

Central Council for Research in Ayurveda & Siddha

MINISTRY OF HEALTH & FAMILY WELFARE
(GOVERNMENT OF INDIA)

16

Annual Report 1989-90

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

**ANNUAL REPORT
1989-90**



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

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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. During the reporting period 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 badly affected for want of funds even for minimum requirements. However, every possible efforts were made to maintain continuity in the work. 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), *Paksavadha* (hemiplegia), *Gridhrasi* (sciatica), *Saisaviyavata* (polio-myelitis), *Amlapitta* (hyperacidity), *Parinamasula* (duodenal ulcer), *Annadravasula* (gastric ulcer), *Pravahika* (dysentery), *Grahani roga* (malabsorption syndrome), *Kamala* (jaundice), *Tamaka swasa* (bronchial asthma), *Swetapradara* (leucorrhoea), *Raktapradara* (detrorrhagia), *Madhumeha* (diabetes mellitus), *Mutra Kriccha* (dysuria), *Vrikkasotha* (chronic nephritis), *Raktachapa* (hypertension), *Hridroga* (ischaemic heart diseases), *Slipada* (filariasis), *Visamajwara* (malaria), *Kitibha* (psoriasis), *Pama* (scabies), *Vicarcika* (oozing eczema) and *Arbudavisesa* (cancer).

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

During the execution of this programme, medical aid to 2,65,020 patients through Out Patient Departments and 906 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 68,030 individuals pertaining to 68 villages including 39 tribal pockets have been covered under this programme and incidental medical aid provided to 20,202 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. A total of 2976 herbarium specimens were added to the Herbarium. 1311 specimens were mounted and 490 specimens were identified. More than 10 quintal of raw drugs were supplied besides collecting about 150 raw drugs samples for Museum. The Survey Units have also taken up maintenance work of their Herbarium and Museum. During the reporting period tissue culture studies have also been initiated at JNAMPGH, Pune. About 450 medicinal species are presently growing in different Gardens. Pharmacognostical studies of 8 drugs, Chemical studies of 28 drugs and Pharmacological and Toxicological studies of 47 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 25 animals at the end of reporting period.

Under Drug Standardisation research studies 82 single drugs, 24 finished products and three methods of manufacture have been studied besides laying analytical standards for 27 formulations used in Ayurveda and Siddha.

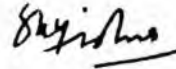
Literary Research Programme

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 upto Sharira Sthana (Chapter VIII) has been completed and printing of Sahasra Yoga is nearing completion. The Council is bringing out quarterly '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 six 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. 311 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 study of *Tankana (Borax)*, *Gunja (Abrus precatorius)*, *Arka (Calotropis procera)* and *Nirgundi (Vitex negundo)* 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.



(S. K. Mishra)

Director & Member Secretary
Governing Body(CCRAS)

Dated : 4/10/90

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, 1990 the membership of the Society and Governing Body of the Council were as under:-

1. President
Shri Ram Niwas Mirdha,
Union Minister for Health &
Family Welfare (upto 4th Dec. 1989).

2. Vice-President
Shri Nilamani Routray
Union Minister for Health &
Family Welfare (from 5th Dec., 89)
Miss Saroj Khaparde,
Union Minister of State for
Health & Family Welfare.
(upto July 1989)

Shri Rafiqe Alam,
Union Minister of State for
Health & Family Welfare
(from July, 89).

3-5 Official Members

1. Shri R. Srinivasan, Secretary
Ministry of Health & Family
Welfare.
2. Shri S.K. Alok, Joint Secretary,
Incharge of ISM, Ministry of
Health & Family Welfare
(upto August, 89).

Shri T.K. Das, Joint Secretary,
Incharge of ISM, Ministry of
Health & Family Welfare
(from Sep., 89).

3. Shri N.S. Bakshi, Joint
Secretary [F.A.] Ministry of
Health and Family welfare
(upto 15/8/89).

undertaking large scale trial of 777 oil for the treatment of Psoriasis.

8. Approved the purchase of essential equipments at an estimated cost of Rs.25,000/- for CRI(S), Madras for preparation of oil.
9. Approved the additional expenditure of Rs.1,40,222.49 on construction/electrical works at JNAMPGH, Pune.
10. Approved the deposit of Rs.1.00 lakh with CPWD, Bombay against the partitioning works at R.R.A. Poddar Central Research Institute (Ay.),Bombay.
11. Approved barbed wire fencing of Blocks 'B' and a portion of Blocks 'A' at RRC (Ay.), Jhansi at an estimated cost of Rs.84,900/- through CPWD.
12. Approved the estimate of Rs.3,45,500/- of State Electricity Board, U.P. for providing 25 H.P. electric feeder line at RRC (Ay.), Hastinapur.
13. Approved the provision of additional items of uniforms to Group D employees posted at Musk Deer Farm at Mehrori.
14. Approved the purchase of a new staff car for Head Quarters Office subject to condemnation of the existing staff car as per rules.
15. Approved the addition of a survey unit to Amchi Research Unit, Leh for undertaking survey of rare minerals and metals without creation of any post and by transferring the posts of RO (Botany) and Driver from other available units and after necessary permission from the Ministry for filling up these posts.
16. Approved holding of expert group meeting/conference by association of leading Amchi and Ayurvedic practitioners.
17. Approved holding of a workshop on "Literary Research in Ayurveda" at an estimated expenditure of Rs.50,000/-.
18. Revised the cost of diet schedule upto a maximum of Rs.12/- per patient per day in respect of CRI/RRI/RRC of the Council subject to budget provision and prior approval of the Finance Committee.
19. Approved the transfer of the Research Project of the Ministry of Forest and Environment on "Conservation of Folk/Tribal medicine in Kerala" to RRI (DR), Trivandrum subject to payment of institutional charge to the extent of 10% of the salary component and transfer of assets of the Project to the CCRAS on conclusion of the term of the Project.
20. Approved the recommendations of the sub-committee constituted by Department of

Family Welfare in regard to re-organisation of existing family welfare research units as per revised staff and expenditure pattern.

21. Approved maintenance and minor repairs to the rent free buildings provided by the state Government to the Indian Institute of Panchakarma at an estimated expenditure of Rs.87491.00.
22. Approved the proposal for establishment of Regional Research Institute (Ay.) by amalgamation of various units functioning at BHU, Varanasi.
23. Agreed in principle to the taking over of a new building with 25 thousand sq.ft. covered area at Bhiwani provided by the Government of Haryana after finalising the terms and conditions of handing over for establishment of Central Research Institute (Ay.) at Bhiwani.

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 S.K.Alok (upto August,89). Shri T.K.Das (from Sep.,89).	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

The Finance Committee met twice on ninth March, 1989 and 16th January, 1990 during the reporting period and dealt with various financial aspects of the affairs of the Council.

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

3.	Vd. Sitaram Mishra	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	Member
13.	Dr. L. Sharadamma	Member
14.	Director, CCRAS	Member Secretary

The Scientific Advisory Committee [Ayurveda] met on 28.8.89 and 24.12.1989 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. P.Gurusironmani	Member
5.	Prof. A.N. Namjoshi	Member
6.	Dr. C.S.Uthamaroyan	Member
7.	Director, CCRAS	Member Secretary

The Scientific Advisory Committee [Siddha] met on 25th August, 1989 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. Two time bound Research Enquiries were also in operation.

Budget Provision :

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

Scheme	Actual expenditure 1988- 89	Budget Estimates 1989-90	Revised Estimates 1989-90	Actual expenditure 1989-90
[Rs. in lakhs]				
Plan	94.88	200.00	180.00	116.45
Non-Plan	458.59	410.00	491.00	499.71
F.W.R.S.	14.18	14.90	15.65	15.65

Audited Statement of Accounts:

The accounts of the Council for the year 1989-90 for the period from 1st April, 1989 to 31st March, 1990 were audited by the D.A.C.R.

Special Events:

Head Quarters building for CCRAS and other Research Councils as well as CCIH and CCH named as Jawaharlal Nehru Bharatiya Chikitsa Evam 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 this year. The building was designed by the Design Bureau of DGHS and the construction is entrusted to CPWD at an estimated outlay of Rs.376.85 lakhs.

The Head Quarters Office has acquired Personnel Computer (PC-AT and PC-XT). Bio-data of Council's employees, sanctioned staff pattern, GIS Accounts, GPF Accounts, Address Lists and List of Medicinal Plants have been computerised besides preparing subjectwise and authorwise index of PG Thesises of Ayurveda and maintaining information on activities and achievements of the council.

TECHNICAL REPORT - AYURVEDA

Abbreviations used for Institutes/Centres/Units

S.No.	Institutes/Centres/Units	Abbreviations
1.	Central Research Institute [Ay.], New Delhi	CRID
2.	Central Research Institute [Ay.], 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	RIIJ
11.	Regional Research Institute [Ay], Junagadh	RIIJu
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. Lakshmiapati Research Centre for Ayurveda, V.H.S., Madras	ALRCAM
26.	Ayurvedic Research Unit, NIMH&NS, Bangalore	ARUB
27.	Clinical Research Unit [Ay], Hyderabad	CRUII
28.	Clinical Research Unit [Ay], Kottakkal	CRUK
29.	Clinical Research Unit [Ayurvedic and Modern Teams under CDRS], Varanasi	CDRSV
30.	Amalgamated Units, Tarikhet	A&UT
31.	Captain Srinivasamurthy Drug Research Institute for Ayurveda, Madras	CSMDRIAM
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	IIHMH
59. Literary Research Unit, Madras	LRUM
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], Jagdapur [M.P]	THCRPJa
67. Tribal Health Care Research Project [Ay], Imphal [Manipur]	THCRPI
68. Drug Standardisation Research Project, Jamnagar	DSRPJ
69. Drug Standardisation Research Project, Varanasi	DSRPV
70. Research Project in Tibetan System of Medicine, Leh	RPTSML
71. Medicinal Plant Garden at RRC, New Itanagar	MPGI

CLINICAL RESEARCH PROGRAMME

The Clinical Research Programme in Ayurveda under the Council consists of clinical therapeutic trials on single drugs, compound formulations and simple herbo-mineral preparations on selected clinical conditions besides the field studies relating to Health Care Research Services through Service Oriented Survey and Surveillance Research Programme, Community Health Care Research Programme and Tribal Health Care Research Programme.

Clinical Therapeutic Trials

The present chapter provides the details of the work carried out under clinical therapeutic trials. The different clinical conditions studied during the reporting period include *Amavata* [rheumatoid arthritis], *Paksavadha* [hemiplegia], *Gridhrasi* [sciatica], *Pangu* [paraplegia], *Saisaviyavata* [poliomyelitis], *Amlapitta* [hyperacidity], *Parinamasula* [duodenal ulcer], *Annadravasula* [gastric ulcer], *Grahaniroga* [malabsorption syndrome], *Tamaka Svasa* [bronchial asthma], *Swetapradara* [leucorrhoea], *Raktapradara* [metrorrhagia], *Kitibha* [psoriasis], *Madhumeha* [diabetes mellitus], *Mutrakriccha* [dysuria], *Vrikkasotha* [chronic nephritis], *Raktacapa* [hypertension], *Hridroga* [ischaemic heart diseases], *Slipada* [filariasis], *Vismajwara* [malaria] and *Arbuda Visesa* [cancer]. During the execution of clinical studies, medical aid was provided to 2,17,768 patients through Out patient Departments and 624 patients through In patient Departments functioning at different Institutes /Centers /Units of the Council. A brief review of each of clinical therapeutic studies indicating the line of treatment, name of the Institutes/Centres/Units where the work was carried out together with the total number of cases of particular disease condition, included into the study and results thereof is provided hereunder.

Amavata [rheumatoid arthritis]

The Clinical therapeutic studies on *Amavata* [rheumatoid arthritis] were conducted at CRI, Bhubaneshwar, IIP Cheruthuruthy, RRI, Calcutta, IIK, Patiala, RRC, Jammu, RRC Itanagar and RRI, Gwalior. A total number of 122 cases have been treated adopting different therapeutic approaches. The following table summarizes the details related to the line of approach and the number of cases treated together with the results.

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

S.No.	Therapy	Instt./ Centre/ Unit	Total cases	Results					
				Comp. rel.	Mark. rel.	Mode. rel.	Mild rel.	No rel.	Drop out
1.	Sunthi Guggulu	CRIBh	5	-	2	1	-	1	1
2a.	Aswagandha Curna with Baluka sweda.	IIPC	5	2	-	-	1	2	-
b.	Pancakarma with Murchana Taila.		1	-	-	-	-	-	1
3a.	Sunthi Guggulu	IIKP	5	-	-	-	2	-	3
b.	Aswagandha Curna with Baluka sweda.		13	-	-	2	3	-	8
4.	Trikustha Guggulu	RRCJ	4	1	-	-	-	1	2
5a.	Musta Curna and Baluka sweda.	RRCI	30	-	5	5	6	2	12
b.	Aswagandha Curna and Baluka sweda.		5	-	1	-	3	-	1
c.	Sunthi Guggulu and Baluka sweda.		15	1	7	3	1	1	2
6.	Sunthi Guggulu and Baluka sweda.	RRIC	26	3	7	-	5	3	8
7.	Musta Curna with Baluka sweda.	RRIG	13	-	-	-	5	5	3
Total			122	7	22	11	26	15	41

Sandhigatavata [osteo-arthritis]

The clinical therapeutic studies on *Sandhigatavata* [osteo-arthritis] were conducted by RRI, Gwalior and RRC, Jammu. Out of the three cases studied by RRI, Gwalior using *Musta Curna* with *Baluka sweda* mild relief was seen in two cases while one case discontinued the study. Out of the 20 cases studied by RRC, Jammu using *Trikustha guggulu* complete relief was seen in one case, marked relief in three cases, moderate relief in eleven, mild relief and No relief in two cases each while remaining one case discontinued the study.

Gridhrasi [sciatica]

The clinical therapeutic studies on *Gridhrasi* [sciatica] was conducted at IIP, Cheruthuruthy. Out of the four patients studied using *Bhallataka Curna* with milk one patient each

showed good response and no response and two patients showed poor response.

Ardita [bell's palsy]

The clinical therapeutic study on *Ardita* [Bell's palsy] was conducted at IIP, Cheruthuruthy. A total number of 12 cases were included into the study using *Mahavataavidwansa Rasa* and *Rasna Saptaka Kwatha* out of which two cases each showed good response and poor response. One case each showed fair response and no response while remaining six cases discontinued the study.

Saisaviyavata [poliomyelitis]

The clinical therapeutic studies on *Saisaviyavata* [poliomyelitis] were conducted at IIP, Cheruthuruthy and CRI, Delhi. A total number of eight cases were included into the study. Out of the four cases studied by CRI, Delhi using *Ekangavira rasa* one case each showed good response, poor response and no response while remaining one case discontinued the study. All the four cases included into the study by IIP, Cheruthuruthy were continuing the treatment at the end of reporting period.

Paksavadha [hemiplegia]

The clinical therapeutic studies on *Paksavadha* [hemiplegia] were conducted at IIK, Patiala, IIP, Cheruthuruthy and CRI, Delhi. A total number of 21 cases have been treated adopting different therapeutic approaches. The following table summarizes the details related to the line of approach and the number of cases treated together with the results.

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

S.No. Therapy		Instt./ Center/ Unit	Total cases	Results					
				Comp. rel.	Mark. rel.	Mode. rel.	Mild rel.	No rel.	Drop out
1	2	3	4	5	6	7	8	9	10
1a.	Ekangavira Rasa	IIKP	5	-	-	-	2	3	-
b.	Samira Pannaga Rasa		1	-	-	-	-	1	-
2a.	Sivagutika and Samira Pannaga Rasa internally and Mahamasa Taila externally	IIPC	3	-	-	-	1	2	-

1	2	3	4	5	6	7	8	9	10
b.	Tapyadi Lauh and Ekangavira Rasa internally and Mahamasa Taila externally		1	-	-	-	1	-	-
c.	Samira Pannaga Rasa internally Mahamasa Taila externally with Salidhanya Pinda Sweda.		1	-	-	-	-	1	-
d.	Ekangavira Rasa internally Maha- masa Taila externally and Salidhanya Pinda Sweda.		2	-	-	-	1	1	-
e.	Pancakarma therapy		4	-	-	-	2	2	-
3.	Ekangavira Rasa	CRID	4	-	1	1	1	-	1
Total			21	-	1	1	8	10	1

Annadravasula [gastric ulcer]

The clinical therapeutic study on *Annadravasula* [gastric ulcer] was carried out at RRC, Itanagar. A total number of 21 cases have been studied in two groups.

In the first group three patients were included and studied using Pravalapisti and Jaharamohra Pisti. Out of these three patients fair response was seen in one patient while two patients discontinued the study.

In the second group 18 patients were studied using *Eladi Curna* and *Amalaki Curna* out of which good to fair response was seen in 11 patients and poor response in one patient while remaining six patients discontinued the study.

Amlapitta [hyperacidity]

The clinical therapeutic studies on *Amlapitta* were conducted at CRU, Hyderabad, RRC, Nagpur, RRC, Mandi, RRC, Hastinapur, RRI, Junagadh, CRU Kottakkal and CRI, Bombay. A total number of 175 cases have been treated adopting different therapeutic approaches. The following table summarizes the details related to the line of approach and the number of cases treated together with the results.

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

S.No.	Therapy	Instt./ Centre/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1a.	Amalaki Curna and Sarjika Ksara	CRUH	9	4	1	-	-	4
b.	Avipattikara Curna & Kapardika Bhasma		25	2	5	-	-	18
2a.	Avipattikara Curna & Kapardika Bhasma	RRCN	4	4	-	-	-	-
b.	Sarjika Ksara		1	-	-	-	-	1
3.	Avipattikara Curna and Kapardika Bhasma	RRCM	5	-	2	1	-	2
4.	Avipattikara Curna and Kapardika Bhasma.	RRCH	32	5	1	-	-	26
5a.	Sarjika Ksara Jaharamohara Pisti and Amalaki Svrasa	RRIJu	10	2	6	1	1	-
b.	Avipattikara Curna, Kapardika Bhasma		8	-	3	4	-	1
c.	Sarjika Ksara and Amalaki Curna.		7	-	2	3	-	2
d.	Control group(Bland diet)		5	-	3	-	-	2
6a.	Avipattikara Curna and Sanka Bhasma.	CRUK	7	2	2	-	3	-
b.	Amalaki Curna and Sarjika Ksara.		18	7	8	1	2	-
c.	Control group		15	-	-	-	15	-
7a.	Sarjika Ksara Jaharamohara Pisti and Amalaki Svrasa	CRIB	8	4	1	-	-	3
b.	Avipattikara Curna, Kapardika Bhasma		9	3	1	-	1	4
c.	Sarjika Ksara and Amalaki Curna.		6	3	1	-	-	2
d.	Control group(Bland diet)		6	2	-	-	1	3
Total			175	38	36	10	23	68

Parinumasula [duodenal ulcer]

The clinical therapeutic studies on Parinamasula [Duodenal ulcer] were conducted at CRU, Hyderabad and Kottakkal and CRI, Delhi. A total number of 70 cases have been treated adopting different therapeutic approaches. The following table summarizes the details related to the line of approach and the number of cases treated with the results.

Table
Results of clinical therapeutic studies of Ayurvedic preparations on Parinamasula [duodenal ulcer]

S.No. Therapy	Instt./ Centre/ Unit	Total cases	Results				
			Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1a. Indukanta Ghrita	CRUH	10	3	4	-	-	3
b. Mahatiktaka Ghrita		27	-	5	-	-	22
2a. Indukanta Ghrita	CRUK	12	4	3	5	-	-
b. Mahatiktaka Ghrita		13	6	1	6	-	-
3a. Sutasekhara Rasa and Amalaki Svrasa	CRID	6	-	1	-	-	5
b. Nimbatiktam capsule		2	1	-	-	-	1
Total		70	14	14	11	-	31

Pravahika [dysentery]

The clinical therapeutic study on Pravahika [dysentery] was conducted at RRC, Gangtok on 75 patients using *Jatiphaladi Curna*, *Mahasankha Vati*, *Chitrakadivati* and *Hingwastaka Curna* out of which 21 patients each got complete relief and marked relief. Mild relief was seen in 19 patients while remaining 31 patients discontinued the study.

Grahaniroga [malabsorption syndrome]

The clinical therapeutic study on *Grahaniroga* [malabsorption syndrome] was conducted at RRC, Jammu, on seven cases using *Kutajaghanavati* and *Sankha drava* out of which two patients got marked relief and five patients got moderate relief.

Kamala [jaundice]

The clinical therapeutic studies on *Kamala* [jaundice] were conducted at RRI, Lucknow, RRC, Jammu, and RRC, Hastinapur. A total number of 18 cases have been treated adopting different therapeutic approaches. The following table summarizes the details related to the line

of approach and the number of cases treated together with the results.

Table

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

S.No.	Therapy	Instt./ Centre/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1.	Punarnava Mandura Arogyavardhini and Sarjika Ksara	RRIL	1	-	-	-	1	-
2.	Punarnava Mandura Arogyavardhini & Sweta Parpati	RRCJ	4	1	3	-	-	-
3.	Punarnava Mandura Arogyavardhini & Sarjika Ksara	RRCH	13	2	1	-	1	9
Total			18	3	4	-	2	9

Raktarsa [bleeding piles]

The clinical therapeutic study on *Raktarsa* [bleeding piles] was conducted at IIK, Patiala, on eight patients in two groups using *Bolabhadra Rasa* in one group and *Surana Kanda Yoga* in another group. All the eight patients were continuing the treatment at the end of reporting period.

Bhagandra [fistula-in-ano]

CRI, Bombay has studied six patients of this disease condition using *Ksara Sutra* technique out of which two patients each got complete relief and marked relief while remaining two patients discontinued the study.

Tamaka Svasa [bronchial asthma]

The clinical therapeutic studies on *Tamakasvasa* [bronchial asthma] were conducted at RRI, Lucknow, IIK Patiala RRI, Junagadh, Patna and Gwalior. A total number of 92 cases have been treated adopting different therapeutic approaches. The following table summarizes the details related to the line of approach and the number of cases treated together with the results.

Table

*Results of clinical therapeutic studies of Ayurvedic preparations on
Tamaka Svasa [bronchial asthma]*

S.No.	Therapy	Instt./ Centre/ Unit	Total cases	Results						
				Comp. rel.	Mark. rel.	Mode. rel.	Mild rel.	No rel.	Drop out	
1.	Bhagottara Gutika	RRIL	3	-	-	-	2	1	-	
2a.	Bhagottara Gutika	IIKP	18	-	3	5	2	2	6	
b.	Somalatadi Yoga		9	-	1	4	3	-	1	
3a.	Bhagottara Gutika	RRIJu	3	-	1	1	1	-	-	
b.	Somalata, Kantakari and Narasara.		1	-	-	-	1	-	-	
4a.	Bhagottara Gutika	RRIP	13	-	2	4	2	-	5	
b.	Somalatadi Yoga		14	-	-	1	1	7	5	
5.	Somalatadi Yoga	RRIG	31	1	6	-	9	7	8	
Total			92	1	13	15	21	17	25	

Swetapradara [leucorrhoea]

The clinical therapeutic studies on *Swetapradara* [leucorrhoea] were conducted at CRI, Bhubaneswar, IIP, Cheruthuruthy and RRC, Nagpur. A total number of 50 cases have been treated adopting different therapeutic approaches. The following table summarizes the details related to the line of approach and the number of cases treated together with the results.

