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ARBOVIRUSES IN INDIA - PART III

INGWAVUMA

This virus belongs to Simbu group and was first isolated in Africa from a weaver and from *Culex univittatus* (McIntosh *et al.*, 1965). In India the topotype virus first named Balagodu was isolated from *Ardeola grayii*. The virus can be transmitted by the bite of *Culex fatigans*. N-antibodies have been demonstrated in sera from humans and paddy birds. Monkey and cattle sera have been tested and were found to be negative (Pavri *et al.*, 1969).

SATHUPERI

This virus belongs to Simbu group and was isolated from a pool of *Culex vishnui* near Vellore in south India. There have been only two isolates so far from the same species of mosquito (Dandawate *et al.*, 1969a). Human sera have been tested for antibodies particularly from cases of pyrexias of unknown origin. Sera studied have been found to be serologically negative (Banerjee and Desai, 1973). Sathuperi virus has been isolated from sentinel cattle in Nigeria (Univ. Ibadan Report, 1968) and one strain from *Culicoides* (Univ. Ibadan Report, 1970).

KAIKALUR

This virus was isolated from a pool of *Culex tritaeniorhynchus* from Andhra Pradesh in 1972. It belongs to the Simbu group and is related to but not identical with other viruses of this group isolated in India (Rodrigues *et al.*, 1977).

BATAI

This virus belongs to Bunyamwera group. In India this virus was first isolated in 1957 from *Anopheles barbirostris* and was labelled as Chittoor virus. Later it was shown to be identical with Batai virus isolated from *Culex gelidus* in Malaysia (Theiler and Downs, 1973). The virus was isolated from Manjri, near Pune, one strain each from *Culex bitaeniorhynchus* and *Anopheles subpictus*, and three strains from *Anopheles tessellatus* (Singh and Pavri, 1966). Studies at the NIV, Pune, indicated that HI antibodies were present in about 30 per cent of goat and 8 per cent of sheep sera from various parts of India. Thirty six per cent of horse sera from Maharashtra State also demonstrated similar antibodies against this virus. Antibodies to this virus in a high proportion of sera of cattle, camels and donkeys have also been demonstrated in several instances (Pavri and Sheikh, 1966; Pavri and Singh, 1969; NIV unpublished data). Several hundred human sera were tested but only occasional sera showed antibodies to Batai virus.

Experimental viraemia with Batai (Chittoor) virus with production of antibodies has been shown in sheep and goats, horse and cow calf. The virus could also be propagated in series by intrathoracic inoculation with *C. fatigans*, *Ae. aegypti*, *Ae. albopictus* and *Anopheles stephensi* (NIV unpublished data). The infection could be transmitted to infant mice through the bite of infected *Anopheles stephensi* and *Aedes aegypti* (Pavri and Singh, 1969).

UMBRE

This virus belongs to the Turlock group. Umbre virus was isolated from *Culex bitaeniorhynchus* in 1955 from Kolaba district of Maharashtra. Several strains of this virus have also been isolated from *Culex vishnui* from Vellore during the period 1955 to 1957 (Dandawate *et al.*, 1969a). In 1963 one strain was isolated from the blood of grey partridge (NIV unpublished data). Antibodies to Umbre virus were demonstrated in six human sera from south India (Banerjee and Desai, 1973).

PALYAM, KASBA AND VELLORE

Palyam, Kasba and Vellore viruses belong to the Palyam group. Only one strain each of these viruses (G15534 was later named as Kasba) has been isolated from *Culex vishnui* collected at Sathuperi near Vellore (Dandawate *et al.*, 1969a; Myers *et al.*, 1971). Limited studies indicated that no antibodies could be detected in human sera against Palyam or Kasba virus (Dandawate and Pavri, 1974). Antibodies to Vellore virus were detected in cattle sera and in one out of 16 human sera tested (Myers *et al.*, 1971).

ICHAMPADI

This virus was isolated in 1956 from a pool of *Culex vishnui* collected near Vellore, south India. It is not related to any known arbovirus and awaits further studies (NIV unpublished data).

