
Total		81,627	1,39,018	2,20,645	1254	1173	

Health Care Research Programme

The programmes under this category comprise of Service Oriented Survey and Surveillance Programme, Community Health Care Research Programme and Tribal Health Care Research Programme. These programmes are designed to provide health care and compile information/data relevant for health care from the population within a radius of 25 to 30 kms. of their location.

The main thrust of these programmes are to study the health profile including morbidities and provide Ayurvedic treatment through the mobile clinics. The collection of information on folklores and health education are also taken up. The data on patients treated includes old cases and patients from neighbouring villages. Hence, it does not represent an index of prevalence of diseases.

1. Service Oriented Survey and Surveillance Research Programme

The study of each and every household in selected villages for providing medical aid to the patients suffering from various diseases at their door step are the main objective. The details of the clinical findings history and physical examination of each and every patient is recorded on specially designed proforma for this purpose. The socio-economic and environmental factors relating to these patients are also recorded. Any specific local practice of healing is also taken note of. During the period under report, total number of 16 villages with a population of 3103 have been covered. The teams provided medical relief to 13257 patients suffering from various diseases. The disease profile of each of the villages has also been worked out. The details of the observations are annexed (Annexure-I).

2. Community Health Care Research Programme

Certain selected villages are adopted under this programme. The people of the selected

villages are provided health education regarding prevention of diseases, ways and means of healthful living and also to make use of the locally available plant drugs for the relief of their common ailments. During the course of these activities, the patients suffering from various ailments are also provided medical aid and their details regarding clinical manifestations, socio-economic status and environmental factors are also recorded as per the prescribed proforma. Few schools in the adopted villages are also selected for health examination of the children and for trial of health promoting measures. The details of work conducted in 46 villages and urban slums covering the population of 18598 are annexed (Annexure-II). During the execution of these programmes, 9340 patients were provided medicare. The teams also compiled five folklore medical claims.

3. Tribal Health Care Research Programme

These projects numbering 7 have been specially designed under a special Tribal sub-plan. These projects located Car Nicobar (Andaman Nicobar Islands), Jamune, Palamu(Bihar), Chinchapada-Dhule (Maharashtra), Rama and Jagdalpur Jhabua (M.P.), Ziro (Arunachal Pradesh) and Imphal(Manipur) are formulated with the objective to study the disease pattern and way of life of the tribal population. The availability of medicinal plants including their folk medical practices are also noted.

During the course of the visit, people in the area are also provided information about the ways and means of healthful living, prevention of diseases and application of any medicinal plants available in the area for their ailments. The patients suffering from various diseases are also provided suitable medical aid and the details pertaining to the diseases, environmental and socio-economic studies are also recorded. This programme covered 45 villages with a population of 47,379 and provided medical aid to 16,608 patients(Annexure- III). Folklore medical claims on 10 herbal drugs have also been recorded.

Annexure-I

Statement of work carried out during 1989-90 under Service Oriented Survey and Surveillance Research Programme

S. NO.	Name of the Instt.\Center\ Unit	Name of the Villages covered	Popu- lation	*No. of patients treated	Common Diseases
1	2	3	4	5	6
1.	CRI, Bubaneswar	Bhingapur	NA	519	Sandhisula, Twakroga Paratisyaya, Krimi.
2.	RRI, Calcutta	Bajetera f.	3838	9164	Pandu, Twakroga, Atisar, Amlapitta, Jwara, Kasa, Kandu, Krimi
3.	RRI, Patna	Saidpur Ganesh	641	248	Kasa, Pratishaya
4.	RRI, Gwalior	Turar	500	119	Pratishaya, Vrana, Kasa, Jwara, Kasa, Vrana

1	2	3	4	5	6
5.	RRC, Bangalore	Kombathahally	127	182	Jwara,Pratishaya, Pravahika,Pandu, Kasa,Atisar
6.	RRC, Gauhati	Garal Athiabari	3000	164	Jwara,Pratishaya, Pravahika, Pandu, Kasa,Atisar
7.	RRC, Nagpur	Khaparakheda	7367	321	Pratishaya, Twakroga, Swasa,Kasa
8.	RRC, Mandi	Mattanical Megal Bhodevl	594	214	Atisar, krimi, Kasa, Jwara,Pratishaya, Twakroga
9.	MCRU,Varanasi	Katlupur, Sultanpur Vajidpur Katesar	8500	190	Pravahika, Atisar, Krimi, Pandu, Pratishaya,striroga
10.	RRC, Hastinapur	Ranianangala	3500	444	Atisar,Kasa,Kandu, Pratishaya,Udara- sula,Vatavyadhi
11.	MCRU, Jamnagar	Vibhapur	724	39	Mukharoga,Pravahika, Pratisyaya,Katisula, Vrana
12.	IIP, Cheruthu- ruthy	Kurumala	2240	1653	Kasa,Katisula,Pandu, Tvakroga
Total			31031	13257	

*Includes patients attended for treatment from neighboring villages.

Annexure-II

*Statement of work carried out during 1989-90 under
Community Health Care Research Programme*

S. No.	Name of the Instt.\ Center\ Unit	Name of the Villages covered	Popu- lation	*No. of patients treated	Common Diseases
1	2	3	4	5	6
1.	CRI, Bhubneshwar	Ganga Patna Bhagbanpur	1500	459	Katisula,Tvakroga, Sandhisula,Netraroga
2.	CRIA, Bombay	Kannanwar Nagar	266	266	Sandhisula,Pandu, Amlapitta,Pratisyaya
3.	RRI, Calcutta	Kada	2639	3578	Amlapitta,Krimi, Swasa,Kasa,Jwara, Kandu,Pandu

1	2	3	4	5	6
4	RRI, Junagadh	Bamangama, Sargavada	2481	282	Jvara,Kasa,Pratisyaya,Pandu,Vatavyadhi,Udarasula, Tvakroga
5.	RRC, Itanagar	Jullyvasti	-	207	Pama,Atisara,Pidika, Kasa,Grahani,Vatavyadhi
6.	RRC, Bangalore	Kothnur	398	709	Amlapitta,Krimi,Swas Kasa,Jvara,Kandu, Pandu
7.	RRC, Nagpur	Suradevi, Bodhalagonhi Ranala,Wela Shamkarpur, Khapri, Telhara	6024	533	Pratisyaya,Kasa, Atisara,Katisula, Amvata,Vrana
8.	RRC, Mandi	Tandu	266	266	Krimi,Kasa, Pratisyaya, Tvakroga
9.	RRC, Gangtok	AhoNamli	800	102	Atisara,Kasa, Kandu,Pratisyaya
10.	A.U., Tarikhet	Thapal,Rinchi Harsaun, Tarikhet, Mona,Chanderkot, Bagdwar,Patauri, Binakot,Nagardauo Simoli,Naught, Chillianula, Mohanari,Sinaura, Rectha,Chyuni, Kalakhet,Kumeri- China,Shyuni, Gumta,Matela, Charar	1624	1424	Kasa, Krimi, Vatavyadhi Jvara,Udaragora
11.	RRC,Hastinapur	Jhunjhuni	3600	957	Atisar,Kasa,Kandu Pratisyaya,Udarsula, Vatavyadhi.
12.	IIP,Cheruthuruthy	Kandazhi	NA	557	Kasa,Pandu,Pardara, Tavakroga,Udarsula, Vatavyadhi.
Total			19598	9340	

*Includes patients attended for treatment from neighboring villages.

*Statement of work carried out during 1990-91
under Tribal Health Care Research Programme*

S. No.	Name of the Unit	Name of the tribal pockets covered	Population	*No. of patients treated	Common Diseases
1.	Jamune (Palamau)	Bahkahara, Gasedag Jamunc, Chiyarki, Barka-gaon, Kaudiya, Jhabar, Pokhrraha-Kalan, Chukru, Sua, Kundelwa	18,138	8242	Tvak Roga, Jvara, Pradara, Pandu, Medoroga, Katisula, Visamjvara, krimi Kasa
2.	Car-Nicobar	Mus Kinmai, Small-Iepathy Tapoiming, Chukchucha Kinyuka, Tamaloo, Perka Malacca, Kakana, Kimios Anng, Sawai, Iectop	19,146	4056	Kasa, Swasa, Krimi, jvara, Amlapitta, Tvlakroga, Katisula
3.	Imphal	New Lambuland, Chingmeirong, Ragailong, Ramgailong (Lai-manai) Cannan Veng, Doupaoveng, Zomi villa.	3,990	947	Atisara, Amlapitta, Kasa, Krimi, Kastha Vadhata, Rakta Vikara, Rakta Capa Swas, Yakrit-vikara
4.	Ziro	Chunilika, Nanchulia, Boppi	12,851	1464	Udara Roga, Kasa, Jvara, Atisara, Vata-vyadhi, Pratisyaya
5.	Jhabua	Gadwara	725	222	Agnimandhya, Amlapitta, Madatyaya etc.
6.	Jagdalpur	Dharmaur	667	913	Atisara, Kasa, Krimi, Amvata, Pratisyaya, Vrana, Tavk Roga.
7.	Chinchipada	Vavadi, Chidapada Nimadra, Tarapur	3727	1032	Jvara, Kasa, Kandu, Pandu, Pratisyaya, Guda Roga
Total		45	59,244	16,876	

*Includes patients attended for treatment from neighboring tribal pockets.

MEDICO-BOTANICAL SURVEY

The drugs (Dravyas) play a dominant role in the Indian Systems of Medicine. It is of paramount importance to explore the medicinal flora of the country and procure authentic drugs for research purposes as well as to meet the demand of growing pharmaceutical industry. The Ayurveda and Siddha Systems of Medicine have the demand of large number of herbal origin drugs, therefore the Council has launched a programme of Medico-ethno-botanical explorations in the different forest areas of the country. The 17 Ayurveda survey Units located at different parts of the country have undertaken this work to assess and identify the potential areas of their availability and to enrich the Ayurvedic pharmacopoeia.

The Survey programmes carried out by the Council for the estimation of Medico-botanical potential of the country extending from alpine Himalayan ranges to the coastal areas and also penetrating to the arid zones have been very useful. A number of special Medico-botanical survey programmes conducted in the forests of tribal areas of Andaman and Nicobar Islands, Arunachal Pradesh, Bastar, Godavari, Ladakh, Puri and Sikkim Himalayas have yielded quite useful results in identifying the potential of medicinal plants wealth of these regions.

Some Major Achievements of the Medico-Botanical Survey Programmes undertaken:

1. The Council has been able to collect, identify and supply the authentic/genuine drugs for its various research programmes, besides actually locating the zones where the required drugs are available.
2. The survey teams at various Institutes/Centres/Units have conducted qualitative and quantitative surveys of different forest areas to unearth hidden treasure of medico-botanical wealth of the country.
3. More than 340 forest areas in the different states have been surveyed. The Council has more than one lakh herbarium specimens in different regional herbaria and have 3000 different drugs samples belonging to animal, mineral and vegetable kingdom in the various regional museums of the country.
4. The Council has made a start to establish Central Medicinal Plants Herbarium and Museum at CRIA New Delhi. This shall be a unique centre to meet the demand of research workers and the pharmaceutical industry as a whole.
5. During the survey programmes a good collection of 3,500 folklore claims have been made by these teams and out of these a monograph on 2,700 claims have been prepared.

The Council has published eleven volumes of the quarterly Bulletin of Medico-ethno-botanical Research which contains several articles published on survey work conducted by the survey teams in different areas e.g. Pithoragarh Distt.(M.P.), Karimnagar Distt. (Andhra Pradesh), U.P.Siang Dist. (Arunachal Pradesh), Udhampur Forest Division (J & K), Rajpipla Forest Division (Gujarat), Lahul-spiti (Himachal Pradesh), Gwalior Forest Division (Madhya Pradesh), Tezpur (Assam), Garhwal Himalayas (U.P.), Subansiri Distt.(Assam), Gurez Valley (J.& K.), Udaipur Distt.(Rajasthan), North Arcot Distt.(Tamil Nadu), Santhal Pargana Distt. Dumka (Bihar), Rajgir (Bihar), Amravati Division (Maharashtra) etc.

Several articles on the important controversial drugs identification and new records have also been published from time to time.

Some monographs have also been published on the basis of survey work conducted e.g.

- A. Medico-botanical Exploration of Puri Distt.(Orissa)
- B. Observations on Medico-botany of Andaman Nicobar Islands
- C. Medico Botany of East and West Godavari (Andhra Pradesh)
- D. Medico-Botanical Explorations in Sikkim Himalayas
- E. Medico-Botanical Survey of Bastar Distt. (Madhya Pradesh)

Resume of Survey work done

The seventeen survey units of the Council are spread over 16 states located at Bangalore, Bhubneshwar, Calcutta, Gangtok, Gauhati, Gwalior, Itanagar, Jaipur, Jammu, Jhansi, Junagadh, Lucknow, Nagpur, Patna, Tarikhet, Trivandrum and Vijaywada and have carried out some of the following programmes during the year 1990-91.

The survey unit located at Bangalore (Karnataka) in the past has carried out survey work in Chikmangalur, Chamarajanagar, Bhadravati, Hunsur, Kollegal, Koppa, Coorg, Tumkur, Kolar, Shimoga and Sagar. During the current year Medico-Botany Monograph on Coorg Distt. was completed and submitted to the Council for publication. The work on the monographs on Botany of Kolar Distt. has also been completed. The Unit has also completed 85% work on the Medico-botanical survey monograph on Shimoga Distt. one survey tour was conducted in the Shimoga Distt. covering Jog surroundings, Hosanagar, Kodachadri ranges, Nagara fort, Agumbe surroundings etc. A total number of 82 plants belonging to 42 families 64 genera and 65 species were collected. Identification of 210 was done. The Unit has contributed 3 research papers and one review paper was published/communicated and 5 papers were sent to various seminars.

The survey unit located at Bhubneshwar (Orissa) has surveyed Phulbani and Koraput Distt. of Orissa in the past and the monograph on this district is under preparation. Information from various libraries was collected for this monograph and two maps, of this district were also procured. Some 3,000 old herbarium sheets and 1,200 mounted sheets were regularly looked after. Museum samples were also properly preserved.

The Survey unit located at Calcutta (West Bengal) has undertaken tour in the Birbhum Dist. and collected 340 plant species representing 250 genera and 80 families, besides this some local tours were also conducted for the collection of raw drug samples for supply purposes, 91.5 kg. of drugs were collected. Another 15 drugs samples were added to the Museum. Preparation of Monograph on Birbhum Distt. was initiated.

The survey unit located at Gangtok (Sikkim) has 4,794 specimens from the various areas of Sikkim, these were properly maintained. Another 500 plant specimens were mounted. General maintenance work was continued. The survey team of Gauhati (Assam) Unit has undertaken a 10 days survey tour programme in the Hojai and Dharamtol ranges of Nagaon division. Local drug collection tours of 19 days were also undertaken. The survey unit of Gwalior (Madhya Pradesh) has participated in a programme of survey in Govind Ghat, Ghangara, Valley of Flowers Badridham (Neelkanth Charam Paduk and Mana areas of UP prepared a list of 555 plants observed in the area which represent 86 families and 322 genera. About 51 kg. crude drug material was supplied from the stocks and another five drug samples were also supplied. Published/Submitted two research papers for BMEBR, compilation of information on the monograph of Jhabua continued.

The survey unit at Itanagar (Arunachal Pradesh) has undertaken local survey tour and collected 37 specimens, representing 21 families and 33 genera. Identification of 200 specimens and mounting of 83 plants was done. Another 81 plants were added to the Herbarium. Some herbarium sheets and drug samples were supplied to Chief Conservator of Forests Nagaland for some exhibition.

The survey unit located at Jaipur has in the past carried out detailed survey of Ajmer, Jaipur, Sirohi, Udaipur, Chittorgarh, Banswara, Bharatpur, Kota, Sawai Madiopur, Tonk, Karauli, Dholpur, Alwar, Baram, Jhalawar forest divisions of Rajasthan. Special Medico Botanical survey programmes in Madhya Pradesh (Panchamari, Amarkantak and Chitrakoot) and desert areas of Rajasthan covering Jodhpur, Barmer and Jaisalmer were carried out. Several useful articles based on the survey programmes have been published. A total number of 6398 specimens added to herbarium were regularly maintained. These specimens represent 137 families, 532 genera and 880 species. The Museum having 374 plant origin/raw drugs material was also maintained. During the reporting year one tour in the Jaipur and Ajmer forest division was undertaken. About 343 plants were accessioned, 380 plants were identified. Another 14 specimens were added to the Museum, 88 index/species cards were prepared eight raw drug samples were collected and supplied. Dr.K.V.Billore, R.O.(Bot.) participated and presented paper in the 2nd International Conference at Kunming (China).

The survey unit located at Jammu (J & K) has in the past carried out survey work in the important areas like Baramullah, Gulmarg, Khillanmarg, Rajouri, Sunderbani, Bhadarwah, Ramnagar, Drass, Kargil, Leh, Chumathang, Nubra, Zanskar, Jammu and Sind etc. and have collection of approx. 17,736 plant specimens and added 13,588 specimens in the herbarium. These specimens represent 160 families, 737 genera and 1810 species. These specimens were regularly maintained. About 171 kg. of crude drug material was collected for use in O.P.D. of this centre. The Survey unit at Jhansi (U.P.) has continued the maintenance & upkeep of the Herbarium specimens. About 1,000

specimens from the previous collections were mounted and added to herbarium. 42 kg. of drugs were supplied. Another 25 kg. of drug samples were also collected.

The Survey Unit located at Junagadh (Gujarat) has undertaken local survey tour programmes of 18 days, 44 species of plants collected. 119 specimens were mounted & 25 were incorporated in the Herbarium. Crude drug (dry) material weighing about 44.60 kg consisting of ten drugs were collected and supplied. Two research articles were submitted for publication. A monograph on medicinal plants of Kachchh was completed and submitted to the Council for publication.

The survey unit at Mandi (Himachal Pradesh) has in the past surveyed Kangra, Una, Hamirpur, Kulu, Churah, Mandi, Dalhousie, Shimla, Lahul and Spiti, Chamba, Pangi, Suket and Rajgarh forest divisions and 4,467 specimens added to the herbarium were maintained.

The survey unit located at Nagpur (Maharashtra) has surveyed Nagpur, Wardha, Bhandara, Gandia, Allapalli, West Melghat, Yawatmal, Pusad, Amravati, Akola, Akot & Buldhama forest divisions and a total number of 6,745 plant specimens collected from these areas were maintained and 2393 were added to the herbarium. Museum has 426 specimens which were also maintained, 696 index cards were prepared. During the current year one survey tour of 13 days duration in the East and West Melghat forest division was undertaken. 56 specimens were collected, 181 specimens were mounted, 24 were accessioned, 12 index cards were prepared. Two monographs on Western Melghat and Nagpur & Wardha forest divisions were compiled and submitted to the Council for publication.

The survey unit located at Patna (Bihar) has in the past undertaken survey work in Dumke, Shahbad, Champaran West and Central, Monghyr, Shahebganj, Giridh, Saranda, Porahat, Ranchi, Daltonganj, Gumla, Garwa, Koderma & Chitra South, forest divisions and total number of 15,725 plant specimens collected were maintained, 6643 specimens were mounted and 4377 were added to herbarium. 518 index cards were prepared.

The survey unit located at Tarikhet (U.P.) has in the past surveyed 3/4th important forest Divisions and their ranges in Garhwal & Kumaon including Tarai-Bhabar, Montane, Sub-montane & Alpine zones. Besides this in the U.P. plains, Social forestry Divisions of Doab was also covered. Tribal belts of Mirzapur was also surveyed and plant specimens collected represent 173 families, 1175 genera and 2565 species. Total number of 36,000 sheets were mounted and 25,000 added to Herbarium, these were maintained regularly. Museum has 936 drug samples (including 420 market samples) of plant origin, 26 of mineral origin and 12 of animal origin drugs which were also maintained. 23 different drug samples weighing approx. 3.5 quintal were collected for supply purposes. 31 research articles were published/submitted during the current year.

The survey unit located at Trivandrum (Kerala) has in the past surveyed and completes work in Munnar Division in Idukki district. Two more divisions namely Wyand and Nilambur are also nearing completion. A total number of 3319 specimens belonging to 907 species were collected and are being maintained. During the current year one survey tour of eight days was conducted in the

Kasaragod range of Wyand division. 60 species of plants belonging to 55 genera were collected. 230 specimens were incorporated in the herbarium. 287 plant specimens were mounted and 250 specimens were identified . 60 index cards were prepared. One research article was submitted for publication.

The survey unit at Vijayawada (Andhra Pradesh) has in the past surveyed Medak, Hyderabad, Kakinada, Karimnagar, Eluru,Guntur,Bhadrachalam (North & South), Vishakhapatnam, Narsipatnam,Nellore, Chittoor, (North and South), Cuddapah, Vizianagaram & Nalgonda forest divisions and a total number of 5,259 specimens were collected which represent 181 families, 646 genera and 1098 species. Mounting of 4,937 specimens was done and 4281 were maintained. During the current year Anantapur district was surveyed for 18 days. Eleven drug samples were also collected for supply purposes. Gomutra " Shilajit" was located about Madaksira forest range, Anantapur district. Wild "Senna" (Swaranapathi) was located in Anantapur district.

MUSK DEER BREEDING PROGRAMME

The Central Council for Research in Ayurveda and Siddha has one of its programme of breeding musk deer in captivity at Mehroori under Amalgamated Units, Tarikhet and trying to evolve methods for extraction of musk by artificial methods without harming the animal. The centre is also collecting data of different aspects of the life cycle, behaviour and nature of the musk deer.

During the reporting year maintenance of 25 animals of different age groups was continued. Close observations were taken on the behaviour, adaptability, feed and fodder, cereals, milk feed, water intake, postures, growth and development, delivery, birth of fawns, weaning off, diseases, wounds injuries etc. and their remedial measures. Some of the observations made are as follows:

Behaviour in the stockades : Every male musk deer, after the age of twelfth month, preferred an individual spacious enclosure. Adult females also want separate living. Males have aggressive behaviour.

Feed and Fodder : Musk deer are selective in eating and have been observed nibbling the tender leaves, shoots, and flowers of vegetables, Agricus and fern species. They always prefer grazing in early and late hours of the day. Milk feeding and boiled wheat feeding is also preferred by these animals.

Information about regeneration : In July 1990, two females named Shayama and Radha have delivered twins. The Shyama's female fawn died after 2 days and Mridula's male fawn died after 73 days. The cause of death was pneumonia disease.

Efforts are being made to obtain adjoining land for decongestion of the stockades and undertaking cultivation of plants which are eaten by the animal.

CULTIVATION OF MEDICINAL PLANTS

Five herbal gardens of the Council located at Pune (Maharashtra), Mangliawas (Rajasthan), Jhansi & Tarikhet (U.P.) and Itanagar (Arunachal Pradesh) has taken up a small scale experimental and semi large scale cultivation of a few important medicinal plants of Ayurveda and Siddha Systems of Medicine. About 400 important medicinal species are presently properly maintained in these different gardens and the plantation includes those of tropical, sub-tropical and temperate regions, besides exotic ones. The main aim of this programme is to study adaptability, growth, flowering, fruiting and also to assess the yield at different altitudinal levels and other ecological conditions etc., besides, providing quality drug material in adequate quantity for research and pharmaceutical purpose. These herbal gardens also work out suitable agro-chemical techniques for the successful cultivation and growth of scarcely distributed/rare/threatened medicinal species.

The Guggulu herbal farm in Mangliawas which is exclusively devoted to a large scale experimental cultivation of Guggulu has provided adequate information base to consider medicinal plants cultivation of this species on a large scale for the procurement of oleo-gum-resin and also conservation of this most important Ayurvedic medicinal plants which is at the verge of extinction.

Successful propagation of saffron (Kumkum), at Ranikhet, Chamma and other adjoining areas is noteworthy feature in view of its non-habitance to that region.

Jawaharlal Nehru Ayurvedic Medicinal Plants Garden and Herbarium, Pune has achieved rare distinction of its being recognised by WHO for imparting training to its fellows in the field of medicinal plants cultivation due to its being the only Institute in the country carrying out research in the field of cultivation of Ayurvedic medicinal plants and tissue culture studies as well as growing about 400 Ayurvedic medicinal plants species in its garden for demonstrative purpose.

A brief review of the cultivation programme carried out in each of the cultivation centres is provided hereunder:

Jawaharlal Nehru Ayurvedic Medicinal Plants Garden & Herbarium, Pune

The garden of the Institute has confined its cultivation activities and maintenance of its medicinal plants demonstration garden in about 10 acres out of the total of 19 acres of the land available for cultivation purpose.

The garden is maintaining about 400 species of medicinal, economic and ornamental importance which includes about 140 medicinal species mentioned in the Ayurvedic Formulary Part I. This entire plantation consist of annuals, bi-annuals and prennial growing at different places in the garden.

Under experimental cultivation programme, trials on cultivation of Vaca (*Acorus calamus* Linn.) in the soil & climatic conditions of Pune have been undertaken and the study is in progress. Seed germination of 13 medicinal species was also studied. These include Guggulu (*Commiphora wightii* (Arn.) Bhandari), Aamalaki (*Embllica officinalis* (Linn.) Gaertn.), Ishwari (*Aristolochia indica* Linn.), Bilva (*Aegle marmelos* Corr.), Paribhadra (*Erythrina varigata* Linn.), Latakaranja (*Caesalpinia bonduc* Roxb.), Bhallataka (*Semecarpus anacardium* Linn. f.), Chitiraka (*Plumbago zeylanica* Linn.), Khadira (*Acacia catechu* Willd.), Dhatura Krishna (*Datura fastuosa* Linn.), Sarpagandha (*Rauwolfia serpentina* Benth. ex Kurz.), Kapittha (*Feronia limonia* (Linn.) Swingle.), Haritaki (*Terminalia chebula* Retz.)

In addition to above, seventy more plants belonging to fourteen species were also planted in the garden viz Shrisha (*Albizia procera* (Roxb.) Benth), Gulmohar (*Delonix regia* Aat.), Parisha (*Thespesia populnea* Soland ex. Correa.), Mahagani (*Swietenia macrophylla*), Vata (*Ficus bengalensis* Linn.), Karanja (*Pongamia pinnata* (Linn.) Pierse.), Udumbara (*Ficus racemosa* Linn.), Putranjivaka (*Drypetes roxburghii* Coall.), Paribhadra (*Erythrina variegata* Linn.), Lakucha (*Artocarpus lacucha*), Madhuca (*Madhuca longifolia* (Koenig.) Machride), Saptaparna (*Alstonia scholaris* R.Br.), Chenduphal (*Parkia biglandulosa* W&A.) and Kalamb (*Myragyna parviflor* Korth.). Krishna Dhatura (*Datura fastuosa* Linn.) having deep violet flowers has also been newly introduced in the garden.

The Institute also meets partly the drug requisitions of the Council's different research institutes/Centres/Units and also PLIM Ghaziabad. During the reporting period the Garden has collected about 105 kg. (dry weight) crude drugs consisting of different drug parts belonging to about 8 species. The important among these are Madana (*Xeromphis spinosa* (Thunb) Keay), Bhallatak (*Semecarpus anacardium* Linn.), Latakaranja (*Caesalpinia bonduc* Roxb.), Bakuchi (*Psoralea corylifolia* Linn.) and Amalaki (*Embllica officinalis* Gaertn.). Besides this more than 20 quintals of fresh Kumari leaves (*Aloe barbedensis* Mill.), about 8 quintals of fresh roots of Ushira (*Vetiveria zizanioides* (Linn.) Nash.), a good quantity of Japakusum (*Hibiscus rosasinensis* Linn.) and Nirgundi (*Vitex negundo*) are also available in the garden.

The other activities of the Institute includes the initiative taken for popularisation/encouragement of the medicinal plants cultivation by supplying seeds/seedlings/plant material of medicinal plants to some research academic organisations and Government departments for establishment of medicinal plants garden and nurseries etc. and providing technical knowhow consultancy for undertaking plantation of medicinal plants in waist land and rural development programme.

The Institute has participated in National seminars and presented scientific papers in the field of cultivation, pharmacognosy and tissue culture.

The Institute has also received several visitors including some eminent scientists, teachers and students from Resesarch organisations, universities, colleges etc. from within the country and also from some foreign countries like USA and Australia.

Regional Research Centre, Jhansi.

The main objective of the Herbal Garden of RRC Jhansi is to give top priority to the cultivation of such medicinal plants which are of immense importance and utility in Ayurveda and Siddha Systems of Medicine. This entire cultivation programme is confined to about 15 acres of the land out of a total of 45 acres of the land presently under its possession. The cultivation both on large as well as experimental scale has been taken up besides representing a large medicinal plants plantation for demonstration purpose. Presently in the herbal garden has about 200 medicinal species growing and also properly maintained. This plantation also includes 45 medicinal species mentioned in Ayurvedic Formulary Part -I.

Some of the important plants which have been taken up on large and experimental scale cultivation are Yashtimadhu (*Glycyrrhiza glabra*), Rasna (*Pluchea lanceolata*), Sarpagandha (*Rauwolfia serpentina*), Bakuchi (*Psoralea corylifolia*), Prishnarni (*Uraria picta*), Satavari (*Asparagus racemosus*), Vacha (*Acorus calamus*) and Guggulu (*Commiphora wightii*).

The demonstration beds represents about 70 medicinal plants specie growing at different places in the garden. A few important species are Gunja (*Abrus precatorius*), Sahachar (*Barlaria prionitica*), Apamarga (*Achyranthes aspera*), Punarnava (*Boerhavia diffusa*), Shankhapushpi (*Convolvulus pluricaulis*), Salparni (*Desmodium gangeticum*), Aswagandha (*Withania somnifera*), Chitrak (*Plumbago zeylanica*), Pippali (*Piper longum*), Nirgundi (*Vitex negundo*), Sariva (*Hemidesmus indicus*), Bala (*Sida cordifolia*), Brihati (*Solanum indicum*), Sahadevi (*Vernonia cinerea*), Kantakari (*Solanum xanthocarpum*), Sadabahar (*Vinca rosea*), Ushir (*Vetiveria zizanioides*), Dhatki (*Woodfordia fruticosa*), Trivirt (*Operculina turpethum*).

A total of 194 species of important medicinal plants are also being maintained in polythene bags and cement pots in the Green House and regular observations are made for their adoptability and growth behaviour etc. These species are also available for demonstration purpose under Pot Cultivation Programme. The garden has also taken up cultivation of a few important medicinal plants species belonging to different climatic and geographical areas on experimental scale for studying their adoptability under the climatic conditions of Jhansi. A few of these plants are Daruharidra (*Berberis aristata*), Jyotishmati (*Celastrus paniculatus*), Nagdamni (*Artimisia vulgaris*), Brahmi (*Bacopa monierri*) etc.

The garden's drug produce during the reporting period was about 220 kg consisting of different drug parts of about 35 species for supply to Council's different Institutes /Centres/ Units etc. It has also produced about 59 quintals of Kumari (*Aloe barbadensis*) and earned a revenue of Rs. 7066/-

Amalgamated Unit, Tarikhet

This Centre has continued its cultivation programme both at Ranikhet and Chamma with the main objective to study the possibilities of cultivation of important medicinal plants drawn from wild sources and belonging to different geographical/ altitudinal and climatic conditions, by studing their adoptability and growth behaviour etc. in the climatic conditions of Ranikhet and Chamma. The entire cultivation project of Ranikhet is carried out on about 2.5 acres of the land out of a total

of 7.8 acres of the land available for the purpose. This includes about 1.5 acres of the land which is exclusively confined to Saffron Experimental Cultivation Project. At Chamma Garden, cultivation activities are carried out in about one acre of the land out of two acres land available for the purpose.

The medicinal plants garden at Ranikhet has about 200 medicinal plants species mostly of Ayurvedic importance and are properly maintained in 296 beds laid in the garden at different places. This plantation is mostly for demonstration purpose besides a few plants taken up for experimental trials. Some of the important species on experimentation include Ela (*Elettaria cardamomum*), Tvakpatra (*Cinnamomum tamala*), Bilva (*Aegle marmelos*), Tulasi (*Ocimum sanctum*), Nimba (*Azadirachta indica*), Saptaparna (*Alstonia scholaris*), Haritaki (*Terminalia chebula*), Arjuna (*Terminalia arjuna*), Amlaki (*Embelica officinalis*), Syonak (*Oroxylum indicum*) and Aragvadha (*Casia fistula*). Most of these species have shown satisfactory growth and regular observations are being made. Some of the other important species earlier taken up on experimental cultivation programme have also shown satisfactory growth which includes Rudraksha (*Elaeocarpus genitrus*), Mandukparni (*Centella asiatica*), Pippali (*Piper longum*), Yashtimadhu (*Glycyrrhiza glabra*) and Tagara (*Valeriana wallichii*) etc. Pippali have shown good vegetative growth with the application of calcium while Tagara ave good vegetative and flowering growth with the application of urea.

During the reporting period about 120 medicinal plants consisting of 25 species brought from Haldwani - Dalkua which includes eight new species were planted in the garden and regular observations are being made with respect to its growth behaviour etc. About 2200 medicinal plants have also been transplanted in the garden during the rainy sesason comprising of Tagara, Pashanbheda, Mandukparni, Safed Musali and Sati etc. The exotic plants species successfully introduced in the garden are *Artemisia annua*, *Digitalis purpurea*, *Digitalis tamala*, *Lallemantia royleane* and *Calendula officinalis*.

A total of 66 medicinal species of this entire plantation in the garden consist of medicinal plants included in the Ayurvedic Formulary Part -I.

Medicinal plants garden at Chamma has 45 species of medicinal plants of Ayurvedic importance growing in different beds and properly maintained. Some of the important species are Satavari, Pashanbhed, Tagar, Manjistha, Daruharidra, Kumkum and Talisa etc.

The Centre has supplied about 225 kg. of the drug material consisting of different drug parts of 3 medicinal species to the Council's different research projects during the reporting period.

Saffron Experimental Cultivation

Saffron Experimental Cultivation was continued on about 1.5 acres of the land and regular observations were carried out on growth, development and multiplication etc. of the saffron corms. At present a total of about 4 lakhs corms of large, medium and small sizes are properly maintained in different beds of the garden.

The different results so far undertaken have indicated that application of N.P.K. in doses of one gm and 2gm per sq.ft proved effective in increasing the number of flowers to 40 percent and 20

percent respectively as compared to the control. Propagation of saffron through corms cuttings by the application of veradix - I, (root promoting hormone) has shown germination in 80 percent corms besides, showing a good vegetative growth also.

The application of agromin in dose of 0.4 gm. per sq.m. also proved effective in increasing the number of flowers by 8 percent as compared to control.

The flowering season lasted for a period of one month which started from 1st week of October to 1st week of November, 1990. During the flowering period a total of 3037 flowers weighing 1109gm (fresh) were collected yielding 21 gm of saffron consisting of dry stigma and little part of style.

Experimental cultivation of saffron has also been taken up in Hour garden at Chamma and about 300 bulbs of different sizes are growing and properly maintained. Its growth behaviour has indicated its successful adoption in this area.

Guggulu Herbal Farm, Mangliawas (Rajasthan)

The main activity of Guggulu Herbal Farm Mangliawas is the conservation, cultivation and propagation of the plant on large scale and observing its growth behaviour under different experimental conditions. The entire Guggulu plantation is presently being carried out in about 40 acres of the land out of about 140 acres available with the garden for cultivation purpose. The farm is grouped into 20 blocks based on topographical characteristics. At present 13736 number of total Guggulu plants are growing on mass experimental scale in different blocks and all possible attempts were made for their proper maintenance. The remaining portion of the land is covered with natural vegetation of Guggulu plants besides about 56 important medicinal plants species mostly of Arid Zone region.

During the month of June, 1990 a total of 6254 cuttings of Guggulu plants were introduced in the Farm for experimental studies and observations for their growth behaviour etc. were made at different growth stages. Besides this, cuttings of Kundru (*Boswellia serrata*), Amlaki (*Emblica officinalis*) and Kumari (*Aloe vera*), have also been introduced in the garden.

Some of the other important plants growing in the garden are Satavari (*Asparagus racemosus*), Sarpunkha (*Tephrosia purpurea*), Langali (*Gloriosa superba*), Babul (*Acacia nilotica*), Goksuru (*Tribulus terrestris*), Alarka (*Calotropis procera*), Dadima (*Punica granatum*), Guduchi (*Tinospora cordifolia*), Punarnava (*Boerhaavia diffusa*), Sirish (*Albizia lebeck*), Salmali (*Bombax ceiba*), Erand (*Ricinus communis*), Bilva (*Aegle marmelos*), Vanapalandu (*Urginia indica*), Sadabahar (*Vinca rosea*), and Nimba (*Azadirachta indica*). The entire plantation includes about 26 medicinal species mentioned in Ayurvedic Formulary Part -I.

A number of important and interesting observations have been reported on certain experimental studies undertaken. Vegetative propagation through cuttings have shown much faster growth on Guggulu plants than those raised from the seeds. The germination by Guggulu seeds have been reported to be very poor. The best period for the plantation of Guggulu cuttings and for the

transplantation of Guggulu plants has been observed to be the month of June and July/August respectively.

The germination of the seeds of *Caesalpinia bonduc*, *Ricinus communis* has been found satisfactory. Exotic species *Euphorbia anticephaletica*, *Tylophora asthamatica* and *Bersera hindersinna* have shown satisfactory vegetative growth.

Different control measures have also been taken by the garden to prevent termite and other insect attack and Bacterial/ fungal growth etc. on the Guggulu plantation.

The Centre has made collection of about 16 kg. of the Oleo-gum-resin (Guggulu) and 3 kg. of crude drug material belonging to two medicinal species besides making huge collection of seeds, fruits, roots cuttings of 8 medicinal plants for supply to different research projects etc.

Regional Research Centre, Itanagar

The cultivation activities of the herbal garden of the centre is confined to about 9 acres of the land out of a total area of about 17 acres available for the cultivation project. Presently a total of 119 medicinal plants species of Ayurvedic importance are growing in the garden and also properly maintained for demonstration purpose. 4 medicinal species has been undertaken on experimental trials and 7 species on mass scale cultivation. The entire plantation also includes about 66 species mentioned in the Ayurvedic Formulary Part -I.

Some of the important medicinal plants represented in the garden are Ashwagandha (*Withania somnifera*), Bakuchi (*Psoralea corylifolia*), Sarpagandha (*Rauvolfia serpentina*), Nagkesara (*Mesua ferrea*), Bilva (*Aegle marmelos*), Rudraksha (*Etaeocarpus ganitrus*), Japa (*Hibiscus rosasiensis*), Bhringraja (*Eclipta alba*), Amalaki (*Emblica officinalis*), Vacha (*Acorus calamus*), Kakamachi (*Solanum nigrum*), Guduchi (*Tinospora cordifolia*), Sahadevi (*Vernonia cinerea*), Banapsha (*Viola odorata*), Nirgundi (*Vitex negundo*), Latakasturi (*Hibiscus abelmoschus*), Chitrak (*Plumbago zeylanica*), Satavari (*Asparagus racemosus*), Aragvadha (*Cassia fistula*), Nimba (*Azadirachta indica*), Saptaparna (*Alstonia scholaris*), Kumari (*Aloe barbedensis*), Vasa (*Adhatoda vasica*), Ashthisrinkhala (*Cissus quadrangularis*), Bhringraja (*Eclipta alba*), Tulasi (*Ocimum sanctum*), Tvaktakra (*Cinnamomum tamala*), Tvak (*Cinnamomum zeylanicum*), Mahabala (*Sida rhombifolia*), Durva (*Cynodon dactylon*), Atibala (*Abutilon indicum*), Daruharidra (*Berberis aristata*), Gunja (*Abrus precatorius*) and Kapikachu (*Mucuna pruriens*). A total of 45 species have also been introduced in the garden on small experimental level for studying their adoptability, growth behaviour.

A total of 69 kg. of the crude drug material consisting of 13 medicinal species have been collected from the garden and supplied about 61 kg. of the material consisting of five species to the OPD of the Centre and PLIM Ghaziabad.

PHARMACOGNOSY RESEARCH STUDIES

Proper identification and evaluation of the authenticity, genuineness of the crude drugs, utilizing different methods/aspects of approach are the prime requisites in the initiation and carrying out the Drug Research Programmes. Pharmacognostical studies play an important role in the entire gemut of drug research studies taken up by the Council. Different Pharmacognosy research Unit functioning at Calcutta, Delhi, Lucknow, Jammu and Pune have taken up the Pharmacognostical investigations on the following drugs widely used in Ayurveda:

1. Draksha (*Vitis vinifera* Linn.)
2. Mulaka (*Raphanus sativus* Linn.)
3. Brahmi (*Bacopa monnieri* Linn.) Pennell - Whole plant
4. Sigru (*Moringa oleifera*)-Fruit, Bark
5. Parusaka (*Grewia asiatica* Linn.) - Leaf, stem, bark, fruit
6. Mandukparni (*Centella asiatica* Linn.) Urban - Leaf
7. Yashtimadhu (*Glycyrrhiza glabra* Linn.) - Root, Rhizome
8. Amalvetasa (*Garcinia pedunculata* Roxb.) - Leaf
9. Aralu (*Ailanthus excelsa* Roxb.)- Stem bark
10. Erand (*Ricinus communis* Linn.)- Root.
11. Haridru (*Adina cordifolia* Roxb. Benth. & Hook.f.)

The Pharmacognostical investigations covered elaboration of details in respect of their origin, botanical identification and correct determination of Ayurvedic nomenclature including synonyms together with properties, botanical description and key characters. This comprehensive task includes study of different facets, viz., morphology of crude drugs including the sensory characters, cell and tissue structures both qualitative and quantitative, cell contents, preliminary phytochemical analysis, chromatographic studies, identification of the chemical constituents like alkaloids, steroids and terpenoids, phenols, tannins, saponins, flavonoids, protiens etc., fluorescence analysis, physical constant values including ash and extractive values, dry matters and moisture contents etc. The analytical studies of the powdered drug which is considered to be of immense help in detection of adulterants was also carried out.

These studies find useful place in evolving the Pharmacopoeial standards for single drugs besides helping in overcoming the controversy and confusion that exists regarding their proper identity/authenticity due to synonyms, and use of one and the same name for more than one drug, also for identifying the substitutes and adulterants.

PLANT TISSUE CULTURE

The Council established a Plant Tissue Culture Laboratory at JNAMPG & H, Pune, which started functioning from January, 1990. The main objectives of this laboratory is the propagation and multiplication of rare, endangered and important Ayurvedic Medicinal taxa, maintenance and improvement of the quality of crude drugs of plant origin and development of a germplasm bank of medicinal plants.

The Tissue Culture studies initiated during previous years, on five important national plants viz. Kutaja (*Holarrhena antidysenterica* Wall.), Satavari (*Asparagus racemosus*, Willd), Langali (*Gloriosa superba* Linn.), Meshashringi (*Gymnema sylvestre* R. Br.) and Guggulu (*Commiphora wightii* Arn. Bhandari) were continued and a good amount of response/success was observed in respect of Kutaja, Satavari, Meshashringi and Langali.

In respect of the drug Kutaja, different parts, viz., root, stem and leaves of seedlings obtained in aseptic conditions were tried for raising the callus on MSB medium supplemented with different concentrations of various growth regulators.

The combination of IAA (moderate conc.) + Kn. (Lower conc.) was found to be most favourable for callusing in stem & root pieces. But for callusing in leaf segments 2,4-D (low conc.) + Kn (low conc.) gave the best results.

It was also found possible to get shoot regeneration from nodal segments of stem on MSB medium supplemented with low concentration of both IAA & Kn. The rooting to these regenerated shoots was achieved after transferring them to high auxin containing medium. Plantlets, thus developed, were subjected to hardening before transferring them to the soil. Survival rate was found to be 75 percent.

It is worth mentioning that this is the first report related to successful in vitro propagation of Kutaja.

In case of Satavari, studies related to shoot tip culture and initiation of callus from stem segments were tried on MSB medium supplemented with different concentrations of a few cytokinins & growth regulators. BAP in lower concentration gave multiple shooting response from the shoot tip whereas Kn + 2,4-D in low concentration were found favourable for callusing in stem segments. Shoots were differentiated from callus on medium containing low concentration of BAP. Rooting in these newly regenerated shoots was found possible on the medium containing low concentration of auxins. Rooted shoots when transferred to hormone free medium, developed into full plantlets within a month. Further studies are in progress.

The significant achievement made during the studies on the plant Langali is multiple rhizomes obtained from rhizome segments or MSB medium supplemented with lower concentration of IAA & Kn. Further studies are in progress. These multiple rhizomes may prove to be of great help in faster multiplication of this threatened medicinal taxa of much commercial importance.

Various parts of the drug Meshashringi viz., leaf, stem & root of the seedlings grown in aseptic conditions were tried for culture on MSB medium supplemented with different growth regulators in varying concentrations. The growth regulators were used singly as well as in combination. 2,4-D & Kn in moderate concentration were found to be favourable for the growth and maintenance of callus. Shoot tip culture tried on MSB medium supplemented with a few growth regulators has so far not given promising results.

CHEMICAL RESEARCH PROGRAMME

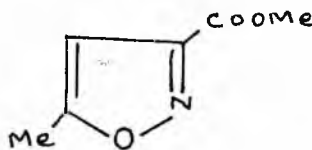
Chemical studies of plant drugs have an important role in the development of drug research. These studies comprise of isolation of active principle(s) and ingredient(s) responsible for their medicinal value. The Council is engaged in such studies through Phytochemical Research Units located at Calcutta, Delhi, Hyderabad, Lucknow, Varanasi, Trivandrum and Madras. A brief resume of the work carried out is reported as under:-

1. Agnimantha (*Premna integrifolia* Linn.)

ChRUC

Stem and leaves of the plant were extracted with alcohol and concentrated. The crude residue was fractionated with solvent ether and methylene chloride. Both fractions after chromatographic separation, yielded a crystalline product m.p. 85-86°, M^+ 141, M.F. $C_6H_7O_3N$. The structure of this compound was suggested as 3-carbomethoxy-5-methyl isoxazole (Premnazole), a new isoxazole alkaloid (Fig.1) considering all the spectral data. Incidentally, this happens to be the first report of isolation of an isoxazole alkaloid in the *Verbenaceae*.

Premnazole has been found to inhibit cotton pellet induced granuloma formation significantly.



2. Amlavetasa (*Garcinia pedunculata* Roxb.)

CRID

Ethyl acetate extract of fruits on repeated column chromatography over silica gel yielded a white crystalline compound, m.p. 240-40°C. Its structural characterisation is in hand. Ethanol (90%) extract of the leaves was also prepared.

3. Amlika (*Tamarindus indica* Linn.)

ChRUH

Methanolic extract of the fruits gave positive colour test for acids, carbohydrates, phenols and terpenoids.

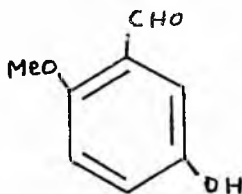
This extract is ready for dispatch to Pharmacology Unit for screening.

4. Ananta, Sariva (*Hemidesmus indicus* R.Br)

ChRUC

Two phenolics-HI/7 and HI/8 were isolated from this plant. Structure elucidation of HI/7 is in

progress while the HI/8, m.p. 110-11° was identified as 3-hydroxy-6-methoxy benzaldehyde (Fig.2).



5. Ashvashakota [*Glycosmis pentaphylla* (Ret. Correa)]

ChRUC

Ethyl acetate extract (neutral part) of the plant on the concentration afforded four compounds viz. GP-1, GP-2, GP-3 & GP-4. Structure of GP-1 had been reported earlier. Structure elucidation of the other compounds i.e. GP-2, m.p. 156-8°, GP-3, m.p. 130-32°, GP-4, M.P. 148-50°, is in progress.

6. Bhunimba, Kalmegha (*Andrographis paniculata* Nees)

ChREL

Alcoholic extract (50%) and its fractionation along with literature survey of the above mentioned plant was completed.

Clinical trial of the alcoholic extract of *A. paniculata* was done on the patients of diarrhoea. Results were very exciting and encouraging.

7. Bhurjapatra (*Betula utilis* D. Don)

CRID

On repeated column chromatography, ethyl acetate extract yielded a yellow solid, m.p. 230°C, which answered tests for flavonoids.

8. Candana (*Sanatatum album* Linn.)

ChREL

Ethanol extract of the drug was sent for anti-malarial activity.

9. Gambhari (*Gmelina arborea* Linn.)

ChRUC

Concentrated ether fraction of the stem and leaves of the plant, on chromatography afforded a crystalline product, premnazole (Fig.1) m.p. 85-86°. Its structure was established on the basis of various spectral data i.e. UV, IR, ¹H NMR, ¹³C NMR and Mass.

Premnazole has been found to inhibit cotton pellet induced granuloma formation significantly.

10. **Ghiwain** (*Elaeagnus latifolia* Linn.)

CSMDRIAM

Dried leaves(1.5 kg) of the plant were extracted with chloroform in the cold. The extract was chromatographed over silica gel. The separation of the compounds present is in progress.

11. **Jati** (*Jasminum grandiflorum* Linn.)

ChRUC

Whole plant was soxhleted with methanol. The concentrated methanolic extract was then fractionated successively with petroleum ether, ethyl acetate and chloroform. Gummy methanolic extract of the drug, upon chromatographic separation afforded two compounds. Further work is in progress.

12. **Jyotismati** (*Celastrus paniculatus* Willd.)

ChRUC

Petroleum-ether extract of the drug, on repeated column chromatography yielded a solid compound designated as CP-(II), m.p. 49-51°. Structure elucidation with the help of modern methodologies is in progress.

ChRUH

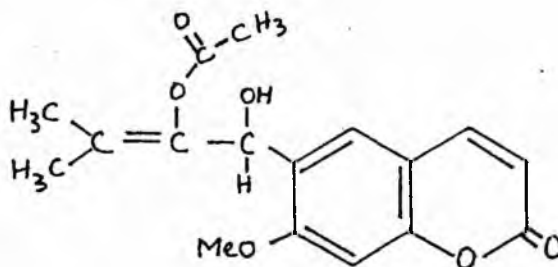
The analysis of the oil has not yielded any encouraging results. So, further work on this plant is discontinued.

13. **Karnasphutica** (*Boenninghausenia albiflora* Reich)

ChRUC

Hexane fraction of the drug, yielded a crystalline product, m.p. 178-80°. It was found to be a glycoside by some tests. Further work on the compound is in progress with the aid of various spectral & chemical techniques.

Chromatography of the benzene fraction of the methanol extract of the drug afforded, a novel coumarin derivative, albiflorin-I, (C₁₇H₁₈O₆), m.p.128° (Fig.3).



Further, elution of the column afforded a solid, m.p. 218-20° , which was identified as umbelliferone by m.m.p., Co-TLC, CO-IR with an authentic sample as well as with various spectral data. This is the first report of isolation of umbelliferone from this plant.

On successive elution of the column, a solid, m.p. 258-60° was isolated. Further work on elucidation of structure is under study by employing various spectral aids.

Methylene chloride fraction of methanolic extract of the drug afforded two solid compounds viz., BG(m)-10 (i), m.p. 250-52° and BG(M)-10 (ii) or albiflorin-3, m.p. 144-45° . Further work for identification of the compound is in hand.

14. **Kasamarda** (*Cassia occidentalis* Linn.)

RRIT

The air dried seeds of the plant were extracted with petroleum-ether, acetone and ethyl alcohol in succession. Sitosterol, amyrin and friedelin were isolated from the petroleum-ether extract. The alcoholic extract showed the presence of flavanoid compounds. Identification of the flavanoids is in progress.

ChRUC

Crude alcoholic extract(cold) of the roots of the drug was partitioned successively with petroleum-ether, benzene and ethyl acetate. The former fraction, upon chromatographic separation yielded four solids viz. PCO-I, PCO-II, PCO-III & PCO-IV. Further work is in progress.

15. **Kataka** (*Strychnos potatorum* Linn.)

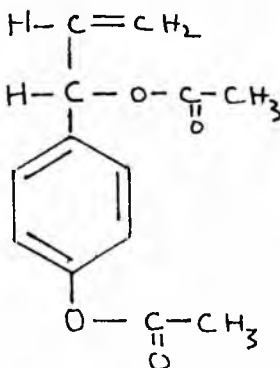
ChRUV

The dried seeds (800 gm approx.) were subjected to soxhlet extraction with pet.-ether(60-80°) and rectified spirit (20%). A solid obtained from the pet.-ether extract was column chromatographed. Further work is in progress.

16. **Kulanjan** (*Alpinia galanga* Willd.)

ChRUC

From the roots of the drug, an ulcerogenic compound, 1'-acetoxychavicol acetate(Fig.4), $C_{13}H_{14}O_4$ (M*234) was isolated. Its structure was elucidated with various spectral data.



17. **Mamsrohini** (*Soymida febrifuga* A.Juss.)

ChRUC

Alcoholic extract of the bark of the plant was concentrated and was partitioned in ether and ethyl acetate. The column chromatographic separation of the components is in progress.

18. **Mushkbala** (*Valeriana wallichii* DC.)

ChRUC

Ethanol extract of the roots of the plant, after concentration was fractionated with ether and ethyl acetate respectively. The later fraction, after concentration afforded a white amorphous powder, m.p. 257-60° designated as 'VW-1'. The different fractions are under examination.

19. **Nimba** (*Azadirachta indica* A.Juss.)

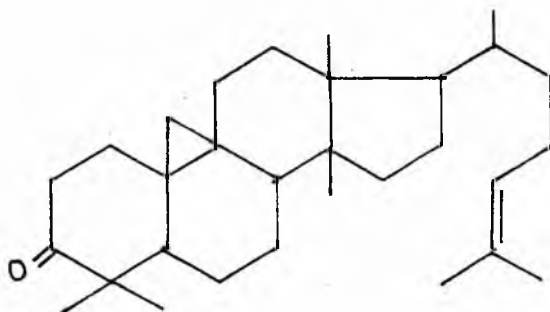
ChRUH

Petroleum-ether and chloroform extracts of the flowers of the Nimba, on column chromatography yielded a colourless compound, m.p. 136, which was identified as sitosterol on direct comparison with authentic sample.

20. **Panasa** (*Artocarpus heterophyllus* Lam. syn. *A.integrifolia* Linn.f.)

ChRUC

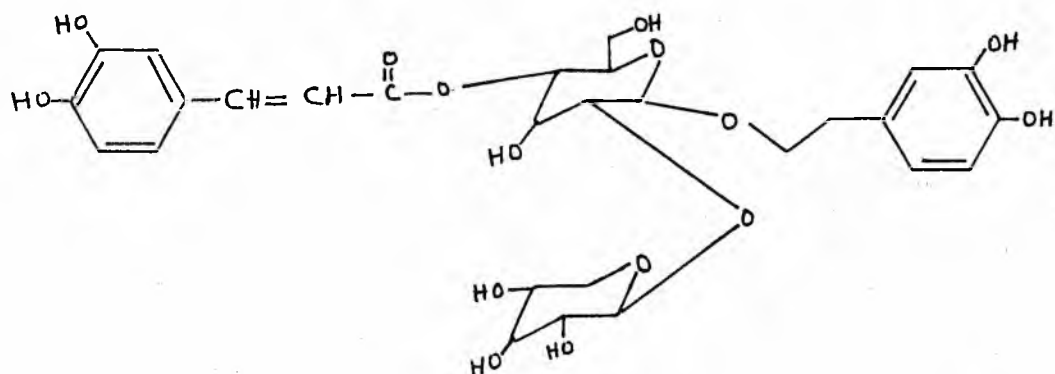
From the ethereal extract of the latex of the drug, cycloartenone (Fig.5), m.p. 92-96, a tetranortriterpenoid compound was isolated. For structure elucidation various spectral data were employed.



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

CSMDRIAM

Methanol extract of the seeds yielded a new phenylpropanoid glucoside, which on acetylation furnished a monoacetate, m.p. 75-77, C₄₆H₅₂O₂₄, m/e 983 (M⁺). Based on spectral data, the glucoside has been assigned the structure (Fig.6).



22. **Puga** (*Areca catechu* Linn.)

ChRUC

Neutral part of the drug furnished four compounds, AC-I, AC-II, AC-III & AC-IV. The structural characterisation of AC-I is in progress by using various spectral data i.e. UV, Mass, ¹HNMR and ¹³CNMR.

23. **Raktacandana** (*Pterocarpus santalinus* Linn. f)

ChREL

The ethanolic extract was sent for CVS activity. The extract was also sent again for anti-allergic activity.

24. **Sati** (*Hedychium spicatum* Ham-ex Smith.)

ChRUH

The petroleum-ether, chloroform, acetone and methanol extracts could not yielded any single compound in isolable quantity even after repeated triturations with different solvents. The quantity of these extracts was very less. Hence, further work on this plant is discontinued.

25. **Shrivati** (*Mussaenda frondosa* Var. *glabrata* Hook.f.)

RRIT

The air-dried leaves of the drug were extracted with ethyl alcohol(85%). The alcoholic extract was concentrated and the aqueous concentrate was extracted with benzene, ether and ethylacetate respectively. Triacontanol, amyirin and sitosterol were isolated from the benzene extract. The ether extract yielded quercetin. Systematic studies are being carried out on the ethyl acetate extract.

26. **Sigru** (*Moringa oleifera* lam.)

ChRUH

Petroleum-ether and benzene extracts of the stem bark indicated the presence of steroids. TLC examination indicated the presence of two compounds in these extracts. One compound was isolated by column chromatography and identified as sitosterol by comparing with authentic sample. Methanol extract gave positive test for glycosides and proanthocyanins.

Standardisation work on Sigru bark powder was done following I.P. and B.P. procedures. Percentages of these tests were reported. Fluorescence analysis of the petrol, benzene, chloroform and methanol extracts was also done under UV light. Fibre content was determined by Dutch process.

27. **Tarkari** (*Clerodendrum phlomidis* Linn.)

ChRUV

Dried powdered flowers of the plant were extracted in a soxhlet extractor successively with pet.-ether(60-80), chloroform and ethyl acetate. After removal of the solvents and concentration, these extracts were sent to Pharmacological Unit of the Council.

Ethyl acetate extract on column chromatography yielded three crystalline products viz, A, B & C. Compound A, m.p. 210°, M⁺(314) was characterised as pectolinarigenin (5,7-dihydroxy-4',6-dimethoxy flavone) on the basis of UV,IR, NMR and Mass spectra.

Structural elucidation of the compounds B and C alongwith the Pharmacological study of the Compound A is in progress.

28. **Tvakpatra, Tamala** (*Cinnamomum tamala* Nees & Eberm)

ChREL

Literature survey of the drug was completed. Ethanolic extract(50%) of C.tamala was sent to different departments for various biological activities i.e. anti-allergic, immunostimulant, antiviral, antiamebic, anti-diarrhoeal, anti-malarial and antidiabetic. The extract was also sent again for hypotensive activity.

29. **Vahisa** (*Momordica diocia* Roxb.)

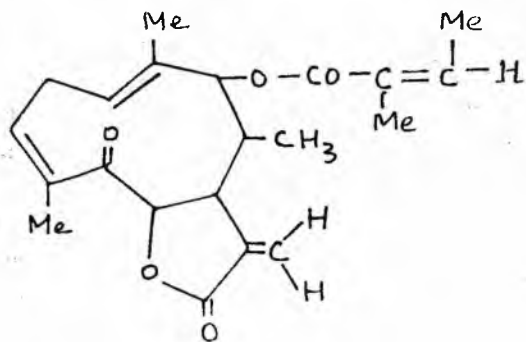
ChREL

Literature survey as well as ethanolic extract(50%) of the drug were completed.

30. **Vandhyavari** (*Vicoa indica* DC)

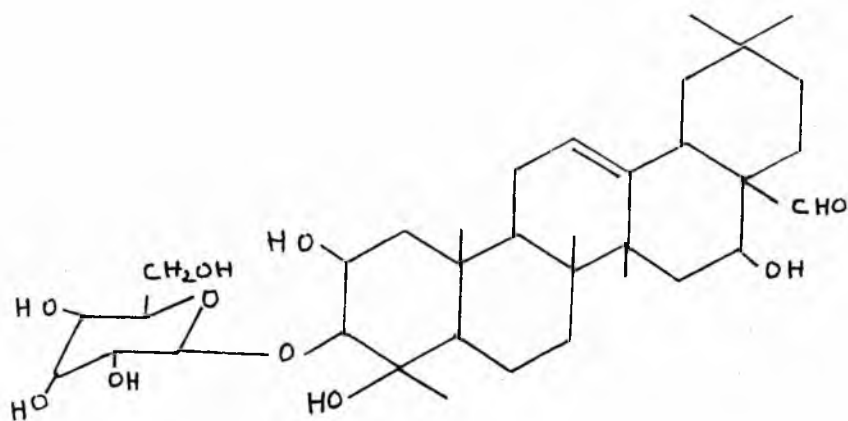
ChRUC

Petroleum ether extract of the dried plant material, on chromatographic separation over silica gel, afforded four compounds viz, V-i/1(m.p.230°), V-i/2 (m.p. 158-60°), V-i/3(m.p.75°) and V-i/4(m.p.208-10°). Of the four compounds V-i/1 was identified as a long chain fatty ester. Structure elucidation of V-i/2 and V-i/3 are in progress. From the tentative structure of V-i/4, it was found to be a new guaianolide (Fig.7) by considering MS(M⁺358) UV,IR,PMR,CMR etc.



CSMDRIAM

The alcoholic extract of the aerial parts of the plant (marc left after the chloroform extract) was partitioned into ethylacetate. The latter extractive on concentration and chromatography over silica gel yielded a new 28-nor-triterpenoid glucoside viz. Vicoside A. The structure of Vicoside A was formulated as 2 β , 3 β , 16 β , 23-tetrahydroxy-17 β -formyloxy-28-norolean-12-ene-3-O-B-D-glucopyranoside (Fig.8) by spectral studies and chemical conversions.



This is the first report of the naturally occurring triterpenoid with 17- β -formyloxy substituent and is an important intermediate in the biogenetic formation of 28-nor compound.

A new fat VI/145 from the same plant was also isolated. Acetonide and NaIO₄ oxidation was carried out on this compound and its structural elucidation is under way.

31. **Vriksamala (*Garcinia indica* Chois.)** **ChRUH**

A yellow compound m.p. 220° was isolated from repeated column chromatography. It was found to be a phenol by its UV spectra. NMR and Mass spectra of this compound could not be obtained. Hence, further work on this plant is discontinued.

32. ***Clerodendrum splendens*** **CRID**

Ethyl acetate extract of the leaves on repeated column chromatography over silica gel yielded a colourless crystalline compound, m.p. 189-90° C. Its structure elucidation is in progress.

33. **Extraction Supply** **ChRUH**

Different extracts of three plants were dispatched to Pharmacology Units for testing.

ChRUC

From the Extraction Supply Unit, substantial amount of extracts of different plant materials(12) used in the manufacture of coded drugs of the Council (Ayush-56 & Ayush-64) have been supplied to the RRI(Ay.), Calcutta at regular intervals.

CRID

During the period under review, 12 extracts of the 6 plants were prepared for supply to the Pharmacological Units.

RRIT

- | | |
|---|--------------------|
| (a) Quantity of neem oil worked out | 90.00 kg. |
| (b) Quantity of Nimbathiktam supplied to the Clinical/Pharmacology unit | 1.79 kg. |
| (c) Quantity of the plant materials extracted for the preparation of active fractions, principles, derivatives, ointment etc. | 3.50 kg. |
| (d) Quantity of active fractions, ointment/paste prepared/supplied to the Clinical Section/IIP, Cheruthuruthy | 800 gm + 6 liters. |

(i) Ayurvedic Finished Products

Systematic studies were carried out for the identification of amino acids and sugars present in two choornams.

(a) Samangadhi choornam

Glycine, alanine, arginine, aspartic acid and serine as amino acids alongwith glucose, fructose and sucrose as sugars were detected in the choornam.

(b) Musta choornam

Alanine, arginine, glutamic acid, lysine and valine as amino acids as well as glucose, fructose and sucrose as sugars were identified.

PHARMACOLOGICAL RESEARCH PROGRAMME

Pharmacological studies constitute a very vital part in Drug Research Programme. Pharmacological and Toxicological studies are based on experimental models in different species of animals. This provides necessary information vital for pursuing Clinical studies. These studies are carried out by various Pharmacological /Toxicological Research Units located at Delhi, Bombay, Calcutta, Lucknow, Patiala, Varanasi, Jaipur, Trivandrum and Cheruthuruthy. During the period under review 27 drugs (Single drugs, Coded drugs and Compound Formulations) were investigated by these units for routine pharmacological screening/specific effects such as, analgesic, anti-pyretic, anti-inflammatory, anti-histaminic, C.N.S. depressant, cardio vascular, hypoglycaemic, anti-ulcer and adaptogenic effects etc. Toxicological studies comprising of acute, sub-acute and chronic toxicity studies are also being pursued at Jhansi and Bombay exclusively and by other Pharmacological units elsewhere. A brief resume of the work carried out is reported below:

1. Adraka (*Zingiber officinale* Rosc.)

PhRUC

The petroleum-ether extract solubilised in propylene glycol and administered 1,2, and 4mg/kg, i.v. on anaesthetised cats, showed biphasic response in b.p. It partially blocked the effect of adrenaline on repetition of doses, the hypotensive nature was found diminished. There was temporary stoppage of respiration.

The chloroform extract solubilised in propylene glycol produced transient biphasic response in b.p. on anaesthetised cats, in doses of 1 and 2 mg/kg i.v. The result remained unaffected by prior administration of Ach, histamine and adrenaline.

The methanol extract produced transient hypotension with insignificant effect of respiration of anaesthetised cats, after intravenous administration. The nature of hypotensive effect is under investigation.

2. Agnimantha (*Premna integrifolia* Linn.)-Alcoholic ext.

PhRUC

The alcoholic extract exhibited significant anti-inflammatory property in doses ranging from 100 to 250 mg/kg, p.o. on acute models (carrageenin, dextran, propylene glycol, turpentine pleurisy, 5-HT and prostaglandin E₂) of inflammation on rats which was confirmed after repeated experiments. However, the extract produced significant anti-inflammatory property with 50mg/kg/days p.o. on subacute/chronic models (formaldehyde, adjuvant arthritis, granuloma pouch, cotton pellet granuloma) of inflammation in rats. The effect was repeated and confirmed.

The extract in 250 mg/kg administered orally once a day for 10 consecutive days in *T. cruzi* infected albino mice, since the day of inoculation, exhibited no antitrypanosomal property.

The oral administration of CNS emulsified extract in a dose of 500 mg/kg on groups of mice and studied for 24 hours, keeping untreated, milk of magnesia and dulcolax treated groups of mice as control, exhibited significant purgative property which was evidenced by increase in the number as well as mean weight of bolus.

3. *Arimeda (Acacia leucophloea Willd.)*

IIPC

Ethanol extract of the bark of the plant was used. In doses of 1mg/ml and 10 mg/ml this extract failed to elicit any anti-bacterial or antifungal activities.

4. *Arishta (Xanthium strumarium Linn.)*

PhRUV

The ethanolic (90%) extract of the leaves was used for the pharmacological studies. The extract showed significant anti-inflammatory activity by intraperitoneal route. In this case dose dependent effect was observed and their ED₅₀ values ranged from 25 to 125 mg/kg i.p. The extract was ineffective orally. The extract showed no analgesic activity by intraperitoneal and oral route when screened by rat tail method but by writhing method, extract showed significant response on subcutaneous administration. The extract was ineffective orally. The extract showed significant protection against aspirin induced gastric ulcer when administered by intraperitoneal as well as oral routes.

Acute toxicity studies were carried out by intraperitoneal and oral routes for the extract where anti-inflammatory ED₅₀ was calculated. The extract when given orally showed no toxicity upto the dose of 2g/kg.

5. *Bhurjapatra (Betula utilis D.Don)*

TRUJ

Benzene extract of stem bark was used for the Pharmacological studies. The drug did not produce any morbidity or mortality during a period of 24 hours. Hence, it could be inferred that the drug is safe upto a dose of 300 mg/kg by oral route in rats.

The animals were found to be normal in behaviour. Their reflexes were not affected. The stomach of rats receiving highest dose (30 mg/kg) on macroscopic examination showed perforation and petechial haemorrhages all over the stomach wall. There was no significant change in their body weight.

The drug was found to be devoid of any antimicrobial effect during the studies.

The drug in doses of 1,3,10,30,100 U and 1,3,10,30 mg were devoid of any significant effect on rats and amplitude of the perfused frog's heart. Whereas a dose of 100 mg showed significant depression which got reversed with the outflow of drug. 30 mg/kg dose produced Pathological changes in lung, liver and kidney.

6. **Chilahinta (*Cocculus hirsutus* (Linn.) Diels)**

PhRUV

The ethanolic (90%) extract of the root, stem and leaves of the plant was used. In the case of *C.hirsutus* Linn.(root) dose dependent effect was observed and ED₅₀ values ranged from 25 to 125 mg/kg i.p. However, the extract was active by oral route though less as compared to intraperitoneal route. The extracts showed no analgesic activity by intraperitoneal and oral route when screened by rat tail method but by writhing method, *C.hirsutus* Linn.(root) extract showed significant response on subcutaneous administration. The extracts were ineffective orally.

C.hirsutus Linn. (root) extract showed significant protection against aspirin induced gastric ulcers when administered by intraperitoneal as well as oral routes. The extract of the leaves showed significant protection by intraperitoneal route but were found to be ineffective by oral route.

Acute toxicity studies were carried out by intraperitoneal and oral routes for those extracts where anti-inflammatory ED₅₀ was calculated. The extracts when given orally showed no toxicity upto the dose of 2g/kg.

7. **Civet (*Gandhamarjara veerya*)**

IIPC

Anti-inflammatory activity was noticed in doses of 100, 200 and 400 mg/kg (in carrageenin induced paw oedema), 200, and 400 mg/kg (in formalin induced ascitis in rats). In doses of 200 and 400 mg/kg it also showed anti-convulsant activity (in SME shock). The percentage protection afforded by Gandhamarjara veerya in metrazol convulsion was 10%, 40% and 40% when administered in doses of 100, 200, & 400 mg/kg.

It failed to elicit hypothermic effect. In doses of 25 and 50 mg/kg. it failed to produce any analgesic activity. However, in higher doses (100, 200, and 400 mg/kg) it showed mild analgesic activity.

8. **Dhataki (*Woodfordia fruticosa* Kurz)-Alcoholic ext.**

PhRUC

The extract in 5 mg dose inhibited histamine induced contractions on guineapig ileum. The extract in 1,2,5, and 10 mg produced dose dependent relaxations against BaCl₂ induced spasm on rat ileum.

The extract, thus appeared to possess musculotropic antispasmodic properties.

The extract in 250 mg/kg. p.o.exhibited significant anti-inflammatory activity against carrageenin induced rat hind paw oedema. The extract in 150 mg/kg, p.o. also inhibited hind paw oedema of the propylene glycol treated rats.

The extract, thus appeared to possess anti-inflammatory effect. Further studies are in progress.

The extract in 250 mg/kg. p.o. dose for 10 consecutive days on *T.cruzi* infected mice exhibited no anti-trypanosomal activity.

9.(a) Hansprabha

CRIB

Acute-toxicity and Sub-acute toxicity studies of the drug were carried out in mice and rats by oral route. The doses used were 0.5 g/kg, 1 g/kg, 2 g/kg, and 4 g/kg. None of the animal in all the groups showed any untoward effect or toxicity symptoms. The LD₅₀ value of 'Hansprabha' in mice and rats by oral route is more than 4.0 g/kg. During Sub-acute toxicity studies the drug was administered orally in doses of 500 mg/kg and 1.0 g/kg in rats for a period of 4 weeks. No toxic manifestations were detected during these studies.

9.(b) Hansprabha

TRUJ

Aqueous suspension of the 'Hansprabha' was evaluated for its acute toxic effects and general behaviour by orally in rats in doses 10,30,100,1000,2000 and 3000 mg/kg. Hansprabha upto a dose of 100 mg/kg did not produce any toxic effect.

Sub-acute toxicity was observed on rats in doses 10,30,100 mg/kg. All the animals were found to be normal. The biochemical parameters were within the normal range.

10. Kakamaci (*Solanum nigrum* Linn.)

PhRUT

Aqueous and alcoholic extracts of whole plants were used for the study. Studies on Acute toxicity, effect on CNS, CVS and Urinary system are in progress. The drug exhibited significant diuretic effect in albino rats.

11. Kharjura (*Phoenix dactylifera* Linn.)

PhRUJ

The ethanol extract of fruits of the plants was once again tested in doses of 1 gm/kg, 3mg/kg and 10 gm/kg doses against castor oil induced diarrhoea in rats to confirm whether the fresh extract had similar results as was seen in the previous studies reported in the year 1989-90. But, it was found that none of the doses studied inhibited the diarrhoeal dropping produced by castor oil.

Further, the ethanol extract was also studied, using different does, on isolated rabbit's heart and isolated rabbit's ileum. Like earlier studies, there was no significant effect.