Table

*Results of clinical therapeutic studies of Ayurvedic preparations on
Swetapradara [leucorrhoea]*

S.No.	Therapy	Instt./ Centre/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drep out
1	Swarna Vanga and Kukkutandatwak Bhasma	CRIBh	20	5	2	8	-	5
2a.	Swarna Vanga, Kukkutandatwak Bhasma and Punar- anava Mandura with douche of Udumbara Tvak Kwatha	IIPC	9	5	1	1	-	2
b.	Lodhrasava , Patrangasava, Aswan- gadha Curna and Pichu with Nirgundi Taila		6	3	2	1	-	-
c.	Punarnava Mandura Bhasma and douche of Panchvalkala Kwatha.		9	5	3	1	-	-
3.	Aswagandha Curna Lodhrasava and Patrangasava	RRCN	6	1	1	-	-	4
Total			50	19	9	11	-	11

Rakta Pradara [metrorrhagia]

The clinical therapeutic studies on *Rakta Pradara* [metrorrhagia] were conducted at IIK, Patiala and RRI, Junagadh. A total number of 53 cases have been treated adopting different therapeutic approaches. The following table summarizes the details related to the line of approach and the number of cases treated together with the results.

Table

Results of clinical therapeutic studies of Ayurvedic on Rakta Pradara [metrorrhagia]

S.No.	Therapy	Instt./ Centre/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1a.	Pusyanuga Curna and Pratapalankeshwara Rasa	IIKP	33	13	19	-	-	1
b.	Kamdudha Rasa and Durva Svrasa		10	-	5	1	-	4
2.	Kamdudha Rasa and Durva Svrasa	RRIJu	10	-	4	3	-	3
Total			53	13	28	4	-	8

Madhumeha [diabetes mellitus]

The clinical therapeutic studies on *Madhumeha* [diabetes mellitus] were conducted at IIK, Patiala, RRI, Calcutta and ALRCA, Madras. A total number of 24 cases have been treated adopting different therapeutic approaches. The following table summarizes the details related to the line of approach and the number of cases treated together with the results.

Table

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

S.No.	Therapy	Instt./ Centre/ Unit	Total cases	Results				
				Good cont.	Fair cont.	Poor cont.	No cont.	Drop out
1a.	Nygrodhadi Curna and Vijayasara Kwatha	IIKP	9	-	-	-	-	9
b.	Nishayadi Yoga and Vijayasara Kwatha		5	-	-	2	-	3
2.	Bimbi and Nisaamalaki	ALRCAM	3	-	3	-	-	-
3a.	Nygrodhadi Curna and Bhumyaamalaki Curna	RRIC	5	1	1	-	-	3
b.	Control group [Tolb.]		2	1	-	1	-	-
Total			24	2	4	3	-	15

Medoroga [obesity]

The clinical therapeutic study on *Medoroga* [obesity] was conducted by RRI, Junagadh using AYUSH-55. Out of nine cases studied one case showed fair response and three cases showed poor response while remaining five patients discontinued the study.

Mutrakriccha [dysuria]

The clinical therapeutic studies on *Mutrakriccha* [dysuria] were conducted at RRI, Lucknow and Gwalior, RRC, Itanagar and Hastinapur. A total number of 134 cases have been treated adopting different therapeutic approaches. The following table summarizes the details related to the line of approach and the number of cases treated together with the results.

Table

*Results of clinical therapeutic studies of Ayurvedic preparations on
Mutrakriccha [dysuria]*

S.No.	Therapy	Instt./ Centre/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1.	Trinapanamula Kwatha, Goksuradi Guggulu and Sveta Parpati.	RRIL	1	-	-	1	-	-
2a.	Trinapanamula Kwatha and Sveta Parpati.	RRCI	30	8	4	9	-	9
b.	Laghupanmula Kwatha		65	3	24	12	2	24
3.	Trinapanamula Kwatha and Sveta Parpati.	RRIG	7	-	4	3	-	-
4a.	Sveta Parpati and Trinapanamula	RRCH	19	4	-	-	-	15
b.	Sveta Parpati and Goksuradi Guggulu		12	4	2	-	-	6
Total			134	19	34	25	2	54

Mutrasmari [urolithiasis]

The clinical therapeutic study on *Mutrasmari* [urolithiasis] was conducted at RRC, Jammu on nine cases using *Svetaparpati*, *Pasanbheda* and *Goksuru Kwatha*. The treatment provided showed good response in two cases, fair response in six cases and poor response in one case.

Vrikka Sotha [chronic nephritis and nephrotic syndrome]

The clinical therapeutic study using kwatha of *Punarnava*, *Trinapancamula*, *Goksuru*, *Varuna* and *Sigru* was continued further by CRU [AT & MT] Varanasi. During the reporting period eight new cases were included, into this study. The study showed clinical improvement as well as decline in creatinine and urea levels and rise in creatinine clearance suggesting improved kidney functions.

Raktacapa [hypertension]

The therapeutic studies on *Raktacapa* [hypertension] were conducted at IIK, Patiala and RRI, Calcutta. A total number of 22 cases have been included into these studies. RRI, Calcutta studied 18 cases in two groups using *Tagaradi* and *Ushiradi Curnas* out of which good response was seen in one, fair response in three and no response in one case. The remaining 13 cases discontinued the study.

All the four cases included into the study by IIK, Patiala using *Ushiradi Curma* were continuing the study at the end of the reporting period.

The role of Puskarmula and Guggulu in the cases of Ischaemic heart diseases and hypertension.

This study was continued further at CRU[AT] and CRU[MT] Varanasi and 24 new cases were included into the study during the reporting period. The study showed significant fall in serum cholesterol, serum triglycerides and serum total lipids besides fall in body weight after treatment. Most of the cases got fair relief from precordial pain, dyspnoea and palpitation. Significant improvement in ECG was seen in most of the cases. Overall assessment showed good response in most of the cases who continued treatment for more than three months.

Visamajwara [malaria]

✓ The clinical therapeutic studies on *Visamajwara* [malaria] were conducted by RRI, Junagadh, RRC, Jammu and ALRCA, Madras. A total number of 19 positive cases were studied using AYUSH-64. The treatment provided complete relief in 18 cases and no relief in one patient.

Visamajwara [symptomatic cases]

The clinical therapeutic studies on *Visamajwara* [symptomatic] cases were conducted at CRI, Delhi, RRI, Jaipur, RRC, Nagpur, RRC, New Itanagar, RRC, Mandi and RRC, Hastinapur. A total number of 79 cases have been treated adopting different therapeutic approaches. The following table summarizes the details related to the line of approach and the number of cases treated together with the results.

Table
*Results of clinical therapeutic studies of Ayurvedic preparations on
Visamjwara [symptomatic cases]*

S.No. Therapy	Instt./Total Centre/cases	Results						
		Unit	Comp. rel.	Mark. rel.	Mode. rel.	Mild rel.	No. rel.	Drop out
1. AYUSH-64	RRIJ 15		9	3	1	-	2	-
2. AYUSH-64	RRCN 4		-	-	-	-	-	4
3. AYUSH-64	RRCI 8		5	-	-	-	-	3
4. AYUSH-64	RRCM 15		4	-	-	3	-	8
5. AYUSH-64	RRCG 5		3	2	-	-	-	-
6. AYUSH-64	CRID 7		4	2	-	1	-	-
7. AYUSH-64	RRCH 25		19	-	-	-	1	5
Total		79	44	7	1	4	3	20

Slipada [filariasis]

The clinical therapeutic studies on *Slipada* [filariasis] were conducted at CRI, Bhubaneswar, RRC, Nagpur and RRI, Patna. A total number of 31 cases have been treated adopting different therapeutic approaches. The following table summarizes the details related to the line of approach and the number of cases treated together with the results.

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

S.No.	Therapy	Instt./ Centre/ Unit	Total cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1	2	3	4	5	6	7	8	9
1.	Sudarsanaghana Vati, Arogyavardhini and Punarnavarista	CRIBh	17	6	5	2	4	-
2.	AYUSH-64 with Nimba Pancanga Curna	RRCN	2	1	1	-	-	-

1	2	3	4	5	6	7	8	9
3a.	AYUSH-64	RRIP	11	5	-	3	-	3
b.	Sudarsanaghanavati and Mahamanjishtadi Kwatha.		1	-	-	1	-	-
Total			31	12	6	6	4	3

Kitibha [psoriasis]

The clinical therapeutic studies on *Kitibha* [psoriasis] were conducted at RRI, Junagadh and RRI, Trivandrum. A total number of 56 cases have been treated adopting different therapeutic approaches. The following table summarizes the details related to the line of approach and the number of cases treated together with the results.

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

S.No.	Therapy	Instt./Total Centre/cases	Unit	Results					
				Comp. rel.	Mark. rel.	Mode. rel.	Mild rel.	No rel.	Drop out
1.	Arogyavardhini Vati and Cakramarda Kera	RRIJu	8	-	-	5	3	-	-
2a.	Nimbidin cap. and Lajjalu kera.	RRIT	37	-	5	10	5	2	15
b.	Arogyavardhini Vati and Cakramarda Kera		11	-	1	4	3	-	3
Total			56	-	6	19	11	2	18

Vicarcika [oozing eczema]

The clinical therapeutic studies on *Vicarcika* [oozing eczema] were conducted at RRI, Trivandrum and RRC, Itanagar. A total number of 38 cases have been treated adopting different therapeutic approach. The following table summarizes the details related to the line of approach and the number of cases treated together with the results.

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

S.No. Therapy	Instt./ Centre/cases	Total Unit	Results					
			Comp. rel.	Mark. rel.	Mode. rel.	Mild rel.	No rel.	Drop out
1a. Cakramarda Kwatha and Cakramarda Kera.	RRIT	2	-	2	-	-	-	-
b. Manjisthadi Kwatha and Arkapatra Kera		3	-	1	2	-	-	-
2a. Cakramarda kwatha and Cakarmarda Kera	RRCI	19	2	1	3	6	4	3
b. Arogyavardhini and Aragbadhadikar taila		14	3	-	7	-	3	1
Total		38	5	4	12	6	7	4

Pama [scabies]

The clinical therapeutic study on *Pama* [scabies] was conducted by RRC, Itanagar. A total number of 37 patients were included into the study. The first group consisting of 28 cases studied using *Tuvaraka Curna*, *Sudhagandhaka* and *Mahamaricyadi Taila* showed complete relief in one patient, marked relief in six patients and mild relief in eight patients. No relief was seen in three patients while remaining 10 patients discontinued the study.

The second group consisting of nine patients studied using *Arogyavardhini Vati*, *Kaishore Guggulu* and *Marichyadi Taila* showed complete relief, moderate relief and no relief in two patients each. One patient each showed marked relief and mild relief while one patient discontinued the study.

Switra [vitiligo]

The clinical therapeutic studies on *Switra* [vitiligo] were conducted at RRI, Trivandrum and RRC, Hastinapur. A total number of 22 cases have been studied with AYUSH-57. The study showed fair response in three patients and poor response in one patient. The remaining 19 patients discontinued the study.

Other Tvak Roga [skin diseases]

The clinical therapeutic study on *Tvak Roga* [skin diseases] was conducted at RRC, Gangtok. A total number of 43 cases have been treated with *Sudhagandhaka*, *Arogyavardhini vati* and *Haridra Khanda*. The study showed complete relief in two patients, marked relief, moderate relief and mild relief in nine patients each while remaining 14 patients discontinued the study.

Apasmara [epilepsy]

The clinical therapeutic study on *Apasmara* [epilepsy] using AYUSH-56 was conducted by CRI, Delhi and 22 new cases were included into the study besides 20 old cases continuing treatment from previous year. The treatment has shown fair response in most of the patients who continued the treatment for more than six months.

Chittodvega [anxiety neurosis]

The clinical therapeutic study on this disease condition was conducted at Dr. A. Lakshmi pathi Research Center for Ayurveda, Madras on six patients using AYUSHMAN-15. The study showed mild relief in four patients while remaining two patients discontinued the study.

Study of Rasayana effect of Ayurvedic drugs

This study was conducted by Dr. A. Lakshmi pathi Research Centre for Ayurveda, Madras using a compound drug containing *Bala*, *Guduci*, *Amalaki* and *Yashti*. Out of the 17 cases included into the study fair response was seen in 11 cases while remaining six cases discontinued the study.

Arbuda Visesa [cancer]

The study on *Arbuda Visesa* [cancer] was carried out by CRI Delhi on eight patients using plumbagin and STG compound. Out of these one patient has shown some improvement and no improvement was seen in one patient. One patient discontinued the study and remaining five patients were continuing the treatment at the end of reporting period.

*Statement showing disease group, number of patients included
and participating projects during 1989-90*

S.No. Disease groups	No. of patients	Participating projects
1. Vatavyadhi		
a. Amavata	122	CRIBh, IIKP, IIPC, RRIC RRIG, RRCJ and RRCI

b.	Sandhigatavata	23	RRIG and RRCJ
c.	Paksavadha	21	IIKP,IIPC & CRID
d.	Gridhrasi	4	IIPC
e.	Ardita	12	IIPC
f.	Saisaviyavata	8	CRID, IIPC
2.	Amlapitta, Parinamasula		
a.	Annadravasula	21	CRUH, RRCI
b.	Amlapitta	175	RRCM, RRCN, RRCH, RRIJu, CRUK,CRIB
c.	Parinamasula	70	CRID,CRIBh, CRUH, CRUK
3.	Pravahika, Grahniroga		
a.	Pravahika	75	RRCG
b.	Grahniroga	7	CRIBh, RRCJ
4.	Other Udar Roga		
a.	Kamala	18	RRCJ,RRCH,RRIL.
b.	Raktarsa	8	IIKP, RRIC
C.	Bhagandara	6	CRIB.
5.	Tamaka Svasa	92	IIKP,RRIL, RRIJu, RRIP,RRIG
6.	Stri roga		
a.	Swetapradara	50	CRIBh,IIPC,RRCN.
b.	Raktapradara	53	IIKP,RRIJu
7.	Madhumeha, Mutra roga		
a.	Medo roga	9	RRIJu.
b.	Madhumeha	24	IIKP,RRIC,ALRCAM
c.	Mutrakriccha	134	RRCI,RRCH,RRIL
d.	Mutrasmari	9	RRCJ
e.	Vrikkasotha	8	CDRSV
8.	Raktacapa	22	IIKP,RRIC
9.	Hridroga	24	CDRSV
10.	Visamajwara		
a.	Visamajwara [malaria]	19	RRCJ, RRIJu,ALRCAM
b.	Visamajwara	79	CRID,RRIJ,RRCN,RRCI, RRCM, RRCH
11.	Slipada	31	CRIBh,RRCN,RRIP.
12.	Tvak Roga		
a.	Kitibha	56	RRIJu,RRIT
b.	Vicarcika	38	RRIT,RRCI
c.	Pama	37	RRCI
d.	Svitra	22	RRCH,RRIT
e.	Other Tvakroga	43	RRCG
13.	Manasaroga		
a.	Apasmara	22	CRID
b.	Chittodvega	6	ALRCAM

Table
Statement of the patients attended at OPD and
admitted/discharged in the IPD during 1989-90

SNo.	Instt./ Centre/ Unit	Number of Patients attended				% of Bed	
		O.P.D.	I.P.D.		Occpancy		
		NEW	Old	Total	Admitted	Discharged	
1.	CRI, Bhubaneswar	5759	7978	13937	41	31	4.40
2.	CRI, Delhi	8655	9288	17937	43	53	5.20
3.	IIC, Patiala	7245	6428	13673	61	74	20.92
4.	IIP, Cheruthuruthy	6036	15320	21356	27	24	07.34
5.	CRI, Bombay	2362	8228	10590	Not yet started		
6.	RRI, Lucknow	5330	4779	10109	12	12	01.02
7.	RRI, Calcutta	3348	12806	16154	8	8	09.19
8.	RRI, Junagardh	4075	7913	11988	9	10	03.22
9.	RRI, Patna	2098	1785	3883	4	4	13.08
10.	RRI, Gwalior	5525	5079	10604	51	56	14.42
11.	RRI, Trivandrum	2515	9400	11915	26	22	48
12.	RRI, Jaipur	2558	2513	5071	67	66	18.95
13.	RRC, Nagpur	1326	4374	5700	Not yet started		
14.	RRC, Bangalore	828	1829	2657	Not yet started		
15.	RRC, Jammu	5383	7187	12570	- do -		
16.	RRC, Mandi	3629	2459	6088	10	14	02.07
17.	RRC, Hastinapur	3957	4005	7962	14	14	26.00
18.	RRC, Gangtok	4654	2505	7159	-	-	-
19.	RRC, Jhansi	1434	1483	2917	Not sanctioned		
20.	RRC, Itanagar	4182	8380	12562	24	29	01.02
21.	RRC, Vijayawada	3112	7328	10440	-	-	
22.	CRU, Kottakkal	-	-	-	149	153	92.69
23.	ALRCA, Madras	241	365	606	5	5	N.A.
24.	ARU, Bangalore	306	496	802	21	24	55.05
25.	CRU, Hyderabad	1082	-	1082	25	25	N.A.
Total		77,185	122,640	217,768	593	624	

Health Care Research Programme

Health Care Research Programme of the Council consists of Service Oriented Survey and Surveillance Research Programme, Community Health Care Research Programme and Tribal Health Care Research Programme. These programmes operate at the selected villages around the location of Institutes/Centers/Units carrying out these programmes. These programmes have been badly affected during the reporting period since visits to the villages had to be curtailed / discontinued for want of funds for medicines and fuel for vehicles. However all possible efforts have been made to maintain continuity in the the work wherever it could be possible within the meager resources. The details of the work carried out during the reporting period under each of these three programmes is provided hereunder:

1. Service Oriented Survey and Surveillance Research Programme

This programme envisages survey of each and every house of the selected villages for extending medical aid to the diseased persons at their door steps and collection of data pertaining to the diseased persons with regard to their illness using the prescribed proforma specifically designed for the purpose. Informations about the socio-economic status of the village, natural resources, the standard and type of treatment available to the rural folk are also collected. During the reporting period 13 villages consisting of a population of 25,892 individuals have been covered and incidental medical aid extended to 3727 patients [Annexure - I]. Besides this MCRU, Varanasi have carried out clinical studies on Sweta pradara using douche of Udumbar twak kwatha on 26 patients in the field conditions. The treatment provided good to fair response in 25 patients while one patient discontinued the study.

2. Community Health Care Research Programme

This programme envisages adoption of the selected villages for extending medical aid and for creating awareness through group discussions/lectures regarding the ways and means to be adopted for maintenance of positive health and prevention of diseases besides acquainting the rural folk about the herbs locally available together with their uses so that many of the common ailments may be treated by the locally available resources. While extending medical aid detailed information about the diseased persons are also collected in the prescribed proforma. During the reporting period 11 villages consisting of a population of 21923 individuals have been covered and incidental medical aid provided to 2285 patients [Annexure II]. During execution of this programme school children of a few villages were also benefited by way of their health check up and medical aid.

3. Tribal Health Care Research Programme

This programme has been initiated with the aim to study living conditions of tribal people, folk medicines used by them occurrence of medicinal plants in the area, propagation of knowledge about oral hygienes, prevention of diseases, uses of common medicinal plants available in the area and to extend medical aid at their door steps. This programme has been

continued further by the Tribal Health Care Research Projects functioning at Car-Nicobar [Andaman-Nicobar Island], Ranka Block District Palamau [Bihar], Chinchapada District Dhule [Maharashtra], Rama Block District Jhabua, Jagdalpur [Madhya Pradesh], Ziro [Arunachal Pradesh] and Imphal [Manipur]. During the reporting period 22 tribal pockets/villages consisting of a population of 15,558 individuals have been covered and incidental medical aid extended to 11,165 patients (Annexure-III). About 150 specimens of the plants found growing in these areas have been collected. Efforts have also been initiated to compile and analyse the data/informations gathered by these projects. Besides this the project at Palamau carried out some clinical trials on Visamjwara, Parinamsula, Abhisayanda, Gridhrasi and Twak roga in the field conditions. The treatment provided in these clinical conditions and results there of is shown in the table

Table

S.No.	Disease & Treatment	Total cases	Results					
			Comp. rel.	Mark. rel.	Mode. rel.	Mild. rel.	No rel.	Drop out
1.	Visamjwara (AYUSH-64 & Amritarist)	89	79	-	-	-	-	10
2.	Parinamsula (Avipattikara Curna, Yastimadhu Curna and Kapardika Bhasma)	64	48	-	16	-	-	-
3.	Abhisayanda (Saptamrita Lauha and Chandrodaya Vriti)	35	31	-	-	-	-	4
4.	Gridhrasi (Yogaraja Guggulu, Agnitundi Vati, Balarista and Nirgundi Lepa)	28	28	-	-	-	-	-
5.	Tvak Roga (Kaishore Guggulu, Kanchnara Guggulu and Gandhaka Tankan Yoga)	74	69	-	-	-	5	-

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

S. No.	Name of the Instrt.\ Centre\ Unit	Name of the Villages covered	Popu-lation	*No. of patients treated	Common Diseases
1.	IIP, Cheruthuruthy	Kurumala	1094	395	Atisara, Tvakroga, Svasa, Vatavikara, Udarasula, Pandu, Sirahsula, Pradara.
2.	MCRU, Jamnagar	Morkanda Khimaliya Nava Nagar Vibhapur	1184	226	Jvara, Tvakroga, Atisara, Kasa, Svasa, Karnaroga, Vatavyadhi, Katisula Mukhroga, Udarasula
3.	MCRU, Varanasi	Benipur Sonakha Sarasauli	3800	2086	Striroga, Atisara, Krimi, Pravahika, Sandhisotha, Pratisaya.
4.	CRI, Bhubaneshwar	Panchagaon	1500	386	Tvakroga, Sandhisula, Katisula, Slipada, Kandu, Pravahika, Mukhroga, Krimi, Amlapitta.
5.	RRI, Gwalior	Gangamalan pur	1800	70	Vrana, Sandhivat, Kasa Atisara, Krimi, Gridhrasi, Netraroga.
6.	RRI, Calcutta	Kantatala- Tardah	3345	110	Jvara, Amlapitta, Krimi, Atisara, Kasa, Grahani, Pratisaya, Pandu.
7.	RRC, Nagpur	Khaparkheda.	2069	135	Amavata, Sandhisula, Pratisaya, Vatavyadhi, Agnimandya, Tvakroga, Pandu, Svitra.
8.	RRC, Bangalore	Kombatha- hally	600	61	Kasa, Katisula, Amlapitta Vatavyadhi, Vrana, Pandu, Kosthabadhata.
9.	RRC, Hastinapur	Raninangla	3500	128	Kasa, Krimi, Udarasula, Kosthabadhata, Pradara, Vatavyadhi, Atisara, Arsa.
10.	RRC, Gauhati	Garal Athiabori	7000	130	Jvara, Krimi, Atisara, Kasa, Pravahika, Tvakroga, Kranaroga.
		Total	15	25,892	3,727

*Includes patients attended for treatment from neighboring villages.