MINNAL

One strain of Minnal virus was isolated from a pool of *Culex vishnui* from a place near Vellore (Dandawate *et al.*, 1969a). Limited studies indicated the presence of N-antibodies in a small proportion of human sera (Dandawate, C.N. - personal communication).

VENKATAPURAM

Only one strain of this virus has been isolated so far from *Culex vishnui*. No serological tests have been done.

ARKONAM

This virus was isolated from a pool of *Anopheles subpictus* from south India (Dandawate *et al.*, 1969a). Two additional isolations were made subsequently (NIV unpublished data). N-antibodies were demonstrated in a small proportion of human sera collected in North Arcot district of Tamil Nadu.

SANDFLY-BORNE VIRUSES

SANDFLY FEVER VIRUS

This virus belongs to the sandfly fever group, members of which have been isolated from various parts of the world. Although the presence of a filterable agent in the blood and the role of *Phlebotomus papatasi* in papatasi fever had been demonstrated in the early part of the century, the two antigenic types of virus, Sicilian and Naples, were actually identified by Sabin in 1951. Considerable attention was paid to this virus in the Indian subcontinent. But large sandfly fever outbreaks from India have not been recorded during the last twenty five years. However, in West Pakistan, four strains were isolated from humans and 39 strains from sandflies. Among these isolates were agents found to be indistinguishable from the Neapolitan and Sicilian strains of *Phlebotomus* fever virus (Barnett and Suyemoto, 1961; George, 1970). In India both the types have been isolated from sandflies and febrile patients from Aurangabad (Bhatt *et al.*, 1971). Fifteen strains (11 from sandflies and 4 from humans) of Naples and 11 Sicilian type (2 from humans and 9 from sandflies) have already been identified. Continuous monitoring of sandflies has been done over the last several years and many strains of this virus have been isolated. Antibodies in human sera have been found from Maharashtra and Gujarat. Sera from sheep, goats, cattle, and dogs have been found to be negative against Sicilian type virus (Goverdhan, M.K. - personal communication).

CHANDIPURA

Chandipura virus belongs to the vesicular stomatitis group of arboviruses. Two strains of the virus were isolated from blood of two cases of fever during an epidemic of dengue in Nagpur when both chikungunya and dengue were also found to be active (Bhatt and Rodrigues, 1967). Later this virus was also isolated from a pool of sandflies from Aurangabad in Maharashtra State (Dhanda *et al.*, 1970). Chandipura virus can be transmitted through the bite of *A. aegypti* to infant mice (Ramachandra Rao *et al.*, 1967). Nearly 900 human sera from various parts of India have been tested for N-antibodies. Forty per cent of the sera were positive. N-antibodies have also been demonstrated in sera from monkeys, horses, goats, donkeys, cattle and sheep (Bhatt and Rodrigues, 1967). Isolation of Chandipura virus from *Atalapha spiculens* (wild hedgehog) had been reported from Nigeria (Univ. Ibadan Report, 1970).

CULICOIDES-BORNE VIRUS

African horse-sickness (AHS) as a disease has been known in South Africa for centuries where strains of AHS virus have been isolated repeatedly from wild-caught *Culicoides*. The disease was noted in Iran, West Pakistan and Afghanistan in 1959 and in 1960 AHS made its appearance in India. An outbreak occurred in Jaipur, Rajasthan, among horses of a cavalry unit (Shah and Pavri, 1963; Shah, 1964). The Indian strains are now known as type 8 of AHS

virus. No virus could be isolated from *Culicoides* captured in the vicinity but measures to prevent the horses being bitten by *Culicoides* were effective. The outbreak spread rapidly to different parts of India and over 20,000 animals died. Since then outbreaks of AHS have not been reported from India.

