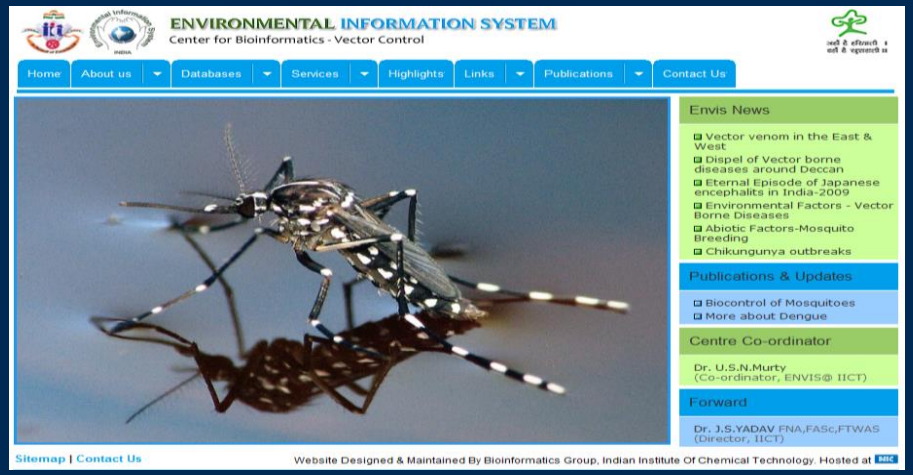
ENVIS Centre on "Bioinformatics-Vector Control"

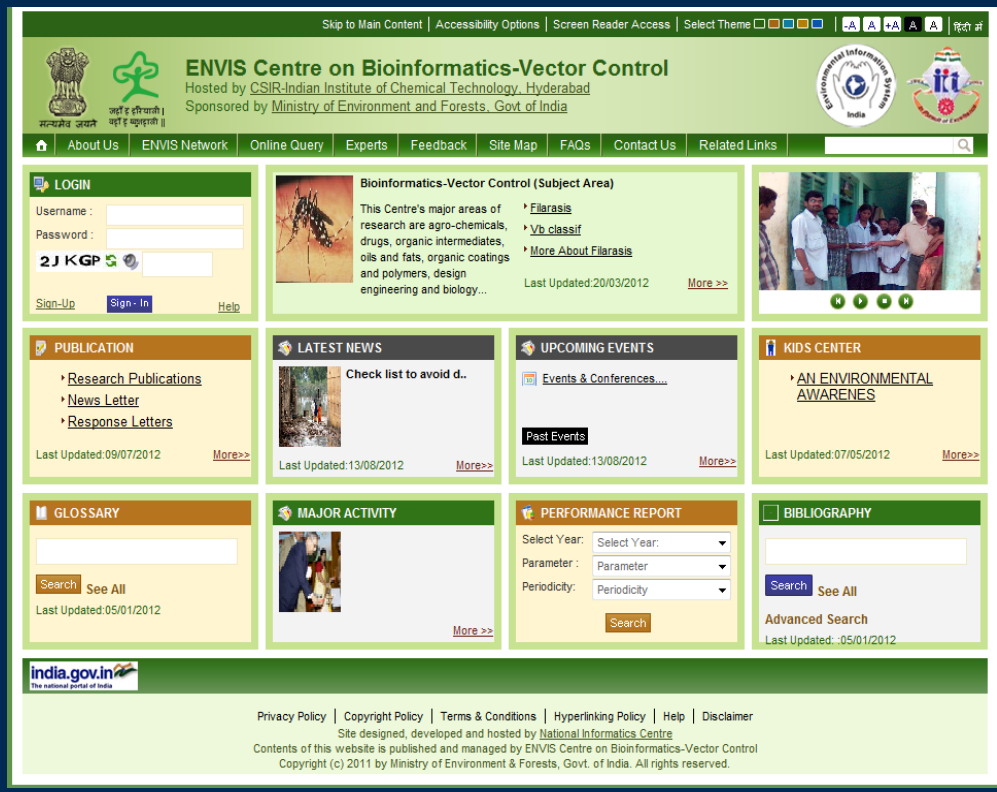
Dr. M Srinivasa Rao
Scientist, Biology Division
Coordinator , ENVIS centre
CSIR–Indian Institute of Chemical Technology
Hyderabad-500607, India

Evolution of ENVIS @ CSIR- IICT

2003 (First design of ENVIS)



2008 (Second design of ENVIS)



Recently updated ENVIS home page

Objectives

- Development of databases on vector species in all aspects (identification, Biology, Bionomics etc) and related diseases.
- Organizing work shops on the role of information system in environmental management for the vector control and vector borne diseases (EMVCVBD).
- Conducting training program for the postgraduates in environmental sciences, computer sciences & social sciences on the prospectus of information technology in ENVIS – vector borne diseases (VBD).

About ENVIS at CSIR-IICT

- **Establishment of ENVIS Node :** 27/02/2003
- **Conversion of Node into Centre :** February 2005
- **Subject area assigned :** "Bioinformatics-Vector Control"

Details on infrastructure

1. **Physical (Separate room for ENVIS Centre): YES**
2. **Hardware:**
   - **Windows servers.**
   - **03 nos work stations.**
   - **02 Scanner & Printers (01 color & 01 black & White)**
   - **Photocopy printer.**
   - **LAN, Internet Facility-2MBPS leased Line from BSNL.**

3. **Manpower**
   - **Dr. Srinivasa Rao - Co-ordinator**
   - **Ms. D. Steffee - Information Officer**
   - **Mr. Mr.Prabhakar Reddy - IT Assistant**
   - **Mr.Rajashekar - Programme Officer**

Mandate of the Host Organization (CSIR-IICT)

- **To become an innovative global R&D organization in the field of chemical sciences and technology with reference to industrial and specialty chemicals.**

- **To be and institution of international excellence in basic research in organic chemistry and adjacent chemical and engineering sciences.**

- **To establish balance between innovation and discovery research.**

Mandate of the ENVIS Centre

- **Development of databases on vector species in all aspects (identification, Biology, Bionomics etc) and related diseases.**

- **Organizing work shops on the role of information system in environmental management for the vector control and vector borne diseases.**

- **To conduct training program for the postgraduates in environmental sciences, computer sciences & social sciences on the prospectus of information technology in ENVIS – vector borne diseases (VBD).**

Major achievements during last 05 Years

- **Updations:** Frequently updated with latest information on vectors and vector borne diseases.
- **News letters:** Published more than 15 news letters and 04 abstract books on vectors and vector borne diseases.
- **Databases:** Updated existing databases on malaria, filariasis and Japanese encephalitis.
- Developed database on Climate Change & Mosquito borne diseases and maped state wise distribution of mosquito borne disease.

- Product developed: Developed Dengue decision support system in collaboration with “Sir Ronald Ross Institute of Tropical Diseases, Hyderabad”.
- Developed “e-Catalogue of Indian mosquito species” (2015).
- Developed web based “GIS epidemic atlas on mosquito borne diseases” (2012).
- Disease awareness programs: Conducted disease awareness programs (in 2013 & 2014) to school children's.

Annual plan of activities 2016-17

- **Upload latest disease out break information of vector borne disease from various parts of India and global.**
- **Upgradation of database on vector and vector borne disease by states wise with spatio-temporally.**
- **Publish news letters (04 nos.) on epidemiology of Zika virus, role of climatic factors on dengue transmission, Vector Ecology and other aspects of vector borne diseases.**
- **Upgradation of publication database with latest research information on vectors and vector borne diseases.**
- **AWAKEN-An awareness program for school children's on vector borne disease .**

New initiatives

- **Proteomic database of mosquito species .**
- **Vector borne disease outbreak map.**

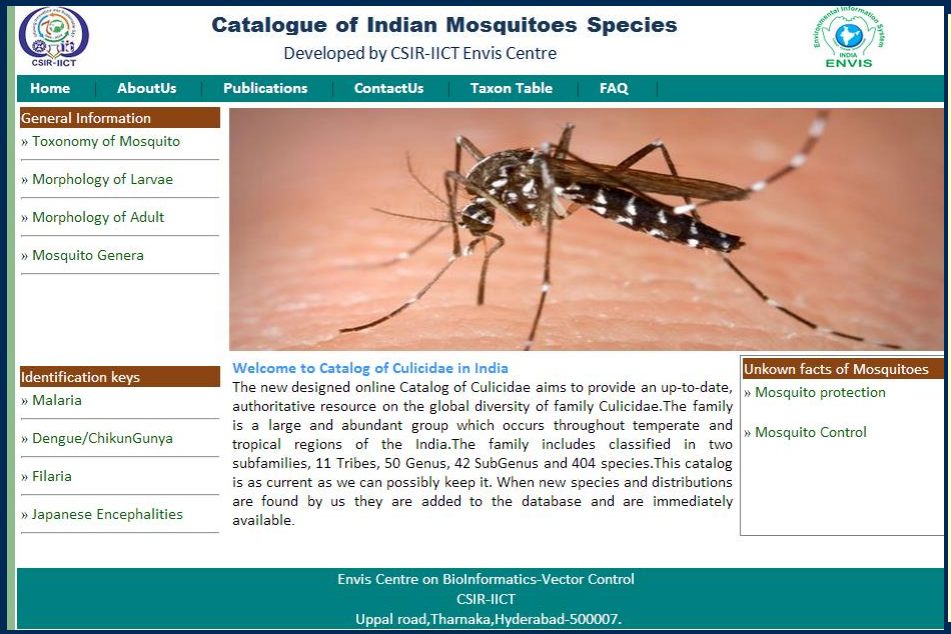
THANK YOU

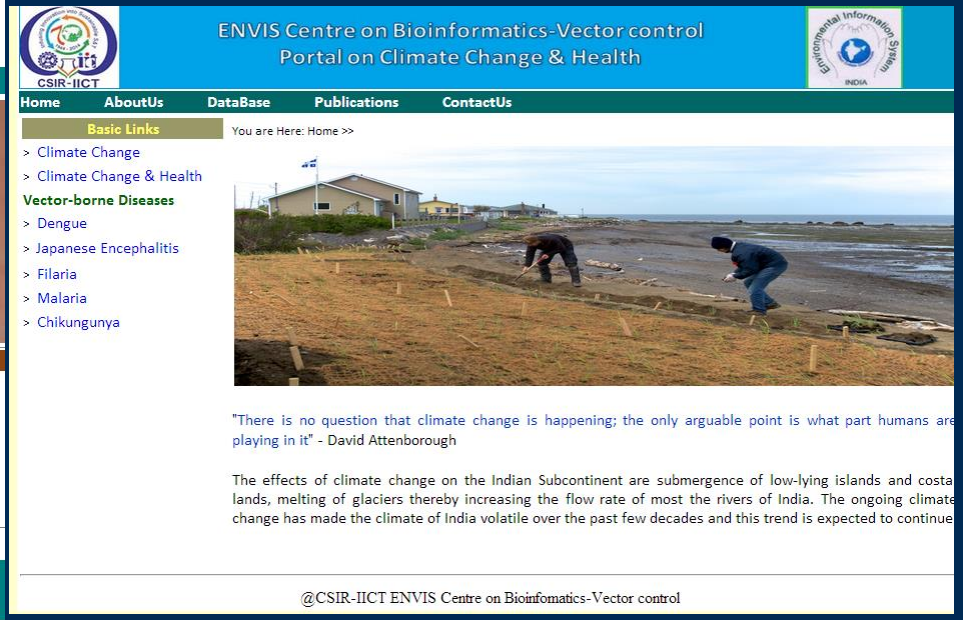
Srinivas

Activities pursued during 2015-16

- **Subject area:**
  - Incorporated bionomics of *Aedes aegypti* and its control measures under **Dengue.**
  - Incorporated information on Zika virus, transmission, clinical symptoms, diagnosis, prevention & control.
  - Uploaded Frequently asked questions on Zika virus.
  - Press clipping of Zika virus by Dr.USN Murty, IICT-ENVIS Coordinator in **ETV interview.**
  - Incorporated information on Mosquito and mosquito borne disease in Wetlands.
  - Wetland ecosystems for human health.
  - Mosquito ecology & Mosquito Borne Diseases in Wetland zones-Case study.

- **Databases developed during 2015-16:**
  - **Developed “e-Catalogue of Indian mosquito species”.**
  - **Database on Climate Change & Mosquito borne diseases.**
  - **GIS database: Mapped state wise distribution of mosquito borne disease.**





- **Publications:**
  - Research publications: Updated with ZIka virus & integrated vector control by, comprehensive, environmental and community.
  - News letters: Updated with “Genetically Modified Mosquitoes, Mosquito and Mosquito borne Disease in Wetlands, Deforestation and Human Health & Abstracts on Biological control of mosquitoes by plant extracts”.
  - Malaria, Filariasis, Dengue, Chikungunya & JE: Updated with World/India malaria reports, research publications etc.
  - Abstracts on environment: Updated with vector borne disease control-problems, literature on flood-mosquitoes, creating awareness on mosquito borne disease etc..

- **Latest news**
  - Outbreak of Zika Virus
  - Zika Virus Global Health emergency
  - Brazil says Zika Virus Outbreak Worse Than Believed
  - Message of Shri Prakash Javadekar, MoEF & CC, Govt. of India on the occasion of World Wetlands Day.
  - India's Intended Nationally Determined Contribution
  - Dengue Cases In Different States of India
  - Climate Change & Dengue
  - Dengue In Assam & Mumbai
  - Dengue Cases Across The Nation

- **Upcoming events**
  - World Environment Day....
  - International day for biological diversity....
  - 17th International Congress On Infectious Diseases ....
  - International Congress On Entomology....
  - 18th International Conference On Tropical Infectious Diseases ....
  - Conference On Molecular Approaches To Malaria:....
  - The International Congress For Tropical Medicine And Malaria-2016....

- **Major activity:**
  - Hands-On Bhuvan Training Programme For ENVIS Centres
  - Air Quality Assessment, Prediction And Control For Industrial Areas.

News Letters published Under ENVIS

ENVIS 2014-15

Activities Pursued (2014-15)

- **Latest News: Updated latest news with**
  - Dengue Outbreak In Odisha
  - Encephalitis Claims 700 Lives This Year
  - Dengue In Odisha
  - Tripura Is grappling with an outbreak of Malaria
  - A check to Dengue-GM mosquito
  - Encephalitis In West Bengal
  - Japanese Encephalitis In Assam
  - Dengue Cases In Kerala.
  - Dengue Cases In Bangalore, Karnataka
  - Malaria Cases In Mumbai

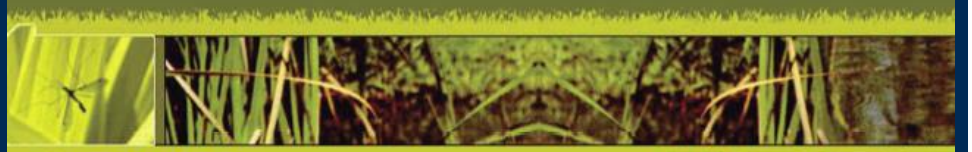
- **Subject Area: Subject area updated** *(27-03-2014)*
  - **Facts on Malaria.**
  - **Facts about Dengue.**
  - **More about Dengue.**
  - **Frequently Asked Questions on Dengue.**
  - **Frequently Asked Questions on Lymphatic Filariasis.**
  - **Frequently Asked Questions on Chikungunya.**

News Letter on Genetically Modified Mosquitoes

ENVIS NEWS LETTER

www.iictenvis.nic.in

Vol. 8 • Issue 1 • January 2015



ENVIS CENTRE FOR BIOINFORMATICS-VECTOR CONTROL

Environmental Information System

GENETICALLY MODIFIED (GM) MOSQUITOES

FOREWORD

Dr. M. LAKSHMI KANTAM FNA
Director, CSIR-IICT

Current prevention methods for malaria do their best but could not keep the disease at below threshold levels. The possible viability of a cheap, gene-based prevention method is a big news in the Public Health.