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

S. No.	Name of the Instt.\ Centre\ Unit	Name of the Villages covered	Population treated	*No. of patients	Common Diseases
1.	CRI, Bombay	Barahchawl Rabodi, Vikroli Kannawar Nagar	14214	721	Pratisaya, Sandhisula, Tvakra, Kasa, Pradara, Pandu, Katisula, Jvara, Sirahsula, Udarasula.
2.	CRI, Bhubaneswar	Bhagabanpur	1500	62	Krimi, Twakra, Prati- syaya, Sandhisula, Katisula, Mukharoga, Vatavyadhi.
3.	RRI, Junagadh	Baman Gam	106	9	Jvara, Kasa, Karnaroga, Mutrakriccha, Vata- vyadhi.
4.	RRC, Nagpur	Sonegaon [Nipani]	1003	34	Vatavyadhi, Tvakra , Panduroga, Raktavikara, Pratisaya, Vicarcika.
5.	RRC, Itanagar	Midpur	500	134	Atisara, Pama, Tvakra Krimi, Kasa, Karnaroga, Jvara, Vrana, Netraroga Amlapitta.
6.	AU, Tarikhet	Rinchi		874	Not indicated.
7.	RRC, Hastinapur	Jhunjhuni Bhandora	3600	103	Kasa, Jvara, Amlapitta, Vrana, Pidika, Kasthaba- dhata, Netraroga, Prati- syaya, Vatavyadhi.
8.	RRC, Gangtok	[Medical relief camp on National Science day.]	278		Kasa, Pratisaya, Jvara, Krimi, Udarasula, Kandu, Sirahsula, Katisula.
9.	RRC, Gauhati	Navagaon	1000	70	Jvara, Atisara, Krimi, Kasa, Yakritroga, Pandu, Tvakra, Pravahika.
Total		12	21,923	2285	

*Includes patients attended for treatment from neighbouring villages.

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

S. No.	Location of the Project	Tribal pockets covered	Population	*No. of patients treated	Common Diseases
1.	Chinchapada	Sawarat, Tilasar, Pati, Bandharary, Pachambha, Bilgaon, Bedaki, Devalipada, Tinmoli	6327	3719	Jvara, Katisula, Pandu Udarasula, Tvakroga, Kasa, Pradara, Atisara, Krimi, Mukharoga, Netra roga, Svasa, Urahsula, Visamjvara, Vicarcika
2.	Imphal	Langol Tarong, Naikalong Tarong, Tharon	1020	125	Pratisaya, Sandhisula Pravahika, Siransula, Kosthabadhata, Svitra, Katisula, Krimi, Jvara, Mukharoga, Udarasula, Mutrakriccha.
3.	Car Nicobar	OPD at Car-Nicobar and Tribal Pockets of Great Nicobar	475	1489	Kasa, Jvara, Amavata, Svasa, Amlapitta, Katisula, Kandu, Pratisaya Gulma, Krimi, Tvakroga, Udarasula, Vatavyadhi, Pravahika, Raktacapa.
4.	Palamau	Chatakman, Jolgan, Kasmar, Kudrum, Pindra, Furegada, Tamgekhurd, Tamge Kala, Gaugada	7610	3306	Jvara, Kasa, Krimi, Netraroga, Karnaroga, Visamjvara, Vrana, Tvakroga, Pravahika, Atisara, Galganda, Katisula, Mukhroga.
5.	Jagdalpur	Patients attended at OPD and collected 80 medicinal plants from Bastar District		1194	Udarasula, Amlapitta, Raktachapa, Kasa, Pratisaya, Jwara, Sandhisula, Svasa, Vatiksula.
6.	Ziro	Bri	126	1332	Kasa, Jwara, Pratishya, Udarsula, Yakritvikar, Vatavyadhi, twakroga, Pardara, Pravahika.
Total			22	15,558	11,165

* Includes patients attended for treatment from neighbouring villages.

MEDICO-ETHNO BOTANICAL SURVEY PROGRAMME

The Medico-ethno botanical Survey programme of CCRAS is extended through out the country, through its 17 survey units located in 16 different states. The activities of survey include the collection of information regarding herbal wealth from different forest areas and their identification, status of availability and their adulterants/substitutes and to maintain and develop the herbarium and museum. The Medico ethno botanical survey team comprises of survey officer and his counter part officer of Ayurveda discipline who is responsible for the collection of information on the habits/ customs/ social status particularly in the tribal pockets/ areas etc.

The survey work carried out throughout the country provides an overview of the composition of vegetation enumeration of plants, constitution of its flora, occurrence of different species in the different climatic zones of the country, availability of common and rare medicinal plants and information regarding the endangered species etc.

The observations made during the survey of mountain ranges specially of the Himalayas has provided information about the vegetation and general appearance of scenario and a complete and surprising change with the advent of the oak tree (*quercus incana*) and Rhododendron (*Rhododendron arboreum*), both small ever green trees, rarely exceeding 30 to 40 ft. with wide spreading rugged twisted branches. The start of rare and potent medicinal plants begins from these areas. The occurrence of Abies and Pinus above 7000 ft. marks the beginning of different form of medicinal flora. The most common shrubby form includes Salix, Rosa, Rubus, Lonicera, Viburnum, Berberis, Indigofera and Princepia etc. The occurrence of more specific type of herbs like *Violo*, *Geranium*, *Valeriana* etc. begins from a bit higher altitude. With the commencement of the rainy season in the month of June, in mountains, the appearance of very vigorous and luxuriant medicinal plants, begin to take place. The vegetation about 12,000ft. possesses a few interesting alpine plants.

The brief resume of the salient feature of work carried out by the different medico botanical survey units of the Council spread over 16 States of the country located at Bangalore, Bhubaneshwar, Calcutta, Gangtok, Gauhati, Gwalior, Itanagar, Jaipur, Jammu, Jhansi, Junagardh, Mandi, Nagpur, Patna, Tarikhet, Trivandrum and Vijayawada during the year 1989-1990 is given as below:-

The survey unit located at Bangalore has continued the maintenance of herbarium and museum specimens and preparation of 328 Index Cards. Only the local survey tour programmes were carried out for drug collection work.

The Unit located at Calcutta has undertaken collection of local herbs for OPD of the Centre. Dossiers of 47 drugs were completed. Different 60 raw drug samples were collected. Maintenance of herbarium and museum was continued.

The Survey unit located at Gangtok mounted 500 plant specimens and general upkeep of herbarium was continued.

The Survey unit located at Gauhati has continued maintenance of Herbarium and Museum.

The survey unit at Gwalior has undertaken drug collection work in bulk quantity for use in the OPD and IPD of the Institute by undertaking local survey tour programmes.

The unit located at Itanagar has added about 349 specimens to the herbarium and local drug collection work for the OPD was continued.

The survey unit located at Jaipur has continued the preservation and upkeep of herbarium and museum samples, accessioned 404 species, identified 90 specimens and 12 drug samples were collected for supply purposes.

The survey unit located at Jammu has continued maintenance of herbarium and museum samples and local drug collection work.

The survey unit located at Jhansi has accessioned 200 specimens for the herbarium and undertaken local survey tour programmes for drug collection work. The Unit has supplied 450 kg. of the drug samples.

The survey unit located at Junagadh has undertaken maintenance work of the herbarium and museum samples. Accessioned 295 herbarium sheets. The drug collection work was continued in the local areas and 184 kg. of the drug samples were collected for OPD and supply purposes.

The Survey unit located at Mandi has identified 400 specimens from old collections and 213 plants were accessioned.

The survey unit located at Nagpur has undertaken general maintenance and upkeep of the herbarium specimens. 401 specimens were mounted and 126 accessioned.

The survey unit located at Patna has continued general maintenance and upkeep work of herbarium and museum samples. Local drug collection work was continued.

Survey unit at Trivandrum mounted 410 sheets and accessioned 703 specimens. 60 specimens of crude drugs were supplied and 21 samples added to the Museum.

The survey unit located at Vijayawada has undertaken local drug collection work and supplied 25 kg. of drug samples for research purposes. The unit has also accessioned 407 plant specimens.

The survey units of the Council have not been able to undertake their regular survey work assigned to them due to the lack of funds in the Council. However, the Units have started compilation of information/data collected so far for drafting monographs on different regions. Maintenance and upkeep of herbarium and museum samples has been attended by all the survey units. The drug supply work for the OPD and IPD of some institutes was undertaken and several drugs for research purposes have been supplied to the different units.

MUSK DEER BREEDING PROGRAMME

The musk deer breeding farm is being maintained by the Council at a height of 7,500 ft. m.s. l. on two acre land at Mehrori in Kumaon Hills. At present, there are 25 animals, out of which 11 are male and 14 are female animals. During the last 18 years, the Council has made efforts to maintain properly these animals in the natural surroundings and the feed given to them is also obtained from the locally growing herbs. The observations made on the behavioral adaptability of the animals, in taking milk feed, fodder, grain, water and also their pasture, growth and development during heat and pregnancy, diseases, injury and wounds and their remedial measures etc. have been studied.

It has been observed that the animals do not like any type of change, alternation, addition and disturbances etc. They prefer calm and quiet surrounding in their living area. Females also did not like to live in herds. The stockades have now been extended to 17 in number, so that the increased number of animals could be maintained in comfort. The animals in rainy season prefer to eat *Prunus domestica*, *Bergenia species*, *Persicaria nepalenses*, *Geranium wallichianum* Sweet leaves and some ferns and *Agaricus* species etc. In Monsoon after care of retention of urine and stool, the adult male animal prefers start grazing with *Agaricus* species and ferns.

The animals under observation were so dependent upon milk that the animals become reluctant showing symptoms of lack of exhilaration and resistance to transfer to their living cabins. During the period under report, the female animal Mridula aged 10 years, Radha aged three years and Shayama aged 3½ years, delivered after a period of gestation of 202 days, 200 days and 202 days one male each respectively while Mridula has delivered one female also. The studies have indicated that during the monsoon period, 6 adult male animals suffered with retention of urine and stool upto 4 to 6 days. Two female animals died during the reporting period.

During the rainy season 322 plants of different species were planted around the stockades for getting the required feed in sufficient quantity.

Extensive cultivation of some of the herbs required as fodder for the Musk Deer can be collected from neighboring areas also viz:-

- 1) Plum(*Prunus domestica*)
- 2) Rivins(*Cotoneaster affinis*)
- 3) Lamer(*Jasminum officinalis*)
- 4) Gophal(*Holboelia latifolia*)
- 5) Pasanbhed (*Bergenia ligulata*)
- 6) Ratangal/Ratigiyali/Rattala(*Persicaria nepalensis*)
- 7) Marchiya Ghas (*Galinsoga parviflora*)
- 8) Tiptiya jhar (*Geranium wallichianum*)
- 9) Rikh veeru(*Crataegus crenulata*)
- 10) Guldavari(*Chrysanthemum fornerium*)
- 11) Burans (*Rhododendron arboreum*).

Some other herbs like wild and cultivated varieties of Spinach, Chummy leaves and Soyabeen leaves are eaten by the Musk Deer. Poor farmers can be encouraged to grow these herbs for supply to our farm.

CULTIVATION OF MEDICINAL PLANTS PROGRAMME

The Council through its five herbal gardens located at Pune, Jhansi, Mangliawas, Tarikhet and Itanagar has taken up experimental small scale cultivation of about 500 medicinal plants species of Ayurveda and Siddha importance, besides large scale cultivation of a few species having shown success at experimental level. The plantation includes those of tropical, sub-tropical, and temperate regions, besides exotic ones.

The main objective of this entire programme is to study the medicinal plants for their adoptability, growth behavior, flowering, fruiting etc. at different altitudinal levels and ecological conditions, working out suitable agro-chemical techniques for the successful cultivation and growth of rare, scarcely distributed and threatened plant species and to provide quality drug material in adequate quantity for research/ pharmaceutical purposes.

Successful propagation of Kumkum at Ranikhet, Chamma and other adjoining areas is a noteworthy feature in view of its non-habitance to these regions. The experimental cultivation of Guggulu in Mangliawas has also provided adequate information base to consider mass scale cultivation of this important Ayurvedic medicinal plant which is almost at the verge of extinction.

A brief account of the cultivation activities carried in each of the herbal garden is provided hereunder:

Jawahar Lal Nehru Ayurvedic Medicinal Plants Garden and Herbarium, Pune:

The garden possesses about 19 acres of land, out of which about 10 acres are presently being utilized for cultivation of medicinal plants and maintenance of demonstrative medicinal plants garden. The garden is maintaining about 400 species of medicinal, economic and ornamental importance, out of which 142 taxa are from among the medicinal plants included in Ayurvedic Formulary Part I. Five species were newly introduced in the garden during the reporting period. These include Ramaphala (*Anona reticulata* Linn.), Swetapunarnava (*Trianthema portulacastrum* Linn.), Tambul (*Piper betel* Linn.), Prispiparni (*Uraria picta* Desv.) and Pippali (*Piper longum* Linn.).

Under experimental cultivation, effect of manures and fertilizers, including Farm Yard Manure, Urea & Suphala on the growth of Nirgundi (*Vitex negundo* Linn.) and Vasa (*Adhatoda vasica* Nees.) were studied. It has been observed that Urea and Suphala considerably affected the growth of Nirgundi during the first two month after their application. The overall growth of plants including height, spread and number of branching was increased two to three times in comparison to control. In case of Vasa, the production of leaves per plant has increased 1.5 times by application of Urea.

In addition to above the germination trials of the seeds of ten medicinal species including Trivrita (*Operculina turpethum* (L.) Silva Manso), Kokilaksha (*Astercantha longifolia* Nees),

Arjuna (*Terminalia arjuna* W. & A.), Karpuratulasi (*Ocimum kilimandscharicum* Guerke), Kupilu (*Strychnos nux-vomica* Linn.), Kapikachu (*Mucuna prurita* Hook), Langali (*Gloriosa superba* L.) and Latakasturi (*Hibiscus abelmoschus* Linn.) were carried out to study the germination percentage and seed dormancy in the climatic conditions and soil of Pune. In the cases where percentage of germination was low or negligible different treatments like soaking the seeds in hot/cold water and acid treatment for varying periods etc. were tried and success was achieved in raising the germination percentage considerably in case of Trivrita, Latakasturi, Kokilaksha and Arjuna.

The Centre collected 75 kg. (dry weight) crude drugs from the garden in form of its produce, belonging to more than one dozen species to meet partly the drug requisitions of the Council's different research projects. Among these Amalaki (*Emblia officinalis* Gaertn.), Japa (*Hibiscus rosa-sinensis* Linn.), Dhataki (*Woodfordia fruticosa* Kurz.), Kuberaaksha (*Caesalpinia bonduc* Roxb.), Bhallataka (*Semecarpus anacardium* Linn.), Arishtaka (*Sapindus emarginatus* Vahl.), Vacha (*Acorus calamus* Linn.), Bakuchi (*Psoralea corylifolia* L.), Brahmi (*Centella asiatica* Urb.), Madana (*Xeromphis spinosa* Thunb.), and Avartani (*Helicteres isora* Linn.) are worth mentioning. In addition to above the crop of more than 5 quintal of fresh leaves of Kumari (*Aloe barbadensis* Mill.) and about 8 quintal fresh roots of Ushira (*Vetiveria zizanioides* Linn. Nash) is also available in the garden. Further, seeds of about one dozen medicinal taxa were collected during the year to enrich the seed bank.

Its other activities includes participation and presentation of scientific papers in five workshops/seminars concerned with Pharmacognosy, cultivation and conservation of medicinal plants, organisation of two exhibitions and delivering a few lectures in local colleges to bring awareness among scientists, teachers, students and common man towards the growing need of conservation and cultivation of medicinal plants and their utility in the treatment of common ailments; free consultations to interested individuals and organizations in respect of technical knowhow for propagation, multiplication and cultivation of medicinal taxa and imparting of one month's training in Pharmacognosy to one of the Scientists of Maharashtra Association for cultivation of sciences, Pune.

The Institute also received several visitors including some eminent scientists, teachers and students from research organizations and colleges of different disciplines like Ayurveda, Botany, Agriculture, Horticulture and Pharmacy not only from within the country but also from some foreign countries like West Germany, Indonesia and U.S.A.

Guggulu Herbal Farm, Mangliawas (Rajasthan)

Conservation, cultivation and propagation of Guggulu plants and observing its growth pattern under different experimental parameters are the main activities of this herbal farm. The entire Guggulu project is at present devoted to about 45 acres out of a total of 142 acres of the land available for the purpose. A total of 14006 plants are growing under mass scale cultivation and all possible attempts were made for the proper maintenance of this entire plantation. The

remaining portion of the land is having natural vegetation of guggulu besides about 50 other medicinal plant species mostly of arid zone region.

During the reporting period a total of 3615 guggulu cuttings and 150 guggulu plants were introduced in the farm (June to August, 1989) under experimental cultivation programme and regular observations were made for their growth behavior etc. at different growth stages. A few of the other important medicinal species growing in the Farm are Kuberaaksha (*Caesalpinia bonduca*), Mahanimba (*Melia azadirach*), Kundru (*Boswellia serrata*), Kumari (*Aloe vera*), Satavari (*Asparagus racemosus*), Langli (*Gloriosa superba*), Gokshura (*Tribulus terrestris*), Dadima (*Punica granatum*), Sirish (*Albizia lebeck*), Shalmali (*Bombex ceiba*), Gunja (*Abrus precatorius*), Guduchi (*Tinospora cordifolia*), Vana-palandu (*Urginia indica*), Punarnava (*Boerhavia diffusa*).

The experimental studies have yielded some interesting and important results. It has been observed that vegetative propagation of guggulu through stem cuttings is faster than those raised from seeds. Percentage of sprouting was also quite high. 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. Seeds germination in *Caesalpinia bonduca* and Eranda (*Ricinus communis*) have been quite satisfactory while Gunja (*Abrus precatorius*) have shown unsatisfactory growth.

Three exotic species *Euphorbia anticephaletica*, *Bursera hyndersiana* and *Tylophora asthmatica* are also growing well in the garden.

The garden has also taken different control measures to prevent the termite and other insect attacks and bacterial/fungal growth etc. The collaborative studies taken up with Agriculture College, Jobner for the standardisation of tapping techniques for the extraction of oleo-gum-resin without causing any harm to the Guggulu plants are also reported to be quite encouraging.

A total of 20 kg. of Guggulu has been collected from the Farm and supplied 9.5 kg. of the same for research purpose. About 150 kg. of crude drug material consisting of 13 medicinal species is presently reported to be in the stock.

Amalgamated Unit, Tarikhet:

This Centre has its medicinal plants gardens located at Ranikhet, District Almora (1700 meter) and at Chamma District Tehri (1500 meter). The main activities of these gardens are experimental cultivation of some important medicinal plants from wild sources and nurseries and study of their adoptability, growth behavior, flowering and fruiting etc. in the local climatic conditions of these regions, besides taking up large scale cultivation of a few important medicinal plant species showing success at the experimental level. The cultivation project at Ranikhet is carried on about five acres of the land which includes 1.53 acres exclusively confined to Kumkum (Saffron) experimental cultivation programme. A total of 204 medicinal species mostly of Ayurvedic importance are growing in different beds in the garden and have

been properly maintained.

Medicinal plants garden at Chamma has been established in two acres of land. The garden at present has 34 types of medicinal plant species growing in different beds and are properly maintained. Most of these species are for demonstrative purpose but a few important species have been subjected to experimental trials for studying their adaptation, vegetative and reproductive growth behaviour etc.

A few of the important medicinal species showing satisfactory growth are Mandookparni (*Centella asiatica* (Linn.) Urban), Yasti madhu (*Glycyrrhiza glabra* Linn.), Brihadela (*Amomum-subulatum* Roxb.), Sathi (*Hedychium spicatum* Buch-Hary), Pippali (*Piper longum* Linn.), Tagara (*Valeriana wallichii*), Rudraksa (*Elaeocarpus genitrus* Roxb.), Punarnava (*Boerhavia diffusa* Linn.), Risabhaka (*Microstylis wallichii* Lindl.), Kapikachu (*Mucuna prurita* Hook.), and Vacha (*Acorus calamus* Linn.) Special measures/techniques are being worked out for evolving an ideal technique for the propagation of these plants through runners/cuttings, etc. A few of these plants are also observed for their growth behavior when subjected to different fertilizers and farm yard manure treatment. Special emphasis is being given to the cultivation of Yashtimadhu, Rudraksha and Brihadela.

In view of the satisfactory growth observed, a few medicinal species of Ayurvedic importance have also been undertaken for large scale cultivation to meet the drug demand of the Council's different research projects, Pharmacies and OPD etc. These include Tagar (*Valeriana wallichii*), Risabhaka (*Microstylis wallichii*), Vacha (*Acorus calamus* Linn.), Mandookparni (*Centella asiatica* (Linn.) Urban), Talamuli (*Curculigo orchioides* Gaertn.), Punarnava (*Boerhavia diffusa* Linn.), Pasanbheda (*Bergenia ligulata*), Sathi (*Hedychium spicatum* Buch-Ham), Haridra (*Curcuma amada* Roxb.) etc.

The other important plants of the garden include Katphal (*Myrica nagi* Hook.f.), Karvira (*Nerium indicum* Mill.), Chitrak (*Plumbago zeylanica* Linn.), Tumburu (*Zanthoxylum alatum* Roxb.), Nirgundi (*Vitex negundo* Linn.), Manjistha (*Rubia cordifolia* Linn.), Mahameda (*Polygonatum cirrhifolium* Royle), Langali (*Gloriosa superba* Linn.), Saptaparna (*Alstonia scholaris* R.Br.), Bibhitak (*Terminalia belerica* Roxb.), Haritaki (*Terminalia chebula* Retz.) Arjun (*Terminalia arjuna* (Roxb.) W.A.), Amalaki (*Emblica officinalis* Gaertn.), Argavadha (*Cassia fistula* Linn.), Syonak (*Oroxylum indicum* Vent.), Vanas (*Dendrocalamus strictus* (Roxb.) Nees) etc.

The exotic plant species successfully introduced in the garden are *Mentha arvensis*, *Calendula officinalis*, *Duranta plumeri*, *Digitalis purpurea*, *D.lanata*, *D.ferruginea*, *Artemisia annua* and *Lallemantia royleana*.

Saffron Experimental Cultivation:

Saffron cultivation project is being carried out on about 1.5 acres of land which is a part of the local cultivable area of about five acres. A total of about 4,55,000 corms of different sizes

are being properly maintained in about 560 beds of varying sizes covering an area of 2,300 sq. meters. Regular observations were carried out on growth development and multiplication of saffron corms from time to time. Flowering was observed from the last week of September and continued till first week of November. During the entire flowering period a total of 837 flowers weighing 264 gm. (fresh) were collected yielding 6 gm. of saffron consisting of dry stigma and a little part of style. Extension of saffron has also been taken up in our garden at Chamma and in a number of areas of Chamoli district in collaboration with the District Administration. Observations with last year trials with nutrients Ca, K and growth regulator N.A.A. were continued.

Regional Research Centre, Jhansi:

The Herbal garden of the Centre has continued with the Cultivation programme on about 15 acres of the land out of a total area of 45 acres presently under its possession for cultivation activities. The cultivation of important ayurvedic medicinal plants both on experimental as well as large scale has been taken up and the entire garden represents a total plantation of about 200 medicinal species of Ayurveda and Siddha importance in the form of demonstration beds, experimental and large scale beds and also in the Green House.