VECTOR NOT KNOWN

Certain viruses whose vectors remain unknown, have been reported from birds and

TABLE VIII
VIRUSES WITH VECTORS NOT KNOWN

Virus	Number of strains isolated	Source	Reference
Thimiri	8	<i>Ardeola grayii</i> (paddy bird)	Carey <i>et al.</i> , 1971a
Sembalam	5	<i>Nycticorax nycticorax</i> (Night heron) <i>Ardea cinerea</i> (Grey heron)	"
Kammavanpettai*	1	<i>Sturnus pagedarum</i> (Brahminy myna)	"
Kannamangalam	1	<i>Corvus splendens</i> (House crow)	"
Thottapalyam	1	<i>Suncus murinus</i> (shrew)	Carey <i>et al.</i> , 1971b
Sagar	1	<i>Acridotheres fuscus maharattensis</i> (Jungle myna)	NIV unpublished data

* No antibodies in human sera tested

rodents from collections near Vellore in connection with studies on JE virus (Table VIII).

The probable presence of activity of some other arboviruses is indicated in serological surveys. N-antibodies against Zika and Ntaya were detected in about 17 and 9 per cent of human sera from what are now known as Maharashtra and Gujarat States (Smithburn *et al.*, 1954). Some sera from Maharashtra, Gujarat and Tamil Nadu also showed antibodies to Uganda virus (Smithburn *et al.*, 1954). Antibodies in sera of man and animals specially sheep and goats, to CHF-Congo virus have been demonstrated (Shanmugham *et al.*, 1976).

Arbovirus research in India, from the humble beginnings in 1930's has come a long way to provide the basis for public health authorities to control human disease caused by these viruses.

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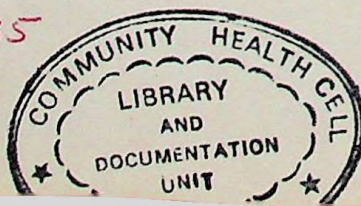
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This write-up (in three parts) is based on the S.C. Agarwal Oration (1979) of the Association of Microbiologists of India, delivered by Dr. N.P. Gupta, Sr. Deputy Director-General, Indian Council of Medical Research, New Delhi.

ABSTRACTS

Some Research Projects completed recently

Cardiomegaly in chronic anemia - an experimental study

Post weanling rats when maintained on a diet consisting of whole milk and sugar rapidly became anaemic. This iron deficiency anaemia led to cardiomegaly which was not due to hypertrophy but to compensatory enlargement. The cardiomegaly was reversible when the animals were adequately treated by normal laboratory diet supplemented with iron and copper.

The heart of the anaemic animal when subjected to an acute volume overload by intravenous fluid infusion showed fairly specific type of damage to the myocardial fibres at the ultrastructure level in the form of separation of intercalated discs, supercontracted and superstretched myofibres, ruptured myofila-

ments and distended and ruptured capillaries. The pulmonary arteries of anaemic rats showed evidence of pulmonary hypertension.

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Clinical assessment of the value of oleo-resin of Commiphora mukul (guggul) in obesity and hyperlipidemia

The hypolipidemic, weight reducing and anticoagulant actions of the oleo-resin of *Commiphora mukul* (guggul) have been studied. Out of a total of 93 patients, only 47 conti-

nued regular visits and follow up. Patients were given placebo for one month followed by 2 g of *guggul*, three times a day without any dietetic restrictions, for three months and evaluated at monthly intervals. Follow up was continued for a further three months.

A significant fall was observed in cholesterol level every month during the therapy and for three months after cessation of *guggul*, while serum triglyceride and free fatty acid levels showed a significant fall only after two months of *guggul* therapy; this was maintained during follow up. There was no significant change in serum phospholipid level.

Serum beta lipoprotein levels showed a significant fall only after three months of therapy and during follow up.

The prothrombin time and clotting time were significantly prolonged after three months of therapy and remained prolonged even after three months of cessation of *guggul* therapy. There were no significant changes in bleeding time, platelet count, weight and skin fold thickness during or after completion of *guggul* therapy.

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Sevagram.

Effect of methaqualone hydrochloride on gonads of adult albino rats.

Results of the study on the effects of methaqualone hydrochloride on structure and

function of male and female sex organs showed that in both male and female rats methaqualone produced marked damage of sex organs and significant inhibition of gonadal function.