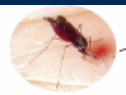
The idea of using **genetically modified (GM) mosquitoes** to wipe out malaria has been around for a while. Theoretically, if one can create a better, and stronger mosquito that is unable to spread the malaria parasites. If tens of thousands of better mosquitoes are released into the wild, they would win the survival game and replace the wild mosquitoes that are capable to spread malaria. In this theoretical solution, once malaria were eradicated from a particular area, it would not come back because the mosquitoes couldn't carry it back. But there has always been a glitch.

The researchers believe that the genetic modification probably weakens the malaria-resistant mosquitoes in general, but they gained the survival advantage because the parasite couldn't develop in the gut. This seems to have caused them to live longer, allowing them to lay more eggs than their malaria-infected counterparts.

But it's not time to release swarms of malaria-resistant mosquitoes into the wild environment. There are several issues associated with huge release of GM mosquitoes though the results are very promising in the laboratory and in some experimental fields the results are to be worked out and are only the tip of the iceberg in terms of actually using GM mosquitoes to stem the spread of malaria. It would seem like good news, but it's not. The GM mosquitoes had an advantage only when the malaria parasite entered the picture, and they also need to be better under non-malaria circumstances too. Most female *Anopheles* mosquitoes never pick up the parasite. In order for effective control strategy the GM mosquitoes have to replace the wild mosquitoes that have any real effect on malaria transmission. The GM mosquitoes released in the wild would have to out survive the wild mosquitoes even when the malarial parasites were not present in the environment.

This newsletter deals with the topic of **"Genetically Modified Mosquitoes"** in detail and gives the readers and researchers the much needed information to tackle the disease causing mosquito menace. I am sure the contents of this elaborative News Letter will open up a new paradigm in the area of mosquito control and to effectively tackle the spread of vector borne diseases.

CONTENTS



GMM-GENETICALLY MODIFIED MOSQUITOES

Introduction

Vector-borne diseases are endemic in more than 100 countries and affect approximately 50% of the world's population (WHO, 2014). Reemergence and resurgence of mosquito-borne infections results in an unacceptably high burden of disease that reflects up on inadequate implementation of current control measures. Effective prevention strategies could reverse these trends, and vector control is aimed at interrupting the transmission and is a key component of such strategies.

Understanding the vectors is not only on the basis of their life cycle but also on the molecular information regarding their vectorial capacity which is an important aspect. Molecular understanding of the vectors disease transmission methods and looking for an inhibition to it is an intelligent logical step towards vector control. Therefore, the use of genetically modified mosquitoes (GMMs) for disease control has social, economic and ethical implications. The first technical consultation on genetically modified mosquitoes for malaria and dengue control was held at WHO headquarters in Geneva, Switzerland in May 2009. The meeting was attended by 38 scientists and specialists from 13 countries. Its main objectives were to update participants about the progress made till then and to identify potential issues, challenges and needs related to GMM. Various important recommendations were made on developing internationally acceptable guidance principles for GMM testing in the same meeting.

Vector control using GMM technologies encompasses multiple approaches. GMM applications seek to suppress or manipulate mosquito populations so as to decrease the vector mosquito populations or reduce their ability to transmit disease. Some non-GMM control approaches are described here alongside GMM where there are common principles of rearing and releasing mosquitoes and common measures of efficacy are likely to apply. The overall GMM approaches under active investigation for control of malaria and dengue transmission are majorly of two types:

1. Population suppression approach, where reduction is done for the numbers of disease transmitting mosquitoes without affecting the transmission capability of remaining individuals (e.g. through individual sterility) (WHO, 2009) and

2. Use of transmission-inhibited populations, in which *Aedes* and *Anopheles* populations have a high proportion that are unable to transmit malaria or dengue-causing pathogens because of population gene replacement. Much progress has been made in recent years, and several of these strategies have achieved proof-of-principle in laboratory studies (WHO, 2009).

Approaches to testing and evaluation of these alternative technologies may inform the development of GMM technologies.

Strategy	GMM technologies	Non-GMM technologies
Population manipulation or replacement	Homing endonuclease	Wolbachia-mediated heritable biocontrol
	Medea-based gene drive	
	Underdominance gene drive	
Population suppression (sterile insect technique)	RIDLdominant lethal gene systems	Wolbachia-mediated cytoplasmic incompatibility (CI) Classical radiation-induced Sterility

Table 1. Strategies and technologies adopted in vector control

ENVIS 2013-14

News Letter on Climate Change-Malaria

ENVIS NEWS LETTER

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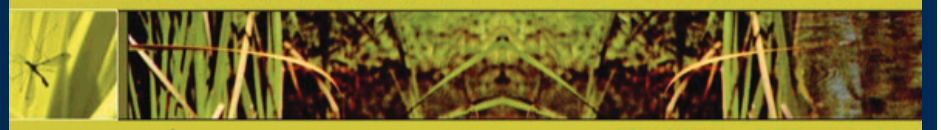
Vol. 7 • Issue 1 • March 2014



ENVIS CENTRE FOR BIOINFORMATICS-VECTOR CONTROL

nmental Information System

CLIMATE CHANGE - MALARIA

Dr. M. LAKSHMI KANTAM FNA
Director, CSIR-IICT

Foreward

Malaria is one of the common infectious diseases our world faces today and is prevalent in all parts of the globe except in Antarctica. It is spread by the female *Anopheles* species of mosquito by transmission of protozoan parasite called the *Plasmodium*.

