ANNUAL REPORT 1992-93

Central Council for Research in Ayurveda & Siddha

MINISTRY OF HEALTH & FAMILY WELFARE
(GOVERNMENT OF INDIA)

CENTRAL COUNCIL FOR RESEARCH IN AYURVEDA AND SIDDHA

ANNUAL REPORT
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MINISTRY OF HEALTH AND FAMILY WELFARE
(GOVERNMENT OF INDIA)
NEW DELHI

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Technical Report - Siddha

PREFACE

The studies conducted under different categories of Research Programmes in Ayurveda and Siddha have been put forth in this Annual Report for the year 1992-93. The implementation of Programme Projection for the 8th Five Year Plan (1992-97) have been initiated from April, 1992. These programmes are executed through infrastructure of Central Research Institutes, Regional Research Institutes, Regional Research Centres and many other important research projects and units. The highlights of achievements under Clinical Research, Drug Research, Literary Research and Family Welfare Research Programmes are indicated herewith.

The clinical trials of Ayurveda and Siddha herbal and herbomineral preparations have been further persued on many chronic diseases like Peptic ulcer, Hypertension, Diabetes, Neurological disorders, Urolithiasis etc. The study of the personality in relation to some selected Psychosomatic disorders have been intiated during this period. The Clinical Research Projects under the Council have also provided medicare to 2,84,824 patients through their OPD Services. A total number of 2,042 patients have also been admitted in the Council's hospitals for intensive research investigations. The contraceptive potential of the herbal preparations through oral route and Neem oil as local spermicidal agent has been further persued in more than 1500 human female volunteers. The Family Welfare Programme have been reviewed by a Sub-Committee of the National Committee for research in human reproduction which recommended further intensive studies of Pippalyadi Yoga and Neem oil for their application in National Family Welfare Programme.

The Health Care Programmes, Survey Surveillance, Community Health Care and Tribal Health Care Research Programmes have been taken up in 128 villages and tribal pockets with a polulation of 1,18,097 and 48,897 patients have been provided medicare during this period.

Medico-Botanical exploration of fresh areas resulted in collection of about 2575 specimen, identification of about 1673 specimen and mounting and accession of 2,497 and 211 specimen respectively. About 867 kgs of drug material has been supplied for research to Council's projects and PLIM, Ghaziabad. The cultivation of Medicinal Plants Programme through 5 gardens maintain about 930 drugs plants, besides extensive cultivation and intensive experimental studies on a few of them. Scientific investigation

on 21 drugs for Pharmacognosy, 25 drugs for Phytochemistry and 32 drugs under Pharmacology/Toxicology has been concluded. The Musk deer breeding farm in Kumaon hills studied various aspects of life of musk deer.

Pharmacopoeal Standardisation work of 83 single drugs, 37 formulations and method of manufacture of 3 categories of preparations are carried out. In addition, preliminary standardisation work of 38 formulations of Ayurveda/Siddha are also covered.

The publication of 3 journals - Journal of Research in Ayurveda and Siddha, Bulletin of Medico-Ethno-Botanical Research and Bulletin of Indian Institute of History of Medicine have been published. The Council is also publishing Monographs of different aspects of its research programmes.

A number of exhibitions and displays of the Council's Literary Research activities have been arranged in different parts of the country.

H R Goyal

Date: 26.7.1994

(Dr. H.R. Goyal)
Director
CCRAS, New Delhi

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, 1993, the membership of the Society and Governing Body of the Council were as under:-

President		:	Shri M.L. Fotedar, Union Minister for Health & Family Welfare (upto January, 1993)
		:	Sh. B. Shankaranand, Union Minister for Health & Family Welfare (from January, 1993)
		:	Mrs. D.K.Tara Devi Siddarth, Union Minister of State for Health & Family Welfare (upto January, 1993)
Official Members	1.	:	Sh. M.S. Dayal Additional Secretary (H), Ministry of Health & F.W.
		:	Sh. I. Chaudhuri, Additional Secretary (H), Ministry of Health & F.W.
	2.	:	Mrs. Veena Maitra, Joint Secretary, Incharge of ISM, Ministry of Health & F.W.
		:	Sh. Pawan Chopra, Joint Secretary, Ministry of Health & F.W.
	3.	:	Mrs. A.P. Ahluwalia, Joint Secretary (FA), Ministry of Health & F.W.

Non-official Members	:	1.	Vd. D.K. Triguna
		2.	Dr. S.S. Changani
		3.	Vd. Satya Pal Gupta
		4.	Dr. N. Hanumantha Rao
		5.	Dr. (Miss) P.V. Tewari
		6.	Dr. G.V. Satyawati
		7.	Prof. H.H. Siddiqui
		8.	Prof. A.N. Namjoshi
		9.	Dr. Y.K. Sarin
		10.	Dr. A. Ananda Kumar
		11.	Dr. R. Kannan
Director, NIA, Jaipur	:		Vd. L.N. Sharma
Director, NIS/CRI(s)	:		Vacant
Member Secretary	:		Dr. V.N. Pandey, Director, C.C.R.A.S.

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

Finance Committee:

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

1.	Joint Secretary (ISM) Ministry of Health & F.W.	:	Mrs. Veena Maitra Sh. Pawan Chopra	Chairman
2.	Dy. Secretary (IF), Ministry of Health & F.W.	:	Sh. A.K. Joshi Sh. S.K. Srivastava	Member
3.	One Technical member to represent Ayurveda	:	Vd. B.D. Triguna	
4.	One Technical Member to represent Siddha	:	Dr. A. Ananda Kumar Dr. R. Kannan	Member
5.	Director, CCRAS	:	Dr. V.N. Pandey	Member Secretary

The Finance Committee met once on 13th October, 1992 and 9th November, 92 and inter-alia decided on the following important matters.

1. Recommended the upgradation of the post of Lab. Technician in the pay scale of Rs. 1320-2040 in the Indian Institute of Ayurveda for Drug Research to that of Research Assistant (Farm). in the pay scale of Rs 1400-2300 and promotion of Shri Ini Ram in the post. The Committee also directed that after superannuation of Sh. Ini Ram, the post may be fillied as per recruitment rules.

2. Recommended the upgradation of the pay scale of Rs. 950-1500 attached to the post of Proof Reader in the Documentation and Publication Division, New Delhi to that of Rs 1200-2040.

3. Recommended the creation of the following posts for Tissue Culture Laboratory of Pharmacognosy Research Unit functioning at Jawaharlal Nehru Ayurvedic Medicinal Plants Garden and Herbarium, Pune.

1.	R.O. (Plant Tissue Culture) Rs. 2200-4000	- 1
2.	R.A. (Plant Tissue Culture) Rs. 1400-2300	- 1
3.	Lab. Technician Rs. 1320-2040	- 1
4.	Lab. Attendant Rs. 800-1150	-1

4. Approved the condemnation of mobile van of M.C.R.U., Varanasi only. Regarding purchase of Gypsy in replacement of van, the Finance Committee suggested that private vehicles may be engaged for Mobile Clinical Research Unit work from time to time and the question of utilisation of the staff especially the driver of the verhicle elsewhere may be explored.

5. Approved the proposal for the purchase of a Maruit Gypsy at an estimated expenditure of Rs. 2.25 lakh at Government approved rates in replacement of accidented condemned Mobile Van No. DEP-3206 of C.R.I. (Ay.), New Delhi. The Committee also approved the disposal of the condemned vehicle as per rules in consultation with the Insurance Company.

6. Approved the construction of 13 stockades including two with modified specification in place of 17 stockades by Rural Engineering Services, Almora within the deposite of Rs. 6.26 lakh.

7. Noted the deposite of Rs. 5,63,100/-- with the C.P.W.D. for construction of compound wall on the land allotted by the State Govt. of Madhya Pradesh for construction of building for R.R.I. (Ay.), Gwalior with the approval of the President of the Council (Hon'ble Union Minister for Health and F.W.) and also directed that a self contained proposal for the entire construction of building on the land with building plan indicating various activities of the Institute, problems allotted, staff in position, etc. may be submitted to the Committee.

8. Approved the following construction/electrical works in respect of J.N.A.M.P.G.&H., Pune:-

I. Approved the actual expenditure as per final statement/estimates.

Items of work		Sanctioned Amount	Actual Exp. Rs.	Excess Exp. Rs.
(a)	Construction of Garden shed & Demolition of dilapidated stores	2,61,269/-	3,02,222.26	40,953.26
(b)	Installation of submersible pump	82,900/-	84,089.00	1,189.00
(c)	Electrical work	1,17,808/-	1,23,870.00	6,062.00
			Total	48,204.26

II. The following items of works were also approved.

(a)	Electrification of garden shed & Lavotory	69,811.70
(b)	Renovation and construction of compound wall on the lower part of the garden.	2,88,512.00
(c)	Construction of parking shed for scooters/ cycles etc. and approach gate.	60,266.00
	Total :	4,18,589.70

9. Approved the following items of work in respect of Indian Institute of Panchakarma, Cheruthuruthy.

(a) Renovation of Internal Electrical installation for various building of I.I.P., Cheruthuruthy. Rs. 57,286

(b) Annual repairs and maintenance to the building of I.I.P., Cheruthuruthy. Rs. 1,38,600

Recommended the repairs and provision of rolling shutters in the Semi-permanent building of C.R.I.(S), Madras at an estimated expenditure of Rs. 35,000.

10. Recommended the enhancement of rent in respect of Amchi Research Unit, Leh-Ladakh as under:-

(a) From Rs. 891/- p.m. to Rs. 1000/- p.m. w.e.f. 1.1.91.

(b) From Rs. 1000/- p.m. to Rs. 1230/- p.m. from date of the meeting of the Governing Body.

11. Approved the enhancement of honorarium from Rs. 250/- p.m. to Rs. 1000/- p.m. attached to the post of Honorary Project Officer, Dr. A. Lakshmipati Research Centre for Ayurveda, Madras. The Committee also directed that Dr. M.V. Chari, Project Officer will not be entitled for any other allowances (including conveyance allowance) and the payment of honorarium will not be taken as precedent for extending similar benefit to other project Officer.

12. Approved the establishment of Mineral and Metal Museum Section at the Central Museum and Herbarium, New Delhi and creation of one post each of Museum Curator (Mineral and Metal) in the scale of Rs. 2000-3500 and Lab. Technician (Minerology) in the scle of pay Rs. 1320-2040 in the Central Museum and herbarium, Delhi.

13. Approved the creation of one post of Lab. Technician in the pay scale of Rs. 1320-2040 in the Clinical Research Unit (Siddha), Trivandrum.

14. Approved the enhancement of delegation of powers to the Director, CCRAS upto Rs. 2000/- in the matter of appointment of Part-time workers on consolidated remuneration as per practice in vogue in Unani Council and also recommended the amendment to item No. 45 of Schedule-I of Rule 50 of Rules and Regulations and Bye-laws of the Council as under:

Subject	Present powers	Proposed
Power to appoint part-time workers and fix their remuneration on consolidated basis.	Full provided the remuneration so fixed shall not exceed Rs. 500.	Full provided the remuneration so fixed shall not exceed Rs. 2000.

15. Recommended the grant of conveyance allowance to the Honorary Project Officers of Tribal Health Care Research Projects and other Units under the Council limited to the actual expenditure incurred by then subject to a ceiling of Rs. 500/- per month keeping in view the specific working conditions and merits in each case.

16. Approved the maintenance works like white-washing, painting and plastering etc. to the building of R.R. Podar Central Research Institute (Ay.), Bombay at an estimated expenditure of Rs. 1,22,878/- through State P.W.D. as a deposit work.

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

The Council is following the orders and guidelines laid down by the Government of India in respect of reservation and representation of SC/ ST in the services of the Council. The recruitment/promotion is done according to the roster points. The Council is having a total staff strength of 1610 employees and No. of SC/ST employees in different groups as on 1.1.93 is as under (upto 31.12.1992).

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

Group	No. of employees	SC	Percentage of total employees	ST	Percentage of total employees
A	116	6	5.17	2	1.72
B	117	8	6.83	2	1.70
C	698	83	11.89	21	3.00
D	679	219	32.25	51	7.51
Total :	1610	316	19.6	76	4.7

Official Language Implementation Committee

The Council is having an official Language Implementation Committee under the Chairmanship of the Director, CCRAS to review the position regarding implementation of Official Language Act/Policy/Rules, Orders, programmes, etc. and to suggest measures for increasing the pace of Hindi in the Council. During the period under report the Committee met on 6.7.92 and 3.3.93.

Scientific Advisory Committee (Ay.)

During the year under report the Scientific Advisory Committee consisted of the following:

1.	Vd. B.D. Triguna	Chairman
2.	Vd. S.S. Changani	Member
3.	Prof. A.N. Namjoshi	Member
4.	Vd. S.P. Gupta	Member
5.	Vd. D.K. Triguna	Member
6.	Vd. S.K. Mishra	Member
7.	Dr. Rajender Gupta	Member
8.	Vd. Sri Ram Sharma	Member
9.	Dr. S.M. Angadi	Member
10.	Sh. P.R. Krishna Kumar	Member
11.	Dr. (Miss) P.V. Tewari	Member
12.	Vd. M.S. Shastri	Member
13.	Vd. R.P. Swami	Member

14.	Vd. Bhagwan Singh	Member
15.	Dr. V.N. Pandey	Director & Member Secretary

The Scientific Advisory Committee (Ay.) met on 10.8.92 during the period under report and evaluated various research programmes/scheme of the Council and provided necessary guidance and reviewed the ongoing programmes and suggested improvements wherever felt necessary.

Constitution of the Sub-Committee of SAC (Ay.)

The Director, CCRAS in consultation with Chairman, SAC (Ay.) released the constitution of three Sub-Committees (i) Clinical Research Sub-Committee having members Vd. Sri Ram Sharma, Prof. (Km.) P.V. Tewari, Sh. P.R. Krishna Kumar and Vd. S.K. Mishra (ii) Drug Research Sub-Committee having members Prof. A.N. Namjoshi, Dr. Rajender Gupta, Vd. Satya Pal Gupta and Vd. D.K. Triguna and (iii) Literary Research Sub-Committee having members Vd. S.S. Changani, Vd. M.S. Shastri, Vd. R.P. Swami, Vd. Bhagwan Singh and Dr. S.M. Angadi to evaluate the Clinical Research, Drug Research and Literary Research programmes respectively. These Committees were constituted on the recommendation made in the 25th SAC (Ay.) meeting held on 10th August, 1992.

Scientific Advisory Committee (Siddha)

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

1.	Dr. R. Kannan	Chairman
2.	Dr. A. Ananda Kumar	Member
3.	Dr. K.V. Vaitheswaran	Member
4.	Dr. V. Subramaniyan	Member
5.	Dr. R. Thyagarajan	Member
6.	Dr. Joseph Thas	Member
7.	Dr. V.N. Pandey	Director & Member Secretary

The Scientific Advisory Committee (Siddha) met on 7.8.92 during the period under report and evaluated the programmes and new schemes and the recommendations were place before the Finance Committee/Governing Body for consideration and approval.

Organizational Network of CCRAS:

There are 12 Central/Regional Research Institute, 10 Regional Research Centres, 27 Research Units, 7 Tribal Health Care Research Projects in Ayurveda, 1 Documentaion and Publication Division, 12 Family Welfare Research Units and 1 Research Project on Tibetan Medicine besides 2 Research Institutes, 10 Research Units and 2 Tribal Health Care Research Projects in Siddha System and Medicine. One Time Bound Research Enquiry concluded its work and submitted the report.

Budget Provision:

The following Table shows the budgetary provisions made for the Council at a glace:

(Rs. in Lakhs)

Scheme	Funds released (1991-92)	Actual Expenditure 1991-92	Budget Estimates 1992-93	Funds released (1992-93)	Actual Expenditure 1992-93
Plan	150.00	136.12	250.00	267.00	180.72
Non-Plan	572.45	635.45	550.00	599.00	659.18
F.W.R.S.	14.25	19.47	17.80	17.73	16.38

Audited Statement of Accounts

The Accounts of the Council for the year 1992-93 for the period from 1st April, 1992 to 31st March, 1993 were audited by the D.A.C.R.

Special Events

1. A building to house the Central Council for Research in Ayurveda and Siddha and other allied Research Councils, CCIM and CCH, has been under construction for about 5 years at the Institutional Area, Pankha Road, Janakpuri, New Delhi. The foundation stone of the building

was laid by the then Vice-President of India Dr. S.D. Sharma, now the Hon. President of India. The total floor area of this building is 1,15,5,82 square feet in seven floors including basement. This building is also provided with a small auditorium for seminar, conference etc. The CPWD has carried out this work and the senior officials of the Ministry have also been overseeing the execution of the construction work. The Hon'ble Minister of State for Health and Family Welfare Smt. D.K. Tara Devi Siddhartha has also been keenly interested in early completion of the construction work and has also visited the site. The offices of the Councils is likely to be shifted in the new building in near future after the construction work is completed.

2. A meeting of the Sub-Committee of National Committee for Research in Human Reproduction under Indian System of Medicine was held on 21.10.92 in Headquarters Office of CCRAS, New Delhi under the Chairmanship of Dr. I.C. Tewari, Adviser (Health), Planning Commission, New Delhi.

The Sub-Committee examined in detail the background material on the fertility control in Ayurvedic classics and folklore claims. The detailed report on the clinical and experimental studies taken up by the Council in last more than 20 years was considered. The Sub-Committee recommended further intensive studies on Pippalayadiyoga as oral contraceptive and Nimb Tail (Neem Oil) as a spermicidal agent for their inclusion in the National Family Welfare Programme. It also suggested phased experimental screening of 20 single drugs short listed by the Council for their antifertility potential

3. Third International Ayurvedic Conference on Traditional Systems of Medicine was held at Bali (Indonesia) from 3rd to 6th Septermber, 1992. Sh. Pawan Chopra, Joint Secretary (ISM), Ministry of Health and Family Welfare, Govt. of India and Dr. V.N. Pandey, Director, CCRAS, New Delhi participated in the conference as Govt. of India nominees. The theme of the conference was an application of herbal and Ayurvedic medicines in the management of common ailments in South East Asian Countries in general and Indonesia in particular. The ways and means to be adopted for this objective were also discussed at length.

4. A meeting to discuss research on AIDS in Ayurveda and Siddha and Homoeopathy was held on 21st September, 1992 in Nirman Bhawan, New Delhi under the Chairmanship of Smt. D.K. Tara Devi Siddhartha,

Minister of State for Health and Family Welfare, New Delhi.Shri I. Chaudhuri, A.S. (Health), Shri P.R. Dasgupta, Project Director, National AIDS Control Organisation, Dr. S.P. Tripathi, Director General, ICMR, New Delhi, Sh. Pawan Chopra, Joint Secretary (ISM), Vd. B.D. Triguna, New Delhi, Dr. Jugal Kishore, New Delhi, Vd. Gurdip Singh, Dean, J.A.U, Jamnagar, Hakim Saifuddin Ahmed, Hon. Advisor (Unanin), Vd. S.K. Mishra, Spl. Commissioner (ISM), Shri R.K. Mukhi, Director (ISM), Dr. V.J. Augustine, Advisor (Homoeopathy), Dr. V.N. Pandey, Director, CCRAS, Dr. D.P. Rastogi, Director, CCRH, Dr. P.N. Verma, Director, HPL, Ghaziabad, Dr. R.U. Ahmed, Director, PLIM, Ghaziabad and Dr. Shiv Lal, Addl. Project Director, National AIDS Control Organisation attended the meeting.

At the outset, Vd. S.K. Mishra, welcomed the Hon. Minister and the members. Hon'ble Minister expressed her views on AIDS and desired to know the results of research being done in different medical system. Among the views of various scientists, Dr. Pandey, Director, CCRAS explained about experimental study made on Ayurvedic formulations in Lab. at Belgium, Europe against HIV virus. He added that the CCRAS needs to test the drugs on other similar category of patients before arriving at any conclusion.

Vd. Triguna made a strong plea for more research facilities in Ayurvedic System of Medicine. He mentioned the treatment of AIDS related symptoms available in Ayurveda Shastras.

Sh. Das Gupta hearing the views of various members stated that there is a valid reason for encouraging research in Indian Systems of Medicine in AIDS particularly in Ayurveda, Homoeopathy and Unani Systems.

In the end the Chairperson thanked the members for expressing their views.

Medical Relief and Health Education Camp in villages of Navapur Taluka of District Dhule (Maharastra)

Dr. N.K. Bansal, Research Officer Incharge, Tribal Health Care Research Project, Chinchpada and Dr. Sanjay Manekar, Medical Officer Incharge, Primary Health Centre, Umran have organised Medical Relief Camp in Navapur Taluka in villages Tinmoli, Bilgaon, Vavadi, Amlan and Khthara during the month of October, 1992. The villagers were examined and patients were given proper treatment. They were also educated for Health

Care, Family Planning and Prevention from infective diseases. Total 425 patients were treated in the Camp.

Visit of South African Physicians to Headquarters Office, CCRAS

A South African Physician Shri Reggi Naidoo, Executive Director, Independent Business Enrichment Centre, East London (South Africa) alongwith Dr. Appavoo and Mr. F.V.G. Pillay visited the Headquarters Office of CCRAS on 18th November, 1992. They were apprised with the research activities of the Council and results achieved so far in various fields of research by the Senior Officers of the Council. The delegation expressed their interest in various efforts being made to study the Pharmacognostics of the herbal preparations.

II. TECHNICAL REPORT - AYURVEDA

Abbreviations used for Institutes/Centres/Units

S.No.	Institutes/Centres/Units	Abbreviations
1.	Central Research Institute [Ay.], New Delhi	CRID
2.	Central Research Institute [Ay.], Bhubaneshwar	CRIBh
3.	Central Research Institute [Ay.], Bombay	CRIB
4.	Indian Institute of Kayachikitsa, Patiala	IIKP
5.	Indian Institute of Panchakarma, Cheruthuruthy	IIPC
6.	Regional Research Institute [Ay.], Calcutta	RRIC
7.	Regional Research Institute [Ay.], Patna	RRIP
8.	Regional Research Institute [Ay.], Lucknow	RRIL
9.	Regional Research Institute [Ay.], Gwalior	RRIG
10.	Regional Research Institute [Ay.], Jaipur	RRIJ
11.	Regional Research Institute [Ay.], Junagadh	RRIJ
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. Lakshmipati Research Centre for Ayurveda, V.H.S., Madras	ALRCAM
26.	Ayurvedic Research Unit, NIMH&NS, Bangalore	ARUB
27.	Clinical Research Unit [Ay.], Hyderabad	CRUH
28.	Clinical Research Unit [Ay.] Kottakkal	CRUK
29.	Clinical Research Unit [Ayurvedic and Modern Team under CDRS], Varanasi	CDRSV
30.	Indian Institute of Ayurveda for Drug Research, Tarikhet.	IIADRT
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 New 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	PRUC
57.	Pharmacognosy Research Unit, Pune	PRUP
58.	Indian Institute of History of Medicine, Hyderabad	IIHMH
59.	Literary Research Unit, Thanjavur	LRUT
60.	Documentation and Publication Division, New Delhi	DPDD
61.	Tribal Health Care Research Project [Ay.], Car-Nicobar	THCRPC
62.	Tribal Health Care Research Project [Ay.], Ziro	THCRPZ
63.	Tribal Health Care Research Project [Ay], Palamau	THCRPP
64.	Tribal Health Care Research Project [Ay.], Jhabua	THCRPJ
65.	Tribal Health Care Research Project [Ay.], Chinchapada	THCRPCh
66.	Tribal Health Care Research Project [Ay], Jagdalpur [M.P.]	THCRPJa
67.	Tribal Health Care Research Project [Ay], Imphal [Manipur]	THCRPI
68.	Drug Standardisation Research Project, 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, Itanagar	MPGI

CLINICAL RESEARCH PROGRAMMES

The Clinical Research Programmes under the Council may be categorised into two i.e. Clinical Evaluation of Selected therapies in about 30 clinical conditions and health care research programmes. The health care research programmes include Survey and Surveillance, Community Health Care Research and Tribal Health Care Research.

