**Determination of Breeding Habitats and Seasonal Prevalence of Larvae of *Aedes aegypti* (L) and Other Possible Vector of Dengue in Kathmandu Valley**

Gautam I

Date: 2009

**Background**

Dengue Fever/Dengue Hemorrhagic Fever occurs primarily in tropical and subtropical areas of the world, prevalent in over 100 countries and threatens the health of approximately 100 million cases of Dengue Fever, 500,000 cases of Dengue Hemorrhagic Fever, and several thousand deaths occur annually worldwide. During the past decades, dengue virus has emerged in southern Asia; Dengue Fever/Dengue Hemorrhagic Fever epidemics have occurred in Bhutan, India, Maldives, Bangladesh, and Pakistan. The incidence of dengue has been increasing in recent years in densely populated areas in Nepal. Dengue viruses are transmitted from viremic to susceptible human beings by various mosquitoes of the subgenus Stegomyia, notably day-biting mosquitoes *Aedes aegypti* and *Aedes albopictus*, vectors throughout tropical and sub-tropical areas.

**Methods**

In this study, house-to-house surveys of larval breeding places and larval prevalence were conducted covering all three districts of Kathmandu valley during April, May, June, July, August, September and October in 2009. The sample sites included Koteshwar, Manahara, Gongabu-Balaju, Tokha, Jorpati and Kalanki (Kathmandu district), Tikathali, Lokanthali, Kaushaltar, Thimi, Darbar square and Bode (Bhaktapur district). Satdobato, Thalchkhel, Mahalaxmisthan, Dhobighat, Sanepa, Bagalamukhi, Dholahiti, Chibahal, Thecho, Chapagaon, Badegaon, and Godawari (Lalitpur district) of Kathmandu valley. Collection sites were selected in both town and rural residential areas. Nine major Water-filled containers discarded tires, metal /plastic drums, plastic buckets, flower pots, mud pots, cement tank, metal containers, plastic pots and miscellaneous small, discarded items such as tin cans, jars and plastic food containers were searched for the presence or absence of Aedes larvae and/or pupae. Adult Aedes mosquitoes were examined with the help of aspirators and flash-lights. All live mosquito larvae and pupae collected were reared until adult emergence and identified. Primary end points of this study were the Breteau index and the house index; the secondary end point was the container index. Larval survey techniques were used to obtain the House Index, Container Index and Breteau Index. The container preferences of Aedes mosquitoes were assessed by calculation of breeding preference ratio (BPR).

**Results**

The highest House Index, Container Index and Breteau Index recorded for *Aedes aegypti* were 4.42, 3.63 and 9.73 respectively in October, and 9.91, 12.45 and 31.40 respectively for *Aedes albopictus* in September, 2009 (Kathmandu district) whereas, for *Aedes aegypti* in Lalitpur district were 5.50, 4.06 and 12.80 respectively in October, 2009. For *Aedes albopictus*, the highest House Index, Container Index and Breteau Index recorded for *Aedes albopictus* in Lalitpur district were 15.64 in August, 9.83 and 25.30 in September, 2009. The highest breeding preference ratio recorded for *Aedes aegypti* and *Aedes albopictus* in Kathmandu district were 1.89 and 1.89 in August, 2009. Similarly, the highest breeding preference ratio recorded for *Aedes aegypti* and *Aedes albopictus* in Lalitpur district were 1.69. It was observed that discarded tires lying outdoors were the preferred breeding habitats. No breeding of *Aedes aegypti* was observed in other containers during this seven months survey. However, breeding of *Aedes albopictus* was also observed in metal drum in Mangal bazar and in metal container in Gwarko of Lalitpur district .

**Conclusions**

*Aedes aegypti* and *Aedes albopictus* are established within the urban agglomeration of Basundhara, Gongabu-Balaju area of Kathmadu district and Satdobato-Gwarko, Thalchikhel, Mahalaxmithannad Sanepa area in Lalitpur district showing larval indices. