BIOLOGICAL MATERIAL BEING MAINTAINED AT THE CENTRE

Mosquito Species

An. stephensi

From urban and semi-urban areas

Nehru Place, Delhi
Okhla, Delhi
Chennai, Tamil Nadu

From rural areas

Ladpur, Haryana

Morphological mutants

Red eye (r)	–	sex linked recessive
Black larvae (bl)	–	autosomal semi-dominant
Golden yellow (gy)	–	autosomal recessive
Creamish white eye (cw)	–	new mutant
Reddish brown eye (rb)	–	new mutant

Biochemical variants

Bahadurgarh (EST-2)

Insecticide resistant lines

Malathion resistant
Permethrin resistant
Lambdacyhalothrin resistant
Deltamethrin resistant
Cyfluthrin resistant
Fenthion resistant

An. culicifacies complex

Species A

Dehra, Uttar Pradesh
Burari, Delhi
Rourkela, Orissa

Species B

Acrocentric Y-chromosome lines

Ladpur, Haryana
Haldwani, Uttar Pradesh

Submetacentric Y-chromosome lines

Rameshwaram, Tamil Nadu
Rourkela, Orissa

Insecticide resistant lines

DDT resistant – Ladpur, Haryana
Malathion resistant – Ladpur, Haryana

Species C

Submetacentric Y-chromosome line

Jabalpur, Madhya Pradesh

Insecticide resistant line

DDT resistant – Jabalpur, Madhya Pradesh

***An. fluviatilis* complex**

Species S and T – Rourkela, Orissa
Species T and U – Hardwar, Uttaranchal
Species T – Haldwani, Uttaranchal

An. sundaicus

Cyclic colonies established from Car Nicobar
Katchal, Tressa (A & N Islands)

An. annularis

Nathupura, Delhi

Aedes aegypti

Delhi

Culex quinquefasciatus

Delhi
Sonepat, Haryana
Mewat, Haryana

Insecticide resistant lines

Malathion resistant	–	Sonepat, Haryana
Permethrin resistant	–	Sonepat, Haryana
Lambdacyhalothrin resistant	–	Sonepat, Haryana
Deltamethrin resistant	–	Sonepat, Haryana
Cyfluthrin resistant	–	Sonepat, Haryana
Fenthion resistant	–	Sonepat, Haryana

Morphological mutants

Red eye (re)
Scarlet eye (se)

Biological Material Available at the Parasite Bank

Human Plasmodia

P. falciparum

Non-adapted cryopreserved isolates

Non-adapted field isolates having different cytoadherence and erythrocyte invasion properties

Adapted cryopreserved isolates

Sera/plasma from infected patients

Different stages of the parasite from culture

- Merozoites (from culture supernatant)
- Ring (by synchronization)
- Gametocytes (by Hypoxanthine treatment)
- Free parasites for antigen preparation (by Saponin lysis and ultrasonication)

P. vivax

Non-adapted cryopreserved isolates
Sera/plasma from the infected blood
Sporozoites harvested from artificially fed mosquitoes

P. malariae

Non-adapted cryopreserved isolates
Plasma from the infected blood

Non-human Plasmodia

Different species of avian, simian and rodent plasmodia
Rodent plasmodia infected rats/mice
Sera/plasma from respective vertebrate hosts

Cell Lines

- Hepatoma cell line: Hep G2 A16 used in the *in vitro* cultivation of exo-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)

Non-human malaria parasites available at the Parasite Bank

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

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

Details of *P. falciparum* isolates collected and adapted *in vitro*

Place of collection	No. of isolates collected	Adapted/ Cryopreserved*
Delhi	172	70
Ghaziabad (Uttar Pradesh)	27	22
Shankargarh (Uttar Pradesh)	39	27
Baharaich (Uttar Pradesh)	21	–
Gautam Budh Nagar (Uttar Pradesh)	39	–
Shahjahanpur (Uttar Pradesh)	6	6
Mandla (Madhya Pradesh)	23	15
Jagdalpur (Madhya Pradesh)	14	6
Sonapur (Assam)	25	2
Rourkela (Orissa)	33	9
Rameshwaram (Tamil Nadu)	1	1
Jaisalmer (Rajasthan)	39	27
Bharatpur (Rajasthan)	35	1
Alwar (Rajasthan)	25	–
Nuh (Haryana)	25	2
Kolkata (West Bengal)	19	
Visakhapatanam (Andhra Pradesh)	12	–
Collected during 2001		
Delhi	3	
Bissam Cuttack (Orissa)	22	
Total	580	188

*****Continuous cultivation and adaptation was discontinued due to the shortage of normal human blood and serum.

Details of adapted/characterized *P. falciparum* parasites

Species/Strains of parasite	No. of isolates
Adapted isolates susceptible to chloroquine	54
Adapted isolates resistant to chloroquine	52
Adapted isolates to be tested for their sensitivity to chloroquine	82
NF-54, an infective gametocyte producing strain of *P. falciparum*	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 in neuraminidase or in trypsin treated erythrocytes	3
Field isolates which can invade both in neuraminidase treated and in 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

Experimental Animal Facility

Rabbits, pigeons, domestic fowls, laboratory mice, etc. were procured, maintained and utilized 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. Animals that fell ill in the process of feeding the mosquitoes were given treatment and rest as and when required. Laboratory mice were used in screening the antimalarials, host-parasite intraction studies and maintenance of rodent plasmodia at the parasite bank. Carcases were disposed properly. Experiments on animals were performed with the approval of SAC and Institutional Animal Ethics Committee (IAEC) of the Centre. The IAEC meetings were conducted and approval for the seven proposals regarding use of animals in maintaining biological materials and research experiments was taken from the Chairman of the IAEC after discussion. Proposal for renovation/upgradation

of the existing experimental animal facilities along with budget estimate was sent to the Director-General, ICMR for necessary action. Requirements and suggestions were given regarding animal testing facility which is to be constructed as a part of Research Block of MRC building at Dwaraka.