NAME OF THE PROJECT:

Morphological Cytological and Molecular Diversity of Anopheles mosquito in Calcutta and Suburban Areas.

Principal Investigator:

Dr. Pranab Kumar Banerjee

File No: UGC(MRP)-41-93/2012(SR)

The present studies deals with population survey of Anophelines mosquitoes from September 2012 to December 2015 in some areas of three districts of West Bengal . The data reveal that *An. subpictus* is a predominanat species in three districts of West Bengal and it occupies a vigorous volume as compare to the other available vectors & suspected vector species of *Anopheles* mosquitoes. Such preponderence of incidance some way refects competetion , coexsistance among Anophelines , fitness in selection , coadaptation in natural population. In our field study *An. vagus* population is also remarkbly prevalant in the investigated area. The population load of *Anopheles* mosquitoes is carried out by the population volume of *An subpictus* *An vagus* and to some extent by *An.barbirostris.*

Our data indicate that in some areas of Hooghly district *An. subpictus* population is enormous. On the other hand in some areas of South 24 Parganas population load of *Anopheles* is carried out by the population volume of *An subpictus* and *An.barbirostris*. Diversity of Anopheline population is well observed in the three districts of West Bengal. In Kolkata *An. subpictus* , *An. annularis* and *An. culicifacies* are avilable .On the other hand in Hooghly district population abundance of *An. subpictus* and *An. vagus* are significant .In south 24 Parganas, population load of *Anopheles* mosquitoes is carried out by *An. subpictus* ,*An. vagus*, *An. barbirostris*, *An. annularis* and *An. stephensi*.

Our data reflect the diversity of *Anopheles* population in south 24 parganas. Avalibility of *An. stephensi* ,a promimnent vector species of malaria , in South 24 Pargana is a remarkable observation during our field study.

Our data (2013-2015) reveals that the diversity of population in Anophelines are well mantained in rural sub-urban and urban areas of three districts of West Bengal. For the investigation of seasonal and spacial diversity of Anophelines in Kolkata and sourrounding areas, it has been observed that in South 24 pargana (Diamondharbour) diversity of Anopheline mosquitoes are more prevalant . There are total five types of *Anopheles* species are observed in south 24 parganas viz *An. subpictus* ,*An. vagus*, *An. barbirostris*, *An. annularis*, and *An.stephensi* .

Furthure more it has been observed that in south 24 pargana *An.vagus* , *An.subpictus* and *An . barbirostris* mosquitoes population are prevalant through out the year. Monsoon season is very favourable for growth of Anopheline population. *An.vagus* population reach highest peak during these season *An stephensi* is only found in post monsoon and beginning of winter seasons.

Not only the seasonal and spacial diversity, the morphological variation in *Anopheles* are well observed during the above mentioned study period. Earlier it has been reported that cup shaped proboscis in *An. subpictus* are avalible in different parts of West Bengal (Banerjee & Chatterjee 1997-1998). Now in our observation cup shaped probocis is also available both in *An. vagus* and *An.subpictus* . The availability of cup shaped proboscis in *An. vagus* has been reported by B.N Nagpal in 1984.Cup shaped proboscis and palp with black tip in both *An subpictus* and *An.vagus* are frequently observed in the above mentioned areas. Unequal length of Palp and Palp with black tip is also documented in *An. vagus* .Variation in Palp is also obsrved in *An. annularis* .

Cytological studies through the observation of ovarian nurse cell polytene chromosome have been done in different Anopheline species in different district of West Bengal. Cytological variation are manifested through polytene chromosome inversion and the formation of asynapsis. Cytological variation through inversion is more prevalant in South 24 Pargana ( ) which indicate the genetic load of the species.

The second internal transcribed spacer (ITS2) region of ribosomal DNA(r DNA), separating the 5.8S and 28S ribosomal RNA gene, is considered an excellent species diagnostic molecular marker (Walton *et al*, 1999) as its sequence is likely to vary even between closely related species. Sequence variation of ITS2 region in different Anopheline species are well observed in our research study. Base pair length in *An. subpictus* varies from 600-750 in our studied area and the GC content ranges from 55%-56%. In *An. vagus* bp length is around 800 more than any *An.subpictus*. In *An. vagus* . GC content is 56.8%. The bp length of *An. barbirostris* is 911. No tandem repeat is found.

Acknowledgement:

We are grateful to Dr. Laltluangliana Khiangte the ex- Principal, and Dr. Vansanglura the Present Principals of Serampore College, for providing all the laboratory facilities and We are also very thankful to Dr. Subhadeep Sarkar for his continuous encouragement to carry out the present work. This Project work is funded by UGC major research project **[41- 93/2012(SR)]** of Dr. P.K. Banerjee.

30/4/2019

Principal
Serampore College
Serampore, Hooghly

SERAMPORE COLLEGE
Hooghly
W.Bengal
India