

Central Council for Research in Ayurveda & Siddha

MINISTRY OF HEALTH & FAMILY WELFARE
(GOVERNMENT OF INDIA)

13



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

**ANNUAL REPORT
1986-87**



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

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PREFACE

The Central Council for Research in Ayurveda and Siddha, an autonomous body under Ministry of Health and Family Welfare, Government of India is an apex body in India for the formulation, coordination, development and promotion of research on scientific lines in Ayurveda and Siddha. The Council carries out its objects and functions through the net work of Research Institutes and Centres functioning under its direct control and through a number of Units/ Enquiries located in Universities, Ayurveda/Siddha and Modern Medical Colleges etc. located in different parts of the country. During the reporting period the research studies covered the broader areas of Clinical Research, Health Care Research including Tribal Health Care Research, Drug Research, Medico-historical and Literary Research and Family Welfare Research. The programmes while continued have also been stepped up and new programmes formulated to meet the demands of Health for All by 2000 AD. The Programme Projection (1986-90) was circulated to facilitate the Institutes/Centres/ Units to suitably plan the programmes in the coming years. With a view to implement the programmes, projects functioning under the Council has taken a number of steps including development of research protocols/working papers, review and consolidation of the work carried out in different fields of research. Suitable measures to further augment the research activities have been taken so that the slant towards the result oriented goals may be palpable. A brief review of the research activities carried out during the period under review is reported hereunder:

Clinical Research

Clinical research studies on a variety of clinical conditions including Amavata (Rheumatoid arthritis), Sandhigatavata (Osteoarthritis), Pakshavadha (Hemiplegia), Gridhrasi (Sciatica), Khanja

and Pangu (Monoplegia and Paraplegia), Saisaveeyavata (Poliomyelitis), Amlapitta (Hyperacidity), Parinamasula (Duodenal ulcer), Annadravasula (Gastric ulcer), Grahani roga (Malabsorption syndrome), Krimi roga (Parasitic infestation), Tamak swasa (Bronchial asthma), Rakta pradar (Metrorrhagia), Sweta pradar (Leucorrhoea), Switra (Vitiligo), Pama (Scabies), Kitiba, Vicharchika (Oozing eczema), Madhumeha (Diabetes mellitus), Mutrakriccha (Dysuria) Sleepada (Filariasis), Vishamajwara (Malaria), Unmada (Schizophrenia), Arbuda vishesh (Cancer) and Galaganda (Goitre) in Ayurveda have been carried out. Valigunmam (Peptic ulcer), Putrunoi (Cancer), Manjal kamalai (Infective hepatitis), Sandhi vata soolai (Rheumatoid arthritis), Kalanjaga padai (Psoriasis), Vellainoi (Leucorrhoea), Peruveeru (Ascitis), Venkuttam (Leucoderma), and Neerazhivu (Diabetes mellitus) are some of the important disease conditions studied under Siddha System of Medicine. During the execution of this programme, medical aid to 3,72,350 patients (1,43,304 New 2,29,046 old) through Out Patient Departments and 3247 patients at In-door Patient Departments functioning at different Institutes/Centres of the Council have been provided. Steps have been taken to develop research protocols/working papers on the new programme envisaged in the Programme Projection 1986-90. Efforts have also been made to consolidate the work carried out so far and publish the same in the form of monographs. Six monographs on clinical research studies including the study of AYUSH-64 on malaria are in the press and are expected to be released shortly.

Health Care Research Programme

Health care research programme carried out by the Council consists of Service Oriented Survey and Surveillance Screening Programme, Community Health Care Research Programme and Tribal Health Care Research Programme. These programmes are modulated to have rural bias so that benefits of the research programme carried out can reach the grass root level. Under these programmes, team of research personnel visit each and every house in the villages selected/adopted and provide incidental medical aid besides collecting data pertaining to the nature and frequency of prevalent diseases, food habits with regard to different seasons, socio-economic factors, natural resources, the standard and types of treatment available to

the rural/ tribal folk. During the period under report, a population of 1,31,371 individuals pertaining to 122 villages including 49 tribal pockets have been covered and incidental medical aid provided to 52,183 patients. A monograph entitled "The study of Health Statistics under Mobile Clinical Research Programme (Ayurveda)" enlisting the details of the study over a population of 56,600 individuals pertaining to 57 villages have been published during the reporting period.

Drug Research

The Council has been carrying out Medico-botanical Survey, Cultivation of Medicinal Plants, inter-disciplinary research programmes like Pharmacognostical, Chemical, Pharmacological and Toxicological studies besides Drug Standardisation studies. Under Medico-botanical survey programme, 45 forest areas have been covered and 4951 herbarium specimens were added to the Herbarium in addition to the 43 drug specimens added to the Museum. Drug samples amounting to more than 830 Kg. including dry and fresh raw drugs were collected and supplied during the course of survey besides collecting 523 folk medical claims. About 300 medicinal species have been taken for experimental and large scale cultivation. Pharmacognostical studies of 16 drugs, Chemical studies of 29 drugs, Pharmacological and Toxicological studies of 45 drugs used in Ayurveda and Siddha System of Medicine have been carried out during the reporting period. Two expert group meetings were held at Ajmer and Jhansi to review and suggest suitable measures for the overall development of Guggulu Herbal Farm, Mangliawas and Medico-botanical survey programme being carried out by the Council. Recommendations made in these meetings are in the process of implementation. Efforts have also been made to consolidate the work carried out in the other fields of drug research resulting in compilation of a monograph on Phytochemical investigation of 205 drugs and a monograph on Pharmacological and Toxicological investigations of 246 drugs used in Ayurveda and Siddha. These monographs are being edited to make them suitable for printing.

Under Drug Standardisation research studies 111 single drugs, 26 finished products and six methods of manufacture have been studied besides laying analytical standards for 32 formulations used

in Ayurveda and Siddha. A monograph entitled "Pharmacopoeial Standards for Ayurvedic Formulations" is in the process of finalisation.

Literary Research

Literary research programme broadly covering medico-historical studies, collection and compilation of references relating to drugs and diseases from classical treatises, lexicographic works, contemporary literature and publications of Ayurveda, Siddha and Modern Sciences was continued further. In the field of revival and publication of ancient literature, publication of Astanga sangraha is nearing completion and publication of Sahasra yoga in Sanskrit and Hindi is in the process of printing. The Council is bringing out quarterly "Journal of Research in Ayurveda and Siddha", "Bulletin of Medico-Ethno-Botanical Research," "Bulletin of Indian Institute of History of Medicine" besides the News Letter. During the reporting period, a major portion of the backlog of these periodicals have been cleared.

Family Welfare Research Programme

Clinical screening and Pharmacological studies of the oral contraceptive agents are being carried out under this programme. 479 new cases besides 574 old cases carried forward from the previous year were studied for clinical evaluation of oral contraceptive agents like AYUSH AC-IV, K-capsule, Pippalyadi yoga and Vandhyavari. Pharmacological studies of Japakusum (*Hibiscus rosea sinensis*), Neem oil, and Aristak (*Sapindus trifoliatus*) have been carried out. A meeting of the officers working in this programme was also held to review the work carried out so far and suggest suitable measures for strengthening of this programme. Recommendations made by this group are being processed for implementation.

The Council's officials were the recipients of gold and silver medals by the august bodies for the outstanding research work/studies carried out by them in various fields under the aegis of the Council.



(V.N. PANDEY)

Director and Member Secretary,
Governing Body, CCRAS

Dated. August 20, 1987

ADMINISTRATIVE REPORT

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, 1987, the Membership of the Society and Governing Body of the Council were as under :

1. President : Smt. Mohsina Kidwai,
Union Minister for Health and
family Welfare (Upto 24-6-86).
: Shri P.V. Narasimha Rao,
Union Minister for Health and
Family Welfare w.e.f. 24-6-86.
2. Vice-President : Miss Saroj Khaparde,
Union Minister of State for
Health and Family Welfare (w.e.f.
12-5-1986).
- 3-5. Official Members : Shri S.S. Dhanoa, Secretary,
Union Ministry of Health and
Family Welfare.
: Shri S.K. Alok, Joint Secretary,
Incharge of ISM, Union Ministry
of Health and Family Welfare.
: Shri R.M. Bhargava, Joint
Secretary (FA), Union Ministry
of Health and Family Welfare
(upto 22-12-86 F.N.).
: Shri N.S. Bakshi, Joint Secretary
(FA) Union Ministry of Health
and Family Welfare (From
22-12-86 A.N).

- 6-16. Non Official Members : Prof. V.J. Thakar
: Prof. P.V. Sharma
: Dr. S.T. Gujar
: Vd. B.D. Triguna
: Vd. K.S. Warriar
: Vd. Nanak Chand Sharma
: Dr. Akhtar Hussain
: Dr. N.K. Bhide
: Dr. S.S. Gothoskar
: Dr. V. Subramanian
: Dr. J.R. Krishnamurthy
17. Director, : Dr. Swamy Ram Prakash
National Institute of
Ayurveda, Jaipur
18. Director, : Vacant
National Institute of
Siddha/Central Research
Institute (Siddha)
19. Member-Secretary : Vd. S.K. Mishra (upto 2-6-1986)
Dr. V.N. Pandey

During the period under report, the Governing Body met on 12th December, 1986 and decided among others the following important matters :

1. Desired that the establishment of Central Research Institute (Ay.), Bombay may be expedited.
2. Suggested that matter regarding scheme for merit promotion may be looked into by the committee to be constituted by Health Secretary.
3. Approved in principle the establishment of a Medicinal Plants Garden in the land offered by the Government of Tamil Nadu free of charge.
4. Approved the purchase of three-wheeler scooters one each for Central Research Institute (S), Madras and Central Research Institute (Ay.), Delhi.

5. Approved the construction of office building complex for Headquarters Offices of Research Councils at an estimated cost of Rs. 376.85 lakhs on the land allotted at Janakpuri.
6. Approved the grant of benefits of added years of service for pension in respect of scientific and technical personnel whose retirement age has been enhanced.
7. Authorised the Director to divert funds from Health budget to Family Welfare budget when needed in Council's interest subject to refund at the earliest.
8. Approved the detailed budget estimates and revised estimates for 1985-86 and Budget estimates 1986-87 in respect of C.C.R.A.S.
9. Approved the revised estimates of Rs. 4,62,368/- in respect of compound wall, garage and internal road of Indian Institute of Panchakarma, Cheruthuruthy.
10. Approved an estimated cost of Rs. 67,671/- for repairs/maintenance of buildings of Indian Institute of Panchakarma, Cheruthuruthy.
11. Authorised the Director to incur expenditure upto Rs. 50,000/- in each case for repairs of Council's buildings and other construction works through C.P.W.D./ State P.W.D./ Govt. agencies subject to availability of fund.
12. Approved the revised estimates of Rs. 1,99,836/- in respect of construction of compound wall on the land allotted to Regional Research Institute (Ay.) at Salt Lake, Calcutta for construction of Regional Research Institute complex.
13. Approved establishment of departmental canteen for the employees of the Headquarters Office/D.P.D., construction of a temporary shed at a cost of Rs. 10,000/- for the canteen, provision of a sum of Rs. 6,000/- from the budget of the Council to be placed at the disposal of the Managing Committee of the canteen and creation of essential posts for running the canteen and fixing suitable remuneration for them.

14. Approved the enhancement of honorarium for the Hony. Consultants from Rs. 500/- to Rs. 1000/- p.m. with effect from 12-12-1986 and grant of conveyance allowance in lieu of honorarium if specifically requested by them subject to the ceiling of honorarium of Rs. 1000/- p.m.
15. Approved the enhancement of revolving fund earmarked under 'Advances' from Rs. 3.40 lakhs to Rs. 8.40 lakhs in the Revised Estimates for 1986-87 and Rs. 4 lakhs during 1987-88 totalling Rs. 12.40 lakhs.
16. Approved condemnation of the existing dodge van of the Indian Institute of Kayachikitsa, Patiala and its disposal by public auction and purchase of diesel jeep at a cost of Rs. 1,29,933.08 in replacement of the van.
17. Approved participation of the Council in the 'Festival of India' Moscow during 1987 and an allocation of Rs. 50,000/- for the same.
18. Approved the proposal for undertaking Tissue Culture Studies at Jawaharlal Nehru Ayurvedic Medicinal Plants Garden and Herbarium, Pune on a few selected medicinal plants of Ayurvedic importance in close collaboration with National Chemical Laboratory and purchase of equipments and articles at a cost of Rs. 1,79,500/- for the purpose.
19. Approved the establishment of a Medicinal Plants Garden-cum-Demonstration Centre at Regional Research Centre, Itanagar.
20. Approved revision of the staff pattern of Literary Research Unit (Ay.), Thanjavur.
21. Approved the proposal to hold a Seminar/Workshop on Skin Disorders with special reference to Psoriasis for which a sum Rs. 1,14,000/- was sanctioned.
22. Approved the creation of a post of G.D.A. in the Clinical Research Unit (Siddha), New Delhi.
23. Approved the scheme for institution of awards and prizes for promoting research talent in the Council.

24. Approved the grant-in-aid enquiry on 'Documentation and Printing of Siddha Palm Leaf Manuscripts' submitted by Dr. (Mrs.) S. Prema, Associate Professor, Department of Siddha Medicine, Tamil University, Thanjavur at a cost of Rs. 23,600/- for a period of one year.
25. Approved the creation of one post each of Administrative Officer in the pay scale of Rs. 700-1300 (pre-revised) in all the six major Research Institutes.
26. Approved the estimates of Rs. 74,000/- for the construction of a temporary shed for Pharmacy and garage for Mobile Van of Indian Institute of Kayachikitsa, Patiala.
27. Approved the replacement of damaged/burnt electric wiring of Indian Institute of Kayachikitsa, Patiala at an estimated expenditure of Rs. 40,360/-.
28. Approved the proposal for repairs/maintenance of the building at Indian Institute of Kayachikitsa, Patiala at an estimated expenditure of Rs. 67,770/-.
29. Approved the proposal to undertake capital work at an estimated cost of Rs. 2,14,274/- in the Regional Research Centre (Ay.), Jhansi.
30. Approved the proposal to provide water proofing treatment in the office building of JNAMPG&H, Pune at a cost of Rs. 19,410/- as a deposit work.
31. Approved the proposal for enhancement of fellowship of Jr. Research Fellow and Sr. Research Fellow from Rs. 600/- to Rs. 1000/- p.m. and Rs. 800/- to Rs. 1200/- p.m. respectively from 12-12-1986.
32. Approved the revision of scale of pay of Field Attendant sanctioned in the Mobile Clinical Research Unit, Madras from Rs. 196-232 to Rs. 210-270 from 7-10-1986.
33. Approved the proposal for a post of Machine Operator-cum-Fitter in the scale of Rs. 210-270 in the Pharmacy of Regional Research Institute (Ay.), Calcutta.
34. Approved the proposal for creation of a post of Record Clerk in the scale of pay of Rs. 260-400 (pre-revised) in the Headquarters Office of the Council.
35. Approved the creation of one post each of Hindi Assistant (Translator) in the scale of pay of Rs. 425-800 (pre-revised) in

all the six major Research Institutes.

36. Approved the revised estimates 1986-87 and budget estimates for 1987-88 for the Council.
37. Ratified the adoption by circulation of the annual report and audited statement of accounts for the year 1984-85 and also adopted the annual report for the year 1985-86.
38. Approved the creation of two posts of Chowkidar in the pay scale of Rs. 196-232 (pre-revised) in Documentation and Publication Division, one post of Safaiwala in the scale of Rs. 196-232 in Regional Research Institute (DR), Trivandrum and one post of Chowkidar in the scale of Rs. 196-232 in the Regional Research Centre (Ay.), Jhansi.
39. Approved the appointment of Miss. E.V. Butler, Staff Nurse in the scale of pay of Rs. 425-640 (pre-revised) on regular basis with effect from 12-12-1986 and enhancement of the remuneration being paid to Miss Butler from Rs. 500/- at present to Rs. 1000/- with effect from 18-3-1986 to 11-12-1986.
40. Agreed in principle to delegate more powers to subordinate authorities like Finance Committee and Director of C.C.R.A.S.
41. Approved amendments to the Pension Rules and also to the Bye-Laws of the Council.
42. Approved the proposal to permit the employees of the Council to exercise fresh option to come over to pension scheme within a period of six months.
43. Agreed in principle for hiring of 6000 sq. ft. additional accommodation for the D.P.D. and Headquarters Office of the Council in the premises of All India Ayurvedic Congress at Punjabi Bagh subject to the rent being finalised by the Arbitrator to be appointed by the Health Secretary.
44. Approved the Arbitration Award in respect of Building No. S-10, Green Park Extension Market, New Delhi for enhancement of rent.
45. Approved the proposal to apply for land for Central Research Institute (Ay.), Delhi.

46. Approved the extension of the term of the grant-in-aid enquiry functioning at Amala Cancer Hospital and Research Centre at Trichur upto 31.3.1987.
47. Suggested that the Council should depict its activities through Video films apart from written documents for proper appreciation of the achievements and directed that efforts should be made to give publicity to the activities of the Council through Video coverage and short films so that development of ISM in the country could be focussed in the international forum also.

Finance Committee

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

- | | | |
|---|---|---------------------------------------|
| 1. Joint Secretary (ISM),
Ministry of Health and
Family Welfare | — | Shri S.K. Alok, Chairman. |
| 2. Dy. Secretary (IF),
Ministry of Health
and Family Welfare | — | Shri R.K. Jindal, Member. |
| 3. One Technical member to
represent Ayurveda | — | Vd. B D. Triguna. |
| 4. One technical member to
represent Siddha | — | Dr. J.R. Krishnamurthy. |
| 5. Director of the Council | — | Dr. V.N. Pandey.
Member Secretary. |

The Finance Committee met on 7.10.1986 during the reporting period and dealt with various financial aspects of the affairs of the Council.

Representation of Scheduled Castes/Scheduled Tribes in 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 Council is maintaining rosters in respect of all categories of staff according to the brochure on reservation of SC/ST candidates and recruitment/promotion is done strictly following the roster points. The Council is having a

total staff strength of 1566 employees and representation of SC/ST as on 1.1.1987 is as under :

Group	No. of employees	S.C.	percentage of total employees	S.T.	% of total employees
A	121	4	3.3	—	—
B	117	5	4.27	2	1.70
C	685	66	9.6	14	2.04
D	643	205	31.89	41	6.38
Total:	1566	280		57	

The Council is having seven Tribal Health Care Research Projects which have been specially located in tribal pockets. These programmes envisage a close scope not only to understand the local health problems and inter-dependent issues but also to identify and apply/advice 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 benefits have been extended to a large number of SC/ST population. The budget of the Council stipulates specific allocations for SC/ST component plans.

Official Language Implementation Committee

The Council is having an Official Language Implementation Committee under the chairmanship of the Director, CCRAS to review the position regarding implementation of Official Languages 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 17.9.86 and 27.2.87 and reviewed the progress made in the use of Hindi for the official purposes and made suitable recommendations for the progressive use of Hindi in the Council.

Scientific Advisory Committee (Ayurveda)

1. Dr. S.T. Gujar — Chairman
2. Vd. Nanak Chand Sharma — Member
3. Vd. B.D. Triguna — Member
4. Dr. P.K. Warriar — Member
5. Dr. K. Sadashiv Sharma — Member
6. Vd. Channabasappa — Member
7. Vd. S.K. Mishra — Member
8. Dr. A.V. Rama Rao — Member
9. Dr. S.K. Jain — Member
10. Dr. R.M. Verma — Member
11. Dr. N.K. Bhide — Member
12. Prof. P.V. Sharma — Member
13. Dr. S.P. Kinjawadekar — Member
14. Director, CCRAS — Member-Secretary

The Scientific Advisory Committee (Ay.) met thrice on 26th May, 1986, 25 Sept., 1986 and 8th March, 1987 during the period under report and evaluated various research programmes/schemes of the Council and provided necessary guidance.

Scientific Advisory Committee (Siddha)

1. Dr. J.R. Krishnamurthy — Chairman
2. Dr. A.M. Faisuddeen Ahmed — Member
3. Dr. R. Kannan — Member
4. Dr. A.V. Rama Rao — Member
5. Dr. N.K. Bhide — Member
6. Dr. V. Subramanian — Member
7. Director, CCRAS — Member-Secretary

The Scientific Advisory Committee (Siddha) met twice on 22nd August, 1986 and 9th March, 1987 during the period under report.

Organisational net work of the CCRAS

There are 12 Central/Regional Research Institutes, 10 Regional Research Centres, 26 Research Units, 5 Tribal Health Care Research Projects, one Documentation and Publication Division, 12 Family Welfare Research Units and one Research Project on Tibetan System

of Medicine besides, two Research Institutes, 10 Research Units and two Tribal Health Care Research Projects in Siddha System of Medicine. Besides 14 time-bound research enquiries were in operation.

Budget Provision

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

Scheme	Actual Expenditure 1985-86	Budget Estimates 1986-87	Revised Estimates 1986-87	Actual Expenditure 1986-87
	(Rs. in lakhs)			
Plan	45.57	110.00	87.50	75.60
Non-Plan	310.68	334.45	391.10	384.80
F.W.R.S.	9.99	33.00	9.40	12.87

Audited Statement of Accounts

The Accounts of the Council for the year 1986-87 were audited by D.A.C.R. (for the period from 1st April, 1986 to 31st March, 1987).

TECHNICAL REPORT—AYURVEDA

Abbreviations used for Institutes/Centres/Units

<i>S. No.</i>	<i>Institutes/Centres/Units</i>	<i>Abbreviations</i>
1	2	3
1.	Central Research Institute (Ay.), New Delhi	CRID
2.	Central Research Institute (Ay.), Bhubaneswar	CRIBh
3.	Central Research Institute (Ay.), Bombay	CRIB
4.	Indian Institute of Kayachikitsa, Patiala	IIKP
5.	Indian Institute of Panchkarma, Cheruthurthy	IIPC
6.	Regional Research Institute, (Ay.), Calcutta	RRIC
7.	Regional Research Institute, (Ay.), Patna	RRIP
8.	Regional Research Institute, (Ay.), Lucknow	RRIL
9.	Regional Research Institute, (Ay.), Gwalior	RRIG
10.	Regional Research Institute, (Ay.), Jaipur	RRIJ
11.	Regional Research Institute (Ay.), Junagadh	RRIJu
12.	Regional Research Institute (Ay.), Trivandrum	RRIT
13.	Regional Research Centre (Ay.), New Itanagar	RRCI
14.	Regional Research Centre (Ay.), Gauhati	RRCGa
15.	Regional Research Centre (Ay.), Gangtok	RRCG
16.	Regional Research Centre (Ay.), Mandi	RRCM
17.	Regional Research Centre (Ay.), Jammu	RRCJ
18.	Regional Research Centre (Ay.), Hastinapur	RRCH
19.	Regional Research Centre (Ay.), Jhansi	RRCJh
20.	Regional Research Centre (Ay.), Nagpur	RRCN
21.	Regional Research Centre (Ay.), Vijayawada	RRCV
22.	Regional Research Centre (Ay.), Bangalore	RRCB
23.	Mobile Clinical Research Unit, Jamnagar	MCRUJ
24.	Mobile Clinical Research Unit, Varanasi	MCRUV
25.	Dr. A. Lakshmiapati Research Centre for Ayurveda, V.H.S., Madras	ALRCAM

1	2	3
26.	Ayurvedic Research Unit, NIMH&NS, Bangalore	ARUB
27.	Clinical Research Unit (Ay.), Hyderabad	CRUH
28.	Clinical Research Unit (Ay.), Kottakal	CRUK
29.	Clinical Research Unit (Ayurvedic and Modern Team under CDRS), Bombay.	CDRSB
30.	Clinical Research Unit (Ayurvedic and Modern Team under CDRS), Pune.	CDRSP
31.	Clinical Research Unit (Ayurvedic and Modern Team under CDRS), Varanasi.	CDRSV
32.	Dietetics Research Scheme, R.A. Podar Ayurvedic College, Bombay.	DRSB
33.	Panchakarma Research Scheme, R.A. Podar Ayurvedic College, Bombay.	PRSB
34.	Amalgamated Units, Tarikhet	AUT
35.	Captain Srinivasamurthy Drug Research Institute for Ayurveda, Madras.	CSMDRIAM
36.	Jawahar Lal Nehru Ayurvedic Medicinal Plants Garden, Herbarium and Museum, Pune.	JNAMPGHP
37.	Clinical Research Unit under FWRP, Ahmedabad.	CRUFA
38.	Clinical Research Unit under FWRP, Trivandrum	CRUFT
39.	Clinical Research Unit under FWRP, Varanasi	CRUFV
40.	Clinical Research unit under FWRP, Bombay	CRUFB
41.	Pharmacological Research Unit under FWRP, Jamnagar	PhRUFJ
42.	Pharmacological Research Unit under FWRP, Varanasi	PhRUFV
43.	Pharmacological Research Unit under FWRP, Bhubaneshwar	PhRUFB
44.	Pharmacological Research Unit under FWRP, Trivandrum	PhRUFT
45.	Pharmacological Research Unit, Grant Medical College and Haffkine Institute, Bombay.	PhRUB
46.	Pharmacological Research Unit, Calcutta	PhRUC
47.	Pharmacological Research Unit, Lucknow	PhRUL

1	2	3
48.	Pharmacological Research Unit, Jodhpur	PhRUJ
49.	Pharmacological Research Unit, Varanasi	PhRUV
50.	Pharmacological Research Unit, Trivandrum	PhRUT
51.	Toxicity Research Unit, Grant Medical College, Bombay.	TRUB
52.	Toxicity Research Unit, Jhansi	TRUJh
53.	Chemical Research Unit, Calcutta	ChRUC
54.	Chemical Research Unit, Varanasi	ChRUV
55.	Chemical Research Unit, Hyderabad	ChRUH
56.	Chemical Research Unit, Lucknow	ChRUL
57.	Pharmacognosy Research Unit, Calcutta	PeRUC
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.), Andaman Nicobar	THCRPA
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	THCRPC
66.	Drug Standardisation Research Project, Jamnagar	DSRPJ
67.	Drug Standardisation Research Project, Varanasi	DSRPV
68.	Research Project in Tibetan System of Medicine, Leh	RPTSML
69.	Amla Cancer Hospital, Trichur	ACHT

CLINICAL RESEARCH

The Clinical Research in Ayurveda under the Council consists of clinical therapeutic trials on single drugs, compound formulations and simple herbomineral preparations on selected clinical conditions besides the field studies relating to Health Care Services through Service Oriented Survey and Surveillance Screening Programme, Community Health Care Research Programme and Tribal Health Care Research Programme. The present chapter provides the details of the work carried out under clinical therapeutic trials. As in the past clinical trials on different clinical conditions viz. Amavata (Rheumatoid arthritis), Sandhigataavata (Osteo-arthritis), Pakshavadha (Hemiplegia), Gridhrasi (Sciatica), Khanja and Pangu (Monoplegia and Paraplegia), Saisaveeyavata (Poliomyelitis), Amlapitta (Hyperacidity), Parinamasula (Duodenal ulcer), Annadravasula (Gastric ulcer), Grahani roga (Malabsorption syndrome), Krimi roga (Parasitic infestation), Tamak swasa (Bronchial asthma), Rakta pradar (Metrorrhagia), Sweta pradar (Leucorrhoea), Switra (Vitiligo), Pama (Scabies), Kitibha, Vicharchika (Oozing eczema), Madhumeha (Diabetes mellitus), Mutrakriccha (Dysuria), Slipada (Filariasis), Visham jwara (Malaria), Unmada (Schizophrenia) and Arbuda Vishash (Cancer) etc. were continued further. A brief review of each of these studies indicating the line of treatment, name of the Institute/Centre/Unit where the work is carried out together with the total number of cases of particular disease condition, included into the study and results thereof is provided hereunder.

Amavata (Rheumatoid arthritis)

The clinical trials on Amavata (Rheumatoid arthritis) were conducted at the CRI Delhi, Bhubaneshwar, IIP Cheruthuruthy, IIK Patiala, RRI Junagadh, Gwalior, Calcutta, Patna, RRC Itanagar and Jammu. A total number of 358 cases have been treated adopting different therapeutic approaches.

The following table summarises the details related to the line of approach and the number of cases treated together with the results.

Table

Results of clinical therapeutic trials of Ayurvedic preparations on Amavata (Rheumatoid arthritis) at a glance.

Sl. No.	Theraphy	Instt/ Centres	Total cases	Results					
				Comp. rel.	Mark. rel.	Mode. rel.	Mild rel.	No rel.	Drop out
1	2	3	4	5	6	7	8	9	10
1.	Vatari guggulu, Yogaraj guggulu, Vishatinduk vati, Kaishore guggulu, Rasnadi kwatha, Amavatari rasa.	CRID	35	7	5	12	2	2	7
2.	Sunthi guggulu with Balukasweda.	CRIB	14	1	4	5	—	—	4
3A.	Vachadi, Haridradi and Vetumaran tablet.	IIPC	33	9	4	2	—	2	16
B.	Simhanada guggulu.		15	5	2	1	—	1	6

Contd.

Mark.—Marked
rel.—relief
Mode.—Moderate

1	2	3	4	5	6	7	8	9	10
4.	Yogaraj guggulu, Rasna saptaka kwatha and Patra pinda sweda.	IHKP	110	—	2	47	18	8	35
5.	Amavatari rasa, Lepa gutika and Baluka sweda.	RRIJu	29	1	4	8	9	2	5
6.	Simhanada guggulu, Lahsunadi vati, Mahanaryana taila and Baluka sweda.	RRIG	10	—	—	3	4	1	2
7A.	Nishindha guggulu.	RRIC	21	—	4	2	5	3	7
B.	Sunthi guggulu.		3	1	—	2	—	—	—
C.	Mustak churna with Baluka sweda.		15	—	—	2	2	—	11
8A.	Yogaraj guggulu and Sameer pannaga rasa.	RRIP	5	—	2	1	—	—	2
B.	Yogaraj guggulu, Sameer pannaga rasa and Saindhawadi taila externally.		41	2	5	6	9	5	14
9A.	Nirgundiyadi churna and Prasarni taila/ Mahanarayana taila.	RRCI	12	—	—	3	3	3	3

Contd.

1	2	3	4	5	6	7	8	9	10
B.	Mahayogaraj guggulu, Maharasanadi kwatha and Maha vishgarbha taila/ Mahanarayana taila.		1	—	1	—	—	—	—
10A.	Trikustha guggulu tablets.	RRCJ	11	1	1	1	1	4	3
B.	Trikustha gug- gulu tablets and Kustha taila for local snehan.		3	—	—	1	1	1	1
Total :			358	27	34	96	54	31	116

Sandhigatavata (Osteo-arthritis)

The clinical trials on Sandhigatavata (Osteo-arthritis) were conducted at the RRI Gwalior, Calcutta and RRC Jammu. A total number of 23 cases have been treated adopting different therapeutic approaches. The following table summarises the details related to the line of approach and the number of cases treated together with the results.