The effect of ethanol extract was studied on the general behaviour of rats. The extract did not modify the general behaviour of these animals.

12. Lalsabuni (*Trianthema portulacastrum* Linn.)

PhRUC

The alcoholic extract emulsified in CMC was administered in a dose of 250 mg/kg.p.o. for 10 consecutive days of *T.cruzi* infected albino mice and screened for 21 days. The extract exhibited no antitrypanosomal activity.

13. Madan (*Randia dumetorum* Linn.)

PhRUV

The ethanolic (90%) extract of the stem bark was used for the Pharmacological studies. The

extract showed significant anti-inflammatory activity by intraperitoneal route. It showed dose dependent effect and the ED₅₀ value ranged from 25 to 125 mg/kg i.p. The extract was ineffective orally.

The extract showed no analgesic activity by intraperitoneal and oral routes when screened by rat tail method. It was ineffective orally.

The extract was screened for ulcerogenic/anti-ulcerogenic activity by intraperitoneal and oral routes and showed no ulcerogenic activity.

Acute toxicity studies were carried out by intraperitoneal and oral routes for the extract where anti-inflammatory ED₅₀ was calculated. The extract when given orally showed no toxicity upto the dose of 2g/kg.

14. Marich (*Piper nigrum* Linn.)

PhRUT

Hypoglycaemic activity of the decoction of the fruits of the plant was assessed using fasting normal albino rabbits (1.5-2 kg). Test drug was given in doses of 1,2 & 5g/kg as decoction and to lbutamide (250 mg/kg) as the standard hypoglycaemic agent. Test drug decoction at 2 and 5 g/kg dose levels showed significant action, by reducing the blood sugar. At 2 g/kg. the effect was 70% of that of tolbutamide.

To evaluate the effect on gastric secretion and acidity, the test durg decoction was given to fasted albino rats (125-150 g) in dose levels of 1,2 & 5 g/kg orally. It was observed that the drug treatment reduced the gastric secretory volume and both free and total acidity. More effect was noticed at 1 g/kg dose level.

15. Medasaka (*Litsea glutinosa* (Lour) C.Robins)

PhRUV

The ethanolic (90%) extract of the stem bark was used for the Pharmacological studies. The extract showed significant anti-inflammatory activity by intraperitoneal route. It was ineffective orally.

The extract showed no analgesic activity by intraperitoneal and oral route when screened by rat-tail method & writhing method. The extract was ineffective orally.

The extract showed significant protection against aspirin induced gastric ulcer when administered by intraperitoneal as well as oral routes.

Acute toxicity studies were carried out by intraperitoneal and oral routes for the extract where anti-inflammatory ED₅₀ was calculated. The extract when given orally showed no toxicity upto the dose of 2g/kg.

Motha (*Cyperus rotundus* Linn.)
(Clinico-Pharmacological Studies)

PhRUL

Finely powdered tuberous roots has been used in the clinical trials of rheumatoid and osteo-arthritis since 1984 in different stages of clinical trial. In the present study, some cases who has been using the drug regularly for the last 5 years have been assessed and reported. The response was very good in majority of the cases and the patient preference was very high. Thus, considering all the experimental and clinical studies, there is ample base to use this drug in patients of rheumatoid and osteo-arthritis.

17. Musk(1) - Blackish variety (On reproductive cycle of rats)

PhRUC

Musk(1) was administered in 1 mg/day/animal p.o. on non virgin rats of 175-190 g/body/wt., for six cycles and were mated for proestrus phase, keeping untreated group of rats as control. 50% of musk treated rats showed positive loodrsis receptivity and pregnancy. Nursing attitude of mother was found normal.

18. Nagkesar (*Mesua ferrea* Linn.)

PhRUL

Petroleum-ether and ethyl acetate extracts (F_1 and F_2) of the flowers were used in this study. Both F_1 and F_2 fractions increase the swimming performance and anoxia tolerance in mice and the responses of graded doses appeared to be dose dependant. However, higher doses did not increase the response. Thus, both fractions (F_1 and F_2) appear to be staminator and increase the capacity of CNS cells to tolerate oxygen deficit more than normals. Thus, it has the same effect as Sanjeevani (*Selaginella bryopteris*).

19. Nilini (*Indigofera tinctoria* Linn.)

PhRUC

Ethyl acetate extract in 0.5 and 1 mg in 10 ml bath produced dose dependent relaxation against $BaCl_2$ induced contractions on isolated rat ileum, suggesting musculotropic antispasmodic effect.

Petroleum-ether extract in 1 and 5 mg in 10 ml bath produced no musculotropic antispasmodic effect against $BaCl_2$ on isolated rat ileum.

20. Nimbidine

TRUJ

Nimbidine in 2500 mg/kg and above doses was lethal to mice. Death occurred due to CNS stimulation which could not be protected even with diphenylhydantoin and pentobarbitone. The drug failed to influence the adrenaline induced hyperglycaemia in rabbits.

21. Parusaka (*Grewia asiatica* Linn.)

PhRUC

The ethyl acetate extract emulsified in CMC produced no effect by itself in 1 to 5 mg on isolated guineapig ileum, rat ileum and colon. The extract exhibited no antispasmodic property against Ach, histamine and $BaCl_2$.

The petrolcum-ether extract of the drug in 1,2,5 and 10 mg in 10 ml bath exhibited relaxation against Bac12 induced spasm on isolated rat ilcum, suggesting musculotropic antispasmodic effect.

22. **Patharchati, Sanjeevani** (*Selaginella bryopteris*)

PhRUL

Aqueous extract from the whole plant was extracted, dried and the residue dissolved in normal saline was used for the study by per oral route. Effect of the drug was studied on swimming performance test and anoxia tolerance test in mice. The drug in graded doses of 35, 52.5 and 70 mg/kg produced a significant increase in duration of swimming in all groups of mice. It also increase the anoxia tolerance in doses of 25,50 and 75 mg/kg in a dose dependant manner. Thus, this drug appears to be an adaptogen (anti-stress agent) which increases stamina and reduces oxygen consumption of brain cells and thus can be useful in diseases causing brain anoxia and unconsciousness.

23. **Peetcandana** [*Cosciniium fenestratum* (Gacrtn.) Colebr]

PhRUT

Aqueous extract (decoction) and ethanol extract of stem bark of the plant were used for the study.

The aqueous extract (decoction) was given orally in doses of 100, 500, 1000, 2000 and 5000 mg/kg to overnight fasted albino mice(15-25 g) and they were observed for any toxicity and mortality. Upto 5000 mg/kg, the decoction did not exhibit anytoxicity or mortality and LD₅₀ could not be determined due to difficulty in administering the drug beyond the above dose level.

To detect the CNS sedative effect of the decoction, the effect of the drug feeding on pentobarbitone induced sleeping time in mice was determined. Overnight fasted mice(20-25 g) were given the decoction orally in dose levels of 250, 500 & 1000 mg/kg (i.p.). In the present study, the test drug in all the three dose levels did not prolong the sleeping time in mice.

Ethanol extract was made partially soluble in tween 80 (2%) and used for the study. The extract was given orally in 100,200,400,500,1000,2000 and 4000 mg/kg (p.o.). In higher dose levels there was CNS excitement followed by depression leading to death. At 500 mg/kg there was 12.5% mortality and from 2000 mg and above there was 100% mortality. LD₅₀ is to be determined.

The ethanol extract at 100 mg/kg and above showed significant prolongation of sleeping time in mice indicating CNS sedative effect.

Ethanol extract in doses of 50, 100 and 200 mg/kg did not exhibit any antipyretic effect in albino rats.

Effect of ethanolic extract on gastric secretory volume and acidity is in progress.

On jejunum, the ethanol extract exhibited a dose dependant relaxation and at 100 ug/ml bath fluid, there was complete relaxation with inhibition of spontaneous movements.

The extract also partially inhibited the Ach induced spasm on both the preparations. The study is in progress.

24. *Pilu (Salvadora persica Linn.)*

PhRUV

The ethanolic (90%) extract of the leaves was used for the pharmacological studies. The extract showed significant anti-inflammatory activity by intraperitoneal route. It was found ineffective orally. The extract showed no analgesic activity by intraperitoneal and oral routes when screened by rat tail method but was ineffective orally. The extract was screened for ulcerogenic/anti-ulcerogenic activity by intraperitoneal and oral routes and showed no ulcerogenic activity. This extract showed significant protection by intraperitoneal route but were found to be ineffective by oral route.

Acute toxicity studies were carried out by intraperitoneal and oral routes for the extract where anti-inflammatory ED_{50} was calculated. The extract when given orally showed no toxicity upto the dose of 2g/kg.

25. *Pushpakvati*

TRUJ

Aqueous decoction and infusion of the 'Pushpakvati' were used. The drug was studied against maximal electroshock seizures in albino rats of both sexes weighing 100-150 gms. The doses given were 100,300, and 1000 mg/kg body weight. The drug failed to abolish the hind limb tonic extension in electrically induced convulsions where as standard drug abolished the same. So, the test drug is devoid of this activity in rats.

Analgesiometer with hot nichrome wire was used to investigate the analgesic activity of 'Pushpakvati' if any. The drug in the doses of 100,300, and 1000 mg/kg body weight, studied did not exhibit any analgesic activity.

The drug in the doses of 1,3,10,30,100,3000 μ , 1,3 and 10 mg alone and along with acetylcholine neither had any action of its own nor it modified the contractions induced by acetylcholine. Thus, the drug is devoid of any action on this tissue. The drug is devoid of antimicrobial property as tested by disc method.

26. *Sahadevi (Vernonia cinerea Less.)*

PhRUV

The ethanolic (90%) extract of the root, stem and leaves of the plant was used for the Pharmacological studies. The extracts showed significant anti-inflammatory activity by intraperitoneal route. The extracts showed dose dependent effect and their ED_{50} values ranged from 25 to 125 mg/kg i.p. The extracts were ineffective orally.

The extracts showed no analgesic activity by intraperitoneal and oral routes when screened by rat tail method but by writhing method, extracts showed significant response of subcutaneous administration. The extracts were ineffective orally.

The extracts were screened for ulcerogenic/anti-ulcerogenic activity by intraperitoneal and oral routes and they showed no ulcerogenic activity. The extracts were found to be ineffective by intraperitoneal route but showed significant response by oral route.

Acute toxicity studies were carried out by intraperitoneal and oral route for those extracts where anti-inflammatory ED_{50} was calculated. The LD_{50} was calculated by intraperitoneal route. The extracts when given orally showed no toxicity upto the dose of 2 g/kg.

27. **Sinsapa** (*Dalbergia sissoo* Roxb.)

PhRUJ

A 10% solution of the ethanol extract of leaves of the plant was tested against gonococci. The culture was found to be sterile i.e. it is devoid of any effect against gonococci.

PHARMACEUTICAL RESEARCH/ STANDARDISATION STUDIES

The Council has carried out studies evolving analytical standards on the formulations of I & II Part of Ayurvedic Formulary of India. The study assumes importance as the analytical data laid down are based on the textual formulations prepared in the Research project itself. This approach vouch safe for quality control on the formulations which are used in the Clinical Research studies and other medicare programmes undertaken by the Council.

Having regard to this the Council has undertaken Research Studies on single drugs that are entering as ingredient in the particular formulation, on process of manufacture like Asava, Arista, Bhasma, Taila etc., in addition to shelflife, role of preservatives. Standardisation studies non single drugs, method of manufacture, finished products, are undertaken by RRI, Trivandrum; A&U, Tarikhet; CSMDRIA, Madras; DSRP, Jamnagar while rapid analytical data laying studies were carried out at CSMDRIA, Madras; DSRP, Jamnagar and Varanasi and Standardisation studies on single drugs and finished products are undertaken at RRC, Bangalore.

As a second phase of study the Council has worked out a plan to lay down analytical values and to identify the presence or otherwise of main and other ingredients by preparing using different proportionate ingredients in different quantity or deleting some of them other than the standard and to lay down the analytical values. This new study has revealed some encouraging leads, and in time to come, this study may be able to identify only genuine, quality controlled formulations for clinical armamentariaim.

The details of the Standardisation Studies carried out during the year 1990-91 are as under:-

Single drugs

Physico-chemical values were laid down for the following single drugs:-

Kakamachi	<i>Solanum nigrum</i>	DSRUJ
Kulatha	<i>Dolichos bilflorus</i>	-do
Sahachara	<i>Barleria prionitis</i>	-do-
Agn imantha	<i>Clerodendrum serratum</i>	A&UT
Varuna	<i>Crataeva nurvala</i>	-do-
Vanya jiraka	<i>Centrantherum anthelminticum</i>	-do
Shailyaka	<i>Parmelia perlata</i>	-do-
Shringataka	<i>Tarapa bispinosa</i>	-do-
Punarnava	<i>Boerhaavia diffusa</i>	-do-

Datura	<i>Datura alba</i>	A&UT
Karkata shringi	<i>Pistacia integerima</i>	-do-
Talisa patra	<i>Taxus baccata</i>	-do-
Karpoora	<i>Cinnamomum camphora</i>	-do-
Kirata tikta	<i>Swertia chirata</i>	RRCB
Nagabala	<i>Sida spinosa</i>	-do-
Mandookaparni	<i>Centella asiatica</i>	-do-
Arjuna	<i>Terminalia arjuuna</i>	DSRPV
Vijaya sara	<i>Pterocarpus marsupium</i>	-do-
Malsyakshi	<i>Alternanthera sessiles</i>	-do-
Ashoka	<i>Saraca ashoka</i>	RRIT
	<i>Spondias mangifera</i>	-do-
Nimba	<i>Melia azadirachta</i>	-do-
Chitraka	<i>Plumbago zeylanica</i>	-do-
Tulsi	<i>Ocimum sanctum</i>	-do-
Gmbhari	<i>Gmelina arborea</i>	-do-
Avartaki	<i>Cassia accidentalis</i>	-do-
Lajjalu	<i>Mimosa pudica</i>	-do-
	<i>Mussaenda frondosa</i>	-do-
Krishna sariva	<i>Cryptolepis buchanani</i>	CSMDRIA
Trivrit	<i>Operculina turpethum</i>	-do-
Shyonaka	<i>Oroxylum indicum</i>	-do-
Vandhyavari	<i>Viccoa indica</i>	-do-

Method of Manufacture

Rasa	DSRPJ
Asava	A&UT, CSMDRIA

Rapid analytical values were laid down on Gojihvadi kvath.

Mutra virechaniya kvath	DSRPJ
Mutra sangrahana kvath	-do-
Stanya janaka kvatha	-do-
Krimikuthara rasa	-do-
Nirdrodaya rasa	-do-
Panchanana rasa	-do-
Vijra kapata rasa	-do-
Yakuti rasa	-do-
Dashamula kvatha churna	CSMDRIA
Dashmula taila	-do-

DETAILED STANDARDISATION STUDIES

Detailed standardisation studies carried out on

Lokanath Rasa	DSRPJ
Krimi kuthara rasa	-do-
Hemant rasa	-do-
Rajata bhasma	-do-
Svarna Makshika bhasma	-do-
Abhraka bhasma	A&UT
Kanakasava	-do-
Laxmivilasa rasa	-do-
Bhringaraja taila I,II,III,& IV	
Indukanta ghrita	RRCB
Amritotara kvathachurna	DSRPV
Ardhabilva kvatha churna	-do-
Darunagardi kvatha churna	-do-
Chaturjata churna	-do-
Pushyanuga churna	-do-
Nalpamaradi keram	RRIT
Samangadi churna	-do-
Vyoshadi guggulu	-do-
Kutajarista	-do-
Musta churna	-do-
Lodhrasava	-do-
Dashamularaista	CSMDRIA
Dashamula kvatha churna	-do-
Dashamula taila	-do-
Langali churna	-do-

MISCELLANEOUS STUDIES

CSMDRIA, Madras has also carried out Bio-chemical, Microbiological, Antifertility potential, anti inflammatory, antipyretic and anti tumor activity of *Viccoia indica* and *Nyctanthi arbrotristes*.

The Standardisation Research Project have also studied the effect of container on the content and on shelf life on certain of the formulations.

LITERARY RESEARCH PROGRAMME

Research has to be a continuous process because a new thing becomes old soon after its discovery and further new ground needs to be covered to keep one abreast of the developments. The Literary research programme fulfills this initial need of fast coming advancing frontwave of the ever expanding knowledge.

The literary and Medico-historical research programmes of the Council are being carried out at Indian Institute of History of Medicine, Hyderabad, Documentation and Publication Division, New Delhi, Literary Research Unit, Madras and Amchi Research Unit, Leh and Ladaakh. The programme included medico-historical studies, collection and compilation of references relating to drugs and diseases from classical treatise, lexicographic work and contemporary literature, publication of critical and rare books of Ayurveda and allied medical sciences. Survey of manuscripts from the oriental libraries of repute and collection of medico historical events from the archives and Museums is also being undertaken.

Indian Institute of History of Medicine

The Institute has completed translation of biography of 38 physicians of Hyderabad during Nizam dynasty. Information on a disease "Arsha" has been collected, the Hindi Journals from 1984-89 have been perused and published under the title "Selected Articles on Medical History from Hindi Journals". Collected Information from nine medical manuscripts of Qutab Shahi period. Completed the study on "History of Rasashstra" and prepared an articles.

A paper entitled "A study of Ilkhtiyarate-Qutab Shahi" was presented at National Seminar on "The Manuscripts of Hyderabad" held at Salarjung Museum, Hyderabad.

The articles contributed by the outsiders apart from our own staff, were edited and two issues of the Bulletin Vol.19 No.2, 1989 and Vol.20 No.1 1990 were brought out. The International Journals on History of Medicine were perused and important significant notes on medico-historical activities were called and published in the heading "Progress and Expansion of History of Medicine".

54 books have been acquired. International Journals on History of Medicine and Ayurveda and other systems were subscribed and acquired. Guidance, assistance and referral services were provided to the readers, scholars etc.

The museum & reprographic section with the facilities of plain paper copier helped several scholars and the research staff of the Institute and enriched the material of the Institute by taking copies of paper manuscripts, books and articles from journals etc.

Dr. Denton G.Cooley, world renowned cardiothorasic surgeon of Texas Heart Institute, Honston,Texas, U.S.A. visited the Institute during February'90 .

Documentation and Publication Division;New Delhi

Information on Abhrak, Agastaya, Akarkarabha, Anjana, Gandhak, Kankola, Kapittha, Klitaki, Ksirakakoli, Kusa, Meda, Rishbbhaka, Shilajatu have been collected from Brahattrayi, Laghuttrayi and other related texts of Ayurveda and allied sciences and periodicals.