Malaria was nearly eradicated from India in the early 1960s but the disease has re-emerged as a major public health problem. Early setbacks in malaria eradication coincided with DDT shortages. Later in the 1960s and 1970s malaria resurgence was the result of many operational problems. In the late 1960s malaria cases in urban areas started to multiply, and upsurge of malaria was widespread. Malaria at one time a rural disease, diversified under the pressure of developments into various ecotypes. These ecotypes have been identified as forest malaria, urban malaria, rural malaria, industrial malaria, border malaria and migration malaria; the latter cutting across boundaries of various epidemiological types. Further, malaria in the 1990s has returned with new features not witnessed during the pre-eradication days. These are due to the vector resistance to insecticides extensive vector breeding grounds created principally by the resource development projects on water, urbanization and industrialization. Malaria control has come to a complex state, and strategy for its management requires decentralization and effective community participation based on local transmission of the disease.

There is a strong belief among climatologists that our planet is experiencing a progressive rise in surface temperature due to the increased production of **'greenhouse'** gases and the possible consequences of elevated temperature influencing the malaria transmission. This clearly indicates that small increases in temperature at low temperatures may increase the risk of transmission substantially. It is thought that global warming leads to coastal flooding, changes in precipitation and, indirectly, effects changes in land use. How these changes effect transmission at a regional level requires an understanding of the ecology of local vectors, since environmental changes which favour malaria transmission in one vector species may reduce it in another. Methods for predicting future changes in malaria in different regions are the need of the hour for further research in this area. Most importantly, there is a need for researchers to validate the accuracy of the models used for predicting malaria and to confirm the assumptions on which the models are based. The present ENVIS newsletter mainly focuses on the present situation of malarial disease in our country and the role of climate change. We also present in this newsletter about the various climatic models developed by CSIR-IICT for the effective management of this disease.

CONTENTS

Vector-borne diseases continue to plague world health. The World Health Organization estimates the following global annual impact: 300 million malaria cases, 50–100 million dengue cases, and 120 million filariasis cases. The toll from other vector-borne diseases like trypanosomiasis, leishmaniasis, Japanese encephalitis, onchocerciasis and yellow fever add more millions of cases each year. It has been estimated these diseases represent 17% of the global disease burden due to all parasitic and infectious diseases recorded as disability-adjusted life years. 120 years ago it was found that arthropods were transmitting pathogens to humans. Now it is accepted that vector-borne disease cycles are complex systems due to the requisite interactions between arthropod vectors, animal hosts and pathogens that are under the influence of environmental factors that contribute to variation in disease transmission in complex ways. The Inter-governmental Panel on Climate Change (IPCC) lists vector-borne diseases among the most likely consequences to change due to climate change. In addition to climatic factors, the incidence and geographic distribution of vector-borne diseases are influenced by many demographic and societal factors. Transmission requires that the reservoir host, a competent vector, and the pathogen be present in an area at the same time, and in adequate numbers to maintain transmission (W. J. Tabachnick 2010).

The vector-borne disease episystem illustrating interactions between selected environmental factors with effects on the vector-pathogen-host epidemiologic cycle
(Source: The Journal of Experimental Biology 213, 946-954)

Despite evidence that climatic patterns, of temperature and rainfall, have direct effects on vector-borne diseases, there are reservations about the potential for predicting future effects of climate change on vector-borne diseases. The climate-driven hypothesis for vector borne disease epidemiology generally point to the need for greater understanding of the ecology of vector-borne diseases in order to understand and predict the effect of future changes in the environment. Vector-borne diseases will continue to evolve in a changing world as they have done throughout history. For example, the evolution of the domestic form *Aedes aegypti* (L.) occurred after humans began storing water in containers. This type of water storage provided the niche for the evolution of this container-breeding mosquito and led to its urbanization and commensalism with humans, resulting in an increase in the level of transmission of both yellow fever virus (YFV) and dengue virus (DENV). Changing climate conditions make diseases, which have already been eradicated, or newly emerging diseases a threat to human health.

Indirect and direct influences on vector borne diseases
(Source: Molyneux 2003)

The low and middle-income countries are responsible for only a small percentage of global greenhouse gas emissions that leads to adverse health effects associated with climate change. High-risk areas include those already experiencing a

Inaguration of the workshop by *Guest of Honour Dr. Sammaiah* and *Dr. M. Lakshmi Kantam, Director CSIR-IICT, Hyderabad* also seen *Dr.USN Murty*, IICT ENVIS coordinator.

Children's participated in AWAKEN workshop he on 10.07.2014, at CSIR-IICT, Hyderabad.

Section of school children who participated in AWAKEN workshop held on 10.07.2014, at CSIR-IICT.

Children participating in the elocution competio held on 09.07.2014 as part of AWAKEN-14

School children during the "AWAKEN 2014" drawing competition held on 09.07.2014

Winners of elocution and drawing competitions receiving momentoes from *Dr.Lakshmi Kantam* Director, CSIR-IICT during AWAKEN-14 workshop.

AWAKEN-14: "ENVIRONMENT & HEALTH"

on 10.07.2014

AWAKEN-II

An Environmental Awareness program

A section of the audience and school children participated in AWAKEN-II: Environmental Awareness program on “Environmental management of Mosquito borne diseases”. held at CSIR-IICT auditorium on the occasion of “World Environment Day-2013”.