Table

Results of clinical therapeutic trials of Ayurvedic preparations on Sandhigatavata (Osteo-arthritis) at a glance.

Sl. No.	Therapy	Instt./ Centres	Total cases	Results					
				Comp. rel.	Marked rel.	Mode. rel.	Mild rel.	No Drop out	
1	2	3	4	5	6	7	8	9	10
1.	Simhanad guggulu, Lasunadi vati, Mahanarayan taila, and Baluka sweda.	RRIG	11	—	1	3	7	—	—

Contd.

1	2	3	4	5	6	7	8	9	10
2.	Yogaraj guggulu.	RRIC	9	—	2	—	3	—	4
3A.	Trikustha tablets.	RRCJ	2	1	—	—	—	—	1
	B. Trikustha guggulu tablets and kustha taila for local snehan.		1	1	—	—	—	—	—
Total :			23	2	3	3	10	—	5

Pakshavadha (Hemiplegia)

The clinical trials on Pakshavadha (Hemiplegia) were conducted at the CRI Delhi, Bhubaneshwar, IIP Cheruthuruthy and IIK Patiala. A total number of 142 cases have been treated adopting different therapeutic approaches. The following table summarises the details related to the line of approach and the number of cases treated together with the results.

Table

Results of clinical therapeutic trials of Ayurvedic preparations on Pakshavadha (Hemiplegia) at a glance.

Sl. No.	Therapy	Instt./ Centres	Total cases	Results					
				Comp. rel.	Marked rel.	Mod. rel.	Mild rel.	No rel.	Drop out
1	2	3	4	5	6	7	8	9	10
1.	Ekangvira rasa, Masha taila and Dashmula baspa sweda.	CRID	13	1	—	5	—	2	5
2A.	Hingutriguna taila.	CRIB	3	—	1	2	—	—	—

Contd.

1	2	3	4	4	6	7	8	9	10
B. Katuki guggulu.			2	—	—	1	—	1	—
3A. J.J.* taila internally and externally.	IIPC		18	—	—	1	3	9	5
B. J.J. taila internally			26	—	—	1	4	12	9
C. Masha taila internally with Panchakarma therapy.			23	—	1	—	6	3	13
D. Masha taila internally and externally with Panchakarma therapy.			19	—	—	3	4	4	8
4A. Yogaraj guggulu, Rasna saptak kwatha and Abhyanga with Mahanarayan taila.	IIKP		26	—	1	5	6	2	12
B. Abhrak bhasma, Pravala pisti and Abyanga with Mahanarayana taila.			12	—	—	—	7	—	5
Total :			142	1	3	18	30	33	57

Gridhrasi (Sciatica)

The clinical trails on Gridhrasi (Sciatica) were conducted at the CRI Delhi, Bhubaneshwar, IIP Cheruthuruthy, RRI Jaipur and Calcutta. A total number of 44 cases have been treated adopting different therapeutic approaches. The following table summarises the details related to the line of approach and the number of cases treated together with the results.

*J.J.=Jatamansi and Jyotishmathy.

Table

**Results of clinical therapeutic trails of Ayurvedic preparations
on Gridhrasi (Sciatica) at a glance.**

S. No.	Therapy	Instt./ Centres	Total cases	Results					
				Comp. rel.	Marked rel.	Mode. rel.	Mild rel.	No Drop rel.	Drop out
1.	Sudha bhallataka.	CRID	18	8	—	6	—	4	—
2.	Eranda taila.	CRIB	2	—	1	—	—	1	—
3.	A. Samana with P.V. taila.	IIPC	3	—	1	1	—	1	—
	B. P.M. kwatha internally and P.V. taila externally.		3	—	1	1	1	—	—
	C. Panchakarma with P.V. taila.		3	2	—	1	—	—	—
	D. Panchakarma and Samana with P.V. taila.		1	—	—	—	1	—	—
4.	Sephali patra ghansatva.	RRIJ	5	3	—	—	1	—	1
5.	Vatagajankush rasa.	RRIC	9	—	4	—	—	1	4
Total :			44	13	7	9	3	7	5

P.V.=Prabhanjana vimardanam

P.M.=Placebo

Saisaveeyavata (Poliomyelitis)

The clinical trials on Saisaveeyavata (Poliomyelitis) were conducted at CRI Delhi and IIP Cheruthuruthy. A total number of 65 cases have been treated adopting different therapeutic approaches. The following table summarises the details related to the line of approach and the number of cases treated together with the results.

Table

Results of clinical therapeutic trails of Ayurvedic preparations on Saisaveeyavata (Poliomyelitis) at a glance.

Sl. No.	Therapy	Instt./ Centres	Total cases	Results					
				Comp. rel.	Mark. rel.	Mode. rel.	Mild rel.	No. rel.	Drop out
1.	Ekgavira rasa internally and Masha taila externally.	CRID	38	4	—	15	—	3	16
2. A.	Balaswagan-dadi taila internally and externally.	IIPC	6	—	2	1	2	1	—
B.	P.M. kwatha internally and Balaswagandadi taila externally.		7	—	—	2	3	2	—
C.	P.M. kwatha internally, Balaswagandadi taila externally and Shashtikasali pinda sweda.		11	1	—	1	9	—	—
D.	Balaswagandadi taila internally and externally with Shashtikasali pinda sweda.		3	—	—	—	3	—	—
Total :			65	5	2	19	17	6	16

Khanja and Pangu (Monoplegia and Paraplegia)

The clinical trial on Khanja and Pangu (Monoplegia and paraplegia) was conducted at the IIP Cheruthuruthy. A total number of 27 cases have been treated adopting different therapeutic approaches. The following table summarises the details related to the line of approach and the number of cases treated together with the results.

Table
Results of clinical therapeutic trials of Ayurvedic preparations on Khanja and Pangu (Monoplegia and Paraplegia) at a glance.

Sl. No.	Therapy Instt./ Centres	Total cases	Results						
			Comp. rel.	Mark. rel.	Mode. rel.	Mild rel.	No Drop out	Death	
1A.	Samana with P.V. taila	IIPC 7	—	—	1	5	—	—	1
B.	P.M. kwatha internally and P.V. taila externally.	8	—	—	1	3	4	—	—
C.	Panchakarma with P.V. taila.	4	—	—	3	1	—	—	—
D.	Panchakarma and Samana with P.V. taila.	8	—	—	—	6	1	1	—
Total :		27	—	—	5	15	5	1	1

Panchakarma Chikitsa

PRSB

Ereastwhile Panchakarma Research Unit, Bombay now merged with CRI (Ay.) Bombay has continued the study on the effect of Panchakarma Chikitsa on certain Vatavyadhis. During the reporting period 30 patients were included into the study. Out of these Snehana/Swedana was performed in four patients, Vamana karma in two patients, Virechana in seven, Basti in one, Siro-basti in two, Nasya in eight and Pinda/Baluka/Nadi sweda was performed in six

patients. Poorvakarma in the form of Snehana/Swedana was performed in almost all the cases besides administration of some oral drugs and yogic exercises in some cases. The results of the study are reported hereunder.

Table

Sl. No.	Disease	Results of treatment					
		Comp. rel.	Marked rel.	Mode. rel.	Mild rel.	No Drop rel.	Total out
1.	Pakshavadha	—	1	9	9	—	21
2.	Ardita	—	—	1	—	—	2
3.	Kampavata	—	—	2	—	—	3
4.	Ababauka	—	—	—	1	—	1
5.	Other Vatavyadhis	—	—	—	2	—	3

Amlapitta (Hyperacidity)

The clinical trials on Amlapitta (Hyperacidity) were conducted at the CRI Delhi, Bhubaneshwar, RRI Junagadh, RRC Mandi and CRU Hyderabad. A total number of 147 cases have been treated adopting different therapeutic approaches. The following table summarises the details related to the line of approach and the number of cases treated together with the results.

Table

Results of clinical therapeutic trials of Ayurvedic preparations on Amlapitta (Hyperacidity) at a glance.

Sl. No.	Therapy	Instt./ Centres	Total cases	Results					
				Comp. relf.	Marked rel.	Mode. rel.	Mild rel.	No Drop rel.	Total out
1	2	3	4	5	6	7	8	9	10
1A.	Satavari	CRID	6	—	—	3	—	1	2
B.	Satavari yoga		3	—	1	—	—	—	2
C.	Satavari yoga, Kamadugha and Sutasekhar rasa.		8	2	4	1	—	—	1

Contd.

1	2	3	4	5	6	7	8	9	10
2.	Sutasekhar rasa, Dhatri loha and Kamadugha rasa.	CRIB	5	2	—	2 (P.R.)*	—	—	1
3.	Kamadugha rasa, Godanti bhasma, Shatavari churna, Guduchi churna.	RRIJu	37	1	12	13	7	2	2
4A.	Sutasekhar rasa Shankha bhasma and Jahar- mohra pisti.	RRCM	65	3	2	5	12	2	41
B.	Avipattikara churna and Sutase- khar rasa.		14	—	2	2	2	1	7
5.	Amasaya sodhan chikitsa	CRUH							
A.	Amasaya sodhan (A course of ten).		1	—	—	—	1	—	—
B.	Amasaya sodhan (A course of five)		8	—	—	1	3	—	4
Total :			147	8	21	27	25	6	60

Parinamasula (Duodenal ulcer)

The clinical trials on Parinamasula (Duodenal ulcer) were conducted at the CRI Bhubaneshwer, RRI Trivandrum, RRC Itanagar, CRU kottakal, Hyderabad and CDRS (AT & MT), Bombay. A total number of 287 cases have been treated adopting different therapeutic approaches. The following table summarises the details related to the line of approach and the number of cases treated together with the results.

*P.R. = Partial Relief.

Table

Results of clinical therapeutic trials of Ayurvedic preparations on Parinamasula (Duodenal ulcer) at a glance.

Sl. No.	Therapy	Instt./ Total		Results					
		Centres	cases	Comp. rel.	Mark. rel.	Mod. rel.	Mild rel.	No Drop rel.	Drop out
1	2	3	4	5	6	7	8	9	10
1.	Sutasekhar rasa, Dhatri loha and Kamadugha rasa.	CRIB	29	17	—	2 (P.R.)	—	1	9
2.	Nimbidin	RRIT	7	4	2	—	—	—	1
3A.	Yastimadhu churna, Kaparadika bhasma/Varantika bhasma.	RRCI	8	—	1	2	1	—	4
B.	Sutasekhar rasa, Dhatri loha and Avipattikar churna.		12	1	—	2	3	2	4
4A.	Indukanta ghrita (Sodhan and samana).	CRUK	29	28	—	—	—	1	—
B.	Indukanta ghrita (Samana).		21	16	—	2 (P.R.)	—	3	—
C.	Mahatiktaka ghrita (Sodhan and samana).	CRUK	39	36	—	2 (P.R.)	—	1	—
D.	Mahatiktaka ghrita (Samana).		20	13	—	4 (P.R.)	—	3	—
E.	Placebo.		32	—	—	—	—	32	—

Contd.

*P.R. = Partial Relief.

1	2	3	4	5	6	7	8	9	10
5.	Amasaya CRUH sodhan chikitsa.								
A.	Amasaya sodhan (A course of ten).	24	11	3	—	7	—	3	
B.	Amasaya sodhan (A course of five).	60	21	—	2	10	—	27	
6.	Sutasekhar CDRSB rasa.	6	2	—	1	—	1	2	
					(P.R.)				
Total :		287	149	6	17	21	44	50	

Annadravasula (Gastric ulcer)

The clinical trials on Annadravasula (Gastric ulcer) were conducted at the RRC Itanagar, CRU Hyderabad and Kottakal. A total number of 41 cases have been treated adopting different therapeutic approaches. The following table summarises the details related to the line of approach and the number of cases treated together with the results.

Table

Results of clinical therapeutic trials of Ayurvedic preparations on Annadravasula (Gastric ulcer) at a glance

Sl. No.	Therapy	Instt./ Centres	Total cases	Results					
				Comp. rel.	Marked rel.	Mode. rel.	Mild rel.	No rel.	Drop out
1	2	3	4	5	6	7	8	9	10
1A.	Yasthi-madhu churna, Kaparadika bhasma/Varantika bhasma.	RRCI	17	—	1	4	2	—	10
B.	Sutasekhar rasa, Dhatri loha and Avipattikar churna.		6	1	1	1	2	—	1

Contd.,

1	2	3	4	5	6	7	8	9	10
2A.	Indukanta ghrita (Sodhan and samana).	CRUK	4	2	—	1 (P.R.)*	—	1	—
B.	Indukanta ghrita (Samana).		2	1	—	1 (P.R.)	—	—	—
C.	Mahatiktaka ghrita (Sodhan and samana).		6	5	—	1 (P.R.)	—	—	—
D.	Mahatiktaka ghrita (Samana).		2	2	—	—	—	—	—
E.	Placebo.		2	—	—	—	—	2	—
3.	Amasaya sodhan chikitsa.	CRUH							
A.	Amasaya sodhan (A course of ten).		1	1	—	—	—	—	—
B.	Amasaya sodhan (A course of five).		1	1	—	—	—	—	—
Total :			41	13	2	8	4	3	11

Atisara (Diarrhoea)

CRID

The clinical therapeutic trial on Atisara (Diarrhoea) was conducted at CRI Delhi, using Kutajadi vishesh yoga, Panchamrita parpati and Chitrakadi vati. A total number of five cases were included into the study, out of which three cases got complete relief and one showed mild relief. The remaining one patient discontinued the treatment.

Pravahika (Dysentery)

The clinical trials on Pravahika (Dysentery) were conducted at the CRI Delhi and RRC Gangtok. A total number of 135 cases

*P.R. = Partial Relief.

have been treated adopting different therapeutic approaches. The following table summarises the details related to the line of approach and the number of cases treated together with the results.

Table
Results of clinical therapeutic trials of Ayurvedic preparations on Pravahika (Dysentery) at a glance.

Sl. No.	Therapy	Instt./ Centres	Total cases	Results					
				Comp. rel.	Marked rel.	Mode. rel.	Mild rel.	No Drop out	
1.	A. Jatiphaladi churna.	CRID	7	5	—	2	—	—	—
	B. Avartani churna.		2	1	—	1	—	—	—
2.	Jatiphaladi churna, Mahashankavati, Chitrakadi vati and Hingwastak churna.	RRCG	126	35	29	26	36	—	—
Total :			135	41	29	29	36	—	—

Grahani Roga (Malabsorption syndrome)

The clinical trials on Grahani roga (Malabsorption syndrome) were conducted at the CRI Delhi, Bhubaneshwar, RRI Lucknow and Gwalior. A total number of 66 cases have been treated adopting different therapeutic approaches. The following table summarises the details related to the line of approach and the number of cases treated together with the results.

Table

**Results of clinical therapeutic trials of Ayurvedic preparations
on Grahani roga (Malabsorption syndrome) at a glance.**

Sl. No.	Therapy Instt./ Centres	Total cases	Results						
			Com-lete rel.	Mark. rel.	Mode. rel.	Mild rel.	No Drop rel.	Death out	
1.	Kutajadi CRID vishesh yoga, Panchamrit parpati, Chitra- kadi vati.	13	5	2	1	4	1	—	—
2.	Sunthi CRIB churna.	12	3	—	3	—	—	5	1
					(P.R.)				
3.	Bilva RRIL churna and Kutaj churna.	2	—	—	1	1	—	—	—
4.	Pancha- RRIG mrit parpati, Chitrakadi vati and Mustakarista.	39	—	3	5	8	7	16	—
Total :		66	8	5	10	13	8	21	1

Jeerna Pravahika (Mucous colitis)

The clinical trials on Jeerna Pravahika (Mucous colitis) were conducted at the RRI Calcutta and Trivandrum. A total number of 27 cases have been treated adopting different therapeutic approaches. The following table summarises the details related to the line of approach and the number of cases treated together with the results.

Table

**Results of clinical therapeutic trials of Ayurvedic preparations
on Jeerna Pravahika (Mucous colitis) at a glance.**

Sl. No.	Therapy	Instt./ Total Centres cases	Results					
			Comp. rel.	Marked rel.	Moderate rel.	Mild rel.	No rel.	Drop out
1.	Panchamrita parpati, Hinguwastak churna and Shankha bhasma.	RRIC 23	1	1	—	1	2	18
2.	Panchamrita parpati.	RRIT 4	2	1	—	—	—	1
Total :			3	2	—	1	2	19

Kamala (Jaundice)

The clinical trials on Kamala (Jaundice) were conducted at RRI Lucknow and RRC Mandi. A total number of five cases were included into the study. The treatment group consisted of Punarnava mandoor, Arogyavardhini vati and Kumariasava. The treatment provided showed marked relief in two cases and moderate relief in one case, while remaining two cases discontinued the study.

Yakrit Daludar (Liver enlargement)

The Clinical therapeutic trial on Yakrit Daludar (liver enlargement) was conducted at CRI Delhi using Ksharpunkha bhasma, Arogyavardhini vati with the kwatha of Varun, Sigru and Sada bahar. Out of 13 cases included into the study, five cases got complete relief, one case showed marked and one showed moderate relief, mild relief was observed in four cases and one case showed no relief. One patient discontinued the study.

Pandu Roga (Anaemia)

The clinical therapeutic trial on Pandu roga (Anaemia) was conducted at IIP Cheruthuruthy. The treatment groups consisted of Bhrungaraja churna and Vyosadi kashaya churna. Since only five cases were included in both of these groups, no specific conclusion could be drawn. The study is in progress.

Arsha (Piles)

The Clinical trial on Arsha (Piles) was conducted at IIK Patiala using Arshari vati. Out of the 38 cases included into this study, marked relief was observed in four cases, moderate relief in six and mild relief in eight cases. Remaining 20 cases discontinued the study.

Krimi Roga (Parasitic Infestation)

The clinical trials on Krimi roga (Parasitic infestation) were conducted at the IIK Patiala, RRI Jaipur, Lucknow, Patna, RRC Itanagar, Mandi and Nagpur. A total number of 258 cases have been treated adopting different therapeutic approaches. The following table summarises the details related to the line of approach and the number of cases treated together with the results.

Table

Results of clinical therapeutic trials of Ayurvedic preparations on Krimi roga (Parasitic infestation) at a glance.

Sl. No.	Theraphy	Instt./ Centres	Total cases	Results					
				Comp. rel.	Marked rel.	Mode. rel.	Mild rel.	No rel.	Drop out
1	2	3	4	5	6	7	8	9	10
1.	Kampil-laka churna.	IIKP	27	8	4	—	—	2	13
2.	Aralu ghansatva.	RRIJ	8	2	—	—	1	—	5
3.	Krimimudgar rasa, Bilva churna, Palas beeja churna and Kutaj churna.	RRIL	9	—	—	1	6	—	2

Contd.

1	2	3	4	5	6	7	8	9	10
4.	Krimimudgar RRIP rasa.	68	6	—	—	60	—	2	
5A.	Palasa beeja RRCI churna.	26	11	—	—	—	1	14	
B.	Vidanga beeja churna.		4	3	—	—	—	1	—
C.	Krimimudgar rasa.		4	1	—	—	—	1	2
6A.	Kampillaka RRCM churna.	31	7	—	2	1	—	21	
B.	Krimimudgar rasa.		72	4	1	8	11	—	48
7A.	Kampillaka RRCN churna.	5	2	—	—	—	—	3	
B.	Krimimudgar rasa.	4	3	—	—	—	—	1	
Total :			258	47	5	11	79	5	111

Giardiasis and Entamoeba histolitica

The clinical therapeutic trial on this disease condition was carried out by CRU (Ay.), Kottakal using Dadimastaka churna. A total number of 15 cases were included into the study, out of which 12 cases got complete relief and three cases got partial relief.

Tamak Swasa (Bronchial asthma)

The clinical trials on Tamak swasa (Bronchial asthma) were conducted at CRI Delhi, Bhubaneshwar, IIP cheruthuruthy IIK Patiala, RRI Junagadh, Lucknow, Gwalior, Patna, RRC Itanagar and Vijayawadha. A total number of 536 cases have been treated adopting different therapeutic approaches. The following table summarises the details related to the line of approach and the number of cases treated together with the results.

Table

Results of clinical therapeutic trials of Ayurvedic preparations on Tamak swasa (Bronchial asthma) at a glance.

Sl. No.	Therapy	Instt./ Centres	Total cases	Results					
				Comp. rel.	Marked rel.	Mode. rel.	Mild rel.	No rel.	Drop out
1	2	3	4	5	6	7	8	9	10
1.	Kramavar-dhman pippali	CRID	46	—	7	10	5	14	10
2.	Swasa kuthar rasa, Sitopladi churna, Talisadi churna, Vasavalaha and Kanakasava.	CRIBh	13	3	7	—	—	—	3
3A.	Dasamoolarishta, Kanakasava, Dhanwantharam pill and Vamana.	IIPC	3	1	1	—	—	—	1
	B. Agastyahareetaki, Dasamoola ka tuthrayam and Dhanwantharam pill.		2	—	—	1	—	1	—
4A.	Nardiya laxmivilas rasa mishran.	IHKP	61	—	—	20	9	6	26
	B. Swasa kuthar rasa mishran.		7	—	1	2	2	—	2
	C. IIKC—3*.		4	—	—	—	1	—	3
5A.	Kantakari lavan.	RRIJu	4	—	1	—	2	—	1
	B. Kantakari bibhitaki.		16	—	1	9	2	4	—

Contd.

*Containing Somalata, Shringi, Pushkarmool, Tankan and Bharangi chhal.

1	2	3	4	5	6	7	8	9	10
6.	Somalata churna, Swasa kuthar rasa and Shringarabha.	RRIL	34	—	—	2	14	6	12
7A.	Somalata churna.	RRIG	52	—	6	15	14	13	4
B.	Swasa kuthar rasa, Talisadi churna, Chandra- mrut rasa and Sudha tankan.		48	—	3	8	20	12	5
8A.	Haridra khanda.	RRIP	14	—	2	7	3	—	2
B.	Haridra khanda and Sameer pannaga rasa.		168	—	19	34	75	5	35
9A.	Kantakari- yadi churna and Sitopaladi churna.	RRCI	18	1	2	2	4	4	5
B.	Swasa kuthar rasa, Kantkariyadi avaleha and Tali- sadi churna.		5	2	1	1	1	—	—
10A.	Lasuna haridra.	RRCV	25	8	7	—	—	1	9
B.	Lasuna, Haridra, Yasthi churna.		16	1	3	2	—	—	10
Total :			536	16	61	113	152	66	128

Pratishyaya (Common cold)

The clinical therapeutic trial on Pratishyaya (Common cold) was conducted at RRC, Bangalore using compound preparation containing Pippali, Maricha, Sunthi, Rasa sindura, Tamboola patra and Tulasi patra swarasa. The study conducted on 42 patients showed

complete relief in 17 patients, marked relief in two and moderate relief in ten patients while three patients each showed mild and no relief. Remaining seven cases discontinued the study.

Jeerna Pratishyaya (Sinusitis)

The clinical therapeutic trial on Jeerna pratishyaya (Sinusitis) was conducted at IIP Cheruthuruthy using Tribhuvana keerti rasa in one group containing eleven cases and Trirasa in another group containing eight cases. The study showed that in the first group two cases each got marked relief and moderate relief while one case each showed mild relief and no relief. Remaining five cases in this group discontinued the study.

In the second group two cases each got marked relief, moderate relief and mild relief while remaining two cases discontinued the study.

Sweta Pradara (Leucorrhoea)

The clinical trials on Sweta pradara (Leucorrhoea) were conducted at the CRI Delhi, Bhubaneshwar, RRI Junagadh and Gwalior. A total number of 113 cases have been treated adopting different therapeutic approaches. The following table summarises the details related to the line of approach and the number of cases treated together with the results :

Table

Results of clinical therapeutic trials of Ayurvedic preparations on Sweta pradara (Leucorrhoea) at a glance.

Sl. No.	Therapy Centres	Instt./ cases	Total	Results					
				Comp. rel.	Marked rel.	Moderate rel.	Mild rel.	No rel.	Drop out
1	2	3	4	5	6	7	8	9	10
1A	katanda c bhasma.	CRID	18	1	6	5	3	—	3
B	yanuga na.		14	1	1	4	4	1	3
2.	agandha churna and Patrangasava.	CRIBh	4	—	—	1	2	—	1

Contd.

1	2	3	4	5	6	7	8	9	10
3.	Shatavari churna and Godanti bhasma.	RRIJu	45	1	7	21	5	—	11
4.	Arogya- vardhini, Chanda- nadi loha and Harada churna.	RRIG	32	8	2	1	—	1	20
Total :			113	11	16	32	14	2	38

Rakta Pradara (Metrorrhagia)

The clinical trials on Rakta pradara (Metrorrhagia) was conducted at the CRI Delhi and IIK Patiala. A total number of 61 cases have been treated adopting different therapeutic approaches. The following table summarises the details related to the line of approach and the number of cases treated together with the results:

Table

Results of clinical therapeutic trials of Ayurvedic preparations on Rakta pradara (Metrorrhagia) at a glance.

Sl. No.	Therapy	Instt./ Centres	Total cases	Results					
				Comp. rel.	Marked rel.	Mode. rel.	Mild rel.	No rel.	Drop out
1.	Dhatriyadi churna and Praval pisti.	CRID	27	11	4	9	—	2	1
2.	IIKC—II*	IIKP	34	6	1	6	1	2	18
Total :			61	17	5	15	1	4	19

Three cases of Asrigdara were also studied at CRI Bhubaneshwar using Kamadugha rasa.

Kastartava (Dysmenorrhoea)

The clinical trial on Kastartava (Dysmenorrhoea) was conducted at IIK, Patiala using Pushyanugachurna and Prataplankeshwar rasa on 39 patients. The study showed complete relief and moderate relief in five patients each while 29 patients showed marked relief.

*Containing Mocharas, Praval bhasma, Gairika, Makshika bhasma and Shankhjirk.

Yonivyapada

The clinical trial on Yonivyapada was conducted at the CRI, Delhi. A total number of 27 cases were included into the study and divided into two groups. Kaishora guggulu, Dashmula kwatha and douche with Jatyadi taila was provided in one group consisting of five patients, out of which one patient each showed marked and moderate relief while remaining three patients discontinued the study.

The second group consisting of 22 patients was provided with Kaishora guggulu, Panchvalkala kwatha and douche with Jatyadi taila. The study showed complete relief in one patient, marked relief in two and moderate relief in seven patients, while six patients got mild relief and two patients got no relief. Remaining four patients discontinued the study.

Medoroga (Obesity)

The clinical therapeutic trial on Medoroga (Obesity) was conducted at RRC Mandi. A total number of 23 cases were included into the study and divided into two groups. One group consisting of 18 cases was treated with AYUSH—55, out of which moderate and no relief was observed in one case each while seven cases got mild relief. Remaining nine cases discontinued the study.

The second group consisting of five cases was treated with Arogyavardhini, Swetaparpati, Goksuradi guggulu and Punarnavasava, out of which one patient each got moderate and mild relief. Remaining three cases discontinued the study.

Madhumeha (Diabetes mellitus)

The clinical trials on Madhumeha (Diabetes mellitus) were conducted at the CRI Delhi, IIK Patiala, RRI Calcutta and CRU Kottakal. A total number of 100 cases have been treated adopting different therapeutic approaches. The following table summarises the details related to the line of approach and the number of cases treated together with the results :

Table
**Results of clinical therapeutic trials of Ayurvedic preparations
on Madhumeha (Diabetes mellitus) at a glance.**

Sl. No.	Therapy	Instt./ Centres	Total cases	Results				
				Good control	Marked control	Border control	No Drop cont.	Drop out
1.	AYUSH-82 and Shudha shilajita.	CRID	64	34	14	—	4	12
2.	Chandraprabha vati and Arjuna vati.	IIKP	21	—	1	3	6	11
3.	Nimbavati.	RRIC	11	—	6	—	2	3
4.	Katakakhadi-radi kasaya.	CRUK	4	1	—	3	—	—
Total:			100	35	21	6	12	26

Mutra Kriccha (Dysuria)

The clinical trials on Mutra kriccha (Dysuria) were conducted at the CRI Delhi, RRI Patna and RRC Mandi. A total number of 38 cases have been treated adopting different therapeutic approaches. The following table summarises the details related to the line of approach and the number of cases treated together with the results.

Table
**Results of clinical therapeutic trials of Ayurvedic preparations
on Mutra Kriccha (Dysuria) at a glance.**

Sl. No.	Therapy	Instt./ Centres	Total cases	Results					
				Comp. rel.	Marked rel.	Mode. rel.	Mild rel.	No Drop rel. out	
1A.	Pasanbheda ghansatva.	CRID	7	—	3	1	—	1	2
B.	Trikantkadi kwatha.		12	—	3	6	2	1	—

Contd.

1	2	3	4	5	6	7	8	9	10
2.	Goksuradi guggulu, Swet parpati and Chandanasava.	RRIP	17	2	4	3	—	—	8
3.	Pasanbhedadi kwatha.	RRCM	2	—	—	—	1	—	1
Total :			38	2	10	10	3	2	11

Raktachapa (Hypertension)

The clinical trials on Raktachapa (Hypertension) were conducted at the CRI Delhi, IIK Patiala, RRI Lucknow and RRC Mandi. A total number of 45 cases have been treated adopting different therapeutic approaches. The following table summarises the details related to the line of approach and the number of cases treated together with the results;

Table

Results of clinical therapeutic trials of Ayurvedic preparations on Raktachapa (Hypertension) at a glance.

Sl. No.	Therapy	Instt./ Centres	Total cases	Results					
				Comp. rel.	Marked rel.	Mode. rel.	Mild rel.	No rel.	Drop out
1.	Arjuna ksheera paka and Sankhapushpi churna.	CRID	5	1	—	—	2	—	2
2.	Arjuna twak vati.	IIKP	23	—	—	5	7	1	10
3.	Sarpagandha	RRIL	3	—	—	—	2	—	1
4A.	Sankhapu- shpi mishran.	RRCM	12	—	2	—	5	1	4
B.	Sarpagandha vati and Sankha- pushpi mishran.		2	—	1	—	1	—	—
Total:			45	1	3	5	17	2	17

The role of Pushkarmool and Guggulu in the cases of Ischaemic heart diseases and Hypertension. **CDRSV**

The study has been continued further and 35 cases were included into the study during the reporting period. The study showed statistically significant fall in serum cholesterol, serum triglycerides and serum total lipids after one month of treatment. The results were found to be very encouraging specially in the patients who continued their treatment at least for a period of six months. In such cases precordial pain, dyspnoea and palpitation were found completely absent. There was normal pattern of ECG and bio-chemical findings. The study showed moderate to complete relief in 29 patients out of these 35 cases.