The Clinical Trials:

The clinical trials are taken up on more than 30 diseases in the year 1992-93 to evaluate the therapeutic response of selected herbal, herbo-mineral and some of the phyto-chemical extracts. The trial methodology being evolved for the study covers specific diagnosis according to the Ayurveda and also from modern point of view. The evaluation of the effect is based on the cardinal clinical features and the bio-chemical and pathological parameters. In some of the disease endoscopic examination has also been taken up. The trial therapies are selected keeping in view the fundamental concepts of *Samprapti Vighatana* in Ayurveda. Though every effort has been made to adopt uniform methodology for diagnosis and evaluation in different centres under multi-centric trials, there is a possibility of variation at a few centres. The studies on Amavata (rheumatoid arthritis), Paksavadha (hemiplegia), Saisaviyavata (post-polio-paralysis), Amlapitta (hyperacidity), Parinamasula (duodenal ulcer), Annadravasula (gastric ulcer), Arsa (piles), Tamaka Svasa (bronchial asthama), Sveta Pradara (leucorrhoea), Rakta Pradara (dysfunctional uterine bleeding), Madhumeha (diabetes mellitus), Mutrasmari (urolithiasis), Hridroga (ischaemic heart disease), Vyana bala vaisamya (hypertension), Visamajvara (malaria), Kala-a-zar, Slipada (filariasis), Kitibha (psoriasis), Vicarcika (eczema), Apasmara (epilepsy), Manasa Vikara (mental disorders) and Arbuda visesa (cancer) etc. have been taken up during the year under report and the observations are presented separately for each of these clinical conditions. During the execution of these clinical research programmes 2,36,554 patients were provided medicare at OP level and 1,658 patients have been treated at IP level. The effect of the therapies are discussed in tabular form which include the trial therapies participating Institutes/Centres/Units total no. of cases included in the trial and the results thereof.

Amavata (Rheumatoid Arthritis):

The clinical studies on 121 patients of *Amavata* have been taken up at CRI Bombay, Bhubneshwar IIP Cheruthuruthy, RRI Gwalior and Calcutta, IIK Patiala and RRC Itanagar.

Results of Clinical Studies of Ayurvedic preparations on Amavata (Rheumatoid Arthritis)

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. (a)	Asvagandha curna Eranda taila	IIKP	6	2	2	-	-	2
(b)	Musta curna	IIKP	3	-	1	-	2	-
(c)	Sunthi Guggulu	IIKP	21	3	9	6	2	1
2. (a)	Musta curna	IIPC	8	2	2	-	2	2
(b)	Asvagandha curna	IIPC	7	1	1	2	-	3
(c)	Pancakarma therapy	IIPC	5	2	-	2	-	1
3.	Mahayogaraja guggulu Vaisvanara curna Simhanada guggulu	CRIBh	13	3	2	2	-	6
4. (a)	Asvagandha curna Baluka sveda	CRIB	2	-	1	-	-	1
(b)	Musta curna Baluka sveda	CRIB	3	1	-	-	-	2
(c)	Sunthi guggulu	CRIB	10	2	4	-	1	3
5.	Sunthi guggulu	RRIC	20	3	5	3	1	8
6.	Mahayogaraja guggulu Simhanada guggulu Vaisvanara curna	RRIG	11	-	-	4	6	1
7. (a)	Asvagandha curna	RRCI	9	1	6	1	-	1
(b)	Mahayogaraja guggulu Simhanada guggulu	RRCI	3	1	2	-	-	-
	Total		121	21	35	20	14	31

Paksavadha (Hemiplegia)

The clinical studies on 107 patients of Paksavadha have been taken up at IIP Cheruthuruthy, IIK Patiala and CRIs Bombay and BBSR. The details of the observations are tabulated below:

Results of Clinical Studies of Ayurvedic preparations on Paksavadha (Hemiplegia)

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. (a)	Ekangavira rasa Mahamasa taila Abhyanga	IIKP	12	1	5	2	2	2
(b)	Samira pannaga Rasa Mahamasa taila, Abhyanga	IIKP	2	-	-	2	-	-
(c)	Tapyadi lauha Ekangavira rasa Abhyanga	IIKP	1	1	-	-	-	-
2. (a)	Samira Pannaga Sastikasali svedana Nirgundi taila Snehana	IIPC	20	3	9	5	2	1
(b)	Ekangavira rasa Sastikasali svedana Masa taila snehana	IIPC	18	3	3	7	3	2
(c)	Pancakarma therapy	IIPC	28	1	12	7	3	5
3. (a)	Samira Pannaga rasa & Abhyanga	CRIBh	5	-	1	3	-	1
(b)	Ekangavira rasa, & Abhyanga	CRIBh	5	-	-	2	1	2
4. (a)	Samira Pannaga Rasa & Abhyanga	CRIB	4	-	2	-	1	1

1	2	3	4	5	6	7	8	9
(b)	Ekangavira rasa, & Abhyanga	IB	12	1	5	2	1	3
	Total		107	10	37	30	13	17

Gridhrasi (Sciatica):

The clinical observations on 39 patients of Gridhrasi have been taken at CRI Delhi and IIP Cheruthuruthy as per the results tabulated below:

Results of Clinical studies of Ayurvedic preparations on Gridhrasi (Sciatica)

S.No.	Therapy	Instt./ Centre/ Unit	Total Cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1.	S. Bhallataka	IIPC	26	2	11	4	3	6
2.	Trayodasanga-guggulu Visatinukavati	CRID	13	3	3	4	3	-
	Total		39	5	4	8	6	6

Kampavata (Parkinsons disease)

The effect of *Kampavatari Rasa* and *Blasvadandhadi kvatha* with or without *Abhyang* with *Maha Masa taila* has been taken up on 4 patients of *Kampavata* at CRI Bombay. The trial is still under process.

Saisaviyavata (Post polio paralysis)

The clinical trial of *Ekangavira rasa* with *Maha masa taila* and *Sastikasali pinda sveda* has been further conducted on 11 cases *Saisaviyavata (khanja)* at IIP Cheruthuruthy and CRI Delhi. The observations indicate reasonably good effect of thereapy since two cases reported fair response while 5 cases show poor response. Out of remaining 4 cases shows no response while two cases have been drop out.

Pangu (Paraplegia)

The Indian Institute of Pancakarma, Cheruthuruthy has conducted clinical trials of *Pancakarma* therapy and *Ashwagandha Kvatha, Gorocanadivati* alongwith *Balashwagandha taila Abhyanga* on 20 cases of Pangu. The results may be seen in the table below:

Result of Clinical Studies of Ayurvedic Preparations on Pangu (Parapligia)

S.No.	Therapy	Instt./ Centre/ Unit	Total Cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1.	Pancakarma therapy with Murcchita taila	IIPC	9	2	2	5	-	-
	(b) Asvagandha kvatha Gorocanadi vati Balasvagandha Taila Abhyanga	IIPC	11	4	3	1	2	1
	Total		20	6	5	6	2	1

Parinamasula (Duodenal ulcer)

Clinical studies on 61 patients of *Parinamasula* have been taken up to assess the effect of Ayurvedic therapies, at CRIs Bhubneshwar and Delhi and CRUs Hyderabad and Kottakal. The results may be seen in table below.

Results of Clinical 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
1.	Nimbatiktam	CRIBh	7	4	-	-	-	3
2. (a)	Nimbatiktam	CRID	7	2	4	1	-	-
(b)	Suta Sekhara Rasa Amalaki Svarasa	CRID	2	1	1			
(c)	Amalaki Rasayan	CRID	4	3	1	-	-	-
3. (a)	Indukanta ghrta	CRUH	17	-	11	-	-	6

1	2	3	4	5	6	7	8	9
	(b) Maha tiktaka ghrta	CRUH	1	-	-	-	-	1
4.	(a) Mahatikta ghrta (graduated)	CRUK	5	1	1	3	-	-
	(b) Mahatiktaka ghrta (snehpana)	CRUK	10	1	3	6	-	-
	(c) Indukanta ghrta (Sodhana & samana)	CRUK	7	1	2	4	-	-
	(d) Nimbatiktam	CRUK	1	-	-	1	-	-
	Total		61	13	23	15	-	10

Annadravasula (Gastric ulcer)

Clinical studies on selected Ayurvedic preparations has been taken on 34 patients of *Annadrava Sula* at RRC Itanagar and CRU Hyderabad. The results are tabulated herewith.

Results of Clinical studies of Ayurvedic preparations of Annadrava sula (Gastric ulcer)

S.No.	Therapy	Instt./ Centre/ Unit	Total Cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1.	Praval pisti Jahara mohara pisti Mukta sukti bhasma	RRCI	10	3	2	-	-	5
2.	Eladicurna Amalaki curna	CRUH	24	1	11	-	-	12
	Total		34	4	13	-	-	17

Kamala (Jaundice)

A comparative study on effect of Ayurvedic therapy and placebo in the management of *Kamala* has been taken up at RRC Jammu. The results are tabulated herewith.

Results of Clinical 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 Sveta Parpati	RRCJ	6	6	-	-	-	-
2.	Placebo	RRCJ	14	-	3	8	3	-
3.	P. Mandura Arogyavardhini, Sveta Parpati	RRCH	2	2	-	-	-	-
	Total		22	8	3	8	3	-

Grahani Roga (Malabsorption syndrome)

A combination of *Kutaja, Bilva, Babbula* and *Jiraka* has been put to trial on 13 cases of *Grahani roga* at RRC Jammu. Good response was observed in eight cases while 5 cases showed fair response.

Bhagandara (Fistula-in-ano)

The management of *Bhagandra* with *Ksara sutra* has been continued at CRIs Bombay and Delhi on 22 patients as per table below:

Results of Clinical studies of Ayurvedic therapy on Bhagandra (Fistula in ano)

S.No.	Therapy	Instt./ Centre/ Unit	Total Cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1.	Ksara sutra	CRID	12	12	-	-	-	-
2.	Ksara sutra	CRIB	10	10	-	-	-	-
	Total		22	22	-	-		

Arsa (Piles)

The effect of ksara sutra therepy has been studied on 49 cases. All the 31 cases who completed treatment showed good response.

Gudavidara (Fissure-in-ano)

All the 16 cases of Gudavidara who completed full courses of treatment with Ksara Karma showed good response.

Tamaka Svasa (Bronchial asthama)

Clinical trial of various Ayurvedic therapies had been conducted on 200 patients at IIK Patiala, RRIs Gwalior, Junagadh and Patna and RRC Vijaywada. The results are tabulated herewith.

Results of Clinical studies of Ayurvedic preparations on Tamaka Swasa (Bronchial asthama)

S.No.	Therapy	Instt./ Centre/ Unit	Total Cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1.	Bhagottara gutika	IIKP	43	7	10	6	2	18
	Somalatadi Yoga	IIKP	12	4	1	4	-	3
2.	(a) Bhagottara gutika	RRIJu	4	2	-	1	1	-
	(b) Somalatadi Yoga	RRIJu	4	-	-	2	-	2
	(c) Pippali vardhamana	RRIJu	7	2	1	3	-	1
3.	(a) Pippali Vardhamana Samira Pannaga rasa	RRIG	17	-	1	9	6	1
	(b) Sirisa Tvaka kvath	RRIG	1	-	-	-	1	-
4.	Sirisa Tvaka Kvatha	RRCV	9	3	3	3	-	-
5.	(a) Bhagottara gutika	RRIP	69	9	7	26	1	26
	(b) Somalatadi yoga	RRIP	34	3	-	9	5	17
	Total		200	30	23	73	16	69

Sveta Pradara (Leucorrhoea)

The evaluation of a few sets of Ayurvedic drugs has been taken on 69 patients of *Sveta Pradara* at IIK Patiala, CRI Delhi and RRC Nagpur. The results are tabulated here with:

Results of Clinical studies of Ayurvedic preparations on Sveta Pradara (Leucorrhoea)

S.No.	Therapy	Instt./ Centre/ Unit	Total Cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1.	Punarnava Mandura Kukkutandatvaka Bhasma, Svarna vanga	IIKP	46	7	36	3	-	-
2.	(a) Svarna vanga Kukkutandatvak Bhasma	CRID	11	1	6	3	-	1
	(b) Asvagamndha curna Lodhrasava, Nirgundi taila picu	CRID	8	1	4	-	2	1
3.	Svarna vanga Kukkutandatvak Bhasma, Punarnava Mandura	RRCN	4	1	-	-	2	1
	Total		69	10	46	6	4	3

Amlapitta (Non-ulcer dyspepsia)

The trial of Avipattikara curna alongwith Shankha Bhasma or Kapard Bhasma has been completed on seven patients of *Amlapitta* at RRC Hastinapur. All the patients reported good response or fair response.

Rakta Pradara (Metrorrhagia)

The effect of a few drug regimen have been studied on 21 patients of *Rakta Pradara* at IIK Patiala and CRI Delhi. The results are given below:

Results of Clinical studies of Ayurvedic preparations on Rakta Pradara (Metrorrhagia)

S.No.	Therapy	Instt./ Centre/ Unit	Total Cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1. (a)	Kamadudha Rasa Durva svarasa	IIKP	9	7	2	-	-	-
(b)	Bola baddha rasa	IIKP	1	1	-	-	-	-
2.	Bola baddha rasa	CRID	11	-	7	1	2	1
	Total		21	8	9	1	2	1

Madhumeha (Diabetes mellitus)

The clinical trial of selected Ayurvedic drugs has been taken on 80 cases of *Madhumeha* at IIK Patiala, CRIs Bombay and Delhi, RRI Junagarh and ALRCA Madras. The results are tabulated below:

Results of Clinical studies of Ayurvedic preparations on Madhumeha (Diabetes mellitus)

S.No.	Therapy	Instt./ Centre/ Unit	Total Cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1. (a)	Nisadiyoga Vijayasara kvatha	IIKP	22	1	5	3	7	6
(b)	Nygrodhadi curna	IIKP	5	-	-	1	2	2
2. (a)	Candraprabha vati Trivanga Bhasma Vijayasara kvatha	CRIB	15	2	1	3	1	8
(b)	Methika curna	CRIB	7	-	-	1	2	4
3.	Ayush 82	GRID	20	2	-	1	9	8
4.	Ayush 82	RRIJu	7	2	-	3	2	-
5.	Ayush 82	ALRCAM	4	-	-	2	-	2
	Total		80	7	6	14	23	30

Mutrakricchra (Dysuria)

The clinical trial of a combination of Sveta parpati and Goksuradi guggulu has been completed on two patients of Mutra Kriccha. Both the cases reported good response.

Mutrasmari (Urolithiasis)

Clinical studies on 46 patients of *Mutrasmari* has been conducted at CRI Delhi and RRC Jammu. The efficacy of the trial therapies may be seen in table below:

Results of Clinical studies of Ayurvedic preparations on Mutrasmari (Urolithiasis)

S.No.	Therapy	Instt./ Centre/ Unit	Total Cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1.	Sveta parpati Pasanabheda Goksuru & Kulatha kvatha	CRID	21	1	5	4	11	-
2.	(a) Sveta parpati Kulatha	RRCJ	15	11	3	1	-	-
	(b) Palasha ksara	RRCJ	10	4	5	1	-	-
	Total		46	16	13	6	11	-

Medoroga (Obesity)

The role of Navaka guggulu and *Ayush 55* in the management of *Medoroga* has been studied on 33 patients at IIK Patiala and RRI Junagadh. The results are tabulated herewith.

Results of Clinical studies of Ayurvedic preparations on Medoroga (Obesity)

S.No.	Therapy	Instt./ Centre/ Unit	Total Cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1.	Ayush 55	IIKP	24	-	3	6	6	9

1	2	3	4	5	6	7	8	9
2.	(a) Ayush 55	RRIJu	5	-	2	1	-	2
	(b) Navaka guggulu	RRIJu	4		2	1	-	1
	Total		33		7	8	6	12

Hridroga (Ischaemic heart disease)

The role of Puskara guggulu in the treatment of *Hridroga* has been studied on 21 patients at CRU Varanasi, Good response was observed in 12 cases, fair response in 7 cases and poor response was noted in two cases.

Vyanabala Vaisamya (Hypertension)

The efficacy of Tagaradi curna and Usiradi curna with Arjuna and Jatamansi has been studied on 83 patients of Vyanabala Vaisamya at IIK Patiala, CRI Delhi and Bombay, RRI Calcutta and RRC Mandi. The results may be seen in table below:

S.No.	Therapy	Instt./ Centre/ Unit	Total Cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1.	(a) Tagaradi curna	IIKP	9	4	3	2	-	-
	(b) Usiradi curna	IIKP	12	4	6	-	-	2
2.	Usiradi curna	CRIB	14	3	2	4	-	5
3.	(a) Tagaradi curna	CRID	12	2	3	1	4	2
	(b) Usiradi curna	CRID	11	1	1	-	4	5
4.	(a) Tagaradi curna	RRIC	12	1	3	2	2	4
	(b) Usiradi curna	RRIC	4	-	1	1	-	2
5.	Arjuna Tvak	RRIC	1	-	1	-	-	-
6.	(a) Tagaradi curna	RRCM	6	2	1	1	-	2
	(b) Usiradi curna	RRCM	2	-	1	-	-	1
	Total		83	17	22	11	10	23

Visamajvara (Malaria)

The trial of Ayush 64 has been taken on 34 patients of *Visamajvara* with positive *P. Vivax* blood smear at IIK Patiala and ALRCA Madras. The results are tabulated below:

Results of Clinical studies of Ayurvedic preparations on Visamajvara (Malaria) Smear positive

S.No.	Therapy	Instt./ Centre/ Unit	Total Cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1.	Ayush 64	IIKP	30	15	2	3	-	10
2.	Ayush 64	ALRCAM	4	1	-	-	1	2
	Total		34	16	2	3	1	12

The effect of Ayush 64 has been studied on 64 patients of Visamajvara without positive blood smear at IIK Patiala, RRIs Jaipur, Junagadh and Gwalior and RRC Jammu.

Results of Clinical studies of Ayurvedic preparations on Visamajvara (Malaria, clinical)

S.No.	Therapy	Instt./ Centre/ Unit	Total Cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1.	Ayush 64	IIKP	35	19	1	4	1	10
2.	Ayush 64	RRIJ	11	6	2	2	1	-
3.	Ayush 64	RRIJu	9	8	-	-	-	1
4.	Ayush 64	RRCJ	7	7	-	-	-	-
5.	Ayush 64	RRCG	2	1	1	-	-	-
	Total		64	41	4	6	2	11

Kala-a-zar

The clinical studies on *Kala-a-zar* has been further continued on 26 patients to assess the effect of a combination of Mukta Vidrumanjana Rasa, Lokanatha Rasa, Jvarasani and Sarva jvara Hara lauha. Good response was observed in 3 patients, fair response was noted in 10 cases, one patient reported poor response and 5 patients did not show any effect. Six patients discountinued the trial, while one patient died.

Slipada (Filariasis)

The effect of selected trial drugs has been studied on 44 patients of *Slipada* -microfilaria and manifest disease at CRI BBSR and RRC Vijaywada. Th results may be seen at table below:

Results of Clinical 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. (a)	Ayush 64	CRIBh	6	5	-	-	-	1
(b)	Saptaparna	CRIBh	2	-	-	-	2	-
(c)	Sudarshana ghana Arogyavardhini vati, Punarnava kvatha	CRIBh	12	8	2	1	-	1
2.	Arogyavardhini Sudarsana ghana vati, Purnarvadi kvatha	RRCV	24	1	14	2	3	4
	Total		44	14	16	3	5	6

Kitibha (Psoriasis)

Clinical studies on 29 patients of *Kitibha* has been conducted at RRIs Junagadh and Trivandrum. The results on the effect of trial therapies may be seen in table below:

Results of Clinical studies of Ayurvedic preparations on Kitibha (Psoriasis)

S.No.	Therapy	Instt./ Centre/ Unit	Total Cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1. (a)	Arogyavardhini Cakramarda	RRIT	6	3	1		2	
(b)	Nimbatiktam Lajjalu kera	RRIT	10	5	1	1	1	2
2. (a)	Arogyavardhini Cakramarda	RRIJu	7	-	3	3	-	1
(b)	Nimbatiktam Lajjalu kera	RRIJu	6	-	-	4	1	1
	Total		29	8	5	8	2	6

Vicarcika (Oozing eczema)

The observations on the studies on 12 cases of *Vicarcika* in RRI Trivandrum may be seen in the table below:

Results of Clinical studies of Ayurvedic preparations on Vicarcika (Oozing eczema)

S.No.	Therapy	Instt./ Centre/ Unit	Total Cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1. (a)	Cakramarda kvatha Cakramarda kera	RRIT	7	4	1	-	-	2
(b)	Manjisthadi kvatha Arkapatra kera	RRIT	5	1	2		1	1
	Total		12	5	3	-	1	3

Apasmara (Epilepsy)

Clinical studies on assessment of effect of Ayush 56 on 98 patients has

been further continued at CRI Delhi and RRI Jaipur. Data may be analysed after completion of study.

Sirahsula (Headache)

The effect of Ksira bala taila Nasya and pathyasadanga kvatha has been evaluated on 55 patients in two groups at IIP Cheruthuruthy. The results may be seen in table below:

S.No.	Therapy	Instt./ Centre/ Unit	Total Cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1. (a)	Ksira bala taila Nasya	IIPC	26	14	6	5	1	-
(b)	Pathyasadanga kvatha	IIPC	29	13	7	4	5	-
	Total		55	27	13	9	6	-

Cittodvega (Anxiety neurosis)

The comparative efficacy of Ayushman 15 and Ksira Bala taila has been studied on 53 patients of *Cittodverga* at ALRCA Madras. The results are tabulated below:

Results of Clinical studies of Ayurvedic preparations on Cittodvega (Anxiety neurosis)

S.No.	Therapy	Instt./ Centre/ Unit	Total Cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1. (a)	Ayushmana 15	ALRCAM	35	1	9	10	3	2
(b)	Ksira bala taila	ALRCAM	18	3	8	1	1	5
	Total		53	4	17	11	4	17

Rasayana (Prevention of aging)

The studies on assessment of *Rasayana* effect of a combination of Satavari, Bala, Punarnava, Guduci, Amalaki and Yasti has been further

continued at ALRCAM on 13 volunteers. Good response was noted in seven cases, fair response in 5 cases and poor response was noted in one case.

Arbuda Visesa (Cancer)

Attempt has been made to study anti cancer effect of Plumbagin and S.T.G. on 11 cases of cancer. The response does not appear to be satisfactory.

Results of Clinical studies of Ayurvedic preparations on Arbuda visesa (Cancer)

S.No.	Therapy	Instt./ Centre/ Unit	Total Cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1.	Plumbagin	CRIB	4	-	-	1	1	2
2.	(a) Plumbagin	CRID	1	-	-	-	-	1
	(b) S.T.G.	CRID	6	-	-	-	3	3
	Total		11			1	4	6

Galaganda (Goitre)

The effect of Kancanara guggulu, godanti Bhasma and Punarnava Mandura, has been studied on 5 cases of *Galaganda* at RRC gangtok. The fair response was observed in two cases. Remaining two cases have been grouped as dropout.

Prakriti Pariksha

An attempt has been made to study the *Prakriti* of 860 patients of Hridroga, Vyanabal Vaisamya, Parinamasula, alaganda, Tamakasvasa, Vatavyadhi and Cittodvege. The analysis of data to establish relationships with Prakriti and incidence of diseases is under process.