- **Dr Andy Morse & his group**, Reader, **School of Environmental Sciences**, University of Liverpool, Liverpool, UK visited ENVIS Centre and gave high appreciation for the services rendered to the people residing in endemic zones.

Activities Pursued (2013-14)

- **Latest News: Updated latest news with**
  - **"Dengue outbreak in Delhi".**
  - **"Chikungunya in Gujarat".**
  - **"Malaria cases in Punjab".**

- **Subject Area: Subject area updated with**
  - **Facts on Malaria.**
  - **Facts about Dengue.**
  - **More about Dengue.**
  - **Frequently Asked Questions on Dengue.**
  - **Frequently Asked Questions on Lymphatic Filariasis.**
  - **Frequently Asked Questions on Chikungunya.**

Activities Pursued (2013-14)

Publications:

- Monthly Upgradation of publication on Malaria, Filariasis, Japanese encephalitis, Dengue and Chikungunya.

- Published a news letter on Climate Change and Malaria.

Upcoming Events: Updated with

- "Dengue Conference" at CRME, Madurai.
- "International Conference on Vector & Vector Borne Diseases" at Udaipur.
- "Third International Conference on Dengue & Dengue Haemorrhagic Fever" at Thailand.
- "Arbovirus Surveillance Mosquito Control Workshop"
- "Challenges in Malaria Research"
- "Workshop on Insect Chemical Ecology-2014"
- "5th Asia-Pacific Conference on Public Health **etc.....**

Activities Pursued (2012-13)

- Updated the latest information on “Dengue outbreak in Tamilnadu”.
- Incorporated the information on “Check list to avoid dengue”.
- Updated the press information on “Modelling approaches for prediction of malaria and encephalitis”.
- Updated with “influence of landscape ecology on vector borne diseases”
- Updated with research publication on vector borne diseases.
- Latest upcoming events and conferences are incorporated in the ENVIS.
- Published a news letter on “Epidemiology of Vector Borne Diseases in India”.

Published a news letter on “Epidemiology of Vector Borne Diseases in India”

ENVIS NEWS LETTER

www.iictenvis.nic.in

Vol. 6 • Issue 1 • August 2012

ENVIS CENTRE FOR BIOINFORMATICS-VECTOR CONTROL

Environmental Information System

EPIDEMIOLOGY OF MOSQUITO BORNE DISEASES IN INDIA

Dr. J.S. YADAV, FTWAS
Director, IICT

FOREWORD ...

With the onset of every New Year a new disease is afflicting the planet earth. The problem gets more compounded with the vectors like mosquitoes contributing to the vector borne diseases thus affecting millions of lives in the form of pandemics and epidemics.

The mortality and morbidity caused by diseases like Malaria, Filariasis, Dengue and Japanese encephalitis (J.E) is mind blowing in partially developed, developing and under developed countries. Vector borne diseases are emerging with vigour due to changes in Public Health, Insecticide and Drug resistance, Genetic changes in the pathogens, vast areas to be covered and the ever growing population.

The emergence/re-emergence of Vector Borne Disease like Malaria, Dengue, and Japanese encephalitis could also be due to climatic changes in the form of global warming. The factors like Temperature, Rainfall, and Humidity influence the transmission dynamics of vector borne diseases. This ever changing scenario of vector borne diseases enthused CSIR-IICT to develop tools for integrated control/management of diseases like Malaria, Dengue, J.E. and Filariasis. This News letter highlights in brief the methodologies and strategies used in combating these deadly vector borne diseases.

CSIR-IICT has taken a quantum lead in this integrated approach of tackling the vector borne diseases and have addressed the issue of Malaria in North East of India, by undertaking Seasonal Prevalence studies and Data Base Management system of malaria in Arunachal Pradesh. Malaria epidemiology modelling involving weather variables in N.E. India in collaboration with (CSIR-CMMACS, Bengaluru) and application of Self Organising Maps(SOM) in Manipur to name a few.

The Bayesian network for assessing J.E. vector density and Database Management system for storing the epidemiological and entomological data pertaining to J.E. was done in Kurnool District of Andhra Pradesh. Addressing the issue of Filariasis Microfilaraemia prevalence in Karimnagar and Chittoor Districts of Andhra Pradesh was taken up, Application of (SOM) for prioritization of endemic zones of Filariasis in Andhra Pradesh. Dengue Decision Support System (DDSS) for diagnosis of Dengue fever in India.

I am sure that by the efforts of CSIR-IICT integrated control of vectors and vector borne diseases would add a new paradigm and add more cutting edge in controlling the Vector Borne Diseases when used with the already ongoing control operations in the war against the tiny insect called "Mosquito".

The Main objective of this News letter is to provide information to the researchers and the public health officials on Integrated control methods of vectors so that mortality and morbidity arising because of these diseases can be minimised.

CONTENTS

between the dynamics of *Wuchereria bancrofti* among the population.

Results: Microfilaraemia prevalence was found among all the age groups and its occurrence was more prevalent especially in above 30 years age groups. Similarly, the microfilaraemia and disease rates were found significantly higher in males compared to females.