Vishama Jwara (Malaria)

The clinical trials on established cases of Vishama jwara(Malaria) were conducted at the IIK Patiala, RRI Jaipur, Junagadh, Gwalior, RRC Jammu, Nagpur and ALRCA Madras. A total number of 66 cases have been treated. The following table summarises the details related to the line of approach and the number of cases treated together with the results:

Table

Results of clinical therapeutic trails of Ayurvedic preparations on Vishama Jwara (Malaria) at a glance.

Sl. No.	Therapy	Instt./ Centres	Total cases	Results					
				Comp. rel.	Marked rel.	Mode. rel.	Mild rel.	No Drop out	
1.	AYUSH-64	IIKP	2	—	—	—	1	1	
2.	AYUSH-64	RRIJ	2	1	—	—	1	—	
3.	AYUSH-64	RRIJu	28	25	—	—	—	3	
4.	AYUSH-64	RRIG	2	—	—	—	1	1	
5.	AYUSH-64	RRCJ	11	3	—	—	1	7	
6.	AYUSH-64	ALR-	17	14	—	—	2	1	
CAM									
7.	AYUSH-64	RRCN	4	4	—	—	—	—	
Total :			66	47	—	—	1	5	13

Visham Jwara (Symptomatic or Negative cases)

The clinical trials on Visham jwara (Symptomatic or negative cases) were conducted at the CRI Delhi, IIK Patiala, RRI Jaipur, RRC Itanagar, Mandi, Hastinapur and Gangtok. A total number of 299 cases have been treated. The following table summarises the details related to the line of approach and the number of cases treated together with the results:

Table

Results of clinical therapeutic trials of Ayurvedic preparations on Visham jwara (Symptomatic or negative cases) at a glance.

Sl. No.	Therapy	Instt./ Centres	Total cases	Results					
				Comp. rel.	Marked rel.	Mode. rel.	Mild rel.	No rel.	Drop out
1.	AYUSH-64	CRID	84	36	—	—	30	18	—
2.	AYUSH-64	IIKP	18	5	—	2	—	1	10
3.	AYUSH-64	RRIJ	29	20	4	—	3	2	—
4.	AYUSH-64	RRCI	13	7	—	—	—	1	5
5.	AYUSH-64	RRCM	125	26	7	3	4	1	84
6.	AYUSH-64	RRCH	23	7	—	—	—	—	16
7.	AYUSH-64	RRCG	7	5	2	—	—	—	—
Total :			299	106	13	5	37	23	115

Slipada (Filariasis)

The clinical trials on Slipada (Filariasis) were conducted at the CRI Bhubaneshwar, RRI, Patna, RRC, Nagpur and Vijayawada. A total number of 77 cases have been treated adopting different therapeutic approaches. The following table summarises the details related to the line of approach and the number of cases treated together with results:

Table**Results of clinical therapeutic trials of Ayurvedic preparations on Slipada (Filariasis) at a glance.**

Sl. No.	Therapy	Instt./ total Centres	Results						
			cases	Comp. rel.	Marked rel.	Mode. rel.	Mild rel.	No Drop rel.	Drop out
1.	Sudarsana-ghana vati and Punarnavarista	CRIBh	8	1	5	—	—	—	2
2.	AYUSH-64	RRIP	27	—	2	9	3	—	13
3.	AYUSH-64	RRCN	5	1	1	—	—	—	3
4A.	Slipada capsule.*	RRCV	28	1	3	6	8	4	6
	B. Gomutra haritaki.		9	1	2	1	2	1	2
Total:			77	4	13	16	13	5	26

In addition to this CRI, Bhubaneshwar has conducted survey of incidence of Microfilaraemia with and without manifestation of disease in two villages Malipada and Chandaka having a population of 279 and 203 individuals respectively. These villages are in the interior area with no medical facility. The people of these areas are mostly poor and illiterate. Their ignorance or lack of awareness about health problems and partly due to negligence seems to be the factors responsible for not using proper protective measures against mosquitoes. In addition, their living condition i.e. staying in the nearby sheds of the domestic animals or keeping animals inside the same dwelling units which attracts mosquitoes, the carrier of the disease, open wells, ponds, poor dietetic habits and other environmental factors too play a role in causation of the disease and development of various stages of the disease Slipada.

*Containing Amruta guggulu, Sunthi, Punarnava, Shakotaka twak, Haridra, Rasna and Haritaki.

A. Survey of Incidence of Microfilaraemia and trial of Nityananda rasa and AYUSH-64.

DEC Provocative test has been conducted in the patients of Slipada from both the villages and night blood samples of the patients from the village Malipada were collected and analysed. 35 positive cases of Microfilaraemia detected from the village Malipada and 27 from the village Chandaka were studied with Nityananda rasa and AYUSH-64 respectively. The results of the study are as under :

Drug	No. of cases	Results of treatment		
		Responded	Not responded	Drop out
Nityananda rasa	35	7	16	12
AYUSH-64	27	—	6	21

B. Survey of Incidence of Manifest disease and trial of Sudarshana ghana vati.

46 cases of manifest disease-Slipada were detected in the village Malipada and 17 cases in the village Chandaka. Most of these cases were found chronic dormant and having swelling (Deformity) in upper and lower limb. A trial of Sudarshanaghana vati was conducted in 25 manifest cases of Slipada including 18 dormant cases having swelling, from the village Malipada. The study showed that the treatment provided complete relief in four patients, partial relief in two patients and no relief in one patient, whereas remaining ten patients discontinued the study. The study also showed that out of the 18 chronic dormant cases 10 got partial relief with slight to substantial reduction in measurement of swelling ranging from .5 cm. to 5 cm.

CRI, Bhubaneshwar has also taken up a study on the effect of AYUSH-64 and Rasmanikya in the cases of microfilaraemia at IPD level. In this study five cases were studied with AYUSH-64 and two cases with Rasmanikya. All the seven cases did not responded to the treatment.

Apasmara (Epilepsy)

The clinical trials on Apasmara (Epilepsy) were conducted at the

CRI Delhi and IIK Patiala. A total number of 85 cases have been treated adopting different therapeutic approaches. The following table summarises the details related to the line of approach and the number of cases treated together with the results:

Table

Results of clinical therapeutic trails of Ayurvedic preparations on Apasmara (Epilepsy) at a glance.

Sl. No.	Therapy	Instt./ Centres	Total cases	Results				
				Control- led.	Impro- ved	Mild imp.	No imp. Drop out	
1.	AYUSH-56	CRID	69	13	29	—	—	27
2.	Brahmighrta	IIKP	16	—	—	16	—	—
Total :			85	13	29	16	—	27

In addition to this four new cases and 23 follow up cases were studied with AYUSH-56 at RRI, Calcutta. The study showed complete alleviation of fits in 66.70% cases, reduction in 14.80% and no reduction in 18.50% cases.

Lakshan Samucchaya of Unmada

ARUB

The study has been continued further and 62 cases of Unmada were included into the study making a total of 234 cases studied so far. This study will be concluded after completing 300 cases of Unmada.

Unmada (Schizophrenia)

ARUB

The study was continued further and completed after inclusion of four patients during the reporting period. In this single blind study thirty six patients of either sex in the age range of 16 to 45 years with acute psychotic symptoms and duration of illness between one moth to ten years were included and divided into two groups. One group received Ayurvedic treatment consisting of Anthasnehana, Swedana, Abhyanga and Virechana besides Shamana (Palliative) drugs viz., AYUSHMAN-13, 14 (coded drugs), Unmada gajakesari,

Sutashekara rasa, Saraswatharista and Aswagandharista and the other group received allopathic treatment consisting of Chloropromazine 300 to 600 mg. per day and Trihexibhanidyl HCl 2 mg. 1-1-0. Duration of treatment was 28 days. In order to measure the improvement, the psychiatric assessment, Ayurvedic assessment, Psychological assessment and a global assessment was done. All the four assessments following the initial indicate that both the treatments were effective in reducing the psychopathology in Schizophrenic patients and there is no significant difference between the two treatment groups.

Pama (Scabies)

The clinical trials on Pama (Scabies) were conducted at the IIP Cheruthuruthy and RRC Itanagar. A total number of 103 cases have been treated adopting different therapeutic approaches. The following table summarises the details related to the line of approach and the number of cases treated together with the results :

Table

Results of clinical therapeutic trials of Ayurvedic preparations on Pama (Scabies) at a glance.

Sl. No.	Therapy	Instt./ Total		Results					
		Centres	cases	Comp. rel.	Marked relf.	Mode. rel.	Mild rel.	No rel.	Drop out
1	2	3	4	5	6	7	8	9	10
1A.	Pathola triphaladi churna and Rasothamadi lepa externally.	IIPC	6	3	—	—	—	—	3
B.	Pathola triphaladi churna, internally and Tamboola taila externally.		4	1	—	1	—	—	2

Contd.

1	2	3	4	5	6	7	8	9	10
C.	Panchatikta kashaya inter- nally and Nalpa- maradi kera externally.		2	—	1	—	—	—	1
D.	Panchatikta kashaya inter- nally and Rasot- hamadi lepa externally.		10	4	3	—	—	1	2
E.	Panchatikta kashaya.		16	8	2	—	1	1	4
F.	Pathola tri- phaladi churna internally and Nalpamaradi kera externally.		2	2	—	—	—	—	—
2.	Tubarak RRCI churna, Gandhak and Marichadi taila.		63	18	3	6	2	4	30
Total :			103	36	9	7	3	6	42

Vicharchika (Oozing eczema)

The clinical trials on Vicharchika (Oozing eczema) were conducted at the IIP Cheruthuruthy, RRI Trivandrum and RRC Itanagar. A total number of 88 cases have been treated adopting different therapeutic approaches. The following table summarises the details related to the line of approach and the number of cases treated together with the results:

Table

Results of clinical therapeutic trials of Ayurvedic preparations on Vicharchika (Oozing eczema) at a glance.

Sl. No.	Therapy	Instt./ Centres	Total cases	Results					
				Comp. rel.	Marked rel.	Mode. rel.	Mild rel.	No rel.	Drop out
1	2	3	4	5	6	7	8	9	10
1A.	Panchatikta kashaya internally and Rasot-hamadi lepa externally.	IIPC	2	—	—	1	—	—	1
B.	Panchatikta kashaya internally and Tamboola taila externally.		7	1	1	—	1	1	3
C.	Panchatikta kashaya internally and Nalpa-maradi kera externally.		2	—	—	—	—	—	2
D.	Patholatriphaladi churna internally and Rasothamadi lepa externally.		9	4	—	1	3	—	1
E.	Pathola triphaladi churna internally and Tamboola taila externally.		21	4	6	—	3	—	8
2A.	Chakkramarda kwatha and Chakkra-marda kera.	RRIT	3	2	—	—	—	—	1

Contd.

1	2	3	4	5	6	7	8	9	10
B. Manjistadi kwatha and Arkapatra sarshapa taila.			4	1	—	—	—	—	3
C. Aragwadha kwatha and Arkapatra sarshapa taila.			5	3	—	1	—	—	1
3. Tubarak churna, Sudha gandhak, Mahamanjisthadi kwatha and Tubarak/ Marichadi taila.	RRCI		35	6	5	6	5	2	11
Total :			88	21	12	9	12	3	31

Kitibha

The clinical trials on Kitibha were conducted at the CRI Delhi and RRI Trivandrum. A total number of 40 cases have been treated adopting different therapeutic approaches. The following table summarises the details related to the line of approach and the number of cases treated together with the results:

Table

**Results of clinical therapeutic trials of Ayurvedic preparations
on Kitibha at a glance.**

Sl. No.	Therapy	Instt./ Centres	Total cases	Results				
				Comp. rel.	Marked rel.	Mode. rel.	Mild rel.	No rel.
1.	Kaishora guggulu, Kanchnar guggulu and Arogyavardhini.	CRID	18	7	—	8	—	3
2.	Nimbidin internally, and Lajjalu kera externally.	RRIT	22	—	3	14	4	1
Total :			40	7	3	22	4	4

Dadru (Ring worm)

RRIT

The clinical therapeutic trial on Dadru (Ring worm) was conducted at RRI, Trivandrum. A total number of 60 cases were included in the study and divided into two groups. One group consisting of 32 cases was treated with Viswamitra kapala taila. The treatment provided complete relief in 18 cases, partial relief in seven cases and no relief in 4 cases while three cases discontinued the study.

Another group consisting of 28 cases was treated with Chakkra-marda kera. In this group complete relief was observed in 16 cases, partial relief in eight cases and no relief in two cases. Remaining two cases discontinued the study.

Vrana (Ulcer)

CRID

The clinical trial on Vrana (Ulcer) was conducted at CRI, Delhi. The treatment provided consisted of Jatyadi taila besides some oral medication in some cases. A total number of 50 cases were included into this study, out of which complete relief was observed in 27 cases, moderate relief in 15 cases and no relief in eight cases.

Twak Roga

The Clinical trials on Twak roga were conducted at the RRC Mandi, Gangtok and RRI, Junagadh. A total number of 218 cases have been treated adopting different therapeutic approaches. The following table summarises the details related to the line of approach and the number of cases treated together with the results:

Table

Results of clinical therapeutic trials of Ayurvedic preparations on Twak roga at a glance.

Sl. No.	Therapy	Instt./ Centres	Total cases	Results					
				Comp. rel.	Marked rel.	Mode. rel.	Mild rel.	No rel.	Drop out
1	2	3	4	5	6	7	8	9	10
1A.	Arogyavar-dhini, Rasmanikya and Sarivadyasava	RRCM	59	1	3	6	2	2	45

Contd.

1	2	3	4	5	6	7	8	9	10
B. Kanchnara guggulu, Kishora guggulu, Rasmanikya and Sarivadyasava.			29	2	4	1	4	—	18
C. Sudhagandhak, Haridra khanda and Manjistadi kwatha.			42	3	4	3	3	1	28
2. Triphala churna, Kancharnar guggulu and Gandhak malaham.	RRIJu	34	—	5	7	7	6	9	
3. Sudhagandhak and Haridra khanda.	RRCG	54	8	6	11	23	—	6	
Total :			218	14	22	28	39	9	106

Switra (Vitiligo)

The clinical trials on Switra (Vitiligo) were conducted at the IIP Cheruthuruthy, RRC Hastinapur and RRC Vijayawada. A total number of 40 cases have been treated adopting different therapeutic approaches. The following table summarises the details related to the line of approach and the number of cases treated together with the results :

Table
Results of clinical therapeutic trials of Ayurvedic preparations on Switra (Vitiligo) at a glance.

Sl. No.	Therapy	Instt./ Centres	Total cases	Results					
				Comp. rel.	Marked rel.	Mode. rel.	Mild rel.	No rel.	Drop out
1	2	3	4	5	6	7	8	9	10
1A.	Nimbapanchanga churna and Gunjachitraka vati.	IIPC	8	—	1	1	—	—	6

Contd.

1	2	3	4	5	6	7	8	9	10
B. Dhatrayadi churna and Avalgujabeejadi vati.			8	--	--	2	--	1	5
C. Switari rasa and Gajalinda- jadi vati.			2	--	--	2	--	--	--
2. AYUSH-57	RRCH	12	--	--	4	1	--	7	
3. AYUSH-57	RRCV	10	1	--	2	--	--	7	
Total			40	1	1	11	1	1	25

Arbuda Vishesh (Cancer)

ACHT

Amla Cancer Research Centre, Trichur has taken up the study of Cancer of oral, breast, cervix, larynx, intestine, lung and vocal cord etc. During the reporting period 48 cases were included in this study. 39 cases in one group were treated with Gulgulutiktakam kwatha, Kanchanar guggulu gutika and Rasasinduram and 9 cases in another group were treated with Chitraka rasayan and Siddha makaradwaja. The treatment provided, showed encouraging response. Further study is in progress.

Abhishyandha (Conjunctivitis)

RRIG

The clinical trial on Abhishyandha (Conjunctivitis) was conducted at RRI Gwalior using Khakramula. A total number of 44 cases were included into the study, out of which complete relief in eight cases, marked relief in 21 cases and moderate relief in 12 cases was observed. Two cases got mild relief and one case discontinued the study.

Pothaki (Trachoma)

RRCH

The clinical trial on Pothaki (Trachoma) was conducted at RRC, Hastinapur. The treatment provided consisted of Nimbadi anjan in

one group, teramycin ointment in second group and a place boointment in third group. Since only eight cases were included into this study, no specific conclusions could be drawn. The study is in progress.

Galganda (Goitre)

RRCG

The clinical trial on Galganda (Goitre) was taken up during the reporting period by RRC, Gangtok using Kanchanar guggulu, Godanti bhasma and Punarnavamandur. 24 cases were included into the study, out of which seven cases showed marked relief and three cases showed mild relief. Remaining 14 cases discontinued the study.

Evaluation of Gastric response to Kulatha and Moong in Normal volunteers.

DRUB

Erestwhile Dietetic Research Scheme, Bombay now merged with CRI (Ay.) Bombay has continued this study. During the reporting period Fractional Gastric Analysis was done in eight samples to select volunteers for the study, out of which three volunteers were rejected since Fractional Gastric Analysis showed some abnormality in their gastric samples. In the remaining five volunteers secretion was found to be below normal range and thus these too were not selected for further study. The data on the volunteers studied so far is being scrutinised.

Preliminary study to observe the effect of Glucose and Honey on blood sugar levels in normal volunteers and Diabetic patients.

DRUB

This study was initiated during the reporting period and eight diabetic patients were included in the study. Variation in mean blood sugar levels at one, one and half and two hours interval with glucose and honey load in these patients was studied. No specific conclusion could be drawn since only eight cases have been studied so far.

Tibetan Research Unit, Leh-Ladakh

The unit has taken up the study of hypertension during 1984-85. 30 cases each of this disease have been studied upto 1986-87 in two groups viz. groups A) Skurunerna and group B) Thaktuk-Kunsel. These case are still under follow-up. The study conducted so far shows that Skurunerna is more useful and effective in lowering and maintaining of hypertension.

The unit has taken up another study on eczema during 1984-85. So far 15 cases each have been studied with Lhodot chhogyat and Sposkarchhopa respectively. The study showed that Lhodot chhogyat is much effective to relieve eczema.

The unit has attended 2423 (1597 new and 826 old) patients at O.P.D. level.

The unit has carried out a survey cum collection of her balmedicines in Zanskar range and exhibited Amchi traditional equipments and manuscripts during the annual conference of senior officers held at Nagpur.

Statement showing disease groups, number of patients studied
and participating projects during 1986-87

S. No.	Disease groups	No. of patients	Participating projects.
1	2	3	4
1.	Amavata/Sandhigatavata		
	(a) Amavata	358	CRID, CRIBh, IIPC, IIKP, RRIJu, RRIG, RRIC, RRIP, RRCJ, RRCI
	(b) Sandhigatavata	23	RRIG, RRIC, RRCJ
2.	Amlapitta, Parinamasuia		
	(a) Amlapitta	147	CRID, CRIBh, RRIJu, RRCM, CRUH
	(b) Parinamasula	287	CRIBh, RRIT, RRCI, CRUK, CRUH, CDRSB
	(c) Annadravasula	41	RRCI, CRUH, CRUK
3.	Atisara, Pravahika Grahani roga		
	(a) Giardiasis and E.H.	15	CRUK
	(b) Pravahika	135	CRID, RRCG
	(c) Atisara	5	CRID
	(d) Grahni roga	66	CRID, CRIBh, RRIL, RRIG,
	(e) Jeerna pravahika	27	RRIC, RRIT
4.	Other Udar roga		
	(a) Krimi roga	258	IIKP, RRIJ, RRIL, RRIP, RRCI, RRCM, RRCN

Contd.

1	2	3	4
	(b) Kamala	5	RRIL, RRCM
	(c) Yakrit daludar	13	CRID
	(d) Arsh	38	IIKP
	(e) Pandu roga	5	IIPC
5.	Swasa, Kasa, Pratishyaya		
	(a) Tamak swasa	536	CRID, CRIBh, IIPC, HKP, RRIJu, RRIL, RRIG, RRIP, RRCI, RRCV
	(b) Jeerna pratishayaya	19	IIPC
	(c) Pratishyaya	42	RRCB
6.	Twak roga		
	(a) Kitibha	40	CRID, RRIT
	(b) Pama	103	IIPC, RRCI
	(c) Switra	40	IIPC, RRCH, RRCV
	(d) Vicharchika	88	IIPC, RRIT, RRCI
	(e) Dadru	60	RRIT
	(f) Twak roga	218	RRCM, RRIJu, RRCG
7.	Stri roga		
	(a) Kastartava	39	IIKP
	(b) Sweta pradara	113	CRID, CRIBh, RRIJu, RRIG
	(c) Rakta pradara/ Asrigdara	64	IIKP, CRID, CRIBh
	(d) Yoni vyapada	27	CRID
8.	Manasroga		
	(a) Unmada	4	ARUB
	(b) Lakshana samuchhya of Unmada	62	ARUB
	(c) Apasmarā	89	CRID, IIKP, RRIC
9.	Madhumeha, Mutra roga		
	(a) Madhumeha	100	CRID, IIKP, RRIC, CRUK

1	2	3	4
	(b) Mutra krichha	38	CRID, RRIP, RRCM
	(c) Medo roga	23	RRCM
10.	Slipada	164	CRIBh, RRIP, RRCN, RRCV
11.	Vishma jwara		
	(a) Vishama jwara (Malaria)	66	IHKP, RRIJ, RRIJu, RRIG, RRCJ, RRCN, ALRCAM.
	(b) Vishama jwara (Symptomatic cases)	299	CRID, IHKP, RRIJ, RRCI, RRCM, RRCH, RRCG.
12.	Vatavyadhi		
	(a) Pakshavadha	163	CRID, CRIBh, IIPC, IHKP, PRSB
	(b) Khanja and Pangu	27	IIPC
	(c) Gridhrasi	44	CRID, CRIBh, IIPC, RRIJ, RRIC
	(d) Saisaveeyavata	65	CRID, IIPC
	(e) Other vatavyadhies	9	PRSB
13.	Raktachap	45	CRID, IHKP, RRIL, RRCM
14.	Hridroga	35	CDRSV
15.	Vranan	50	CRID
16.	Netra Roga		
	(a) Abhishyandha	44	RRIG
	(b) Pothaki	8	RRCH
17.	Galganda	24	RRCG
18.	Arbuda vishesh	48	ARHT

Statement of the patients attended at OPD and admitted/discharged in the IPD during 1986-87

Sl. No.	Institute/Centre/Unit	Number of patients attended					percentage of bed occupancy
		O.P.D.			I.P.D.		
		New	Old	Total	Admitted	Discharged	
1	2	3	4	5	6	7	8
1.	CRI, Delhi	17383	20437	37820	402	352	47.85
2.	CRI, Bhubaneshwar	8265	12773	21038	187	174	26.2
3.	IIP, Cheruthuruthy	12655	44567	57222	175	170	77.18
4.	IIK, Patiala	7847	7826	15673	248	257	40.91
5.	RRI, Lucknow	11816	17584	29400	103	103	18.20
6.	RRI, Calcutta	3960	16059	20019	80	78	57.46
7.	RRI, Junagadh	4956	11912	16868	69	66	22.74
8.	RRI, Patna	4474	7893	12367	72	76	79.62
9.	RRI, Jaipur	3987	3619	7606	173	178	50.25
10.	RRI, Gwalior	6641	7436	14077	152	149	37.14

(Contd)

1	2	3	4	5	6	7	8
11.	RRI, Trivandrum	4466	N.I.*	4466	101	101	92.00
12.	RRC, Nagpur	1913	4730	6643	—	—	—
13.	RRC, Itanagar	4050	5766	9816	Not yet started		—
14.	RRC, Vijayawada	4900	7996	12896	53	53	47.00
15.	RRC, Gangtok	7052	2688	9740	121	116	44.90
16.	RRC, Hastinapur	6962	6565	13527	5	5	2.00
17.	RRC, Jammu	6568	9034	15602	193	134	47.33
18.	RRC, Jhansi	1492	1659	3151	—	—	—
19.	RRC, Bangalore	1354	3612	4966	Not yet started.		—
20.	RRC, Mandi	3642	2737	6379	Started recently		—
21.	CRU, Kottakal	Not applicable			189	192	94.34
22.	CRU, Hyderabad	—	—	—	97	95	N.I.*
23.	ARU, Bangalore	447	928	1375	12	17	18.20
24.	ALRCA, Madras	—	—	—	17	16	Not available
25.	ARU, Leh	1597	826	2423	—	—	—
26.	PRS, Bombay	—	—	—	50	54	37.10
Total :		1,26,427	1,96,647	3,23,074	2,499	2,386	

*Not indicated

HEALTH CARE RESEARCH PROGRAMME

Health Care Research Programme being carried out by the Council consists of Service Oriented Survey and Surveillance Research Programme, Community Health Care Research Programme, and Tribal Health Care Research Programme. These Programmes are modulated to have rural bias so that benefits of the research programme carried out can reach to the people at village level. Priority for these programmes have been drawn keeping in view that outcome of the research studies have a wider utilitarian base and should flow to the every remote corner of the country. The Council since beginning has been carrying out Health Care Research Programme through Mobile Clinical Research Teams attached to various Institutes, Centres and Units functioning under the Council. Data collected under Mobile Clinical Research Programme have been compiled and published in the form of a monograph entitled "The study of Health Statistics under Mobile Clinical Research Programme (Ayurveda)". The details of the work carried out under Health Care Research Programme during the reporting period is provided hereunder :

1) Service Oriented Survey and Surveillance Research Programme :

This Programme emphasises collection of data pertaining to the nature and frequency of prevalent diseases, food habits with regard to different seasons, socio-economic factors, natural resources, the standard and type of treatment available to the rural folk. Under this programme, team of physicians visit each and every house in the selected villages and provide incidental medical aid besides collecting requisite data. During the reporting period 32 villages having a population of 38,796 individuals have been covered and incidental medical aid has been provided to 11,716 individuals. In addition to this, MCRU, Varanasi has carried out some clinical trials during the survey work (Annexure-I).

Annexure-I

Statement of work carried out during 1986-87 under Service Oriented Survey and Surveillance Research Programme

Sl. No.	Name of the Institute/ Centre/Unit	Name of the villages covered	Population of the villages covered	*No. of patients treated	Name of the common diseases
1	2	3	4	5	6
1.	CRI, Bhubaneshwar	Bankual, Jharpada, Nargoda	6750	884	Twak roga, Krimi, Katisula, Sandhisula, Pravahika, Prati- shyaya, Vatavyadhi, Atisara, Vrana, Kandu, Swasa, Jwara, Slipada.
2.	IJK, Patiala	Araepur, Naulakha	1145	493	Udarsula, Kasa, Jwara, Kandu, Pratisyaya, Swasa, Sirahsula, Sandhi sula, Sandhi- vata.

(Contd)

*Includes patients treated from neighbouring villages who attended for treatment.

1	2	3	4	5	6
3.	CRI, Delhi	Nilothi, Kamaruddin Nagar	1383	1154	Vrana, Rakta vikara, Amlapitta, Pratishyaya, Kasa, Swasa, Pradara, Mukha roga, Twak roga, Karna roga.
4.	IIP, Cheruthuruthy	Venganellur, Enkakkad	6415	2383	Jwara, Pandu, Udarsula Vatavyadhi, Kasa, Rajdosha, Swasa, Sirahsula, Kundu, Atisara.
5.	RRI, Gwalior	Veerampur, Ralanpura	Not indicated	461	Kasa, Pratishayaya, Kandu, Jwara, Vrana, Atisara, Pradar, Udarsula, Vatavyadhi, Dadru, Amavata.
6.	RRI, Calcutta	Kantatala	1229	1365	Krimi, Twak roga, Amlapitta, Atisara, Kasa, Vatavyadhi, Jwara, Kosthabadhata, Swasa, Pandu.
7.	RRI, Jaipur	Roop Ki Nagal, Panchayawala, Kuthada	2829	495	Vrana, Kasa, Jwara, Pradar, Rakta vikar, Vatavyadhi, Udarsula, Pratishayaya, Karna roga.

(Contd.)

1	2	3	4	5	6
8.	RRC, Mandi	Behali	688	365	Kasa, Twak roga, Pratishayaya, Pradara, Atisara, Jwara, Visham jwara.
9.	RRC, Jhansi	Simrabari	1000	97	Twakvikar, Atisara, Jwara, Kasa, Vrana, Dadru, Mukapaka, Pandu.
10.	RRC, Gauhati	Garal, Kamakhya	Not indicated	610	Jwara, Kasa, Atisara, Amalpitta, Pratishyaya, Vatroga, Udarsula, Twakroga, Agnimandya, Pandu, Pradra.
11.	RRC, Vijayawada	Rayanapadu	1461	644	Jwara, Kosthabadhata, Swasa, Dourbalaya, Padasadha, Kasa, Vatavyadhi, Sandigatavata, Udarsula.
12.	RRC, Bangalore	Channasandra	608	371	Vrana, Jwara, Atisara, Pandu, Kasa, Krimi, Twak roga, Katisula.
13.	RRC, Nagpur	Kanhan	5877	500	Swasa, Jwara, Krimi, Pravahika, Rajyakshma, Vicharchika, Vatavyadhi.

(Contd)

1	2	3	4	5	6
14.	RRC, Hastinapur	Nangla Chand	1700	444	Jwara, Kasa, Atisara, Udarsula, Amalpitta, Pratishayaya, Krimi, Mukha roga.
15.	RRC, Jammu,	Chak Ladgam, Jaswan	704	163	Pratishyaya, Kasa, Atisara, Pradra, Amalpitta, Grahni roga, Udarsula.
16.	RRC, Gangtok	Nazitam, Chisopani, Nampongand, Burtok	2007	204	Kandu, Kasa, Pratishayaya, Jwara, Krimi, Vrana and Atisara.
17.	MCRU, Varanasi	Ahirauli, Sheorampur	5000	1083	Striroga, Pandu, Atisara, Pravahika, Pratishayaya, Krimi, Amavata.
Total :		32	38,796	11,716	

In addition to the details of work reported in the foregoing pages Mobile Clinical Research Unit, Varanasi has carried out the following clinical trials during the survey work in the villages :

- 1) Study on the effect of Kutajadi visesha yoga in the treatment of Atisara (Diarrhoea) and Pravahika (Dysentry).
- 2) Study on the effect of Mandoor bhasma in Pandu (Anaemia).
- 3) Study on the effect of Udumbar twak kwatha in the treatment of Pradra (Leucorrhoea and non-specific vaginitis).

A total of 235 patients were included into these studies. The following table summarises the details related to the number of cases treated together with the results :

Table
Results of clinical therapeutic trials of Ayurvedic preparations at a glance.

