

# Repository of Biological Material

# 5

## Mosquito species

### *Anopheles stephensi*

#### From urban and semi-urban areas

Nehru Place, Delhi; Gurgaon, Haryana; Nanak Enclave, Delhi; Hardwar, Uttaranchal; Nathupura, Delhi

#### From rural areas

Ladpur, Haryana; Badhdhana, Haryana; Single Line, Punjab; Faridkot, Punjab

#### Morphological mutants

Red eye (*re*) – sex-linked recessive  
Black larvae (*bl*) – autosomal semi-dominant  
Golden yellow (*gy*) – autosomal semi-dominant  
Creamish – new mutant  
white eye (*cw*)  
Black larva – new mutant  
white eye (*blew*)

#### Biochemical variant

Bahadurgarh, Haryana (EST-2)

### *Anopheles culicifacies* Complex

#### Species A

Dehra, Uttar Pradesh; Burari, Delhi; Rourkela, Orissa; R6-Rourkela, Orissa; RM-4-Chennai, Tamil Nadu

#### Species B

#### Acrocentric Y-chromosome lines

Ladpur, Haryana; Haldwani, Uttaranchal; R39-Rourkela, Orissa

#### Species C

#### Submetacentric Y-chromosome lines

Jabalpur, Madhya Pradesh; Rourkela, Orissa

### *Anopheles fluviatilis* Complex

#### Species T

Rourkela, Orissa; Hardwar, Uttaranchal; Haldwani, Uttaranchal

#### Species U

Hardwar, Uttaranchal

### *Anopheles sundaicus* Complex

Brackish water, A&N Islands; Nancourie, A&N Islands; Katchal, A&N Islands; Tressa, A&N Islands

#### Morphological mutant

Dark green (Larvae) mutant

### *Aedes aegypti*

Delhi

### *Culex quinquefasciatus*

Delhi



### Morphological mutants

Red eye (*re*); Scarlet eye (*se*)

### Parasite Species

#### Human Plasmodia

- Nonadapted cryopreserved isolates of *P. falciparum*, *P. vivax* and *P. malariae*
- Sera/plasma from infected patients

#### *P. falciparum*

- Adapted/Characterised isolates
- Different stages of the parasite from culture
- Merozoites (from culture supernatant)
- Ring (by synchronisation)
- Gametocytes (by Hypoxanthine treatment)
- Free parasites for antigen preparation (by Saponin lysis and ultrasonication)

#### *P. vivax*

- Sporozoites harvested from artificially fed mosquitoes

#### Cell Lines

- Hepatoma cell line: Hep G2 A16 used in the *in vitro* cultivation of pre-erythrocytic stage malaria parasites
- Myeloma cell line: SP2
- Hybridomas: 2A 10 (anti-*P. falciparum* sporozoite antibody secreting cells); 2 F2 1 A7 (anti-*P. vivax* sporozoite antibody secreting cells)

#### Nonhuman Plasmodia

- Different species of avian, simian and rodent plasmodia

Details of characterised *P. falciparum* Isolates

Species/Strains of parasite	No. of isolates
Adapted isolates susceptible to chloroquine	54
Adapted isolates resistant to chloroquine	52
NF-54 : an infective gametocyte producing strain of <i>P. falciparum</i>	1
3D 7A : a clone of NF-54	1
A-4 : a clone with binding property to CD36	1
Dd2 : a clone which can invade trypsin treated erythrocytes	1
Field isolates which can invade trypsin treated erythrocytes	3
Field isolates which can invade neuraminidase treated but not trypsin treated erythrocytes	3
Field isolates which can invade normal erythrocytes but not neuraminidase or trypsin treated erythrocytes	3
Field isolates which can invade both neuraminidase treated and trypsin treated erythrocytes	5
Field isolates which can form rosettes	3
Field isolates which can bind to CSA	1
Field isolates which can bind to CD36	9
Field isolates which can bind to ICAM-1	2
Isolates with isoenzyme profile of GPI, GDH, ADA and LDH markers	22
Isolates with MSP-1, MSP-2 and GLURP markers	40



## Nonhuman malaria parasites available at the Parasite Bank

Parasite species	Source	Susceptibility to antimalarials
<b>Simian malaria parasites</b>		
<i>P. cynomolgi bastianelli</i>	NICD, Delhi	Not done
<i>P. knowlesi</i>	–do–	–do–
<i>P. fragile</i>	CDRI, Lucknow	–do–
<b>Avian malaria parasites</b>		
<i>P. gallinaceum</i>	NICD, Delhi	Not done
<i>P. relictum</i>	Wild, Delhi	–do–
<b>Rodent malaria parasites</b>		
<i>P. berghei</i> NK-65	PGI, Chandigarh	Not done
<i>P. berghei</i> NK-65*†	CDRI, Lucknow	CQ sensitive
<i>P. berghei</i> *	–do–	CQ resistant
<i>P. berghei</i>	–do–	Quinine resistant
<i>P. chabaudi</i>	INSERM, Paris	Not done
<i>P. vinckei petteri</i> 279 BY	–do–	–do–
<i>P. yoelii yoelii</i> 265 BY**	–do–	–do–
<i>P. yoelii nigeriensis</i> **†	LSHTM, London	–do–
<i>P. yoelii nigeriensis</i>	CDRI, Lucknow	Multi-resistant
<i>P. yoelii</i>	ICGEB, New Delhi	Not done

\*Oocyst positive in *An. stephensi*; \*\*Oocyst and sporozoite positive in *An. stephensi*; †Infective gametocyte producing strain.