The refrences on disease conditions namely Oajakshya (AIDS) and Andhatva (Blindness) have been collected.

Research articles published during the period 1971-85 has been taken up in three bibliographical series relating to clinical research, Drug Research and Literary Research. The 3rd phase (1981-85) of the 1st series has been completed and rest is nearing completion.

Various issues of the CCRAS quarterly Documentation Bulletin that provides digests of current research papers were processed for release and mailed to Instu./Centres/Units under the Council.

Current Ayurvedic information being published in press, news bulletin and Ayurvedic periodicals has been indexed. Regarding the Documentation of thesis of P.G. in Ayurveda about 100 abstracts were indexed in cards from the post graduate departments of Ayurveda, Calcutta & Puri and about 200 abstracts indexed from P.G.Institute, B.H.U.,Varanasi during the year.

Twenty eight queries of various nature have been attended besides providing xerox copies of research papers on demands of research workers for their research use.

172 books were acquired and three Ay. Manuscript on Netra parkash, Madhava Cikitsa and Caraka Samhita were located.

Steps have been in progress for microfilming of two rare Ayurvedic works i.e. Harmakhla part I & II and sushena vaidyak. Photographic coverage of Meetings/Conferences have been completed besides attending to slides preparation and xerox work to the tune of 28196 prints.

The printing section undertook printing work to the tune of 129450 impression besides carrying out duplication works (93960) and binding of 804 books.

Steps were taken up for the publication of respective issues of Council's Journals JRAS from July to Dec,1989 and Jan.,1990 to Dec.,90.

All the issues of BMEBR from Jan. to Dec., 1990 were released during the reporting period.

Seven monographs/books entitled "Medico-botanical Exploration of Puri Distt. Orissa", "Amchi Pharmaco-therapeutics" , "Medico-botanical Survey of Baster Distt.,(M.P)," "Medico Botany of

East and West Godavari Distt of Andhra Pradesh", "Phytochemical Investigations of Certain Medicinal Plants used in Ayurveda", "Sahasrayoga", "Shabdachandrika" were published during the reporting year.

Exhibitions of the Council's Publication were arranged by the publication wing on the eve of conferences/Seminars of National importance and Council's publications worth Rs.43,195.46 were sold.

Literary Research Unit, Madras

The Literary Research Unit is functioning at Dr. A. Lakshmipati Research Centre for Ayurveda, Madras. The work on Singal drugs of "Sarabhendra Vaidyaka Kosha" is continued regarding their Botanical identification, Synonyms along with their therapeutic uses etc. The editing work of Chikitsamrita sagara is still continuing along with the comparisons with other manuscripts and standard works related to this subject.

The following work is ready for Publication as reported by the Unit and Council has asked the Unit to provide the Photo copies of each of these manuscripts to finalise the matter for press copy.

1. Sata Sloki, 2. Netra Prakasika, 3. Rasa rajalakshmi, 4. Dhanvantari Vilasam, 5. Dhanvantari Saranidhi, 6. Nanavidhia vaidya Grantha, 7. Kumar tantram, 8. Netra roga nidanam and 9. Pathya Pathya Vibodhan.

In addition to this the Council has published a critical edition of "Astanga Samgraha" part Ist(A) and "Sahasrayoga" a sanskrit Hindi translation of a famous Malayalam chikitsa grantha and released.

Amchi Research Unit, Leh.

This unit has completed the printing work of the book entitled "Amchi Pharmacotherapeutics" and the same has been published by the Council. The Unit is also conducting the Survey tours in the local area of Himalaya for collection of several important medicinal plants and their identification along with the traditional uses in the common ailments prevalent in the area.

FAMILY WELFARE RESEARCH PROGRAMME

The programme have two main aspects ie Clinical trials and Chemico-Pharmacological studies including Toxicological studies. The Clinical trials of herbal, herbo-mineral formulations and single plant drugs are conducted in human volunteers for study of their anti-fertility potential. On the other hand Chemico-Pharmacological studies are designed for pyto-chemical fractionation of plant drugs and study of their anti-fertility potential, anti-implantation, anti-ovulatory and oestrogenic activity. The toxicological studies cover acute, sub-acute and chronic toxicity of drugs.

Clinical Studies

Clinical evaluation of five drugs and drug combinations have been taken up at the Institutes/ Units functioning at Ahemdabad, Bombay, Calcutta, Delhi, Jaipur, Lucknow, Patiala, Madras, Trivandrum and Varanasi. The details about the number of new cases included into the study during the reporting period, number of old cases carried forward from previous year, number of drop outs and number of cases continuing at the end of reporting period separately for each drug is annexed.

Chemico - Pharmacological studies

Chemico-Pharmacological studies were carried out at the Units functioning at Bhubaneshwar, Jamnagar, Trivandrum, Varanasi and Jhansi. The work carried out by these units is summarized hereunder:

1. Karvi Tori (*Luffa acutangula*)-Fruit

PhRUFB

The Aqueous extract was administered to pregnant albino rats in the dosages of 50,100,and 200 mg per Kg body weight orally. The efficacy regarding prevention of pregnancy was found to be 20,40 &50% respectively with the three dosages used.

The extract at a dose level of 50 mg/kg body weight orally had no significant effect on the epididymal sperm reserve and sperm maturation which were used as indices to study its effect on the male reproductive function. No toxic effects were observed upto 5000 ml per kg body weight during acute toxicity studies.

2. Newar patti(*Buddleia asiatica*)- Flower

PhRUFB

The aqueous extract of its flowers was administered orally in 50,100 &200 mg per kg body weight in pregnant albino rats to assess its anti-implantation effect. There was 30% regression with 50 mg/kg body weight dose while 60% regression was observed with the two higher dosages.

NO toxic symptoms were observed upto 5000 mg per kg body weight orally during acute

toxicity studies.

4. Kemuk (*Costus speciosus*)-Root & Tuber

PhRUFB

The aqueous extract of its root and tuber showed an anti-implantation effect of about 40% with 50 mg per kg body weight orally and 50% effectiveness with higher dosages i.e. 100 mg & 200 mg/kg in pregnant albino rats. During acute toxicity studies, no toxic manifestations were observed upto 5000mg per body weight.

4. Katha (*Acacia catechu*)-hard wood

PhRUFB

The aqueous extract of its bark showed 40,60% and 60% effect with 50 mg, 100 mg and 200 mg per kg body weight dosages respectively, when administered to pregnant albino rats.

The extract at a dose level of 50 mg per body weight orally had no significant effect on the epididymis sperm reserve and sperm maturation which were used as indices to study its effect on the male reproductive function. No adverse effect was observed upto 5000 mg per body weight on oral administration during acute toxicity studies.

5a. Nirgundi (*Vitex negundo*) leaves

PhRUFJ

The pet.ether and chloroform extracts of leaves were screened for their anti-fertility effect. Both the extracts were administered in the dose of 100 mg/kg body weight in pregnant albino rats. 33.33% pregnancy were noted in the group given chloroform extract while the administration of Pet.ether extract was discontinued on the 4th day due to its toxic effects.

5b. Nirgundi (*Vitex negundo*) (root part)

PhRUFV

The alcoholic extract of roots in dosage of 1,2 & 4gm/kg. was administered orally to pregnant Albino rats. The animals of treated groups were laparotomized to observe the position of the two horns of uteri to assess its anti-implantation effect. Thus 40 to 60% anti-fertility effect was observed with this extract:

Its antiovolatory effect has been reported earlier.

5c. Nirgundi (*Vitex altissima*) Bheda (leave)

PhRUFJ

The methanol extract of the leaves was administered orally in the dose of 100 mg per kg body weight to pregnant albino rats. 33.33% rats did not litter in the drug treated group as compared to control

6. *Stropilanthes heyneanus* - (Stem)

PhRUFJ

The methanol extract of stem was evaluated for its anti-fertility effect in pregnant albino rats. The extract was given in the dose of 200 mg per kg body weight orally. 33.33% of the animals did

not conceive. The methanolic extract was also screened for its effect on vaginal opening in immature mice and for uterotopic effect according to the method of Ramesh Wavarc(1990). The extract did not influence the Vaginal opening and also had no effect on uterine weight indicating lack of oestrogenic activity.

7. *Calotropis procera* - Flowers

PhRUFJ

Mixed colour flowers (Purple and white) were used in this study. The aqueous decoction was administered orally to pregnant albino rats in two dosages. The lower dosage (corresponding to 76.90 mg per kg body weight of the powdered drug) did not show any anti-fertility effect. However, the higher dosage (equivalent to 153.80 mg per kg body weight of the powdered drug) prevented pregnancy in 50% animals. The drug had no effect on the body weight and length of the pups.

8a. Hansprabha

PhRUFb

The acute toxicity studies of Hansprabha were carried out in mice and rats by oral routes. The LD₅₀ value of Hansprabha in both species is more than 4g per kg. The sub-acute toxicity studies were also carried out in albino rats. The drug was administered orally in doses of 500 mg/kg body weight and 1.0 gm/kg body weight orally in rats for a period of four weeks. No toxicity was observed through the tests conducted i.e. Haematological, Biochemical and gross pathological studies. The vital organs have been preserved for histopathological studies. There was no significant change in the organ weight after administration of this drug.

8b. Hansprabha

TRUJh

Both acute and sub-acute toxicity studies were carried out with the aqueous suspension of Hansprabha in albino rats. The drug was found to be safe upto 3000 mg/kg body weight orally. During sub-acute toxicity studies, three different groups were administered the drug in the dosage of 10 mg, 30 mg and 100 mg per body weight orally for 15 days. All the animals were found to be normal and their body weight was unchanged, there were no gross pathological lesions, the biochemical parameters were within the normal range. The findings of histopathological studies are awaited.

9. Gunja (*Abrus precatorius*)

PhRUFT

White variety seeds were procured, identified Pharmacognostically and extracted with ethanol for further study.

Acute toxicity tests in albino rats and mice, anti implantation studies in fertile female rats and effect on spermatogenesis in young male rats are in progress.

No toxicity was observed with alcoholic and aqueous extracts upto 4000 and 5000 mg/kg respectively in mice.

(i) Acute Toxicity

Both albino rats and mice received a single oral dose of borax as fine suspension in 1% gum acacia.

Mice (20-30 g) of either sex were fasted overnight and divided into groups of 8 or more for each dose level. They received the test drug in doses ranging from 100 mg to 30 gm/kg body wt. Thereafter all of them were observed carefully every 30 min. for 3 hrs. and later every 24 hrs. for 3 days. Mortality during the above period and gross behavioural changes etc. were recorded. Autopsy was conducted if there was any mortality and noted the gross changes on internal viscera. Dead percentage of each dose level was recorded and LD₅₀ was determined by miller & Tainter method (1944).

Similarly acute toxicity was determined in albino rats of either sex(125-150g.) in the above dose levels.

CNS excitement, followed by sedation noticed in higher doses. Mortality seen within 2 h.s. in higher doses. NO gross changes in viscera noticed at autopsy. LD₅₀ in mice was 8913+135 mg/kg.(p.o).

(ii) Sub-acute toxicity

Borax was administered in three dose levels of 200, 400 and 800 mg. in 1% gum. acacia per orally to adult male and female rats (150-200 gm.) for 4 weeks duration. All the animals were killed on the 30th day and the weight of vital organs, haematology, LFT, serum creatinine values were noted to assess the systemic toxicity. The data is being analysed.

**Statement of the cases studied for clinical
evaluation of oral contraceptive agents**

Name of the Drug	Center	Number* of cases						
		Studied		Dropped out due to				Continuing the study
		New	Old*	Pregnancy		side effects	Other reasons	
D.F.	D.O.							
AYUSH-AC-IV	Trivandrum	4	89	-	-	-	93	-
	Lucknow	25	103	17	-	-	34	77
	Calcutta							
	Group-I	-	3	-	-	-	3	-
	Group-II	-	6	-	-	-	6	-
	Bombay	-	11	-	-	-	-	11
	Delhi	5	6	-	-	-	7	4
	Patiala	4	9	1	-	1	8	3
Madras	27	3	1	2	1	18	8	
Pippalyadi yoga	Calcutta	31	13	4	2	2	25	11
	Ahemdabad	20	-	-	1	-	-	19
K-kapsule	Varanasi	7	53	4	-	-	5	51
Neem oil	Delhi	2	7	-	2	-	4	3
Vandhyavari	Delhi	-	7	1	-	-	-	6
	Bombay	81	165	-	-	-	-	245
	Trivandrum	12	9	-	-	-	15	6
	Varanasi	38	188	38	-	5	47	136
	Ahemadabad	04	21	04	-	8	-	13

* Subject to change as per clarification sought from units.

PUBLICATIONS/PARTICIPATIONS

I.Publications:

S. No.	Name of The Author	Title of the Paper	Name of the Journal	Date of Publication
A. Clinical and Basic Research:				
1.	Dash,S. Tewari,N.S. Prem Kishore	Clinical trial of Suta- sekhar Rasa,Dhatri Lauh and Kamdugha Rasa in the management of Parinamsula	JRAS VOI.10 1&2	March-June 1989
2.	Jain,J.P	A clinical trial volatile oil of <i>Curcuma longa</i> Linn. in cases of bronchial asthma(<i>Tamaka swasa</i>)	JRAS VOI.11(1-4): i 20-30	March-Dec. 1990
3.	Menon,T.V. <i>et al</i>	Evaluation of Acupunture Therapy in Pakshavadha (<i>Hemiplegia</i>)	JRAS Vol.10 3&4,	Sep.-Dec. 1989
4.	Mukherjee,G.D	The concept of Mahabhuta theory	Journal of Integrated Medicine (NIMA,W.B)	Feb., March 1991
5.	Mukherjee,G.D	The concept of Srotos	Journals of Integrated Med Medicine (NIMA,W.B).	Dec. 1990
6.	Nair,P.R.C. <i>et al</i>	Effect of Bhadradarvadi Taila and Sahacaradi Taila in Khanja and Pangu	JRAS Vol.10(1-2)	1989
7.	Nair,P.R.C <i>et al.</i>	Effect of Snehapana on Haemoglobin, A serendip- itous find	JRAS Vol.10	1989

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|-----|---|--|--|-----------------------|
| 9. | Nair,R.B
<i>et al</i> | Antidiabetic activity of
Amritadi Cumam-A compou-
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&
Sharma K.D. | AIDS Nivaran main Ayurveda
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No.1 | July
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| 12. | Jaya,N. <i>et al</i> | Community Health Care Pro-
gramme in Thichur Village
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of some observations | JRAS
Vol.10(3-4):
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B.Health Care Research:

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S. No.	Name of The Author	Title of the Paper	Seminar/ Conference	Date of Participation
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A. Clinical and Basic Research:

1.	Chopra,K.K	Swas Roga avam Chikitsa	Seminar on Swasam Sansthangat Vyadh- iyan organised by Rashtriya Ayurveda Mandal Medical Research Centre Hospital,Bombay	23/9/90
2.	Holla, B.V.	Management of Brain Fever	National conf.on Ayud. at Malladi Hall,Bangalore	May 1991
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| 4. | Pandey, V.N. & Sharma, K.D. | Madhumeha Ki Ayurvediya Chikitsa ka Anusanandh-anatamaka Vivecana | Raj. Pradesh Vaidya Sammelana
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| 6. | Ramu, M.G. | A controlled study of Ayurvedic treatment in acutely ill patients of scizophrenia (Unmada): rationale and results | Special meeting of Faculty Members and students of P.G. Training & Research, G.A.U. Jamnagar | 29 Oct. 1990 |
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et al Prospects of Ethnomedicinal lores in Birth control IInd International Congress on Ethnobiology 1990 at Kuming (China). Oct. 1990
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TECHNICAL REPORT-SIDDHA

Abbreviations used for Institutes/Units

S. No.	Name of the Institute/Units	Abbreviations
1.	Central Research Institute Siddha, Madras	CRISM
2.	Regional Research Institute Siddha, Pondicherry	RRISP
3.	Clinical Research Unit Siddha, Palayamkottai	CRUSP
4.	Clinical Research Unit Siddha, New Delhi	CRUSD
5.	Clinical Research Unit Siddha, Trivandrum	CRUST
6.	Mobile Clinical Research Unit Siddha, Madras	MCRUSM
7.	Drug Research Scheme (Multi-Disciplinary), Madras	DRS(MD)M
8.	Drug Standardisation Res. Unit Siddha Madras	DSRUSM
9.	Drug Standardisation Res. Unit Siddha, Bangalore	DSRUSB
10.	Drug Standardisation Res. Unit Siddha, Trivandrum	DSRUST
11.	Tribal Health Care Research Project Siddha Tirupathur North Arcot District	THCRPST
12.	Tribal Health Care Research Project, Siddha Kalasa, Chikamagalore District	THCRPSK
13.	Survey of Medicinal Plants Unit Siddha Palayamkottai	SMPUSP
14.	Literary Research and Documentation Department Siddha, Madras	LRDDSM

CLINICAL RESEARCH PROGRAMME

Clinical Research is being carried out on selected clinical conditions by the Institutes/Units of the Siddha Medicine functioning under the Council. The clinical conditions studied during the reporting year include Kalanjagapadai (Psoriasis), Putrunoi (cancer), Manjal Kamalai (Infective hepatitis), Santdhi Vatha soolai (Rheumatoid arthritis), Gunman (Intestinal disorders), Venkuttam (Leucoderma), Velluppunoi (Anaemia) etc.

1. *Kalanjaga padai* (Psoriasis)

Kalanjaga padai (Psoriasis) has been taken up for study using a coded drug '777 Oil' formulated by the Central Research Institute (Siddha), Madras. Clinical trials were conducted at CRI(S), Madras and CRU (S) Safdarjung Hospital, New Delhi and CRU(S) Trivandrum. 10ml. of oil with milk was administered in two divided doses internally on all the 239 cases selected for study. The patients were also advised to apply oil externally on the affected parts of the body. The details of results of the treatment are reported hereunder:-

Table
Results of clinical therapeutic trial of Siddha preparations on Kalanjaga padai (Psoriasis)

S.No.	Therapy	Instt./ Center/ Unit	Total cases	Results				
				Comp. rel.	Mark. rel.	Mode. rel.	Mild rel.	LAMA
1.	777 Oil	CRI(S) Madras	202	6	38	70	25	63
2.	777 oil	CRU(S) New Delhi	17	5	2	3	-	7
3.	777 oil	CRU(S) Trivandrum	20	11	4	-	-	5
Total			239	22	44	73	25	75

2. *Putrunoi* (Cancer)

Putru is described in Siddha texts under the head of Virananoigal. This was described as Putru and named after the affected organ (i.e) if the uterus is affected it is called Yoniputru noi. The study was undertaken at Central Research Institute (Siddha), Madras to determine the efficacy of the Siddha drugs in the cases Putrunoi using the coded drugs RGX, VK₂ and SKX. One gm. of these drugs were administered along with honey in two divided doses. Ulcers and tumors were dressed with Nithiyakalyani Kalkam and Panchainennai with thurusu. 24 cases of Putrunoi were studied during the reporting year. Reduction in the size and growth of the ulcer/tumors, reduction or arrest of the discharges and also reduction in pain was noticed in some of the cases.