Sl. No.	Disease	Total cases	Result of treatment					No. rel.	Drop out
			Comp. rel.	Marked rel.	Moderate rel.	Mild rel.			
1.	Atisara	60	32	9	5	7	4	3	
2.	Pravahika	45	21	6	8	5	3	2	
3.	Pandu								
	(Group A)	25	—	13	6	2	3	1	
	Dose 1 gm.								
	(Group B)	25	2	13	7	—	2	1	
	Dose 2 gm.								
4.	Pradara	80	56	12	9	—	—	3	

2) Community Health Care Research Programme :

This programme is being carried out in the villages specifically adopted for this purpose. The team of physicians visit the adopted villages and acquaint the village people about the ways and means of healthful living. The physicians also try to educate them about the herbs locally available together with their uses so that many of the common ailments may be treated by the locally available resources. During the period under review, 38 villages consisting of a total population of 56,235 individuals have been covered and incidental medical aid provided to 15,669 individuals (Annexure —II).

During the execution of Community Health Care Research Programme some the Institutes/Centres have studied certain specific problems, details of which is provided hereunder :

Central Research Institute, Bhubaneshwar has carried out the study of health status of 75 school children in the age group ranging from 8-13 years of the upper Primary School, Chandaka and trial of Ayurbala biscuit. The study showed that most of the school children have one or the other manifestation of malnutrition such as stomatitis, discolouration or pallor of skin, eyes and nails. The height and weight too have been found to be below all India average in many of them. Most of the children were found to be anaemic. Haemoglobin percentage has also been found below normal range in most of the children.

The trial of one month course of Ayurbala biscuits showed moderate effect since many of the manifestations of malnutrition were found relieved with increase in their body weight and haemoglobin percentage.

Central Research Institute, Delhi organised a camp for the treatment of Netrabhishyanda for a period of one week at the village Nilothi and Kamaruddin Nagar. One hundred patients were treated with Netra bindu successfully in this camp.

Regional Research Centre, Itanagar has also carried out a study on the effect of Ayurbala biscuits on the school going children. 200 children of both sex from three different Primary Schools were selected and divided into three groups. First group consisting of 140 children received Ayurbala biscuits for 15 days, second group

consisting of 20 children received the biscuit for 30 days and remaining 40 children were observed for a period of 15 days without providing any biscuits. The study showed marginal increase in weight and improvement in general health of the children who were provided biscuits for 30 days.

Regional Research Centre (Ay.), Jhansi, have organised special medical relief camp from 7th April, 1986 to 12th April, 1986 on the eve of World Health Organisation Day, in the hail storm affected area of Babina Raksha and Baruasagar consisting of a population of about 9000 individuals. Incidental medical aid was extended to 320 patients during this camp.

Regional Research Centre (Ay.), Gauhati have organised a medical relief camp for the flood affected villages Chinigaon and Sonapur. Incidental medical aid was provided to 200 patients during this camp.

Regional Research Centre, Bangalore has conducted Health Survey of the children of three schools consisting of 156 students in the age ranging from 3 to 12 years. Most of the children were found to be of poor health and suffering with the diseases like under Pandu, Krimi, Udar sula and Pama. Haemoglobin percentage was found to be below 10 gm. in many of them.

Regional Research Centre, Jammu has also conducted health survey of the children of the schools in the village Dharchorachan consisting of children in the age ranging from 7 to 12 years. About 50% of the children examined had poor health. Medical aid was also extended to 14 children suffering from diseases like Krimi, Pratishayaya and Kasa.

3) Tribal Health Care Research Programme :

Tribal Health Care Research Programme has been initiated with the aim to work out an appropriate strategy for health and medicare programme of the backwardly placed areas inhabited by Scheduled Caste and Scheduled Tribe population. This programme is being carried out through Tribal Health Care Research Projects functioning at Car-Nicobar (Andaman-Nicobar Island), Ranka Block Distt. Palamu (Bihar), Chinchapada Distt. Dhule (Maharashtra), Rama Block Distt. Jhabua (Madhya Pradesh) and Ziro (Arunachal

Pradesh). Under this programme about 47 tribal pockets consisting of a total population of more than 32,000 individuals have been covered and incidental medical aid has been provided to 21,844 individuals (Annexure—III.).

In addition to the work reported above Tribal Health Care Research Project, Ziro has carried out clinical trials on Atisara, Amlapitta, Kandru, Vicharchika and Raktatisara at OPD level. A total number of 158 cases of these disease conditions have been treated adopting different therapeutic approaches. The following table summarises the details related to the line of approach and the number of cases treated together with the results:

Table

Results of clinical therapeutic trials of Ayurvedic preparations at a glance.

Sl. No.	Name of the Disease & Therapy	Total cases	Results					
			comp. R.	Mark. rel.	Mod. rel.	Mild rel.	No re.	Drop out
1	2	3	4	5	6	7	8	9
1.	Atisara (Kutaja ghanvati)	43	11	2	8	6	6	10
2.	Amlapitta (Avipattikara churna)	44	14	9	4	4	8	5
3.	Kandru (Sudha gandhak, Vakuchi churna and Manjisthadi kwatha)	19	8	—	2	3	4	2

Contd.

1	2	3	4	5	6	7	8	9	10
4.	Vicharchika (Sudha gandhak, Vakucni churna, Manjisthadi kwatha& Mari- chadi taila.)		36	11	3	8	4	6	4
5.	Raktatisar (Kutaja ghan vati and Kutajavaleha)		16	4	1	2	—	4	5
Total :			158	48	15	24	17	28	26

Annexure—II

Statement of work carried out during 1986-87 under Community Health Care Research Programme

Sl. No.	Name of the Institute/Centre/Unit	Name of the villages covered	Population of the villages covered	*No. of patients treated	Name of the common diseases
1	2	3	4	5	6
1.	CRI, Bhubaneshwar	Malipada, Chandaka	2650	441	Vrana, Udarsula, Katisula, Slipada, Twakroga, Jwara, Kasa Krimi, Vatavyadhi.
2.	IHK, Patiala	Reeth Kheri	1200	136	Kasa, Jwara, Sandhivata, Sirahsula, Udarsula, Pratihayaya, Swasa, Twakroga.
3.	IIP, Cheruthuruthy	Thichur, Thirumittacode-II, Chittanda	14075	6028	Vatavyadhi, Kandu, Udarsula, Sirahsula, Pradara, Katisula, Pandu, Mukhroga, Uralsula, Swasa, Jwara, Kasa.

Contd.

*includes patients who attended from neighbouring villages for treatment.

1	2	3	4	5	6
4.	RRI, Junagadh	Mandanpara, Vijapur	5200	170	Twakroga, Udarsula, Jwara, Pratishayaya, Vatavyadhi, Atisara, Kasa, Pandu, Vrana.
5.	RRI, Calcutta	Makaltala, Khorokhali	1015	2121	Amlapitta, Twakroga, Atisara, Krimi, Vatavyadhi, Jwara, Kasa, Pandua, Vrana, Pravahika, Sula, Kustha.
6.	RRI, Jaipur	Siwar	5300	453	Vrana, Twakroga, Jwara, Kasa, Vatavyadhi, Netraroga, Udarsula, Sirahsula.
7.	RRI, Gwalior	Kesarkhera, Parsen	6000	440	Kasa, Jwara, Sandhivata, Atisara, Vatavyadhi, Swasa, Udarsula, Vrana, Sirahsula, Abishyanda.
8.	RRC, Mandi	Kothi	524	445	Jwara, Kasa, Krimi, Pratisha- yaya, Pradara, Twakroga, Visha- mjwara, Atisara.

(Contd.)

1	2	3	4	5	6
9.	RRC, Itangar,	Pachni, Midpa	1200	1162	Pama, Kasa, Vrana, Krimi, Vicharchika, Vatavyadhi, Grahni, Atisara, Pratishayaya.
10.	RRC, Jhansi	Laxman Pura, Runija	651	178	Kasa, Jwara, Pratishayaya, Sweta pradar, Twakroga, Vishamjwara.
11.	RRC, Gauhati	Maguapara Deusatal, Chakardo	N.I.*	429	Jwara, Pratishayaya, Kasa, Twakroga, Atisara, Amlapitta, Udarsula, Pandu, Agnimandya.
12.	RRC, Bangalore	Nagegowdana, Palya	305	331	Jwara, Atisara, Vrana, Pandu, Kasa, Twakroga, Katisula, Pradara.
13.	RRC, Nagpur	Tarasi, Khairy, Dongargaon	1311	250	Galaganda, Swasa, Amavata, Krimi, Pandu, Twakroga, Vishamjwara.
14.	RRC, Hastinapur	Saifpur	3500	813	Udarsula, Kasa, Jwara, Pratishayaya, Amlapitta, Atisara, Krimi, Mukhroga, Netra roga, Vatavyadhi.

(contd.)

*Not indicated.

1	2	3	4	5	6
15.	RRC, Jammu	Dhardharochan, Dabsoodan	1429	468	Jwara, Pravahika, Pratishayaya, Kasa, Atisara, Twakroga, Vatavyadhi, Vishamjwara.
16.	RRC, Gangtok	Trikutam	620	34	Swasa, Kasa, Krimi, Udarsula Adhaman, Katisula etc.
17.	ALRCA, Madras	Seven villages	10,800	778	Kasa, Krimi, Twakroga, Krimi- roga, Mukha roga, Vatavyadhi, Udarsula.
18.	ARU, Tarikhet	Rinchi	455	992	Pradara, Krimi, Jwara, Udarvi- kar, Swasa, Vatavyadhi, Netra- roga, Karnaroga.
Total :		38	56235	15669	

Statement of work carried out during 1986-87 under Tribal Health Care Research Programme

Sl. No.	Name of the tribal project	Name of the tribal pocket/village covered	Population of the tribal pocket/village covered	Folklore claims collected	No. of* patients treated	Name of the common diseases
1	2	3	4	5	6	7
1.	THCRP, Chinchapada (Dhule)	Jamada, Dogegao, Bilwara Rayangan	5700	—	7775	Kasa, Jwara, Vatavyadhi, Amlapitta, Krimi, Pratishtyaya, Parinausula Pravahika, Rajdosha, Sandhigatvata.
2.	THCRP, Ranka Block Palamu	Palhay, Boila, Lady Kanda, Son Purwa, Kukumbar, Semarkhar Delay, Khura, Babda, Jhagraha, Tetadih Saleya, Daundag, Siroi Kala, Serio Khurd, Majhigawa, Birbandha, Swadiha, Sigakhurd, Siga Kala, Uchari. Chankari.	7443	7	10431	Sandhigatvata, Tawakroga, Jwara Rajodosha, Netra- roga, Vicharchika, Udar- Galganda, Kasa, Katisula, sula Karna roga, Pradar, Pravahika, Swasa, Gridhrasi, Slipada.

Contd.

*includes patients who attended from neighbouring tribal pockets for treatment.

1	2	3	4	5	6	7
3.	THCRP Car-Nicobar.	Kimios, Perka, Malacca, Mus, Kinmai, Tamalo, Sawai, Teetop, Arong, Kakana, Kinyuka, Chukchucha, Tapuiming, Small Lapati, Big Lapati	13546	12	588	Kasa, Swasa, Prawahika, Vatavyadhi, Jwara, Abhish- yanda, Udarsula, Kandu, Katisula, Mukharoga, Sirahsula.
4.	TACRP, Ziro	Hari, Talo, Deed, Dam Hong, Yacul, Mayl	5673	—	3050	Jwora, Kasa, Atisara, Amlapitta, Ajirna, Kandu, Arsha, Dantasula Katisula, Kostabadhata, Mukha- roga.
Total		47	32362	19	21844	

MEDICO-BOTANICAL SURVEY

The Medico-botanical survey programme occupies a pivotal place in the bio-medical research programmes of the Council. The activities of the survey units broadly include the exploration of the forest areas for collection of information regarding herbal wealth, identification, status of availability and their adulterants/substitutes and to maintain and develop the Herbarium and Museum. The survey parties conduct qualitative and quantitative assessment of drugs found in the country. They also gather information on the habits/customs/social status particularly in the tribal pockets of the country, while carrying out the medico-ethno-botanical survey.

The brief resume of the salient features of the work carried out by the 17 medico-botanical survey units of the Council spread over 16 states of the country and located at Bangalore, Bhubaneswar, Calcutta, Gangtok, Gauhati, Gwalior, Itanagar Jaipur, Jammu, Jhansi, Junagadh, Mandi, Nagpur, Patna, Tarikhet, Trivandrum and Vijayawada during the year 1986-87 is provided hereunder.

Andhra Pradesh

- RRCV

The survey unit located at Vijayawada surveyed Cuddapah district and Kolleru lake area under Krishna and West Godavari districts covering four forest divisions and collected 160 specimens. A total of 106 plant specimens were poisoned and mounted. About 212 plant specimens were accessioned for Herbarium. The unit has also prepared 54 index cards and collected 192 folklore claims. About 36 kg. of different parts of drug samples of nine medicinal species were collected for supply purpose. An interesting feature of the survey of Cuddapah region by the team is locating of occurrence of Gomoothra shilajita, a much valued drug of Ayurveda. This is perhaps the first indication relating to its occurrence in South India. Another finding of the team relates to recording of availability of Swarna patra (*Cassia angustifolia* Vahl. Hindi: Sunamukhi Sanaya) in certain parts of Cuddapah district, whose demand both in the country and outside is well known.

Arunachal Pradesh**RRCI**

The survey unit located at Itanagar conducted survey work in Tawang, Dirang and Kalaktang ranges in Tawang and Bomdila forest divisions respectively, and collected 417 plant specimens including local collections representing 86 families, 193 genera and 372 species. A total of 489 specimens have been accessioned, 1250 specimens mounted and 1500 specimens poisoned. 65 drug samples were added to the Museum. About 35.00 kg. of the plant material of 16 medicinal species were collected for supply purpose. Information on 200 folklore claims was gathered.

Assam**RRCGa**

The survey unit located at Gauhati surveyed Garampani area of Jorhat district Naogan and Amguri areas of Sibsagar district. During the survey work, the unit collected 45 plant specimens representing 25 families, 37 genera and 38 species. A total of 115 plant specimens were poisoned and 152 specimens mounted for Herbarium. A total of about 16 kg. of the dried crude drug material consisting of five species were collected for supply purpose. Five folklore claims were also collected.

Bihar**RRIP**

The survey unit located at Patna conducted medico-botanical explorations in Garhwa South forest division and Daltonganj North forest divisions and covered seven forest ranges comprising of 57 areas falling under these forest divisions. During the survey work, the unit collected a total of 921 plant specimens spreading over 307 field book numbers, representing 70 families, 161 genera and 307 species. A total of 879 plant specimens were identified, 927 specimens poisoned, 708 specimens mounted and 508 specimens accessioned. A total of 17 folklore claims, 18 drug samples for Museum and about 40 kg. of the crude drug material of three medicinal species were also collected. A total of about 25 kg. of the plant material was supplied for research purposes.

Gujarat**RRIJu**

The survey unit located at Junagadh surveyed Kachchh and Junagadh districts and covered about seven important forest/coastal areas. During the survey work 43 plant specimens were collected representing 22 families, 39 genera and 43 species. A total

of 158 plant specimens comprising of 46 species were mounted for Herbarium and 280 specimens of about 76 species were accessioned. Three crude drug samples were added to the Museum. A total of 127 kg. of the dried crude drug material of 15 species were collected for supply purpose. Four folklore claims were also collected.

Himachal Pradesh

RRCM

The survey unit located at Mandi conducted six local collection tours for the collection of raw drugs and survey of medicinal plants and covered areas of Kothi, Saigali, Pandoh, Panarasa and Thallout falling under Suket, Nachan and Mandi forest division. A total of 126 plant specimens were collected representing 40 families, 90 genera and 125 species. A total number of 300 plant specimens were poisoned and mounted and about 200 specimens were identified for adding to the Herbarium. Nine drug samples weighting about 30 kg. were collected for supply purpose. About seven drug samples were added to the Museum.

Jammu and Kashmir

RRCJ

The survey unit at Jammu has undertaken collection tours in different adjoining areas of Jammu District and collected seven species of Ayurvedic medicinal importance representing five families, six genera and seven species. A total of 214 plant specimens were accessioned, 601 specimens mounted for Herbarium and 1600 specimens poisoned. A total number of 421 index cards were prepared. Seven drug samples were added to the Museum. About 240 kg. of the crude drug material of 12 medicinal species was collected and supplied about 126 kg. for research purpose.

Karnataka

RRCB

The survey unit located at Bangalore conducted survey work in Kolar and Coorg districts and collected 171 plant specimens representing 52 families, 73 genera and 152 species. A total of 362 specimens were identified and 200 mounted for Herbarium. About 14 drug samples were added to the Museum. A total of 300 index cards were also prepared.

Kerala

RRIT

The survey unit located at Trivandrum carried out two survey tours in Wynad Forest division and covered a large number of areas. A total of 203 plant specimens representing about 195 species were

collected. About 200 plants specimens were accessioned, 380 specimens mounted and 125 poisoned. 12 drug samples were added to the Museum. A total of about 150 kg. of crude drug samples were supplied for research purpose. Five folklore claims were also collected.

Madhya Pradesh

RRIG

The survey unit located at Gwalior conducted the survey tour in the Patal Kote and Panchmarhi areas of the districts Chhindwara and Hoshangabad respectively. A total of 237 plant specimens were collected as per field book numbers representing 46 families, 106 genera and 182 species. A total of 723 plant specimens were accessioned and another about 800 identified for adding to the Herbarium. 14 drug samples were added to the Museum. About four drug samples weighing 60 kg. were collected for supply purpose. A total number of 30 folklore claims were also collected.

Maharashtra

RRCN

The survey unit located at Nagpur carried out the survey work in Buldana forest division Yavatmal circle and covered seven forest ranges. A total number of 37 plant specimens representing tentatively 19 families, 18 genera and 32 species were collected. About 172 plant specimens mounted, 254 plant specimens accessioned, and 217 specimens poisoned. About 5 kg. of the plant material of five medicinal species were collected for supply purpose. 40 drug samples were added to the Museum. Six folklore claims were also collected.

Orissa

CRIBh

The survey unit located at Bhubneshwar has accessioned 384 plant specimens and poisoned 856 specimens. About 108 index cards were also prepared.

Rajasthan

RRIJ

The survey unit located at Jaipur conducted medico-botanical explorations in Bharatpur, Dholpur and Alwar forest divisions and collected 222 plant specimens representing 59 families, 119 genera and 136 species. A total number of 585 specimens were mounted, 557 were accessioned, 200 specimens were poisoned and 22 index cards prepared: 10 drug samples were added to the Museum. Drug samples of 15 medicinal species weighing about 12 kg. were collected for supply purpose. 16 folklore claims were also collected.

Sikkim**RRCG**

The survey unit located at Gangtok conducted local survey tours within 10 kms. from the centre and collected some plant specimens. A total number of 200 plants were poisoned, 51 plants were accessioned and 42 plant specimens were incorporated in the Museum.

Uttar Pradesh**AUT**

The Survey unit located at Tariket conducted two raw drug collection tours in the Tarai Bhabher belt of Knmaon of District Nainital. The different areas covered include Mohan, Kumarya, Dhikuli, Dhikale, Ramnagar, Kaladhungi, Haldwani, Kathgodam and Hairakkan. A total of 1433 plant specimens were mounted for Herbarium and 60 specimens were accessioned. A total of 28 drug samples of 21 medicinal species weighing about 200 kg. were collected for supply purpose. Three folklore claims were also collected.

RRCJh

The survey unit located at Jhansi conducted survey work in collaboration with RRI Gwalior. The areas surveyed include Patalkot in Chhindwara forest division and Pachmari forest division of District Hoshangabad. A total of 213 plant specimens were collected for Herbarium and living plants of 40 medicinal species for the Herbal Garden. 14 drug samples were added to the Museum. Another 11 medicinal species weighing about 106 kg. were collected for supply purpose. Five folklore claims were also collected.

West Bengal**RRIC**

The survey unit located at Calcutta carried out survey tours in West and East Midnapur forest division and in areas of Andul, Amta, Jagalballavpur, Bauria and Baluhati in Howrah district. A total of 290 plant specimens were collected representing 90 families, 207 genera and 290 species. 270 plant specimens were accessioned, 180 mounted, 243 identified and 180 poisoned. Ten drug samples were added to the Museum. About 12 drug samples were collected for supply purpose. A total of 38 folklore claims were also collected.

Abstract of Medico-botanical survey work conducted by different units during the year 1986-87.

Sl. No.	Total forest areas covered	Total herb. sp. added to Herbarium	Total herb. sp. added to Museum	Total plants identified.	Total plant awaiting confirmation	Drug supply	Total folklore claims	
1	2	3	4	5	6	7	8	9
1. Andhra Pradesh (Vijayawada)	4	212	1	106	54	17 kg. of 5 medicinal species.	192	
2. Arunachal Pradesh (Itanagar)	1	489	65	—	—	26 kg. of 12 species.	200	
3. Assam (Gauhati)	2	—	—	195	—	16 kg. of 5 medicinal species.	4	
4. Bihar (Patna)	2	508	18	879	—	25 kg. of 3 species.	17	

Contd.

1	2	3	4	5	6	7	8	9
5.	Gujarat (Junagadh)	2	280	3	185	175	127 kg. of 15 species.	4
6.	Himachal Pradesh (Mandi)	—	—	7	200	—	30 kg. of 9 medicinal species.	—
7.	Jammu and Kashmir (Jammu)	—	214	7	—	—	126 kg. of 12 species.	—
8.	Karnataka (Bangalore)	2	—	14	362	200	—	—
9.	Kerala (Trivandrum)	2	200	12	120	450	150 kg.	5
10.	Madhya Pradesh (Gwalior)	2	723	14	800	270	—	30
11.	Maharashtra (Nagpur)	1	854	40	226	—	4 kg. of 5 species	6
12.	Orissa (Bhubaneshwar)	—	384	—	—	—	—	—

Contd.

1	2	3	4	5	6	7	8	9
13.	Rajasthan (Jaipur)	3	557	10	170	52	28 kg. of 24 medicinal species.	16
14.	Sikkim (Gangtok)	—	42	—	—	—	—	—
15.	Uttar Pradesh (Jhansi)	—	—	14	—	—	46 kg. of 7 species.	5
16.	Uttar Pradesh (Tarikhet)	—	60	—	—	—	200 kg. of 21 medicinal species.	3
17.	West Bengal (Calcutta)	2	270	10	243	47	32 kg.	38
Total :		23	4793	215	3486	1248	827 kg.	520

CULTIVATION OF MEDICINAL PLANTS

The Council has taken up experimental and large scale cultivation of medicinal plants of Ayurveda and Siddha importance, in its four Herbal Farms located at Jhansi (U.P.), Mangliawas (Rajasthan), Pune (Maharashtra) and Ranikhet (U.P.). The aim of this programme is to study adaptability, growth, flowering, fruiting and also to assess the yield at different altitudinal levels and other ecological conditions etc. besides, providing quality drug material, in adequate quantity for research and pharmaceutical purpose. These Herbal Farms have taken up cultivation of about 400 medicinal species and the plantation includes those of tropical, sub-tropical and temperate regions, besides exotic ones. These Herbal Farms also work out suitable agro-techniques for successful cultivation and growth of scarcely distributed/threatened plant species.

Successful production of Kumkum at Tarikhet is a noteworthy feature in view of its non-habitance to that region. The experimental cultivation of Guggulu in Mangliawas has provided adequate information-base to consider mass scale cultivation for the procurement of oleo-gum-resin. In view of the encouraging results obtained during the experimental cultivation programme, the council has undertaken mass scale cultivation of few important medicinal plants of Ayurveda and Siddha at these Farms. The mass scale cultivation is presently restricted to a few acres of land and efforts are being made to enlarge the area of cultivation of these much used/demanded plants by undertaking the reclamation of so far unused land.

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

Regional Research Centre, Jhansi

The centre has continued with the cultivation programmes of important Ayurvedic medicinal plants both on experimental as well as mass scale. This programme is presently confined to about 15 acres

of the land, out of a total area of about 45 acres available with the centre, which have been suitably reclaimed and made fit for undertaking cultivation activities. The remaining area of about 30 acres is full of ditches and hillocks and attempts are being made to utilise this for growing some important medicinal shrubs and trees, which do not require much care and attention for their maintenance and also not endangered of grazing.

A total of about 200 medicinal species are presently being grown and properly maintained in the garden. This entire plantation which is represented in the demonstration, experimental and large scale beds and also in the green house includes about 60 medicinal species mentioned in Ayurvedic Formulary Part-I. The produce of the garden is effectively utilised and meets the part of the drug supply requirement of different research projects.

The important plants undertaken on mass scale cultivation are Guggulu (*Commiphora whightii*), Satavari (*Aparagus racemosus*), Sarpagandha (*Rauwolfia serpentina*), Bakuchi (*Psoralea corylifolia*), Prsniparni (*Uraria picta*), Ghrta kumari (*Aloe barbadensis*), Ashwagandha (*Withania somnifera*), Yastimadhu (*Glycyrrhiza glabra*), Rasna (*Pluchea lanceolata*), Vacha (*Acorus calamus*), Kalmegh (*Andrographis paniculata*) and Kemukh (*Costus speciosus*).

Large scale plantation undertaken along the boundary of the land includes Lata karanj, Karanj, Neem, Aragvadha, Arjun, Bibhitaka Madhurika etc.

Some of the important plants cultivated on experimental scale for the study of their vegetative and reproductive behaviour are Pippali (*Piper longum* Linn.), Mandukparni (*Centella asiatica* Linn.), Vacha (*Acorus calamus* Linn.), Rasna (*Pluchea lanceolata* Oliver & Hiern.), Trivrit (*Operculina turpethum* R.Br.), Gandhaprasarni (*Paederia foetida* Linn.), Antmul (*Tylophora indica* Bun. merr.), Tulsikarpura (*Ocimum klimandischaricum*), Tulsi (*Ocimum sanctum* Linn.), Yastimadhu (*Glycyrrhiza glabra* Linn.), Pashanbhed (*Bergenia ligulata*), Tejbal (*Zanthoxylum alatum* Roxb.), Peppermint (*Mentha arvensis*), Chopchini (*Smilax aspera*), Padmak (*Pruuus cerasoides* D. Don.).

The demonstration beds represent about 58 important medicinal species. About 170 medicinal species have been grown in the green house in polythene bags and cement pots, etc. under the pot

cultivation programme, for observing their adaptability and growth behaviour etc. Pashanbhed (*Bergenia ligulata*), a high altitude plant, has so far shown satisfactory growth behaviour and flowers and fruits have also appeared. Special attention has been paid to this specie for its survival during the summer season.

Saplings of 13 important medicinal species were prepared in polythene bags for large scale plantation.

The total produce of the garden during the year was about 465 kg. dry material and 154 kg. fresh material of different drug parts of about 30 medicinal plant species, besides the production of 50 quintal of fresh Ghritkumari. The total supply made during the year to its drug depot and OPD was about 282 kg. and 330 kg. respectively.

Guggulu Herbal Farm, Mangliawas (Rajasthan)

The main activity of this Herbal Garden is the conservation, cultivation and propagation of Guggulu on large scale and observing its growth behaviour under different experimental conditions.

The entire Guggulu project is spread over about 40 acres, out of 142 acres of the total land available with the garden. The rest of the area occupies natural vegetation of Guggulu plants and other Arid zone medicinal plant species.

A total number of 19,101 Guggulu plants are presently growing under mass scale cultivation in the Farm and attempts have been made for their proper maintenance. During the June-July, 6368 Guggulu cuttings and 1404 Guggulu plants raised through cuttings were introduced for experimental studies, and observations were made for their growth behaviour at different growth stages.

Besides Guggulu plantation, about 50 other medicinal species are growing in the Farm; the important being Kunduru (*Boswellia serrata*), Dadima (*Punica granatum*), Amalaki (*Embllica officinalis*), Nimba (*Azadirachta indica*), Karanj (*Caesalpinia boneuc*), Sadabahar (*Vinca rosea*), Kumari (*Aloe vera*), Satawari (*Asparagus racemosus*), Aragvadha (*Cassia fistula*), Shirish (*Albizzia lebbeck*), Guduchi (*Tinospora cordifolia*) and Langali (*Gloriosa superba*) etc. This entire plantation includes 13 such medicinal plants mentioned in the Ayurvedic Formulary Part I.

The Herbal Farm has also reported certain important and interesting experimental results. Vegetative propagation through cuttings have shown faster growth of Guggulu plants than those raised from seeds. Percentage of sprouting was also observed very high. Kunduru, Dadima and an exotic species *Euphorbia anticephaletica* have shown satisfactory growth levels when raised through cuttings. A healthy growth was observed in Sadabahar plants raised from seeds. In case of Langali better growth response was observed when its tubers were separated. The germination of seeds in Karanj, Katkaranj, Sadabahar, Satavari and Erand was satisfactory. Three exotic species *Euphorbia anticephaletica*, *Pursera hyndensiana* resembling *Commiphora* and *Tylophora asthmatica* introduced in the garden are growing well.

66.8 kg. of the crude drug material of 13 medicinal species have been collected which includes 23 kg. of oleo-gum-resin (Guggulu). A total of 150.65 kg. plant material of different drug parts of these species is available at present. About 8 kg. of the crude drug material of three species and seeds/cuttings of Guggulu plant have been supplied to different research projects of the Council and other scientific bodies.

Jawaharlal Nehru Ayurvedic Medicinal Plants Garden and Herbarium, Pune.

This garden has under its possession about 19 acres of the land and out of this about 10 acres is presently confined to the cultivation of important Ayurvedic and Siddha medicinal plants both at experimental as well as mass scale. A total of 356 species of medicinal, economic and ornamental importance are being maintained. About 134 medicinal species are planted in about 180 beds of 10' × 10' size for demonstrative, experimental and larges scale cultivation. Continuous observations are being made on the plants undertaken for experimental studies, for their vegetative and reproductive stages of the growth.

Some of the important plants undertaken on experimental cultivation are Isabgol (*Plantago ovata*), Bakuchi (*Psoralea corylifolia*) Avartani (*Helicteres isora*), Arjuna (*Terminalia arjuna*), Haritaki (*Terminalia chebula*), and Bibhitaka (*Tern inalia belerica*) and studies on their yield and other growth factors by employing different agro-chemical techniques etc, are carried out. Air layering has been

found to be successful for the propagation of Avartani. Quite encouraging results have been noticed in other cases. Urea and cowdung have been observed to be the best to increase the yield of Isabgol and Bakuchi respectively among the different fertilizers and manures tried. The drugs taken for large scale cultivation include Japakusum (*Hibiscus rosa-sinensis*), Kumari (*Al e barbadensis*), Ushira (*Vetiveria zizanioides*) and Antmul (*Tylophora indica*).

A total of 297 plants, mostly medicinal species comprising of annuals, biannuals and perennials are also being grown in different areas of the garden, other than in the beds. About half of the entire plantation consists of the medicinal plants mentioned in Ayurvedic Formulary Part-I.

The other notable achievement during the reporting year is the introduction of 23 additional medicinal species in the garden, besides undertaking large scale plantation of Japakusum (*Hibiscus rosa sinensis*), in views of the regular demand of this drug by the various units of the council for research purpose. A separate sector for marshy plants like Vacha, Mandookparni, Jalapippali, Brahmi, Bhringraja etc. is also developed.

