

1.9 Polymorphisms in Duffy blood group genes of *Plasmodium vivax* malaria patients and control population-

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Commencement: September, 2010

Duration: Two Years

Status: Ongoing

Funding: Desert Medicine Research Centre (Intramural)

OBJECTIVES

1. The four phenotypic variants of Duffy blood group [Fy:(a+b+), Fy(a+b-), Fy(a-b+) and Fy(a-b-)] will be calculated within the *Plasmodium vivax* malaria patients and control population
2. Duffy blood group genotyping in *P. vivax* malaria patients and control population from the endemic areas of Rajasthan

PROGRESS

The present study was undertaken to know the polymorphisms of Duffy blood group genes of the malaria patients of the desert population of Rajasthan and its correlation with malaria infectivity. Both males and females were included in the study between the age 1 to 60 years. All the subjects were taken from different families. Fever cases reported to Pokaran CHC were screened for malaria positivity. Blood samples of all the subjects were screened for the presence of malaria parasite. For the diagnosis of malaria a thick and thin film was prepared in the same slide from the peripheral blood. Thin films of the slides were fixed with methanol before staining. The blood films were stained with Jaswant Singh Bhattacharjee (JSB) stain and microscopically examined under an oil-immersion lens. A thick smear was regarded as negative on initial examination if no parasites were seen in 100 high power fields. All the *P. vivax* and *P. falciparum* malaria cases were confirmed by the additional rapid malaria diagnostic test. Those found to be positive were included in the study. Blood samples of 2 ml were taken in vacutainer for the genomic and phenotypic study. A total of 49 fever cases were screened for malaria and out of them 26 were found to be malaria positive. The whole genomic DNA was isolated by the use of the Qiagen Mid prep kit. The extracted DNA was confirmed by running in 1% agarose gel. All the malaria cases were treated as per the national drug policy.

1.10 Mapping of mosquito breeding habitats and location of vertebrate hosts in North and Southern parts of Rajasthan state prone for emergence of JE virus using space technology (RS & GIS) -

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Commencement: August, 2012

Duration: 3 years

Status: Ongoing

Funding agency: Indian Council of Medical Research - Vector Science Forum (Extramural)

OBJECTIVES

1. Mapping of mosquito larval habitats, particularly *Culex tritaeniorhynchus* and *Cx. vishnui* sub-group of mosquitoes and location of vertebrate hosts (pigs) which play major role in transmission of Japanese encephalitis (JE) virus using RS and GIS technologies
2. To identify JE prone areas with the help of RS and GIS in conjugation with entomological studies in the proposed study sites
3. To develop early warning system of JE occurrence

PROGRESS

To initiate the study, field visits were made to three villages viz., Jetana (Udaipur district, Bichhiwara (Dungarpur district) and Shivpur (Banswara district) of Rajasthan state to collect immature stages of mosquitoes from different breeding habitats and adult specimens from various resting places. In addition to this, observations were made on types of vegetation being grown, types of water bodies situated and location of vertebrate hosts in the aforementioned areas. Data on geo-coordinates of selected study sites were recorded using GPS receiver.

Mosquitoes:

A total of 181 adults & 207 immature stages of mosquitoes belonging to 14 species were sampled from cattle sheds and different breeding habitats respectively in order to determine presence of JE vectors. As many as 7 JE vectors viz., *Cx. tritaeniorhynchus*, *Cx. bitaeniorhynchus*, *Cx. fuscocephala*, *Cx. quinquefasciatus*, *Cx. pseudovishnui*, *An. subpictus* and *Ma. uniformis* were collected.

Vegetation types:

Information was gathered on types of vegetation grown in Udaipur, Dungarpur & Banswara district during monsoon season. It was noted that paddy is being cultivated

in these areas with maximum coverage in Banswara (0.28 lakh hectares) followed by Dungarpur (0.19 lakh hectares) and Udaipur district (0.02 to 0.07 lakh hectares). Selected paddy fields and other perennial water bodies will be searched for presence of mosquito larvae, particularly JE vectors and simultaneously they will be mapped using space technology during the further course of study.

Location of vertebrate hosts:

During field visits, Udaipur, Dungarpur & Banswara district were searched for location of pig sties and roosting places of ardiel birds which play important role in JE epidemiology. More data, on this aspect, will be collected during subsequent field visits.

Meteorological data:

Meteorology data pertaining to rainfall, number of rainy days, maximum/minimum temperature were recorded in respect of Udaipur, Dungarpur & Banswara district. These data will be utilised in analysing mosquito-genic conditions in aforementioned three study sites.

Recoding of Geo-coordinates of study sites:

Geo-coordinates of mosquito breeding habitats, including ponds, trenches, large water bodies (water reservoir) and the area which is likely to remain under paddy cultivation during monsoon season in Udaipur, Dungarpur & Banswara district were recorded. These data will help us in mapping down the breeding habitats of mosquitoes, including JE vectors using remote sensing technology during different months of the year.