The study showed moderate relief in one and mild relief in 10 cases while 13 cases discontinued the study against medical advice.

3. *Manjal Kamalai* (Infective hepatitis)

Manjal Kamalai was studied at Central Research Institute (Siddha), Madras. The choornam made of Athinathuram was administered in the doses 1 gm. two times a day with water in all the 20 cases selected for the trial. Salt and fat free diet was advised to all the cases included into the study. No side/toxic effects were noticed. The study showed complete relief in eight and marked relief in four cases. One case each got moderate and mild relief while remaining six case discontinued the study.

4. *Sandhi Vatha Soolai* (Rheumatoid arthritis)

A study to evaluate the effect of Vanga Chendooram in the management of Sandhi Vatha Soolai was envisaged at Central Research Institute (Siddha), Madras. 200 mg. of the trial drug was administered two times a day with honey in all the 34 cases admitted during the period under review. Tamarind and chilli free diet with less salt was advised during treatment. Mynathylam was advised for use externally on the affected parts.

The study showed marked relief in 12 cases, moderate relief in 13 cases and mild relief in six cases while remaining three cases discontinued the study.

5. *Vatha Soolai*

Vatha soolai is one among the 80 Vatha diseases described in Siddha texts. The RRI(S), Pondicherry is engaged in determining the efficacy of the drug Chanda marutham and Vatha kesari thailam. 75 cases of Vatha Soolai were registered during the reporting year.

Table
*Results of clinical therapeutic trial of Siddha
preparations on Vatha Soolai*

SNo. Therapy	Total cases	Results				
		Comp. rel.	Mark. rel.	Mode. rel.	Mild rel.	LAMA
1. Chanda marutham 130 mg.B.D. with honey	12	3	-	1	3	5
2. Vatha kesari thailam external use	7	1	-	3	3	-
3. Combination of 1&2	56	33	-	11	5	7
Total	75	37	-	15	11	12

6. Oothal noi

Oothal noi is described as one of the intestinal disorder in. The study on this disease was taken up by the RRI(S), Pondicherry using Mandoorathi, Adai kudineer and vediuppu chunnam. Out of 10 cases included into the study 9 cases got complete relief and one case did not respond to the treatment.

7. Valligunmam (Peptic ulcer)

The study was under taken at Central Research Institute (Siddha), Madras to determine the effect of Nagarpam in the cases of Valligunmam. The cases having pain in the abdomen in relation to food, discomfort in the Epigastric region, nausea, vomiting, erucation and haematamesis etc. were selected for trial. The diagnosis was confirmed by FTM and Barium meal X-ray reports. The trial drug was administered at the dose level of 200 mg. filled in gelatin capsules two times a day for 21 days. Omam bath was given to all the 35 cases admitted for study on the 22 days. The study showed complete relief in two cases, marked relief in 12 cases and moderate relief in three cases. Six cases showed mild relief while remaining 12 case discontinued the study.

8. Velluppunoi (Anaemia)

Clinical studies were conducted in cases of velluppunoi (anaemia) at Clinical Research Unit (Siddha), Palayamkottai and Regional Research Institute (Siddha), Pondicherry using Aya bringaraja Karpam at the dose level of 260 mg. with honey three times a day. The study showed complete relief and moderate relief in 12 cases each and mild relief in one case. Remaining 7 case discontinued the study. No side effects/toxic effects were noticed during or after the treatment.

9. *Sarumanoigal* (Skin disorders)

The study on this clinical condition was carried out at Clinical Research Unit (Siddha), Trivandrum using Irunelli Karpam and Gandhaga rasayanm at the dose levels of 130 mg. and 1 gm. respectively in two divided doses followed by milk. The following table provides the details of result of treatment.

Table
Results of clinical therapeutic trial of Siddha preparations of Sarumanoigal (Skin disorders)

S.No.	Drugs	Total cases	Results				
			CR	MR	MO.R	MIR	LAMA
1.	Irunelli Karpam (130 mg. B.D.) Karpam thailam externally	15	7	6	-	-	2
2.	Gandhaga rasayanm (2 gm. B.D.) Arugan thailam externally	15	4	5	-	-	6
	Combination of 1&2	14	5	6	-	-	3
Total		44	16	17	-	-	11

10. *Junmam* (Intestinal disorders)

The study was under taken at Regional Research Institute (Siddha), Pondicherry and Clinical Research Unit (Siddha), Palayamkottai using Uppu chendooram, Athimathura choornam and Kavikkal choornam in the selected cases. The details of result of the treatment are shown hereunder:-

Table
Results of clinical therapeutic trial of Siddha preparations on Gunman (Intestinal disorders)

S.No.	Drugs	Total cases	Results				
			MR	MOC	MO.R	MIR	IAMA
1.	Uppu chendooram (130 mg. TDS)	24	10	-	4	3	7
2.	Athimathura choornam and Kavikkal choornam (one gm. both B.D.)	5	3	2	-	-	-
3.	Gunmagudori mezhugu (1gm.TDS)	27	11	-	4	7	5
Total		56	24	2	8	10	12

11. Neerazhivu (Diabetes mellitus)

Neerazhivu is described as one of the Suruneer noigal in Siddha literature. The study on this clinical condition using Abraga chendooram, Vanga parpam, and keezhanelli choornam was carried out by Clinical Research Unit (Siddha) at Safdarjang Hospital, New Delhi and Clinical Wing of Drug Research Scheme (MD), Madras. Mild and moderate cases of Neerazhivu were taken up for study. The following table provides details of result of treatment.

Table
Results of clinical therapeutic trial of Siddha preparations On Neerazhivu (Diabetes mellitus)

S.No.	Drugs	Total case	Results			
			MC	MO.C	MC	LAMA
1.	Abraga Chendooram (200 mg. B.D)	17	9	7	-	1
2.	Vanga parpam (200 mg. BD)	9	4	4	-	1
3.	Keezhanelli choornam (500 mg. BD)	10	-	-	3	7
4.	Sivakaranthai choornam (500 mg. BD)	21	-	-	2	19
Total		57	13	11	5	28

12. *Venkuttam* (Leucoderma)

Venkuttam is one of the 18 kutta noigal described in Siddha texts. Response of certain selected siddha drugs was studied in his condition at clinical wing of Drug Research Scheme (MD), Madras. No toxic/side effects were noticed during or after the treatment. The details of result of the treatment are tabulated hereunder:-

Table
Results of clinical therapeutic trial of Siddha preparations on Venkuttam(Leucoderma)

S.No.	Drugs	Total cases	Results				
			CR	MR	MO.R	MIR	LAMA
1.	Thamira chendooram	58	-	-	-	6	52
2.	Ponnimilai chendooram + Chirattai thylam	28	-	-	-	5	23
Total		86	-	-	-	11	75

13. *Vellai noi* (Leucorrhoea)

Vellai noi (Leucorrhoea) is as described in siddha texts is one of the magalir noigal. The C.R.U.(S), Trivandrum using chemparuthi Kashayam and kukkil parpam studied. 16 cases of Vellai noi admitted during the period under review. The study showed complete relief in 10 cases and marked relief in five cases while one case discontinued the study.

14. *Eraippu noi* (Bronchial asthma)

Eraippu noi is one of the respiratory diseases described in siddha literature. The efficacy of the drugs like Irunelli karpam and Swasa kudori mathirai was studied by C.R.U.(S), Trivandrum ;in 14 cases of Eraippu noi. The study showed complete relief in eight cases and marked relief in four cases while remaining two cases discontinued the study.

15. *Keel vayu*

Keel vayu is one among the 80 vatha diseases described in Siddha classics. The efficacy of Ayakantha chendooram, Sivanar amirtham and Amukkara choornam was studied by CRU(S),Trivandrum in 15 cases registered during the period under review. The study showed complete relief in seven cases and marked relief in three cases while remaining three cases discontinued the study.

OUT PATIENTS/ IN-PATIENTS ATTENDANCE

SNo.	Institute/Units	No.of patient attended at OPD/			Patients admitted at IPD
		New`	old	Total	
1.	CRI(S), Madras	7384	12259	19643	315
2.	RRI(S), Pondicherry	4130	10670	14800	175
3.	CRU(S), Palayamkottai	1087	2577	3664	-
4.	CRU(S), New Delhi	80	914	994	-
5.	CRU(S), Trivandrum	954	9331	10285	-
6.	DRS(MD), Madras	117		117	-
Total		13,752	35751	49,503	490

HEALTH CARE RESEARCH PROGRAMME

Health Care research programme has been taken up through Mobile Clinical Research Units attached to Central Research Instt., Madras and Regional Research Institute, Pondicherry and Tribal Health Care Research Projects functioning at Tirupathur N.A.A. Distt. (Tamil Nadu) and Karasa Chikamagalore (Karnataka).

A. Tribal Health Care Research Programme .

THCRPST

The team conducted 10 tours in the tribal pockets of Elagiri hills (i.e.) Kohar, Kohaiyur, Mettukaniyur, Pallakaniyur, Puththur, Paduvanur, Mangalam, Thayalooce, Punganur, Muththanur and collected health statistics about 200 individuals, incidental medical aid was provided to 380 patients. Out of which 200 cases were new. Sarumanogal, Irumal, pun/Nalpattapun, Sandhuvatham, Suram, Tholnoigal, Kudarpuzhuniogal are some of the diseases found prevalent in the area.

THCRPST

The team conducted 9 visits in the tribal pockets spread over 10 helmets (i.e.) Gangam, Kudige, Kargadde, Hebbal Marasanige, Thalgodu, Samso, Basarikallu, Abbrukudige, Kaganella, and Jamble. Health statistics were recorded for 459 individuals. 463 patients were suffering with different diseases like Suram, Tholnoigal, Pun/Nalpatta pum, Kudar puzhunoigal, Irumal etc. were provided incidental medical aid during the reporting year.

B. Mobile Clinical Research Programme

MCRUSM

The team conducted study in the village Ramavaram during the reporting year and collected information on 293 individuals from the total population of 820. The data of the study carried out shows that individuals are suffering from one or the other diseases like Irumal, Eraippunoi, Pun, Prumkazhichal, Vellai, Vaccruvali, Muttuvali thalaivali, Tholnoigal, Suram etc. and provided incidental medical aid to 768 cases.

MEDICO BOTANICAL RESEARCH PROGRAMME

It is a well known fact that the drug (Marunthu) is the primary tool of entire research programme. Survey of forest areas for procuring drugs and arranging supply of material required for research purposes occupies an important place. Medico-botanical survey unit functioning at Govt. Siddha Medical College, Palayamkottai has taken up this task in 1971: For the last 20 years, the unit is engaged in studying the availability of the medicinal plants used in Siddha Medicine in the forest areas of Tamil Nadu, identification of the plant specimens, availability of genuine drugs including its substitute/adulterants etc.

During the reporting year, the survey unit has conducted one survey tour to vasudevanallur in Tirunelveli Forest Division and 10 collection tours in and around Tirunelveli Forest Division and herbarium specimens spread over 111 field book numbers 5354-5464 having importance in Siddha medicine belonging to 58 families, 74 genera and 111 species were collected and reported.

Some of the plants specimens collected for herbarium are Maravizhuthi (*Cadaba trifoliata* W&A); Matthagrivember (*Codrela toona* Roxb.); Ponapathiri (*Stereospermum tetragomum* DC.); Peiathi (*Ficus hispida* L.); Munnai (*Premna serratifolia* L.) Thannirkodi (*Cissus pallida* Planch); Karamkodi (*Derris benthamli* Thw.); Orithal thamarai (*Habenaria rariflora* A.Rich); Mussuttai (*Rivea lycocrateriformis* Choisy); Nirpulli (*Cyanotis oxillaris* Rena & Sch.); Pilavaram (*Mundulea suberosa* Benth.); Somakodi (*Ceropegia tuberosa* Roxb.); Sitrallem (*Heracleum courtallense* Gamble); Milagaranai (*Toddalia asiatica* Lam.); Ranakalli (*Bryophyllum pinnatum* Kurz.); Thagarai (*Cassia tomentosa* Willd); Iruvi (*Dryopteris filixmas* Schoot); Veruvettai (*Dalbergia coramandellina* Proin); Malli (*Erygium foetidum* L.); Kattu suriagandhi (*Vicoa indica* DC); Palavalipoondu (*Spilanthes acmella* Nurr.); Samjevi (*Lycopodium cernuum*); Vedipala (*Cullenia excelba* Wt.J.); Kozhikal Imbooral (*Drymaria cordata* Willd.) etc.

12 crude drug samples were collected and added to the museum. A few important are fruits of peiathithi (*Ficus hispida* L.); Stems of Sathurakkali (*Ephorbia antiguoram* L.); Oolakalli (*Euphorbia* sp.); Thannirkodi (*Cissus pallida* planch); Gum of othiyam (*Odina woodier* Roxb.); Whole plant of Karavallarai (*Hydrocotyle javanica* Thumb.); fruit of Uthalankai (*Gerbera manghas* L.) etc. 9. (Nine) folklore claims were collected during the survey.

Apart from this, the unit has completed the process of poisoning and preserving in respect of 306 herbarium specimens and kept for mounting in the herbarium sheets. 120 plants were accessioned and 59 index cards were prepared during the reporting year.

Medicinal Plants Garden:

A small herb garden is being developed and maintained by the CRI(S), Madras to cater the need of raw (fresh) drugs to its pharmacy and hospital. 167 plants species are being maintained in the garden. Crude drugs both fresh and dry were supplied in different quantities of the pharmacy and hospital.

Herbarium and Museum:

A Central herbarium and museum is maintained at CRI(S), Madras. Samples were preserved in the museum. About 150 identified plant specimens are maintained in the herbarium section.

PHARMACOGNOSTICAL RESEARCH PROGRAMME

Pharmacognostical research programme is being carried out at pharmacognosy wing of DRS (MD), Madras. The study was conducted on the following plants during the reporting year:

1. Naval
2. Tura Poondu - *Mollugo oppositifolia* L.

The study includes macro and microscopic characters (qualitative and quantitative) extractive values, inorganic qualitative test and preliminary phyto-chemical screening for the presence of different group of chemical compounds besides reporting of regional names distribution, description and medicinal values of the drug.

PHARMACOLOGICAL RESEARCH PROGRAMME

The Council is engaged in pharmacological findings on Siddha drug in the pharmacological section functioning at CRI(S), Madras. The following work has been reported during the period under review :-

I. Acute Toxicity Studies :

1. MAP - a coded anti-fertility drug
2. Annabedi chenduram
3. Kadugurohini choornam
4. Athimathuram choornam
5. Kadukkai choornam
6. Thayirchundi choornam
7. Naga parpam
8. Vallarai choornam
9. Naval choornam
10. Mookarathai - Boerhavia diffusa Linn.

II. Anti-inflammatory study :

1. Kadugurohini choornam
2. Thayirchundi choornam
3. Vallarai choornam
4. Siru Kurinjan - Gymnema sylvestreae

III. Anti-fertility study :

PSI - a code anti-fertility drug

I. Acute toxicity studies :

1. MAP - a coded anti-fertility drug on albino mice:

The coded anti-fertility drug MAP was administered in the dose level of 5000 mg per kg. body weight. One group received distilled water as vehicle which served as untreated control. The animals were observed for 72 hours for any toxic manifestations. The drug did not show any toxic effects and mortality.

2. Annabedi chenduram (albino mice):

The drug annabedi chendooram was administered in the doses of 250, 500, 1000, 2000, 3000,

4000 & 5000 mg. per kg. body weight. One group received vehicle and which served as untreated control. The animals were observed for 72 hours for any toxic manifestations. The drug did not show any toxic effects on the employed doses. The study is in progress on higher doses.

3. i. Kadugurohini (albino mice)

The drug *Kadugurohini* was administered in the doses of 3000, 5000 & 10000 mg. per kg. body weight. One group received vehicle only which served as untreated control. The animals were observed for 72 hours for any toxic manifestations. The drug is found to be non-toxic on the employed doses.

ii. Kadugurohini (albino rats)

The drug *Kadugurohini* was administered in the dose level of 5000 mg per kg. body weight. One group received vehicle, which served as untreated control. The animals were observed for 72 hours for any toxic manifestations. The drug did not show any toxic effects in the above employed dose level. The study is in progress.

4. Athinathuram choornam (albino mice)

The drug *Athinathuram* was administered in the doses of 100, 200, 500 & 1000 mg. per kg. body weight. One group received vehicle which served as untreated control. The animals were observed for 72 hours for any toxic manifestations. The drug did not show any toxic effects.

5.i. Kadukkai choornam (albino mice)

The drug *Kadukkai choornam* was administered in the doses of 200, 500, 1000 mg per kg. body weight. One group received vehicle which served as untreated control. The animals were observed for any toxic manifestations and mortality. The drug did not show any toxic effects on the employed doses.

ii. Kaddukai choornam (albino rats)

The drug *Kadukkai choornam* was administered in the dose level of 5000 mg per kg. body weight. One group received vehicle, which served as untreated control. The animals were observed for 72 hours for any toxic manifestations. The drug did not show any toxic effects in the above employed dose level.

6. Thayir chundi choornam (albino rats)

The drug *Thayir chundi choornam* was administered in the doses of 100, 200, 500, 1000, 2000, 3000, 4000, 5000, 6000, 7000, 8000, 9000 & 10000 mg. per kg. body weight. One group received vehicle, which served as untreated control. The animals were observed for 72 hours for any toxic manifestations and mortality. The drug did not show any toxic effects on the employed doses.

7. Nagarpam (albino rats)

The drug *Nagarpam* was administered in the dose of 25, 50, 100, 200, 500, & 1000 mg. per kg. body weight. One group received vehicle only which served as untreated control. The animals were observed for any toxic manifestations and mortality. The drug did not show any toxic effects.