The garden also meets partly the drug requisitions of the different research projects. The drug collection from the garden was about 100 kg. (dried crude drugs) comprising of 25 medicinal species.

Amalgamated Units, Tarikhet

The Herbal Garden of Amalgamated Units, Tarikhet is located at Ranikhet. The main activities of this garden is experimental cultivation of Saffron and also to study the possibilities of cultivation of different medicinal plants drawn from Wild sources, by studying their adaptability growth, flowering and fruiting etc. in the climatic condition of Ranikhet. The garden has a total area of about 8 acres land but the cultivation activities are confined only to about 2.5 acres of the land by terracing slope, including the Saffron cultivation. A total of about 190 medicinal plant species mostly of Ayurvedic importance are growing in different beds in the garden and are properly maintained. Most of these species are for demonstrative purpose, but a few have also been

undertaken for experimental trials to observe their adaptability, vegetative and reproductive behaviour etc. The important species which indicated satisfactory growth include Yastimadhu (*Glycyrrhiza glabra*). Brhadaela (*Amomum subulatum*). Akarkara (*Anacyclus phrethrum*), Pippali (*Piper longum*), Tagara (*Valeriana wallichii*), Punarnava (*Boerhaavia diffusa*), Mandukparni (*Centella asiatica*), Rudraksha (*Elaeocarpus ganitrus*) and Shathi (*Hedychium spicatum*) etc. Special agrochemical techniques have been followed for their successful propagation. A few of these plants are also being studied for their increase in the active principle contents. Special emphasis has been laid on the cultivation of Yastimadhu and Rudraksha.

In view of the satisfactory growth potential observed, a few medicinal species of Ayurvedic importance, namely, Tagara (*Valeriana wallichii*), Jeevak (*Microstylis wallichii*), Vacha (*Acorus calamus*), Brahmi (*Bacopa monnieri*), Vanajmod (*Thymus serpyllum*), Kakoli (*Roscoea procera*) and Talmulika (*Curculigo orchiodes*) etc. have also been taken up for large scale cultivation.

The exotic plant such as *Mentha arvensis*, *Calendula officinalis*, *Digitalis purpurea*, *Digitalis lanata*, *Digitalis ferruginea* and *Duranta plumeri* have also been successfully raised in the garden.

This entire medicinal plantation also includes about 20 Ayurvedic Medicinal plants of alpine, sub-alpine Eastern and North-Western Himalayas, Tarai and Shiwalik ranges etc., which have been successfully introduced at various places in the garden and observations with regard to their adaptability and satisfactory growth behaviour are made from time to time.

4.625 kg. of the garden produce consisting of different parts of the plant material of two medicinal species have been supplied to different Institutes/Centres for research purpose.

Saffron Cultivation Farm

An area of about 1.5 acres is ear-marked for the Saffron Cultivation Project. Experimental trials were continued and regular observations were made on growth, development and multiplication of saffron corms. A total of 5,37,858 corms of different sizes are being properly maintained in about 560 beds of varying sizes, covering

an area of 2,297 sq. meters. Sprouting in the corms was observed in the end of August, 1986 and by the end of December, 1986, vigorous vegetative growth was observed and plants had attained a good height. First flowering growth was noticed in first week of October, 1986 and it continued till November, 1986. Total flowering period had been for about 43 days. During the entire flowering a total of 2,288 period, flowers were collected yielding 17.00 gms. of Saffron consisting of dry stigmas and style.

A few of the important medicinal plants under cultivation in the different herbal gardens, that are either extensively or largely or sparingly available are listed hereunder:

- Akarkarabha (*Anacyclus pyrethrum*)
- Amalaki (*Embllica officinalis*)
- Antmul (*Tylophora indica*)
- Aragvadha (*Cassia fistula*)
- Arjuna (*Terminalia arjuna*)
- Asoka (*Saraca asoca*)
- Asthisambara (*Cissus quadrangularis*)
- Aswagandha (*Withania somnifera*)
- Atibala (*Abutilon indicum*)
- Atmagupta (*Mucuna pruarita*)
- Bakuchi (*Psoralea corylifolia*)
- Bala (*Sida cordifolia*)
- Bhallataka (*Semecarpus anacardium*)
- Bharangi (*Clerodendrum serratum*)
- Bhringraj (*Eclipta alba*)
- Bibhitaka (*Terminalia belerica*)
- Bilva (*Aegle marmelos*)
- Bimbi (*Coccinia indica*)
- Brihadela (*Amomum subulatum*)
- Campaka (*Michelia champaca*)
- Citraka (*Plumbago zeylanica*)
- Danti (*Baliospermum montanum*)
- Daruharidra (*Berberis aristata*)
- Dhataki (*Woodfordia floribunda*)

Eranda (*Ricinus communis*)
 Ghritakumari (*Aloe barbadensis*)
 Goksura (*Tribulus terrestris*)
 Guduchi (*Tinospora cordifolia*)
 Guggulu (*Commiphora wightii*, *Commiphora beryii*)
 Gunja (*Abrus precatorris*)
 Haridra (*Curcuma longa*)
 Haritaki (*Terminalia chebula*)
 Ingudi (*Balanites roxburghii*)
 Isabgol (*Plantago ovata*)
 Japa (*Hibiscus rosa-sinensis*)
 Jati (*Jasminum grandiflorum*)
 Jayanti (*Sesbania sesban*)
 Kakodumbara (*Ficus hispida*)
 Kalmegh (*Andrographis paniculata*)
 Kampillak (*Mallotus philippinensi*)
 Kanchanar (*Bauhinia variegata*)
 Kantakari (*Solanum xanthocarpum*)
 Kapittha (*Feronia limonia*)
 Karanja (*Derris indica*)
 Karpura tulsi (*Ocimum kilimandischaricum*)
 Kataphala (*Myrica nagi*)
 Khadira (*Acacia catechu*)
 Kuberakshi (*Caesalpinia bonduc*)
 Kutaja (*Holarrhena antidysenterica*)
 Langali (*Gloriosa superba*)
 Lata kasturi (*Hibiscus abelmoschus*)
 Lodhra (*Symplocos racemosa*)
 Madanphal (*Xeromorphis spinosa*)
 Madhuyasti (*Glycyrrhiza glabra*)
 Mandookparni (*Centella asiatica*)
 Manjistha (*Rubia cordifolia*)
 Nimba (*Azadirachta indica*)
 Nirgundi (*Vitex negundo*)

Palasa (*Butea monosperma*)
 Parijata (*Nyctanthes arbortristis*)
 Parpataka (*Fumaria parviflora*)
 Pashanbheda (*Bergenja ciliata*, *Bergenja ligulata*)
 Punarnava (*Boerhaavia diffusa*)
 Rasna (*Pluchea lanceolata*)
 Sadapushpi (*Vinca rosea* var.) White and pink.
 Sahadevi (*Vernonia cinerea*)
 Salaparni (*Desmodium gangeticum*, *Desmodium laxiflorum*)
 Sallaki (*Boswellia serrata*)
 Sarpagandha (*Rauwolfia serpentina*)
 Sarpunkha (*Tephrosia purpurea*)
 Satavari (*Asparagus racemosus*)
 Sati (*Hedychium spicatum*)
 Shalmali (*Salmalia malabarica*)
 Shankhpushpi (*Convolvulus pluricaulis*)
 Shirish (*Albizzia lebbek*)
 Svetacandan (*Santalum album*)
 Sveta sariva (*Hemidesmus indicus*)
 Syonaka (*Oroxylum indicum*)
 Tagara (*Valeriana wallichii*)
 Tulasi (*Ocimum sanctum*)
 Udumbara (*Ficus glomerata*)
 Vaca (*Acorus calamus*)
 Vansa (*Bambusa bambos*)
 Varuna (*Crataeva nurvala*)
 Vasa (*Adhatada zeylanica*)
 Vishnukranta (*Evolvulus alsinoides*)

The following crude drugs (quantity indicated against each) were made available by these cultivation Centres to different Institutes/ Centres of the Council and PLIM, Ghaziabad for research purposes :
 Aragvadha (*Cassia fistula* Linn.) Fruit 25 kg. (dry).
 Arjuna (*Terminalia arjuna* (Roxb) W & A Bark (fresh) 25 kg.
 Antmul (*Tylophora indica* (Burr) Merr. leaves (fresh) 2 kg.

Bala (*Sida cordifolia* Linn.) Whole plant 5 kg.
 Bakuchi (*Psoralea corylifolia* Linn.) Seed 70 kg.
 Bibhitaka (*Terminalia beleica* Roxb.) Fruit (dry) 10 kg.
 Bilva (*Aegle marmelos* Corr.) Phala majja 18 kg.
 Eranda (*Ricinus communis* Linn.) Seed 20 kg.
 Gokshur (*Tribulus terrestris* Linn.) Whole Plant 6 kg., Seeds 5 kg.
 Guduchi (*Tinospora cordifolia*) Stem (fresh) 50 kg.
 Guggulu (*Commiphora wightii* (Arn.) Bhand) Oleo-gum-resin-5 kg.
 Japakusum (*Hibiscus rosasinensis* Linn.) flowers 2.3 kg.
 Ingudi (*Balanites roxburghii* Planch) Fruit (dry) 2 kg.
 Kalmegh (*Andrographis paniculata* Nees) Whole Plant (dry) 13 kg.
 Kantakari (*Solanum zanthocarpum* Schrad. & Wendle) Whole plant
 30 kg.
 Karpura tulsi (*Ocimum kilimandscharicum*) leaves (fresh) 25 kg.
 Kuberakshi (*Caesalpinia bonduc* Roxb.) Seeds (dry) 0.5 kg.
 Mandukparni (*Centella asiatica* (Linn.) urban leaves (fresh) 2 kg.
 Nimba (*Azadirachta indica* A. Juss) Whole Plant 6 kg., Bark 5 kg.
 Nirgundi (*Vitex negundo* Linn.) Root 7 kg., leaves 10 kg.
 Palasha (*Butea monosperma* (Lam) Kuntze flower 5 kg.
 Prishniparni (*Uraria picta* Desv.) Seed 50 kg., whole plant 35 kg.
 Punarnava (*Berhaovia diffusa*) Root (fresh) 20 kg.
 Rasna (*Pluchea lanceolata* C.B. Clarke) Root 3 kg., (Fresh) 5 kg.
 Salaparni (*Desmodium gangeticum*) D.C. Whole plant 5 kg.
 Sarpagandha (*Rauwolfia serpentina* Benth) Root 500g.
 Sarapunkha (*Tephrosia purpurea* Linn.) Pers. Root (fresh) 2 kg.
 Satavari (*Asparagus racemosus* Wild) Root (dry) 7 kg.
 Shalmali (*Salmalia malabarica*) Schott. & Endl. Flower 10 kg.
 Shankhapushpi (*Convolvulus pluricaulis* Choisi)) Whole Plant (dry)
 5 kg. (fresh) 10 kg.
 Shati (*Hedychium spicatum* Buch-Ham.) Whole plant (dry) 4.5 kg.
 Udumbar (*Ficus glomerata* Linn.) leaves (fresh) 10 kg.
 Varuna (*Crataeva nurvala* Buch Ham.) Bark (dry) 33 kg.
 Vasa (*Adhatoda zeylanica* Medic) leaves (fresh) 30 kg.
 Vijaya (*Cannabis sativa* Linn.) flowers 125 gm.

Abstract at a glance

1. Total number of medicinal species cultivated both on experimental/ mass scale cultivation. 400 approximately
2. Total produce (in kg.) of the Herbal Farms, during 1986-87 consisting of various parts of about 70 species. 637 kg. (dry) and 53 quintals (fresh).
3. Total drug supplied (in kg.) by the Herbal Farms to different Institutes/ Centres of the Council for research purposes. 725 kg. approximately of 61 medicinal species.

PHARMACOGNOSTICAL RESEARCH STUDIES

Pharmacognostical studies have an important role in the entire gamut of drug research studies taken up by the Council. 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.

The Pharmacognostical Research Units functioning at Calcutta, Delhi, Lucknow, Jammu and Pune have taken up the Pharmacognostical studies on the following 13 drugs widely used in Ayurveda and Siddha Systems of Medicine. The different units during the previous years have carried out and completed pharmacognostical investigations on about 153 drugs.

1. Asvatha (*Ficus religiosa* Linn.)-Bark
2. Chitraka (*Plumbago zeylanica* Linn.)-Root.
3. Devdaru-market sample-Wood (identified as *Pinus roxburghii* Sargent).
4. Gunja (*Abrus precatorius* Linn.)-Root and seed.
5. Jatamansi (*Nardostachys jatamansi* DC.)
6. Jayapala (*Croton tiglium* Linn.)-Seed.
7. Jivanti-Commercial sample-Leaf and Pseudo-tuber identified as *Dendrobium macraei* Lindl.
8. Karveera (*Nerium indicum* Mill.)-Root, leaf.
9. Lakoocha (*Artocarpus lakoocha* Roxb.)-Bark and stem.
10. Musta (*Cyperus rotundus* Linn.)-Tuberous roots, rhizome, leaf and stem.
11. Pushkarmula (*Inula racemosa* Hook f.)-Root,

12. Rudraksha (*Elaeocarpus ganitrus* Roxb.)-Fruit.
13. Salmali (*Salmalia malabarica* Schott. & Endl.) Flower and fruit.

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

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

CHEMICAL RESEARCH STUDIES

For the overall development of drug research the chemical research studies has a very important role to play. 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 Council has carried out such studies since inception at its various Units/Institutes. A brief resume of the work carried out during the year 1986-87 is reported as under :—

1(a). **Amlavetas** (*Garcinia pedunculata* Roxb.)

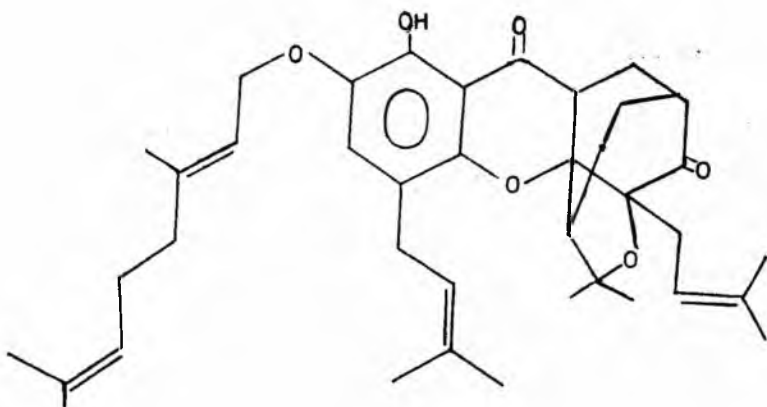
CRI, Delhi

Dry fruit (pulp) of the drug was successively extracted with benzene, ethyl acetate and ethanol (90%). The various extracts on concentration gave dark coloured viscous mass. Ethyl acetate fraction was extracted with ether and it was concentrated. Further work is in progress.

1(b). **Amlavetas** (*Garcinia pedunculata* Roxb.)

Ch.RU, Calcutta

From the petrol extract of *G. pedunculata* a new compound designated Gp-2 has been isolated. From detailed analysis of its spectral data a tentative structure has been assigned to Gp-2.



2. **Ardraka** (*Zingiber officinale* Rosc.)

Ch. RU, Calcutta

A compound has been isolated from the petrol extract of *Z. officinale* the structure elaboration of which is in progress. Pharmacological studies of this extract showed that it possesses definite anti-inflammatory and anti-malarial property.

3. **Arsaghna (Zaminkand)** (*Amorphophallus campanulatus* Roxb. Bl.)

Ch. RU, Calcutta

The petrol extract showed anti-inflammatory effect with the higher dose. Attempts are being made to isolate the active constituents.

4. **Bakuchi** (*Psoralea corylifolia* Linn.)

CRI, Delhi

Petroleum ether (60-80°) extract of the seeds on repeated column chromatography yielded 3 crystalline compounds viz. A. m. p. 162-64°, B.m.p. 132° and C.m.p. 128-30°. Infrared spectra showed them to be furocoumarins. Further study for their identification is in progress.

5. **Bhurja patra** (*Betula utilis* D. Don)

CRI, Delhi

(a). **Bark**

On column chromatography, a single compound, m.p. 261-62° was obtained from the benzene extract of the bark. The acetylation (acetic anhydride/pyridine) yielded an acetate, m.p. 220-4°. On the basis of infrared spector and melting point of the compound as well as its acetate, it was identified as Betulin.

(b). **Leaves**

Another crystalline, compound, m.p. 304-5° was isolated from the ether fraction of the 90% ethanolic extract of the leaves. It afforded an acetate, m.p. 203-4°. Final structural elucidation is in progress with the help of various spectra.

Ethyl acetate fraction of the ethanol extract on column chromatography yielded, crystalline compounds viz B₁. m.p. 237°, B₂ m.p. 218-220° and its acetate, m.p. 135.° On the basis of the various spectral studies the final structural characterisation is in progress.

7. **Jyotismati** (*Celastrus paniculata* Willd) **Ch. RU, Hyderabad**

(a). **Leaves**

800 g. powdered leaves were extracted in cold condition with methanol and 80 g. of the extract was obtained. It was further processed with other solvents. T.L.C. studies indicated the presence of α and β -amyrins. Further work is in progress.

(b). **Stem bark**

The wood bark powder was processed with various organic substances and the extracts obtained was processed on T.L.C. and column chromatography. Thus two pure compounds were obtained. Further work is in progress. The cold methanolic extract of stem bark also yielded two single compounds.

(c). **Heart wood**

Some studies with heart wood are also in progress.

6. **Hingu** (*Ferula foetida* Regel) **Ch. RU, Calcutta**

Several interesting sesquiterpenoid coumarins have been isolated from *F. foetida*. The structure elucidation of all these compounds with the help of modern spectroscopic methodologies and chemical experimentations is underway.

8. **Kairata** (*Swertia chirata* Buch-Ham.) and

Amra (*Mangifera indica* Linn.)

Ch. RU, Calcutta

Significant anti-inflammatory activity in the alcoholic extract of *M. indica* and in the benzene extract of *S. chirata* have been observed.

9. **Karchuras** (*Hedychium spicatum* Ham. ex Smith)

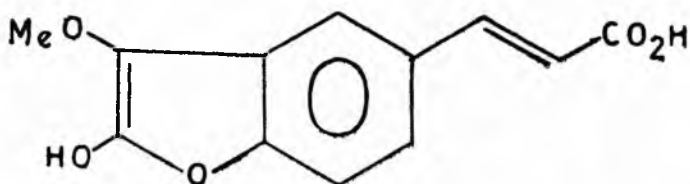
Ch. RU, Hyderabad

The plant material was subjected to steam distillation. The distillate so obtained was extracted with hexane and dried under reduced pressure. An essential oil was obtained in small quantity. Further studies are in progress.

The oily plant compound was extracted in soxhlet apparatus with petroleum ether, chloroform and Methanol successfully. An oily substance was obtained which gave positive test of phenols and terpens. Further work is in progress.

10. **Katnim** (*Murraya exotica* Linn.) **Ch.RU, Calcutta**

Repeated column chromatography of the concentrated CH_2Cl_2 fraction of the alcoholic extract of defatted *M. exotica* leaves afforded murraxonin. The structure of the compound has been settled as shown under, from spectroscopic data and chemical reactions.



11. **Nagakesar** (*Mesua ferrea* Linn.) **Ch RU, Hyderabad**

Petroleum ether extract of *Mesua ferrea* stamens on column chromatography yielded β -amyrin, β -sitosterol and a light yellow glossy product. This product was further purified to get colourless compound designated as Mesuaferrol. Based on the I.R., NMR, ^{13}C NMR and high resolution mass spectrometry studies, structural elucidation has been done and a cyclohexadione structure has been proposed.

12. **Nirgundi** (*Vitex negundo* Linn.) **Ch.RU, Calcutta**

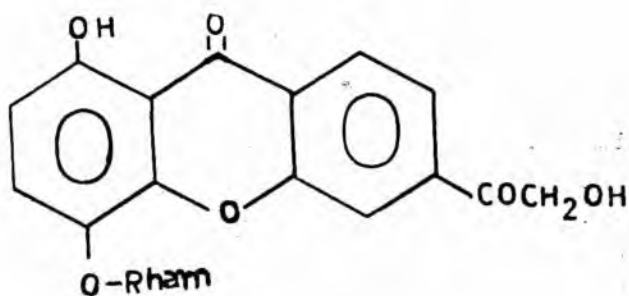
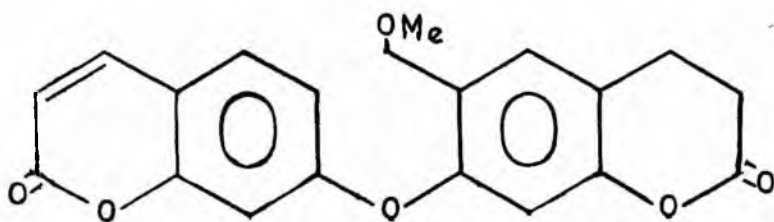
The seeds of the plant showed pronounced anti-inflammatory activities against different experimental models of inflammation. Isolation and characterisation of the polar constituents is underway.

13. **Parpataka** (*Fumaria indica* Pugsley) **CRU, Varanasi**

Search for active alkaloidal constituents of *Fumaria indica* was carried out. The alkaloids provisionally designated as Fi-St-1, Fi-St-2, Fi-St-3 and Fi-St-4 were under taken for detailed chemical and spectral analysis. The leaves and roots of the plant *F. indica* have also been taken for the isolation of the active alkaloidal constituents which is in progress.

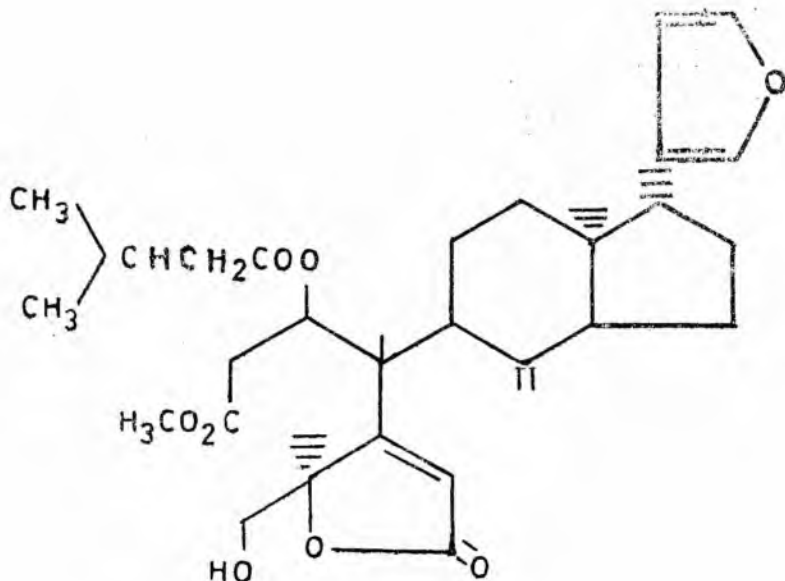
14. Rametha (*Lasiosiphon eriocephalus* Gcne) Ch.RU, Calcutta

A biscoumarin, Lasiocephalin (2) and a new xanthone glycoside, ALE/6(3) have been isolated and identified from the leaves of *Lasiosiphon eriocephalus*.



15. Rohitaka (*Aphanamixis polystachya* Wall. Parker)

From the chloroform extract of *A. polystachya* a potentia anti-feedant aphanamixolide has been isolated and its structure has been elaborated as follows :



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

CRU, Varanasi

Triterpenoid isolated from Pet. ether of stem bark which were designated as TG-1, TG-2, TG-3, TG-4 were identified as lupeol, betulin, betulinic acid and betulinic aldehyde by detailed study of its IR, 400 MMZ, 1 HNMR, ¹³C NMR and mass spectral data. The glycoside isolated from ethanol extract of roots of *T. grandis* i.e. TR-8, m.p. 215° was studied during this period. Final structure of the compound was settled on the basis of its chemical degradation and spectral analysis. The compound is under study for its biological activity. A naphthaglunone isolated from same fraction of the drug i.e. Lapachol was also studied for its biological activity and found to have anti-ulcerogenic effect on subsequent induced experimental animals.

17. Sallaki, Kunduru (*Boswellia serrata* Roxb.)—Gum Oleoresin

Ch,RU, Hyderabad

An essential oil has been isolated. Further confirmation of the composition of essential oil of gum oleoresin of *B. serrata* by GC-MS studies is in progress.

18. **Ulatkambal** (*Abroma angusta* Linn. f.) **Ch.RU, Calcutta**

The structure elucidation of the solid compound isolated from this plant is in progress.

19. **Vasa** (*Adhatoda vasica* Nees.) **Ch.RU, Hyderabad**

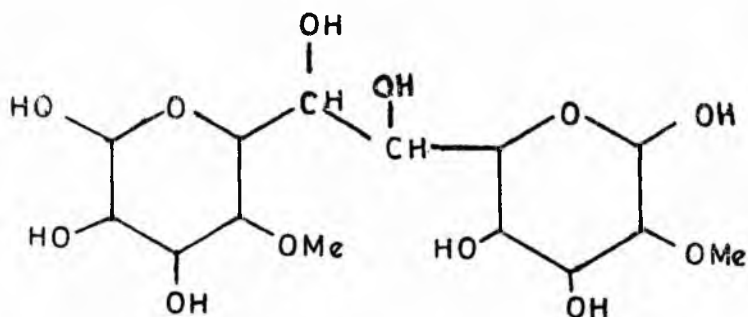
Flowers, leaves and stems of the plant was collected from Osmania University Campus. The plant material was shade dried and powdered, 700 g. of flowers, 3.2 kg. of leaves and 5.6kg. of stems were extracted with methanol to carry out chemical work.

20. **Vriksamla** (*Garcinia indica* Chois) **Ch.RU, Hyderabad**

A fresh lot of 2 kg. shade dried stem bark of *Garcinia indica* was collected from N. Canara distt. The powdered material was cold extracted successively with pet. ether (60-80°), chloroform and acetone, with a view to isolate a phenolic compound in larger quantity so that its structural elucidation studies and pharmacological screening can be done. Further work is in progress.

21. **Kuberakshi** (*Caesalpinia crista* Linn.) **Ch.RU, Calcutta**

A new polyhydroxy compound has been isolated from the methanolic extract of *C. crista*. The structure of the compound has been assigned as under from spectral data and chemical reactions.



22. **AYUSH-56 and AYUSH-64** **Ch.RU, Calcutta**

Detailed chemical work on the different extracts of the tablets of Ayush-56 and Ayush-64 as also with the extracts of the plant constituents present in these drugs have been carried out.

PHARMACOLOGICAL RESEARCH STUDIES

Drug research is a continuous process and studies on experimental animals is a very vital component. Whether it is the development of a new drug or confirmation of old claims, the Pharmacological studies and Toxicological studies play a very important role. Such studies are pursued by the Council for the overall development of Ayurvedic Drug Research. These studies are being pursued by various Institutes and Units of the Council located in different parts of the Country. During the year 1986-87, various single drugs, coded drugs and compound formulations were studied which are summarised as under:

A) Compound Formulation

1. Gokshuradi Guggulu

Ph. RU, Bombay.

Its effect on general behaviour in mice was studied. No untoward effect or any change in the movement was recorded with dosages upto 3200 mg./kg. However, 6400 mg./kg. doses showed decrease in the body movement in mice.

Dosages from 50 mg./kg. to 6,400 mg./kg. when given orally showed dose dependent increase in sleeping time during Sodium barbitone hypnosis studies. No analgesic effect was observed. Anticholinergic action with 40 mg./ml. of bath was observed in frog rectus abdominus muscle preparation.

2) Chandraprabha Vati

Ph. RU, Bombay.

No change in the general behaviour of mice was observed. Anticholinergic activity which was not reversible for a long time on frog rectus abdominus preparation was observed.

3) Brahmi Rasayan

Ph. RU, Jodhpur

The drug was studied for its effects on central nervous system in rats and mice. The Brahmi rasayan caused marked reduction of

locomotor activity and partial ptosis. It had inhibitory effect on most behavioral parameters, in particular the flight responses following noise and touch and the avoidance fraction to novel environmental stimuli were depressed.

The test drug afforded protection against maximal electro shock seizures. Pretreatment of Brahmi rasayan delayed the onset of leptazole induced convulsions and mortality; decreased the duration of tonic seizures; and prevented death in 2/6 and 3/6 animals in dose of 3 and 10 gm./kg. p.o. respectively. Thirty gram per kg. Brahmi rasayan did not protect the animals against mortality, although onset of convulsions was delayed and mean duration of tonic seizures was decreased.

The Brahmi rasayan had aninociceptive effect in all the dose tested. The test drug had no effect on motor coordination in dose of 1,3 and 10g./kg./p o. However, in 30 g./kg./p.o. dose 33.3% of mice showed inhibition of motor coordination within 30 min. and 50% of the animals at 1,2 and 3 hour of Brahmi rasayan administration. There was inhibition of the descent latency time of haloperidol induced catalepsy in animals treated with Brahmi rasayan. The results indicate that Brahmi rasayan inhibited conditions avoidance response in varying degrees in the rat in all the 3 doses tested. It induced significant potentiation of pentobarbitone narcosis in doses of 10 and 30 g/kg/p.o.

4) Dashamoolarishta and Balarishtam IIP, Cheruthuruthy

Dasamoularishta depressed SMA in mice. Both preparations protected mice against CCl₄ induced hepatic injury.

B) Single Drug

1. Amlavetasa (*Garcinia pedunculata*) IIK, Patiala

Acute toxicity studies were carried out in mice and rats of both sexes. The aqueous extract of the plant was given in graded doses and animals were observed for 24 hours. The LD₅₀ in mice and rats was 5 gm./kg. and 7.5 gm./kg. respectively.

The subacute studies were also conducted in rats. The drug was administered orally daily for a period of four weeks. Mild sedation

was observed in the animals receiving this drug. No gross or microscopic changes could be observed in heart, lung, liver, spleen and kidney. No hypothermic effect was observed in rats. However, the drug reduced the sleeping time in rats at 300 & 500 mg. dose. The extracts produced significant diuretic effect in rats at 300 and 1000 mg./kg. dose.

2. Amra (*Mangifera indica*)—Alcoholic extract. Ph. RU, Calcutta

The extract was screened for its anti-inflammatory effects on a number of experimental models and was found to possess statistically significant anti-inflammatory effect. (Percentage reduction/inhibition varied from 36% to 88.35%). The mechanism of action of this aspect is being investigated. The drug has been found non-toxic upto the dose of 2000 mg./kg. in mice. No toxic effects were observed during the course of sub-acute toxicity studies in mice which included haematological as well as histopathological studies on vital organs.