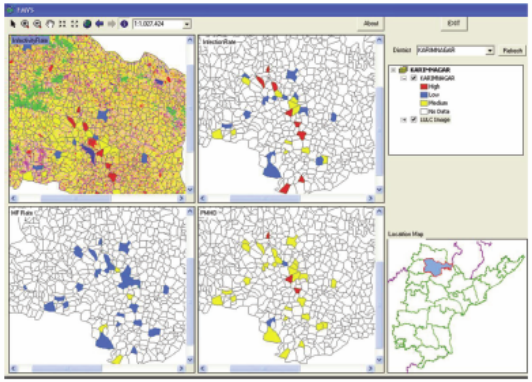
Conclusions: Using this baseline data it would be useful in planning for the elimination of lymphatic filariasis in Andhra Pradesh as per the WHO goal to eliminate lymphatic filariasis by 2020.

2. Applications of Self Organizing Map (SOM) for Prioritization of Endemic Zones of Filariasis in Andhra Pradesh, India

Entomological and epidemiological data of Lymphatic Filariasis (LF) was collected from 120 villages of four districts of Andhra Pradesh, India. Self-Organising Maps (SOMs), data-mining techniques, was used to classify and prioritise the endemic zones of filariasis. The results show that, SOMs classified all the villages into three major clusters by considering the data of Microfilaria (MF) rate, infection, infectivity rate and Per Man Hour (PMH). By considering the patterns of cluster, appropriate decision can be drawn for each parameter that is responsible for disease transmission of filariasis. Hence, SOM will certainly be a suitable tool for management of filariasis.

3. Filaria Monitoring Visualization System: A Geographical Information System–Based Application to Manage Lymphatic Filariasis in Andhra Pradesh, India

Among various public health diseases, filariasis constitutes a major public health problem in India, wherein an estimated 553.7 million people are at risk of infection. The aim of this article is to present a spatial mapping and analysis of filariasis data over a 3-year period (2004–2007) from Karimnagar, Chittoor, East and West Godavari districts of Andhra Pradesh, India. The data includes epidemiological and entomological studies (i.e., infection rate, infectivity rate, mosquito per man hour, and microfilaria rate). These parameters were customized on Geographical Information System (GIS) platform and developed filaria monitoring visualization system (FMVS) for identifying the endemic/risk areas of filariasis among these four districts. GIS map for filariasis transmission from the study areas was created and stratified into different spatial entities like low, medium, and high risk zones. On the basis of the data and FMVS maps, it was demonstrated that filariasis remained unevenly distributed within the districts. Balancing the



Spatial map showing the village level prevalence of filariasis (infectivity, infection, MF rate and PMH) in Karimnagar district of Andhra Pradesh.

Activities Pursued (2011-12)

- **The ENVIS-IICT website had been contributed with a blend of analyses of research articles on thematic topics and outbreaks of vectors and vector borne diseases.**

- **Japanese encephalitis, the disease known for its endemicity in Uttar Pradesh and Bihar. Differentiation of JE & Epidemic Brain Attacks/ NON-JE, Acute Encephalitis Syndrome are discussed under '*AES and JE swapping in Bihar'*.**

- **Updated ENVIS with "*environmental factors in the view of vectors & vector borne diseases*".**

- **Uploaded the information on "Delhi swarmed by vectors of Malaria, JE, Dengue and Chikungunya".**

- **Updated the ENVIS with '*announcements on research and trainings in tropical diseases*'.**
- **Web based "GIS epidemic atlas on mosquito borne diseases" are designed.**
- **Updated the bibliography on various vectors borne diseases.**
- **Developed malaria prediction model for Arunachal Pradesh using epidemiology & climate data.**
- **Published a Hindi news letter on Chikungunya & Dengue.**

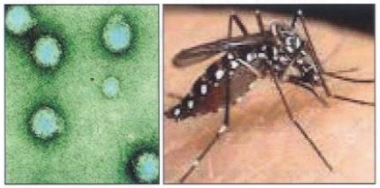
Published Hindi News letter on Chikungunya & Dengue

चिकनगुन्या - एक झलक

- डॉ.यू.एस.एन. मूर्ति
जीवविज्ञान प्रभाग
आई.आई.सी.टी., हैदराबाद

1. चिकनगुन्या क्या है ?

चिकनगुन्या *एडीस एजेप्टि* नामक मच्छर से संक्रमित चिकनगुन्या वाइरस से होने वाला बुखार या ज्वर है जिसका विशिष्ट गुण होता है - यह स्व-नियंत्रित (self-limiting) रोग है ।



2. चिकनगुन्या के लक्षण क्या है ?

सरदर्द, उल्टी/वमन, प्रकाश भीति, जोड़ों में दर्द और ददोरों या बिना ददोरों के साथ सूजन सहित एक से लेकर तीन दिन तक ज्वर रहता है । अगर ज्वर/ बुखार 3 दिन से भी ज्यादा चलता रहा तो सीरमविज्ञान सम्बन्धी परीक्षण करने की आवश्यकता है ताकि अन्य कारणों की संभव्यता को दूर हो सके ।

3. चिकनगुन्या का प्रमाणिक लक्षण क्या है, जो इस ज्वर को अन्य ज्वर से अलग दिखाता है ?

यह ज्वर तीन दिन से ज्यादा नहीं रहता । जोड़ों में सूजन व दर्द ज्वर कम होने के बाद भी बने रहेंगे । सूजन और जोड़ों में दर्द 1-3 सप्ताह या रोगी की उम्र के अनुसार महीनों तक रह सकते हैं ।

4. चिकनगुन्या के संक्रमण की विधि क्या है ?