A total of 188 medicinal plants are represented in the Green House in polythene bags and cement pots under pot cultivation programme. A few important are: Gunja (*Abrus precatorius* Linn.), Atibala (*Abutilon indicum* Linn.), Vasa (*Justicia adhatoda* Linn.), Danti (*Baliospermum montanum* Muel - Arg.), Apamarga (*Achyranthes aspera* Linn.), Pashanbhed (*Bergenia ligulata* (Wall) Engle.), Palasha (*Butea monosperma* (Lam.) Kurz.), Bharangi (*Clerodendrum serratum* Linn. Kutze.), Shankhapushpi (*Convolvulus pluricaulis* Choisy.), Langali (*Gloriosa superba* Linn.) Lajalu (*Mimosa pudica* Linn.), Tulasi (*Ocimum sanctum* Linn.), Chitrak (*Plumbago zeylanica* Linn.), Guduchi (*Tinospora cordifolia* (Willd) Miers.), Goksuru (*Tribulus terrestris* Linn.), Ushira (*Vetiveria zizanioides* (L) Nash.), Sadabahar (*Vinca rosea* Linn.), Nirgundi (*Vitex negundo* Linn.), Ashwagandha (*Withania somnifera* Dunal.), Mandookparni (*Centella asiatica* (Linn.), Urban), Vacha (*Acorus calamus* Linn.) etc.

Some of the important medicinal plants undertaken on mass scale cultivation are Satavari (*Asparagus racemosus* Willd.), Kumari (*Aloe barbadensis* Mill), Guggulu (*Commiphora wightii* Arn.), Yashtimadhu (*Glycyrrhiza glabra* Linn.), Latakasturi (*Hibiscus abelmoschus* Linn.) Rasna (*Pluchea lanceolata* C.B. Clarke), Sarpagandha (*Rauwolfia serpentina* Benth.), Bakuchi (*Psoralea corylifolia* Linn.), Prisiniparni (*Uraria picta*), and Salparni (*Desmodium gangeticum* D.C.), etc. Large scale plantation undertaken alongwith a boundary of the land includes Haritaki (*Terminalia chebula* Retz.), Asoka (*Sarca asoca* (Roxb) DC. Wilde), Latakasturi (*Hibiscus abelmoschus* Linn.), Nimba (*Azadirachta indica* A.Juss.) etc.

Some of the important medicinal plants taken up on experimental scale for the study of their vegetative and reproductive growth behavior are Yashtimadhu (*Glycyrrhiza glabra* Linn.), Kalmegh (*Andrographis paniculata* Nees), Pippali (*Piper longum* Linn.), Rasna (*Pluchea lanceolata* C.B. Clarke), Aswagandha (*Withania somnifera* Dunal), Trivrit

(*Operculina turpethum*), and chopchini (*Smilax aspera* Linn.) etc.

The demonstrative beds represents about 75 important medicinal plants. Some of the important species grown are: Atibala, Danti, Vasa, Sahachara, Bharangi, Kemuk, Mandookparni, Gunja, Salparni, Nirgundi, Pippali, Ajmoda, Goksuru, Chitrak, Ushira, Sadabaha, Sahadevi, Kantakari, Nagbala etc. The garden has also taken up plantation of some of the important medicinal species belonging to different geographical areas for observing their adaptability and growth behaviour under the climatic conditions of Jhansi. It is interesting to note that the species like Daruharidra, Tejbala, Pashanbhed, Banapsha, Priyangu, have so far shown satisfactory growth behaviour and flowers and fruits have also appeared in some cases. Special attention is being paid to these species for their survival during the summer season. Seedlings/saplings of about 25 important medicinal species have also been prepared in polythene bags for the purpose of experimental/large scale plantation.

The total produce of the garden during the year was about 250 kg. dry material consisting of about 49 medicinal plant species.

Regional Research Centre, Itanagar:

The herbal garden of this Centre has started functioning in June, 1987. The cultivation of important Ayurvedic medicinal plants is presently devoted to about nine acres of the land out of a total area of about 17 acres available with the Centre for the cultivation project. A total of 106 medicinal plant species are presently growing in the garden and also properly maintained in the demonstrative, experimental and large scale beds. This also includes 58 species mentioned in Ayurvedic Formulary Part-I.

A few important medicinal plants represented for demonstration purpose are Ashwagandha (*Withania somnifera* Dunal), Bakuchi (*Psoralea corylifolia* Linn.) Latakasturi (*Hibiscus abelmoschus* Linn.), Sarpagandha (*Rauwolfia serpentina* Benth.ex. Kurz), Kebuka (*Costus speciosus* (Koenig) Sm.), Bilva (*Aegle marmelos* Corr.), Japa (*Hibiscus rosasinensis* Linn.), Nirgundi (*Vitex negundo* Linn.), Rudraksha (*Elaeocarpus ganitrus* Roxb.), Amlaki (*Emblia officinalis* Gaertn.), Vacha (*Acorus calamus* Linn.), Satavari (*Asparagus racemosus* Willd.), Bhringraja (*Eclipta alba* Hassk.), Chitrak (*Plumbago zeylanica* Linn.) Guduchi (*Tinospora cordifolia* (Willd.) Miers), Kakamachi (*Solanum nigrum* Linn.), Bhunimba (*Andrographis paniculata* Nees), Sahadevi (*Vernonia cinerea* less.), Banapsha (*Viola odorata* Linn.) etc. A total of 36 species have also been introduced during the reporting period on small experimental level for studying their adaptability and growth behaviour etc.

About 200 kg. of crude drug material consisting of eight medicinal plant species have been collected and supplied about 75 kg. of the material consisting of different drug parts of four medicinal species to the OPD of the Centre.

PHARMACOGNOSY RESEARCH STUDIES

The different Pharmacognosy Research Units of the Council have carried out pharmacognostic studies on the following drugs of ayurvedic importance with the objective to help overcome the controversy and confusion that exists regarding their proper identity due of synonym and use of one and the same name for more than one drug and to evolve standards for single drugs so that genuine and authentic drug material can be made available for research and the pharmaceutical industry.

1. Palasha (*Butea monosperma* (Lam.)Kuntze)leaf,bark,fruit.
2. Patola (*Trichosanthes dioica* roxb.) root, leaf & fruit.
3. Asoka (*Sarca indica* Linn.) stem bark.
4. Sigr (*Moringa oleifera* Lam.) root, bark,flower,fruit & seed.
5. Atmagupta (*Mucuna prurita* Hook) root and seed.
6. Draksa (*Vitis vinifera* Linn.) fruits and leaf.
7. Bala (*Sida cordifolia* Linn.) root & stem.

The pharmacognostic research programme includes the study of source, collection, identification, morphological and histological characters (both qualitative and quantitative). identification of diagnostic characters, test for purity, preliminary phytochemical studies, chromatographic studies, identification of chemical constituents like alkaloids, steroids, and terpenoids, phenols, tannins, saponins and flavonoids etc. and fluorescence analysis of the various plant parts. These chemo-taxonomic studies have greatly helped not only in the identification of genuine drug material but also to know of spurious and adulterated and substituted drugs.

PLANT TISSUE CULTURE

The plant tissue culture laboratory has been recently established at JNAMPG & H, Pune and it started functioning only in January, 1990. The main objective of this laboratory is the propagation and multiplication of rare and threatened medicinal taxa, maintenance and improvement of the quality of crude drugs of plant origin and development of a germ plasm bank of medicinal plants. Five medicinal plants namely, Meshashringi (*Gymnema sylvestre* Br.), Guggulu (*Commiphora wightii* (Arn.) Bhandari,Langali (*Gloriosa superba* Linn.), Satavari(*Asparagus racemosus* Willd) and Kutaja (*Holarrhena antidysenterica* Wall.) were taken up for study and tried for initial callusing using different growth regulators viz. IAA, GA3,4-D, Kn in varying concentrations. Positive response was observed in Meshashringi, Kutaja, Satavari, and Guggulu, Further work related to differentiation of embryonic callus is reported to be in progress.

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 during the year 1989-90 is reported as under.

1. Agnimantha (*Premna integrifolia* Linn.)

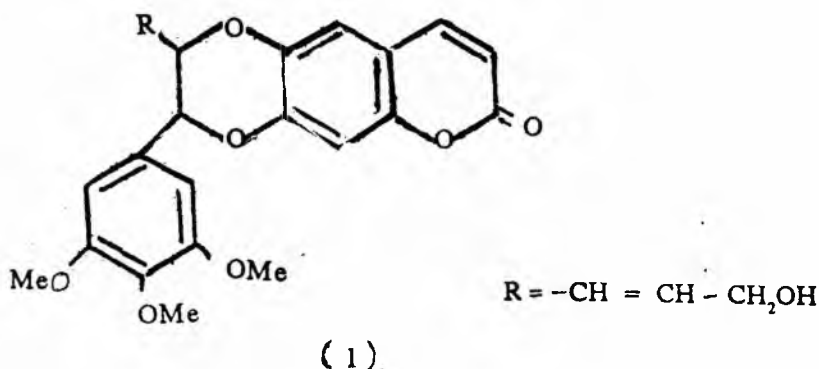
ChRUC

Bark, stem and leaves of the plant were extracted with alcohol and concentrated. Methylene chloride fractionated fraction after concentration followed by chromatography afforded a white solid (designated as Pi-1), m.p. 83-84°. Structure elucidation of this compound is in progress using various spectral data i.e. IR, UV, NMR etc.

2. Ananta; Sariva (*Hemidesmus indicus*)

ChRUC

From the petrol defatted benzene extract of *H.indicus*, a new coumarino lignoid, Hemidesmin-3(1) has been isolated and characterised on the basis of spectral evidence. These coumarino-lignoids are known to possess anti-cancer and anti-hepatotoxic properties.



3. Alarka (*Solanum trilobatum*)

CSMDRIAM

A study of seasonal variation in the yield of glycoalkaloids from *S.trilobatum* has been carried out. The total glycoalkaloidal content from 1 kg of the aerial part of the plant was determined every month by the usual method. The yield was found to be maximum during the summer season (May-June) and minimum during winter(October-November).

4. Amrataka (*Spondias mangifera*)

RRIT

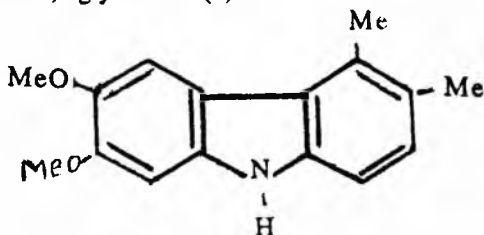
The air dried leaves of *S.mangifera* were extracted successively with pet.-ether, acetone and ethyl alcohol. The pet.-ether extract yielded three neutral compounds triacontanol, β -amyrin

and sitosterol. Systematic studies are being carried out on acetone and alcohol extract.

5. Ashvashakota (*Glycosmis pentaphylla*)

ChRUC

Ethyl acetate extract (neutral part) of the plant on the concentration afforded two compounds. Identification of one of the compounds designated GP-1 is being presented. Based on various spectra i.e. UV, IR and NMR the structure of the GP-1 is identical with that of a carbazole alkaloid, glycozoline(2).



6(a). Badari (*Zizyphus jujuba*)

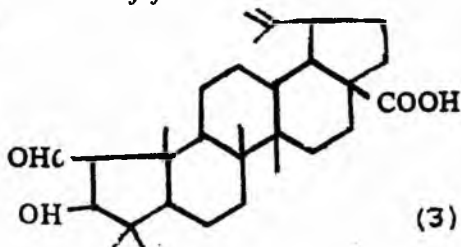
ChRUV

Powdered stem bark of *Z.jujuba* (5 kg) were extracted with pet.-ether. The residue obtained after removal of the solvent was chromatographed repeatedly over silica gel to yield betulinic acid (750 mg) and betulin (250 mg). Betulinic acid crystallised from methanol as colourless crystals, m.p. 320-323°, M⁺456, M.F. C₃₀H₄₈O₃ and was identified by IR, ¹HNMR and direct comparison with authentic sample. Betulin crystallised from benzene-ethyl acetate, m.p. 249-50°, M⁺442, M.F. C₃₀H₅₀O₂. It was identified by direct comparison with authentic sample. These two compounds have been reported to possess anti-cancer activity. Further work of isolation of cyclopeptide alkaloids from the plant is in progress.

(b). Badari (*Zizyphus jujuba*)

ChRUC

A pentacyclic triterpenoid, Zizyberanic acid (3), m.p. 263-265° have been isolated from both bark and roots of *Z.jujuba*. The structure of the compound has been established from spectral data.



Pet.-ether extract of the dried and powdered bark afforded already reported compounds viz., lupeol, betulinic acid and ceanothic acid.

7. Bhurjapatra (*Betula utilis*)

CRID

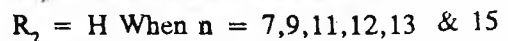
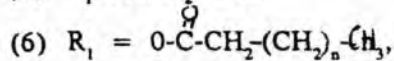
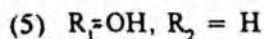
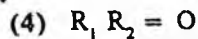
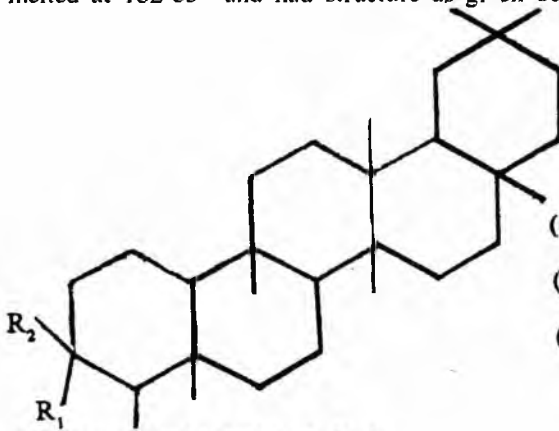
The leaves of the plant were extracted with ether. After the removal of the solvent, the residue was chromatographed over silica gel and eluated with solvents of increasing polarity. A yellow solid was obtained which was found to be flavonoid in nature. Characterisation of

the compound is in progress.

8. Chirabilva (*Holoptelea integrifolia*)

ChRUC

The petroleum-ether extract of the bark of the plant afforded friedelin (4), m.p. 248-250°, epi-friedelinol(5), m.p. 280-82° and a group of new triterpenoids. One of the new triterpenoid melted at 162-65° and had structure as given below(6).



9. Ishvari (*Aristolochia indica*)

RRIT

The air dried roots were extracted with 85% ethyl alcohol and the extract was concentrated. The aq. alcoholic extract was further extracted successively with benzene, ether and ethyl acetate. Sitosterol, -amyrin and friedelin were isolated from the benzene extract. The ether extract yielded a phenolic compound while the ethyl acetate extract showed the presence of three flavonoid compounds. Identification of these compounds is in progress.

10(a). Jyotismati (*Celastrus paniculatus* Willd.)

ChRUII

Powdered seeds of *C.paniculatus*(1 kg) were extracted in cold with Pet.-ether (5 : 1). On concentration an oil (20 gm) was obtained. On crystallisation with Pet.- ether: methanol mixture (4:1) yielded a white crystalline substance which was found to be a mixture of β -amyrin and sitosterol on comparison with the authentic samples. Further work on oil is in progress.

10(b). Jyotismati (*Celastrus paniculatus* Willd.)

ChRUC

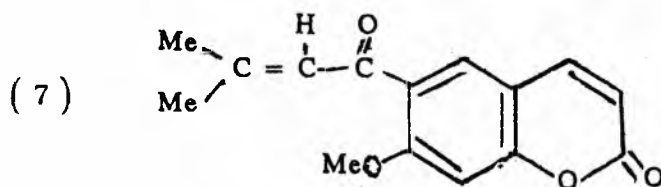
Petroleum-ether extract of *C.paniculatus* on repeated column chromatography furnished a solid, m.p.51-52°. Further, ether fraction and ethyl acetate extract of the drug also yielded two compounds, CPI(E), m.p.290-91° and CP-Et(1), m.p.293-97° respectively. Final characterisation is in hand.

11. Karnsphutika (*Boeninghausia albiflora*)

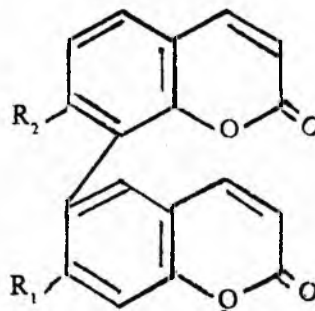
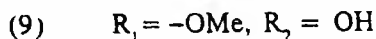
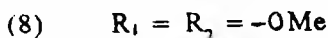
ChRUC

Benzene fraction of the methanol extract furnished two compounds BG(B)-2(B) and BG(B)-2C. The former one melted at 128° and its structure elucidation with the help of various spectra

is in hand. The later one, m.p. 132° was found to be a new coumarin derivative and was identified as dehydrogejerin(7) by using various spectral data.



Two more bis-coumarin derivatives Matsukazelactone, m.p.251-52° (8) and Bhubaneshwin, m.p.285-90° (9) have been isolated from *B.albiflora*.



Bergapten was reported from the hexane fraction.

12. Kasturi(Musk)

ChRUC

The musk sample (7.00 gm) was extracted with methanol under reflux. The extract was concentrated under reduced pressure. The concentrated extract furnished a yellow amorphous solid (M/1)m.p. 79-80°. (10 mg) which was filtered. Its IR and other physical data were recorded. From mother liquor, an immiscible liquid was separated. TLC studies in different solvents and IR of this liquid were noted down. Mother liquor after separation of the liquid was extracted with ether. The ether fraction was chromatographed on silica gel and with Hexane-EtoAC (95.5:05) mixture afforded a gummy material which crystallised with methanol as shining colourless needles, m.p.65-67° (M/2) (yield 2 mg). The mother liquor of the solid on concentration gave a red coloured liquid (M/3), showing a single spot on TLC. The IR of M/2 and M/3 were also recorded.

13. Kataka(*Strychnos potatorum*)

ChRUV

The study of chemical structures of the compounds Sp-1, Sp-2, Sp-3, Sp-4, Sp-5, Sp-6, Sp-7, Sp-8 and Sp-9 isolated earlier from the plant is in progress. Some of the compounds were also sent to Pharmacology Unit for their biological screening.

14. Kumkum(*Crocus sativus*)

ChRUC

8.6 gm of Kumkum was refluxed with methanol (4x100 ml) on water bath. After distilling of the solvent, a crude residue (4.25 gm) was obtained. On TLC examination in different solvents three components were observed. The crude residue was chromatographed over silica

gel with solvents of increasing polarity and fractions of 50 ml each were collected. On TLC, Fr.(1-8) was found to have one component. Fr.(9-53) showed the presence of atleast three component while Fr.(54-80) was a mixture of several components. Due to small quantity of Kumkum, components could not be separated.

15. Kustha(*Symplocos spicata*)

ChRUV

Powdered plant material (4.5 kg) was extracted with pet.-ether (60-80°) in soxhlet. The extract was filtered to remove a waxy material. Removal of the solvent from the filtrate yielded a dark brown gum (15 gm). It was chromatographed over silica gel and eluated with solvents of increasing polarity. Benzene-chloroform eluant yielded a colourless crystalline compound (230 g) as needles m.p. 164-65° which gave a positive test for steroid. IR, HNMR, Mass spectrum and various chemical reactions suggested the isolated sterol to be spinasterol. The compound, -spinasterol was found to possess anti-inflammatory activity.

16. Madanphala(*Randia dumetorum*)

ChRUC

Ethyl acetate extract of the above plant afforded three compounds i.e. R.D.-I, m.p.52°, RD-II, m.p.174-76° and RD-III, m.p.283-85°. IR spectra of all the three compounds were carried out. Characterisation of all the comounds is in progress.

17. Nimba (*Azadirachta indica*)

ChRUH

Shade dried flowers of *A.indica* were extracted in cold with petrol, chloroform and methanol. Presence of phenolic and flavonoid type compounds was indicated in colour tests. Pet.-ether extract(5 gm) of the shade dried flowers was chromatographed on silica gel. Pet.-ether eluants number 7,8,9,10, and 11 each 200 ml on evaporation yielded a white solid compound which was found to be flavonoid in nature on the basis of colour tests. Identification of this compound is in progress. Ethanol extract (25 gm) of the seeds of *A.indica* was sent for pharmacological studies.

18. Nirgundi(*Vitex negundo*)

ChRUV

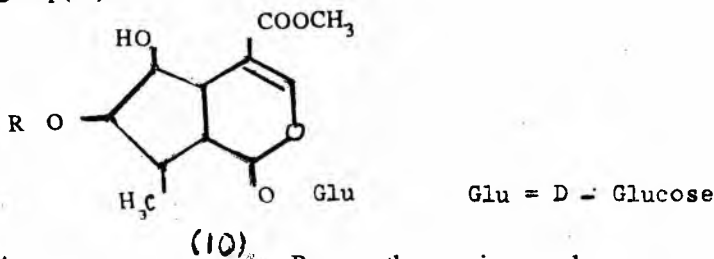
Dried and powdered plant was extracted in a soxhlet with alcohol. The residue obtained after removal of the solvent was chromatographed on silica gel with solvents of increasing polarity. Similar spots on TLC chromatogram were mixed and crystallised from methanol. Thus sitosterols m.p., 135-137°, M⁺414 and sitosterol glucoside, m.p.264-266° were obtained. Sitosterol was identified by direct comparison with authentic sample while sitosterol glucoside was identified by hydrolysis with 6N HCl. Crystallisation of other eluants furnished compounds Vn-1, m.p. 216-18°, Vn-2, m.p.312-315° and Vn-3, m.p. 218-20°. These compounds showed tests for terpenes. The Chemical characterisation of these compounds and further isolation of compounds are in progress. The alc. extract was also sent to Pharmacology Unit for preliminary screening.

19. *Parijata(Nycthanthes arbortristis)*

CSMDRIAM

Coarsely powdered leaves (2 kg) were extracted exhaustively with benzene, ethyl acetate and alcohol successively at room temperature. Ethyl acetate extract on chromatography over silica gel yielded an amorphous hygroscopic powder, () D⁶⁵ (E to H).

Preliminary examination of its spectroscopic data indicated it to be an iridoid glycoside. The compound formed a pentacetate with sodium acetate and acetic anhydride (m.p. 80°), ¹H and ¹³CNMR of the compound and its pentaacetate showed them to be a mixture of two glucosides arbortristoside C and D in the ratio of 2:3 with traces of diester. Arbortristoside C and D could not be separated, but ¹H, ¹³C, ¹³C (DEPT) and 2D hetero - and homo-correlated NMR spectroscopy allowed the complete assignment of all the protons and carbons and on comparison of the spectral data with that of arbortristoside A. It was observed that arbortristoside C and D had the same structural features as arbortristoside A, differing only in the nature of the arylester group(10).



Arbortristoside A,
Arbortristoside C,
Arbortristoside D,

R=p-methoxy cinnamoyl
R=trans - cinnamoyl
R=benzoyl

Similar studies to confirm the position of caffeoyl group in arbortristoside E are in progress.