From these experiments it appears that the inhibitory effect of methaqualone is primarily mediated via the hypothalamus and pituitary as revealed by low levels of hypothalamic MAO activity and raised levels of total pituitary gonadotropin. However, the nature of histological change in the gonads, particularly the testis, is strongly suggestive of a direct toxic effect of methaqualone. Mere deprivation of pituitary gonadotropin for a period of 15 days is not likely to produce extensive destruction of testicular architecture as such changes are not demonstrated in testis of hypophysectomized rats.

Although the doses *viz.* 30 mg/kg and 60 mg/kg, used in this study are much higher than the recommended therapeutic dose, the toxic potential of methaqualone assumes significance in view of the higher doses reported to be taken by abusers of methaqualone. Further studies are however necessary using the therapeutic dose over a prolonged period, to determine the chronic toxicity of the drug.

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ICMR NEWS

Dr. T.A. Lambo, Deputy Director-General, WHO, Geneva, visited the Council and delivered a lecture on 'Biomedical and Health Services Research from the Standpoint of WHO', on June 16, 1980.

Dr. V. Ramalingaswami participated in a workshop seminar on 'Diarrhoeal Diseases and Oral Rehydration Therapy' organised at the Indian Medical Association building, New Delhi, on June 22, 1980.

Dr. V. Ramalingaswami, Director-General, ICMR, participated in the joint WHO/UNICEF

meeting on 'Strategies for Health for All by 2000 AD', held between June 24-30, 1980, at the WHO South-East Asia Regional Office, New Delhi.

Dr. Badri N. Saxena, Deputy Director-General, ICMR, participated in the Steering Committee meeting of the WHO Task Force on Service Research in Family Planning held between June 2-5, 1980, at Geneva.

Dr. Usha K. Luthra, Deputy Director-General, ICMR, participated in the 7th International Congress of Cytology held between May

18-22, 1980, at Munich, West Germany, and presented a paper on 'Epidemiology of Cervical Precancerous and Cancerous Lesions'. She also participated in the 3rd International Conference on 'Automation of Diagnostic Cytology and Cell Image Analysis' held on May 23-24, 1980.

Expert Group/Task Force Meetings:

The following Expert Groups/Task Forces of the Council met during the month:

Task Force on Enterovirus (Picorna Virus) Infection other than Poliovirus (at ICMR) June 5-6, 1980

Expert Group on the Tuberculosis Prevention Trial (at ICMR) June 10-11, 1980

Task Force on Male Fertility Regulating Methods (at ICMR) June 16-17, 1980

Task Force on Tick Borne Diseases in India (at NIV, Pune) June 26-27, 1980

Task Force on Product Development - Non-Radio-Isotopic Chemical Assay Methods. June 23-24, 1980

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Dr.S.G. Srikantia relinquished the office of the Director, National Institute of Nutrition, Hyderabad, on May 31, 1980. He proposes to take up voluntary community health service in Mysore city, in collaboration with the Ramakrishna Mission.

ICMR AIDED SYMPOSLA/SEMINARS/WORKSHOPS/CONFERENCES

Symposium/Seminar/Workshop/ Conference	Date	Institution/Department
Symposia on Viral Encephalitis and Recent Advances in Blood Transfusion and a Slide Seminar on Non-tumorous Lesions of CNS.	January 3-5, 1980	Postgraduate Institute of Medical Education and Research, Chandigarh (Association of Pathologists and Microbiologists).
Winter School on Crystallographic Computing Techniques.	January 4-14, 1980	Indian Institute of Science, Bangalore.
Workshop on Utilization of Health Services Facilities at 3 Primary Health Centres attached to Medical Colleges for Training Undergraduate Medical Students.	January 9-11, 1980	All India Institute of Hygiene and Public Health, Calcutta.
XXXIII Annual Conference of the Indian Radiological Association.	January 11-14, 1980	Gauhati Medical College, Gauhati.
XIX Annual Conference of the Indian Association for the Advancement of Medical Education.	January 17-19, 1980	Medical College, Trivandrum.
International Symposium on Hundred Years of Malaria Research.	January 17-19, 1980	Institute of Postgraduate Medical Education and Research, Calcutta.