Timira (Errors of refraction)

The study of effect of Sapramrita lauha alongwith exercises of eye has been studied on 70 cases of Myopia, hypermetropia at CRI Delhi. The results may be seen in table below:

Results of Clinical studies of Ayurvedic preparations on Timira (Errors of refraction)

S.No.	Therapy	Instt./ Centre/ Unit	Total Cases	Results				
				Good resp.	Fair resp.	Poor resp.	No resp.	Drop out
1.	Saptamrita lauha exercises	CRID	51	4	7	13	13	14
	(a) Myopia	-	-	-	-	-	-	-
	(b) Hypermetropia	CRID	19	-	-	8	8	3
	Total		70	4	7	21	21	17

Diseases, Number of Patients and Participating Projects under Clinical Research Programmes during 1992-93

S.No.	Disease Group Wise	Pts. Nos.	Participating Projects
1.	**Vatavyadhis**		
	(a) Amavata	121	IIPC, RRIC, RRIG, RRCI, CRIBh, IIKP, CRIB
	(b) Paksavadha	107	IIKP, IIPC, CRIB, CRIBh
	(c) Kampavata	4	CRIB
	(d) Saisaviya vata	11	CRID, IIPC
	(e) Gridhrasi	39	IIPC, CRID
	(f) Pangu	20	IIPC
2.	**Amlapitta/Parinamasula**		
	(a) Parinamasula	61	CRID, CRUH, CRUK, CRIBh
	(b) Annadravasula	34	RRCI, CRUH
	(c) Amlapitta	7	RRCH
3.	**Other G I Diseases**		
	(a) Kamala	22	RRCH, RRCJ
	(b) Arsa	89	CRID, CRIB
	(c) Bhagandara	22	CRIB, CRID
	(d) Grahani roga	13	RRCJ
	(e) Parikartika	18	CRID
	(f) Gudvidara	16	CRID

S.No.	Disease Group Wise	Pts. Nos.	Participating Projects
4.	**Tamaka Swasa**	97	IIKP, RRIP, RRIJu, RRCV
5.	**Striroga**		
	Sveta pradara	69	CRID, IIKP, RRCN
	Rakta pradara	21	IIKP, CRID
6.	**Mutraroga**		
	(a) Madhumeha	80	CRID, CRIB, IIKP, RRIJu, ALRCAM
	(b) Mutrasmari	46	CRID, RRCJ
	(c) Mutra kricchra	2	RRCH
7.	**Medoroga**	33	RRIJu, IIKP
8.	**Hridroga**	21	CDRSV
9.	**Vyanabala Vaisamya**	83	IIKP, CRID, CRIB, RRIC RRCM
10.	**Visamjvara**		
	(a) P. Vivax	34	IIKP, ALRCAM
	(b) Clinical	64	IIKP, RRIJ, RRIJu, RRCJ, RRCG
11.	**Kala-a-zar**	26	RRIP
12.	**Slipada**	14	RRCV, CRIBh
13.	**Tvak roga**		
	(a) Kitibha	29	RRIJu, RRIT
	(b) Vicarcika	1	RRIT
14.	**Manasa Roga**		
	(a) Apasmara	98	CRID, RRIJ
	(b) Cittodvega	53	ALRCAM
15.	**Sirahsula**	55	IIPC
16.	**Rasayana**	13	ALRCAM
17.	**Arbuda Visesa**	11	CRID, CRIB
18.	**Galaganda**	5	RRCG
19.	**Prakriti**	860	CDRSV
20.	**Timira**	70	CRID

HOSPITAL STATISTICS OF CLINICAL RESEARCH PROJECTS

S.No.	Instt./Centre	OPD			IPD		
		New	Old	Total	Admtd.	Disch.	%bed occup
1.	CRI Delhi	11488	12049	23537	222	222	-
2.	CRI BBSR	4874	4236	9110	96	105	18.2
3.	IIK Patiala	4914	5074	9988	344	341	38.00
4.	IIP Chy	7177	35830	43007	199	191	72.02
5.	CRI Bombay	2486	6435	8921	158	153	-
6.	RRI Lucknow	4251	4273	8524	36	36	5.5
7.	RRI Calcutta	4537	16262	20779	59	60	31.10
8.	RRI Junagadh	3799	7390	11089	28	29	7.29
9.	RRI Patna	3284	5059	8343	-	-	-
10.	RRI Gwalior	2233	2145	4378	46	46	24.24
11.	RRI Trivandrum	2437	10463	12900	55	54	-
12.	RRI Jaipur	2389	2039	4438	86	82	26.87
13.	RRC Napur	1494	5898	7392	-	-	-
14.	RRC Bangalore	887	2267	3154	-	-	-
15.	RRC Jammu	4893	6142	1103	31	26	46.12
16.	RRC Mandi	4284	3259	7543	3	3	-
17.	RRC Gangtok	4893	2885	7778	13	3	-
18.	RRC Jhansi	70	35	105		-	-
19.	RRC Itanagar	5610	9597	15207	43	43	28.3
20.	RRC Vijaywada	3011	5205	8216	25	25	27.0
21.	RRC Hastinapur	3841	5569	9410	13	13	7.9
22.	ALRCA Madras	-	-	265	-	-	-
23.	ARU Bangalore	293	375	668	13	13	30.5
24.	CRU Hyderabad	-	-	657	48	42	-
25.	CRU Kottakal	-	-	-	150	166	69.09
	Total	83145	152487	236554	1668	1658	

HEALTH CARE RESEARCH PROGRAMME

There are three components of this programme i.e. Survey, Surveillance Research Programme, Community Health Care Research Programme and Tribal Health Care Research Programme. The villages within a radius of 25 to 30 km. of the location of the HQs. of these programme are taken up for compilation of health statistics of the selected villages. The study of health status and the various diseases alogwith compilation of folk medical practices are the main objectives of these programmes. The brief note on each of these programmes alongwith the observations recorded are discussed hereafter.

(a) Service Oriented Survey and Surveillance Programme

The population of the randomly selected villages is contacted for the study of socio-economic status of the people. The incidence of the diseases and their relationship with various *etiological* factors are recorded. The patients observed during survey are also provided Ayurvedic treatment. The local practices of healing if any observed are also recorded. During the year 1992-93 this programme has been taken up in 39 villages with a total population of 45244 and 9974 patients are also provided treatment (Table I).

(b) Community Health Care Research Programme

The programme is taken up in villages adopted by the Instt./Centres. An attempt is also made to provide health education, measures for prevention of diseases and the health promotion. The use of local herbs for relief of common ailments is also encouraged apart from providing incidental medical aid. The information regarding socio-economic status and the factors responsible for the causation of the disease are also noted. The details of work conducted in 29 villages with a population of 21317 and 5424 patients treated may be seen in Table II.

Table I

Survey and Surveillance Programme

S.No.	Instt./Centres/Unit	Village	Population covered	Pts. trtd.	Common Diseases
1	2	3	4	5	6
1.	IIP Cheruthuruthy	Panger-palli	1267	1036	Jvara, Kasa, Pandu Vata vyadhi, Sula, Hridroga
2.	IIK Patiala	Sarvajpur	-	177	Atisara, Jvara, Sandhi vata, Udarasula
3.	CRI Bhubneshwar	Bhingarpur	10000	314	Amlapitta, Pratisyaya, Pravahika, Sandhivata, Tvakroga
4.	CRI Delhi	Sundarnagari	1750	480	Amavata, Kasa, Raktavikara, Atisara, Yakrta vikara, Tvak roga.
5.	CRI Bombay	Gitanjali Nagar, Shiva sakti Nagar	7100	191	Jvara, Kasa, Udara sula, Sita pitta, Pidika.
6.	RRI Calcutta	Kestomati More II	1670	1087	Krimi, Atisara, Jvara Kasa, Tvak roga
7.	RRI Junagarh	Vadhowa	900	211	Udarasula, Vata-vyadhi, Pratisyaya, Pandu, Svasa
8.	RRI Gwalior	Jarga	1500	260	Sirahsula, Sandhi sula, Udarasula
9.	RRI Jaipur	Jaipura Khori, Chandpur saida road	1131	372	Abhisyanda, Amlapitta Vrana, Rakta vikara, Pradara
10.	RRI Patna	Maksudpur	1676	694	Tvakroga, Kasa
11.	RRC Vijayawada	Pathapadu	533	305	Jvara, Kasa, Svasa, Vata vyadhi
12.	RRC Bangalore	Chinchan Katti	800	430	Jvara, Atisara, Udarsula, Kasa

1	2	3	4	5	6
13.	RRC Nagpur	Ukhali Pugkhang Asola Agani, Bhansuli	5373	177	Pratisyaya, Svasa, Jvara, Kasa, Tvak roga, Sandhi sula
14.	RRC Guwahati	Padumbari	2000	319	Atisara, Jvara, Kasa Krimi, Pravahika
15.	RRC Mandi	Jhal, Skor Bhiale Chipnu	413	68	Amlapitta, Pratisyaya
16.	RRC Jammu	Pouniwand Wazeerpur	809	285	Pratisyaya, Pradara, Krimi Pama, Atisar
17.	RRC Jhansi	Dangarwala	1000	81	Svasa, Atisara, Pratisyaya Sandhi Sula
18.	RRC Gangtok	Marchak Penlong Shotak, Nazitam	2025	555	Atisara, Kasa, Jvara, Svasa, Agnimandya
19.	RRC Hastinapur	Mubarakpur	3000	217	Kasa, Krimi, Kostha-baddhata
20.	MCRU Varanasi	Bankharaon Chaurahat Ratanpur	3100	2705	Krimi, Atisara, Jvara, Kasa svasa
21.	MCRU Jamnagar	Naragaonghed	772	2	-
	Total	39	45244	9974	

Table II

Community Health Care Research Programme

S.No.	Instt./Centre/Unit	Village covered	Population trtd	Pts.	Common Diseases
1	2	3	4	5	6
1.	IIP Cheruthuruthy	Chalekkode Vata Kethara	-	1053	Jvara, Kasa, Pandu Vata vyadhi, Tvak roga, Udara sula
2.	CRI Bhubneshwar	Bhagwati pur	6000	68	Tvak roga. Jvara
3.	IIADR Tarikhet	Dakarhatti	278	275	Jvara, Tvak vikara, Vata vikara, Pradara, Amlapitta

1	2	3	4	5	6
4.	RRI Calcutta	Sandigiir	505	425	Jvara, Kasa, Tvak vikara, Krimi
5.	RRI Junagarh	Mandalikpur	1500	211	Pratisyaya, Pandu, Vatavyadhi, Udara-sula, Agnimandya
6.	RRI Gwalior.	Jenawali	800	152	Kandu. Kasa, Pratisyaya
7.	RRC Bangalore	Kothanur	1500	507	Jvara, Kasa, Tvakroga. Vata vikara. Udara Sula
8.	RRC Nagpur	Mandarghorad Neelgoha Yerangaon Amkajhari Kavdas Kaustha Chikane Dalika, Chunjhani	5456	201	Jvara kasa, Pratisyaya, Svasa, Sandhi sula. Tvak-roga. Udarasula
9.	RRC Itanagar	Chimpuvasti	-	1333	Atisara. Aruci, Agni mandhya, Galaganda
10.	RRC Guwahati	Baragaon	800	151	Atisara, Krimijvara, Kasa, Pravahika
11.	RRC Mandi	Chambi Attha Kv Mandi Rumbaj	690	318	Kasa, Krimi. Pratisyaya
12.	RRC Jammu	Saini Rakwalan	731	363	Pratisyaya, Pradara. Pama, Krimi, Sandhi-sula, Atisara. Kasa
13.	RRC Jhansi	Mathbagona Danipura	1860	89	Kasa, Atisara, Pravahika
14.	RRI Jaipur	Mukunda pura	2000	140	Tvak roga. Netra roga, Vrana. Jvara
15.	RRI Patna	Barki	697	138	Kasa, Atisara
	Total	29	21317	5424	

Tribal Health Care Research Programme

This programme has been initiated with the aim to study living condition of Tribal people, folk medicines used by them occurence of medicinal plants to the area. Prolagation of knowledge about oral hygienes, prevention of diseases, use of common 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), District Palamau (Bihar), Chinchchpada Distt. Dhule (Maharashtra), Jagdalpur (Madhya Pradesh), Ziro (Arunachal Pradesh) and Imphal (Manipur). During reporting period 50 Tribal pockets/villages consisting of a population of 43,289 individuals have been covered and incidental medical aid extended to 31,682 patients (Table I). About 100 specimens of the plants found growing in these areas have been collected. Efforts have also been initiated to compile and analyse the data/information gathered by these projects. Besides this the project at Palamau carried out some clinical trials on Visamjvar, Ankushkrimi in the field conditions. The treatment provided in these clinical conditions and research thereof is shown in the Table II.

Table I

Work Conducted Under Tribal Health Care Research Programme

S.No.	Location of the Project	Tribal Pkts. covered	Population	No. of Patients treated ST/SC & Other	Common Diseases
1	2	3	4	5	6
1.	Imphal (Manipur)	Koirangei Changangi Chingkhunlong	1080	1080	Atisar, Amlapitta, Jvara, Galganda, Kasa, Pandu, Pradara, Pratisaya Sirasula, Krimi, Twagroga
2.	Jagdalpur (Bastar)	Badegalabad Dhoorgudha Pandripani	6299	6098	Atisar, Arsha, Apasmara, Amlapitta, Amavata, Balaroga Gridhrasi, Hridroga, Jvara, Kasa, Krimi, Kamala, Katisula, Mukhroga, Pandu, Netraroga, Svasa roga, Rajoroga/dosa, Vicarcika, Udarsula, Tvak roga.

1	2	3	4	5	6
3.	Palamu (Bihar)	Rajderwa Biriya, Khandib Purnadih Basawra Duba, Polpol Urhulia	9040	6446	Pradara, Svasa, Switra, Atisar, Arsha. Apasmar, Amlapitta, Amavata. Balapakshaghata, Galganda, Jvar, Kasa. Krimi, Kamla, Pravahika, Mukhoroga Tvagroga, Vishamjvara
4.	Ziro (Arunachal Pradesh)	Ziro old Duta Hari, Kalong, Reru, Lampia Talo, Dam, Sivi	15125	10937	Atisar. Aruci. Agnimandya, Arsha Charole, Daha, Galanganda, Katisula, Krimi, Pradara, Prameha, Pravahika Rajodosh.
5.	Car-Nicobar	Mus Kimanai Sanallapathy Tapoim, Okukchucha, Kinyuka, Tamal Pereka. Sawani Teetop	2444	1440	Atisar. Arsha, Apasmar, Amavata, Amlapitta, Arbuda, Galganda, Jvar, Kasa, Krimi, Kamala, Katisula, Pandu, Pradara Pravahika, Prameha, Rajodosa Svasa, Sotha. Sandhisula, Urahsula, Daha, Vipadika
6.	Chincha Pada (Maharashtra)	Kareyghat Kothra Gard, Vadfali Bandharfali Kadwan, Ampada Thowa Sagipada Khatijambhi Barvir	9301	3353 2228	Atisar. Arsa, Amlapitta, Galganda, Jvara. Kasa, Krimi. Kamala, Kandu, Katisula, Dantsula, Dantikrimi. Mukhapak, Mutrakrichra. Pandu, Swet Pradara, Prameha. Svasa, Timira, Manoroga
7.	Jhabua (M.P)	Nil	-	100	During the reporting year due to non availability of staff tribal village pocket are not surveyed.
	Total	50	43,289	31,682	

Table. II

Result of Treatment

Diseases/Treatment	Good res.	Fair Res.	Poor res.	No. res.	LAMA	Total
Visam Jvara Ayush-64 Karanja-Bijamajja Curna	95	-	-	9	-	104
Ankush Krimi	110	-	11	6	11	138
	37	-	-	6	3	46

MEDICO-ETHNO-BOTANICAL SURVEY PROGRAMMES

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

1. The Council has been able to collect, identify and supply the authentic/genuine drugs for its various research programmes, besides actually locating the zones where the required drugs are available.

2. The survey teams at various Institutes/Centres/Units have conducted qualitative and quantitative surveys of different forest areas to unearth hidden treasures of medico-botanical wealth of the country.

3. More than 340 forest areas in the different States have been surveyed. The Council has more than one lakh herbarium specimens in different regional herbaria and have 3000 different drugs samples belonging to animal, mineral and vegetable kingdom in the various regional museums of the country.

4. The Council has made a start to establish Central Medicinal Plants Herbarium and Museum at CRIA, New Delhi. This shall be a unique centre to meet the demand of research workers and the pharmaceutical industry as a whole.

5. During the survey programmes a good collection of 3,500 folklore claims have been made by these teams and out of these a monograph on 2,700 claims have been prepared.

The Council has published thirteen volumes of the quarterly Bulletin of Medico-Ethno-Botanical Research which contains several articles published on survey work conducted by the survey teams in different areas e.g. Pithoragarh Distt. (M.P.), Karimnagar Distt. (Andhra Pradesh), U.P., Siang Distt. (Arunachal Pradesh), Udhampur Forest Division (J&K), Rajpipla Forest Division (Gujarat), Lahul Spiti (Himachal Pradesh), Gwalior Forest Division (Madhya Pradesh), Tezpur (Assam),Garhwal Himalayas (U.P.),

Subansiri Distt. (Assam), Gurez Valley (J&K), Udaipur Distt. (Rajasthan), North Arcot Distt. (Tamil Nadu), Santhal Pargana Distt. Dumka (Bihar), Rajgir (Bihar), Amravati Division (Maharashtra) etc.

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

Following monographs have also been published on the basis of survey work conducted.

(A) Medico-botanical exploration of Puri Distt. (Orissa)

(B) Observations on Medico-botany of Andaman Nicobar islands.

(C) Medico-botany of East and West Godavari (Andhra Pradesh)

(D) Medico-botanical exploration in Sikkim, Himalayas

(E) Medico-botanical Survey of Bastar Distt. (Madhya Pradesh)

The following is the list of monographs prepared on the basis of survey work conducted and are under the process of printing.

1. Medico-botanical survey of Koraput & Phulbani Distt., Orissa.
2. Common Medicinal Plants of Rajasthan.
3. Medico-botany of Coorga (Kodagu) Distt., Karnataka.
4. Ethno-Medico-Botanical studies of West Melghat Division, Amravati Circle, M.S.
5. Medicinal Plants of Kachcha.
6. Ethno-botanical exploration of Nagpur and Wardha Forest Division, Nagpur Circle, M.S.
7. Special Medico-Botanical Survey of Panchmarhi.
8. Special Medico-botanical Survey of Chitrakoot.
9. Medico-botanical Survey of Mount Abu.

A brief resume of the work carried out during the year 1992-93 by the seventeen medico-botanical survey units of CCRAS located at Bangalore, Bhubneshwar, Calcutta, Gangtok, Guwahati, Gwalior, Itanagar, Jaipur, Jammu, Jhansi, Junagadh, Mandi, Nagpur, Patna, Tarikhet, Trivandrum and Vijaywada is presented below:

The Survey Unit at RRC (Ay.), Bangalore (Karnataka) has undertaken Four medico-botanical Survey tour programmes, one in most decidupus & everygreen forests of North Kanara and also carried out 3 local survey tours in Bangalore district. Collection of 212 species distributed over 176 general and 63 families was made. A total number of 264 Herbarium sheets were mounted and 187 species were identified. Contributed 2 research articles. Provided technical assistance in students of Botany, Ayurveda and M.Pharm, M.D. and other Ph.D. students.

The Survey Unit located at CRIA, Bhubneshwar (Orissa) has conducted local tours around Bhubneshwar. Collected 65 kg. of fresh drug material for use in O.P.D./I.P.D. and supply to the Units. One research paper was sent for the Seminar on Drug Research, Itanagar. Poisoned 250 specimens and identified 30 specimens.

The Survey Unit at RRI (Ay.), Calcutta (West Bengal) has undertaken survey work in the North Sikkim distt. and Howrah distt. of West Bengal. Collection of 430 species was made which represent 103 families and 230 generas of the 430 species collected, 390 are identified. Raw drug collection of 11 drugs weight 30 kg. was made. Organised an exhibition during the seminar on traditional medicine.

The Survey Unit located at RRC (Ay.), Gangtok (Sikkim) has undertaken one survey tour of North Sikkim area with the collaboration of RRI (Ay.), Calcutta staff, collected 160 plant specimens.

The Survey Unit located at RRC (Ay.), Gauwahati (Assam) has undertaken 30 days local survey tours and collected 68 kg. of fresh raw drugs. Maintenance of Herbarium & Museum was continued.

The Survey Unit located at RRI, Gwalior (Madhya Pradesh) with the collaboration of RRC (Ay.), Jhansi Survey staff has undertaken preparation of draft monograph on Ethno-medico-botanical aspects of Bundelkhand. Identified 145 specimens of Bilaspur Distt. collections. Incorporated 213 sheets in Herbarium.

The Survey Unit at RRC (Ay.), Itanagar (Arunachal Pradesh) has done

some local survey tours, collected 59 specimen representing 140 general and 192 species. Communicated two papers for Seminar proposed at Tarikhet.

The Survey Unit at RRI, Jaipur (Rajasthan) has undertaken 15 days local survey tour programmes in the Rattangarh and Sikar forest areas and Bundi Baran Forest Division using 315 Field Book numbers. Identification of 496 specimen and mounting of 767 was done. 32 folklore claims were collected. Monograph on the Desert areas of Rajasthan was submitted for publication purposes and is under typing & scrutiny of Chitrakoot report done.

The Survey Unit at RRC (Ay.), Jammu-Tawi (J&K) has surveyed three forest areas, collected 426 Field Books Nos., poisoned 2600 specimens, 134 specimen and 140 specimens accessioned.

The Survey Unit at RRC (Ay.), Jhansi (Uttar Pradesh) has ledgred 905 herbarium sheets, collected 436 kg. fresh drug and dried weight 72 kg. for supply purposes, submitted one paper for Itanagar Seminar.

The Survey Unit located at RRI (Ay.), Junagadh, (Gujarat) has undertaken one survey tour programme in the local areas and Rajkot district using 54 Field books nos. collection of 66 plants. Accessioned 43 species. Collected two folklore claims. Three drug samples weight 34.58 kg. were also supplied.

The Survey Unit at RRC (Ay.), Mandi (Himachal Pradesh) has mounted 700 specimens from the previous collection of Herbarium & Museum. Communicated one paper for Itanagar Seminar.

The Survey Unit located at RRC (Ay.), Nagpur (Maharashtra) has undertaken one survey tour programme in the North Chanderpur circle Brahampuri division, using 27 field Book Nos.Mounting of 40 specimens and poisoning of 68 plants was done. Accessioned 28 plants specimen and prepared 15 index cards. A monograph on Gondia forest division Nagpur circle has been prepared. Another paper on East and West Melghat District has been published in BMEBR. Submitted one paper for Itanagar Workshop.

The Survey Unit at RRI (Ay.), Patna (Bihar) has surveyed Giridih forest division. During explorations about 388 herbarium specimens spread over 136 field book numbers were collected, 12 museum samples were also collected. 10 kg. of raw drugs material was collected for supply purpose 5 kg. of drug Vandhyavari collected was supplied to CRIA Bombay.

The Survey Unit at IIADR, Tarikhet (Uttar Pradesh) has surveyed Jogeshwar forest range and collected 131 plant specimens belonging to 60 families, Maintenance of Herbarium and Museum was continued. Monograph entitled "Medico-Ethno-Botany of Tribal areas of Sonebhadara (previously under Mirzapur) U.P." was completed and submitted for publication. Compilation work of "Herbal wealth of Garhwal and Kumaon" completed and submitted for publication. During this year 7 research papers were published. A short trip to Jaursi for location of Shilajeet was conducted. Material for the Silver Jubilee Celebration prepared.

The Survey Unit at RRI (Ay.), Trivandrum (Kerala) has conducted two survey tours in Nilampur and Kottayam Forest Divisions collected 117 plant species belonging to 97 Genera and 36 families. Identified 95 and mounted 250 specimens. Incorporated 82 specimens supplied 55 drug samples to different Centres/Institutes of the Council.

During tour to Kottayam on tribe Mala arayan were studied in detail, collected 14 folklore claims from Kottayam, completed compilation work of Mumnor Forest Division.

The Survey Unit at RRC (Ay.), Vijaywada (Andhra Pradesh) has undertaken one major 15 days survey tour programme in the Tribal pockets of Khamman distt. (A.P.). Raw drug material weight 56 kg. was collected for supply purpose. Submitted one paper for Itanagar Workshop.