20. *Puga (Areca catechu Linn.)*

ChRU

Neutral part of the drug afforded four compounds AC-I, AC-II, m.p. 290-92°, AC-III, m.p. 308-10°, AC-IV, m.p. 188-190°. only AC-I was described earlier. Structural investigation of the other three compounds are under progress using various spectral data.

21. *Sathi(Hedychium spicatum)*

ChRUH

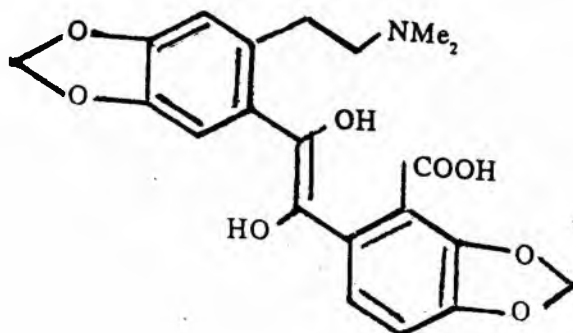
Plant material (600 g) was extracted with pet.- ether, chloroform, acetone and methanol. Pet.-ether extract contained terpenoids and phenol. Chloroform extract showed the presence of phenol and glycosides. Methanol extract gave positive test for phenol, flavonols and glycosides. Further work is in progress.

22. *Parpata(Fumaria indica)*

ChRUV

Dried and powdered seeds (3 kg) of the plant *F.indica* were successively extracted with

pet.-ether (60-80°) and ethanol (95%) in a soxhlet. The pet.-ether extract was extracted with 7% citric acid. Aq. acidic solution was basified with ammonia and the crude bases were extracted with chloroform from basic fraction. The crude alkaloids were chromatographed over silica gel and eluted with solvents of increasing polarity. Chloroform:methanol (9:2) eluant yielded a compound which crystallised from methanol as light yellow granules, m.p. 242-46°. On the basis of physical, chemical and spectral data, the alkaloid was identified as a new alkaloid (not earlier reported). It was named as narceimicine (11)-a secophthalide is quinoline alkaloid. Further isolation of other alkaloids and the study of their biological activity are in progress



23. Tamala (*Cinnamomum tamala*)

(11)

ChREL

Literature survey revealed it to have numerous biological activities. The alcoholic and aqueous extracts were prepared and sent for activity screening to various departments-Pharmacology, Parasitology, Toxicology, Biochemistry, and Mycology. The ethanolic extract was found to possess CVS activity. The ethanolic extract also showed antimalarial activity against NK-65 strain and fertility regulating effect. Chemical studies are being carried out.

24. Tejapatra (*Cinnamomum macrocarpum* Hook)

ChRUC

Petroleum-ether extract of the leaves of the above plant on chromatographic resolution furnished a solid, which on acetylation melted at 128°. The compound was identified as sitosterol through m.m.p., Co-TLC, Co-IR with an authentic sample.

25(a). Vandhyavari (*Vicoa indica*)

CSMDRIAM

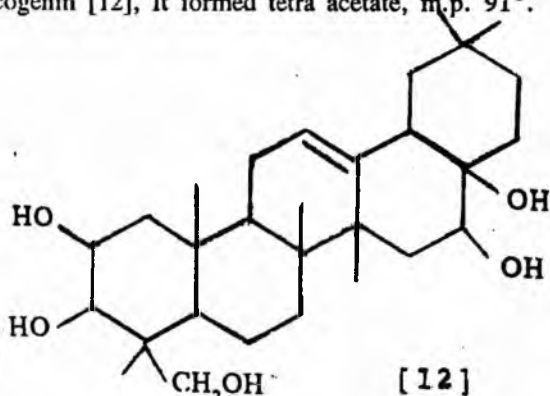
Isolation of Vi/145

The chloroform extract of the plant was chromatographed over silica gel and elution with chloroform:methanol [9:1] mixture gave a compound, which was purified by repeated chromatography and crystallised from methanol, m.p. 145°, M⁺664, M.F. C₄₃H₈₄O₄, [yield 50 mg.]. Further work is in progress.

Structure of Vicogenin

The structure of Vi/245 previously isolated from chloroform extract of *V. indica* has been

elucidated as 2, 3, 16, 17, 23-pentahydroxy-28-nor-olean-12-ene by spectroscopic data. The compound has been named Vicogenin [12], It formed tetra acetate, m.p. 91°.



25[b] Vandhyavari (*Vicoa indica*)

ChRUC

Dried plant materials [5 kg] were extracted with petrol in a soxhlet apparatus. Petrol extract so obtained was chromatographed over silica gel with solvents of increasing polarity to obtain the four compounds [i] V-i/1 [m.p.230°], [ii] V-i/2 [m.p.158-60°] [iii] V-i/3 [m.p. 75°] [iv] V-i/4 [m.p. 208-10]. The structure of V-i/1 was suggested as a long chain fatty ester considering all the spectral data. The structure elucidation of other is in progress. Petrol extract [50 gm] and compound V-i/1 [1.5 gm] from petroleum ether were sent to the Department of Pharmacology of Calcutta University for evaluation of antifertility activity.

26. Vriksamla (*Garcinia indica chois*)

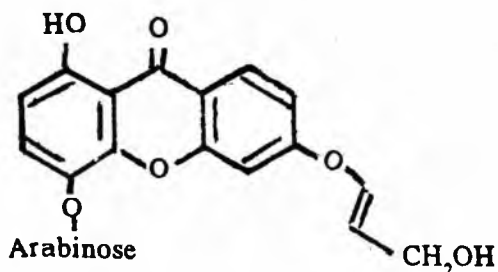
ChRUH

A yellow phenolic compound m.p. 220° and M⁺574 has been isolated by repeated column chromatography. Its structural elucidation on the basis of NMR, IR etc. is in progress.

27. *Lasiosiphon eriocephalus* Decne

ChRUC

Alcoholic extract of the aerial parts of the plant was chromatographed over silica gel where lasioside, m.p. 250° was obtained. UV, IR, PMR spectral data and CMR studies showed that the lasioside was 3-O-[2'-one-prop-1-ol]-5-arabinosyl-8-hydroxy xanthone [13].



Miscellaneous Work:

(13)

ChRUC

During the period under review, 18 extracts were prepared and supplied to the RRI [Ay.], Calcutta

The following extracts have been supplied to the Pharmacological Research Unit, Calcutta for Pharmacological evaluation.

1.	Alcoholic extract of <i>Woodfordia fruticosa</i> [flowers]	50 gm
2.	Methylene chloride fraction of alc. extract of <i>Premna integrifolia</i>	1.77 gm
3.	Ether Fraction of alc. extract of <i>Premna integrifolia</i>	1.77 gm
4.	Petrol and petrol:benzene [1:3] eluates and solid obtained from the pet.-ether extract of <i>Trianthema portulacastrum</i>	4.3 gm
5.	Petrol extract of <i>Gmelina arborea</i>	1.2 gm
		5.5 gm

CRID

1. Pet.-ether extract of *Raphanus sativus* [seeds] was prepared and sent to CRI(Ay.), Bombay for Pharmacological studies.
2. Benzene extract of *Garcinia pedunculata* [leaves] was prepared and sent to CRI(Ay.), Bombay for Pharmacological studies.
3. Ethanol extract of *Phoenix dactylifera* [fruit] was prepared and sent to Pharmacological Research Unit, Jodhpur for Pharmacological studies.
4. Benzene extract of *Hibiscus abelmoschus*(seeds) was prepared and sent to Pharmacological Research Unit, Jodhpur for Pharmacological studies.
5. Ethanol extract of *Dalbergia sisoo* [leaves] was prepared and sent to Pharmacological Research Unit, Jodhpur for Pharmacological studies.
6. Benzene extract of *Betula utilis* [leaves and stem bark] was prepared and was sent to Toxicity Studies Unit, Jhansi for Pharmacological studies.
7. Benzene extract of *Ficus gibbosa* [fruit] was prepared and sent to Toxicity Studies Unit, Jhansi for Pharmacological studies.
8. Ethanol extract of *Zinziber officinale* (Rhizome) was prepared and sent to Toxicity Studies Unit, Jhansi for Pharmacological studies.

RRIT

1.	Quantity of neem oil worked out	=	125 kg.
2.	Quantity of Nimbathiktam supplied to the Clinical/Pharmacological Unit	=	2.71 Kg.
3.	Quantity of plant material extracted for the preparation of active fractions, principles, derivatives, ointments etc.	=	10 kg.
4.	Quantity of active fraction/ointment/pastes prepared/supplied to the Clinical Section, IIP, Cheruthuruthy.	=	800 gm.

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 provide 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, Jodhpur, Trivandrum and Cheruthuruthy. During the period under review 37 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, hypolipidaemic, 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. Arogyavardhini

TRUJ

Arogyavardhini possesses antimicrobial property against few species of bacteria. The drug is a direct cardiac stimulant. It is safe upto 2000 mg./kg. in mice by oral route. The drug is devoid of analgesic property as judged by chemically induced writhing episodes in mice.

2. Tuttha Bhasma

PhRUD

Sub-acute toxicity of the above bhasma was carried out on albino rats. Various doses (100 mg.-400mg./kg.) orally were administered. None of the animal showed any adverse effect during the initial 96 hours.

3. Amalvetasa(*Garcinia pedunculata* Roxb.)

IHKP

The aqueous extract of the drug reduced the sleeping time significantly in albino rats. The drug did not show diuretic effect in rats.

4. Arka(*Calotropis procera* R.Br.)

PhRUD

Ethanol extract of the stem was investigated for its anti-pyretic activity. Different doses (1g to 8gm./kg.) orally were administered to albino rats. The drug did not show any significant antipyretic effect.

5. Babbula(*Acacia leucophloea* Willd.)

IHKP

Ethanol extract of the bark of the plant was used for all the studies. In doses of 100 and 300 mg./kg., it failed to elicit any anti-inflammatory activity. However, in a dose of 900 mg./

kg., it showed this activity (in xylene induced mouse ear oedema and in formalin induced ascitis in rats). In doses of 300 and 900 mg./kg., it showed analgesic activity in radiant heat method. In all these dose levels, it failed to afford any significant protection to the animals and did not modify the seizure pattern when tested for its anti-convulsant activity by the Supra Maximal Electroshock method and in pentylene-tetrazol induced convulsions. It also failed to exhibit any hypothermic effect in mice in these dose levels.

6. Bhumyamalki(*Phyllanthus niruri* Hook.f.) PhRUL

P. niruri was administered as 500 mg./kg. orally to see its effect on intestinal transit in rats. It was found to have no significant effect on intestinal transit as compared to control group.

7. Bola(*Commiphora myrrha*) PhRUV

The aqueous suspension was tested for its anti-inflammatory activities but no such effect was observed upto 3000 ml./kg. dose orally.

8. Brihati(*Solanum indicum*-roots) PhRUV

The ethanol extract was used but it did not show any consistent anti-inflammatory effect. The extract showed cardiac depressant effect which in some cases was followed by some stimulant effect. This depressant effect was not blocked by atropine.

9. Dhanyaka (*Coriandrum sativum* Linn.) PhRUD

Aqueous decoction of *C.sativum* fruits was given in various doses (1 g. to 100 gm./kg.) orally to albino rats. The results indicated that aq. decoction of fruits is devoid of any toxicity and is well tolerated by rats.

10. Jatiphala(*Myristica fragrans* Houtt.) PhRUT

Petroleum-ether, chloroform and ethanol extracts of seeds were used to study the anti-diarrhoeal activity. Pet.-ether extract at 200 mg./kg. reduced the fecal output by 60.46% compared to 54.72% of chloroform extract(100 mg./kg.). But alcohol extract at 200 mg./kg. showed 72.55% reduction in fecal output compared to 90.27% of loperamide (10 mg./kg.). This showed that alcohol and pet.-ether extracts possessed significant anti-diarrhoeal property in rats.

Again, Pet.-ether extract at 500 mg./kg. showed 90% protection, while chloroform and alcohol extracts at 200 mg./kg. showed only 55 and 60% protection from castor oil diarrhea. Results are under analysis. Enteropooling assay in rats is under study.

Alcoholic extract possess myocardial depressant or bradycardic effect in frog heart. Similarly, a dose dependent myocardial depressant effect was noticed with transient heart block when pet.- ether and chloroform extracts were administered in dose levels above 10 mg.

11. Kakamaci(*Solanum nigrum* Linn.)

PhRUT

Preliminary pharmacological studies including acute toxicity studies using aqueous extract, in mice and CNS effects in mice and rats are in progress.

12(a). Kasturi (Musk)

CRIB

Musk(a) and Musk(b) in a dose of 500 mg./kg. orally were studied for analgesic action in mice. Musk(a) showed significant protection against acetic acid induced writhings, Musk(b) was devoid of analgesic effect.

Musk(a) and Musk(b) did not potentiate pentobarbitone induced narcosis.

12(b). Kasturi(Musk) (I) - blackish variety

PhRUC

The drug produced moderate increase in spontaneous motility in rabbit jejunum in 1 mg. dose. The drug, exhibited inhibition of Ach induced contractions, in doses 0.1, 0.25, 0.5 and 1 mg./10 ml but produced no effect against histamine and barium chloride.

The drug in 1,2, 5 mg./10 ml bath produced no effect on frog rectus and also did not exhibit effect against Ach.

The drug in doses of 0.5, 1 and 2 mg. exhibited dose dependent decrease in volume of perfusate and delayed in volume of perfusate and delayed recovery time in isolated guinea pig lung - suggesting spasmogenic actions on bronchial muscles.

The drug in doses of 250 to 3000 mg./kg., p.o. produced no behavioral effect. The drug did not potentiate pentobarbitone sleeping time in mice.

The drug in 1 and 5 mg./kg. i.v. produced no effect on blood pressure but caused a little increase in rate of respiration. The drug in 250 to 3000 mg./kg., p.o. exhibited no mortality in 72 hours in mice.

The drug in 25 mg./kg., p.o. x 7 days produced an increase in total WBC only without affecting total RBC and hemoglobin values.

12(c). Kasturi(Musk)(II) - greyish variety

PhRUC

The drug in 250 mg./kg., p.o. produced no anti-inflammatory effect against carrageenin induced rat paw oedema. It also failed to produce effect against adjuvant arthritis.

Oral administration of drug in a dose of 1 mg./animal produced reduction of both total and free acids. The drug in 250 mg./kg., p.o. exhibited absence of free acidity whereas total acidity was reduced to 20%.

The drug in a dose of 1 mg./animal for 21 days produced no change in liver, kidney, pituitary and testis but prolongation of non-secretory phase in uterus and regression of corpus luteum.

The drug in 0.25, 0.5, 1 and 2 ml./10 ml. bath exhibited inhibition of Ach on guinea pig ileum, but did not have effect against histamine and barium chloride.

The drug in 1,2,5 mg./10 ml. of bath produced no effect on frog rectus. The drug produced insignificant change in spontaneous motility in rabbit jejunum.

The drug in 0.25, 0.5 and 1 mg. produced dose dependent increase in volume of perfusate in isolated guinea pig lung and prolongation of recovery time on repeated experiments.

The drug in 0.5, 1,2 mg./kg. i.v. produced reduction in heart rate with intestinal relaxation.

The drug in 0.25, 0.5, 1,2 and 3 gm./kg., p.o. produced no mortality in 72 hours.

13. Kataka(*Strychnos potatorum* Linn.)

PhRUD

Aq. decoction of *S.potatorum* seed was given in various doses (1gm. to 16gm./kg.) orally to albino rats. The results indicated that aq. decoction causes toxicity with 16gm./kg. orally. All the rats died within three hours after the administration of drug.

Aq. decoction of seed was used in various doses (varying from 200mg.-4gm./kg.) orally to find out the analgesic activity with the help of tail immersion (thermal) method in rats. The drug did not show any significant analgesic activity.

14(a). Kumkum(Saffron)(*Crocus sativus* Linn.)

The material in 0.125, 0.5 and 1 mg./10 ml. of bath produced dose dependent antagonism of Ach, but exhibited no effect against histamine and barium chloride on guinea pig ileum.

It exhibited no effect on frog rectus in doses of 1,2 and 5 mg./10 ml.

It produced dose dependent increase in volume of perfusate of guinea pig lung in doses of 0.125, 0.25, 0.5 and 1 mg.

In doses of 0.25, 1, 2.5 and 5 mg./kg., i.v. it produced no effect on blood pressure and respiration. It produced no effect on Ach and histamine in such experiment.

The drug produced no mortality in mice in doses 250, 500, 1000 and 3000 mg./kg. within seventy two hours.

The drug in 250 mg./kg., p.o. produced no effect on oestrus cycle.

14(b). Kumkum(*Crocus sativus* Linn.)

CRIB

Kumkum in a dose of 500 gm./kg orally was studied for analgesic action in mice. It showed significant protection against acetic acid induced writhings.

It did not potentiate pentobarbitone induced narcosis.

15. Kharjura (*Phoenix dactylifera* Linn.)

PhRUJ

The ethanol extract of fruits of the drug was tested against castor oil induced diarrhea in rats. It did not show any change in number of diarrhoeal droppings in rats in doses of 3 gm./kg. However, a dose of 10 gm./kg inhibited significantly the diarrhoeal droppings produced by castor oil.

The ethanol extract was also studied using different doses on isolated rabbit's heart and isolated rabbit's ileum. But, there was no significant effect.

16. Krisnasariva (*Cryptolepis buchanani* Roem. & Schult.)

PhRUT

Root decoction was prepared and investigated for various pharmacological activities. Hypoglycaemic activity was studied on rabbits. No significant effect was noticed.

Effect of *C.buchanani* decoction on bleeding and clotting time was assessed in healthy rabbits. In 10 g/kg dose level, there was a remarkable increase in bleeding time at the end of 30 min.

Drug decoction was tested for its anti-pyretic effect in albino rats. No anti-pyretic activity was noticed in all the three doses (1,2,5 gm./kg.) .

17. Latakasturi(*Hibiscus abelmoschus* Linn.)

PhRUJ

The effect of benzene extract of seeds was studied on isolated rabbit's ileum and isolated rabbits heart etc. in different doses (1 mg., 3 mg., 10 mg., 30 mg. and 100 mg.). The findings are not significant.

18. Marica(*Piper nigrum* Linn.)

PhRUT

Dried ripe fruit decoction or kwatha was prepared and tested for acute toxicity and general behaviour in mice. No mortality and toxicity was seen with 10 and 20 g/kg dose orally in mice and rats respectively. LD-50 could not be determined due to difficulty in oral administration in large volume.

Decoction in 500 mg./kg. and above showed prolongation of pentobarbitone sleeping time ($p < 0.05$) in mice. At 10,000 mg./kg. the CNS sedative effect was more ($p < 0.001$). Effect of *Piper* decoction was studied on hypnosis induced by diazepam. The decoction exhibited CNS sedative effect but results are under analysis. The test drug in various dose level failed to protect the mice from convulsions, but tegretol showed complete protection from the seizure.

From a number of experiments, it was concluded that the decoction from 25 mg. onward showed a transient dose dependent myocardial depressant effect with more cardiac arrest from 200 mg. onwards. This suggested a -ve *inotropic* and *chronotropic* effect in higher doses.

Preliminary studies showed that the decoction possessed hypoglycaemic potential in 5g/kg dose level (30-50% reduction in Blood Sugar). But, tolbutamide (250 mg./kg.) exhibited 45.50% reduction in Blood Sugar at the end of 5th hour. Further studies using more number of rabbits are in progress.

Diuretic activity of the decoction is under analysis and apparently no effect has been noticed.

Hypocholesterolaemic and anti-pyretic activity are also under investigation.

19. *Munja*(*Saccharum munja* Roxb.)

PhRUV

The ethanol extract were studied but no anti-inflammatory effect was observed upto 3000 mg./kg. dose orally nor any significant analgesic effect was observed.

20. *Musta*(*Cyperus rotundus* Linn.)

PhRUL

Root powder was used for pharmacological studies. It was administered as 500 mg./kg. per oral to see the effect on intestinal transit of rats. *C. rotundus* was found to have no significant effect on intestinal transit as this did not show any significant difference in their values as compared with control.

The drug has been extensively evaluated for rheumatoid arthritis, osteo-arthritis, gout and ankylosing spondylitis and has undoubtedly provided proof of its efficacy and patients preference in these diseases besides it being absolutely innocuous.

21. *Nila*(*Indigofera tinctoria* Linn)

PhRUC

Both pet.-ether and ethyl acetate extracts in doses of 100 and 250 mg./kg., p.o. produced significant analgesic effect in rats.

The extracts emulsified in vaseline administered locally in doses of 1 to 20 mg./Rabbit for 10 to 30 days exhibited increase in hair growth in depelised animals.

The extracts produced transient fall of blood pressure in 1 and 2.5 mg./ kg., i.v.

None of the extracts, exhibited trypanosomicidal effect on inoculated mice, administered in doses of 250 mg./kg. x 10 days since the day of inoculation.

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

CRIB

Extracts of the flowers (AZF/ME,AZF/P,AZF/CH) were used for the pharmacological evaluation. No toxicity or mortality was observed upto the dose level of 1 gm./kg.

None of the extracts showed analgesic effect by 'Hot water' method in a dose of 500 mg./ kg. orally.

None of the extract showed any anti-inflammatory activity in a dose of 500 mg./kg. orally.

The extracts failed to show anti-pyretic activity in a dose of 500 mg./kg..

23. Parushak(*Grewia asiatica*)

PhRUC

The extracts(pet.-ether & ethyl-acetate) in a dose of 250 mg./kg. P.O. exhibited no anti-inflammatory property against dextran induced rat-paw oedema, but seems to possess anti-inflammatory effect against turpentine pleurisy in rats. Further work is in progress.

The extract (pet.-ether) in doses of 1,2,5 and 5 mg./10 ml. bath produced contraction of guinea pig ileum in 5 mg./10 ml. dose only. The pet.-ether extract in 2.5 and 5 mg./10 ml. produced a little contraction of rat colon but highly potentiated Ach induced contraction.

The extracts in doses of 250 mg./kg., P.O. x 10 days exhibited no trypanosomicidal effect against inoculated mice.

24. Patharchati(*Selaginella bryopteris*)

PhRUL

Aqueous extract of the drug in dose of 10 mg./kg. per oral produced slight decrease in the activity of the albino rats as tested by Photoactometer. There was no effect on the rate of respiration and on the heart rate of rats with this dose. No overt behavioural change was observed in this dose.

In doses of 100 mg./kg., p.o. it reduced the passage of charcoal meal significantly as compared to control.

The drug induced a marked increase of anoxia tolerance in albino rats. The findings were significant ($p < 0.02$) as compared to both inter and intra group controls. The plant has an anti-oxidant activity and may prove to be an anti-stress agent.

25. *Patala*(*Stereospermum suaveolens* DC.)

CRIB

Following extracts were used for various pharmacological activities:

- 1). SSB/CVR/C 2). SSB/CVR/M 3). SSB/CVR/P 4). SSR/CVR/M

No toxicity or mortality was observed upto the dose level of 1.0 mg./kg.. None of the extracts showed analgesic effect by 'Hot water' method in a dose of 500 mg./kg. orally. All the extracts of the plant failed to show anti-pyretic activity.

None of the extracts showed anti-inflammatory activity in a dose of 500 mg./kg. orally.