Symposium/Seminar/Workshop/ Conference	Date	Institution/Department
Seminar on Industrial Accidents with Special Reference to Hand Injuries.	January 19-20, 1980	All India Institute of Hygiene & Public Health, Calcutta (Indian Association of Occupational Health).
XXXV Joint Annual Conference of the Association of Physicians of India.	January 20-23, 1980	Medical College, Trivan- drum.
International Symposium on Leish- maniasis.	January 21, 1980	Indian Council of Medical Research, New Delhi (Indian Society for Mala- ria and other Communi- cable Diseases).
Symposium on Lathyrism.	January 28-30, 1980	S.S. Medical College, Rewa (Indian Association of Preventive and Social Medicine).
Workshop on Modern Trends of Aerobio- logy with Special Reference to Plant Pathology and Medicine.	January 29-31, 1980	Bose Institute, Calcutta.
Indo-French School on Recent Advances in Computer Techniques in Meteoro- logy, Bio-mechanics and Applied Sys- tems.	February 4-13, 1980	Centre for Atmospheric Sciences, Indian Institute of Technology, New Delhi.
All India Symposium on Management of Indian Science for Development and Self Reliance.	February 6-9, 1980	All India Institute of Medical Sciences, New Delhi (Society of Young Scientists).
First Indian Conference on Ecology and Environmental Science	February 18-20, 1980	University of Rajasthan, Jaipur.
Symposium on Vaccines for Human Wel- fare : India's Strategy for 1980's.	February 20-21, 1980	Department of Virology, Christian Medical College and Hospital, Vellore.
Sixth Workshop on Hospital Infections with Special Reference to Gram Nega- tive Bacilli.	February 20-27, 1980	Department of Microbio- logy, All India Institute of Medical Sciences, New Delhi.
Third Annual Conference of the India Academy of Forensic Medicine.	February 22-24, 1980	Department of Forensic Medicine, All India Insti- tute of Medical Sciences, New Delhi.
Symposium on Nutrition and Fertility of Women.	February 23-24, 1980	National Institute of Nutrition, Hyderabad (Nu- trition Society of India).

Symposium/Seminar/Workshop/ Conference	Date	Institution/Department
VII Annual Conference of the Indian Association for Radiation Protection.	February 25-27, 1980	M.S. University, Baroda.
National and Regional Workshop on Drug Abuse.	March 10-15, 1980	Department of Psychiatry, All India Institute of Medical Sciences, New Delhi.
Third Conference on Medical Physics.	March 19-21, 1980	Bhabha Atomic Research Centre and Tata Memorial Hospital, Bombay (Association of Medical Physicists of India).
First Conference on Role of Ayurveda and Traditional Medicine in Primary Health Care.	March 20-23, 1980	Institute of Medical Sciences, Banaras Hindu University, Varanasi.
First All India Workshop on Microbiological Investigations of Food Poisoning - New Trends.	March 22-24, 1980	Department of Microbiology, All India Institute of Medical Sciences, New Delhi.
Symposia on Recent Advances in Research on Malaria, Babesiosis, Theileriosis and Anaplasmosis and The Use of Nuclear Techniques in Parasitology.	April 24-26, 1980	Haryana Agricultural University, Hissar (Indian Society for Parasitology).
Symposium on Medicine and Technology and a Workshop on Biomedical Instrumentation.	July 11-13, 1980	Institute of Basic Medical Sciences, Madras (Indian Association of Biomedical Scientists).
Symposium on Growth of Ultrasonic Industry in India.	July 20, 1980	National Physical Laboratory, New Delhi (Ultrasonic Society of India).
Symposium on Ethno-Pharmacology.	September 30 - October 2, 1980	Regional Research Laboratory, Jammu Tawi (Indian Pharmacological Society).
Symposium on Hazards in Chemical Industry.	October 19-20, 1980	National Institute of Occupational Health, Ahmedabad.
Workshop on Microbial Procedures in Antibiotic Resistance in Bacteria	October 22-29, 1980	Department of Microbiology, Lady Hardinge Medical College, New Delhi.