3. Ardraka (*Gingiber officinale*)—Petroleum ether extract

Ph. RU, Calcutta

The extract was emulsified in the 5% C.M.C. for screening purposes. The extract was put to a number of routine pharmacological screening both in vivo and vitro and it was observed that it has got significant anti-inflammatory effect. Further, the extract possessed anti-malarial property when studied against *P. berghei* infected mice. However, this effect was less as compared to AYUSH-64. It possessed trypanocidal property against *T. cruzi* infected mice. Further studies are in progress.

4. Bhanga (*Cannabis indica*)

Ph. RU, Lucknow

The Indian variety of *Cannabis sativa* was used in this study. In the earlier studies we reported anti-stress activity of the plant and possible role of benzodiazepine receptors in its action. Its chronic users the Sadhus of Shiva cult with symbol figure of Lord Shiva with Cobra as poison in (Neel Kanth) and offering of Dhatura and use of *Cannabis* by its votarie initiated us for this study.

These Sadhus are known to fare better than others when bitten by poisonous snakes. These above facts led us to explore its anti-venom effect in mouse against deadliest sanke poison of banded

snake (*Bengarus tascinatus*). Three weeks pre-treatment with this drug in mouse significantly reduced the ill effects of the poison and reduced the mortality. The results suggest chronic use of *Cannabis* may save life in sanke infested areas of India.

5. Badara (*Zujyphus jujuba*) **Ph. RU, Calcutta**

a) Methanolic extract

The extract was screened on a number of isolated smooth muscle preparations. It potentiated the Ach. induced contraction on isolated rat colon. It also increased the tone of intestinal movement in g. ileum preparation.

b) Ethyl acetate extract

The extract potentiated the Ach. colon effect on isolated rat colon.

6. Gajapipali (*Scindapsus officinalis*) **Ph.RU, Trivandrum**

A decoction of *Scindapsus officinalis* in doses from 10 mg. onwards produced transient heart block. It also showed significant anti-spasmodic activity in a dose of 30g./kg. orally and above.

7. Haritaki (*Terminalia chebula*) **Ph. RU, Calcutta**

a) Chloroform extract

On isolated smooth muscle preparation of g. ileum, the extract exhibited no effects against histamine induced contractions. It markedly increased the amplitude intestinal movement.

b) Petroleum extract

The extracts could not modify histamine induced contraction on isolated g. ileum. It also could not modify effect of Ach on isolated ratcolon.

8. Jatiphala (*Myristica fragrans*) **Ph. RU, Trivandrum**

The seed kernel of *Myristica fragrans* was successively extracted with Petroleum ether (60°—80°), chloroform, alcohol and water and the percentage of extractive in each case was found to be 28. 4, 6.18, 6. 22 and 5.43 respectively.

9. Jalapipali (*Lippia nodiflora*) **IIP, Cheruthuruthy**

Roots of female palm leave used in different extracts were prepared. The ETE and CAI were screened for various Pharmaco-

logical activities. Both extracts depressed SMA in mice. ETE prolonged latency of onset of strychnine convulsions. ETE showed anti-inflammatory, hypoglycaemic and hypocholesterolaemic activities. The extracts do not possess antidepressant and anti-psychotic effect.

10. Kapitha (*Feronia limonia*)

Ph. RU, Bombay

The petroleum ether extract of fruits of these plants showed perse contraction with dose (100 mcg./ml. to 800 mcg./ml). This effect was blocked by atropine sulphate. This blocking effect was reversible. The chloroform extract has no perse effect upto 400 mcg./ml. But this concentration blocks the acetylcholine response. This block is reversible. At 800 mcg./ml., the extract shows perse contraction which is not blocked by atropine. The methanol extract shows perse relaxation followed by contraction and the effect is dose dependant.

The study of various extracts on blood pressure and respiration in anaesthetised cats was studied. The petroleum ether extract showed no perse effect but blocked the rise and fall of adrenaline response. This extract seems to act through muscarinic receptors.

11. Karanja (*Pongamia pinnata*)

Ph. RU, Trivandrum

A decoction of *Pongamia pinnata* in doses of 200 mg. and above produced a dose linked transient heart block in perfused frog heart. But neither it produced any significant action on skeletal muscle nor it blocked the acetylcholine induced contraction of this tissue in doses upto 400 mg./ml. bath solution. This decoction in a dose of 8 g./kg. orally produced significant anti-implantation activity (87.5%).

12. Kiratatikta (*Swertia chirata*) Total Xanthones Ph. RU, Calcutta

The extract was emulsified in 5% gum acacia. A number of experimental models were used to test its anti-inflammatory effects. The percentage inhibition varied from 30% to 82%. The extracts appears non-toxic upto a dose of 2000 mg./kg, orally. During sub-acute toxicity studies in mice, more toxic effects either haematologically or on vital organs were observed.

**13. Kubreakshi (*Caesalpinia crista*)—Methanolic extract of seed
Ph. RU, Calcutta**

The extract was studied on isolated g. ileum and rat colon. From this study, it appears that the extracts possess some anti-chlorogenic activity.

14. Madayanti (*Lawsonia inermis*) TRU, Bombay

The following five extracts of this plant were screened for the anti-inflammatory and antipyretic activities :

- 1) II. TRN/LIR/P 2) III TNR/LIR/CH 3) IV. CVR/LIF/P
- 4) V. CVR/LIF/CH 5) CVR/LIF/M

None of the extracts exhibited any such activity.

15. Madhavi (*Hiptage benghalensis*) IIP, Cheruthuruthy

Studies were conducted with ETE and CAI. ETE produced CNS depression and hypothermia in mice. It also depressed SMA. CAI antagonised d-amphetamine stereotypy, shortened the duration of mice immobility, protected mice against pentylenetetrazol convulsions and possessed analgesic and anti-inflammatory activities. The extracts do not possess anti-parkinsonian and anti-depressant effects.

16. Marica (*Piper nigrum*)—Piperine Ph. RU, Calcutta

During Chemotherapeutic studies against *T. Cruzi* in mice piperine showed some Trypanocidal effect. The compound significantly potentiated Pentobarbitone induced sleeping time in mice. The compound failed to produce muscular in-coordination in mice Rotarod test. The L.D.₅₀ value was found between 750 and 800 mg./kg.

17. Motha (*Cyperus rotundus*) Ph. RU, Lucknow

Motha—root powder was found to be a potent and innocuous drug with high patient's preference in cases of Rheumatoid arthritis in a double blind placebo controlled trial.

18. Nimba (*Melia azadirachta*) Ph. RU, Lucknow

An alcoholic extract lotion was found to be effective against scabies, ring worm and acute eczema in man (second phase clinical trial).

19. Nirgundi (*Vitex negundo*) Petroleum ether extract of seed.

Ph.RU, Calcutta

The extract exhibited some anti-chlorogenic activity on isolated rat colon. It also exhibited 32% anti-inflammatory effect with a dose of 250 mg./kg. in carrageenin injected rats.

Further, the unit is maintaining *P. berghei* infected rats and mice as well as *Trypanosoma cruzi* infected rats and mice.

20. Nirnochi (*Vitex leucoxylo*)

IIP, (Cheruthuruthy

Leaf extract was used for the study. Studies were conducted with 90% ethanol extract (ETE) and cold aqueous infusion (CAI). ETE showed CNS depression and ETE and CAI depressed SMA in mice. CAI antagonised d-amphetamine stereotypy in mice. Both extracts possess analgesic and anti-inflammatory effects. CAI shortened duration of mice immobility and antagonised oxotremorine tremors. The extracts are devoid of anticonvulsant and antiparkinsonian activities.

21. Suran (*Amorphophallus campanulatus*)—Petroleum ether extract.

Ph.RU, Calcutta

The extract did not possess any analgesic effect upto 500 mg./kg. body weight. It possessed insignificant anti-inflammatory property. (only 15% reduction with 500 mg./kg. dose). It failed to exhibit anti-malarial activity against *P. berghei* infected mice. The extract possessed some anti-chlorogenic activity.

22. Tala (*Borassus flabellifer*)

Ph. RU, Trivandrum

Decoction of *Borassus flabellifer* produced neither mortality nor any toxic symptoms in mice upto a dose of 10g./kg. orally. However, it failed to show any analgesic (hot wire method in rats and acetic acid induced writhing in mice) and anti convulsant activity (against electro shock) in rats upto a dose of 4 g./kg. orally in rats and 10g./kg. orally in mice.

23. Tulsi (*Ocimum sanctum*)

Ph. RU, Lucknow

Tulsi has been studied by us earlier for its anti-stress effects and in the present study an extension of the same was done. It was found to possess, anti-radiation effect in mouse (work carried out in collaboration with Radiobiology, Department of Manipal Medical College). Receptor binding studies were also done and are in progress.

24. Trivrit (*Operculina turpethum*)

Ph. RU, Bombay

The following five extracts of this plant failed to show antipyretic activity :

- 1) MOT/CVR/M 2) MOT/CVR/C 3) MOT/CVR/C
- 4) JOT/CVR/P 5) JOT/CVR/M

25. Vata (*Ficus benghalensis*)

HK, Patiala

The aqueous extract of bark and prop root of Vata did not exhibit any hypothermic activity in albino rats. The alcoholic extract of the bark at a dose of 300ml./kg. slightly potentiated the pentobarbitone induced hypnosis whereas, 500mg. dose exhibited a significant effect.

The aqueous as well as alcoholic extracts of its bark indicated anti-diuretic effect which was directly proportional to the dosages used.

26. Nimbatikktam (Nimbidin)

TRU, Jhansi

Acute studies in albino rats were conducted with dosage varying from 100ml. to 200 ml./kg. No mortality or any abnormal change in behaviour during the period of observation i.e. within 24 hours was observed. Further studies are in progress. Since the drug is insoluble in water, for all toxicological and pharmacological screening, it was used as 2% suspension in gum acacia. Nimbidin perse showed dose dependant cardiac depressant activity on isolated frog's heart. It was found to be devoid of any activity on frog's rectus abdominis muscle and rabbit's ileum in vitro.

27. *Panax sikkimensis*

Ph. RU, Luknow

An Indian variety similar to *Panax ginseng* of Chinese origin was tested pharmacologically and it was found to possess potent hypotensive effect in anaesthetised dogs. The rhizome extract was used for this study.

28. Anti—venom Studies

IIP, Cheruthuruthy

V. leucoxydon, *B. flabellifer*, *H. madablotta* and *L. nodiflora* extracts were evaluated against cobra venom envenomation. None of the extracts could protect mice against envenomation. However, ETE of *B. flabellifer* significantly prolonged survival time.

Coded Drugs :-

29. AYUSH-56

Ph. RU, Calcutta

Certain chemotherapeutic studies against *T. cruzi* infected albino mice were conducted. The drug failed to show any trypanocidal property. It did not exhibit any mortality upto 72 hours in albino mice upto a dose of 5000 mg./kg. orally. Haematological studies in rabbits were conducted but no appreciable change in total and differential Leucocyte count and Haemoglobin percentage was observed.

30. AYUSH-64

Ph. RU, Calcutta

The drug failed to exhibit any trypanocidal property against *T. cruzi* in mice. Haematological studies in rabbits revealed no appreciable change in total R.B.C. and W.B.C. count and percentage of haemoglobin.

PHARMACEUTICAL RESEARCH / STANDARDISATION STUDIES

The Council Considering the necessity to have standards for Pharmaceutical processes and preparations, have taken up studies connected with evolving of analytical standards. The study assumes importance as the analytical data is based on the preparations made by the Units. This approach vouchsafes for genuineness and authenticity of the ingredients of the preparation as well as manufacturing process. It is needless to say that this occupies a pivotal place in the drug research programmes. Drug standardisation is no new idea and Ayurvedic works have laid down principles in this regard as below :

“And of that medicine, this is the test (you should know) that it is of such a nature, of such a quality, of such an efficacy; is born of such a country of region, of such a season ; gathered in such a manner, preserved in such a way, medicated thus and in such a dose, administered in such disease to such a person, either eliminates or allays such and such humor. And if there be any other administered medication in a similar manner, it should also be examined.”

Having regard to the aforesaid points, the Council has undertaken standardisation research studies on single drugs, processes of manufacture of formulations and finished preparations/formulations such as Rasa, Taila, etc., besides ancillary studies like shelf life, estimation and role of preservatives etc. that have relevance to the Ayurvedic pharmaceutical sciences. Standardisation studies on single drugs, method of manufacture and formulations are being carried out at Regional Research Institute, Trivandrum; Captain Srinivasa Murthy Drug Research Institute for Ayurveda, Madras ; Amalgamated Unit, Tarikhet and Drug Standardisation Research Project, Gujarat Ayurveda University, Jamnagar. Standardisation studies on formulations and single drugs are carried out at Regional Research Centre, Bangalore, while rapid analytical values are laid down by Captain

Srinivasa Murthy Drug Research Instt. for Ayurveda, Madras; Drug Standardisation Research Project, Gujarat Ayurveda University, Jamnagar and Drug Standardisation Research Project, Instt. of Medical Sciences, BHU, Varanasi.

The following pages provide briefly the particulars of the standardisation research studies on single drugs, process of manufacture and finished products alongwith the assignment of laying down analytical values of the formulations included in the Ayurvedic Formulary I & II volume, Government of India, carried out during the reporting year :

Single Drugs

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Physico/chemical data have been worked out on the following:

Swarna makshika-A	DSRPV
Swarna makshika-B	—do—
Vandhyawari (<i>Vicoa indica</i>)	CSMDRIAM
Shweta kutaja (<i>Wrightia tinctoria</i>)	—do—
Nimba (<i>Azadiracta indica</i>)	CSMDRIAM, RRIT
Shalmali (<i>Bombax malabaricum</i>)	CSMDRIAM
Poochandira pattai	—do—
Parijata (<i>Nyctanthes arborstritis</i>)	—do—
Patala (<i>Stereospermum suaveolens</i>)	RRCB
Yavani (<i>Trachyspermum roxburghi anum</i>)	RRCB
Danti (<i>Baliospermum montanum</i>)	—do—
Saireya (<i>Convolvulus pluricaulis</i>)	—do—
Bhumyamalaki (<i>Phyllanthus niruri</i>)	—do—
Maricha (<i>Piper nigrum</i>)	RRCB
Khadira (<i>Acacia catechu</i>)	RRCB, RRIT
Brihati (<i>Solanum indicum</i>)	RRCB
Murva (?) (<i>Chonemorpha fragrens</i>)	—do—
Apamarga (<i>Achyranthes aspera</i>)	RRIT
Ankota (?) (<i>Alangium salvifolium</i>)	—do—
Rasna (?) (<i>Alpinia calcarata</i>)	—do—
Pooga (<i>Areca catechu</i>)	—do—
Palasha (<i>Butea monosperma</i>)	—do—
Arka (<i>Calotropis gigantia</i>)	—do—
Jayapala (<i>Croton tiglium</i>)	—do—
Kapitha (<i>Feronia limonia</i>)	—do—

Nili (<i>Indigofera tinctoria</i>)	RRIT
Pushkaramoola (<i>Inula racemosa</i>)	—do—
Lajjalu (<i>Mimosa pudica</i>)	—do—
Atmagupta (<i>Mucuna pruriens</i>)	—do—
Nyanjana sugandha (<i>Murrya koengi</i>)	—do—
Jatamansi (<i>Nardostachys jatamansi</i>)	—do—
Kumuda (?) (<i>Nelumbium spicosum</i>)	—do—
Tulasi (<i>Ocimum sanctum</i>)	—do—
Kankola (<i>Piper cubeba</i>)	—do—
Pippali bheda (?) (<i>Piper retrifactum</i>)	—do—
Dadima (<i>Punica granatum</i>)	—do—
Madanaphala (<i>Xerompis spinosa</i>)	—do—
Sarpagandha (<i>Rauwolfia serpentina</i>)	—do—
Sala (<i>Shorea robusta</i>)	—do—
Amratika (<i>Spondias mangifera</i>)	—do—
Lodhra (?) (<i>Symplocos spicata</i>)	RRIT
Haritaki (<i>Terminalia chebula</i>)	—do—
Chincha (<i>Tamarindus indica</i>)	—do—
Sahadevi (<i>Vernonia cinerea</i>)	—do—
Badara (<i>Zizypus jujuba</i>)	—do—
Kutaja (<i>Hollarhena antidysenterica</i>)	AUT
Karavellaka (<i>Momordica charantia</i>)	—do—
Amlavetasa (<i>Garcinia pedunculata</i>)	—do—
Vatsanabha (<i>Aconitum chasmanthum</i>)	—do—
Rakta karavira (<i>Nerium indicum</i>)	—do—
Kanchanara (<i>Bauhinia variegata</i>)	—do—
Madayantika (<i>Lawsonia innermis</i>)	—do—
Nirgundi (<i>Vitex negundo</i>)	—do—
Durva (<i>Cynodon dactylon</i>)	—do—
Dhataki (<i>Woodfordia fruticosa</i>)	—do—
Shalaparni (<i>Desmodium gangeticum</i>)	AUT, DSRPJ
Shigru (<i>Moringa pterygosperma</i>)	AUT
Babbula (<i>Acacia arabica</i>)	—do—
Kantakari (<i>Solanum xanthocarpum</i>)	—do—
Jiraka (<i>Cuminum cyminum</i>)	—do—
Shunthi (<i>Zingiber officinalis</i>)	—do—
Madhuka (<i>Madhuka indica</i>)	—do—
Asana (<i>Pterocarpus marsupium</i>)	
Nridhadaru (<i>Argyria speciosa</i>)	DSRPJ
Hapusa (<i>Juniperus macropodu</i>)	—do—

Padmaka (<i>Prunus cerasoides</i>)	DSRPJ
Sirisha (<i>Albizzia lebbeck</i>)	—do—
Priyangu (<i>Callicarpa macrophylla</i>)	—do—
Patha (<i>Cissampelos pareira</i>)	—do—
Agnimantha (<i>Clerodendron phlomides</i>)	—do—
Punarnava (<i>Boerhaavia diffusa</i>)	—do—
Saptaparna (<i>Alstonia scholaris</i>)	—do—
Dhanyaka (<i>Coriandrum sativum</i>)	—do—
Daruharidra (<i>Berberis aristata</i>)	—do—
Eranda (<i>Ricinus communis</i>)	—do—
Gajapippali (<i>Scindapsus officinalis</i>)	—do—
Atibala (<i>Abutilon indicum</i>)	—do—
Gokshura (<i>Tribulus terrestris</i>)	—do—
Parpata (<i>Fumaria parviflora</i>)	—do—
Choraka (<i>Angelica glauca</i>)	—do—

Process Standardisation

Standardisation studies were carried out on the following processes of manufacture :

Asavarista	CSMDRIAM, DSRPJ
Taila	RRIT
Keraataila	—do—
Rasa	AUT, DSRPJ
Bhasma	DSRPJ
Parpati	—do—

Analytical Standards

Analytical data/values were laid down on the following formulations :

Swarna makshika-A	DSRPV
Swarna makshika-B	—do—
Shringarabhra rasa	CSMDRIAM
Manmathabhra rasa	—do—
Swarna bhasma-Batch III	—do—
Pravala panchamrits rasa	—do—
Panchanana rasa	—do—
Maha jvarankusha rasa	—do—

Jvarankusha rasa	CSMDRIAM
Vasakarista	DSRPV
Arogyavardhini rasa	—do—
Gangadhara rasa	—do—
Mushaka taila	DSRP7
Javahar mohara	—do—
Mritasanjivini sura	DSRPJ, DSRPV, CSMDRIAM

Formulations

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Detailed standardisation studies were carried out on the following formulations :

Vasakarista	DSRPV
Arogyavardhini rasa	—do—
Dashamoolarista	CSMDRIAM
Khadirarista	—do—
Brihat vidyadharabhra rasa	RRCB
Kapha keturasa	—do—
Rajanyadi churna	—do—
Marichadi gutika	—do—
Lajjalu keram	RRIT
Drakshadi vati	—do—
Chakramardha keram	—do—
Arka vati	—do—
Mushakadi tailam	—do—
Dasana samskara choorna	—do—
Katphaladi choornam	—do—
Musali choornam	—do—
Parthadyaristam	—do—
Kravyad rasa	AUT
Lavangadi vati	—do—
Jvrankusha rasa	—do—
Yetala rasa	—do—
Yasada bhasma	DSRPJ
Svrna parpati	—do—
Sri jayamangala rasa	—do—
Javaharmohara	—do—
Punanadyarista	—do—

General

Studies were also carried out on the following, to differentiate the genuine/authentic and known adulterant drugs :

Authentic drug	Substitute/Adulterant
1. <i>Syzygium aromaticum</i>	<i>Cinnamomum wightiana</i>
2. <i>Aconitum heterophyllum</i>	<i>Cryptocoryne spirata</i>
3. <i>Myristica fragrans</i>	<i>Myristica malabarica</i>
4. <i>Glycyrrhiza glabra</i>	<i>Abrus precatorius</i>
5. <i>Rauwolfia serpentina</i>	<i>Rauwolfia densiflora</i>

Studies are also carried out for shelf life, on formulations, besides carrying out studies in the field of micro-biology and tumor biology. Studies on drugs considered to possess contraceptive potentiality are in progress with a view to find out a non-steroidal oral contraceptive agent.

The Council has initiated action to identify the composition and percentage of the important ingredients used in the formulations besides preparing them with different proportions of ingredients/ combinations, other than those indicated in Ayurvedic Formulary of India with a view to study whether there is any comparable variation in the preparation. Efforts are also made to isolate identifiable key compounds from the standard formulations which may help in placing the identity of the formulation on firm ground.

Musk Deer Breeding Programme

The Council has a Musk Deer Breeding Farm at Maharuri (Dharmagarh—1200 (m.a.s.l.) and efforts are in progress for obtaining musk without sacrificing the animal.

The living and diet habits of the animals have been studied and the council has been able to breed the musk deer in captivity. There are at present 18 animals of different sex and age groups ranging from 250 days to 11 years in the Farm.

The council hopes to achieve the ultimate aim of obtaining musk without sacrificing the animal in the years to come.

LITERARY RESEARCH PROGRAMME

The literary and medico-historical research programmes are being carried out at Indian Institute of History of Medicine, Hyderabad, Documentation and Publication Division, New Delhi and Literary Research Unit, Thanjavur. The programme broadly covers medico-historical studies, collection and compilation of references relating to drugs and diseases from classical treatises, lexicographic works and contemporary literature and publications of Ayurveda and Modern sciences. The council is bringing out two quarterly periodicals i.e. Journal of Research in Ayurveda and Siddha and Bulletin of Indian Institute of History of Medicine. A monthly News Letter informing current activities of the organisation is also being released.

Indian Institute of History of Medicine, Hyderabad

Three manuscripts i.e. Sutrasthana, Kalpasthana and Rasasutram which appears to be commentaries on Ashtanga Hridaya by Gelavangala Mangalagirisari available at Andhra Pradesh Oriental Manuscripts Library and Research Institute were taken up. An abstract was prepared on this under the title "An hitherto unknown commentator". In view of ever increasing interest in the study and practice of traditional medicine, the Institute has made efforts to gather information in this regard from traditional medical practitioners and hereditary Ayurvedic physicians in and around Hyderabad. The Institute has been able to obtain 10 palm-leaf manuscripts from them and they were microfilmed. Biographical details of 27 traditional medical practitioners have been gathered.

Details relating to medicinal and other uses of Tambula and Vidanga from both medical and non-medical works have been gathered.

Biographic information of 23 physicians of Hyderabad during the Nizam dynasty has been collected. Translation of the last chapter

of Islami Tibb is in process. A note on a medical manuscript entitled Maulijat-e-Nebavi of Gulam Imam has been prepared. The study of the last volume of Al-Hawi of Rhazes has been completed and the list of the physicians mentioned therein has been compiled.

The Institute has provided referral service and assistance to about 150 scholars, scientists, post-graduate workers on subjects related to medical historiography.

The Institute during the reporting period acquired 78 books and 612 periodicals on Ayurveda, Yoga and other allied disciplines/systems. A number of enlarged copies of exhibits were prepared for the Festival of India in Soviet Union.

Vol. XIV (1984) and Vol. XV (1985) of the Bulletin of the Institute were released in April, 1986 and in January, 1987 respectively. 14,732 xerox copies which include 867 copies for outside scholars on payment basis were prepared. The income realised through sale of publications during the current period amounts to Rs. 2,413/-.

Documentation and Publication Division, Delhi

The Documentation and Publication Division has stepped up its activities in the direction of collection, compilation and dissemination of information connected with Ayurveda and Siddha systems of medicine and other contemporary sciences relevant to these systems. The division has gathered information on ongoing research projects in the fields of anti-fertility and anti-cancer drug studies.

Ashoka, Banjauri, Dhataki, Ishwari, Japa, Laksha, Nimba Pippali, Puga, Vidanga are a few of the drugs on which information is gathered under anti-fertility drug data gathering. The anti-cancer drugs covered include Aragvadhya, Manjistha, Prayangu, Saptaparna, Sephalika, Vanatrapusi etc. The compilation of information from classical works of Ayurveda on drugs allotted for the year namely Candana, Cirabilva, Darbha, Ghonta, Kancura, Kasturi latika, Mashaparni, Nagabala, Nandi, Patali, Pilu, Plaksha, Prativisha, Rohisa sara, Sprkka, Sveta candana, Sweta jeeraka, Vanjula and Vanya jeeraka was completed. The data gathered includes excerpts

from classical works, research reports, reprints of research papers in addition to classified bibliographies of current information.

References on Hridroga and Mutra krichha have been gathered from Brihatrayi, Laghutrayi and other Ayurvedic works.

The Division has provided referral and document supply service to the scientists and scholars engaged in research in Ayurveda and Siddha and other associated subjects.

The 7th volume of the quarterly Documentation Bulletin aimed to provide current awareness of the research work in Ayurveda and Siddha was released. About 151 research articles of Ayurveda and Siddha relating to 1971-85 were indexed together with annotations on 65 research articles.

The Librery collections were enriched with the procurement of rare Ayurvedic works namely Bower Manuscript, Nagar Sarvaswam and Santana Vignam Samudaya besides other books in the field of Ayurveda, Siddha and allied disciplines.

The photographic section prepared photo prints of Shivdas Sen's Teeka on Astanga Hridya and xeroxed about 13,278 pages. The video-filming of Council's activities was also taken up. The printing section undertook printing of the Council's News Letter, and some proformae required for use in the Council.

The publication wing cleared the backlog of periodicals of the years 1983 and 1984 and also released the issues of JRAS of 1985. Volumes III and IV of BMEBR were also released. The Council's News Letter upto February, 1987 were also released. A number of research monographs were processed for printing through Institutes/Centres/Units. Finalisation of the proceedings of the Silver Jubilee Celebrations of JNAMPG & H, Pune is in the process.

Publication of Ashtanga Samgrah-Uttarkhanda consisting of 30 chapters is nearing completion. Steps have been taken to bring out Sanskrit and Hindi edition of Sahasra yoga.

The sales of the Council's publications during the reporting period was Rs. 27,309.03.

Literary Research Unit, Thanjavur

This Unit has edited and prepared the press copy of the Ayurvedic manuscript entitled *Dhanvantari Vilasah* by King Tulaja, preserved in the Sarasvathi Mahal Library, Thanjavur. This manuscript describes various diseases and their cure. This work has been edited with Tamil translation and a press copy of 44 pages has been prepared. The editing work of *Pathyapathya Vibodha*, another manuscript preserved in the Saraswati Mahal Library which contains details about several plants and their uses in diseases is nearing completion. A press copy of another manuscript entitled "Dhanwantari Saranidhi" of the scholar King Tulaja preserved in Sarasvati Mahal Library is under preparation. 80 pages of the manuscript titled 'Netra Prakasika' of Nandikeswara, which deals with eye diseases and their treatment is prepared. It consists of 800 granthas divided into 15 patalas. The Unit is engaged in preparing press copy of *Chikitsamrita Sagar* with foot notes from all the three manuscripts available with the TSSM Library, Thanjavur.

In addition to the work carried out at Thanjavur, the Council through its Central Research Institute, Bhubaneswar has made survey of the Ayurvedic literature in Orissa State Museum. As a first step the titles of about 600 palm leaf manuscripts available in the Museum have been listed. The subject/title-wise classification of the work has been prepared with the intention of bringing out a descriptive catalogue of palm leaf manuscripts of the Museum.

The Central Research Institute, Bhubaneswar has initiated work on bringing out a Devanagri edition of *Abhinava Chintamani*, of Bhagwan Chakrapani Dass. The book deals with the essentials of Ayurvedic therapy, clinical methods for diagnosis, details of treatment and general principles of Ayurvedic pharmaceuticals. The book was compiled about 200 years back based on then available works on clinical diagnosis and therapy. Nevertheless, the work shows originality of contribution of the author. The specific treatment of *Navajwara*, the clinical description of *Amlapitta*, *Jwara* and emphasis of *Mantra* and *Daiva Vypasraya chikitsa* and a number of newer formulations of therapy for different diseases, are some of the originalities of this work. This work which is in Oriya script is brought out in Devanagri script. The draft copy consists of 66 kiranas (chapters) covering about 600 pages.

FAMILY WELFARE RESEARCH PROGRAMME

Clinical and pharmacological studies being carried out under this programme were continued further during the reporting period. The details of work carried out under both of these aspects is reported hereunder :

Clinical Studies

Clinical studies on plants/plant products as oral contraceptive agents were carried out at the Institutes/Universities functioning at Ahmedabad, Bombay, Calcutta, Delhi, Jaipur, Lucknow, Patiala, Madras, Trivandrum and Varanasi. During the reporting period following drugs were studied.

- | | |
|--|--------------|
| 1. AYUSH AC-IV | A coded drug |
| 2. K-capsule | -do- |
| 3. Pippalyadi yoga | |
| 4. Vandhyavari (<i>Vicoa indica</i>) | |

1. AYUSH AC-IV

The trial of this drug was continued at Bombay, Calcutta, Delhi, Jaipur, Lucknow, Patiala, Madras and Trivandrum. The work carried out on this drug in these projects is reported hereunder :

CRUFB

During the reporting period 72 new cases were enrolled under the study besides the follow-up of 46 old cases, carried forward from the previous year. Out of these 118 cases, two women reported pregnancy due to drug failure and three women discontinued the drug due to side effects, while 90 women discontinued the study due to the reasons other than pregnancy and side effects. Remaining 23 women were continuing the study at the end of reporting period.

CRID

During the reporting period eight new cases were enrolled besides the follow-up study of two cases that were carried forward from the previous year. Out of these ten cases one became pregnant due to drug omission and seven cases dropped out due to reasons other than pregnancy and side effects. Remaining two cases were continuing the drug at the end of the reporting period.

RRIC

The study was continued and 26 new cases were enrolled during the reporting period besides the follow-up study of 48 cases carried forward from previous year. Out of these 74 cases, two cases each became pregnant due to drug omission and drug failure while 49 cases discontinued the study due to the reasons other than pregnancy and side effects. Remaining 21 cases were continuing the study at the end of the reporting period.