26. *Puskarmula*(*Inula racemosa* Hook.f.)

PhRUL

The anti-asthmatic effect of drug is being investigated clinically and the trial is continuing. Its anti-spasmodic effect has already been reported earlier.

27. *Satapatri*(*Rosa centifolia* Linn.)

PhRUL

Rose root powder was administered as 20 mg./kg. orally. The anti-stress agent reduced significantly the intestinal transit of charcoal.

28. *Sinsapa*(*Dalbergia sisoo* Roxb.)

PhRUJ

Ethanol extract of the leaves was prepared and solvent was distilled off. Again 1% solution in ethanol was made from ethanol extract of leaves and its effect was seen against gonococci with the help of Deptt. of Microbiology. The culture was found to be sterile. It has been suggested by microbiology experts that 10% solution be tested against gonococci so it is again being sent for culture and sensitivity test.

29. *Sunthi*(*Zingiber officinale* Rose.)

PhRUC

The extract in 5 mg./kg.,.v. produced bi-phasic response in b.p. followed by sustained fall with increase in rate and amplitude of respiration. The extract almost completely blocked histamine response.

The extract exhibited no trypanosomicidal property against T. Cruzi infected albino mice.

30. *Swet Punarnava*(*Trianthema portulacastrum* Linn.)

PhRUC

The extract administered in a dose of 250 mg./kg. p.o, x 3 days produced diuretic effect in hydrated rats on repeated studies.

Solid isolated from pet.-ether extract emulsified in Twin 80 and administered intrave-

nously in 0.5 to 1 mg./kg. to intrauterine cannulated anesthetized cats exhibited increase in urinary output. Sodium, Potassium and Cl values of urine were increased but the Na, K and bi-carbonated values in serum almost remained unaffected.

31. Tulasi (*Ocimum sanctum* Linn.)

PhRUL

The leaf extract of *O. sanctum* (an antistress agent) administered in the dose of 70 mg./kg. orally, significantly reduced intestinal transit of charcoal.

32. Vata (*Ficus bengalensis* Linn.)

HKP

The alcoholic extract of the bark significantly potentiated the sleeping time (500 mg./kg.). Aqueous and alcoholic extracts of the bark had no anti-diuretic effect in rats.

33. Nimbatikkam

TRUJ

Various graded doses of Nimbatikkam were administered to mice, rats and rabbits. The LD 50 in mice was 2050 mg./kg. body weight by oral route. The drug is safe up to 2300 mg./kg. in rats and 3400 mg./kg. in rabbits, when given orally. Sub-acute toxicity in rabbits showed that the drug (500 mg./kg.) was well tolerated but 1000 mg./kg. was toxic as there was loss of body weight, anorexia, gastric ulcer, petechial haemorrhages on stomach and liver, congestion of spleen, cloudy swelling in Kidney, hydropic degeneration in liver, congestion and oedema of lung. The serum urea and cholesterol level were raised in both the groups. The drug is a direct depressant of smooth muscle of rabbit gut and direct cardiac stimulant.

The drug does not possess analgesic property against chemically induced writhing in mice.

34. Panax ginseng

PhRUL

Panax ginseng (root powder) was administered as 20 mg./kg. orally. The anti-stress agent reduced significantly the intestinal transit of charcoal. It was found to be most potent.

35. AYUSHI-56

PhRUC

The drug produced no behavioural effect at 250 mg./kg., p.o. in rats. But in 500 mg./kg., p.o. exhibited drowsiness only.

The drug in 250 mg./kg., p.o. in rats exhibited stimulation of CAR response only.

The drug in 250 and 500 mg./kg., p.o. in young trained albino rats produced no effect on learning behaviour.

36. Solamarine (Isolated from *Solanum trilobatum* Linn.)

CRIB

Acute toxicity study of solamarine in rats by oral route was carried out.. LD-50 value of

solamarine in rats by oral route determined according to Litchfield-Wilcoxon method is 4.3gm./kg with fiducial limits between 3.58 mg./kg. and 5.16 gm./kg at 95% confidence level.

37. *Bogenvalia*(flower)

PhRUC

The extract in a dose of 250 mg./kg., p.o. showed insignificant anti-inflammatory property against carrageenin induced rat-paw oedema. It, also did not exhibit any effect against adjuvant arthritis, in doses of 250 mg./kg. per orally.

The drug in 100 mg./kg., p.o. x 10 days exhibited no trypanosomicidal property in inoculated mice.

PHARMACEUTICAL RESEARCH/STANDARDISATION STUDIES

The Council has carried out studies connected with evolving of analytical standards for pharmaceutical process and preparations contained in the draft formulary of Government of India. The study assumes importance as the analytical data is based on the preparations made by the Research Projects themselves. This approach vouchsafes for genuineness and authenticity of the ingredients of the preparations as well as the manufacturing process. Its importance in the drug research programme cannot be under estimated since the drugs assume a pivotal position in the studies.

Having regard to this, the Council has undertaken standardisation research studies on single drugs, process of manufacture of formulations and finished preparations/formulations such as Rasa, Taila etc. in addition to ancillary studies like shelf life role or preservatives etc. that have relevance to the Ayurvedic pharmaceutical sciences. Standardisation studies on single drugs, methods of manufacture and formulations are being carried at Regional Research Institute, Trivandrum, Captain Srinivasa Murthy Drug Research Institute for Ayurveda, Madras, Amalgamated Unit, Tarikhet and Drug Standardisation Research Project, Gujarat Ayurved University, Jamnagar. Standardisation studies on formulations and single drugs are carried out at Regional Research Center, Bangalore while preliminary analytical values are worked out by Captain Srinivasa Murthy Drug Research Institute for Ayurveda, Madras, Drug Standardisation Research Project, Jamnagar and Drug Standardisation Research Project, Varanasi.

The Council worked out an approach plan to lay down analytical values and to identify the presence or otherwise of main ingredients in the preparations by adding the ingredients in different proportions, so as to identify the authentic preparation. A meeting of the experts and officials engaged in the field of Standardisation Studies have been convened and uniform methodology has been worked out for implementation in the Standardisation Research Projects of the Council. The Council considers that this approach, in time to come may prove to be foolproof method to identify the authentic preparations from the spurious and improperly prepared ones.

The details of the research studies carried out in the field of Standardisation studies are as under:-

Single Drugs

The following single drug have been subjected to Physicochemical studies:

Kaka jangha	<i>Peristrophe bicalyculata</i>	DRSPJ
Tila taila	<i>Moorchita, Sesamum indicum</i>	DSRPJ
Tila	<i>Sesamum indicum</i>	RRIT
Kakamachi	<i>Solanum nigrum</i>	DSRPJ

Krishna suriva	<i>Cryptolepis buchanani</i>	DSRPJ,CSMDRIAM
Sigru	<i>Moringa oleifera</i>	DSRPJ
Prasarini	<i>Paederia foetida</i>	DSRPJ
Vasa	<i>Adhatoda vasica</i>	DSRPJ,RRIT
Madana phala	<i>Randia dometorum</i>	DSRPJ
Maya phala	<i>Quercus infectoria</i>	DSRPJ
Musali	<i>Asparagus adscandens</i>	DSRPJ
Tejovati	<i>Zanthoxylum indicum</i>	DSRPJ
Drona pushpi	<i>Leucas cephalus</i>	DSRPJ
Nicula	<i>Barringtonia acutangula</i>	DSRPJ,A&UT
Rohisha	<i>Cymbopogon martinii</i>	DSRPJ
Lajjalu	<i>Mimosa pudica</i>	DSRPJ
Shaileyaka	<i>Parmelia perlata</i>	DSRPJ
Sati	<i>Hedychium spicatum</i>	DSRPJ
Sringataka	<i>Trapa bispinosa</i>	DSRPJ
Kumari	<i>Aloe vera</i>	DSRPJ
Kantakari	<i>Solanum xanthocarpum</i>	DSRPJ,RRIT
Amalaki	<i>Embllica officinalis</i>	DSRPJ
Shankha pushpi	<i>Clitoria ternatia</i>	CSMDRIAM
?	<i>Coleus ambonicus</i>	CSMDRIAM
Shyonaka	<i>Oroxylum indicum</i>	CSMDRIAM
Kakamachi bheda	<i>Solanum trilobatum</i>	CSMDRIAM
Vandhyavari	<i>Vicoa indica</i>	CSMDRIAM
Parijata	<i>Nyctanthes arbortristis</i>	CSMDRIAM
Priyangu (?)	<i>Cinnamomum wightii</i>	CSMDRIAM
Priyangu (?)	<i>Ochrocorpus longifolia</i>	CSMDRIAM
Karpoora haridra	<i>Curcuma amada</i>	RRCB
Shweta kutuja	<i>Wrightia tinctoria</i>	RRCB
Kanchanara	<i>Bauhinia purpurea</i>	RRCB
Shunthi	<i>Zingiber officinalis</i>	RRCB
Bhallataka	<i>Semicarpus anacardium</i>	A&UT
Dhattura	<i>Datura alba</i>	A&UT
Nagabala	<i>Sida veronicue folia</i>	A&UT
Nimba tvak	<i>Melia azadirachta</i>	A&UT, RRIT
Pita sarshap	<i>Brassica compastris</i>	A&UT
Tausa patra	<i>Abies webbiana</i>	A&UT
Tambula swarasa	<i>Piper betel</i>	A&UT
Vridhadaroka	<i>Ipomoea petaloidea</i>	A&UT
Sarshpa taila	<i>Mustard oil</i>	A&UT
Gambhari	<i>Gmelina arborea</i>	RRIT
Shalaparni	<i>Desmodium gangeticum</i>	RRIT
Bilva	<i>Aegle marmelos</i>	RRIT
Chandana	<i>Santalum album</i>	RRIT
Ashwatha	<i>Ficus religiosa</i>	RRIT

Amritha	<i>Tinospora cordifolia</i>	RRIT
Musta	<i>Cyperus rotandus</i>	RRIT
Patha	<i>Cyclea peltata</i>	RRIT
Gokshura	<i>Tribulus terrestris</i>	RRIT
Mangistha	<i>Rubia cordifolia</i>	RRIT
Vacha	<i>Acorus calamus</i>	RRIT
Lavanga	<i>Syzygium aromaticum</i>	RRIT
Tulasi	<i>Ocimum sanctum</i>	RRIT
Bhumyamalaki	<i>Phyllanthus neruri</i>	RRIT

Methods of Manufacture:

The following methods of manufacture were studied during the current year:

Rasa	DSRPJ, A&UT
Taila	RRIT
Asava	RRIT

Analytical Standards:

Analytical values were laid down for the following formulations:

Gojihvadi kvath	DSRPJ
Mutra virajaniya kvath	DSRPJ
Mutra sangrana kvath	DSRPJ
Stanya janak kvath	DSRPJ
Sambukadyam tailam	DSRPJ
Brihat chandrodaya makaradhvaj	DSRPJ
Krimikuthara rasa	DSRPJ
Nidrodaya rasa	DSRPJ
Panchanana rasa	DSRPJ
Vajra kapat rasa	DSRPJ
Yakuti rasa	DSRPJ
Rajata bhasma	DSRPJ
Svarna makshika bhasma	DSRPJ
Sankha dravaka	DSRPJ

Detailed Standardisation Studies:

The following formulations were subjected to detailed Standardisation studies:

Lokanath rasa	DSRPJ
Krimikuthara rasa	DSRPJ
Hemanath rasa	DSRPJ

Triphala churna-	DSRPV
Triphala guggulu	DSRPV
Dugdha vati	DSRPV
Chandrakala rasa	DSRPV
Shankha bhasma	CSMDRIAM
Talisadya churna'	CSMDRIAM
Indukanta ghrita	RRCB
Kutajarista	RRCB
Arogyavardhini vati	RRCB
Bhringaraja taila	RRCB
Somaraji taila	A&UT
Laxmivilas rasa (Naradiya)	A&UT
Nayopayam kvath churna	RRIT
Samangadya churna	RRIT
Dashamoola kvath churna	RRIT
Kanakasava	RRIT
Dashamoola katu traya kashyaya	RRIT
Maha shankha vati	RRIT
Mridvikarista	RRIT
Chaturbhadra kashaya	RRIT
Vyoshadi guggulu	RRIT

Miscellaneous studies:

CSMDRIA, Madras has also carried out Biochemical, Microbiological, Anti fertility potential, Anti inflammatory and Anti pyretic activity and anti tumor activity of the isolates of *Viccoa indica*. A&U, Tarikhet also studied the effect of the container on the contents of Gokshuradi guggulu and Somaraji taila, besides it has also prepared about six item of medicines meant for Community Health Care Programme.

LITERARY RESEARCH PROGRAMME

The Literary and Medico-historical research programmes are being carried out at Indian Institute of History of Medicine, Hyderabad, Documentation and Publication Division, New Delhi and Literary Research Unit, Thanjavur presently shifted to Dr. A. Lakshmi pathi Research Centre for Ayurveda at Madras. Some work has also been carried out in Amchi Research Unit, Leh and Laddakh. The Programme included Medico-Historical studies, collection and compilation of references relating to drugs and diseases from classical treatises, 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 also collection of medico-historical events from the Orchards and Museums is also being undertaken.

INDIAN INSTITUTE OF HISTORY OF MEDICINE, HYDERABAD

The translation work of Islami Tibb by Rehber Farooqui has been completed from page 208 to end. The Medico-historical articles published in Hindi Journals during 1984 were reviewed and 32 abstracts were prepared in English. Editing work of 14 article for publication of two issues of Bulletin of Indian Institute of History of Medicine, Hyderabad has also been done.

History of Rasa Sastra was compiled from six books. The biographical details of 20 physicians during Nijam Dynasty were prepared. Critical notes on 90 pages of two Unani manuscripts- Qoot-e-Layemoot by Shifae Khan (Persian) and Lizzat-ul-Nisa were completed.

The library catalogue cards for 398 books from four libraries at Pune were compiled. The library was further enriched by addition of 159 books, 236 periodicals and 14 other publications alongwith one rare book.

The Photography section exposed 9 black & white 35 mm. and two 120 mm. colour film rolls and prepared 90 prints and 14 transparencies..

Two issues (Vol.18 No.2 and Vol.19 No.1) of the Bulletin of Indian Institute of History of Medicine and Sabdachandrika were published. Publications worth Rs.5535.70 were sold. A number of distinguished visitors from India & abroad visited the Institute.

The museum of the institute was further enriched by addition of photographs taken during Hyderabad Chloroform Commission Centenary Celebrations and a mounted photograph of Late Dr. D.B. Subba Reddy. The museum of the Institute was kept open on the occasion of medical exhibition ``Medex 1989'' organised by Osmania Medical College.

DOCUMENTATION AND PUBLICATION DIVISION, NEW DELHI

The references from Brihatrayi, Laghutrayi and other selected texts of Ayurveda and periodical publications were compiled on 16 drugs - namely Aragvadha, Amra, Gandha Durva, Jati, Kankola, Klitaka, Kumuda, Kusa, Madayantika, Mustaka, Nalika, Phalgu, Prapunnada, Sahacara, Yavasaka and Abha. The informations on Asana, Jivaka, Kodrava, Bakuci, Haridra, Haritaki and Kasturi were further updated.

Textual references from Brihatrayi, Laghutrayi and from Journals of Ayurveda and allied sciences were compiled in respect to AIDS and Kustha Roga.

The work of compilation of bibliography of research articles published in Journals published from 1981-85 is nearing completion. These have been broadly categorised under Clinical research, drug research and literary research. The CCRAS Documentation Bulletin providing digest of current research papers was also proposed for release.

The informations relevant to Ayurveda and other medical systems have been compiled from news-papers, bulletins and other Ayurvedic periodicals. Twenty nine technical queries of different nature were also attended.

Harmekhala and Susena Vaid'yaka two rare books and 214 other books were procured for library. The available rare books are being preserved using modern techniques. Efforts are also in progress to procure more rare books and manuscripts.

Photographic coverage of different meetings and conferences held during the reporting period have been done. The microfilming facilities are being further strengthened. The xerox copying work covering 77,375 pages and printing totaling 2,49,616 impressions has been carried out.

Two conjoined issues each of the Journal of Research in Ayurveda and Siddha(1989, Vol.IX No.3 & 4 and Vol.X No.1 & 2) and Bulletin of Medico-ethno Botanical Research (Vol.X No.1 & 2 and Vol.X No. 3 & 4) and News Letter upto December,89 were published. Six monographs were also brought out. Council's publications worth Rs.50,923.55 were sold in Exhibitions, conferences and Symposia.

LITERARY RESEARCH UNIT, MADRAS

The Literary Research Unit functioning at Thanjavure has been shifted to Dr. A. Lakshmiapati Research Centre for Ayurveda at Madras. During the reporting period 200 single drugs from Sarabhendra Vaidyakosha have been taken up for botanical identification and writing of their therapeutic uses alongwith the synonyms etc. The editing of the work of Chikitsamritsagara by Devidra in comparison and collation with other forms and popular classics and treatises has been further continued. Extra portions collected from Bombay manuscripts are compared with other standard works. Additional matters, different readings

are also noted. Karamvipaka portion and Jyotish portion were also compared.

The following works are ready for scrutiny/editing.

1). Satasloki 2). Netra Prakasika 3). Rasaraja lakshmi 4). Dhanwantari vilasam 5). Dhanvantari saranidhi 6). Nanavidha vaidyam 7). Pathiyapathiya vibodam 8). Kumara Dhantram 9). Netra Roganidanam

In addition the H.Q. office has also carried out scrutiny of the manuscripts of Ashtanga Samgraha. The printing work of the Ashtanga Samgraha-critical edition alongwith Indutika upto Sharira Sthana (chapter VIII), has been completed. Printing work of Sahasrayoga is nearing completion.

For Documentation of Post Graduate and Doctoral theses State Ayurvedic College, Lucknow, BHU, Varanasi, National Institute of Ayurveda, Jaipur and M.M. Government Ayurvedic college, Udaipur were visited. 450 Post Graduate and Doctoral theses were documented and abstracted during this period.

AMCHI RESEARCH UNIT, LEH

This unit has completed editing and scrutiny of the book entitled ``Amchi Pharmacotherapeutics'' and submitted the same for publication. A Survey tour was conducted covering the areas of Shargola, Foker and Spai for identification and collection of drugs. About 50 drugs were identified and collected in substantial quantity for use in OPD. The unit has also collected 100 gm. of Shilajit.

The OPD of this unit has attended 2125 patients during the reporting period.

FAMILY WELFARE RESEARCH PROGRAMME

The Council has been carrying out Clinical studies and Chemico-Pharmacological studies under this programme. Clinical studies are carried out for evaluation of plants/plant products as oral contraceptive agents to establish their known anti-fertility activities whereas Chemico-Pharmacological studies on experimental animals are carried out to establish mainly their anti-implantation, anti-ovulatory as well as effect on oestrous cycle. The toxicity studies of some of the drugs are also carried out to study their toxic effects, if any. The work carried out upto 88-89 have been compiled and analysed. The work carried out under both of these aspects during the reporting period is reported hereunder:

Clinical Studies

Clinical studies on plants/plant products as oral contraceptive agents were continued further at the Institutes/Units functioning at Ahmedabad, Bombay, Calcutta, Delhi, Jaipur, Lucknow, Patiala, Madras, Trivandrum and Varanasi. The drugs studied during the reporting period include:

- [a] Ayush AC-IV [A coded drug]
- [b] Pippalyadi Yoga
- [c] K-Capsule [A coded drug]
- [d] Neem oil
- [e] Vandhyavari [*Vicoa-indica*]

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 continued further by the Units functioning at Bhubaneshwar, Trivandrum and Varanasi. The work carried out by these units is summarized hereunder:

1. Tankan (Borax)

(a) Acute Toxicity Study

PhFRUT

Tankan as suspension was administered orally in rats and mice in the dose levels of 1 gm to 30 gm/kg. 10 gm/kg dose showed 50% mortality and 30 gm/kg showed 100% mortality in mice. In rats 100% mortality was seen at 20gm/kg and higher dose levels.

Water desolved tankan was administered to adult mice and albino rats of either sex in the doses of 500, 1000, 2000, 4000 and 5,000 mg/kg body weight once only. No Toxic effects were seen upto the maximum dose of 5,000 mg/kg body weight upto 48 hours.

(b) Anti-implantation Activity**PhFRUT**

Tankan as suspension in 2% gum acacia was administered orally in female rats in the doses of 1,2 and 4 gm/kg from D1 to D10 of pregnancy and the control group received only gum acacia during the above period. The rats were laparatomised on D16 of pregnancy and observed for implants, their size, number and the corpusluteum in ovaries. The study showed 80% anti-implantation effect at 2gm/kg dose level.

PhFRUB

Water desolved tankan was administered to pregnant albino rats in the doses of 50, 100 and 200 mg/kg body weight. The study showed 50%, 40% and 20% efficacy with 100, 200 and 50mg/kg doses respectively.

(c) Oestrogenic Effect**PhFRUB**

Imature female albino rats were allocated randomly into three groups each group having six animals. The animals were ovariectomised and after seven days the drug was administered orally for three days twice daily. The control group received only water as vehicle and standard (positive control) group received .1 ug oestradiol per animal. The experimental group received .1 ug oestradiol subcutaneously along with the drug material 200 mg/kg body weight. On the day 11 the animals were autopoised. The status of vagina, the type of cells in vaginal smear and the net weight of uterus are recorded. The average uterin weight was found to be 38.16, 64.73 and 40.29 in control, standard control and the test drug groups respectively showing that the drug antagonized the action of oestrogen on the uterus to some extent which is essential for implantation.

2. Gunja (*Abrus precatorius*)**PhRUT****(a) Acute Toxicity Study**

Decoction of red variety of seeds of Gunja was administered to albino mice in groups of 12 each in the doses of 100, 500, 1000, 2000, 4000, 5000, 10,000, 20,000 and 50,000 mg/kg and observed for toxicity and mortality for 72 hours after administration of the drug. No toxicity or mortality was seen upto the dose level of 50,000 mg/kg.

(b) Anti-implantation Study

Decoction of red variety of seeds of Gunja was administered to female rats in the doses of

500, 1000 and 2000 mg/kg from D1 to D10 of pregnancy. The control group received dist. Water in appropriate volume. The study showed no significant effect upto the dose level of 2000 mg/kg dose level.

3. Ark (*Calotropis procera*)

PhFRUB

(a) Acute Toxicity Study

Aqueous extract of Ark (root) was administered to adult mice and albino rats of either sex in the doses of 500,1000,2000,4000 and 5,000 mg/kg body weight once only. No toxic effects were seen upto the maximum dose of 5gm/kg body weight upto 48 hours.

(b) Anti-implantation Study

Aqueous extract of Ark (root) was administered to pregnant albino rats in the doses of 50, 100 and 200 mg/kg body weight. The study showed 30%, 80% and 80% efficacy with 50, 100 and 200 mg/kg doses respectively.

(c) Oestrogenic Effect

PhFRUB

The study was conducted using Aqueous extract of Ark (root) in the same manner as for tankan .The average uterin weight was found to be 38.16,64.73 and 42.48 in control,standard control and the test drug groups respectively showing that the drug antagonized the action of oestrogen on the uterus to some extent which is essential for implantation.