MUSK DEER BREEDING PROGRAMME MEHRORI (KUMAON)

The musk deer breeding farm is being maintained by the Council at height of 7.500 ft. m.s. on two acre land at Mehrori in Kumaon Hills. At present there are 19 animals out of which 9 are male and 10 are female animals. During the last 20 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 behavioural adoptability 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 clean and quite

surroundings in their living area. Females also did not like to live in herds. The stockades have new 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, Garanium wallichinum* leaves, the adult male animal prefers stert grazing with *Agarious* species and ferns.

Behaviour in the stockade: Observations on their behaviour, amicability, adoptability, grazing, preference to feed, fodder and cereals, intake of water, milk, urination and defecation, scrapping of soil, head raising, cudding fright, wounds, injuries, scratchs and response and reactions to rain, hail storm, snow, humidity, cold waves, foggy weather, clouds, moonlight, sun heat gromming and pasting behaviour, aggressiveness of males was observed as usual.

Observations on heat: During winter months from 11th December, 1992 to 28th February, 1993 six female of age between 4 years 6 months 8 days to 10 years 1 month & five days were observed in heat. Mating arranged in all of them. But one females named Kanti was found reheated on 29th January, 93, after a gap of 42 days. Remating was arranged.

Dieseases, injuries, scratchs and their remedial measures: Retention of urine and stool: Observations shows that the retention of urine and stool in the male animals occurs every year in the begining of monsoon. This year July (w.e.f. 1.7.92 to 19.7.2) all female animals felt ill by this disorder. The period of ailment was recorded to last maximum 142 hours and minimum of 65 hours. Casualty did not occurs in this year by this ailment. Timely adoption of all the care and animal management helped to recover. Another feature observed was that before the retention of urine and stool the hair of the deer started breaking off from the latteral side of the body. During the climax period fragrance of musk spreads out from the navel pouch. The suffering animal was found to lick the mouth of pouch. In the later part of this ailment the sick animal is found to scratch the solid and takes a little quantity of it.

Deaths of animals: During June and October 92, (five) animals 2 males of 3 females died due to bacterial infections.

CULTIVATION OF MEDICINAL PLANTS

Five herbal gardens of the Council located at Pune (Maharashtra), Mangliawas (Rajasthan), Jhansi & Tarikhet (U.P.) and Itanagar (Arunachal Pradesh) has taken up a small scale experimental and semi large scale cultivation of a few important medicinal plants of Ayurveda and Siddha systems of medicine. About 450 important medicinal species are presently properly maintained in these different gardens and the plantation includes those of tropical; sub-tropical and temperate regions, besides exotic ones. The main aim of this programme is to study adoptability, growth, flowering, fruiting and also to assess the yield at different altitudinal levels and other ecological conditions etc., besides providing quality drug material in adequate quantity for research and pharmaceutical purpose. These herbal gardens also work out suitable agro-chemical technique for the successful cultivation and growth of scarcely distributed/rare/threatened medicinal species.

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

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

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

Jawaharlal Nehru Ayurvedic Medicinal Plants Garden and Herbarium

The Institute has carried out its cultivation activities and maintenance of medicinal plants demonstrative garden in about 10 acres out of a total of 19 acres land available for cultivation purpose. More than 450 species, mostly of medicinal importance and a few of economic or oranmental value are presently being grown in the garden. Out of these 72 medicinal plants species are maintained in beds of different sizes for demonstrative/ experimental/mass cultivation purposes, about 368 plant species consisting of annuals, bienniels and perennials are growing at different places in the garden and 15 species introduced recently from different eco-climatic

garden conditions are being maintained in pots under nursury conditions. About 152 species of the entire plantation are from amongst the list of the medicinal plants included in the Ayurvedic Formulary, Part I.

Some of the important species growing for demonstration purposes include Vacha *(Acorus calamus)*, Shatavari *(Asparagus racemosus)*, Ishwari *(Aristolochia indica)*, Danti *(Baliospermum montanum)*, Agnimantha *(Clerodendrum multiflorum)*, Ashoka *(Saraca asoca)*, Arjuna *(Terminalia arjuna)*, Ashwagandha *(Withania somnifera)*, Asana *(Pterocarpus marsumpium)*, Atmagupta *(Mucuna prurita)*, Bakuchi *(Psoralea corylifolia)*, Sarpagandha *(Rauvolfia serpentina)*, Pippali *(Piper longum)*, Prasarni *(Paederia foetida)*, Brahmi *(Bacopa monnieri)*, Mandookparni *(Centella asiatica)*, Chitraka *(Plumbago zeylanica)*, Trivrita *(Operculina turpethum)*, Yastimadhu *(Glycyrrhiza glabra)* etc. Medicinal species taken for mass cultivation are Vanapalandu *(Urginea indica)*, Ushira *(Vetiveria zizanioides)*, Japa *(Hibiscus rosa-sinensis)*, Nirgundi *(Vitex negundo)*, Kumari *(Aloe barbedensis)*, Bilva *(Aegle marmelos)*, Amlaki *(Phyllanthus emblica)* in order to meet the bulk requirement of the Council's different O.P.D's/Pharmacies etc.

About two dozen medicinal species were newely introduced in the garden during the reporting period. Some of these were procured from subtemperate region of Kumaon Himalayas, planted in pots, kept under nursery conditions and observed for their acclimatisation & survival in the conditions of Pune. Among the newly introduced species, important ones are Shulaela *(Amomum subulatum)*, Pashanbheda *(Bergenia ligulata)* Vijaya *(Cannabis sativa)*, Manjishtha *(Rubia cordifolia)*, Tinditika *(Rhus narviflora)*, Kumkum *(Crocus sativus)*, Akarkarabha *(Spilanthus acmella)*, Prasarni *(Paederia foetida)*, Raktachitraka *(Plumbago indica)*, Kulinjana *(Alpinia galanga)*, Khurasani ajawayan *(Hyocyamus niger)*, and *Digitalis lanata.*

Experimental studies were also undertaken on a few selected species of Ayurvedic importance in order to work out their cultivation practices, to incresase the yield & growth and chemical constituents. The plants undertaken for study are Kalmegha *(Andrographis paniculata)*, Trivrita *(Operculina turpethum)*, Ushira *(Vetiveria zizanioides)* and Bakuchi *(Psoralea corylifolia)*. The preliminary cultivation trials of Kalmegha indicate that it thrives well on medium black soil of Pune and can be successfully cultivated on commercial scale with a reasonable profit of Rs. 4650/- per acre in six months. Evaluation of total oil content of Ushira roots harvested round the year in every month shows that the total oil content

is maximum (11.23%) during August-September and therefore these months are considered most suitable for its harvesting. Studies on Trivrita and Bakuchi are still in progress and the results are expected during the next year.

Steps were also taken to develop a gene bank of threatened medicinal taxa to help e-x situ conservation. In this context about 100 seedlings of Sarpagandha *(Rauvolfia serpentina)* and about 50 seedlings of Ashoka *(Saraca asoca)* were raised, some of them were planted in the field or pots and the rest being maintained in nursery. About 70 plants of Guggulu *(Commiphora wightii)*, another endangered species, are also being maintained in the garden. Some other threatened species being grown in the garden are Langali *(Gloriosa superba)*, Prasarni *(Paederia foetida)*, Lukucha *(Artocarpus lakoocha)*, Meshashringi *(Gymnema sylvestre)*, Ishwari *(Aristolochia indica)*, etc.

The garden also meets partly the drug requirement of the Council's different research projects. During the reporting period about 122 kg. (dry wt.) crude drug material from 18 species was collected from the garden. The important among these are Amlaki *(Phyllanthus emblica Linn.)*, Bakuchi *(Psoralea corylifolia L.)*, Madana *(Xeromphis spinosa* Thanbikera), Palasha *(Butea monosperma* (Lamk) Kuntz.), Kuberaksha *(Caesalpinia bonduce* (L) Roxb.), Mandookparni *(Centella asiatica* (L.) Urban.) etc. A total of 18 kg. of this produce belonging to about 20 species were supplied to Council's various Research Centres/Institutes etc. for research purpose. Further, seeds of 45 medicinal taxa were collected for development of a seed bank in the Institute.

The garden also extended guidance to Indian Institute of Panchakarma, Cheruthuruthy, Regional Research Centre (Ay.), Itanagar and Indian Institute of Ayurveda for Drug Research, Tarikhet for developing medicinal plants garden and streamlining cultivation activites. It also imparted 15 days training to Research Assistant (Botany), RRC, Itanagar on various aspects of experimental cultivation and gardening of medicinal plants.

The other activities of the Institute include initiative taken for popularisation/encouragement to medicinal plants cultivation and development of herbal gardens by supplying seeds/planting material of more than 75 medicinal plants to about ten research/academic organisations and Govt. Departments. Two exhibitions displaying a large number of colour and laminated photographs and live plants were also organised at Pune to attract the attention of common man towards the need of

cultivation, conservation and utilisation of medicinal plants for alleviating the sufferings of people from day to day minor ailments. A large number of visitors interested in medicinal plants were given technical knowhow and guidance on cultivation of medicinal plants free of charge.

The garden also served as a Centre of interest for the students of Ayurveda and allied disciplines as well as the Scientists and Academicians interested in medicinal plants. More than 300 undergraduate/post graduate students of Ayurveda, Homoeopathy and Botany from 12 colleges located in different parts of the country visited the garden alongwith their teachers on educational trips and were benefitted by the demonstrations given by the scientists of the Institute. The garden was also visited by about 70 Scientists/Academicians including a few from abroad.

Regional Research Centre, Jhansi

The Regional Research Centre, Jhansi has continued with the cultivation of important Ayurvedic medicinal plants both on experimental, mass scale as well as for demonstrative purpose. This programme is presently confined to about 15 acres of the land, out of a total of 42 acres available with the Centre, which was suitably reclaimed and made fit for undertaking cultivation activities. The rest about 27 acres of the land is full of ditches and hillocks and can not be utilised for cultivation purpose.

Presently, the herbal garden has a total of about 200 medicinal species properly grown and maintained. This entire plantation which is represented in the experimental and semi-mass scale beds, demonstrative beds as well as in the green house also includes about 50 medicinal species mentioned in Ayurvedic Formulary, Part I. The medicinal plants undertaken on semi-mass scale cultivation are Sarpagandha *(Rauwolfia serpentina* Benth), Shatavari *(Asparagus racemosus Willd)*, Yashtimadhu *(Glycyrrhiza glabra)*, Ghritkumari *(Aloe barbedensis)*, Rasna *(Pluchea lanceolata)*, Prishtaparni *(Uraria picta Desv.)*, Shalparni *(Desmodium gangaticum)*.

Some of the important plants taken up for experimental studies includes Atibala *(Abutilon indicum)*, Gunja *(Abrus precatorius)*, Danti *(Baliospermum montanum)*, Punarnava *(Boerhaavia diffusa)*, Bharangi *(Clerodendrum indicum)*, Sankhapuspi *(Convolvulus pluricaulis)*, Anantmool *(Hemidesmus indicus)*, Bala *(Sida cordifolia)*, Mahabal *(Sida rhombifolia)*, Ushira *(Vetiveria zizanioides)*, Chitrak *(Plumbago zeylanica)* and Kalmegh *(Andrographis paniculata)*.

A few of the important species raised in the demonstration beds are Arkapatri, Akarkara, Anantmool, Meshashringi, Swetgunja, Pristparni, Laghu Panchmool, Kumari, Latakasturi, Bharangi, Ulatkambal, Chitraka, Kapoor-tulsi, Tulsibhed, Bala, Balabhed, Shankhpuspi, Danti, Aprajita, Vasa, Khas, Dhataki etc.

A total of 165 important medicinal plants species are also being maintained in polythene bags and cement pots in the Green House and regular observations are made for their adoptability and vegetative growth behaviour etc. These species are also available for demonstrative purpose under pot cultivation programme. Besides this, the garden has also planted a few important medicinal plants species belonging to different geographical and climatic regions on experimental scale for styding their growth behaviour and adoptability etc. under the climatic conditions of Jhansi. A few of these plants are vacha *(Acorus calamus)*, Brahmi *(Bacopa monnieri)*, Mandookparni *(Centella asiatica)*, Yashtimadhu *(Glycyrrhiza glabra)*, and Pashanbheda *(Berginia ligulata)*, etc. Species of 16 medicinal plants have also been prepared in polythene bags for their plantation in the field besides sowing of seeds and raising of sapplings of many other important medicinal plants in the Green House.

Some creepers of important medicinal plants such as *Argyreia speciosa, Operculina turpethum, Celastrus paniculatus, Paederia foetida, Tylophora indica, Tinospora cordifolia, Cocculus hirsutus* are being growing in the green house.

The total produce of the garden during the year was about 291 kg. (fresh material), consisting of different drug parts of about 30 medicinal plants species for meeting the drug supply requirement of various research projects.

Indian Institute of Ayurveda for Drug Research, Tarikhet

The Institute's herbal garden at Ranikhet is located on a hillock and is bounded by Pine Forest on its northern and western sides. It has also another small medicinal plants garden at Chamma about 400 km. away from Ranikhet. At both those places, cultivation of medicinal plants activities have been continued with the main objective to study the possibilities of cultivation of important medicinal plants drawn from wild sources as well as belonging to different climatic/geographical and altitudinal conditions, by studying their adoptability and growth behaviour etc. in the climatic conditions of Ranikhet and Chamma. At Ranikhet the cultivation project is confined to about 2.5 acres of the land out of a total of 7.5 acres available

for the purpose which includes about 1.5 acres of land exclusively confined to Saffron Experimental Project. At Chamma Garden the cultivation activities are carried out in about 1 acre of land out of two acres available for the purpose.

At Ranikhet Herbal garden the medicinal plants of tropical, sub-tropical and mountaneous climate have been grown successfully and it has about 150 medicinal plants species mostly of Ayurvedic importance properly maintained at different places in the garden. This plantation is mostly for demonstration purpose besides a few plants taken up for experimental trials for their acclamitisation and adoptability etc. Some of the important species taken up on experimental scale e.g. Trivrit, Aparajita, Brihati and Ulatkambal etc. have shown satisfactory growth and adoptation. Another specie Kusum *(Carthamus tinctorious)* taken up for experimental trial have also shown good vegetative growth when subjected to application of different micronutrients.

This entire plantation includes about 80 medicinal plants species mentioned in Ayurvedic Formulary, Part 1 and a few important are: Ashwagandha *(Withania somnifera)*, Tumuru *(Zanthoxylum alatum)*, Erand *(Ricinus communis)*, Nirgundi *(Vitex negundo)*, Vasa *(Adhaoda vasica)*, Chitraka *(Plumbago zeylanica)* Sarpagandha *(Rauwolfia serpentina)*, Dhataki *(Woodfordia floribunda)*, Satawari *(Asparagus curillus)*, Kantakari *(Solanum xanthocarpum)*, Brihati *(Solanum indicum)*, Salmalli *(Bombax malabaricum)*, Karavira *(Nerium odorum)*, Tajavati *(Zanthoxylum alatum Roxb.)*, Daruharidra *(Berberis atistata)*, Pasanbheda *(Bergenia ligulata)* Bhangaraja *(Eclipta alba)*, Mandookparni *(Centella asiatica)*, Mahanimba *(Melia azedarach)*, Yashtimadhu *(Glycyrrhiza glabra)*, Rudraksha *(Elaeocarpus ganitrus)*, Vaca *(Acorus calamus)*, Brihadala *(Amomum subulatum)*, Atmagupta *(Mucuna prurita)*, Syonak *(Oroxylum indicum)*, Aragwadha *(Cassia fistula)*, Guduchi *(Tinospora cordifolia)*.

About 35 medicinal plants species belonging to different climatic and geographical areas have also been introduced in the garden which include Sukshmaela *(Elattaria cardamomum)*, Salmalli *(Salmalia malabarica)*, Haritaki *(Terminalia chebula)*, Arjuna *(Terminalia arjuna)*, Amalaki *(Emblica officinalis)*, Syonak *(Oroxylum indicum)*, Vansha *(Dendrocalamus strictus)*, Aragvandha *(Cassia fistula)*, Kampillak *(Mallotus philippinensis)*, Khadir *(Acacia catechu)*, Palash *(Butea monosperma)*, Khas *(Vetiveria zizandioides)*, Kutaki *(Picrorhiza kurroa)*, Jatamansi *(Nardostachys jatamansi)*, Guduchi *(Tinospora cordifolia)*, Satavari *(Asparagus ascendens)*, Salparni *(Desmodium gangeticum)*,

Kutaj *(Holarrhena antidysenterica)*. The exotic species successfully intoduced in the garden are: *Artemisia annua, Calistomona viminallis* and *Digitalis ferriginea.*

During the reporting period, a total of 700 live plants of Daruharidra, Kathal, Sati and Paribhadra were also collected from the forest and transplanted in the garden during the rainy season. Steps have also been taken up for the identification of pests/pathogenes affecting the medicinal plants crop in the field and the study is still reported to be in progress. A mini medicinal plants nursery have also been developed and has sapplings/ seedlings of about 400 Ayurvedic medicinal plants species.

Medicinal plants garden at Chamma has about 50 medicinal plants species growing in different beds and are properly maintained. A few important species are: Satavari *(Asparagus racemosus)*, Pashanbhedsa *(Bergenia sp.)*, Tagar *(Valariana wallichi)*, Manjistha *(Rubia cordifolia)*, Akarkara *(Anacylus pyrethrum)*, Vacha *(Acorus calamus)*, Eranda *(Ricinus communis)*, Dhataki *(Woodfordia fruiticosa)*, Kumkum *(Crocus sativus)*, Rudraksha *(Elaeocarpus ganitrus)*, Ashoka and *(Polyalthia longifolia)*, Nirgundi *(Vitex negunda)*, Kuth *(Sassurea lappa)* and Bhringaraj *(Eclipta alba)*.

The Institute has also supplied raw drug material to different Institutes/ Centres of the Council for Research purpose from time to time.

Saffron Experimental Cultivation

Saffron Experimental Cultivation and research investigations were continued on about 1.5 acres of the land out of 2.5 acres of the land available for medicinal plants cultivation activities in the herbal garden of the Institute at Ranikhet. Regular observations were carried out on growth, development and multiplication etc. of the Saffron corns. At present a total of 3.9 lakhs corms of large, medium and small sizes have been properly maintained in 560 different beds of different sizes covering an area of 2,297 sq.m. The experimental studies made during the year have indicated that manure of musk deer feaces have no effect in increasing the vegetative and reproductive growth of the Saffron plants. However, application of agromin in dose of 0.4 gm. and 0.2 gm. proved effective in increasing the number of flowers control of 4 and 2 % respectively.

The flowering season lasted for about 1.5 month which started from last week of September, 1992 to first week of November, 1992. During the flowering period a total 8720 flowers weighing 3,296 gms (fresh) were

collected yielding 72 gm saffron consisting of dry stigma and little part of style.

A comprehensive monograph on Saffron cultivation practices has been prepared by the Institute and is in the final stage of printing.

Guggulu Herbal Farm, Mangliawas, Rajasthan

The Guggulu Herbal Farm, Mangliawas is situated about 25 Km. on Ajmer - Beawar Road. The main activitiy of this Herbal Farm is the conservation, cultivation and propagation of Guggulu plant *(Commiphora wightii)* on large scale and observing its growth behaviour under different experimental conditions. The entire farm consist of about 140 acres of the land available for cultivation purpose, but the Guggulu plantation is presently being carried out in about 40 acres of the land. The Farm is grouped into 20 odd blocks based on topographical characteristics.

At present there are about 13700 Guggulu plants growing on mass experimental scale in different blocks and all possible attempts were made for their proper maintainance. The remaining portion i.e. about two third of the land is covered with natural vegetation of guggulu plants besides a few other species, mostly medicinal, of arid zone region.

During the reporting period a total of 739 Guggulu plants raised from cuttings were planted during July/August, 1992 for experimental studies and observations of their growth behaviour etc. at different experimental stages. Besides this, stem cuttings of Guggulu - *Commiphora wightii* (4504), *Boswellia serrata* (61), Rohitaka - *Tecomella undulata* (76), *Thevetia peruviana, Nerium odorum* (60), Guduchi - *Tinospora cordifolia* (100) and 75 tubers of *Chlorophytum tuberosum* (Musali) were also planted. Seeds of Mahanimba *(Melia azedarach* (100 gms), *Annona squamosa* (50 gms.), *Commiphora wightii* 100 gms.), *Caesalpinia bonduce* (1 kg.), Sinsapa - *Dalbergia sissoo* (100 gms.) and Eranda *(Ricinus communis* (200 gms.) were also sown.

About 55 species of other medicinal plants are naturally growing or cultivated in the farm. Some of the important plants growing are: Sallaki *(Boswellia serrata),* Kuberaksha *(Caesalpinia bonduce),* Nimba *(Azadirachta indica),* Sadapushpi *(Vinca rosea), Euphorbia anticepheletical,* Arka *(Calotropis procera),* Goksura *(Tribulus terrestris),* Badara *(Zizyphus jujuba), Thevatia peruviana,* Aragwadha *(Cassia fistula),* Eranda *(Ricinus communis)* Sirish *(Albizia lebbeck) Tylophora asthematica,* Parusaka *(Grewia asiatica)* Guduchi *(Tinospora cordifolia),*

Vanapalandu *(Urgenia indica)*, Punarnava *(Boerhaavia diffusa)*, Kanchanar *(Bauhinia variegata)*, Rohitaka *(Tecomella undulata)*, Ashvigandha, *(Withania somnifera)*, Bakuchi *(Psoralea corylifolia)*, Rantakari *(Solanum xanthocarpum)*. The entire plantation includes about 40 medicinal species mentioned in Ayurvedic Formulary, Part I.

A number of interesting observations have been reported on certain experimental studies undertaken. Standardisation of tapping techniques in Guggulu plant has been carried out in 200 plants using Ethephone (2 Chloro Ethyl phosphoric acid) in different concentrations. The preliminary studies have indicated that average yield of gum per plant increases when Ethephone is fed through root and 450 mg. dose of Ethephone solution is affective in the maximum extraction of oleo-gum-resin. The follow up studies/observations is still continuing.

The other experimental studies made have indicated that vegetative propagation through cuttings have shown much faster growth of Guggulu plants than those raised from seeds. The germination by Guggulu seeds have been reported to be very poor. The best period for plantation of Guggulu cuttings and for the plantation of Guggulu plants has been observed to be the months of June and July/August respectively. Experiments have also been conducted on 10 Guggulu plants to observe the success of air-layering in *Commiphora wightii.* The study is still in progress.

Experimental cultivation of *Chlorphytum tuberosum* has been taken up to study its adoptability in agro-climatic conditions in the farm and 75 tubers were planted for this study. 3 Exotic species introduced in previous years such as *Euphorbia anticephalatica, Tylophora asthmatica* and *Bersera hindarsina* have shown satisfactory growth, regeneration and adoptability. The germination of the seeds of *Caesalpinia bonduce* and *Ricinus communis* has been found quite satisfactory. Control measures have also been taken to prevent termite and other insect attack and bacterial/fungal growth etc. on guggulu plantation.

A total of about 9 kg of the plant material consisting of about 10 plants species including 6 kg. of oleo-gum-resin (Guggulu) have been collected from the farm. A total of 17 kg of the drug material was supplied to Council's different research projects besides as large number of Guggulu cuttings to different outside scientific agencies for research purpose.

Regional Research Centre, Itanagar

The medicinal plants garden of the Centre occupies about 17 acres of

the land consisting of steep slopes and ditches etc. Out of this about 9 acres of the land is presently devoted to cultivation of the medicinal plants. A total of 130 species of Ayurvedic importance are growing in the garden and also properly maintained for the demonstration purpose. This includes 11 and 4 medicinal plants species undertaken on semi-mass scale and experimental cultivation respectively. The entire plantation also represents 77 species mentioned in the Ayurvedic Formulary, Part I.