8. Vallarai choornam (albino mice)

The drug was administered in the doses of 500, 1000, 2000 & 3000 mg. per kg. body weight. One group received vehicle only which served as untreated control. The animals were observed for 72 hours for any toxic manifestations and mortality. The drug did not show any toxic effects on the employed doses.

9. Vallarai Choornam (albino rats)

The drug was administered in the doses of 500, 1000, 2000, 3000, 4000 & 5000 mg. per kg. body weight. One group received vehicle only which served as untreated control. The animals were observed for any toxic manifestations and mortality. The drug did not show any toxic effects on the employed doses.

10. i. Naval choornam (albino mice)

The drug *Naval choornam* was administered in the doses of 1000, 2000 & 3000 mg. per kg. body weight. One group received vehicle only which served as untreated control. The animals were observed for any toxic manifestations and mortality. The drug did not show any toxic effects. The study is in progress on higher doses.

ii. Naval choornam (albino rats)

The drug was administered in the doses of 100, 200, 500, 1000, 2000, 3000, 4000, 5000 & 6000 mg. per kg. body weight. One group received vehicle only which served as untreated control. The animals were observed for 72 hours for any toxic manifestations and mortality. The drug did not show any toxic effects on the employed doses.

11. Mookarathai choornam (albino rats)

The drug *Mookarathai choornam* was administered in the doses of 4000 & 5000 mg. per kg. body weight. One group received vehicle only which served as untreated control. The animals were observed for 72 hours for any toxic manifestations and mortality. The drug did not show any toxic effects.

II. Anti-inflammatory study

1. Kadugurohini (albino rats)

The drug kadugurohini was administered in the dose level of 100 mg. per kg. body weight. One group received vehicle only which served as untreated control. Another group received phenyl

butazone in the dose level of 100 mg. per kg. body weight which served as standard control. The paw edema was induced by injecting 0.1 ml. of 1% carrageenin suspended in 0.5% carboxy methyl cellulose in the planter aponeurosis of right hind paw after 1 hour of drug administration. The final right hind paw volume was measured plythysmographically after 3 hours of carrageenin injection. The difference between the initial and final right hind paw volume was recorded for each animal. The data is being analysed.

2. **Thayir chundi choornam & Vallarai (albino rats)**

The drug *Thayir chundi choornam* and *Vallarai* was administered in the doses of 100 mg. per kg. body weight. One group received vehicle only which served as untreated control. Another group received phenyle butazone in the dose level of 100 mg. per kg. body weight which served as standard control. The odema was induced by injecting 0.1 ml. of 1% carrageenin suspended in 0.5% carbodyle cellulose after 1 hour of drug administration in the planter aponeurosis region. The final right hind paw volume was measured plythysmographically after 3 hours of drug administration. The difference between the initial and final right hind paw volume was recorded for each animal. The data is being analysed statistically.

3. **Sirukurinjan (albino rats)**

The drug sirukurianjan was administered in the dose level of 250 mg. per kg. body weight. One group received vehicle only which served as untreated control. Another group received phenyl butazone in the dose level of 100 mg. per kg. body weight which served as standard control. The odema was induced by injecting 0.1 ml. 1% Carrageenin suspended in 0.5% carboxy-methyl cellulose in the planter aponeurosis of right hind paw after 1 hour of drug administration. The final right hind paw volume was measured plythysmographically after 3 hours of carrageenin injection. The difference between initial and final right hind paw volume was recorded. The data is being analysed statistically.

III. **ANTI FERTILITY STUDY**

Anti implantation study with the coded anti-fertility drug PSI

Healthy proven female and male rats were selected and allowed to mate in the ratio of 3:1. The vaginal smear for individual proven female rats was examined daily and the presence of spermatozoa in clumps in the cestrus phase of cycle was taken as day 1 of pregnancy. The coded drug PSI in crude powder form was suspended in cow's milk and administered in the dose level of 500 mg. per kg. body weight for 9 days from the 1 day of pregnancy. One group of animals received vehicle only which served as untreated control. Laprotomy was conducted on day 10 of pregnancy and the number of implants found in both the horns of uterus were noted for individual animals. Then the animals were allowed for the full term of their gestation period of observed. The animals were also observed for delivery on 21st day of pregnancy. The number of young ones delivered and the teratogenicity if any were also recorded for individual animals. The data is to be analysed statistically.

PHARMACEUTICAL/STANDARDISATION RESEARCH PROGRAMME

The standardisation research has an important role to play for obtaining genuine drugs and medicinal preparations for therapeutic purposes. It also occupies an important place in both drug and clinical applied research since it provides approach data for obtaining genuine drug and authentically prepared compound medicines. The programme aims at study of single drugs. Pharmaceutical process involved in the manufacture of formulations and finished products, and laying down their analytical values.

The drug standardisation research programme covering formulations enlisted in Siddha Formulary Part-I of Govt. of India and single drugs entering into them was carried out at the following standardisation research Units :-

1. DSRU(S) at CSMDRIM, Madras
2. DSRU(S) at RRI(DR), Trivandrum
3. DSRU(S) at RRC(AY.), Bangalore

A. List of plants/drugs on which phyto-chemical studies have been carried out :- (Analytical studies).

1.	Pulippenchedi (<i>Cipadessa baccifera</i> Mig.)	Stem & leaves	DSRU, Madras
2.	Iyvirali (<i>Bryonopsis laciniosa</i> Naud.)	Aerial portion	-do-
3.	Manjalkarisalai (<i>Wedelia calandulacea</i> Less.)	Whole plant	-do-
4.	Nilavembu (<i>Andrographis paniculata</i> Nees.)	Whole Plant	-do-
5.	Tippilimoolam (<i>Piper longum</i> L.)	Root	-do-
6.	Kadarpalai (<i>Argyrea speciosa</i> Sweet.)	Leaves	-do-
7.	Citra mutti (<i>Sida cordifolia</i> L.)	Leaves	-do-
8.	Azhinjil (<i>Alangium decapetalum</i> Lamk. W. & A.)	Root Bark	DSRU, Trivandrum
9.	Orelathamalai (<i>Ionidium suffreticosum</i> Ging.)	Leaves	-do-

10.	Sirukerai (<i>Amaranthus candatus</i>)	Whole plant	DSRU,Bangalore
11.	Allivecrai (<i>Lepidium sativum</i>)	Seeds	-do-
12.	Erathabolam (<i>Aloe vera</i>)	Juice	-do-
13.	Kadarpasi (<i>Lichens</i>)	Whole plant	-do-
14.	Muthuchippi parpam	Compound preparation	-do-
15.	Sringiparpam	-do-	-do-

(B) Analytical standards (Pharmacopoeial Standards) of the Finished Products:-

1.	Sringiparpam		DSRU,Bangalore
2.	Padigalingathuvar		-do-
3.	Ammukkara choornam		-do-
4.	Kazharchi choornam		-do-
5.	Annabedi chendooram (in progress)		-do-
6.	Thalagakaruppu (in progress)		-do-
7.	Elati curanam		DSRU, Madras
8.	Kalarciccuranam		-do-
9.	Tirikatukucuranam		-do-
10.	Cankuparpam - Batch-I		-do-
11.	Cankuparpam - Batch-II(in progress)		-do-
12.	Karuvanga parpam		-do-

Detailed Standardisation Studies:

1.	Attaticcurnam		-do-
2.	Amukkaraccuranam		-do-

(C) Phyto-chemical and anotamical studies:

1.	Venkungilyam (<i>Shorea robusta</i> Gaertn.f.)	Wood	DSRU, Madras
2.	Kattunilavarai (<i>Cassia obovata</i> (L.) Colled)	Whole plant	-do-
3.	Karpasi (<i>Paranelia caperata</i>)	-do-	-do-
4.	Ilava (<i>Salmalia malabarica</i> DC.)	Flowers	-do-
5.	Elikkathilai (<i>Merremia emarginata</i> Hallier)	Leaves	-do-

6.	Ezhath-alari (<i>Plumeria acuminata</i> Ait)	-do-	DSRU, Madras
7.	Kadarppalai (<i>Argyrea speciosa</i> Sweet)	Leaves	-do-
8.	Akasathamaria (<i>Piptia stratiotes</i> L.)	Whole plant	-do-
9.	Uppilanhkodi (<i>Pentatropis microphylla</i> W.&A.)	-do-	-do-
10.	Elaikkalli (<i>Euphorbia nivutia</i> Buch-Ham)	Leaves	-do-
11.	Isangu (<i>Clerodendrum inerme</i> L.)	Whole plant	-do-

D. PHARMACOGNOSY:

1.	Kudaivel (<i>Acacia planifrone</i> W.&A.)		-do-
2.	Itti (<i>Dalbergia lantifolia</i> Roxb.)		-do-
3.	Kadarppalai (<i>Argyrea speciosa</i> Sweet)		-do-
4.	Elikkathilai (<i>Merremia emarginata</i> Hallier)		-do-
5.	Aliverai (<i>Lepidium sativum</i>)		DSRU, Bangalore
6.	Anaikundrumani (<i>Adenanthera pavonia</i>)		-do-
7.	Azhingil (<i>Alangium salvifolium</i>)		-do-

Following single drugs that enter into the Siddha Formulary part-I have also been analysed and reported :-

1.	Oman (<i>Carum capticum</i>)	Seeds	DSRU, Bangalo
2.	Agathi (<i>Sesbania grandiflora</i>)	leave juice	-do-
3.	Ammukkara (<i>Withania somniaferia</i>)	Root	-do-
4.	Murungai (<i>Moringa olifera</i>)	Stem bark	-do-
5.	Kazharchikay (<i>Caesalpinia bondue</i>)	Seeds Seeds	-do-
6.	Elam (<i>Elettaria cardamomum</i>)		-do-

A part from this the DSRU, Bangalore has completed market sample study on Kadukkaipoo (leaf galls of *Terminalia chebula* L.) Gajapippali (*Balanophara fungosassp indica*) and Minnikkizhangu (*Dollicuos trilobus*) available in the south Indian local market were carried out and reported.

The DSRU, Trivandrum has laid down physico-chemical values for 30 samples of 22 single drugs which are used in Siddha preparations. Thin layer chromatography (TLC) was done for different extracts of 24 single drugs.

PHARMACY

Realising the importance of the Pharmacy, the Council has established a Pharmacy to prepare Siddha medicine in the CRI(S), Madras.

The pharmacy is engaged in the preparation of classical preparation mentioned in the Siddha literature and that are chosen for clinical trials in the Institute/Units of Siddha under the Council.

The drug requirement of the pharmacy are met by the medico-ethno-botanical survey projects and through the purchases from the local market.

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

The pharmacy has prepared varieties of preparation both for research and general use. The pharmacy is engaged in preparations mentioned in the classical literatures such as choornam, thailam, parpam, chendooram, nei, ennai and kalkam etc.

During the reporting year, the pharmacy has prepared about 238.900 kg. of choornam, parpam, chendooram, and 1,136,950 liter of oil based preparations.

The pharmacy has also supplied prepared medicines to the following Siddha Units Under the Council. The list of Unit and quantity of medicine supplied is as detailed below :-

Sl.No.	Name of the Unit	Quantity	
		Solid in kg.	Liquid in liter
1.	DRS (MD), Madras	-	-
2.	MCRU(S), Madras	9.7	30.0
3.	CRU(S), New Delhi	2.0	35.0
4.	CRU(S), Trivandrum	30.9	82.0
5.	RRI(S), Pondicherry	6.0	33.0
6.	THCRP, Tirupathur, NA Dist.	-	-
7.	CRU(S), Palayamkottai	1.5	5.0
8.	Hqrs.	-	4.25

LITERARY RESEARCH PROGRAMME

The Literary Research Programme is being carried out at Literary Research and Doc. Department, Madras. The work carried out during the period under review is as follows:-

1. Sangamunivisha vaidhyam-100:

The book has been printed and published during this period. The publication deals with the anti poisonous drugs for the treatment of poisonous bites of snake, seropion and others sects.

2. Hand book of common remedies in Siddha System of Medicine : (IInd edition) (Revised and enlarged)

The book is under print and so far first proof corrections have been completed. It a compilation of commonly available simple therapy listed for the management of 48 different common diseases.

3. 350 poems were transcribed from the work Agasthiyarkalai gnamam - 1200.

4. 750 manuscripts were arranged and classified in the form of catalogue from the collected manuscripts during the collection-cum-survey tours.

5. Rs.9063.20 were collected and deposited to the Council for sale of Council's publication during the reporting year.

PUBLICATIONS /PARTICIPATIONS

I Publications:

S.No.	Name of the Author	Title of the Paper	Name of the Journal	Date of Publication
1.	Rao K.K. Kamalakar Chellammal (Mrs.) Krishnamurthi, J.R. and Veluchaney, G.	Associated Medical problems in Psoriatics	J.R.A.S. Vol.VIII, No.3&4	1986
2.	Rao, K.K. Shetty, B.M.V. Pondiyarajan & Veluchamy, G.	Herbal treatment for Psoriasis A focus on HPE &	J.R.A.S. Vol.IX studies.	1987
3.	Rajalakshmi, S. Sivanandam, G, & Veluchamy G.	Role to Thulasi (Ocimum sanctum) in the management of Viral hepatitis	J.R.A.S. Vol. IX	
4.	Rao, K.K. Ramachandran Krishnamurthi, J.R. & Veluchamy, G.	Effect of 777 oil on Non-specific	J.R.A.S.	
5.	Ponniachamy, G. Rajlaxmi, S. Saroja P.R. & Veluchamy, G.	A simple siddha remedy of puzhu vettu(Alopecia ancrata)	J.R.A.S. Vol. X	1988
6.	Pushpalatha, H. Shantha, T.R. Shetty, J.K.P. & Holla, B. V.	Flok Medicines from some Rural areas of Bangalore	Aryavaidyan	Vol.12 (3-4) May 90 pp 215-219.

I. Participations

S.No.	Name of the Author	Title of the Paper	Name of the Journal	Date of Publication
1.	Sivaprakasam, K. Anand, T. Yasodha, B. Rao Kalvathy, K. & Veluchamy, G.	Ponnimillai Chendooram and Chirattai thylam in the treatment of Leucoderma	National Conference on Siddha Medicine at Trivandrum held on 8.12.90 & 9.12.90	
2.	Sundaramurthy, K.Meenakshi, K.	Siddha - An Explanation	National confer- conference on Siddha Medicine at Trivandrum	8-9th Dec.,90
3.	Chelladurai, V. Apparanantham, T. Subramaniam M.P.S. & Subramanian V.	Botanical identity of Karuppu Kurunthoti - A Siddha drug	National confer- ence on Siddha Medicine at Trivandrum, Kerala State.	8.12.90
4.	Apparanantham, T. Chelladurai, V. Subramanian, M.P.S. & Subramanian, V.	Principles and Practice of Kayakarpam in Siddha Medicine	- do -	9.12.90
5.	Subramanian M.P.S. Chelladurai, V. Apparanatham, T. Subramanian, V. & Sivaprakasam, K.	Botanical Identity of Karkuvai A Siddha drug.	- do -	9.12.90

WORKSHOPS/SEMINARS/SYMPOSIA/ CONFERENCE/EXHIBITIONS

1. 53rd All India Ayurvedic conference held at Kurukshetra.

The Council participated in this Conference held on 20th June,1990 at Kurukshetra University. Director,CCRAS, and a number of Scientists from the Council attended this conference. An exhibition depicting Council's activities, achievements and Council's publication was also arranged on this occasion.

2. The Council participated in 22nd conference of Ayurvedic physicians of Rajasthan held at Parasram Puria Rajasthan Ayurveda Mahavidalaya, Sikar on 22nd May,1990.

3. Regional Research Centre (Ay), Guwahati arranged an exhibition during Scientific Lecture Series on Medicinal Plants held at Govt.Ayurvedic College, Guwahati on 25th May,1990.

4. The Council participated in the Dhanvantri Jayanti celebration celebrated by Indraprasthiya Vaidya Sabha, Delhi at Himachal Bhavan auditorium on 16th October,1990 and arranged an exhibition on this occasion.

5. Dr. O.P.Gupta,Assistant Director (Pharmacognosy) & Dr.K.V.Billore, Research Officer (Botany) participated in the 2nd International Congress on Ethno-Biology held at Kunming(China) from 22nd-26th October,1990.

VISITS OF VIP'S AND FOREIGN DIGNITARIES

1. Shri T.K.Das Joint Secy.(ISM) and Vd. S.K.Mishra Advisor (ASY&N), Ministry of Health and Family Welfare, Government of India visited Amalgamated Units, Tarikhet on 3-4th August,1990.

2. A Swiss delegation visited Central Research Institute(Ay.), Delhi on 22nd August,1990.

3. A delegation led by Director, Institute of Traditional Medicine Olanbattor, Mangolia visited Council's Headquarters Office on 14th September,1990 and Central Research Institute(Ay.), Delhi on 17th September,1990.

4. Mr.K.M.A.Kanakaratne, Extension Officer, Department of Ayurveda, Sri Lanka was deputed as WHO fellow to Jawaharlal Nehru Ayurvedic Medicinal Plants Garden & Herbarium, Pune from 24th December,1990 to 11th January,1991 for the study of Agro Techniques, processing and Extension service of Medicinal Plants cultivation.

ACKNOWLEDGMENT

The Director of the Council places on record its deep appreciation for the service rendered by the members of the the Governing Body, Finance Committee and Scientific Advisory Committees. The valuable assistance, guidance and continued support given by them to the council in the conduct of its work is acknowledged with gratitude.

The Director of the Council also places on record his gratitude and deep sense of appreciation to scientists and Scholars of various disciplines of medical system and other ancillary Sciences, Universities and Governmental agencies who are directly or indirectly associated with this Council and officials of all the research projects including the Headquarters Office for their cooperation in implementing the various programmes undertaken during the period under report.

The Council avails this opportunity to convey its profound thanks to Government of India, Ministry of Health and Family Welfare for their continuous support, helpful attitude and cooperation which enabled the Central Council to pursue its activities in the field of research and hopes to receive their continued support and cooperation in future also for the over all development of Ayurveda and Siddha.

The Council places on record the efforts of Deputy Director (Tech.), all Programme Officers, Senior Scientific Assistant (Stat.), Deputy Director (Admn.), Asstt. Director (Coordn.), Accounts Officer and Publication Section staff members for bringing out the Annual Report in the present form.