RRIL

During the reporting period 20 new cases were enrolled under the study besides the follow-up study of 84 cases carried forward from the previous year. Out of these 104 cases, seven cases became pregnant—three cases due to drug failure and four due to drug omission. Five cases dropped out due to reasons other than pregnancy and side effects. Remaining 92 cases were continuing the study at the end of the reporting period.

ALRCAM

The study was continued further and 37 new cases were enrolled under the study during the reporting period besides the follow-up study of 25 cases carried forward from the previous year. Out of these 62 cases, 4 cases reported pregnancy—one due to drug failure and three due to drug omission. Two cases discontinued the drug due to side effects and 40 cases discontinued due to reasons other than pregnancy and side effects. Remaining 16 cases were continuing the study at the end of the reporting period.

IKP

During the reporting period 26 new cases were enrolled besides the follow-up study of 7 old cases carried forward from the previous year. Out of these 33 cases, one case became pregnant, and four cases left the study due to side effects of the drug. Seventeen cases discontinued the study due to reasons other than pregnancy and side

effects. Remaining eleven cases were continuing the study at the end of the reporting period.

CRUFT

The Unit has enrolled 72 new cases besides the follow-up study of 130 old cases carried forward from previous year. Out of these 202 cases, 17 cases reported pregnancy—seven due to drug failure and ten due to drug omission. One case left the study due to side effects (giddiness) while 72 cases discontinued due to reasons other than pregnancy and side effects. Remaining 112 cases were continuing the study at the end of the reporting period.

RRIJ

During the reporting period 50 new cases were enrolled under the study, out of which eight cases discontinued the study due to the reasons other than pregnancy and side effects. Remaining 42 cases were continuing the study at the end of the reporting period.

2. Pippalyadi yoga

Study on this drug was continued further. RRI, Calcutta has also taken up the trial of the drug in another group with different dose schedule. Details of the work carried out are reported hereunder:

CRUFA

During the reporting period 37 new cases were included into the study in addition to the 77 old cases carried forward from the previous year. Out of these 114 cases, two cases reported pregnancy due to drug omission and two cases due to drug failure while 73 cases discontinued the study due to the reasons other than pregnancy and side effects. Remaining 37 cases were continuing the study at the end of the reporting period.

RRIC

In the group which is being studied with the dose of one gram thrice daily with water for three consecutive days starting from the onset of the period, eleven new cases were included into the study in addition to the eleven old cases carried forward from the previous year. Out of these 22 cases one woman reported pregnancy due to drug omission and eleven women discontinued the study due to the reasons other than pregnancy and side effects. Remaining ten cases were continuing the study at the end of the reporting period.

The trial of this drug has also been taken up during the reporting period with different dose schedule i.e. 500 mg. twice daily with water, starting from 5th day of the onset of the period, throughout the cycle. In this group 42 cases were included, out of which five women conceived, one due to drug failure and four due to drug omission. Another 21 women discontinued the study due to the reasons other than pregnancy and side effects. Remaining 16 women were continuing the study at the end of the reporting period.

CRUFV

3. K—Capsule

Clinical trial of this drug was continued further and 52 new cases were included under the study during the reporting period in addition to the follow-up study of the 125 old cases carried forward from the previous year. Out of these 177 cases, nine women reported pregnancy, eight due to drug failure and one due to drug omission. One woman discontinued due to side effects (Allergic reaction) while 73 women discontinued the drug due to reasons other than pregnancy and side effects. Remaining 94 women were continuing the study at the end of the reporting period.

4. Vandhyavari (*Vicoa indica*)

Clinical Research Unit at Ahmedabad has also taken up the study on this drug in addition to the study being carried out at CRI, Delhi. Details of the work carried out during the reporting period are as follows :

CRUFA

Clinical trial on this drug has also been taken up by this unit during the reporting period. Five cases were enrolled. Out of these cases, two women reported pregnancy due to drug failure and one woman discontinued the study due to reasons other than pregnancy and side effects. Remaining two women were continuing the study at the end of the reporting period.

CRID

During the reporting period 21 new cases were enrolled in addition to the follow-up of the 19 old cases carried forward from the previous year. Out of 40 cases, eleven subjects became pregnant

due to drug failure and 20 subjects discontinued the drug due to side effects such as vomiting immediately after consuming the drug. Three women discontinued the study due to reasons other than pregnancy and side effects. Remaining six women were continuing the study at the end of the reporting period.

Pharmacological Research Studies

Pharmacological research studies were carried out by the units functioning at Bhubaneshwar and Trivandrum. The work carried out by these units is reported hereunder :

(a) Pharmacological Research Unit (under F.W.R.P.) Bhubaneshwar

During the reporting period the unit screened Japakusum (*Hibiscus roseasinensis*) and Neem oil in experimental animal models (rats) to confirm the abortifacient and spermicidal activity of these drugs.

Japa Kusam (*Hibiscus rosea sinensis*)

Alcoholic extract of *Hibiscus roseasinensis* administered in the dose of 100 and 200 mgs. per kg. body weight in pregnant albino rats from day one to day 10 of pregnancy showed 45% and 77% efficacy respectively. All the foetuses which were intact on the 16th day of pregnancy were found under normal development.

Neem Oil

Neem oil was administered to male albino rats in the dose of 5 ml. per rat daily. Significant reduction in the weight of both the testes and epididymus was observed after prolonged (30 days) treatment with the Neem oil. The count and mortality of the sperms was found decreased after 23 days of treatment with Neem oil.

(b) **Pharmacological Research Unit (Under F.W.R.P.) Trivandrum :**

During the reporting period the unit carried out the research study on Aristak (*Sapindus trifoliatus*) in mice and rats to screen acute toxic effect of the drug. The drug in the dose of 20 gm. per kg. body weight showed 100% mortality. As regards its anti-implantation effect in female rats the drug showed significant i.e. 70% anti-implantation activity.

K-Capsule	Varanasi	52	125	8	1	1	73	94
Pippalyadi Yoga.	Ahmedabad	37	77	2	2	—	73	37
	Calcutta	11	11	—	1	—	11	10
	(Group I)							
	Calcutta	42	—	1	4	—	21	16
	(Group II)							
Vandhya vari	Ahmedabad	5	—	2	—	—	1	2
	Delhi	21	19	11	—	20	3	6

Statement showing the details of the cases studied for clinical evaluation of oral contraceptive agents

Name of the drug	Centre	No. of cases studied		No. of cases dropped out due to				No. of cases continuing the study
		New cases enrolled during the reporting period.	Old cases carried forward from previous year.	Pregnancy	Drug failure	Drug omission	Side effects	
1	2	3	4	5	6	7	8	9
AYUSH-AC-IV Delhi								
Lucknow		8	2	—	1	—	7	2
Calcutta		20	84	3	4	—	5	92
Madrass		26	48	2	2	—	49	21
Patiala		37	25	1	3	2	40	16
Trivandrum		26	7	1	—	4	17	11
Jaipur		72	130	7	10	1	72	112
Bombay		50	—	—	—	—	8	42
		72	46	2	—	3	90	23

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A. Clinical and Basic Research				
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II. Participation

Sl. No.	Name of the author(s)	Title of the Paper/Article.	Name of the Conference/Seminar/Workshop.	Date of participation.
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A. Clinical and Basic Research

1. Dixit, K.S., Singh, S.P., Sinha, K.N., Singh, N., Kohli, R.P.
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3.	Dixit, K.S., Singh, S.P., Singh, K.N., Singh, N., Kohli, R.P.	An assessment of some Indian plants (<i>Ocimum sanctum</i> , <i>Terminalia</i> and <i>Inula racemosa</i> in asthma patients.	Proc. IIIrd. world Conf. of Clin. Pharma. & Ther. Abst. No. 1561 Vol. II.	July-Aug., 1986.
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- B. Health Care Research
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14.	Singh, R.P., Singh, Ramji.	Role of Pushkarmool and Guggulu in cases of Ischaemic heart disease.	Ind World Congress on Yoga and Ayurveda held at Varanasi.	Jan., 1987.	
15.	Singh, N., Srivastava, A.K.	A study of Ayurvedic crude plant drugs for their anti-stress activity and usefulness in stress related diseases in man.	Proc. Silver Jubilee of JNAMPG & H, Pune.	May, 86.	
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17.	Singh, N., Singh, S.P., Kohli, R.P.	<i>Cyperus rotundus</i> in the treatment of Rheumatoid arthritis.	Proc. IIIrd World Cong. & Therap. Abst. No. 444.	July-Aug., 86.	
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The role of Ayurveda in the Primary Health Care Programme.

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C. Medico-botanical Survey and Cultivation

29. Billore, K.V.,
Audiichya, K.C.,
Dhar, Bishnu Priya

Conservation of Medicinal plants in Rajasthan with special reference to conservation and propagation of Guggulu.

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30. Billore, K.V.,
Mishra Ratan,
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Role of Medicinal plants in social forestry/Afforestation in Rajasthan.

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Nesamany, S. A review of some important
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26. Singh, R.H. Development of appropriate
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Research. CCRAS Senior Officers
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36. Joshi, M.C.	Cultivation and conservation of Medicinal plants in Gujarat.	Silver Jubilee Celebration of JNAMPG & H, Pune, Scientific Seminar of Indian Medicinal Plants Research.	25th to 27th May, 1986.
37. Majumdar, R., Nair, A.R., Talukdar, T.K.	Some Sastriya medicinal plants of Greater Gauhati and suburb.	Seminar of Medicinal plants at Gauhati.	June, 1986.
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31.	Chaturvedi, D.D., Yadava, B.B.L., Mishra, K.P.	Cultivation/extraction of gum-oleoresin in <i>Commiphora Wightii</i> (Arn.) Bhand. Problems & prospects.	Silver Jubilee Celebration of JNAMPG & H, Pune, Scientific Seminar of Indian Medicinal Plants Research.	25th to 27th May, 1986
32.	Choubey, S.N. Kohli, S.	Contribution of Indian aborigines to the Ayurvedic System of Medicine.	-do-	-do-
33.	Dwivedi, G.V., Ojha, J.K.	Collection, preservation and storage of Medicinal plants.	-do-	-do-
34.	Hemadri, K.	Tribal Medicine—A indepth study.	-do-	25-27th May, 1986
35.	Joshi, G.C., Tiwari, K.C., Pandey, N.K., Tiwari, D.N.	Distribution, analysis, conservation strategy and Folk Medicinal importance of 'Udsalcob' (<i>aronia emodi</i> Wall.) from Western Himalaya.	1st International Seminar on Unani Medicine.	Feb., 87

46. Sharma, B.N.;
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47. Tiwari, K.C.,
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- D. Pharmacognostical and Chemical Research
50. Saxena, R.B.
Study of tannin -do- -do-

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41. Pathak, N.N., Purohit, G.N., Sharma, R.R.	Newer observation of the cultivation of Shatawari (<i>Asparagus racemosus</i> Willd) in Sandy Soil of Bundelkhand, Jhansi.	Silver Jubilee Celebration of JNAMPG & H, Pune, Scientific Seminar of Indian Medicinal Plants Research.	25th to 27th May, 86
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43. Sharma, P.C.	Medicinal plant cultivation—a self appraisal with reference to important aspects of research.	Senior Officers meeting of CCRAS from 6-3-87 to 9-3-87 at Nagpur.	7-3-87
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70.	Rao, A.V. Basaveshwara	Bone setters of Hyderabad.	11nd World congress on Yoga and Ayurveda at B.H.U. Varanasi.	Jan., 87

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1	2	3	4	5
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74.	-do-	Medico Historical information from non-medical sources.	Senior Officers meeting held at Nagpur.	March, 87
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TECHNICAL REPORT—SIDDHA

Abbreviations used for Institutes/Units of Siddha System of Medicine

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

CLINICAL RESEARCH

Clinical research is being carried out on certain selected clinical conditions at the Institutes/Units of the Siddha System of Medicine functioning under the Council. Clinical conditions studied during the reporting period include Valigunmam (Peptic ulcer), Putrunoi (Cancer), Manjal kamalai (Infective hepatitis), sandhi vatha soolai (Rheumatoid arthritis), Kalanjaga padai (Psoriasis), Vellainoi (Leucorrhoea), Peruvaeru (Ascitis), Gunmam (Intestinal disorders), Veluppunoi (Anaemia), Venkuttam (Leucoderma), Neerazhivu (Diabetes mellitus), Oothal noi (Obesity), Karappan noi (Skin diseases).

The research work carried out during the period under review is reported hereunder :

Velluppunoi (Anaemia)

Velluppunoi is described as of five varieties. They are Vatha, Pitha, Kapa, Mukkuttra and Vida Velluppunoigal. Studies on this disease condition were conducted at Regional Research Institute (Siddha), Pondicherry and Clinical Research Unit, Palayamkotai. A total number of 123 cases have been treated adopting different therapeutic approaches. The following table provides details pertaining to the line of approach together with the results of study :

Result of Treatment

Drugs		Relief					
		Com.	Marked	Mod.	Mild	LAMA	Total
1	2	3	4	5	6	7	8
1.	Aya Bangarajakarpan 260 mg., three times a day.	21	13	—	—	7	41
2.	Kantha chendoram 65 mg., three times a day.	12	4	—	—	5	21

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1	2	3	4	5	6	7	8
3.	Ahnabedi chendoo- ram 250 mg., three times a day	17	4	10	11	19	61
Total		50	21	10	11	31	123

Gunman (Intestinal disorders)

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Eight types of Gunman has been described in Siddha texts. According to the Siddha texts, the disease occurs due to irregular dietitic habits, ingestion of hot and spicy food and addition to Alcohol. It also occurs due to stress and strain. Due to this, Vatha and Piṭha get vitiated resulting in loss of appetite, dyspepsia, pain in the epigastric region and vomiting. The study of this clinical condition was carried out at Regional Research Institute (Siddha), Pondicherry. Details of the result of treatment are reported hereunder :

Result of Treatment

Drugs	Relief					
	Com.	Marked	Mod.	Mild	LAMA	total
Gunmakudori Mezhgu 1 gm. thrice a day.	3	8	—	—	6	17

Kazhichal (Digestive disorders)

The study on Kazhichal was carried out at Clinical Research Unit, Palayamkottai and the result of the treatment is tabulated hereunder :

Result of Treatment

Drugs	Relief					
	Com.	Marked	Mod.	Mild	LAMA	Total
Padiga linga thubar 500 mg. BD with Elumichem- pazha charu	4	2	3	3	2	14

Oothal Noi (Obesity)

Four varieties of Oothalnoi (i.e.) Vatha, Pitha, Kapa, and Mukkuttra are mentioned on the basis of Mukkuttra Verc Padugal. Consumption of hot and spicy foods, spoiled and poisonous food, food contaminated with ash, mud and other impurities are some of the factors responsible for causation of this condition. This clinical condition is also found associated with Velluppunoi, Sanni, poisonous snake bites etc. Kapa gets vitiated in this clinical condition. This study was conducted in Regional Research Institute (Siddha), Pondicherry using different drugs. The following table provides the details of the study :

Result of Treatment

Drugs	Relief					Total
	Com.	Market	Mod.	Mild	LAMA	
Vediuppu churnam (130 mg.) with Mullangi charu twice a day.	6	5	—	—	7	18
Vadiuppu churnan (130 mg.) with Mullangicharu and Mandoorathi Addi, Kudineer (60 ml.) twice a day.	10	4	—	—	9	23

Vellainoi (Leucorrhoea)

Vellainoi or Vellai theettu was taken up for study at Regional Research Institute (Siddha), Pondicherry. The study was conducted with Kudeeneer, peechu (douche) in 15 cases. Out of these four cases got complete relief and eight cases showed marked relief. Three cases were discharged against medical advice.

Karappan Noi (Skin disease)

Karappan noi, also known as Sarumanoigal, was studied at Clinical Research Unit (Siddha), Trivandrum. During the reporting period five cases were treated with Gandhaga rasayanam 3 grams in two divided doses for 40 days. Three cases showed complete relief and two cases had marked relief.

Peruvaeru (Ascitis)

The study on this clinical condition was carried out at Regional Research Institute (Siddha), Pondicherry using Vediuppu Chunnam in the dose of 130 mg. three times a day for 21 days with Karumbu-charu. To enhance the effect of the drug a Kanchi (Porridge) consisting of Vellari paruppu, Moolampazha paruppu and Tharboosanaï paruppu was prescribed. Out of the six cases of this condition, five cases got complete relief and one showed marked relief.

Kalanjaga Padai (Psoriasis)

Kalanjaga padai has been taken up using 777 Oil (a coded drug) by the Central Research Institute (Siddha), Madras. 10 ml. of 777 Oil with milk was administered in two divided doses in all the 91 cases selected for study. The patients were advised to apply oil externally on the affected parts of the body. The details of treatment and results thereof are reported hereunder :

Result of Treatment

Drug	Relief					
	Com.	Marked	Mod.	Mild	LAMA	Total
777 Oil (5ml. BD)	24	26	16	6	19	91

No side effects were observed. Recurrence of mild nature was seen after discontinuing the treatment.

Putrunoi (Cancer)

Putrunoi is described in Siddha texts under the head 'Virananogal. This was described as Putru and it is named after the affected organism i.e. if the breast is affected it is called Mulai Putru noi. This study was under taken at Central Research Institute (Siddha), Madras to determine the efficacy of Siddha drugs in the cases of

Putrunoi using the coded drugs RGX consisting of mercury, sulphur and Serankottai (*Semicarpus anacardium*), VK₂ consisting of Venkodiveli (*Plumbago zeylanica*) and SKX consisting of fried nuts of Serankottai (*Semicarpus anacardium*). These drugs were administered at the dose level of one gm. tds in all the selected cases along with Linga Chendooram with honey as a supporting therapy. Ulcers, tumours were dressed with Hithiyakalyani elai Kalkam and Pachaiennai with thurusu. 85 cases were treated during the period under review. All the cases responded well to the treatment. Average duration of the treatment was 60 days. After discharge, these cases are being followed at out patient department of the Institute. Out of 85 cases treated, 34 cases were of Yoniputru (Cervix uteri), 12 cases of Vaeruputru (Cancer stomach) and 5 cases of Mulai putru (Cancer breast). Reduction in the size and growth of the ulcers, tumours, reduction or arrest of the discharges and also reduction in pain was noticed in almost all the cases.

The details of the results of the treatment is reported as under :

Result of Treatment

Drugs	Relief					
	Com.	Marked	Mod.	Mild	LAMA	Total
RGX, SKX, VK ₂ (one gram TDS)	—	2	—	14	69	85

Sandhi Vatha Soolai (Arthritis)

Sandhi vatha soolai which is identified as Rheumatoid arthritis in modern parlance, is one of the 10 varieties of Vatha diseases described in Siddha System of Medicine. A study to evaluate the effect of Gowrichinthamani and Linga chendooram in the management of Sandhi vatha soolai was taken up at Central Research Institute (Siddha), Madras. 300 mg. each of Gowrichinthamani and Linga chendooram was administered two times a day with honey in all the 51 cases studied during the reporting period. Tamarind and chillies free diet with less salt was advised during treatment. Kukil thailam and/or Mynathailam was used externally on the affected parts. The details of result of treatment are reported hereunder :

Result of Treatment

Drugs	Relief					Total
	Com.	Marked	Mod.	Mild	LAMA	
Gowrichinthamani, Linga chendooram (300 mg. each BD)	1	18	14	7	11	51

Manjal Kamalai (Infective hepatitis)

Manjal kamalai is one of the 83 varieties of Kamalai described in the Siddha literature. Manjal kamalai was studied at Central Research Institute (Siddha), Madras. The Kalkam made of Kozhi avarai was administered in the dose of 5 gm. two times a day with water in all the 40 cases selected for the trial. Salt and fat free diet was recommended to all the cases. No side/toxic effects were noticed. The details of result of treatment are reported hereunder :

Result of Treatment

Drug	Relief					Total
	Com.	Marked	Mod	Mild	LAMA	
K3, Kalkam of Kozhi avarai (5 gms. BD)	14	13	8	1	4	40

Valigunmam (Peptic ulcer)

Valigunmam equated to Peptic ulcer in modern parlance is one of the eight varieties of Gunmarogangal described in Siddha literature. The study was undertaken at Central Research Institute (Siddha), Madras to study the effect of Thambiran in this condition. The cases having pain in the abdomen in relation to food, discomfort in the epigastric region, nausea, vomiting, eructation, haematemesis, reduction in body weight are selected for trial. The diagnosis was further confirmed by FTM and barium meal X-ray reports. Tambira chendooram prepared using Karunthulasi charu and Tambiram and coded as P6 was administered at the dose level of 45 mg. with honey

two times a day for 5 days. On 6th day Omambath was given and no 7th day Jeeraga thailam bath was given to all the 84 cases studied during the reporting year. This course was repeated twice. The clinical assessment was made after each course of the treatment. No side/toxic effects were reported. The details of result of treatment are reported below :

Result of Treatment

Drug	Relief					Total
	Com.	Marked	Mod.	Mild	LAMA	
Tambira chendooram (P6) (45. mg. BD)	20	41	7	1	15	84

Venkuttam (Leucoderma)

Venkuttam has been described in Siddha texts as one of the Kuttanoigal. Response of certain selected Siddha drugs was studied in the cases of this disease at Clinical Wing of the Drug Research Scheme (MD), Madras. The details of result of treatment are reported hereunder :

Result of Treatment

Drugs	Relief					Total	
	Com.	Marked	Mod.	Mild	No LAMA		
1. Ponnimalai chendooram with honey	—	—	4	19	22	3	48
2. Kandankathiri choornam, Kandankathiriennai.	—	—	—	6	5	1	12

No toxic/side effects were noticed during and after treatment and also during the follow-up period. The drug Ponnimalai chendooram showed promising results after sixty days of treatment.

Murajwaram (Periodic fever)

Murajwaram was taken up for study at the Clinical Research Unit (Siddha), Palayamkottai. Linga chendooram at the dose level of 250 mg. with honey was administered three times in four cases admitted in the In-Patient Department of the Unit. Out of these four cases, three cases got complete relief and one case got mild relief.

Kakkai Valippu (Epilepsy)

The Clinical Research Unit (Siddha), Palayamkottai carried out the study on Kakkai valippu equated to Epilepsy in modern parlance. 5 to 10 drops of Pachondhi sudar thailam was administered with Inji charu (Ginger juice) two times a day for 40 to 50 days in all the cases taken up for study depending upon their condition. Out of the three cases treated during the reporting year, one case got mild relief while other two cases discontinued the study against medical advice.

Neerazhivu (Diabetes mellitus)

Neerazhivu is described under seruneer Perukkunoigal in Siddha literature.

The study on Neerazhivu using Abraga chendooram was carried out at Clinical Research Unit (Siddha) functioning at Safdarjung Hospital, New Delhi, and also at Clinical Wing of Drug Research Scheme (MD), Madras. The mild and moderate cases of Nearazhivu were taken up for study. The line of approach and the results are summarised in the following table.

Result of Treatment

Drug and doses	Control						Total
	Com.	Marked	Mod.	Mild	No	LAMA	
1. Abraga chendooram (500 mg)	—	—	—	1	2	—	3
2. Abraga chedooram (200 mg)	1	8	5	—	4	—	18

**Statement of the patients attended at OPD(s) and admitted in
the IPD(s) functioning under Siddha System of Medicine**

Sl. No.	Institutes/Units	No. of patients attended at OPD			No. of patients admitted in IPD
		New	Old	Total	
1.	Central Research Instt. (Siddha), Madras.	9544	14080	23,624	485
2.	Regional Research Instt. (Siddha), Pondicherry.	6522	15370	21892	179
3.	Clinical Research Unit, (Siddha), Palayamkottai.	760	2674	3434	84
4.	Clinical Research Unit, New Delhi.	51	275	326	—
Total		16,877	32,399	49,276	748

HEALTH CARE RESEARCH PROGRAMME

The Council has continued the Mobile Clinical Research Programme to identify and assess the health status, environmental conditions, diet habits and their impact on health in addition to gathering information on diseases incidence.

MCRUSM

During the period under review, the Unit has covered 3530 individuals out of the total population of 4509 of the villages Ayapakkam and Kattuppakkam. The Incidental medicare was provided to 1318 individuals. Kudar Puzhunoigal, Sori Sirangu, Muttuvali, Uppisam, Kazhichal Moolam, Kanakkadi etc. are some of the common diseases.

MCRUSP

The Unit has conducted regular visits to the village Korkkadu and covered 543 individuals of total population of 1800. 117 individuals were provided incidental medical aid.

Tribal Health Care Research Programme

There are two Tribal Research Projects functioning under Siddha and their work is reported here under :

THCRTP

Two villages Athanavoor and Nilavoor have been selected for survey from among the 13 villages falling under the zone of operation of this Programme. These villages are situated approximately 30 K.m. away from the Headquarters of the Unit. The total population of the two villages are 2306. The survey party conducted 13 trips and treated 449 patients. The common condition treated are Erigunnam, Irumalnoi, Iraippanoi, Kaduppukazhichal, Kudar puzha noi, Pun/Naalpattapun, Sandhi vathan, Sirangu, Suranoikal, Tholnoikal, Valigunman.

The survey party has gathered the details about age, educational status, marital status, occupation, habits, income and addiction etc. in respect of 267 individuals of the two villages surveyed. The main occupation of the villagers is agriculture. Paddy, Raghi, Oastor Seeds,

Millets, Maize, Kadugu Samai, Pei Ellu and Mulburry are among the few those are cultivated.

Kudukkai, Puli, Palamaran, Koiya, Madulai, Kalpassi and Marapaasi etc. are commonly grown in the area.

THCRPK

Six villages surrounding the Headquarters are selected for the survey. The total population of these villages are 4000 approx. The Unit effectively started functioning only in September 1986. 298 patients of different age groups were treated for the ailments like Irumalnoi, Kan noikal, Neer noigal, Oothal noi, Sandhi, Vatham Suranoikal, Valigunmam.

MEDICO-BOTANICAL SURVEY

Medico-botanical Survey Unit functioning at Govt. Siddha Medical College, Palayamkottai has played an important role in the field of Drug Research. The Unit was established in the year 1971 and during the last one and half decade, the Unit has taken up the task of exploring the Medicinal Flora of Tamil Nadu State with special emphasis on the medicinal plants used in Siddha System of Medicine. The activities of the unit broadly include the exploration of areas of the Tamil Nadu for the qualitative and quantitative study of the medicinal flora; identification of plant specimen availability of genuine drugs and study of their substitutes/adulterants etc. The Unit is maintaining a Herbarium and a Museum consisting of 4552 herbarium specimens and about 100 drug samples respectively.

During the reporting year, the unit conducted survey work in the Forest Areas of Vallanadu, Sanker Nagar, Tirunelveli Forest Division; Kodikkarai, Vedarnuam Forest Areas of Tanjore Forest Division; Coimbatore and Pollachi Forest Areas of Coimbatore; Forest Areas of Martuthuval Pudur; Malai Forest Areas of Kanya Kumari Forest Division; Shenbaga Thoppu and Srivilliputhur Forests Areas of Kamraj Forest Division; Mundanthurai, Lower dam, Shervalar, Thullukkamottal, Kongusolai, Injikuzhi, Papanasam, Shencottai Forest Division; Apart from this, the Unit has also conducted local collection tour in Maharaja Nagar and Raja Vallipuram.

Herbarium

During the survey of the Tamil Nadu areas about 313 plant specimens were collected which consist of 307 species falling in 274 genera and 78 families. During the period under review, out of 313 plant specimens collected about 158 specimens were mounted and added to the Herbarium. Apart from this the Unit has identified 1450 plant specimens out of the previous collections.

Some of the important plant specimens collected and added to the Herbarium include:

Pulanji (*Fluggea leucopyrus* Willd), Kattukodi (*Cocculus hirsutus* Diels), Somakodi (*Ceropogia juncea* Roxb.), Inchangu (*Azima tetraantha* Lam.), Sirupeelai (*Aerva lanata* Juss.), Peithumbai *Anisomeles malabarica* R. Br.), Kasthurivendai (*Hibiscus moschatus*), Chitrapaladai (*Euphorbia hirta* Linn), Pavazhapoondu (*Arthrocnemum indicum* Moq.), Sapathtukalli (*Opuntia dillenii* Ham.), Nanjaruppan (*Tylophora asthmatica* W. & A.), Mulkathiri (*Solanum incanum* Willd.) Uppilankodi (*Pantatropis microphylla* W. & A.), Nilakkumil (*Gmelina asiatica* Linn), Kayambo (*Memecylon umbellatum* Burm.), Pulluruvi (*Loranthus longiflorus* R. Kurz), Marukkarai (*Randia duematorum* Lamak), Kaddakkodi (*Pachygone ovata* Poir Miers), Thagarai (*Cassia occidentale* Linn), Nattuvadumai (*Terminalia catappa* Linn.), Malchankan? (*Azima teracantha* Lam), Poochanthirapattai (*Anisochilus carnosus* Wall), Sagadevi (*Vernonia cineria* Lass), Thuthi (*Abutilon indicum* G. Don), Chennayuruvi (*Achyranthes bidentata* Linn), Kodithuthi (*Sida glutinosa* Cav), Vennangu (*Anogeissus latifolia* Wall), Kolthamarai (*Begonia floeifera* Bedd.), Azhukanni (*Dresera burmanii* Vahl), Pasalaikizhangu (*Portulaca wightiana* Wall), Vishamungil (*Crinum delfexam* Ker), Kolama (*Schleichera triuga* Willd), Arututtukkilangu (*Maranta arudinacea* Linn), Mandarai (*Bauhinia purpurea* Linn), Saranai (*Trianthema portulacastrum* Linn), Nerpaalam (*Coio lachrymajobi* Linn).

Museum

About 22 plants specimens and their drug parts used in Siddha System of Medicine were collected, preserved and added to the Museum making a total of 486 museum samples being maintained by the Unit.

Drug Supply

About one quintal different plant/drug samples like Chembaruthi, Adigam Thulasi, Karisalai Vetpalai, Thottalwadi, Vizha, Oomathai, Nelli etc. were collected and stored by the Unit for supply to other Units of the Council for research purposes during the period under review. About 11.750 Kg. out of the above collected plant material after drying were sent to Council's Units/Centres/Institutes and also to the Headquarters of the Council.

Folk-Medical Claims :

Three folk-medical claims were gathered. One of the claims relates

to the treatment of ulcers and abscesses and the other two are said to be useful antifertility agents.

Medicinal Plants Garden

The Drug Research Scheme (MD), Madras is maintaining a small Medicinal Plants Garden having about 146 species of annuals, bi-annuals, perennials, climbers, trees. During the reporting year about 14 new plants like Kalyana murungai (*Erythrina vareigata*), Vetpalai (*Wrightia tinctoria*), Poovarasu (*Thespesia populnia*), Samparuthi (*Hibiscus rosa-sinensis*), Kozhiavarai (*Canavalia virosa*), Kalarchi (*Caesalpinia crista*), Elavam (*Salmalia malabarica*). Thiruneetru patchi (*Ocimum basilicum*) Sathaguppai (*Anethum sowa*) etc. were added to the Garden. During the year 1768 Kg. of fresh drug was supplied to the Inpatient Department, Pharmacy and animal house of the Central Research Institute, Madras. In addition to this, 250 Kg. of Manjal karisalai (*Wedelia calendulacea*) was sold to Tamil Nadu Medicinal Plant Forms and Herbal Medicine Corporation Ltd. Madras.