संक्रमित व्यक्ति से यह रोग स्वस्थ व्यक्ति को सीधे संक्रमित नहीं होता ।

संक्रमित 'एडिस' मच्छर के काटने से यह रोग संक्रमित होता है ।

5. क्या चिकनगुन्या घातक है ?

नहीं, चिकनगुन्या स्व-नियंत्रित अपंगकारी रोग है लेकिन, निश्चित रूप से घातक नहीं है । विश्वव्यापी सांख्यिकी तथा विश्व स्वास्थ्य संगठन के रिपोर्ट स्पष्ट दर्शाते हैं कि चिकनगुन्या से मृत्यु नहीं होती । चिकनगुन्या के प्रकोप के दौरान विभिन्न कारणों से मृत्यु हो सकती है । अक्सर, मीडिया में चिकनगुन्या से मृत्यु के सम्बन्ध में बढ़ा चढ़ा कर दिखाया जाता है, जिससे दशहत फैल जाती है । लेकिन इस तरह की रिपोर्ट का कोई आधार नहीं है ।

6. क्या चिकनगुन्या के लिए कोई विशिष्ट चिकित्सा है ?

कोई विशिष्ट चिकित्सा नहीं है । लेकिन रोग लक्षणों के अनुसार चिकित्सा के लिए पेरासिटमाल,

डेंगू की जानकारी

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1. डेंगू ज्वर क्या है ?

एक प्रकार के वाइरस से डेंगू संक्रमण होता है । अक्सर इसे डेंगू ज्वर कहते हैं । कभी-कभी डेंगू के रोगी के नाक, मसूडे या चमड़ी जैसे स्थानों से रक्तस्राव हो सकता है । यदा-कदा रोगी कॉफी (Coffee) के रंग की उल्टी या काले रंग की टट्टी / मल कर सकता है, जो जठरांत्रीय रक्तस्राव की सूचना देती है । डेंगू से ग्रस्त रोगी में आघात हो सकता है जिसे डेंगू आघात सिंड्रोम (डीएसएस) कहते हैं ।

2. क्या डेंगू फैलने वाला एक संक्रमित रोग है ?

जी हाँ, सभी प्रकार के डेंगू वाइरस पूरे विश्व में पुन: फैल रहे हैं और विशेष रूप से उष्ण प्रदेशों के शहरों में बार-बार विस्तृत महामारी का कारण बन गये हैं । डेंगू ज्वर के पुन: फैलने के लिए अनेक कारण हैं :

- डेंगू से ग्रस्त अनेक देशों में मच्छरों के नियंत्रण के प्रभावकारी प्रयास नहीं किये जा रहे हैं ।
- पूरे विश्व में महामारी की पहचान व नियंत्रण करने वाली लोक स्वास्थ्य प्रणालियों (Public health systems) का ह्रास हो रहा है ।
- उष्ण प्रदेश के देशों में शहरों के तेजी से विकास के कारण बढ़ रही भीड़-भाड़, शहरी अवनत तथा स्वच्छता की मानक व्यवस्था का न होना आदि सभी ने मच्छरों के साथ लोगों को जीने के लिए मजबूर कर दिया है ।
- जैव-क्षयीकृत नहीं होने वाले प्लास्टिक पैकेजिंग के बढ़ते प्रयोग और फेंके गये टायरों से मच्छरों के प्रजनन के लिए नये-नये स्थान बन गये हैं ।
- हवाई यात्रा में बढ़ोत्तरी के कारण डेंगू से ग्रसित लोग एक शहर से दूसरे शहर आसानी से पहुँच रहे हैं, जो इसके संक्रमण को फैलाने में सहायता कर रहा है ।

3. डेंगू कहाँ पर व्यापक फैला है ?

डेंगू वाइरस संसार के उष्ण प्रदेशों में पाये जाते हैं। अफ्रिका, एशिया, प्रशांत महासागर, आस्ट्रेलिया तथा अमेरिका में डेंगू सामान्यत: पाया जाता है । कैरीबियान बेसिन में यह विस्तृत रूप से फैला हुआ है । शहरों में डेंगू साधारणत: रहता है लेकिन ग्रामीण क्षेत्रों में भी यह पाया जाता है । 4,000 फीट से ज्यादा ऊँचाई के पहाड़ी क्षेत्रों में विरले रूप से पाया जाता है ।

4. कब डेंगू होने का संदेह किया जा सकता है ?

डेंगू होने का संदेह तब किया जा सकता है जब आपको अचानक ज्वर हो जाता है । यह 103-105 फारनहीट या 39-40° सेंटीग्रेड का उच्चतम ज्वर होता है। ज्वर के साथ-साथ गंभीर सर दर्द (अक्सर पेशानी में), आँखों के पीछे दर्द, बदन दर्द, चमडी पर ददोरे और उल्टी या वमन आदि होते हैं । यह ज्वर 5-7 दिन तक रहता है । कुछ रोगियों में, 3 या 4 दिन में कम हो जाता है लेकिन फिर से हो जाता है। रोगी में ऊपर बताए सभी लक्षण नहीं रह सकते। बीमारी के बाद रोगी अधिक तकलीफ महसूस करता है । जोडों के भयंकर दर्द ने डेंगू को "हड्डीतोड़ ज्वर" (Breakbone fever) का नाम दिया है ।