Symposium/Seminar/Workshop/ Conference	Date	Institution/Department
Workshop on Microbial Pathogenecity.	November 17-20, 1980	Department of Microbiology, Institute of Medical Sciences, Banaras Hindu University, Varanasi.
International symposium on Lectins as Tools in Biology and Medicine.	January 7-9, 1981	Institute of Experimental Medicine, Calcutta.
First All India Symposium and Workshop on Anaerobic Infections in Man.	March 1981	Department of Microbiology, All India Institute of Medical Sciences, New Delhi.

COUNCIL'S TRAINING PROGRAMMES FOR 1980

Leprosy:

At the Central Jalma Institute for Leprosy, Agra:

Training course in Leprosy for medical officers: (February 15 to March 28, 1980, and August 31 to October 14, 1980).

(1) Radioimmunoassay of Protein and Steroid Hormones: (January 10 to April 10, 1980).

(2) Training course in Contraceptive Research and Reproductive Endocrinology: (March, 1980).

At the National Institute of Nutrition, Hyderabad:

Virology:

At the National Institute of Virology, Pune:

Diploma course in Medical Virology of Poona University: (July 1980).

(3) Annual certificate course in Endocrinological Techniques and their Application: (August to September, 1980).

Nutrition:

At the National Institute of Nutrition, Hyderabad:

Reproductive Biology:

At the Institute for Research in Reproduction, Bombay:

(1) Training course in Reproductive Biology: (January 10 to April 10, 1980).

(2) Laboratory Techniques in Medical Genetics: (February 1-28, 1980).

(3) Training course in Basic Immunology (January 10 to February 25, 1980).

(1) M.Sc..(Applied Nutrition) course: (June, 1980 to February, 1981).

(2) Annual certificate course in Nutrition: (December, 1980 to February, 1981).

Haematology:

At the Blood Group Reference Centre, Bombay:

Endocrinology:

At the Institute for Research in Reproduction, Bombay:

(1) A certificate course in Blood Banking Technology and Basic Haematology for medical officers: (February 1 to March 15, 1980).

- (2) Training course in Blood Banking Methodology for Technicians: (May 12-26, 1980).

Occupational Health:

At the National Institute of Occupational Health, Ahmedabad:

- (1) NIOH/WHO Training Course on Air Pollution in Relation to Health: (February/March, 1980).
- (2) Refresher course in Occupational Health for E.S.I. medical officers: (September, 1980).

Clinical Pharmacology:

At the Department of Pharmacology, Seth G.S. Medical College, Bombay: (November, 1980).

Biostatistics:

At the Institute for Research in Medical Statistics, New Delhi:

- (1) Certificate course in Statistical Techniques in Medical Research: (January 1 to March 31, 1980).
- (2) Certificate course in Planning and Evaluation of Health Programmes: (April 1 to 30, 1980).
- (3) Diploma course in Biostatistics: (September, 1980).
- (4) Certificate course in Orientation to Biostatistics: (September 1 to November 30, 1980).

Laboratory Animal Technology:

At the National Institute of Nutrition, Hyderabad:

Laboratory Animal Technicians Training Course: Senior level: (January to March, 1980), Junior level: (September to October, 1980).

Tissue Culture:

At the Cancer Research Institute, Bombay:

Training course on use of tissue culture for investigations in human cancer: (November 12 to December 2, 1980).

COURSES FOR TALENT SEARCH SCHEME FELLOWS

Basic Course in Statistics:

At the Institute for Research in Medical Statistics, Madras: (January 2-12, 1980).

Haematological Techniques:

At the Department of Pathology, Christian Medical College, Vellore: (January 8-19, 1980).

Gastroenterology:

At the Christian Medical College, Vellore: (June 16-24, 1980).

Use of Radioisotopes in Medicine:

At the National Institute of Nutrition, Hyderabad: (July, 1980).

Cell-Biology and Cyto-Genetics:

At the Indian Institute of Science, Bangalore: (October, 1980).

Immunological Techniques:

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Clinical Endocrinology:

At the Institute for Research in Reproduction, Bombay: (December, 1980).

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