Herbarium and Museum

The Unit is also maintaining a small Herbarium and Museum with special reference to Siddha System of Medicine. Presently, the Unit is maintaining a Herbarium having 340 specimens and out of this 150 were added during the current year. This Unit has preserved 120 crude drug samples in the Museum. 30 more such samples were added to the Museum during the period under report.

An exhibition was organised on 19-20th April 1986, by the Unit during the work shop on Putrunoi (Cancer).

PHARMACOGNOSTICAL RESEARCH STUDIES

During the period under report, the pharmacognosy section functioning under the Drug Standardisation Research Project, Siddha, has carried out studies, on 1) Vetapalai, 2) Adigam, and 3) Lechai kottai Keerai.

The study includes providing botanical description and carrying out pharmacognostical studies to help identification of authentic drug material.

1. Vetapalai (*Wrightia tinctoria* R. Br.): Leaf (Fam: *Apocyanaceae*)

Vetapalai is a small deciduous tree. The trunk is mostly irregular in shape with sealy bark and the wood is white. Leaves many, pale green, variable in shape and size, glabrous and with milky latex. Flowers interterminal panicles, white follicles narrow, curved and cohering at the tip. Seeds numerous slender and the pidermis is single layered, covered with thin layar of cuticle Transverse section at the midril shows a zone of 6-10 rows of collenchyma cells followed by 15-20 of thin-walled and closely arranged parenchyma cells, with star-shaped calcium oxalated crystal. The vascular bundle is arc shaped bicollateral. Phloem is made up of rectangular parenchymatous cells and sieve tubes and companion cells are present. Vessels are small with thin walls. Lamina is compact with palisade tissue.

2. Adigam : (*Hiptage madabalata* Gaerth). Fam: *Malpighiaceae*

The leaves of Adigam are opposite coriaceous strongly nerved beneath base acute, petioles 6-10 mm long, silky pubescent. Bark brown, exfoliating in flakes. Flowers 1.2-2 cm. across, fragrant white erect finely tomentose racemes, calyx perisistant, petals twice as long as sepals, orbicular, claws fringed on the margin. The uppermost petal broder than the rest. Carpels with a central wing between the two lateral wings, the inner wing 3.5-3.8 cm. long, the lateral wings 2 cm. long. Fruit is of 1-3 unequally winged samaras. Seeds solitary and sub-globose.

The leaf is dorsiventral with large, complex sunken or cushion

shaped grands. Epidermis composed of a single layer of cells followed by homogenous palisade tissue.

In trasverse section the vascular bundle is incurved arc shaped which is a typical example of hiptage. Three rows of sclerenchyma cells are found around the vascular strand with upper portion consisting of closely packed 3-5 rows of parenchyma cells and surrounded by 3-4 row of collenchyma cells.

3. Lechaikottai Keerai (*Pisonia grandis* R. Br)

Lechaikottai Keerai is an evergreen tree along the coastal forests of Andaman and Nicobar. The plant is cultivated in tubs and gardens in Madras and other coastal cities for its leaves which resemble lettuce. It is propogated by cuttings. It is an evergreen tree, 9-12 m. high. All parts of the stem are glabrous or the young shoots are minutely puberulous. Leaves ovate-oblong, ohtuse at the base, shortly acuminate to acute, membranous, glabrous. Flowers dioecious, pedusclcd large puberulouscyme. Fruits glabrous panicles, linear club-shaped, truncate 5 cornered, the corners with a single row of sharp and a little recurved acute prickles. Micro-scopically the leaf is dorsiventral an hppostomatic. Transverse section of the leaf shows single layar of apiderma cells on both sides which are tangentially alongated cells covered externally with thin cuticle, and multi-cullular trichomes. Layer of the palisade cells which are along cylindrindrical and columnar followed by spong mesophyll of 3 to 7 layers of compact parenchyma cells of different sizes and shapes. Naedle like crystals occur as mixed styloids and raphides.

CHEMICAL RESEARCH STUDIES

The Chemical research studies of Siddha plants were undertaken in the Chemistry section of Drug Research Scheme (MD), Madras. The Chemical analysis of the following drugs were reported during the reporting year :—

1. Adigam (*Hiptage madabalata*)
2. JP—a coded drug for Diabetes mellitus.
3. Kovai (*Coccinia indica*)

A brief review of the work carried out on each drug in reported hereunder :

I. Chemical examination of chloroform extract of Adigam (*Hiptage Madabalata*)

The dark brown concentrated chloroform extract answered the colour tests for steroid, triterpene and flavonol. TLC on silicagel with benzene and benzene-ethyl acetate (9:1) showed the presence of Friedelin, Epifriedelinol and β -sitoststrol. These compounds have already been isolated from the stem and stem bark of the plant. However, the TLC examination showed a bright yellow spot below that of β -sitosterol which answered for phenol. The compound may be a flavonoid. The phenolic compound showed a single spot of TLC (solvent system Benzene : Ethyl acetate 4 : 1 RF=0.71).

II. Chemical analysis of JP—a coded drug

The chemical examination of the coded drug-JP claimed as a effective drug for Diabetes mellitus was reported. Presence of Phosphate, Chloride, Sulphate, Sodium, Carborate and Iron has been reported.

III. Kovai (*Coccinia indica*)—Whole plant

The chemical analysis of the plant was reported. presence of Carbonate, Chloride, Phosphate, Iron, Calcium and Magnesium has been reported.

PHARMACOLOGICAL RESEARCH STUDIES

The Pharmacological research study is an essential aspect of drug research leading to the development of new drugs. Such studies have been mainly carried out on single drugs and their isolates. Some studies to assess the biological activity of Siddha compound formulations in the form they are used in clinical practice have also been studied.

A brief summary of work done on the above drugs is reported here under :

1. Sirukurinjan Chooranam

(a) Acute Toxicity Study in Rats

The drug Sirukurinjan was administered in albino rats weighing between 150 to 250 gm. in the dose of 6000 mg./kg. One group received vehicle which served as untreated control. The animals were observed for 72 hours for toxic manifestations. The drug did not show any toxic effect in the dose employed.

(b) Acute Toxicity Study in Mice

The drug was administered in albino mice weighing between 20 to 30 gm. in the doses of 100, 1000, 2000, 3000, 5000 and 10,000 mg./Kg. bodyweight. The animals were observed for toxic symptoms and mortality upto 72 hours. The drug was found to be non-toxic in all the doses employed.

2. Karunjeeragam Choornam—Acute Toxicity Study in Mice

The powdered drug was administered in albino mice weighing between 20 to 30 gm. in the doses of 100, 250, 500, 1000, 2000, 3000, 5000, 6000, 7000, 8000, 9000 and 10,000 mg./Kg. The animals observed for toxic symptoms and mortality upto 72 hours. The drug was found non-toxic in all the above doses.

3. Poovarasu-Acute Toxicity Study in Mice

The drug Poovarasu was administered in albino mice weighing between 20 to 30 gm. in the doses of 100, 1000, 3000, 4000, 5000, 6000, 7000, 8000, 9000 and 10,000 mg./Kg. bodyweight. The animals were observed for toxic symptoms and mortality for 72 hours. The drug was found non-toxic in all the above doses.

4. LRD : (An isolated alkaloid from *Aquilaria uqallocha*)

(a) Acute Toxicity Study in Mice

The drug LRD was administered in albino mice weighing between 20 to 30 gm. in the doses of 25, 100, 500 and 1000 mg./Kg. body-weight. The animals were observed for toxic symptoms and mortality for 72 hours. The drug was found non-toxic in the dose 25 mg./Kg., but the animals showed 16.69% and 33.33% mortality rates in the dose of 500 and 1000 mg./Kg. bodyweight respectively.

(b) Anti-inflammatory Study

(i) Carrageenin induced paw oedema

0.1 ml. of carrageenin was injected under plantar oponeurosis. The drug LRD was suspended in 0.5% CMC and administered in the doses of 5, 10, 15, 25, 50 & 100 mg./Kg. bodyweight. One group received phenyl-butazone in the doses of 100 mg./Kg. and served as standard control. The right hind paw volume was measured before and after 3 hours of carrageenin injection and recorded. The drug showed significant anti-inflammatory effects in the above doses.

(ii) Formalin-induced arthritis in Rats

The drug LRD was administered in the dose of 5 mg./Kg. body weight. One group which received vehicle served as control and another group which received prednisolone served as standard for the purpose of comparison. Arthritis was induced by injecting 0.1 ml. of 2% formalin subcutaneously in the right hind paw on first and third day. The drug was given orally once for 10 days. The body weight and linear cross section of ankle joint of animals were recorded. The study is in progress.

(c) Analgesic Study—Acetic acid induced writhing episode method

The drug LRD was suspended in 0.5% CMC. Male mice between 20 to 30 mg. bodyweight were selected and used for the experiments. The drug LRD was administered in the doses of 5, 10, 15 and 25 mg./Kg. orally once. The writhing syndrome was induced by intraperitoneal injection of 3% solution of acetic acid in a dose of 300 mg./Kg. After each injection each mouse was kept separately and total number of stretching episodes for a period of 30 minutes were recorded. The drug showed significant analgesic effect in all the doses.

5. Kovai Kalkam

(a) Acute Toxicity Study in albino Rats

The drug Kovai kalkam administered in the doses of 100, 1000, 3000, 5000 and 10,000 mg./Kg. One group received vehicle alone which served as untreated control. The animals were observed for 72 hours for any toxic manifestations. The drug did not show any toxic effects.

(b) Acute Toxicity Study in albino Mice

The drug was administered in the doses of 100, 1000, 5000, and 10,000 mg./Kg. One group received vehicle alone which served as untreated control. The animals were observed for 72 hours. The drug did not show any toxic effects.

6. Karisalai Kalkam

(i). Acute Toxicity Study in albino Mice

The drug Karisalai kalkam was administered in the doses of 100, 500, 1000, 2000, 3000, 4000, 5000, 6000, 7000, 8000, 9000 and 10,000 mg./Kg. body weight. One group received vehicle which served as untreated control. The animals were observed for 72 hours for toxic manifestations. The drug was found non-toxic in the above doses.

(ii). Acute Toxicity Study in albino Rats

The drug was administered in the doses of 100, 200, 500, 1000,

2000, 3000, 4000, 5000, 6000, 7000, 8000, 9000, and 10000 mg./Kg. One group received vehicle and served as untreated control. The animals were observed for 72 hours for toxic manifestations. The drug did not show any toxic effects.

7. Keezhanelli Kalkam

i. Acute Toxicity Study in albino Mice

Fresh albino Mice of either sex weighing between 20-30 gm. were selected and grouped into six each. The animals were deprived of food for 18 hours. The drug Keezhanelli Kalkam was administered in the doses of 100, 1000, 2000, 3000, 4000, 5000, and 10,000 mg./Kg. One group received vehicle and served as untreated control. The animals were observed for 72 hours. The drug did not show any toxic manifestations.

(ii) Acute Toxicity Study in albino Rats

The drug Keezhanelli kalkam was administered in the doses 100, 1000, 2000, 3000, 4000, 5000, and 10000 mg./Kg. One group received vehicle which served as untreated control. The animals were observed for 72 hours for any toxic manifestations. The drug was found non toxic.

8. Kandan Kathiri Pazha ennai

(a) Acute Toxicity Study in albino Rats

The drug kandan kathiri Pazha *ennai* was administered in the doses of 10, 50 and 100 mg./Kg. One group received vehicle which served as untreated control. The animals were observed for 72 hours for toxic manifestations. All the animals in the dose levels of 50 and 100 ml./Kg. showed diarrhoea and returned to normalacy after 24 hours. No other toxic symptoms and mortality were observed.

(b) Anti-inflammatory Study—Carrageenin induced paw odema

The drug Kandan kathiri pazha ennai was administered in the doses of 5 ml. and 10 ml./Kg. One group received vehicle which served as untreated control. Another group received phenylbutazone in the dose level of 100 mg./Kg. which served as untreated control. The odema was induced after 1 hour of drug administration by injecting 0.1 ml of 1% carrageenin in the plantar aponeurosis of

right hind paw. The final volume of right hindpaw was measured ptythsmo graphically after 3 hours of carrageenin injection.

9. Vetpalai Verpattai Choornam

(i) Acute Toxicity Study in albino Mice

The drug vetpalai root bark powder was administered in the doses of 100, 200, 500, 1000, 2000, 5000, 6000, 7000, 8000, 8000 and 10,000 mg./Kg. One group received vehicle which served as untreated control. The animals were observed for 72 hours for toxic manifestations. The drug was found non-toxic.

(ii) Acute Toxicity Study in albino Rats

The drug was administered in the doses of 100, 200, 500, 1000, 2000 & 3000 mg. per Kg. One group received vehicle which served as untreated control. The animals were observed for 72 hours for toxic manifestations. The drug did not show any toxic effects.

10. Koyyia—Sub-acute Toxicity Study in albino Rats

Koyyia elai choornam was administered in the doses of 100 and 200 mg./Kg. for 30 days. One group received vehicle which served as untreated control. The body weight, feed intake of individual animals were recorded daily. All the animals were sacrificed on 31st day and the vital organs (Heart, Lungs, Liver, Kidney and Adrenals) were weighed and recorded. The blood samples and homogenates of vital organs, were subjected for bio-chemical estimation and histo-pathological studies.

11. Abraga Chendooram—Hypoglycaemic Study in the albino Rabbits

The drug Abraga chendooram was administered in the doses of 50 and 100 mg./Kg. One group received vehicle which served as untreated control. Another group received tolbutamide in the dose level of 250 mg./Kg. Samples were taken after 1st, 2rd and 5th hour of drug administration and the glucose levels were estimated and recorded.

PHARMACEUTICAL RESEARCH STUDIES

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

The Drug Standardisation Research Programme covering formulations enlisted in the Siddha Formulary Part-I and single drugs entering into them was carried out at the following units.

1. Drug Standardisation Research Unit at CSMDRIA, Madras.
2. Drug Standardisation Research Unit (Siddha), at RRC (Ay.), Bangalore.
3. Drug Standardisation Research Unit (Siddha), at RRI (DR), Trivandrum.

A. List of Plants/drugs on which Phyto-chemical studies have been carried out :

S. No.	Drugs	Parts	Units
1. ✓	Semparuthi (<i>Hibiscus rosea sinensis</i>)	Whole Plant	DSRUB
2. ✓	Nilavila (<i>Feronia himenca</i>)	Whole Plant	DSRUB
3. ✓	Puncantu Pattai (<i>Plectranthus urticifolius</i> Hook. f.)	Stem bark	DSRUM
4. ✓	Anthi malli (<i>Mirabilis jalapa</i> Linn.)	Leaves	DSRUM
5. ✓	Aalivirai (<i>Lepidium sativum</i> Linn.)	Seeds	DSRUM

(B) Formulations on which work relating to evolving analytical Standards has been carried out :

1. Nerunjil Kutinir (DSRUM)
2. Nilruembu Kutinir (DSRUM)
3. Tiraksai Kutinir (DSRUM)
4. Kabajura Kutinir (DSRUM)
5. Talisathi Vatagam (DSRUM)
6. Inci Vatagam (DSRUM)
7. Pirantai Vatagam (DSRUM)
8. Imbural Vatagam (DSRUM)
9. Palacancivi Mathirai (DSRUM)
10. Iraca Mezugu (DSRUM)
11. Civanar Amirtham (DSRUM)
12. Kesari Illekiyam (Sample-II) DSRUB)
13. Venkara Parpam (DSRUM)
14. Sangu Parpam (DSRUM)
15. Silajathu Parpam (DSRUB)
16. Kungilya Parpam (DSRUB) and (DSRUT)—in progress
17. Patikara Parpam (DSRUT)—in progress

(C) Plants/drugs on which Pharmacognostical work has been carried out :

- | | | |
|--|---|-------|
| 1. Nilavila (<i>Feronia limonia</i> -Leaves an stem bark) | } | DSRUB |
| 2. Elumlchai (<i>Citrus aurantifolia</i>) Fruit | | |
| 3. Pavazhamalli (<i>Nyctanthes arbortristis</i> L.) Whole plant) | } | DSRUM |
| 4. Mudiarkoonthal (<i>Mecremia tridentata</i> <i>Cuscuta reflexa</i> Roxb.) Whole plant | | |
| 5. Peyyppeerku (<i>Luffa acutangula</i> L. Roxb.) var. <i>anara</i> Clarke—Whole Plant | | |
| 6. Nayurivi (<i>Achyranthes aspera</i> L.)—Whole Plant) | | |
| 7. Arasu (<i>Ficus religiosa</i> L.)—Stem bark | | |

D. List of single drugs entering into the Siddha formulations/
preparations studied for listing pharmacognostic standards :

1. Nerunjil (*Tribulus terrestris* L.) DSRUM
2. Neernulli (*Asteracantha longifolia* nees.) DSRUM
3. Curaikodi (*Lagenaria vulgaris* Ser) DSRUM
4. Nelavembu (*Andrographis paniculata* L.) DSRUM
5. Peyppudal (*Trichosanthes cucumarina* L.) DSRUM
6. Semmulli (*Barleria prionitis* L.) DSRUM
7. Pirandai (*Cissus quardrangularis* L.) DSURM
8. Imbural (*Oldenlandia umbellata* L.) DSRUM
9. Nochi (*Vitex nigundo* L.) DSRUM
10. Kattrazhai (*Aloe barbadensis* L.) DSRUM
11. Sarakkonrai (*Cassia fistula* L.) DSRUM
12. Kalarchivthai (*Caesalpina bonducella*) DSRUM
13. Vellai milagu (*Piper nigrum* L.) DSRUM
14. Palakarai (Shells of *Cypras monta* L.) DSRUM
15. Semmulli (*Barleria prionitis* L.) DSRUM
16. Karpasi (*Parmelia caperata*) DSRUM
17. Palasu (*Butea monosperma* Kuntza) DSRUM
18. Aalivirai (*Lepidium sativam* L.) DSRUM
19. Agil (Vellai) (*Dyroxylam malabaricum* Bedd.) DSRUM
20. Agil (Cher) (*Chukarasia tabularis* A. Juss) DSRUM
21. Agil (3rd Variety) (*Cedrela toona* Roxb.) DSRUM
22. Agil (4th Variety) (*Hopea paryinflora* Bedd.) DSRUM
23. Arasu (*Ficus religiosa* L.) DSRUM
24. Aththi (*Ficus racemosa* L.) DSRUM
25. Al (*Ficus bengalensis* L.) DSRUM

26. Asokam (*Saraca indica* L.) DSRUM
27. Kumari (*Aloe vera* L.) DSRUM
28. Akasathamarai (*Pistas tratiotes*) DSRUM
29. Mullangi (*Raphanus sativus*) DSRUM
30. Inji (*Zingiber officinale*) DSRUM
31. Maruthu (*Terminalia arjuna*) DSRUM

Apart from this, thin layer chromatography of 92 different extracts of twenty eight plants was carried out.

LITERARY RESEARCH

The Literary Research and Documentation Department has taken up the task of anonotating, editing and translating the Siddha literature from Tamil to English and Hindi. The work done in this field is as hereunder :

- | | | |
|------|---|---|
| I. | 1. Agathiar Pancha Kavya
Nigandu—800 | : Correction of
manuscript and
annotation
completed. |
| | 2. Rama dever—1000 | |
| II. | 1. Agathiar Vidhyakaviyan—1500 | : 50 stanzas were
completed
(Correction and
annotation). |
| III. | 1. Agathiyar Sowmia Sagaran—1200 | : Press copies
are ready |
| | 2. Agathiyar Poornam—205 | |
| | 3. Pathinen Siddhar Nadi Sasthiram | |
| VI. | 1. Konganar Mudal Kandam Part I
and II | : Printing
intiated |
| | 2. Samgamuni Visha Vaidhiyam—100 | |

PUBLICATIONS/PARTICIPATIONS

S. No.	Name of the author(s)	Title of the paper/article.	Name of the conference/seminar/workshop.	Date of publication/participation.
1	2	3	4	5
A. Books				
	1. Veluchamy, G., Ravi Shankar, V.	Siddha System of Medicine— A Profile and Focus on Research and development.	Work-shop on Putrunoi (Cancer), Madras	19th-20th April 1986
	2. -do-	Souvenir on Work-shop on Putrunoi (Cancer)	Work-shop on Putrunoi (Cancer), Madras.	19th-20th April 1986
B. Papers				
I. Clinical Research				
	1. Ravi Shankar, V., Agarwal, M.P.	Clinical Studies of Abraga (Mica) Chandooram in the management of Diabetes mellitus (Neerazhivu)	IInd National Conference of Diabetes at Katni (M.P.)	21st-22nd Feb., 1987

Contd.

6. Raja Lakshmi. S.,
Sivanandam. G.,
Veluchamy. G.

Role of Tulasi (*Ocimum
Sanctum* L.) in the manage-
ment of Manjal kamalai
(Viral hepatitis)—A pilot
study.

Role of Indigenous drugs
in Viral hepatitis, Madras

28th-29th
Aug., 1986

7. Veluchamy, G.

Promotion of Positive health
through Siddha System of
Medicine.

IV National Seminar and
Essay competition,
Trivandrum.

30th Nov., 86

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II. Drug Research

8. Ghosh. D.

Some pharmacological profile
of RGX, SKX, VK2, the three
major Siddha medicine used
in Cancer with special refer-
ence to Toxicity.

Work-shop on Putrunoi
(Cancer), Madras.

19th-20th
April, 1986

9. Narayanappa. D.,
Veluchamy. G.

Extensive cultivation of
Manjal Karisalai (Wedelia
Calendulacea) in CRI(S)—
Herb Garden.

Silver Jubilee of JNAMPG
&H coloborations and
Seminar of Medicinal
Plants Research, Poona.

25th-27th
May, 1986

Contd.

1	2	3	4	5
2.	Ravi Shankar, V., Aggarwal, M.P.	Summary of Clinical Studies of Abraga (Mica) Chendooram in the Management of Diabetes mellitus (Neerazhivu)	Souvenir of IInd National Conference of Diabetes held at Katni (M.P.)	21st-22nd Feb., 1987
3.	Sivaparakasam. K., Anandam, T., Yasoda. R., Kalavathy K.K. Rao, Veluchamy, G.	Clinical study of Poomimala Chendooram on Leucoderma	IInd World Conference on Yoga and Ayurveda, Varanasi	2nd-7th Jan., 1987
4.	Raja Lakshmi, S., Sundaram M., Kalavathy K.K. Rao, Sivanadam, G., Veluchamy, G.	Clinical Evaluation of Siddha drugs in the treatment of Putrunoi	Work-shop on Putrunoi (Cancer), Madras.	19th-20th April, 86
5.	Kalavathy K.K. Rao, Raja Lakshmi. S., Sivanadam, G., Sundaram. M., Veluchamy, G.	Research on Cancer drugs at CRI(S), Madras	Work-Shop on Putrunoi (Cancer), Madras	19th-20th April 1986

1	2	3	4	5
10.	Samtha. T.R., Shaity T.K.P., Gopa Kumar. K.	Pharmacognostical Studies on root of Sachara Nigiranthus heyneannus (Acanthaceas)	Silver Jubilee of JNAMPG&H and Scientific Seminar on Medicinal Plants Research, Poona.	25th-27th May, 1986
11.	Saraswathy, A., Sarikala. J., Sarada. A., Purushothaman. K.K.	Phytochemical examination of an unidentified Siddha drug contribution of Structural Chemistry in its systematic identification.	XII Annual Chemistry Symposium held at IIT Madras.	6th-7th March, 1987
12.	Apparanantham T., Chelladurai. V.	Natural Source of Food—an Ethno-botanical Study at Pt. Calimere.	Silver Jubilee of JNAMPG&H, Pune and Scientific Seminar on Medicinal plants Research, Poona.	25th-27th May, 1986
13.	Apparanantham. T. Subramanian. M.P.S., Chelladurai. V., Joseph Thas. J., Kanakambal. R., Subramanian. V.,	Pharmacological aspects of Kuthukhar Chammati (<i>Indigo- fera oblongifolia Forsk</i>)	Ist International Seminar on Unani Medicine, New Delhi.	13th-15th Jan., 1987

WORKSHOPS/SEMINARS/SYMPOSIA/ CONFERENCES/EXHIBITIONS

Workshop on Putrunoi (Cancer)

A workshop on Putrunoi (Cancer) was conducted at Central Research Institute for Siddha, Madras during 19th and 20th April, 1986. Smt. Mohsina Kidwai, Union Minister of Health and Family Welfare, Government of India inaugurated the workshop. This function was presided by Dr. H.V. Hande, Minister for Health and Family Welfare, Tamil Nadu. A Souvenir containing 20 scientific papers touching various aspects on Putrunoi (Cancer) was released by Dr. S.K. Kalifathullah, President, Central Council of Indian Medicine. A book entitled "A profile and focus on Research and Development on Siddha System of Medicine" published by the Council was released on the occasion by Sh. S.K. Alok, Joint Secretary, Ministry of Health and Family Welfare, Government of India.

Silver Jubilee Celebrations of JNAMPG&H, Pune and Scientific Seminar on Indian Medicinal Plants Research

The Council celebrated Silver Jubilee function of Jawaharlal Nehru Ayurvedic Medicinal Plants Garden and Herbarium, Pune on 25th May, 1986. Sh. R. Venkataraman, Vice-president of India inaugurated the celebration. Mrs. Mohsina Kidwai, Union Minister of Health and Family Welfare, presided over the function. Dr. Shankar Dayal Sharma, Governor of Maharashtra was also present. The Mayor of Pune, Mr. Dhule Ulhas Rao Patel also graced the occasion. The celebrations amongst others were attended by members of the Governing Body and Scientific Advisory Committee of the CCRAS.

A special Souvenir marking the Silver Jubilee Celebrations was released by Mrs. Mohsina Kidwai, Union Minister for Health and Family Welfare. A book entitled "Ayurveda-the Science of Life" published by the Council was released by Dr. Shankar Dayal Sharma, Governor of Maharashtra on the occasion.

A Scientific Seminar on research on Indian Medicinal Plants was held from 25th to 27th May, 1986 to coincide with the occasion. Proceedings of the Seminar are being brought out separately by the Council.

A diagnostic camp was also organised by the Council on the occasion where eminent Ayurvedic Physicians and practitioners provided free consultation and treatment to the patients.

Meeting of Experts for the development of Guggulu Herbal Farm Mangliawas (Ajmer)

A two-day meeting on the development of Guggulu Herbal Farm, Mangliawas was held on 25th and 26th October, 1986 by Regional Research Institute (Ay.), Jaipur at Ajmer at Farm premises. The expert group made the following recommendations to improve the present phase of activities :

1. Adoption of suitable agro-techniques, methods for better cultivation and growth of Guggulu plants.
2. Measures to protect plants from insects, pests and diseases.
3. Techniques relevant to extraction methods of oleo-gum resin and its standardisation without damage to the plants.

A video film on cultivation and presently adopted tapping techniques was taken.

Meeting of the Survey Officers of the Council held at Jhansi

A meeting of the Survey Officers of the Council was held at Jhansi on 15th and 16th December, 1986 to review and take stock of the ongoing medico-botanical programmes and to work out suitable strategy for effective functioning of the Units. The meeting was presided by Dr. S.K. Jain, Emeritus Scientist, NBRI, Lucknow, Member, SAC (Ay.).

A number of important recommendations for the re-organisation of the activities were made. These recommendations were approved by the SAC (Ay.) at its 17th meeting held on 8th March, 1987 at Nagpur.

Annual Conference of the Senior Officers of the CCRAS

The annual Conference of the Senior Officers of the Council

was held on 6th to 9th March, 1987 at MLA hostel, Nagpur. Miss Saroj Khaparde, Union Minister of State for Health and Family Welfare addressed the Senior Officers of the Council on 8th March, 1987. Scientific sessions were also held during the Conference. This includes 24 guest lectures from distinguished scientists on topics having bearing on the research programmes of the Council.

The General body meeting of the Scientific workers also discussed subjects related to the preparation of clinical protocols, periodical and annual reports, formats to be adopted for presentation, publication of scientific papers besides administrative matters like enhancement of financial powers to effectively discharge the responsibilities related to the programmes.

A meeting of the officers engaged in Family Welfare Research Projects and another meeting of the Officers working in Tribal Research Projects was also held during this Conference to have fair understanding of the problem faced during operation and recommendation made by them were taken up for consideration at appropriate levels.

Exhibitions

1. An exhibition was arranged by Central Research Institute (Siddha), Madras during the Workshop on Putrunoi (Cancer) held on 19th to 20th April, 1986.
2. An exhibition on Medicinal Plants was organised by the Council from 25th May to 27th May, 1986 during the Silver Jubilee Celebration of JNAMPG&H, Pune which was inaugurated by Shri R. Venkataraman, Vice-President of India.
3. The Council arranged an exhibition projecting its activities during the Seminar on challenges of science popularisation organised by Bhartiya Vidya Bhawan, New Delhi with the support of Department of Science and Technology (Government of India) from 10-20 July, 1986.
4. The Council participated in the Dhanvantari Jayanti Samaroh held at Karnal (Haryana) on 26th October, 1986 by organising an exhibition of medicinal plants/photographs of plants.
5. An exhibition highlighting the various activities of Guggulu cultivation was arranged at Mangliawas, Ajmer during the

- meeting of experts for the development of Guggulu Herbal Farm, Mangliawas, (Ajmer) on 25th and 26th October, 1986.
6. The Council arranged an exhibition of its activities during the All India Ayurvedic Specialists Conference held from 13th to 15th September, 1986 at Ayurveda and Unani Tibbia College, New Delhi.
 7. The Council participated and displayed exhibits relating to its research activities on the occasion of Second World Congress on Yoga and Ayurveda held from 2nd to 7th January, 1987 at Banaras Hindu University, Varanasi.
 8. The Council arranged an exhibition at Regional Research Centre (Ay.), Nagpur during the Annual Conference of the Senior officers of the Council held at Nagpur from 6th to 9th March, 1987. The exhibition was inaugurated by Miss Saroj, Khaparde Union Minister of State for Health and Family Welfare, Govt. of India.
 9. The Council participated in the various regional drug Seminars held at Kulu Manali, Coimbatore, Gauhati, Delhi and Nainital and also displayed the plants and drug material available in those areas as a step towards acquainting the workers and local people of the resource potentials of the area.

ACKNOWLEDGEMENT

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

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

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

The Council places on record the efforts of Shri R. K. Singhal S.S.A. (Stat.) for bringing out the Annual Report in the present form.