4. Nirgundi (*Vitex negundo*)

(a) Acute Toxicity Study

PhFRUB

Aqueous extract of Nirgundi (root) was administered to adult mice and albino rats of either sex in the doses of 500, 1000, 2000, 4000 and 5,000 mg/kg body weight once only. No toxic effects were seen upto the maximum dose of 5gm/kg body weight upto 48 hours.

(b) Anti-implantation Study

PhFRUB

Aqueous extract of Nirgundi (root) was administered to pregnant albino rats in the doses of 50, 100 and 200 mg/kg body weight. The study showed 40% efficacy with both 100 and 200 mg/kg doses where as no efficacy was seen with 50 mg/kg dose.

(c) Oestrogenic Effect

PhFRUB

The study was conducted using aqueous extract of Nirgundi (root) in the same manner as for tankan . The average uterin weight was found to be 38.16, 64.73 and 40.33 in control, standard control and the test drug groups respectively showing that the drug antagonized the

action of oestrogen on the uterus to some extent which is essential for implantation.

(d) Antifertility Effect

PhFRUV

Three groups each group having five rats of proven fertility were taken for study. Alcoholic extract of the Nirgundi (root) was administered in the doses of 50 and 100 mg per rat for seven days in Ist and IInd group while the IIIrd group received water only and served as control. The rats were kept for matting over night. On the eleventh day of pregnancy these rats were laprotomized and foetus formed counted and recorded. The animals were left in their cages upto the term of delivery after suturing the wound gently. The higher dose in comparison to lower dose has shown significant antifertility effect.

(e) Anti-ovulatory Effect

PhFRUV

Five female adult rats of normal oestrus cycle were selected and alcoholic extract of the Nirgundi (root) was administered in the dose of 50 mg/rat per day in the form of suspension prepared in water orally through rubber catheter tube for four cycles. The drug did not showed any change in oestrous cycle. The same experiment was repeated too to confirm the results.

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	62	82	1	4	1	49	89
	Lucknow	30	89	6	4	-	6	103
	Calcutta							
	Group-I	-	3	-	-	-	-	3
	Group-II	14	11	3	-	1	15	6
	Bombay	-	12	-	-	-	1	11
	Delhi	14	5	-	2	1	10	6
	Patiala	25	8	1	4	2	18	8
	Madras	23	-	-	4	1	15	3
Pippalyadi yoga	Calcutta Ahemdabad	19	19	4	1	-	20	13
K-kapsule	Varanasi	3	57	4	-	-	3	53
Neem oil	Delhi	6	11	-	2	-	8	7
Vandhyavari	Delhi	3	13	7	-	-	2	7
	Bombay	69	101	5	-	-	-	165
	Trivandrum	10	7	-	-	-	8	9
	Varanasi	33	64	25	-	-	14	58

PUBLICATIONS\PARTICIPATIONS

I Publications:

S.No.	Name of The Author	Title of the Paper	Name of the Journal	Date of Publication
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5.	Nair, P.R.C. et al	Bastikarma-A quicker method to achive systemic drug concen- tration	Ayu	May, 89
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14.	Prem Kishore Sudarsan Dash	Study of Health Statistics. in tribal pockets of Kalahandi District Orissa	J.R.A.S. Vol. IX No. 3 & 4	Sept. Dec., 88
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| 75. | Kapoor,M.L. | Pippali | Jeevaniya,Vol.III | 1989 |
| 76. | Kapoor,M.L. | Sarpapriya Jamun | Jeevaniya Vol.II | 1989 |
| 77. | Kapoor,M.L. | Apna Hakeem,Neem | Jeevaniya Vol.II | 1989 |
| 78. | Kapoor.M.L. | Gunkari Ghas Deab | Jeevaniya Vol.I | 1989 |
| 79. | Kapoor,M.L. | Brain tonic,shankh | Jeevaniya,Vol I | 1989 |

80.	Nagaratnam,A Madhavi,A.	New light on ancient Indian Anatomy	Bull.IIHM,Vol.19 No.1	March 1990
81.	Tewari,K.C. et al	Cancer roga ki atihasi- sika prathbhoomi avam lok pranalit jaributi- tayan (Hindi)	Sachitra Ayurveda Cancer Roga Vish- eshank,	Nov., 1989
82.	Tewari,K.C. et al	Ayurvedic aushadh brkshyan dware vanikaran	Sachitra Ayurveda	Jan., 1990
83.	Uniyal,M.R.	Madhuk-pushpi a use- ful tree of tradit- ional importance	CCKAS News letter VolXI[1-2]:	Sept- 1989
84.	Vinod Kumar	Abstracts of medico Historical articles in Hindi Journals	Bull.of IIHM, Vol.18,No.2,	Oct. 1989
85.	Yelne,M.B.	Bahuvridha Gunani Yukta Rudraksha.	Sakal, Pune	Oct., 1989

II. PARTICIPATION

S.No.	Name of The Author	Title of the Paper	Seminar/ Conference	Date of Participation
A. Clinical and Basic Research:				
1.	Arya,M.P.S.	Katipaya Yakrit Roga evam uski Chikitsa	Vimarsh Consult- ancy-Aligarh Jaipur and Ahemdabad	21-28 Jan. 1990
2.	Ghosh,Shashi Sharma,K.D.	Amlapittaki Chikitsa main Katipaya Upayogi Aushadhiyan.	Janpad Ayurveda Sammelana Gula- vati,Buland- shahar,U.P.	24-25 March 1990
3.	Mukherjee,G.D.	Leprosy-a social problem and its Reha- bilitation Management	National Seminar on Kustha-Roga at Calcutta.	17-18 March 1989

4.	Pandey, V.N. Sharma, K.D.	Raktachapa ka Ayurvediya Vishista Nidana Cikitsatmaka Vivechana Avam Anusandhanatmak Dristikone	All India Ayurvedic Congress Swami Bhumanand Haridwar Ay. Mahasammelan Patrika	12-20 July 1989
5.	Pandey, V.N. Sharma, K.D.	Raktachapa Upchar- Ayurvediya Dristikona	National Ayurvedic Seminar Haridwar,	June 1989
6.	Pandey, V.N. Sharma K.D.	Gas Vyadhi ka Ayurvediya Upchar Aik Sodha purna vivechana	Jain vishwa Bharti Ladanu, Rajasthan	6-7 Jan. 1990
7.	Pillai, N.G.K.	Study of Psoriasis	Workshop on Psoriasis at Aligarh Jaipur & Ahmedabad	21-28 Jan. 1990
8.	Sharma, B.B.	Sthaoulya Ayurvedya nidan cikitsatmak varnan aur kuchha medohar dravyo ka anusandhanatmak adhyayan	Workshop on CCRAS Research findings organised by Vimarsh Consultancy under the auspices of WHO and M/H & F.W. at Aligarh Jaipur and Ahmedabad.	21-28 Jan. 1990
9.	Uniyal, M.R. Pandey, V.N.	Irajyaparadh Janya Shakshrit Maha Kustha anusandhan-Parak Cikitsa	National Seminar on Kustha Roga	1989
10.	Uniyal, M.R. Tiwari, K.C.	Amlapitta cikitsa Vivehan	Janpad Ayurveda Mahasamm- lena, Bulandshahar	24-25 March 1990
11.	Verma, R.R. Nair, P.R.C.	Study of Psoriasis.	Seminar on future strategy of Develop- ment of Ayurveda held at Lucknow by CCRAS.	26-27 Aug. 1989
12.	Venugopala- charya, M.	Analytical view on Aetiopathogenesis of Mahakushta-Comparative study with Leprosy and its management.	National Seminar, on Kustha Roga at Calcutta.	17-18 March 1990

B. Health Care Research:

13. Ali Momin	Role of Ayurveda in Primary Health Care	Dhanvantari Jayanti	27 Oct.89
14. Chaturvedi, D.D.	Ayurvedic Cikitsa Padhati dwara prathamik Swasthya raksha	Workshop on findings of CCRAS held at Aligarh, Jaipur & Ahmedabad.	21-28 Jan. 1990
15. Chaturvedi, D.D.	Operational Research in Primary Health Care	III-ICTAM at Bombay	4-7 Jan.,90
16. Mishra et al	Health Survey and Surveillance studies in some rural areas of Jaipur	-do-	-do-
17. Pandey, V.N. Sharma, K.D.	Amlapitta Main Agnidusti Ki Pradhanyata Avam Pathya Palan Vaishistya Paraka Sodha Purna Vivechana	Janpad Ayurveda Sammelana, Gulavati Bulandshahar, U.P.	24-25 March 1990
18. Rao, Rama, B.	Some aspects of theory and Practice of Health care in recent centuries	III-ICTAM Bombay	4-7 Jan. 1990

C. Medico-Botanical Survey and Cultivation:

19. Billore, K.V. et al	The folk remedies of Rajasthan practised today	-do-	-do-
20. Hemadri, K.	Folk Medicine of Bastar	-do-	-do-
21. Hemadri, K.	Contribution to the Medico-Botany of East Godavari and West Godavari districts of Andhra Pradesh	Workshop on Medicinal plants [A.P.] under the auspicious of M/H and Family Welfare Govt. of India, and WHO held at Tirupati.	9-11 Feb. 90

22.	Mehendale, V.V.	Therapeutic uses of important medicinal Plants growing in Maharashtra	Workshop on Traditional System of Medicine & Herbal Remedies, organised by Holistic Health Centre, Pune	6th July 1989
23.	Mukherjee G.D.	Conservation of Medicinal plants-its future possibilities	Workshop programme on medicinal plants at Kalyani, Govt. of West Bengal	22-23 Feb.
24.	Rao, S.S. Venugopalacharya, M.	Medicinal plant wealth of Nalgonda District, A.P.	Workshop on Medicinal plants under the auspicious of M/H & F.W. Govt of India, and WHO held at Tirupati.	9-11 Feb. 1990
25.	Sharma, P.C.	Some Important Medicinal plants of Maharashtra & their propagation	workshop on Traditional System of Medicine & Herbal Remedies, organised by Holistic health Centre, Pune.	3rd July 89
26.	Sharma, P.C.	Medicinal Plants	Seminar on Applied Botany, held at T.C. College, Baramati [Maharashtra].	7th Dec. 89
27.	Sharma, P.C.	Problems & Prospects of Cultivation of Medicinal plants.	Workshop on Medicinal plants held at S.V. Ayurvedic College, Tirupati.	9th Feb. 90
28.	Sharma, P.C.	Some Threatened Medicinal plants of Bihar	ICTAM, Bombay	4-7 Jan. 1990
29.	Tewari, K.C.	Cultivation of Medicinal plants for health care problems and prospects.	-do-	-do-

30. Uniyal, M.R. Traditionally useful Medicinal flora of Sikkim Himalaya. ICTAM, Bombay 4-7 Jan. 1990

31. Yelne, M.B. Nursery Practices for Medicinal Plants Workshop on Traditional System of Medicine & Herbal Remedies, organised by Holistic Health Centre, Pune. 3rd July 89

D. Pharmaceutical and Chemical Research:

32. Dutta, S.K. Standardisation of Ayurvedic drugs Workshop held at Aligarh, Jaipur Jan., 1990

33. Kundu, A.B. et al Zizyberanolic acid, A novel pentacyclic Triterpenoid of *Zizyphus jujuba* National symposium on recent advance in organic chemistry Kalyani, Abstract No.9 1989

34. Uniyal, M.R. Determining the identity of the ancient textual medicinal plant Mudhukpuspi as "Chyura" of Kumaon - *Aesandra buturaceae* [Rox] Baehni. ICTAM, Bombay 4-7 Jan. 1990

35. Yelne, B.M. et al Pharmacognostic study of Jalapipapli (*P. nodiflora* L.) ICTAM, Bombay 4-7 Jan. 1990

E. Pharmacology:

36. Dixit, K.S. et al The effect of stress on Radioligand receptor binding in the C.N.S. and its modification by some medicinal plants. Ninth Ann. Conference of Indian Academy of Neuro sciences T.R.C., Lucknow. 1989

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| 37. | Singh, N. | New concepts in Cardiac and arterial smooth muscle contraction | 2nd International Congress on Cardiovascular nutrition and uptake in coronary heart disease New Delhi. | Feb. 1990 |
| 38. | Singh, N. | A Scientific evaluation of possible role of herbal medicine in Cardio vascular disease | 2nd international Congress on cardiovascular nutrition & uptake in coronary heart disease, New Delhi | July, 1989 |
| 39. | Singh, N. | A Scientific evaluation of Indian Herbal Medicine in modern therapy Proc. of Satellite Symposium on "Medicines of plant origin in modern therapy". | IVth world conference of Clinical Pharmacology pragu Czechoslovakia | July 1989 |

F. Drug Standardisation:

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|-----|---------------------------|---|----------------------------|---------------|
| 40. | Pandey, V.N. et al | Standardisation of Ayurvedic Drugs - A study of workable parameters. | ICTAM, Bombay | 4-7 Jan. 1990 |
| 41. | Pandey, V.N. Sharma, K.D. | Gita Avam Ayurvediya Siddhanton Para Aaharita Vyavahara paraka avam Samikshatmaka Adhyayan. | Geeta Sammelana, Ahmedabad | Oct., 1989 |
| 42. | Ramiah, N. | Drug Testing and Quality Control of Traditional Medicine. | ICTAM, Bombay | 4-7 Jan. 1990 |

G. Family Welfare:

- | | | | | |
|-----|--------------------|---|--|------|
| 43. | Adhikari, P. et al | Anti implantation activity of some indigenous plants in Adult female Rats | 22nd Annual conference Indian Pharmacological Society, Calcutta abstract No.12 | 1989 |
|-----|--------------------|---|--|------|

44.	Choudhary, P. et al	Antifertility activity of a compound isolated from the stalk of <i>Piper betal</i> Linn. on female albino Rats	31st International Union at Physiological science Halasinki Abstract NO.X:P 1439	July 89
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II. Miscellaneous:

45.	Joshi, M.C.	Some folk medicines of the tribals of Gujarat.	ICTAM, Bombay	4-7 Jan. 1990
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46.	Pandey, V.N. Sharma, K.D.	Ayurveda Ka Vartaman Swarupa Kya Ho	Adhiveshana of Govt. Ay.Unani cikitsa Seva Sangh Bulandshahar, and Haridwar.	June, 1989
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47.	Rao, R.B.	Transmission of ayurveda in Medieval period.	seminar on Scientific Heritage of India organised at Tripunitura by Mahatma Gandhi University & Govt. Sanskrit College, Tripunithura.	March 1990
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48.	Sharma, K.D.	Ahara Vijnan Avam Ayurvediya pathya-pathya Vivehana.	WHO conference at Aligarh, Jaipur Ahmedabad held on 21-22, 23-25 & 27-28 Jan., 1990.	
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TECHNICAL REPORT-SIDDHA

Abbreviations used for Institutes/Units

<i>S. No.</i>	<i>Name of the Institute/Units</i>	<i>Abbreviations</i>
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 Research Unit Siddha Madras	DSRUSM
9.	Drug Standardisation Research Unit Siddha, Bangalore	DSRUSB
10.	Drug Standardisation Research 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 Kalanjaga padai (Psoriasis), Putru noi (cancer), Manjal kamalai (Infective hepatitis), Sandhi vatha soolai (Rheumatoid arth ritis), Valligunmam (Peptic Ulcer), Peruvaeru (Ascitis), Gunman (Intestinal disorders), Venkuttam (Leucoderma), Velluppu noi (Anaemia), Vellai noi (Leucorrhoea), Oothal noi (Obesity), Karappan noi (Skin diseases) etc.

The results of the research work carried out during the reporting period is reported here under:

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 Central Research Institute (Siddha), Madras and Clinical Research Unit (Siddha), at Safdarjang Hospital, New Delhi. 10 ml. of oil with milk was administered in two divided doses internally in all the 199 cases selected for study. The patients were also advised to apply oil externally on the affected parts of the body. The details of result of treatment are reported here under.

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

S.No. Therapy	Instit./ Centre/ Unit	Total cases	Results				
			Comp. rel.	Mark. rel.	Mode. rel.	Mild rel.	LAMA
1. 777 Oil	CRI(S) Madras	183	14	78	55	19	17
2. 777 oil	CRU(S) New Delhi	16	9	1	-	-	6

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 breast is affected it is called Mulaiputrunoi. The study was under taken at Central Research Institute (Siddha), Madras to determine the efficacy of the Siddha drugs in the cases of Putrunoi using the coded drugs RGX, VK2 and SKX. These drugs were administered with honey. Ulcers, tunours were dressed with Nithiyakalyani alai Kalkam and Panchainennai with thursu. 15 cases of Putrunoi were treated during the reporting year. Reduction in the size and growth of the ulcer/tumours reduction or arrest of the discharges and also reduction in pain was noticed in almost all the cases. Out of these 15 cases six cases showed mild relief and remaining nine cases discontinued the study.

3. Manjal Kamalai (Infective hepatitis)

Manjal Kamalai was studied at Central Research Institute (Siddha), Madras. The choornam made of Kadugurohini was administered in the doses of 1 gm. two times a day with water in all the 9 cases selected for the trial. Salt and fat free diet was advised. No side/toxic effects were noticed. The treatment provided marked relief in six cases and one case each showed moderate and mild relief while remaining one case discontinued the study.

4. Sandhi Vatha Soolai (Rheumatoid arthritis)

A study to evaluate the effect of Gowrichinthamani and Linga Chendooram in the management of Sandhi Vatha Soolai was envisaged at Central Research Institute (Siddha), Madras. 300 mg. each of the trial drugs were administered two times a day with honey in all the four cases admitted during the period under review. Tamarind and chilli free diet with less salt was advised during treatment. Myna thylam was advised for use externally on the affected parts. The treatment provided showed marked relief and mild relief in two cases each.

5. Valligunmam (Peptic Ulcer)

The study was under taken at Central Research Institute (Siddha), Madras to determine the effect of Suyamagini Chendooram in the cases of Valligunmam. The cases having pain in the abdomen in relation to food, discomfort in the apigastric region, nausea, vomiting erucation and haematemisis etc. were selected for trial. The diagnosis was confirmed by FTM and Barium meal X-ray reports. Suyamagini Chendooram prepared using Katrazhaicharu and coded as VG1 was administered at the dose level of 200 mg filled in gelatin capsules two times a day for 21 days. Omambath was given to all the nine cases included into the study 22nd day. The study showed complete relief and moderate relief in two cases each and marked relief in four cases while one case discontinued the study.

6. Gunmam (Intestinal disorders)

The study was under taken at Regional Research Institute (Siddha) , Pondicherry and Clinical Research Unit (Siddha), Palayamkottai.

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

S.No.	Drugs	Total cases	Results				
			Comp. rel.	Mark. rel.	Mode. rel.	Mild. rel.	LAMA
1.	Uppu Chendooram (130 mg. TDS)	11	3	2	-	4	2
2.	Athi Mathura Choornam and Kavikkal choornam (one gm. B.D.)	10	6	1	1	1	1
Total		21	9	3	1	5	3

7. Vathasoolai (Vatha disease)

A study initiated to evaluate the effect of Chandamarutham in this disease condition was under taken at Regional Research Institute (Siddha), Pondicherry. 130 mg. of Chandamarutham was administered two times a day in all the 16 cases selected for trial. Tamarind and chilli free diet with less salt was prescribed. The study showed marked relief in seven cases and moderate relief in one cases while remaining eight cases discontinued the study.

8. Sarumanogal (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 2 gm. respectively in two divided doses followed by milk.

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

S.No.	Drugs	Total cases	Results				
			Comp. rel.	Mark. rel.	Mode. rel.	Mild. rel.	IAMA
1.	Irunelli Karpam (130 mg. B.D.)	15	6	-	5	-	4
2.	Gandhaga rasayanam (2 gm. B.D.)	15	7	-	4	-	4
3.	Combination of (1 and 2)	50	24	-	15	-	11
Total		80	37	-	24	-	19

9. Velluppu noi (Anaemia)

Clinical studies were conducted on 12 cases of Velluppu noi (anaemia) at Clinical Research Unit (Siddha), Palayamkottai and Regional Research Institute (Siddha), Pondicherry. The drugs tried in these cases are Ayabringgaraja Kapam at the dose level of 250 mg. with honey three times a day and Annabedi Chendooram at the dose level of 250 mg. with honey three times a day.

Table
Results of clinical therapeutic trial of Siddha preparations on Velluppu noi(anaemia)

S.No.	Drugs	Instt./ Centre/ Unit	Total cases	Results				
				Comp. rel.	Mark. rel.	Mode. rel.	Mild rel.	LAMA
1.	Ayabringaraja Karpam (260 mg. TDS)		5	2	2	-	-	1
2.	Annabedi Chendooram (250 mg. BD)		7	3	2	1	-	1
Total			12	5	4	1	-	2

10. Oothal Noi (Obesity)

Four varieties of Oothal noi have been described in Siddha texts. Consumption of hot and spicy food, spoiled and poisonous food, food contaminated with mud, ash, and other impurities are some of the factors responsible for causation of this condition. This clinical condition is also found associated with Sanni, Velluppu noi and poisonous bites etc. The study was conducted at Regional Research Institute (Siddha), Pondicherry using Mondooraathu Adikudineer in the dose of 60 mg. BD in three cases out of which two cases showed complete relief and one case discontinued the study.

11. Neerazhivu (Diabetes mellitus)

Neerazhivu is described as one of the Suruneer noigal in Siddha texts. The study was envisaged on this clinical condition using Abraga Chendooram, Vanga Parpam, Sandhanapodi, and Keezhanelli Choornam was carried out by Clinical Research Unit (Siddha) at Safdarjang Hospital, New Delhi and also at clinical wing of Drug Research Scheme (MD), Madras. The mild and moderate cases of Neerazhivu were taken up for study.

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

S.No.	Drugs	Total cases	Results				
			Comp. rel.	Mark. rel.	Mode. rel.	Mild rel.	LAMA
1.	Abraga Chendooram (200 mg. B.D)	25	-	12	11	-	2
2.	Vanga Parpam (200 mg. BD)	5	-	3	2	-	-
3.	Sandhanapodi (300 mg. BD)	1	-	-	-	-	1
Total		31	-	15	13	-	3

12. Venkuttam (Leucoderma)

Venkuttam has been described in Siddha texts as one of the Kutta noigal. Response of certain selected Siddha drugs was studied in the cases of this disease by Clinical wing of Drug Research Scheme (MD), Madras. No toxic/side effects were noticed after treatment and also during the follow up period.

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

S.No.	Drugs	Total cases	Results				
			Comp. rel.	Mark. rel.	Mode. rel.	Mild rel.	LAMA
1.	Kandan Kathiri pazha choornam and ennai	8	-	-	-	4	4
2.	Ponnimilai chendooram (250 mg. BD)	16	-	-	-	10	6
3.	Thamira chendooram (250 mg. BD)	10	-	-	-	4	6
Total		34	-	-	-	18	16

13. Murai Jwaram (Malaria)

The study was under taken at Clinical Research Unit (Siddha), Palayamkottai using Linga Chendooram in the dose of 200 mg. BD in four cases out of which three cases showed complete relief and one case showed marked relief.

14. Kakkai Valippu (Epilepsy)

The study was under taken at Clinical Research Unit (Siddha), Palayamkottai using Pochondi Sudar Thailam in the dose of 5-10 drops BD in five cases out of which marked relief was seen in two cases and moderate relief in one case while remaining two cases discontinued the study.