Some of the important medicinal plants of Ayurveda represented in the garden are Sarpagandha *(Rauwolfia serpentina)*, Kushtha *(Costus speciosus)*, Bilva *(Aegle marmelos)*, Karpura *(Cinnamomum camphora)*, Nimba *(Azadirachta indica)*, Saptaparna *(Alstonia scholaris)*, Rudraksha *(Elaeocarpus ganitrus)*, Bibhitaka *(Terminalia belerica)*, Satawari *(Asparague racemosus)*, Gunja *(Abrus precatorius)*, Brihati *(Solanum indicum)*, Parsarni (Paedaria foetida), Ashwagandha *(Withania somnifera)*, Bakuchi *(Psoralea corylifolia)*, Ghritkumari *(Aloe barbadensis)*, Arka *(Calotropis gigantea)*, Atibala *(Abutilon indicum)*, Eranda *(Ricinus communis)*, Karanja *(Pongamia pinnata)*, Dronapushpi *(Leucas lavandulaefolia)*, Arjuna (Terminalia arjuna), Amlaki *(Emblica officinalis)*, Chakramarda *(Cassia tora)*, Haritaki *(Terminalia chebula)*, Japa *(Hibiscus rosa-sinensis)*, Mahabala *(Sida rhomblifolia)*, Mahanimba (Melia azedarach), Nagakeshar *(Mesua ferrea)*, Nirgundi *(Vitex negundo)*, Vasa *(Adhatoda zeylanica)*, Vacha *(Acorus calamus)*, Prishniparni *(Uraria picta)*.

The plantation also represents about 20 medicinal species belonging to different climatic and geographical regions of the country for studying their adoptability and growth behaviour etc. under the climatic conditions of the region. A few important species are Chandan *(Santalum album)*, Asoca (Saraca asoka), Yastimadhu *(Glycyrrhiza glabra)* and Guggulu *(Commiphora wightii)*, etc. Seeds of 19 medicinal plants species of Ayurvedic importance procured from JNAMPG & H Pune, have also been sown in the nursery for the germination.

Besides the cultivation activities taken up in the Herbal garden, a large number of medicinal species consisting of annuals, biennials and perennials have also been grown in about 2 acres of the land around the Centre's main building and are properly maintained for demonstrative purpose.

About 55 kg. of crude drug material consisting of different drug parts of 22 medicinal plants species have been collected from the garden. About 37 kg. of the material belonging to 15 species have been supplied to Council's different Institutes/Centres and PLIM, Ghaziabad for research purpose.

PHARMACOGNOSY RESEARCH STUDIES

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

Ashwattha (*Ficus religiosa* Linn.), Stem, bark.
Banjouri (*Vicoa indica* D.C.) Stem, leaf.
Brihat Goksura (*Pedalum murex* Linn.), Root, Fruit
Dadima (*Punica granatum* Linn.) Leaf, Fruit
Hijjala (*Barringtonia acutangula* (L) Gaertn) Leaf, bark, fruit
Hijjala Bheda (*Barringtonia racemosus* (L) Roxb.) Leaf, bark, fruit
Hritpatri (*Digitalis purpurea* Linn.) Leaf
Mudgaparni (*Vigna trilobata* Linn.) Leaf, stem, root
Nagakesara (*Mesua ferrea* Linn.) Leaf, bark
Parushaka (*Grewia asiatica* Linn.) Leaf, bark, fruit
Svarnakshiri (*Argemone mexicana* Linn.) Root, latex.

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

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

PLANT TISSUE CULTURE

Plant Tissue culture Laboratory of JNAMPG & H Pune continued research work initiated during the previous years on five important medicinal plants viz. Satavari *(Asparagus racemosus* Willd), Langali *(Gloriosa superba* Linn.), Meshashringi *(Gymnema sylvestre* R. Br.), Kutaja *(Holarrhena antidysenterica* Wall) and Kumkum *(Crocus sativus* Linn.) Important achievements made include 80 percent survival of tissue culture raised plants of Kutaja in the field and confirmation of previous years observations related to multiple shooting/rooting response in Shatavari and presence of Colchinicine in multiple root/rhizome of Langali.

CHEMICAL RESEARCH PROGRAMME

Chemical studies have an important role in the development of drug research. These studies reveal the hidden secrets of plant kingdom i.e. what are the various compounds present and which are the active ingredients responsible for their effectiveness. The Phytochemical Research Units located at Calcutta, Delhi, Hyderabad, Lucknow, Trivandrum and Varanasi have conducted studies on 21 plants and have isolated active principles from them to carry out further studies. A brief resume of the work carried out during the year 1992-93 is reported as under.

1. **Alabu** ***(Lagenaria siceraria*** **Standl.)** ChRUH

The saponification of the seed oil with methanolic KOH yielded an unsaponifiable matter and mixed fatty acids. GLC studied of the methyl ester of mixed fatty acids revealed the presence of linoleic, oleic, steric and palmitic acids. In addition to above fatty acids presence of unsual compounds of higher retention time was also observed (5%). The detailed study and further work is in progress.

2. **Ananta, Sariva (*Hemidesmus indicus* R. Br.)** ChRUC

Further work on this plant resulted in the isolation and characterisation of a benzaldehyde derivative, 4-hydroxy-2-methoxy-benzaldehyde, m.p. 145°.

3. **Arjuna** ***(Terminalia arjuna*** **W.&A)** ChRUV

Methanol extract of the stem bark on chromatographic separation afforded oleanolic acide, m.p. 305-7° arjunic acid, m.p. 332-335° (dec.),arjunolic acid, m.p. 316-318° and arjunolitin, m.p. 220-223° (dec.). Isolation and structure determination of the arjunolitin had been taken up. Arjunolic acid diglycoside (arjunolitin) was esterified to its acetate and methyl derivatives while methanolysis yielded arjunolic acid. Various spectral data i.e. IR, NMR, MS were employed for the structure elucidation.

4. **Badara (*Zizyphus jujuba* Lam.)** ChRUC

Chloroform fraction of the methanol extract of the leaves of the plant afforded two colourless solids viz., Zj-L (1), m.p. 360°,Zj-L(II), m.p. 353°. The structure elucidation is in progress with the help of various spectra.

5. **Bhurja Patra (*Betula utilis* D. Don)** CRID

Three flavonoid compounds were isolated and purified with various methods. Acetates of the above compounds were also prepared. Literature survey of this plant was also done.

6. **Bongainavillea spectabilis Willd.** ChRUC

Ethanol extract of the fresh leaves of the drug was tested for hypoglycaemic effect in STZ induced diabetic rats in collaboration with Pharmacological Res. Unit, Calcutta. Ethanol and methylene chloride fractions showed significant reduction of the blood sugar alongwith maximum elevation of liver glycogen, reduction of serum cholesterol and significant increase on insulin level of the treated rats have been noted.

7. **Champaka (*Michelia champaca* Linn)** RRIT

Bark, leaves, flowers and seeds were extracted in different solvents and analysed by T.L.C. The bark showed the presence of 5, leaves 4, flowers 4 and seeds 5 compounds. Efforts to isolate and identify these compounds are in progress.

8. ***Decalepis hamiltoni* (W. & A)** ChRUC

Above drug is used as an adulterant of Anantmula (*Hemidesmus indicus* R. Br.) Petroleum-ether extract of the roots afforded two crystalline compounds viz. 2-hydroxy-4-methoxy benzaldehyde, m.p. 43-45° and α–amyrin, m.p. 179-82°. Interestingly, α– amyrin also occur in *H. indicus*. This is the cause for the similarity of the two plants.

9. **Haridru (*Adina cordifolia* Benth & Hook.f.)** ChREL

Sitosterol & its glycoside, α– amyrin and umbelliferone, 6-methoxyumbelliferone and adicardin were isolated from this plant besides two unidentified compounds. Literature survey was also done.

10. **Hingu (*Ferula narthex* Boiss.)** ChRUC

Concentrated ethereal extract of the drug afforded a new sesquiterpenoid coumarin, Ferulin, m.p. 77-78°.

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

Concentrated chloroform extract of the whole plant on chromatography yielded two compounds viz. Jg-II, m.p. 262-63° and Jg-III. The structure elucidation of the compounds are in progress.

12. **Kasamarda (*Cassia occidentalis* Linn.)** ChRUC

Crude alcoholic extract (cold) of the roots of the drug was partitioned

successively with petroleum-ether, benzene and ethyl acetate. The former fraction, upon chromatographic separation yielded four solids viz. P-Co/I, P-CO/II, P-CO/III & P-CO/IV. of which first two have been characterised partially. P-CO/I, m.p. 170-71° and P-CO/II, m.p. 50-51° were recorded for IR spectrum. Further work is in hand.

13. **Lodhra** ***(Symplocos spicata*** **Roxb.)** RRIT

3 Neutral compounds have been isolated from the bark which are under investigation.

14. **Mushk Bala** ***(Valeriana wallichii*** **D.C.)** ChRUC

Chemical investigation of the roots of the drug resulted in the isolation and characterisation of two phytosterols, α– spinasterol. m.p. 163-64° and α- spinasterone, m.p. 167-69°.

15. **Neem (*Azadirachta indica* A. Juss)** ChRUC

Air dried pulverised seeds of the drug on ethanol extraction yielded azadirachtin (probably) while methanol extract afforded yet another solid, m.p. 90°. Structure elucidation is in progress.

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

From the ethereal extract of the latex of the drug, a crystalline compound, designated as AH-5, m.p. 142-44° was isolated. Final structure elucidation is under progress using various spectral data.

17. **Parijata** ***(Nyctanthes arbortristis*** **Linn.)** ChREL

Flowers and seeds were taken up for detailed studies. Some known compounds e.g. sitosterol and its D-glucoside, arbortristoside-A & B, nyctanthic acid and nyctanthoside were isolated. Flowers and fruits were screened for various biological activities i.e. antifungal, antiviral, immunostimulant, anti-leishmanial and antiallergic. Literature survey was also completed.

18. **Pithari** ***(Glossocardia bosbellia*** **DC.)** ChRUH

Four compounds of m.p.s. 75° (I), 60° (II), 286° (III) and 68-70° (IV) were obtained from petroleum ether, chloroform and methanol extracts. Acetates of all these compounds were prepared and further work is in progress.

19. **Rohitaka** ***(Aphanamixis polystachya*** **(Wall) Parker)** ChRUC

The methylene chloride fraction of methanolic extract of stem bark of

the drug was taken for chemical investigation. Two compounds viz. AP/II, m.p. 210-12°, AP/III, m.p. 360° were isolated and their structure identification is in hand.

From the fruits, a crystalline solid was isolated whose structure characterisation is in progress.

20. **Sinsapa *(Dalbergia sisoo* Roxb.)** CRID

Alcoholic extract of the roots was further fractionated in to benzene, ether, ethylacetate and ethylmethylketone soluble fractions and concentrated. Further work is in progress.

21. **Tamala *(Cinnamomum tamala* Nees & Eberm)** CHREL

Literature survey of the drug was completed. Antimalarial, hypoglycaemic, antiviral and hepatoprotective activities were also studied.

Miscellaneous work

ChRUH

1. Petroleum-ether, chloroform and methanol extracts of the *Moringa oleifera* (root) were prepared for despatch to Pharmacological Units.

2. *Diospyros melanoxylon* (fruits) were extracted with petroleum-ether, chloroform and methyl alcohol for despatch to Pharmacological units.

ChREL

Literature survey of the *Zizyphus sativa* and *Sida veronicaefolia* were completed. ChRUC

During the period under review 13 extracts (65.5 kg) of 5 different plants were prepared and supplied to the Pharmacological Units.

RRIT

1. Quantity of Neem oil worked out - 180 kg.
2. Quantity of Nimbathiktam supplied to the clinical/ pharmacological unit-361 kg.
3. Quantity of ointments/pastes/oils prepared with the active extracts/principles and supplied to the Clinical Section - 500 ml.

PHARMACOLOGICAL RESEARCH PROGRAMME

Drug Research is a continuous process and studies on experimental animals constitute an important component of it. Whether it is the development of a new drug or confirmation of old claims, Pharmacological and Toxicological studies play a very vital role. Such studies are persued by the Council for the overall development of Ayurvedic drug research. These studies are carried out by various Institutes and Units of the Council located at Bombay, Calcutta, Cheruthuruthy, Delhi, Jaipur, Jhansi, Lucknow, Patiala, Trivandrum and Varanasi. During the reporting period 36 drugs (single drugs, coded drugs and compound formulations) were studied. A brief review of these studies is reported hereunder:

1. **Amlika *(Tamarindus indica* Linn.)** PhRUJ

Methanol extract of the fruit was employed for Pharmacological screenings. There was no change in the force of contraction and heart rate of frog heart perfusion by the above extract in doses of 1, 3, 10, 30, 100 and 300 mg. It did not modify the tone and amplitude of contraction of rabbit ileum in the doses (10, 30, 50, 100, 300 and 500 mg.) tested. The extract was also studied on frog rectus muscle preparation employing 10, 30, 100, 300 and 1000 mg. doses. It did not modify acetylcholine responses (obtained with 10 mg. dose) in doses studied. The extract did not modify the acetycholine response in frog rectus abdominis preparation in doses studied.

2. **Asvattha *(Ficus religiosa* Linn.)** CRIB

LD_{50} value of the benzene and ethanol extracts in rats by oral route is more than 2 gm/kg. in acute toxicity studies.

3. **Bala (*Sida cordifolia* Linn.)** PhRUC

(a) Alcoholic extract of the aerial part:

The extract in 250 mg/kg, *p.o.* on rats exhibited no reduction in paw-volume in comparison to carrageenin treated controlled rats.

The extract in doses of 1, 25, 5 and10 mg/10 ml. produced no effect but exhibited significant dose dependent antispasmodic effect against ACh. induced contractions. Even after administration of 5 times dose of

ACh. there was no recovery to antispasmodic effect (on isolated smooth muscles guineapig ileum).

The drug itself produced no effect and also showed no effect against ACh. induced contraction (on isolated skeletal muscle-frog rectus abdominis). The drug produced no diuretic effect in four hours observation (diuretic studies on hydrated rats).

The drug did not exhibit potentiation of sleep in drug treated group in comparison to control (pentobarbitone treated group only) (CNS studies - against pentobarbitone hypnosis in mice).

Administration of the drug (solubilised in propylene glycol) produced no effect on blood pressure but insignificant increase in respiratory produced no effect on vasodepressure effect of ACh. and histamine and vasopressure effect of adrenaline (on cardiovascular system).

(b) Petroleum-ether extract of root :

The oral administration of extract appeared to produce insignificant anti-inflammatory effect in rat hind paw. The extract exhibited insignificant reduction in paw volume of rats (acute anti-inflammatory studies).

The extract itself produced no effect but exhibited dose dependent antispasmodic effect agains ACh. The extract also produced muscle relaxant effect against $BaCl_2$ induced spasm (smooth muscle-guineapig ileum). The drug itself produced no effect and also did not modify ACh. effect (on skeletal muscle-frog rectus abdominis).

The extract produced significant reduction in urine excretion in hydrated rats (diuretic effect on hydrated rats).

The extract produced no potentiation of pentobarbitone sleeping time in mice (CNS studies-against pentobarbitone hypnosis in mice).

The intravenous administration of the extract (dissolved in Twine 80) produced no effect on blood pressure and respiration of anaesthetised cats.

4. **Bhurjapatra *(Betula utilis* D. Don)** CRIB

LD_{50} value of the benzene and ethanol extracts in rats by oral route is more than 2 gm/kg. in acute toxicity studies.

5. **Candana (*Santalum album* Linn.)** CRIB

In acute toxicity studies, LD_{50} value is more than 2 gm/kg in mice and rats by oral route.

6. **Hansprabha** CRIB

In acute toxicity studies, LD_{50}, value is more than 4 gm/kg. in mice and rats by oral route.

Sub-acute toxicity studies of the drug were also screened. The drug was administered orally in doses of 0.5 gm/kg. and 1.0 gm/kg. in rats for a period of 4 weeks. No toxicity was detected through the tests conducted.

Treated groups as well as control group showed normal histopathology of various organs viz. cerebellum, heart, liver, kidney, spleen, adrenal, G.I. tract, uterus, fallopian tube. Treated group: (i) Brain-Mild cerebral oedema. (ii) Ovary-Graffian follicles appear to be reduced in numbers. Many of them have degenerated cocytes.

7. **Jayapala (*Croton tiglium* Linn.)** PhRUT

Seed extract (50% alcohol) was screened for toxicity and gastro-intestinal effects. Acute toxicity studies on the extract showed mortality in mice. (50 mg/kg, *i.p.* and 1000 mg/kg, *p.o.*). The extract showed significant cathartic effect from 200 mg/kg. *(p.o.)* in rats.

8. **Jvarasni Rasa** CRIB

In acute toxicity studies, LD_{50}, value of the drug in mice by oral route is more than 2 gm/kg.

TRUJ

The drug was tested for its toxicity activity. The drug in a dose of 5 gm and 3 gm/kg. did not cause any change in body weight of such treated rats. No macroscopic changes could be seen in vital viscera of these rats. There was no effect on the gross general behaviour of rats treated with this drug. The drug was devoid of analgesic and anti-convulsant activity in rats. On perfused frog's heart, the drug upto 9 dose of 30 mg had mild effect but at 100 mg dose, it exhibited positive chronotropic and inotropic activity which could not be blocked by β-blockers like propranolol).

9. **Karanja (*Pongamia pinnata* Pierre)** PhRUV

The water suspension of the finely macerated seeds was used for the Pharmacological screenings. Seven groups of rats were studied with different doses (50-800 mg/kg) given orally. The animals showed tachypnoea in almost all the groups which received drugs. Some animals showed biting behaviour. Apart from this no gross behavioural changes were seen. Two animals out of 6, receiving 200 mg/kg dose, died within 2 hours. However, no other group, including those receiving higher doses, showed any mortality.

The above extract was studied for anti-inflammatory activity in albino rats in carregeenin induced hind-paw inflammation in different dose range (100 mg/kg to 200 mg/kg), but most of the doses showed significant increase in inflammation. Further studies on different routes of administration are being conducted.

10. **Langali (*Gloriosa superba* Linn.)** PhRUT

Root extract (methanol) was taken up for pharmacological screening. Significant anti-secretory and antacid activity in shay rats was observed. Moderate CNS sedative effect was also observed.

11. **Lok Nath Rasa** CRIB

In acute toxicity studies, LD_{50} value of the drug in mice by oral route is more than 2 gm/kg.

TRUJ

Toxicity studies on Lok nath rasa were undertaken. The drug was found to be quite safe upto a dose of 5 gm and 3 gm/kg body weight to rats and rabbits respectively when administered orally. The drug in doses of 30. 100 mg/kg body weight did not cause any loss of body weight in rats after daily feeding for 10 days. No macroscopic and microscopic pathological changes could be seen in the viscera of such treated rats. There was no effect on the gross general behaviour of rats treated with this drug. The drug was devoid of analgesic and anti-convulsant activity in rats on perfused frog's heart, the drug upto a dose of 30 mg had mild effect but at 100 mg dose, it exhibited positive chronotropic and inotropic activity which could not be blocked by β-blockers like propranolol.

12. **Mahameda *(Polygonatum cirrhifolium* Royle)** PhRUT

Methanol extract of the root was studied for its toxicity and tonic (anabolic) effects in experimental animals. Marked increase in liver glycogen reduction in blood urea and elevation in haemoglobin levels suggested tonic activity.

13. **Musta *(Cyperus rotundus* Linn.)** PhRUT

Tuberous root powder has been used in clinical trials since last 7-8 years. The data obtained from these trials confirms its efficacy as an anti-rheumatic agent in man.

14. **Mukta Vidrumanjana Rasa** CRIB

In acute toxicity studies, LD_{50} value of the drug in mice by oral route is more than 2 gm/kg.

15. **Kasturi *(Musk)*** PhRUL

Free radicals have been implicated in tissue/cell damage. Once formed they react with fatty acid of all membrane and produce lipid peroxidosa/ malonaldehyde (MDA): MDA indirectly indicate all damage. Musk reduces MDA and protects all damage and thus can be useful in many disease and can prevent pre-mature aging and fatigue. It had protective effect on liver cells against free radical damage.

16. **Nila Nirgundi (*Justicia gendarussa* Burm.f.)** PhRUC

The Alcoholic extract appeared to produce no anti-inflammatory effect in comparison to carrageenin treated control induced rat hind paw oedema.

17. **Nimba *(Azadirachta indica* A. Juss.)** PhRUJ

Ethanol extract of the seeds was used for various pharmacological screenings. There was no change in the force of contraction and heart rate of frog heart perfusion by the above two extracts studied in doses of 1, 3, 10, 30, 100 and 300 mg. The extract did not modify the tone and amplitude of contraction of rabbit ileum in the doses (10, 30, 50, 100, 300 and 500 mg) tested.

The above extract was also studied on frog rectus muscle preparation employing 10, 30, 100, 300 and 1000 mg doses. It did not modify acetylcholine responses (obtained with 10 mg dose) in doses tested. The extract did not modify the acetylcholine response on frog rectus abdominis preparation in the dosages tested.

18. **Nimbu, Jambira *(Citrus limon* (L) Burm. f.)** PhRUT

Aqueous extracts of stem and root bark were prepared. Toxicity studies were carried out in albino mice of either sex (20-30 g) fasted overnight but had free access to water. The extracts were given in single doses of 10 to 100 g/kg (crude drug) and observed for 48 hour for any toxic effects and mortality. No toxicity or mortality was observed upto 100 g/kg dose level.

19. **Panasa *(Artocarpus integrifolia* Linn.f.)** PhRUC

Alcoholic extract (PR-I) of the seeds was employed for the pharmacological evaluation.

The extract exhibited significant dose dependent miosis in doses of 5 and 10 mg as evidenced by pupillarg constriction. The effect was compared with 5 mg dose of ACh. (Autonomic system exogenous application of rabbit's eye).

The extract exhibited dose dependent contraction of guineapig ileum. Prior administration of the extract followed by ACh. in same both showed an increase in contraction of tissue. After atropinisation the spasmogenic effect of both PR-I and ACh was totally abolished. Even after administration of 10 times, the previous maximum dose of PR-5 (200 kg/10 ml), the tissue could not be revived to normal.

The extract could not modify the spasmogenic effect of histamine on the tissue (on isolated smooth muscle-guineapig ileum).

The drug in doses of 250 kg to 2.5 mg/kg, *i.v.* produced sharp transient fall of B.P. of anaesthetised cats with simultaneous reduction in pulse rate and increase in rate of respiration and also contraction in intestinal movement. The hypotensive effect remained unaltered after prior administraion of antihistaminic and also propranolol-a beta blocker.

The hypotensive effect was totally abolished after atropinisation and

vasopressure response was observed in much higher dose of PR-I (On cardiovascular system).

The extract administered in doses of 500, 750, 1000 and 2000 mg/kg, p.o. in groups of mice produced hyperkinesia with occasional closure of eyes.

The extract produced no mortality in mice during acute toxicity studies however hyperkinesia with occasional closure of eyes was observed.

20. **Patharchati, Sanjeevani** ***(Seloginella bryoptesis)*** PhRUL

The MDA content decreased at the dose of 50 mg/kg. This showed that very low or high doses did not have any effect where as a medium dose of 50 mg/kg had protective effect against lipid peroxidation in liver of albino rats.

21. **Prisniparni** ***(Uraria picta Desv)*** IIPC

Chloroform and thanol extracts and a decoction of the fruits were prepared and studied for their Pharmacological actions. The extracts were administered in a dose of 100 mg/kg, *p.o.* and the decoction in a dose of 1 g/kg, *p.o.* Ethanol extract and decoction potentiated pentobarbitone induced hypnosis in mice. Both extracts also showed analgesic activity (radiant heat method) while ethanol extract produced only mild analgesic activity (in acetic acid induced writhing in mice). Ethanol extract and decoction also showed significant anti-inflammatory effect (mice ear oedema test) while they showed only mild anti-inflammatory effect in carrageenin induced paw oedema in rats. Both extracts and the decoction failed to show any change in formalin induced ascitis in rats. These extracts and decoction also failed to protect mice from strychnine induced convulsions and in producing any change in the rectal temperature of mice.

22. **Puskaramula** ***(Inula recemosa*** **Hook. f.)** PhRUL

The clinical trials have confirmed it to be very useful agent for the treatment of asthma and spasmodic bronchitis.