- Rodent plasmodia infected rats/mice
- Sera/plasma from respective vertebrate hosts

### Animal House Facility

Rabbits, pigeons, domestic fowls, laboratory mice, etc. were procured, maintained and utilised for research purpose throughout the year as per the guidelines issued by the concerned authorities. These animals were housed at 22, Sham Nath Marg and 2,

Nanak Enclave buildings and were used as blood meal source to mosquitoes of different species and strains maintained at the Centre. Laboratory mice were used in screening the antimalarials, host-parasite interaction studies and maintenance of rodent plasmodia at the parasite bank. Experiments on animals were performed with the approval of the Scientific Advisory Committee (SAC) and Institutional Animal Ethics Committee (IAEC) of the Centre.

# Information, Education and Communication (IEC)

## National Science Day Celebration

A speech-cum-discussion was organised at the Centre on 28 February 2005 on Environment factors affecting mosquito borne diseases. The speaker was Dr. R.K. Suri, Deputy Director, Ministry of Environment and Forests, New Delhi. All scientists, technical officers and research fellows attended and participated actively in the lecture/discussion.



## Preparation of Exhibition

An exhibition consisting of 10 panels highlighting the major research activities of Malaria Research Centre was designed and prepared using computer softwares. These exhibits were later displayed at ICMR (HQs) during the visit of Hon'ble Health Minister to ICMR. The scientific informations received from some other institutes of ICMR were also made into exhibition display panels. Basic details of ICMR



(HQs), like numbers of institutes/centres functions, budget, achievements, logo, etc. were also designed and converted into exhibition panels for display.

## Exhibition in Vigyan Rail

Associated and collaborated with ICMR in preparation and display of exhibition on ICMR's major achievements through its esteemed institutes/centres. The train also displayed the exhibition of other scientific departments. It later moved to all the major towns of India and stopped at these towns for 4-5 days to enable school children and general public to see the exhibition.



## Exhibition, Live Demonstration and Malaria Clinic in Indian Science Congress

MRC associated with ICMR in organising the biggest ever exhibition of ICMR and its institutes on the occasion of Annual Indian Science Congress presided by Prof. N.K. Ganguly, Director General, ICMR, and held at Ahmedabad, Gujarat from 1 to 5 January 2005. In addition to the exhibition panels depicting the major activities and achievements of the Centre, MRC, along with the collaboration of its Nadiad field unit organised its services like, on the spot malaria detection and treatment. MRC also displayed live demonstration of two larvivorous fishes which turned out to be centre of attraction to local people and students. Other live exhibits included all stages of mosquito life-cycle (eggs, larvae, pupae



and adults of vector species of *Anopheles*, *Culex* and *Aedes*). Instruction to prevent mosquito breeding in domestic and peridomestic habitats was imparted and pamphlets/handouts were distributed. Video films on prevention and control, and remedial measures of mosquito borne diseases were displayed continuously. Several thousand people including students attended the exhibition-cum-live demonstration and viewed the video films on health and expressed their curiousness and satisfaction. There was an earnest demand from the Hon'ble Chief Minister of Gujarat to extend the show for few more days.

### Health Education Camp

A health camp on mosquito borne diseases, their prevention and control, self protection and creation of general awareness was organised at Kendriya Vidhyalaya, Dwarka, New Delhi in March 2005. School children were briefed about the life-cycle of mosquito and parasite, prevention of mosquito breeding in and around houses, self protection from mosquitoes, first-aid during onset of high fever, blood



examination and treatment etc. Exhibition, video-films and live exhibits were displayed and explained. Brochures and handouts were distributed and questions raised by the visitors were answered. Few books and charts were donated by MRC to the school library.

### Hindi Exhibits

On the occasion of celebration of "Hindi Diwas Saptah" panels on MRC's activities were displayed in Hindi language. These were designed and prepared at the Centre.

### Still Photography

To cover the scientific research activities of the Centre, still photography of the ongoing research work of all the laboratories including parasite bank, insectories, infected blood meal to vectors, bio-chemistry, genetics, immunology etc. was highlighted in the photographs.

### Documentary Videos

- (i) Researching, scripting, story-board and some field shooting of a documentary on the role of Olyset nets in controlling mosquito borne diseases has been undertaken in collaboration with Dr. M.A. Ansari. The evaluation of this product is being undertaken in some villages of Ghaziabad. Evaluation aspects would be shot in night and effectiveness of this product would be assessed and highlighted in this documentary film.
- (ii) Visited Betul, Madhya Pradesh in March along with a team from National Vector Borne Disease Control Programme to facilitate filming of two videos on larvivorous fish and bednets.