OUT PATIENTS/IN PATIENTS ATTENDANCE

S.No.	Institute/Units	No. of patients attended at OPD/IPD			
		OPD		IPD	
		New	Old	Total	
1.	CRI(S), Madras	8779	11174	19953	220
2.	RRI(S), Pondicherry	3411	8762	12173	36
3.	CRU(S), Palayamkottai	739	1625	2364	26
4.	CRU(S), New Delhi	63	987	1050	-
5.	CRU(S), Trivandrum	1038	8354	9392	-
6.	CDRS(MD), Madras	37	158	-	-
Total				45,127	282

HEALTH CARE RESEARCH PROGRAMME

Health Care Research Programme has been taken up through Mobile Clinical Research Units attached to Central Research Institute, Madras and Regional Research Institute, Pondicherry and Tribal Health Care Research Projects functioning at Tirupatur North Arcot Dt. (Tamil Nadu) and Kalasa, Chikmagalore District (Karnataka).

A. Tribal Health Care Research Programme

THCRPT

The team conducted tours in the tribal pockets of Elagiri hills and recorded health statistics of 446 individuals and provided incidental medical aid to 1188 out of which 446 cases were new. Kudarpuzhu noigal, Kuruthi Azhal noi, Velluppu noi are some of the diseases found prevalent in the area.

1HCRPK

The team conducted 37 visits in the tribal pockets spread over 10 helmets (i.e.) gangam Kudige. Kargadde. Hebbal Marasanige, Thalgodu, Samso, Basarikallu, Abbrukudige, Kagnalla and Jamble. Health statistics were recorded for 1799 individuals. 986 patients suffering with different ailments were provided incidental medical aid during the reporting year.

B. Mobile Clinical Research Programme

MCRUP

The mobile team visited 11 times to the village Korkadu having total populations of 938. 207 patients suffering with different ailments were provided incidental medical aid.

MCRUM

The mobile team visited the Noolambur village having total population of 750. 724 new and old patients suffering with different ailments received incidental medical aid.

MEDICO-BOTANICAL RESEARCH PROGRAMME

Medico-Botanical survey Unit functioning at Government Siddha Medical College, Palayamkottai has played an important role in the field of Drug Research.

The aims and objectives of the unit broadly include the exploration of areas of the Tamil Nadu State for the qualitative and quantitative study of medicinal flora, identification of plant specimen, availability of genuine drugs including its substitute/adulterants etc.

During the reporting year, the unit has conducted 12 Survey cum-collection tours covering the forest divisions/areas of Sri Villiputhur of Kamaraj District; Pitchavaram, S.A. Dt; Thenmalai, Shenkottai Shengaltheri, Kalakadu, Maharaja nagar, Naraikkadu, Thirukkuran kudi of Dist; Upper Kothayar, Kanya Kumari Distt; Kodaikkanal, Aringar Anna Dist. and herbarium specimens spread over 279 field book numbers 5075-5353 (having medicinal importance in Siddha Medicine) belonging to 76 families of 242 genera of 279 species were collected and reported. 220 plant specimens were identified and added to the herbarium.

Some of the plant specimens collected for herbarium are:- Korandimul (*Lepidagathis pungens* Nees), Chethai verpullu (*Tragus roxburghi* Pangrahi), Vishinukiranthai (*Evolvulus alsinoides* L.), Sooyam pullu (*Aristida funiculata* Trin & Rupr.) Narivalpullu (*Perotis indica* O.Ktz), Mavilangam (*Niabuhria apotala* Dum.), Mara Vaz Vazhai (*Oberonia wightiana* Lindl.) Kandal (*Rhizophora mucronata* Lamk.), Nagamali (*Rhinacanthus communis* Nees), Ottu (*Loranthes falcatus* kurz.), Kodikathotti (*Capparis moonii* Wt.), Charai (*Zizyphus rugosa* Lamk.), Kumbi (*Gardenia lucida* Roxb.) Kiluvai (*Commiphora caudata* Engl.) Thel kadi-pachilai (*Notonia grandiflora* DC.).

36 crude drug samples were collected and added to the museum. A few important are:- Ponkorandi (*Salacia prinoides* DC.), Vandukolli (*Euonymus dichotomus* Heyne), Kandal (*Rhizophora mucronata* Lam.), Kodam puli (*Garcinia cambogia* Desr.), Mul murukku (*Erythrina* sp.). Romaviruchan pattai (*Bischofia javanica* Bl.), Nari Vengayam (*Urginea indica* kunth.), Athividayam (*Cryptocoryne spiralis* Fisch.), Ivirali (*Bryonopsis lanciniosa* Nand) etc.

13 folk medicinal claims were collected during the survey

Medicinal Plants Garden

A small herb garden is being developed and maintained by the CRI (Siddha), Madras to cater the need of raw (fresh) drugs to its pharmacy and Hospital. 146 plant species are being maintained in the garden and 21 more plant species are included. 15 crude drugs both fresh and

dry were supplied in different quantities to the pharmacy and hospital during the reporting year, out of which 650 kg. Velpalai (*Wrightia tinctoria* R.Br.) has been supplied for the preparation of 777 oil used in Kalanjaga padai (Psoriasis).

Herbarium and Museum

With a view to develop a Central Herbarium and Museum Exclusively for Siddha System of Medicine a small Herbarium and Museum were maintained at Central Research Institute (Siddha), Madras. 146 samples were preserved in the museum out of which 11 drugs belong to mineral origin and 10 drugs belong to animal origin. About 150 identified herbarium specimens are maintained.

PHARMACOGNOSTICAL RESEARCH PROGRAMME

Pharmacognostical Research programme is being carried out at Pharmacognosy wing of Drug Research Scheme (MD), Madras. Only one plant Tara poondu was studied during the reporting year.

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

CHEMICAL RESEARCH PROGRAMME

Chemical Research programme is being carried out at chemistry wing of Drug Research Scheme MDI, Madras. Kottaiakaranthai (*Sphaeranthus indicus* L.) has been studied. The chemical study revealed the presence of sulphate, chloride, phosphate, Carbonate Sodium, Calcium and Iron.

PHARMACOLOGICAL RESEARCH PROGRAMME

The Pharmacological studies were conducted during the year 1989-90 at Central Research Institute (Siddha), Madras and Pharmacology wing of Drug Research Scheme (MD), Madras. The following single drugs and prepared medicines were investigated on experimental models for routine pharmacological screening, specific effects such as acute toxicity studies antifertility studies and antiimplantation studies.

1. Annabedi chendooram
2. Athimath-uram
3. Kadugurohini
4. Pavala parpam
5. PSI-a coded antifertility drug
6. MAP-a coded antifertility drug
7. Mookarath ai
8. Adathodai (seemai)
9. Vallarai
10. Sivanar amistham

I. Acute Toxicity Studies

(1) Annapedi Chendooram (albino mice)

The drug suspended in honey was administered in the doses of 1000, 2000, 3000, 4000 and 5000 mg. per kg. body weight. One group received honey and served as untreated control group. The animals were observed for 72 hours for any toxic manifestations. The drug did not show any toxic effects in the employed doses. The study is in progress on higher doses.

(2) Athimathura Choornam (albino rats)

The drug suspended in honey was administered in the doses of 50, 100, 200, 500, 1000, 3000 and 5000 mg. per Kg. body weight. The group receiving honey only served as untreated control group. Toxic manifestations were noticed for 72 hours. No toxic effects were noted in the employed doses. The study is in progress.

(3)i. Kadugurohini Choornam (albino mice)

The drugs suspended in distilled water was administered in doses of 50, 100, 200, 500 and 1000 mg. per kg. body weight. The group which received vehicle alone served as untreated control group. Toxic manifestations were noticed and the drug did not show any toxic effects on the employed doses. The study in progress.

(3)ii. Kadugurohini Choornam (albino rats)

The drug suspended in distilled water was administered in the doses of 50, 100, 200, 500, 1000, 2000 and 3000 mg. per kg. body weight. One group received vehicle and served as untreated control. Toxic manifestation were observed for 72 hours. The drug did not show any toxic effect in the employed doses. The study is in progress in higher doses.

(4). Pavalarpam (albino rats)

The drug suspended in honey was administered in the dose of 4000 mg. per kg. body weight. One group was kept as untreated control with vehicle alone. Toxic manifestations were observed for 72 hours. The drug did not show any toxic effect.

(5) (i) PSI -a Coded Antifertility Drug (Albino mice)

The drug suspended in cows milk was administered in the doses of 1000, 2000, 3000, 4000 and 5000 mg. per kg. body weight one group which received. Vehicle over served as untreated control group. Toxic manifestations were observed for 72; hours. No toxic effects were noted in the employed doses.

(5) (ii) PSI -a Coded Antifertility Drug (Albino rats)

The drug suspended in cows milk was administered in the doses of 2000, 3000, 4000 and 5000 mg. per kg. body weight. Untreated control group received vehicle alone. No toxic effects were noted in the employed doses even after 72 hours observation.

(6) MAP - A Coded Antifertility Drug (albino rats)

The drug suspended in distilled water was administered in doses of 100, 200, 500, 1000, 2000 and 3000 mg. per kg. body weight. Untreated control group received vehicle alone. The drug did not show any toxic effects even after 72 hours observation. The study is in progress with higher doses.

(7) (i) Mookarathi (albino rats)

The drug suspended in distilled water was administered in the doses of 2000 and 3000 mg. per kg. body weight. Untreated control group received vehicle only. The drug did not show any toxic manifestations even after 72 hours observations.

(ii) Mookarathi (albino mice)

The drug suspended in distilled water was administered in the doses of 100, 200, 500, 1000, 2000 and 3000 mg. per kg. body weight. Untreated control group received vehicle only. The drug did not show any toxic effects even after 72 hours of administering the drug.

(8) Adathodai (Seemai) (albino mice)

The drug suspended in distilled water was administered in the doses of 2000 and 3000 mg. per kg. body weight. Untreated control group received vehicle only. The drug did not show any toxic effects even after 72 hours.

(9) Vallarai (albino rats)

The drug suspended in distilled water was administered in the doses of 50, 100 and 200 mg. per kg body weight. Untreated control group received vehicle only. The drug did not show any toxic effect in the employed doses even after 72 hours observation.

II. Anti-inflammatory study

1. Sivanar amisthem

Carrageenine induced paw oedema study on albino rats

The drug suspended in honey was administered in the dose level of 25 mg. per kg. body weight. Untreated control group received vehicle and standard control group received 100 mg. of Phenylebutazone. The paw oedema was induced by injecting 0.1 ml of 1% carrageenin suspended in 0.5% carboxy methylcellulose in the planter aponeurosis of right hind paw after 1 hour of the drug administration. The final volume of right hind paw was measured after 3 hours of injection. The difference is recorded and the data collected is being analysed.

2. Poovarasu

Acetic acid induced writhing episode on albino mice

The drug suspended in distilled water was administered in the doses of 50, 100, and 250 mg. per kg. body weight. Untreated control group received vehicle and control group received analgin in the dose of 500 mg. per kg. body weight. The writhing episode was induced by injecting acetic acid intraperitoneally in the dose level of 300 mg. per kg. body weight. The number of writhing episodes were counted for 30 minutes from the time of injection. The data is being analysed statistically.

III. Anti-implantation Study

1. PSI-a Coded Antifertility Drug (albino rats)

The presence of cluster sperms in estrous phase of menstrual cycle is taken as D1 of the pregnancy. The drug suspended in cows milk was administered in the doses of 50, 100, 200, 500 and 2000 mg. per kg. body weight from D1 to D9th of pregnancy. The lapratomy was conducted on D10 and number of implants were noted. The animal was allowed to continue to

full term of pregnancy. The number for young ones delivered and any teratogenicity was recorded. The data is being analysed.

2. MAP-a Coded Antifertility Drug (albino rats)

The presence of cluster sperm in estrous phase of menstrual cycle is taken as D1 of pregnancy. The drug suspended in distilled water was administered in the doses of 50, 100, 200 and 1000 mg. per kg. body weight from D1 to D10 of pregnancy. Untreated control group received vehicle only. The number of implants were noted after doing Lapratomy and the animal allowed to continue the pregnancy for the full term. The number of young ones and any teratogenicity was recorded. The data is being analysed.

PHARMACEUTICAL/STANDARDISATION RESEARCH PROGRAMME

Standardisation research studies occupy important place in both drug research and clinical studies since it provides approach data for obtaining genuine drug and authentically prepared compound medicines. This programme aims at study of single drugs, pharmaceutical process involved in the manufacture of formulations and finished products.

The drug standardisation Research Programme covering formulations enlisted in Siddha Formulary Part-I and single drugs entering in to them was carried out at the following Standardisation Research Units.

1. DSRU (S) at CSMDRIA, 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 Standards)

1.	Tlavu (<i>Salmalia malabarica</i> DC)	Flower	DSRP, Madras
2.	Venkungilyam (<i>Shorea robusta</i> Gaertn f.)	Resin	DSRU, Madras
3.	- do-	-do-	-do-
4.	- do-	-do-	-do-
5.	Kattumalli (<i>Heracleum sprengei</i> Anum)	Bark	-do-
6.	- do-	Aerial	-do-
7.	Kattumalli (<i>Heracleum concanense</i> Dalz) (Substitute)	Fruit	DSRU(S), Madras
8.	Kattumalli (<i>Heracleum rigens</i> wass) (Substitute)	-do-	-do-
9.	Chttiramoolam (<i>Plumbago zeylanica</i> L.)	Root Bark	-do-
10.	Karuncurai (<i>Capparis sepiaria</i> L.)	Aerial	-do-
11.	Aanai Kattrazhai (<i>Agave americana</i> L.)	Leaf	DSRU, Bangalore
12.	Sirukeerai (<i>Amaranthus caudatus</i> L.)	Whole plant	-do-

B. Analytical standards (Pharmacopeial Standards)

a. Finished Products

1.	Tiraksai Kutinir	DSRU(S) Madras
2.	Nakkuppuceik (Kolli)	- do -
3.	Atatotai kutinir	- do -
4.	Karuvanga parpam	- do -
5.	Amukkaraccu - ranam	- do -

6.	Attatic curanam	- do -
7.	Trikadugu curanam	DSRU(S)Madras
8.	Tripala curanam	- do -
9.	Tambira centuram in progress	- do -
10.	Padikara parpam -I	- do -
11.	Padikara Parpam - II	- do -
12.	Gandhaga parpam	DSRU (S),Bangalore
13.	Muthu chippi parpam	- do -

(b) **Phyto-chemical Studies**

1.	Venkungiyam (<i>Shorea robusta</i> Gaertn f.)	Resin	DSRU(S)Madras
2.	Odenkodi (<i>Pristimera grahamii</i>)	Leaves	- do-
3.	Ponthagarai (<i>Cassia occidentalis</i> L.)	Whole plant	- do -

C. **Pharmacognosy**

Pharmacognositcal identification of the following plants was done and reported during the period under review.

1.	Velvelam (<i>Acacia leucophloea</i> Willd.)	DSRU (S),Madras
2.	Karavel (<i>Acacia nilotica</i> Delid)	- do -
3.	Ilaikkalli (<i>Euphorbia nivulia</i> Buch.-Ham.) (<i>Euphorbia neriifolia</i> L.)	- do -
4.	Pamacatuppattai (<i>Plectranthus urticifolius</i>)	- do -
5.	Venkungiliyam (<i>Shorea robusta</i> Gaertn.)	- do -
6.	Ayil (<i>Holoptelea integrifolia</i> Planch.)	- do -
7.	Nochi (<i>Vitex negundo</i> L.)	DSRU (S),Bangalore
8.	Adathodai (<i>Adathoda zeylanica</i>)	- do -
9.	Usilamaram (<i>Albizia lebeck</i> Benth.)	DSRU (S), Trivandrum
10.	Andimalli (<i>Mirabilis jalapa</i> L.)	- do -

Drug Standardisation Research Unit, Trivandrum has analysed 27 samples of 21 single drugs which are used in Siddha formulations. TLC was done for 29 different extracts of 22 plants and reported.

PHARMACY

Realizing the importance of the pharmacy the Council has established a pharmacy to prepare Siddha medicines in the Central Research Institutes (S), Madras.

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

The drug requirement of the pharmacy are met by the Medico-ethno-Botanical survey projects and through purchase from the local market.

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

The pharmacy has prepared 22 varieties of preparation both for research and general use. The pharmacy is engaged in preparations mentioned in the classical Siddha literature such as Chooram, Thailam, Parpam, Chendocram, Ennai, Karpam Kalkam, etc.

During the reporting year the pharmacy has prepared about 291.3 kg. of Chooram, Parpam, Chendooram etc. and 940.6 liters of oil based preparations.

The pharmacy has also supplied prepared medicines to the following Siddha units under the Council. The list of the units and quantity of medicine supplied is as detailed below:

SNo.	Name of the units	Quantity Solid in kg.	Liquid in Lit
1.	Drug Research Scheme (MD), Madras	12.600	3.650
2.	Mobile CRU, Madras	4.000	1.600
3.	Headquarters Office, New Delhi	-	42.750
4.	Pharmacology Deptt.of CRI (S), Madras	0.850	0.500
5.	Clinical Research Unit (S), Trivandrum	17.000	28.000
6.	RRI (S), Pondicherry	23.900	-
7.	THCRP, Tirupatur	8.900	-
Total		66.350	76.500

Aligarh Muslim University, Aligarh and Central Council for Research in Ayurveda and Siddha, New Delhi held from 4th to 7th January, 1990.

12. Dr. R.Kannan, Chairman SAC(Siddha) participated in seventh International Conference-seminar of Tamil studies held from 3rd to 8th December, 1989 at Mauritius.
13. A number of scientists from the council participated in the Workshops on Research Findings in Ayurveda by the Central Council for Research in Ayurveda and Siddha sponsored by the Ministry of Health and Family Welfare, Government of India and World Health Organisation and organised by Vimarsh consultancy, New Delhi at Aligarh, Jaipur and Ahmedabad on 21-22, 24-5 and 27-28 January, 1990 respectively.
14. The Council participated in the National Workshop on Drug Abuse, Prevention and treatment sponsored by National Institute of Social Defence, Ministry of Health and Family Welfare, Government of India held on 11th to 13th December, 1989 at New Delhi.
15. The Council participated in the 27th Divisional Medical Conference organised by National Integrated Medical Association held on 4th February, 1990 at Aligarh.
16. The Council participated in Jannapada Ayurveda Sammelan held on 5th Feb., 1990 at Aligarh.
17. The Council participated in 7th All India Ayurvedic Conference and Seminar on Emergency treatment of Vata Roga held on 16th Feb., 1990 at New Delhi.
18. The Council participated in the World Book Fair organised at Pragati Maidan, New Delhi from 14th to 18th Feb., 1990.
19. Dr. R. Kannan, Chairman SAC (Siddha) participated in First State level Conference of Tamil Nadu Siddha Medicine Practitioners held on 18th Feb., 1990 at Trichy.
20. The Council participated in the First International Ayurvedic Conference held from 17-19 March, 1990 at Mauritius and also arranged an exhibition on this occasion. Dr. V.N.Pandey, Director and Shri R.K.Issar R.O.(Pharmacognosy) attended this Conference.
21. The council participated in the National Seminar on Kushtha roga held at Calcutta on 17th & 18th March, 1990.
22. The Council participated in the workshop on Medicinal Plants sponsored by the Ministry of Health and Family Welfare Government of India, organised at S.V. Ayurvedic College Tirupati on 9th & 10th February, 1990.
23. Dr. H.R. Goyal Assistant Director Incharge, Central Research Institute(Ayud.), Delhi visited Mongolia under the Indo-Mongolian Plan of Co-operation in the field of Health and Medicinal Sciences during October-December, 1989

VISITS OF VIP'S AND FOREIGN DIGNITARIES

1. Shri C.S. Dube, Member Legislative Assembly Bihar visited Tribal Health Care Project, Ranka (Garhwa) District - Palamau (Bihar) on 24th April, 1989.
2. The Hon'ble Vallabhbai Patel, Health Minister, Shri Mahant Vijayadasji, Shri Hari Singhji Mahida Hon'ble Minister of Gujarat State and Shri V.R. Mehta, Vice Chancellor, Gujarat Ayurvedic University, Jamnagar visited Drug Standardisation Research Project, Jamnagar on 12th August, 1989.
3. Dr. B.D. Sharma, Joint Director Botanical Survey of India, Calcutta visited Jawaharlal Nehru Ayurvedic Medicinal Plants Garden and Herbarium, Pune on 18th August, 1990.
4. A Foreign deligation consisting of Dr. N.Kohnen, Institute of History of Medicine, University of Luesseldorf (West Germany), Dr. U. Albers, Deptt. of Neurology, City Hospital, Wiesbaden (West Germany), Dr. S. Albers Korean Acupuncturist & Homeopath, Dr. D. Esche, Physician Solo-Central Java, Indonesia, Dr. D. Joyce and Dr. H. Jayce Medical Anthropologists, Surabaja, Selatan (Indonesia) visited Jawaharlal Nehru Ayurvedic Medicinal Plants Garden and Herbarium, Pune on 12th January, 1990.

RELEASE OF COUNCIL'S PUBLICATIONS

During the reporting period following Books/Monographs published by this council were released on the occasion the seminar on Future Strategy of Development of Ayurveda and Siddha and third Annual Conference of Senior Officers/Project Heads of CCRAS projects held from 26-28th August, 1989 :

1. Silver Jubilee Celebration of Jawaharlal Nehru Ayurvedic Medicinal Plants Garden and Herbarium Pune and Scientific Seminar on Medicinal Plants Research (25-27 May, 1986) released by Sh. Rafiq Alam Union Minister Health & Family Welfare.
2. Rastriya Mahatva Ke Roganper Ayurvedic Visheshgyon ki Adhavan Gosthi (3-4 August, 1987) released by Sh. Rafiq Alam Union Minister Health & Family Welfare.
3. A Hand book of Domestic Medicine and common Ayurvedic Remedies Hindi version released by Shri Gopi Nath Dixit, Health Minister U.P.
4. Sabdacandrika released by Shri Gopi Nath Dixit, Health Minister U.P.
5. Ayush-64 A New Anti-Malarial Herbal Compound released by Sh. D.B.Bisht, Regional Director, W.H.O., New Delhi.
6. Concept of Jatharagni and Dhatwagni in Ayurveda released by Vd. S.K. Mishra, Advisor (ASUYN) Govt. of India.
7. Effect of Varunz (*Crataeva nurvala*) in enlarged Prostrate Associated Urinary Disorders released by Dr. R.Kannan, Chairman, SAC (Siddha).
8. Clinical studies on Kamaia and Yakrit Rogas (Liver disorders) with Ayurvedic Drugs released by Vd. S.S. Changani, Chairman, SAC (Ayurveda).
9. Pharmacopoeial Standards for Ayurvedic Formulations released by Prof. A.N.Namjoshi, Member, Governing Body.
10. Aetiopathogenesis and treatment of Timira with Saptamrita Lauha and Mahatriphala Ghrita released by Shri S.B. Goel, Director(ISM), Government of India.

ACKNOWLEDGEMENT

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 its 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 Shri R.K. Singhal, S.S.A.(Stat.) for bringing out the Annual Report in the present form.