23. **Saptaparna** ***(Alstonia scholaris*** **R.Br.)** CRIB

In acute toxicity studies, LD_{50} value is more than 2 mg/kg in mice and rats orally with the stem bark of the drug (locally purchased sample also).

The powder of the stem bark in doses of 0.5 gm/kg and 1.0 gm/kg orally in mice did not affect normal gastric mortality. The drug also showed anti-diarrhoeal activity against castor oil induced purgation in mice.

24. **Swarna patri** ***(Cassia anqustifolia*** **Vahl)** CRIB

In acute toxicity studies, LD_{50} value is more than 2 gm/kg in mice and rats by oral route.

25. **Sarvajvarahara Rasa** CRIB

In acute toxicity studies, LD_{50} value of the drug in mice by oral route is more than 2 gm/kg.

26. **Sarsapa** ***(Brassica campestris*** **Linn.)** CRIB

LD_{50} value of the ethanol extract in rats by oral route is more than 2 gm/kg.

27. **Sigru** ***(Moringa oleifera*** **Lam.)** PhRUT

Methanol extracts of the stem bark was employed for the pharmacological investigations. Preliminary screening in showed significant reduction in blood suger level in rabbits (1 g/kg-37.8% and 1.5 g/kg, -42.7%). GTT also showed significant hypoglycaemic effect in rats.

28. **Syonaka** ***(Oroxylum indicum*** **Vent.)** CRIB

In acute toxicity studies, LD_{50} value is more than 2 gm/kg in mice and rats orally with the bark and root powder of the drug.

The crude powder of the roots showed anti-diarrhoeal activity against castor oil induced purgation in mice.

29 **Udumbara** ***(Ficus racemosa*** **Linn.)** CRIB

LD_{50} value of the benzene and ethanol extracts in rats by oral route is more than 2 gm/kg in acute toxicity studies.

30. **Ushira** ***(Vetiveria zizaniodes*** **(Linn.) Nash)** HPC

Petroleum-ether ($60\text{-}80^0$), chloroform and ethanol extracts and a

decoction of the roots were prepared and studied. The extracts were administered in a dose of 100 mg/kg, *p.o.* and the decoction in a dose of 1 g/kg, *p.o.* Former two extracts potentiated pentobarbitone induced hypnosis in mice significantly. However, ethanol extract and decoction failed in this respect. Ethanol extract and decoction (carrageenin induced paw oedema), chloroform and ethanol extracts and decotion (xylene induced mouse ear oedema) and chloroform extract (formalin induced ascitis in rats) also showed significant anti-inflammatory effects when tested in the above dose levels. However, these extracts and decoction failed to produce any significant analgesic and anti-depressant activities as also any change in the rectal temperature of mice and forced motor activity in trained mice.

31. **Anti-stress agents:** PhRUL

Silarasa *(Altingia excelsa),* Tulsi *(Ocimum sanctum),* Kakatundi *(Diospyrose perigrina),* Katuki *(Picrorrhiza kurroa)* and Ashwagandha *(Withania somnifera)* possess anti-inflammatory activity both in chronic and a cute models of inflammation in animals.

Antipyretic activity was also significant. *Ocimum sanctum* was the most potent among all. Hence these plant extracts may be useful in the treatment of rheumatic disorders.

32. **CODE No. B.S.**

Hypoglycaemic effect: PhRUC

The earlier observations revealed significant hypoglycaemic effect of the extract on normal fasting as well as streptozotocin (Stz.) induced hypoglycaemic rats.

During the present investigation, Biochemical estimation of liver glycogen serum cholesterol and plasma cholesterol were undertaken.

B.S. was administered orally 1100 mg/kg. to normal as well as streptozotocin treated rats. Liver glycogen was significantly raised in comparison to Stz. control in both tolbutamide and B.S. treated rats and it was found statistically significant.

Serum cholesterol was found significantly high in streptozotocin induced diabetic rats in comparison to control, cholesterol value was

significantly decreased in case of diabetic rats treated with B.S. and tolbutamide in comparison to Stz. induced diabetic rats.

Plasma was separated from blood of above treated groups of rats.

The elevation of plasma insulin level was observed in B.S. treated group and tolbutamide treated group and it was found significantly high in comparison to streptozotocin induced diabetic rats.

PHARMACEUTICAL RESEARCH/STANDARDISATION STUDIES

The Council has evolved analytical standards on the formulations of I and II part of Ayurvedic Formulary of India. The study assumes importance as the analytical data are based on the textual formulations prepared in the Research Project itself. This approach vouchsafe for quality control on the formulations which are used in the Clinical Research Studies and other medicare programme undertaken by the Council.

Having regard to this, the Council has undertaken the task of laying down Psycho-Chemical values of the single drugs that are entering as ingredients in the particular formulations undertaken for detailed Standardisation Studies, on the process of manufacture like Asava, Avaleha, Bhasma etc. in addition to shelf life etc. Standardisation studies on single drugs, method of manufacture and finished products are undertaken at Regional Research Institute, Trivandrum (RRIT), Indian Institute of Ayurvedic Drug Research, Tarikhet (IIADR), Captain Srinivasa Murthy Research Institute for Drug Research in Ayurveda, Madras (CSMDRIA), Drug Standardisation Research Project, Gujarat Ayurveda University, Jamnagar (DSRPJ) while rapid analytical values were laid down at CSMDRIA, Madras, DSRP, Jamnagar, and DSRP, Institute of Medical Sciences, Banaras Hindu University, Varanasi (DSRPV) and products were taken up at Regional Research Centre, Bangalore (RRCB).

As a second phase of study, the Council has worked out a plan to lay down the analytical values and to identify devoting or otherwise main and other costly ingredients by preparing different proportionate ingredients in different quantity or deleting them other than the standard formulary and to establish whether there is any changes in the analytical value other than the standard formulations already worked out. This study has shown some encouraging results, and it is presumed that in time to come genuine, authentic and quality control formulations will be available for clinical armamentarium so that health for all by 2000 A.D. could be achieved.

As per the Ministry's directive some of the patent medicines of Private Pharmacies have also been analysed. The details of the Standardisation studies comes out during the year 1992-93 as follows:

Chemico-Physical Values of the following single drugs have been worked out.

Ashodhita Guggulu *(Commiphora mukul)*	CSMDRIA
Shodhita Guggulu *(Comiphora mukul)*	-do-
Karpoora Shilajit *(Gypsom)*	-do-
Avartaki *(Cassia occidentalis)*	-do-
Durva *(Cynodon dactylon)*	-do-
Musali *(Curaligo orchiodes)*	-do-
Soma *(Cerapogia juncea)*	-do-
Aragvadha *(Cassia fistula)*	-do-
Parijata *(Nyctanthus arborstristis)*	-do-
Brihati *(Solanum trilobatum)*	CSMDRIA
Vandhyavani *(Viccoa indica)*	-do-
Vijaya Sara *(Pterocarpus marsupium)*	DSRP-V
Bilva *(Aegle marmelos)*	-do-
Syonaka *(Oroxylum indicum)*	(DSRPV) (RPIT)
Gambhari *(Gmelina arborea)*	-do-
Agnimantha *(Premna integrifolia)*	-do-
Shukti	DSRPV
Shankha	-do-
Mukta Shukti	-do-
Varatika	-do-
Kanta Loha	-do-
Kalamisi *(Ipomia aguatica)*	-do-
Bhringaraja *(Eclipta alba)*	-do-
Shweta kutaja *(Wrightia tinctorea)*	RRCB
Sonamukhi *(Cassia angustifolia)*	-do-
Ativisha *(Aconitum heterophylum)*	RRIT
Kirata Tikta *(Andrographis paniculata)*	-do-
Kirata Tikta *(Cardiospermum helicacabum)*	-do-
Kirata Tikta *(Ceratopteris thalictrodis)*	-do-
Twak *(Cinnamanum zeylanicum)*	-do-
Krishna Sariva *(Cryptolepis buchanani)*	-do-
Ela *(Elattaria cardamomum)*	-do-
Amalaki *(Emblica officinalis)*	-do-
Udumbara *(Ficus officinalis)*	-do-
Nimba *(Melia azadirachta)*	-do-
Lajjalu *(Mimosa pudica)*	RRIT
Kamala *(Nelumbo nucifera)*	-do-
Changeri *(Oxalis corniculata)*	-do-
Madana Phala *(Randia dumetorum)*	-do-

Manjistha *(Rubia cordifolia)*	-do-
Tila *(Sesamum indicum)*	-do-
Lodhra *(Symplocos racemosa)*	-do-
Arjuna *(Terminalis arjuna)*	-do-
Amrita *(Tinospora cordifolia)*	-do-
Gokshhura *(Tribulus terrestris)*	-do-
Shunthi *(Zingiber officinale)*	-do-
Madhu	IIDRA
Sarshpa Taila	-do-
Ghrita	IIDRA
Varshabhu *(Trienthema portulocastrum)*	DSRPJ
Madayanti *(Lawsonia alba)*	-do-
Priyala *(Buchanania lanzan)*	-do-
Kozzuppu *(Portulaca oleracea)*	-do-
Nili *(Indigofera tinctoria)* 54	-do-

Rapid analytical values were laid down on

Jvarasani Rasa	CSMDRIA
Mukka Vidrumanjana Rasa	-do-
Sarva Jvara Hara Loha	-do-
Lokanath Rasa	-do-
Neem oil	-do- (DSRPJ)
Chandra Prabha Vati	-do-
Kutajarista	DSRPV

Method of manufacture

Vati (CSMDRIA)
Shodhana (RRIT)
Avarthana (RRIT)

Detailed standardisdation studies

Chandra Prabha Vati (CSMDRIA)
Chandra Prabha Vati without guggulu (CSMDRIA)
Chandra Prabha Vati without Shilajit (CSMDRIA)

Neem oil (DSRPV)
Guggulu Shodhana (DSRPV)
Kutajarista (DSRPV)
Kaphaketu Rasa II, III (RRCB)

Kesari Jeevana (Market sample of Zandu Pharmacy (RRCB).
Swamala (Market sample of Dhootapapeshwara) (RRCB)
Kushmanda Rasayana, (RRIT)
Balarista (RRIT)
Changesi Ghrita (RRIT)
Chatur Bhadra Kvatha -do-
Samangadi Churna -do-
Kantakaryavaleha (IIDRA)
Jvarasani Rasa (DSRPJ)

Miscellaneous:

Biochemical studies on *Justacia adhatoda, Cleradendrum inerme* were carried out by CSMDRIA.

Anti-inflammatory activity of Maharasnadi Kvatha Churna, Gandharva hasti Kvatha Churna and its ingredients were carried that by CSMDRIA, besides the Anti-inflammatory activity of Alcoholic extract of *Azima tetracantha, Avcenna officinalis* and *Adhatoda beddaneri.* The Institute has also carried out anti-implantation and anti-fertility activity of alcoholic extract of *Cleoma viscosa,* and study revealed 55.5% and 77.7% activity respectively, besides carrying out microbiological study on *Oroxylum indicum, Viccoa indica, Plumeria alba* and *Ceonitis nepetaefolia.*

Some of the adultarant and substitute drugs were also studied for the Physico-chemical standards by RRI, Trivandrum.

DSRP, Jamangar has also continued the studies on Shelf life.

LITERARY RESEARCH PROGRAMMES

The Literary Research Programme under the Council broadly cover the medico-historical studies, revival of ancient literature, documentation of relavent informations on research and publication of research work through three journals and monographs. This work is being taken up by the Documentation and Publication Division at New Delhi, Indian Institute of History of medicine at Hyderabad and Literary Research Unit, Madras. A brief report of the progress during the period 1992-93 is placed below:

Documentation and Publication Division, New Delhi

On the spot microfilming programme of Ayurvedic works/M.S.S., nearly 20 rare Ayurvedic works/Mss. including 10 rare books relating drugs and cosmetics have been procured and microfilmed/zeroxed for library/ research use. In photo section 52177 zerox copies, 84-OHP, Plates 720 colour transperincies of medicinal plants, 933 photographs, 75 prints and 8646 photo copies were prepared.

References on 12 single drugs of vegetable and mineral orgin viz. *Apamarga, Vaca, Sirisha, Satavari, Vasa, Bilwa, Kumari, Nimba, Daruharidra, Iswari, Kasisa* and *Kamsya* have been compiled from classical literature and journals etc. along with two disease conditions viz. Slipada and Vyana Bala Vaisamya (Raktachapa).

On the spot orientation cum-training in information handling has been provided to Dr. (Mrs.) Sanaratne and Dr. (Mrs.) Dayangani Senasekora, WHO Fellows from Sri Lanka. A comprehensive information on Shilajatu has also been gathred for preparation of video film. The efforts have been made to locate the manuscripts/rare Ayurvedic works from Western and Central region of the Country. The Photographic coverage of medicinal plants from Botanical garden and Institute, Palode; Thiruvananthapuram (Kerala) and IIDR, Tarikhet (U.P.) have been under taken.

The division has also prepared the abstracts of 153 M.D. (Ay.), Ph.D. Ayurveda theses. The issues of J.R.A.S and B.M.E.B.R. relating to Vol-12 (No. 3-4) and Vol-13 (No. 1-2) were released besides the issues of News letter of CCRAS up to July-August, 1992. Exhibits of Councils Publications were arranged by the Publication wing on the eve of International convention on Ayurveda, New Delhi, National Seminar on Ayurveda,

Calcutta etc. and Books, Monographs worth Rs. 41,818/- were sold besides receiving subscription amount of Rs. 17,445.00. During the reporting period replies of eight technical enquiries related to Raktachapa, Madhumeha, AIDs, Apasmara, Jatamansi, Rudraksha, Methi, Shilajatu and anti-cancerous drugs have been supplied by the Divsion. Printing to the tune of 82,000 impressions has also been under taken by the printing cell of this division.

Indian Institute of History of Medicine, Hyderabad

The Institute has completed writeups on the life of 22 Ayurvedic physicians of Nizam dynasty period, Hyderabad and the concerned material has been compiled on the life of 6 Ayurvedic and 2 Unani physicians of Hyderabad. The manuscripts related to two Unani medicine have been studied and useful material has been compiled. An Urdu book entitled "Islami Tibbi" written by Sh. Rahabara Farakhi has been translated.

The 12 rare group photographs have been obtained from the renouned Ayurvedic physicians of Hyderabad. The compilation work on 'the Embryology in Holy Bible' and 'The Hospital Systems in Kakatiya period' are in progress. An article has been prepared on 'The History of Medical Institutions of Ayurveda in Hyderabad'. The catalogues of 30 Ayurvedic manuscripts available at Bharatiya Itihasa Samshodhan mandal, Pune have been prepared with detailed informations and an article/writeup has also been completed on the same. The compilation of information on Aruna datta is in progress.

The "Bulletin Indian Institute of History of Medicine" is published up to date. The Institute has two other publications to its credit.

In the specialised reference library of the Institute 56 books and 231 magazines related to Ayurveda/History of Indian medicine have been added by subscribing or purchase from India and abroad and references were provided to the readers and researchers. There is a reprographic unit in the Institute which provides rare research material to the research institutes and the scientists required for their research work.

The Institute has organised specific photographic exhibition of History of Ayurveda and Holoropharam Commission at Srisailam and Hotel Krisna Oberai, Hyderabad in Feb., 1993.

Literary Research Unit, Madras

The catalogueing and preservation of above 80 palm leaf manuscripts available in the unit is being done. The survey for availability of rare manuscripts near Madras is being done. The editing of Cikitsamrita sagara is under process.

Amchi Reasarch Unit, Leh

This unit has completed clinical trial of many compound commonly used in Amchi practices are done on the following disease:

Peptic Ulcer
Arthiritis
Hypertension
Eczema
Influenza

1. Survey tour was conducted covering the areas of Leh tahshil and indentification and collection of drugs about 60 were identified and collected.

2. Translation of Amchi Pharmaco-the rapeutics after Publishing of this Book-lot of demand comes for foreign countries.

The English translation work was under progress.

During the year 1992-93, 2299 patients attended in O.P.D.

FAMILY WELFARE RESEARCH PROGRAMME

This national priority programme has been taken up to evolve safe non-steroidal herbal contraceptive from Ayurveda. The clinical evaluation of selected potential oral contraceptive drugs and a few spermicidal agents are taken up. Side by side experimental studies including Pharmacology and Toxicology has also being taken up to develop newer antifertility agents and also to study the possible toxic effects and mode of action of the drugs under investigation.

(a) **The Clinical studies:** The clinical programmes are taken up through the Family Welfare Research Units located at Lucknow, Trivandrum, Calcutta, Patiala, Bombay, Ahmedabad, Jaipur and Varanasi. In addition this programme is also taken to at CRIA Delhi and AIRCA Madras. During the period under report the following drugs have been taken up for the study of their antifertility potential.

1. Ayush AC-IV
2. Pippalyadi Yoga
3. K Capsule
4. Vandhyavari
5. Neem oil (Spermicidal agent)

The observations on these drugs conducted on human volunteers 1310 are tabulated herewith alongwith the drug failure and reasons for drop outs. The cases continuing the study are also shown in the table.

Results of Clinical trials of Ayurvedic preparations as Contraceptive (Garbha nirodhaka)

Units	No. of cases		Pregnancy		Reasons for Drop out			
	New	Old	Drug ommi-ssion	Drug failure	Side effect	other	Total Drop out	Cases continu-ing at the end of year
1	2	3	4	5	6	7	8	9
Ayush AC-IV								
Lucknow	19	87	-	-	-	36	36	70

1	2	3	4	5	6	7	8	9
Trivandrum	52	45	-	1	1	25	27	70
Madras	1	26	-	-	-	27	27	-
Calcutta	4	1	1	-	-	-	1	4
Delhi	10	8	-	1	-	13	14	4
Patiala	38	5	-	5	4	25	34	9
Bombay	38	42	2	-	-	38	40	40
Pippalyadi Yoga								
Calcutta	26	51	6	-	1	17	24	53
Ahmedabad	15	4	1	-	-	8	9	10
K Capsule								
Varanasi	27	64	-	6	9	-	15	76
Neem oil								
Delhi	21	12	-	2	7	9	24	
Vandhyavari								
Varanasi	-	226	-	40	6	9	55	171
Trivandrum	11	17	3	-	-	5	8	20
Bombay	48	306	-	6	-	-	6	348
Ahmedabad	17	20	-	6	-	18	24	13

CHEMICO-PHARMACOLOGICAL STUDIES:

The experimental and toxicological studies are taken up through the Pharmacological Research Units (FW) located at Bhubneshwar, Jamnagar, Trivandrum and Varanasi. Some toxicological investigations are also conducted at Toxicological Research Units located at Bombay and Jhanis.

These studies are broadly directed towards the study of anti-implantation effect of the drugs on first 10 days of pregnancy in albino-rats and their estrogenic effect for assessment of their antifertility potential in females. Studies on the antifertility potential of these drugs in males have also been conducted through their effect on epidedymal reserve and maturation of sperms in rats. The bio-chemical investigations and histopathological studies are conducted for this purpose. The toxicity studies of these drugs include acute toxicity, sub-acute toxicity and chronic toxicity.

1. *Hibiscus rosa-sinensis* **(Japakusum)**

The drug was administered for just 10 days of pregnancy in albino rats. Aqueous extract of the flower showed 50%, 50% and 80% efficacy with the dosage of 50, 100 and 200 mg. per kg. body weight subsequently, on the 16th day of the autopsy all the foetuses were found to the normal, hence no teratogenic effect of the drug was observed.

It created an unfavourable environment in the endometrium. In male rats the extract of *Hibiscus rosa* reduced weight of both the tests and epididymus significantly, after prolong treatment are compared to control group. After 30 days of treatment sperm mobility rate was reduced comparatively.

The sperm number also decreased significantly as compared to control group after 45 drugs of treatment.

The drug did not show any toxic effect at the maximum dose of 5000 mg. per kg. body weight when administered orally in albino rats and mice.
PhRUFB

Decoction of flower of *H.rosa* was administered per 10 days in female pregnant rats but the drug did not provide any significant antifertility activity. PhRUFV

Costus speciosus **(Kebuk or Kemuk)**

Decoction of rhizome when administered in female rats did not show any significant antifertility activity. Some decrease in pup weight and length was also observed. PhRUFJ

The fresh juice of rhizome during preliminary studies was administered orally in dosages of 0.5 & 1.0 ml. but no abnormality was observed in all the rats during and after pregnancy. Further studies are in progress.
PhRUFV

Buddalcia asiatica **(Newapatti)**

Stem decoction in dose of 1000 mg/kg showed significant antifertility activity 66.6% when administered during post implantation period. The drug did not effect number of implantation and little size. Decrease in pup weight was observed in lower doses of *B.asiatica.* The durg possess abortifacient effect also. PhRUFJ

Carica papaya **seeds (Papita)**

Decoction of seeds did not effect fertility of female rats when administered during post-implantation period. It do not effect significantly the number of implantation and litter size. PhRUFJ

Banjouri *(Vicoa-indica)* Folklore

Total extract of Banjouri was administered in albino rats upto dose of 2000 mg./kg. Extract of 1000 mg/kg for 10 days from D1 to D10 of pregnancy in the rats showed significant antiimplantation activity upto 42%. However no dose response effect was seen.

Vitex negundo **(Nirgundi)**

Aqueous extract of leaves and stem was investigated in albino rats in the dose of 5 g & 10 g/kg 10g/kg. The leaf extract exhibited anti-implantation activity in albino rats. Further studies are in progress to confirm the findings.

No toxicity was observed with the leaf and stem extract upto the dose of 100 g/kg when administered orally in albino mice.

Calotropis procera **(Arka)**

Aqueous extract of leaf and stem was screened for acute toxicity studies in albino mice in different doses.

No toxicity was observed upt 100 g/kg, *p.o.* PhRUFT

PUBLICATIONS/PARTICIPATIONS

Name of Author(s)	Title of the paper	Name of Journal	Date of Publication
Clinical Research			
Mukherjee G.D.	Differential diagnosis and principle of treatment	Jounal of the Integrated Medicine (JIM), Calcutta	April, 92, Vol. 2, No. 3
Mukherjee G.D.	A review of the concept of treatment	JIM, Calcutta	May, 92, Vol. 2, No. 4
Mukherjee G.D.	The concept of Panchakarma Therapy vis-a-vis their practical aspects - A review of Panchakarma therapy	JIM, Calcutta	June, 92, Vol. 2, No. 5
Mukherjee G.D.	Svedana a prepancha-Karma procedure	JIM, Calcutta	July, 92, Vol. 2, No. 6
Mukherjee G.D.	Different Svedana used in applied form	JIM, Calcutta	Aug, 92, Vol. 2, No. 7
Mukherjee G.D.	Panchakarma - Vamana and Virechana	JIM, Calcutta	Sept., 92, Vol. 2, No. 7

	Name of Author(s)	Title of the paper	Name of Journal	Date of Publication
7	Mukherjee G.D.	Mukherjee's Ayurveda in New Concept (Research oriented discussion with supplement to Panchakarma along with special South Indian (Therapy)	JIM, Calcutta	Released at the International Seminar on Traditional Medicine at Taj Bengal, Calcutta during 1992 by Health Minister, Govt. of W.B.
8	Kapoor M.L. Trivedi V.P.	Netra Sharir	Gyandeep	August, 1992
9	Namboodiri P.K.N..	Effect of Panchakarma on Pakshavadha (Hemiplegia)	JRAS	Sept.-Dec., 1991 Vol. XIII, No. 3-4
10	Nair Ramachandran P.	Clinical evaluation of V.H.V. and Simnanda Guggulu in Amavata (Rheumatoid arthritis)	JRAS	Vol. XII, No. 1-2, 1992
11	Nair Ramachandran P.	Comparative study of Patolatriphaladi and Panchatiktaka kwatha Yogas in the treatment of Pama	JRAS	Vol. XII, No. 3-4, 1991
12	Pandey K.K.	Netra me Pratibimba Shikayata Evam Upachar	Jeevaniya, Lucknow	Greachma, 1992
13	Sannd B.N.	A preliminary clinical trial of Vata tvaka curna on Sveta pradara	JRAS	Vol. XIII, No. 1-2, March-June, 92

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14	Venkataram B.S.	Nidana of Manovikara and Satwawajaya Chikits	Ayurvijnana	Vol. 15, No. 12 Dec., 92
15	Rao, T. Sripathi	Revasaner of Rasa Shastra in Shalakya	First National Workshop on Rasa Shastra Banaras Hindu University	Feb. 19th, 93.
16	Reddy K. Pratap *et.. al.*	Sarjika Kshara with Amalaki Churna in Amlapitta-Clinical Report	-do-	-do
17	Singh U.S.	A preliminary Clinical trial of Kevuka and Ayurvedic drug against hypnolepisia in children	Conference on current Biotechnological trends in Medicinal Plants Research, Lucknow	-do-
	Family Welfare			
18	Jukar S.B.	Family Planning in Ayurveda	Visva Vaidya Sammelana	14.11.92
19	Sharma B.B.	Contribution of Ayurveda towards Family Planning in Ayurveda with special reference to Ayush AC-4 Banjhouri and other Ayurvedic drugs.	Seminar on Family Planning, A.I.A.C.	

	Name of Author(s)	Title of the paper	Name of Journal	Date of Publication
20	Shukla Kusum Pandey D.R. Trivedi V.P.	Prospects of utilising Banjhauri and Neem oil as herbal anti-fertility agent.	Conference on current Bio-technological Trends in Medicinal Plants Research, Lucknow.	19-21 Feb., 93
21	Shukla, Kusum Trivedi, V.P.	Clinical Trial of Ayush AC-4 as an anti-fertility agents.	Conference on current Bio-technological trends in Medicinal Plants Research, Lucknow.	19-21 Feb., 93
22	Singh, U.S.	Experimental study of some indigenous drugs for their androgenic, testesterone like activity	Conference on current Biotechnological trends in Medicinal Plants Research.	-do-
23	Biksahapati, T.	Tamakashasa and its treatment	Academy of Ayurveda Vijayawada.	6.12.92
24	Bikshapathi ,T.	A Clinical study of Slipada and its management with Herbal drugs.	Ayurveda Mahamandali Tenali.	24.12.92
25	Chopra K.K.	Kustha Sastra	Conference of Rectal surgons of India	26th, Sep., 1992
26	Kapoor M.L.	Effect of Saptamrit Lauh an Ayurvedic preparation in cases of referectory errors of Eye.	Conference on current Bio-technical trends in Medicinal plants research, Lucknow.	19-21 Feb., 1992

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27	Nagalakshmi, V. et.al.	Amlapitta and is management.	Ayurvediya Tadvidya Sambhasha jointly organised by Greater Hyderabad Ayurveda Sammelan and Shree Baidynath Ayurveda Bhava Ltd. Hyderabad.	24.10.92
28	Naresh Kumar & Anil Kumar	Social and Psychological problems to Kustha Roga (Leprosy)	National Seminar on Kusta roga organised by Gurukul Kangri and Jan Swasth Sansthan.	16th & 17th, 1992
29 88	Pandey, K.K.	Treatment of Anal Fissures (Nadivrana) by an Ayurvedic herbal oil preparation (Jatyadi Tail)	Conference on Current Biotechnical trends in medicinal Plants Research, Lucknow.	19-21, Feb., 92

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Namgail Gurmet	Amchi system of medicine connection with Astrology	Combine seminar in Amchi System of medicine and Astrology held by Ladakh Ecology Society.	September, 1992
Namgail Gurmet	Urological Examination in Amchi system	-do-	-do-
Namgail Gurmet	Hyper-pyrexia	Amchi Conference held by the Deptt. of Health and F.W., J&K State and Ladakh Nutrition Project.	March, 92
Rajastan Tashi	Promagation of Amchi system of medicine in future	-do-	-do-
Rajasthan Tashi	Eight kinds of medicinal water	Combine seminar in Amchi system of Medicine and Astrology held by the Ladakh Ecology socicty.	September, 1992

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Joshi, P.C.	Chemical and Pharmacological Investigation of Anant Mul (*Hemidesmus indicus* R. Br.)	International Seminar on Traditional Medicine held at Hotel Taj Bengal	7.9.1992
Tewari L.C. Agrawal R.G. Pandey G.	Vacha - *Acorus calamus* Linn. A herbal tranquili ser and brain tonic in Ayurveda	Sachitra Ayurveda	April, 1992
Aewari L.C. Pandey M.J. Pandey G. Agarwal R.G.	Technical measures for conservation and development of Himalayas	Himalaya Main Nature	June ,1992
Tewari L.C. Agarwal R.G. Pandey M.J. Pandey G.	Pharmaceutical studies on various plants of western Himalaya for conservation and standardisation	Sachitra Ayurveda	June, 1992
Tewari L.C. Pandey G. Agarwal R.G. Pandey M.J.	Some traditional folk medicine from Kumaun Himalayas	Arya Vaidyan	Jan., 1993
Tewari L.C. Pandey G.	Quality control of Indigenous Pharmaceutical products.	-do-	Oct., 1992

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41	Sharma P.C. Kulkarni S.S.	Use of Plant Tissue Culture for Research in Ayurveda	Research in Ayurveda, The Life Science, Instt. of Indian Medicine, Pune	19.4.1992
42	Yelne M.B. Sharma P.C.	Use of Pharmacognosy for Research in Ayurveda	Research in Ayurveda. The Life Science, Instt. of Indian Medicin, Pune	19.4.1992
43	Mehendale V.V. Yelne M.B. Sharma P.C.	Vacha Ek Sugandhi Vanaspati	In Baliraja Aushada Sugandhi Vanaspati Lagawad Visheshank, Pune	June, 1992
44	Sharma P.C.	Tissue Culture of Ayurvedic Medicinal Plants	International Seminar on Ayurveda, New Delhi	10.4.92 to 13.4.92
45	Sharma P.C.	Cultivation of Yashtimadhu	One day Seminar on Plantation of Medicinal Plants at Pune.	2.7.1992
46	Mehendale V.V.	Importance of Plantation of Dashamula in the Forest Area	-do-	-do-
47	Sharma P.C.	Cultivation of medicinal plants, rare and endangered species.	Vishwa Vaidya Sammelan & Rastriya Vanaspati Parishad, Organised at Pune.	9.11.92 to 14.11.92

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Yelne M.B.	Prospects of Commercial cultivation of Shatavari (*Asparagus racemosus* Willd).	Vishwa Vaidya Sammelan & Rastriya Vanaspati Parishad, Organised at Pune.	9.11.92 to 14.11.92
Sharma P.C.	Profitable Medicinal Plants	Seminar on Medicinal & Aromatic Plants Organised by Paliraja at Pune	23rd & 24th May, 1992
Yelne M.B.	Pharmacognostic studies of Market sample of an important Ayurvedic Drug, Kapikachchhu.	Vishwa Vaidyas Sammelan & Rashtriya Vanaspati Parishad, Pune	9.1.92 to 14.11.92
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Sharma P.C.	Problems & Prospects of Ethnobotanical studies with reference to Health Care	V-Training Course cum Workshop on Ethno botany at Pune	20.2.93

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61	Saxena B.R. Daswani M.T. Trivedi P.D.	Study of Kubjaprasarni taila	Aryavaidyan Vol. 4, No. 4 232	1992
62	Shah D.C. Chaudhary B.C. Vachhrajani Y.R. Subrata D.C.	Medicinal Plants of Goa State used in Ayurvedic Pharmaceuticals	Sachitra Ayurveda 44, (No. 12) 828-831.	June, 1992
63	Chaturvedi B.G. Jani Y.R.V.	Important Medicinal plants of Gujarat-A Source of Raw material for Pharmaceutical Industries.	Bulletin of Medico-Ethno-Botanical Res. Vol. XIII No. 1-2, 65-73	1992
64	Bhat A.V.	Botanical Source of Gajappali in Kerala	Bulletin of Medico-Ethno-Botanical Res. Vol. XIII, No. 3 & 4	1991
65	Nair K.V.	Techno-economic data of some tree sp. of Ayurvedic drugs	First National Conference and Workshop on Ethnopharmacology held at Trivendrum	May, 1992
66	Nesamany, S. Joshi M.C.	Samanga-A less known controversial medicinal Plants	Bulletin of Medico-Ethno botanical Research XII	1991

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67	Pathak N.N.	Specific use of Rasaushdhis based on Research work and experiences	Ist National Workshop on Rasa Shastra, BHU Varanasi	19th & 20th Feb., 93
68	Dwivedi	Fundamental Principals of Ayurvedic drug manufacturing	-do-	-do-
69	Singh U.S.	Ayurveda Bhushan	Awarded by Dhanwantari Ayurveda Mandal Gorakhpur in April, 1992	
70	Pandey D.R.	-do-	-do-	
71	Trivedi V.P.	-do-	-do-	
72	Trivedi V.P.	Ayurveda Prareen	Awarded by Janpad Ayurveda Sammelan, Shajahanpur, U.P., in Dec. 92	
73	Trivedi V.P.	Ayurveda Bhaskar	Awarded by Janpad Ayurveda Sammelan Kanpur	

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74	Pillai N.R.	Antidiarrhoeal activity of *Punica granatum*, Linn. in experimental animals.	Int. J. Pharmacognosy 30 (3): 201	1992
75	Pillai N.R.	Antidiarrhoeal Activity of ***Glyosmis cochinchinensis*** Pierre in experimental animals	Fitoterapia LX III(4): 323	1992
76	Pillai N.R. & Lilykutty L.	Antidiarrhoeal Potential of *Myristica fragrans* seed extracts	Ancient Sc. Life	1992
77	Joshi G.C. Tewari K.C. Pandey G.	A review of Indigenous system of Medicine with special reference to Herbal drugs	Aravaidyan Vol. 5 No. 3, 173-179	Feb. 1992

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78 Joshi G.C. Tewari R.N. Uniyal M.R.	Records of Plants of after a century from Western Himalaya-*Wallichia densiflora* Mart. & *Phyrnium placentarium* (lour.)	Jour. Econ. Tax. Bot. Vol. 15, No. 3	1991
79 Tewari K.C. Tewari R.N. Joshi G.C. Pandey G.	Saving endangered Medicinal Plants reserve of Hill	Uttarakhand Vol. (6) Pant Nagar; pp. 84-90	Dec., 92
80 Joshi G.C. Pandey M.J. Pandey G.	Atharved Me Prakritik Sodhana Se Upachar (Hindi)	Sachitra Ayurveda pp. 479-480	Jan., 93
81 Uniyal M.R. Joshi G.C.	Historical View of Basic Principles of the identification of Controversial Drugs, Problems and Suggestion.	-do- pp. 531-536	Jan., 93
82 Pandey M.J. Joshi G.C. . Pandey G	Atharvedokta Ausadhi Parichaya	-do- pp. 635-640	March, 93

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Joshi G.C. Tewari K.C. Tewari R.N. Tewari R.N. Pandey G.	Conservation strategies & some studies on Habitat ecology of Musk deer *(Moschus chrysogester)* A Vanishing species.	Accepted in Indian forestar	-
Joshi G.C. Tewari K.C. Tewari R.N. Pandey N.K. Pandey G.	Commodity study & Research Survey of the Pharmaceutically important plants of U.P. Himalaya	Accepted for National Workshop on Himalayan Biodiversity.	-
Pandey N.K. Tewari K.C. Tewari R.N. Joshi G.C. Pandey V.N. Pandey G.	Conservation conflict of Medicinal Plants of Western Himalaya and its strategies	-do-	-do-

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87 Joshi G.C. Tewari K.C. Pandey N.K. Pandey G.	Bryophytes the source of the origin of Shilajatu a new hypothesis	BMEBR New Delhi	-
88 Joshi G.C. Tewari K.C. Pandey G.	Traditionally used medicines for skin diseases from Kumaon Himalaya.	Sachitra Ayurved	
89 Joshi G.C. Tewari K.C. Pandey V.N. Pandey G.	Ethno -Medico-Botanical Studies on the fungi of Kumaon Himalayan, U.P.	BMEBR New Delhi	-
90 Joshi G.C. Tewar K.C. Pandey N.K. Pandey G.	Alpine environsaround Kumaon and Garhwal in Central Himalaya, India with special reference to herbal resources.	Indian Journal of ecology Ludhiana	-
91 Tewari K.C. Joshi G.C. Pandey N.K. Pandey G.	Some rare folk tribal medicines from Garo Hills in North Eastern India.	Journal of Eco. Taxonomic Bot.	

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Pant S.C. Tewari K.C. Pandey V.N. Pandey G. Uniyal M.R.	Acclimatization and Multi-plication technique for Rudraksha (Elasocarpus ganitrus Roxb.) Through Auxin treatment at Ranikhet U.P.	BMEBR New Delhi	
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Joshi G.C. Tewari K.C. Pandey N.K. Pandey G.	Dioscorea kumaonensis Kunta. A new source of antirheumatic Drug from Kumaon Himalaya and its conservation strategy.	Ayurvaidyan, Kerala	
Tewari K.C. Uniyal M.R. Pandey V.N.	Botanical Identification of some Ayurvedic Herbal Medicines	BMEBR	

1	2	3	4
97 Tewari K.C. Pandey V.N.	A nut shell account of three decades of Agro Technical studies with medicinal plants at CCRAS, garden, Ranikhet.	Silver Jubilee celebrations	
98 Tewari K.C. Tewari R.N. Pant S.C.	On the introduction of valuable Medicinal Plants from North Eastern to Western Himalayan region of India	Workshop on Drug Research in Ayurveda regional Research Centre (Ay.) Itanagar	
99 101 Tewari K.C. Joshi G.C. Kapdal P.B. Pandey G.	Studies on Adulterants of saffron *(Crocus sativas)* Linn.)	Indian Drugs and Pharmaceutical Industry Bombay.	
100 Tewari K.C. Joshi G.C. Pandey G. Kabodwal P.B.	A note on insect paste & fungel patnogens of Saffron *(Crocus* Linn. their control measures).		
101 Tewari K.C. Tewari V.P.	Some important medicinal plants of Tropical, Sub-Tropical and Temperate region of Sinang Subernser & Tirap Distt. of Arunachal Pradesh.	BMEBR send on 18.2.93	

III. TECHNICAL REPORT-SIDDHA

Abbreviations used for Institutes/Units

No.	Name of the Institute/Units	Abbreviations
1.	Central Research Institute (Siddha), Madras	CRISM
2.	Regional Research Institute (Siddha), Pondicherry	RRISP
3.	Clinical Research Institute, 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 Res. Unit, Siddha, Trivandrum	DSRUST
11.	Tribal Health Care Research Project, Siddha Tirupathur, North Arcot District	THCRPST
12.	Tribal Health Care Research Project, Siddha Kalasa, Chikamagalore District	THCRPSK
13.	Survey of Medicinal Plants Unit, Siddha, Palayamkottai	SMPUSP
14.	Literary Research and Doc. Deptt., Siddha, Madras.	LRDDSM

CLINICAL RESEARCH PROGRAMME

Clinical Research in Siddha System of Medicine is being carried out on selected clinical conditions by the Institutes, Units of the Siddha System of Medicine functioning under the Council. The cinical conditions studied during the reporting year include Kalanjgaapadai (Psoriasis), Putrunoi (Cancer) Manjal malai (Infective hepatitis), Sandhi Vatha Soolai (Rheumatoid arthritis), Gunmam (Intestinal disorders), Venkuttam (Leucoderma), Velluppunoi (Anaemia) etc. Brief resume of work carried out on each of the disease condition is reported hereunder:

Kalanjaga Padai (Psoriasis)

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

TABLE

Results of Clinical/Therapeutic Trial of Siddha Preparations on Kalanjaga Padai (Psoriasis)

S.No.	Therapy	Instt/ Centre/Units	Total Cases	Results				
				Comp. rel.	Mark rel.	Mode rel.	Mild rel.	LAMA
1.	777 oil	CRI(S), Madras	181	24	66	56	18	17
2.	777 oil	CRU(S) New Delhi	9	-	1	-	-	8
3.	777 oil	CRU(S), TVM	5	4	1	-	-	-
	Total		195	28	68	56	18	25

2. Putrunoi (Cancer)

Putru is described in Siddha texts under the head of Viranannoigal. Thus, described as Putru named after the affected organ i.e. if the uterus is affected it is called Yoniputrunoi. The study was undertaken 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 ans SKX. These drugs were administered alongwith honey in two divided doses of 500 mg each. Ulcers and tumors were dressed with Nithiyakalayani Kalkam and Panchainenai with thurusu. 23 cases of Putrunoi were studied during the reporting year. Reduction in the size and growth of the ulcer/tumors, reduction or arrest of the discharge and also reduction in pain was noticed in some of the cases.

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

3. Manjal Kamalai (Infective hepatitis)

The study on Manjal Kamalai was carried out at Central Research Institute (Siddha), Madras. The choornam made of Athimathuram was administered in the dose of 1 gm twice a day with water in all the 16 cases selected for the trial. Salt and fat free diet was advised to all the cases. No side/toxic effect was noticed. The study showed complete relief in four cases and marked relief in five cases. Four cases got moderate relief and one got mild relief, while remaining two cases discontinued the study.

4. Sandhi Vatha Soolai (Rheumatoid arthritis)

A study to evaluate the effect of Vanga churnam in the management of Sandhi Vatha Soolai was carried out at Central Research Institute (Siddha), Madras. 200 mg of the trial drug was administered twice a day with milk in all the 24 cases admitted during the period. Tamarind and chilli free diet with less salt was advised during treatment. Mynathylam was advised for external use on the affected parts.

The study showed complete relief in two cases, marked relief in 18 cases, moderate relief in 4 cases and mild relief in one case while remaining one case discontinued the study.

5. Vatha Soolai

Vatha Soolai is one among the 80 Vatha diseases described in Siddha

texts. The RRI(S), Pondicherry in engaged in determining the efficacy of Chanda marutham and Vatha kesari thailam. 61 cases of Vatha Soolai were registered during the reporting year. Details of the result treatment are reported hereunder:

TABLE

Results of Clinical therapeutic trial of Sidha preparations of Vatha Soolai

S.No.	Therapy	Total cases	Results				
			Comp. rel.	Mark. rel.	Mode rel.	Mild rel.	LAMA
1.	Vatha Kesari thailam external use.	54	32	13	-	-	9
2.	Combination of chandamarutham & Vatha Kesari thailam (Ext.)	7	6	1	-	-	-
	Total	61	38	14	-	-	9

6. Oothal noi.

Oothal noi is described as one of the intestinal disorder. The study on this disease was taken up by the RRI(S), Pondicherry using Mandoorathi, Adai Kudineer and vediuppu churnam. Out of two cases included into the study, one case got complete relief and one case got marked relief.

7. Valligunmam (Peptic ulcer)

The study was taken up at Central Research Institute (Siddha) Madras to determine the effect of Nagaparpam in the cases of Valligunmam. The cases having pain in the abdomen in relation to food, discomfort in the epigastric region, nausea, vomiting, eructation and haematamesis etc. were selected for trial. The diagnosis was confirmed by FTM and Barium meal X-ray reports. The trial drug was administered at the dose level of 200 mg filled in gelatin capsules twice a day for 21 days. Omam bath was given to all the 24 cases admitted for the study. The study showed complete relief in two cases, marked relief in 7 cases and moderate relief in four cases. While 11 cases discontinued the study.

8. Velluppunoi (Anaemia)

Clinical studies were conducted in 19 cases of Velluppunoi (anaemia) at Regional Research Institute (Siddha), Pondicherry using Aya, Bringaraja Karpam in the dose of 260 mg with honey thrice a day. The result of study showed completed relief in 10 cases and moderate relief in 2 cases and mild relief in one case. Remaining 6 cases discontinued the study against medical advice. No side effects/toxic effects were noticed during or after the treatment.

9. Gunmam (Intestinal disorder)

The study was undertaken at Regional Research Institute (Siddha), Pondicherry and Clinical Research Unit (Siddha), Trivandrum and Palayamkottai using Uppu chendooram, Athimathura choornam and Kavikkalchoornam in the selected cases. The details of results of the treatment are shown hereunder:

TABLE

Results of Clinical Therapeutic trial of Siddha preparations on Gunmam (Intestinal disorder)

S.No.	Drugs	Tota cases	Results					
			CR	MR	MOC	MOR	MIR	LAMA
1.	Uppu chendooram (130 mg. TDS)	20	-	13	3	1	-	3
2.	Kavikkal choornam (one gm. both B.D.)	3	-	2	1	-	-	-
3.	Gunmagudori Mezhugu (1 gm. TDS)	7	-	3	1	1	-	2
	Total	30	-	18	5	2	-	5

10. Neerazhivu (Diabetes mellitus)

Neerazhivu is described as one of the seruneer noigal in Siddha literature. The study on this clinical condition using Abraga chendooram,

vanga parpam and Keezhanelli choornam was carried out by Clinical Research Unit (Siddha) at Safdarjang Hospital, New Delhi and Clinical Wing of Drug Research Scheme (MD) Madras. Mild and moderate cases of Neerazhivu were taken up for study. The following table provides details of result of treatment.

TABLE

Results of Clinical Therapeutic Trial of Siddha preparations on Neerazhivu (Diabetes mellitus)

S.No.	Drugs	Total cases	Results				
			CR	MC	MOC	MC	LAMA
1.	Abraga Chendooram (200 mg. B.D.)	10	-	2	7	-	1
2.	Keezhanelli chooranam (500 mg. B.D.)	52	-	-	4	12	36
	Total	62	-	2	11	12	37

11. Venkuttam (Leucoderma)

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

TABLE

Results of Clinical Therapeutic Trial of Siddha preparations on Venkuttam (Leucoderma)

S.No.	Drugs	Total cases	Results				
			CR	MR	MOR	MIR	LAMA
1.	Thamira chendooram	10	-	-	-	3	7
2.	Ponnimilai chendooram & Chirattai Thylam.	14	-	-	-	4	10
	Total	24	-	-	-	7	17

12. Vellai noi (Leucorrhoea)

Vellai noi (Leucorrhoea), as described in Siddha texts, is one of the magalir noigal. The CRU(S), Trivandrum using chemparuthi Kashayam and Kukkil parpam studied 10 cases of Vellai noi admitted during the period. The results of study showed complete relief in 7 cases and marked relief in two cases while one case discontinued the study.

13. Eraippu noi (Bronchial asthma)

Eraippu noi is one of the respiratory diseases described in Siddha literature. The efficacy of Iruneli karpam and Swasa kudori mathirai was studied by CRU(S), Trivandrum in 20 cases of Eraippu noi. The results of study showed complete relief in 11 cases and marked relief in four cases, while remaining two cases discontinued the study.

14. Keel vayu

Keel vayu is one of the 80 vatha diseases described in Siddha classics. The efficacy of Ayakantha chendooram, Sivanar amirtham and Amukkara choornam was studied by CRU(S), Trivandrum and 10 cases were registered during this period. The study showed complete relief in six cases and marked relief in four cases.

15. Yanaikkal noi (Filariasis)

Yanaikkal noi is one of the diseases widely described in Siddha literature under the heading of Vatha diseases. The efficacy of linga chendooram, Thalampoo mathirai, Nilamvmbu kudineer and Kakattan ver Karkkam was studied by CRU(S), Trivandrum. The study was intiated as pilot project on the available cases of both carrier and manifested OPD cases. 70 cases were taken up for study during this period, out of which 35 cases got complete relief, 22 cases showed marked relief, while 13 cases did not respond to the treatment.

16. Karappan (Skin disorders)

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

TABLE

Result of Clinical Therapeutic Trial of Siddha preparation of Sarmanoigal (Skin disorders)

S.No.	Drugs	Total cases	Results				
			CR	MR	MOR	MIR	LAMA
1.	Irunelli Karpam (130 mg. B.D.) (Karpam thailam externally)	4	2	1	-	-	1
2.	Gandhaga rasayanam (2 gm. B.D.) (Arugan thailam externally)	3	2	1	-	-	-
3.	Combination of 1 & 2	6	3	2	-	-	1
	Total	13	7	4	-	-	2

Out Patients/in-Patients Attendance

S.No.	Institute/Units	No. of patients attended at OPD			Patients admitted at I.P.D.
		New	Old	Total	
1.	CRI(S), Madras	6590	11612	18202	268
2.	RRI(S), Pondicherry	4050	8553	12603	100
3.	CRU(S), Palayamkottai	720	1818	2538	6
4.	CRU(S), New Delhi	33	704	737	-
5.	CRU(S), Trivandrum	2939	11079	14018	-
6.	DRS(MD) Madras	82	90	172	-
	Total	14,414	33,856	48,270	374

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 Tirupathur North Arcot District (Tamil Nadu) and Kalasa Chikamagalore (Karnataka). Brief resume of the work carried out by these projects is reported hereunder:

Tribal Health Care Research Programme THCRPST

The team conducted 16 tours in the tribal pockets of Elagiri hills i.e. Kohut, Kohaiyur, Mettukaniyur, Pallakaniyur, Paththur Padavanur Magalam, Thayalore, Punganur, Muthuthanam. Having a total populations of 5973 individuals and collected health statists of about 423 individuals. Incidental medical aid was provided to 810 patients. Sarumpangal, Irumal pun Nalpattapun, Sandhuvatham Suram, Tholnoigal, Kudarpuzhuniogal are some of the diseases found prevalent in the area.

Mobile Clinical Research Programme MCRUSM

The team conducted 87 visits in two villages i.e. Adayalampattu and Puthogaram during the reporting year and collected information on 2305 individuals. The data of the study carried out showed most of the population covered are suffering from one or the other diseases like Irumal, Eraippunoi, Pun, Prumkazhichal, Vellai, Vaccruvali, Muttuvali, Thalaivali, Tholongical suram etc. Incidental medical aid to 2447 cases was provided during this study comprising 537 new cases and 1910 old cases.

CHEMICAL RESEARCH PROGRAMME

The Chemical Research Programme has been carried out by the Chemistry wing of DRS(MD), Madras. The drug Maansevikalli *(P. trithymaloides)* was studied during the reporting period. The study revealed the presence of carbonate, chloride, sulphate and also calcium, sodium.

PHARMACOLOGICAL RESEARCH PROGRAMME

The Pharmacological study on Siddha drugs has been taken up by the Pharmacology Section of CRI(S), Madras and Pharmacology Wing of DRS(MD), Madras. The study has been conducted by the laboratory attached to the Institute on the pre-determinded experimental models to assess efficacy of the following drugs:

1. **Acute Toxicity Studies**

   (i) Kuppaimeni Thailam-oil of *Acalypha indica*

   (ii) Vanga churnam

   (iii) Naga Parpam

   (iv) Kadukkai choornam

   (v) Athimathuram-*Glycyrrhizaus glabra*

2. **Anti-inflammatory studies:**

   (i) Kaduguchini

   (ii) Mookarathai-*Boerhavia diffusa* Linn.

3. **Anti-Arthritic studies:**

(i). **LRD-an isolated drug from Aguillaria agalocha.**

I. **Acute Toxicity Studies**

(1) (a). **Kuppaimeni thailam on albino rats:**

Kuppaimeni thailam was administered in the doses of 0.5, 1, 2, 3, 4, 5, 6, 7, 8 and 9 ml/kg body weight in each group. Another group which

received vehicle gingely oil served as untreated control group. The animals were observed for any toxic manifestations and mortality. The drug did not show any toxic effects upto the maximum dose level of 9 ml per kg body weight.

1 (b) **Kuppaimeni thailam on albino mice:**

Kuppaimeni thailam was fed in the doses of 1 ml and 2 ml per kg body weight. One group received vehicle gingely oil which served as untreated control group. The animals were observed for 72 hours for any toxic manifestations and mortality. The drug did not show any toxic effects in all the doses.

2. (a) **Vanga churnam on albino rats:**

The Venga churnam was suspended in distilled water and administered in the doses of 8000, 9000, 10,000 mg per kg body weight. Another group received vehicle, which served as untreated control. The animals were observed for 72 hours for any toxic manifestations and mortality. The drug did not show any toxic manifestations upto the dose level of 10,000 mg per kg body weight.

2. (b) **Vanga Chunnam on albino mice:**

The Vanga churnam was suspended in distilled water and administered in the doses of 50, 100, 200, 500, 1000, 2000, 3000, 4000, 5000, 6000, 7000, 8000, 9000 & 10,000 mg per kg body weight. Another group received vehicle, which served as untreated control. The animals were observed for 72 hours for any toxic manifestations and mortality. The drug did not show any toxic effect upto the dose level of 10,000 mg per kg body weight.

3. (a) **Nagaparpam on albino rats:**

Naga parpam was suspended in distilled water and administered in the dose level of 10,000 mg per kg body weight. One group received vehicle, which served as untreated control. The animals were observed for 72 hours for any toxic manifestations and mortality. The drug did not show any toxic effects in the dose level of 10,000 mg per kg body weight.

3. (b) **Nagaparpam on albino Mice:**

Nagaparpam was suspended in distilled water and administered in the doses of 8000, 9000 and 10,000 mg per kg body weight. One group received

vehicle, which served as untreated control. The animals wre observed for 72 hours for any toxic manifestations and mortality. The animals in the dose level of 8000 and 9000 showed clumping and depression. In the dose level of 10,000 mg per kg body weight 4 animals died out of 6 (66.66% mortality) during ranging from 24 to 48 hours.

4. **Kudukkai choornam on albino rats:**

Kuddukai choornam was suspended in distilled water and administered in the doses of 6000 & 7000 mg per kg body weight. One group received vehicle, which served as untreated control. The animals were observed for 72 hours for any toxic manifestations and mortality. The drug did not show any toxic effect upto the dose level of 7000 mg per kg body weight.

5. **Athimathuram on albino mice:**

Athimathuram choornam was suspended in distilled water administered in the dose level of 2000 mg per kg body weight. One group received vehicle, which served as untreated control. The animals were observed for any toxic manifestations. The drug did not show any toxic effect in the dose level of 2000 mg per kg body weight.

II. Anti-inflammatory study: (Carrageenin induced Paw Oedema Method)

6. **Kudugurohini on albino rats:**

Kadugu rohini Chooranam in crude form was suspended in distilled water and administered in the dose level of 1000 mg per kg body weight. One group received vehicle, which served as untreated control. Another group received phenylbutazone in the dose level of 100 mg per kg which served as standard control. The paw oedema was induced by injecting 0.1 of 1% carrageenin suspended in 0.5% carboxy methyle cellulose in the plantar apaneurosis region of right hind paw. The final right hind paw volume of individual rats were measured plethysmographicaly. The data are to be analysed statistically and the results will be communicated in due course.

7. **Kuppai Thailam on albino rats:**

Kuppaimeni thailam was administered in the dose level of 1 ml. per kg

body weight. One group received vehicle which served as untreated control. Another group received phenylbutazone in the dose level of 100 mg per kg body weight which served as standard control. The paw oedema was induced by injecting 0.1 ml of 1% carrageenin suspended in 0.5% carboxymethyl cellulose in the Plantar aponeurosis of right hind paw. The final volume of right hind paw of each animal was measured plethysmographically. The data are to be analysed statistically and the results will be communiated in due course.

8. **Naga Parpam on albino rats:**

Naga parpam was suspended in distilled water and administered in the dose level of 100 mg per kg body weight. One group received vehicle which served as untreated control. Another group received phenylbutazone in the dose level of 100 mg per kg body weight which served as standard control. The paw oedema was induced by injecting 0.1 ml 1% carrageenin suspended in 0.53 carboxy methyl cellulose after 1 hour of drug administration. The final right hind paw volume of each rat was measured plethysmographically after 3 hours of carrageenin injection. The data are to be analysed statistically and the results will be communicated in due course.

9. **Mookarathai on albino rats:**

Mookarathai choornam was suspended in distilled water and administered in the dose level of 2000 mg per kg body weight. One group received vehicle which served as untreated control. Another group received phenylebutazone in the dose level of 100 mg per kg body weight which served as standard control. The paw oedema was induced by injecting 1 ml of 1% carrageenin suspended in 0.5% carboxymethyl cellulose after 1 hour of drug administration. The final volume of right hind paw of each animal was measured plethysmographically. The data are to be analysed statistically and the results will be communicated in due course.

III. Anti-arthritis Study:

Formulin induced Arthritis study with coded isolated drug LRD on albino rats:

The initial reading of body weight and the measure of right hind paw by screw gauge was taken on day 1 and recorded. The drug was suspended in distilled water and administered in the dose level of 15 mg per kg body

weight daily once for 10 days. One group received vehicle, which served as control. Another group received wysolone (prednisolone) in the dose level of 10 mg per kg body weight daily once for 10 days. The parameters of body weight, measure of the right hind paw by screw gauge were recorded for 10 days. The date are to be analysed statistically and the results will be communicated in due course of time.

PHARMACY

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

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

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

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

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

During the reporting year, the pharmacy has prepared about 412.300 kg of choornam, parpam, chendooram and 544.450 liter of oil based preparations.

The Pharmacy has also supplied medicines to the following Siddha Units under the Council. The list of unit and quantity of medicine supplied is as detailed below:

S.No.	Name of the unit	Quantity	
		Solid in Kgs.	Liquid in liters
1.	DRS(MD), Madras	8.0	1.1
2.	MCRU(S), Madras	14.8	-
3.	CRU(S), New Delhi	-	-
4.	CRU (S), Trivandrum	37.7	10.0
5.	RRI(S), Pondicherry	-	-
6.	THCRP, Tirupathur	-	-
7.	CRU(S), Palayamkottai	2.0	-
8.	Hqrs.	-	4.5
9.	Pharmacology Lab at CRI(S)	-	0.5
10.	DSRU(S), Madras	-	0.05

MEDICO-BOTANICAL RESEARCH PROGRAMME

It is a well known fact that the drug (Marunthu) is the primary tool of entire research programme. Survey of forest areas for procuding drugs and arranging supply of material required for research purposes occupies an important place. Medico-botanical survey unit functioning at Govt. Siddha Medical College, Palayamkottai has taken up this task in 1971. For the last 22 years, the unit is engaged in studying the availability of the medicinal plants used in Siddha medicine in the forest areas of Tamil Nadu, identification, availability of genuine drugs, including their substitute/ adulterants etc.

During the reporting year, the survey unit has conducted one survey tour to Kodikkarai, Tanjavur Forest Division and 14 collection tours in and around Tirunelveli Forest Division. 127 herbarium specimens having importance in Siddha medicine belonging to 63 families, 182 genera and 204 species were collected and reported.

One survey map of Kodikkarai (Tanjavur Dist.) prepared, 66 photographs of plants including tribal folk practices and also 60 slides of plant origin were prepared during the reporting period.

Out of the total collection, 125 plants were identified, 263 plant

specimens were mounted ad Botanical identity of 22 Siddha medicinal plants has been reported by the unit.

238 Plant specimens were added to the herbarium making the total to 5617 herbarium sheets. Some of the plant specimens added to the herbarium are Milachathaiyan *(Bischofia javanica* Blume); Kattuarathai *(Alpinia malaccensis* Rosch); Kudiottipoondu *(Argemone mexicana,* L); Sirupeelai *(Nothosaerua brachiata* Wt.); Alari (Nerium odorum Soland); Nanthiyarvattai *(Ervatamia coronaria* Stapt); Chembinerunjil *(Crotalaria medicaginea* Lam); Malaimanjadi *(Ormosia travacoria* Bedd.); Savarikorattai *(Trichosanthes tricuspidata* Lour); Umari *(Suaeda marithima* (L) Dumort); Kadal Neermulli *(Acanthus ilicifolius* L.); Peimunnai *(Premna serratifolia* L); Uppili *(Pentatripis capensis* (L.f.) Bullock); Konji *(Glycosmis pentaphylla* (Retz) DC); Peruvagai (uga) *(Salvadora persica* L); Thoradi *(Scutia myrtina (Burm.f.)* Kurz); Marapoo *(Vanda tessellata* Hook, ex.G. Don); Thillai (*Excoecaria agallocha* L.); Kattuvengayam *(Crinum latifolium* Linn); Chemponnerunjil *(Crotalaria medicaginea* Lam); Vezhi *(Cadaba fruiticosa* (L) Druce). Chayaver *(Oldenlandia umbellata* L) Sagadevipoondu *(Vernonia cinerea* (L) Less, Peechangu *(Cleodendrum inerme* (L) Gaertn); Nanjunda *(Balanites aegyptica* (L) Virali *(Dodonaea viscosa* (L); Soonagandhi *(Helianthus annus* L); Kopuramthamki *(Indonessiella echioides* (L) Sreemadh); etc.

73 Different parts of the plant samples were collected and preserved and added to the museum making the total to 705 samples of different origin i.e. plants, animal and mineral origins. Some of the plant samples are Sissu *(Dalbergia sissoo);* Athandai *(Capparis zeylanica);* Valsavakku *(Tamarix gallica);* Kozhi avarai *(Canavalia irosa);* Peipirkku *(Luffa umbelata);* Oduganthazhai *(Cleistanthes collinus);* Valli *(Dioscorea oppositifolia);* Kodikkali *(Sarcostemma brevistigma);* Madanagama *(Cycas circinalis);* Vizhuthi *(Cadaba fruticosa);* Sengam *(Capparis decidua);* Sangu (Shell); Ponkoramdi *(Salacia prinoides);* Vellarugu *(Enicostema axillare);* Thadappa salai *(Acranthera grandiflora);* Krishnapalai *(Cryptolepis buchanani);* Munnai *(Premna serratifolia)* etc.

33 Folk medical claims were recorded by the unit during the reporting period. The claims were collected in and around of Tirunelveli Dist. The claims are reported to be useful in compacting fever followed fits, rat bite poison, itching, ulcers, scabies, reddishness of the skin (kallamkappan) occurs due to unknown reason, piles, STD and also useful for increasing vigour and vitality.

66.750 kg of fresh different parts of the plants were collected out of which 13.950 kg shade dried were supplied to DSRU(S), Madras and JNAMPG&H, Pune during the reporting year.

PHARMACOGNOSTICAL RESEARCH PROGRAMME

Pharmacognostical Research Programme is being carried out at Pharmacognosy Wing of DRS(MD), Madras. The study was conducted on the following plants during the reporting year.

1. Tuvarai *(Cajanus cajan* (L) Mill, sp)

2. Imbooral *(Oldenlandia umbellata* L).

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

PHARMACEUTICAL/STANDARDISATION RESEARCH PROGRAMME

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

The Drug Standardisation Research Programmes covering formulations enlisted in Siddha Formulary, Part-I of Govt. of India and single drugs entering into them was carried out at the following standardisation research units:

1. Drug Standardisation Research Unit(S) at CSMDRIA, Madras.

2. Drug Standardisation Research Unit(S) at RRI (DR.), Trivandrum.

3. Drug Standardisation Research Unit(s) at RRC (Ay.), Bangalore.

A. List of plant drugs on which phytochemical studies have been carried out (Analytical Studies):

S.No.	Name of the drugs	Parts	Name of the units
1.	Vel *(Acacia ariculaeformis* A. cunn)	Leaves	DSRU(S)M
2.	Vilvam *(Aegle marmelos* Corr.)	Pulp	-do-
3.	Nilavarai *(Cassia angustifolia* L)	Leaves	-do-
4.	Eri Salai *(Ammania baccifera* L).	Whole plants	-do-
5.	Civanan vembu *(Indigofera aspalathoides* Vahl).	Root	-do-
6.	Akasa garudan *(Corallo carpus epigaea* f.)	Rhizome	-do-
7.	Latta. a mallu (Redvarity) *(Jatropha gossipifolia* L)	Leaves Leaves	-do- -do-
8.	Aruki rai	Whole plant	DSRU(S)B
9.	Aghinzil	Stem Bark (stem)	DSRU(S)B DSRU(S)T
10.	Elumichan Thulasi *(Ocimum gratissimum)*	Whole plant	-do-
11.	Vel (Karangali) *(Acacia arabica)*	Wood	-do-
12.	Vel (Karuvel) *(Acacia catechu)*	Wood	-do-
13.	Anaikkan drimani *(Adenanthera pavonina)*	(1) Whole plant (2) Seeds	DSRU(S)B DSRU(S)T
14.	Kadasapalai *(Argyreia speciosa)*	Root	DSRU(S)T

15.	Kottathi *(Bauhinia racemosa)*	Stem bark	-do-
16.	Nathu Vidayam *(Cryptocoryne spiralis)*	Rhizome	-do-
17.	Ilakkali *(Euphorbia nivulia)*	Aerial root	DSRU(T)
18.	Vishnuerandhi *(Evolvulus alsinoides)*	Whole plant	DSRU(S)T
19.	Iruvatshi *(Jasminum sambac)*	Flower	DSRU(S)T
20.	Palakkudi *(Leptadenia reticulata)*	Stem bark	DSRU(S)T
21.	Chempakam *(Michelia champaca)*	Flower	DSRU(S)T
22.	Karboka arisi *(Psoralia corylifolia)*	Seed	DSRU(S)T
23.	Kadukkai *(Terminalia chebula)*	Galls	DSRU(S)T

B. Pharmacopoeial Standards (Analytical Standards) of finished products:

1.	Nave Uppu melugu	DSRU(S)M
2.	Vatha kesaru thai pam	-do-
3.	Tamiraecondu ram	-do-
4.	Kawari cinthamani Centuram	-do-
5.	Chandara parpam	-do-
6.	Thalaga mathi rai	-do-
7.	Elathiccurnam	-do-
8.	Ammukkara curanam	-do-
9.	Amaiodu parpam	DSRU(S)T
10.	Annabhedi chenduram No. 1	-do-
11.	Arumukha chenduram	-do-
12.	Ayaveera chenduram	-do-
13.	Gandhaka parpam	-do-

14.	Irunelli karpam	-do-
15.	Linga chenduram	-do-
16.	Muthu parpam	-do-
17.	Naga chenduram	DSRU(S)T
18.	Padiga lingam	-do-
19.	Rasa chenduram	-do-
20.	Suyamangni chenduram	-do-
21.	Venga parpam	-do-

C. **Phyto-Chemical and Botanical studies:**

1.	Kangitayam *(Shorea robusta* Gaert)	Bark	DSRU(S)M
2.	Maralumathai *(Xanthium strumanium* L)	whole plant	-do-
3.	Kattamanakku *(Jatropha gossypifolia* L)	-do-	-do-
4.	Sirupedai *(Nothosaerus brachiata Wight*)	-do-	-do-

D. Pharmacognosy:

The Pharmacognostical identification of the following plant drugs which enter into the Formulary of Siddha, Part-I.

1.	Sarakkndrai *(Cassia fistula* L)	DSRU(S)M
2.	Kamala *(Mallotus philippinensis)*	-do
3.	Omam *(Trachyspermum ammi* Sprague)	-do-
4.	Chenpakam *(Michelia champaca* L)	DSRU(S)T
5.	Anaikkandrimani *(Adananthera pavonina* L)	-do-
6.	Mudiyarkanthal *(Merremia tridontata)*	DSRU(S)B
7.	Arivalmuthan *(Sida acuta* L)	-do-
8.	Akkrottu *(Juglans regia)*	-do-
9.	Korai kizhangu *(Cyperus rotundus* L)	-do-
10.	Mulam *(Citrullus Vulgaris)*	DSRU(S)M

LITERARY RESEARCH PROGRAMME

The Literary Research Programme has been carriedout by the Literary Research and Documentation Department, Madras. The work carried out during this period is given below:

1. Proceeding of the study group meeting of role of Siddha experts in the diseases of National Importance.

Press copy has been prepared including preface and index. The proof correction work pertaining to 80 pages has been completed and the rest work is in progress.

2. Proceeding of the workshop on Kalanjaga Padai (Psoriasis).

Press copy has been prepared. The proof correction is in progress. Sofar, 70 pages has been completed.

3. Dhashinamoorthy paripoornam-1200

The correction work of Dhashinamoorthy paripoornam is in progress. So far 700 stanzas has been completed out of the total 1200 stanzas. The editing and preparation of press copy will be taken up after completion of the corrections.

4. Catalogue

The unit is engaged in preparing catalogue of Siddha manuscripts collected by it and so far 800 Siddha manuscripts has been listed in the catalogue on subjectwise/authorwise basis.

5. Rs. 10,899.70 has been collected on account of sale of Council's Publications has been deposited to the Headquarters Office.

PUBLICATION/PARTICIPATIONS

S.No.	Name of the author(s)	Title of the article(s)	Published/participated	Date of Publication
A. Clinical				
1.	Rajalakshi S, Sivanandam, G. Veluchamy G.	Effect of Kadugurohini *(Picrorbiza-kurroa Royle)* in the treatment of Viral hepatitis (A double blind study wuth placebo control).	J.R.A.S.	Vol. XIII No. 1-2 (1992)
2.	Samkari Rajagopal Meenakshi nathrs E. Gopa Kumar, K.	Siddha Maruthuvathil Vingena araychikalin Pangu	Souvenior of Siddha Maruthuva Marumalachi Manadu.	Dec., 1922
B.Drug				
3.	Chelladurai V. Albert Rajendran	Conservations of Medicinal Plants in Euphorbia Scrub Forest.	National Seminar on Environment and Education, Palayamkottai.	20.4.1992
4.	Chelladurai V. Albert Rajendran	Estimation of Forest degeneration in Kalakkadu Mundam thurai Tiger resceive.	-do-	-do-
5.	Chelladurai V.	Ved Thottamgalil valarkkapadum Mooligaigal (Tamil).	Avizthum Tamil monthly.	Sept., 1992.

S.No.	Name of the author(s)	Title of the article(s)	Published/participated	Date of Publication
6.	Chelladurai V. Apparananthen T. Sorna Subramania N.P.	Some special herbs of Kanyakumari Dist. (Tamil Nadu).	Conference of awaking of Siddha System of Medicine, Trichy.	20th to 30th Dec., 1992.
7.	Chelladurai V.	Asthma sivappu mooligalgel (Tamil).	Aviatham Tamil monthly	January, 1993
8.	Chelladurai V.	The need for conservation of Medicinal Plants in Tamil Nadu.	Wild life celebration Trichy	Oct., 1992
9.	Saraswathy A. Purushothaman K.K. Patra A. Dey, A.K., Kundu A.B.	Shoreaphenol from *Shorea robusta Garten.*	Tirunelveli Phytochemistry.	1992
10.	Sarasvathy A. Sankari R. Pappa V.A.	Standardisation of Elathi churanam.	44th Indian Pharmaceutical Congress, Bangalore	8-10th Jan., 1993
11.	Sarasvathy A. Sankari Rajagopal Pappa V.A. Purushothaman, K.K.	Standardisation of Siddha Compound formulation attaiccurnam	J.R.A.S.	Vol. XIII (1-2) 1992

S.No.	Name of the author(s)	Title of the article(s)	Published/participated	Date of Publication
12.	Sarasvathy A. Susan T. Gujarani M. Sukumar S.S. ,Veluchamy G.	Standardisation of Siddha Medicine used in Rheumatism.	International Seminar on Traditional Medicine A Challenge of Century Calcutta Challenge of Centuary Calcutta	19-21 Feb. 93. 7-9th Nov., 1992.
13.	Sarasvathy A. Susan T. Girija Rani M., Sukumar S.S.	Standardisation studies on some mercurid drugs of Siddha Medicine.	Rasa Sasthra Conference BHU, Varanasi.	19-21st. Feb., Feb. 1993.
14.	Santha J.R. Yoganarasimhan S.N. Pathan shetty, J.K. Suddha R. -	Pharma-Botanical studies of South Indian Market samples of Gajappili, *(Balanphora fungosa fast)*	B.M.E.B.R.	Vol. XIII (1-2) 1992.
C. Literary				
15.	Masilamani S.	Fundamental Principles, diagnostic Arthitis hygine and preventive methods in Siddha Medicine	St. Paul's Medical Academy. Tirupathy	Sept 1992

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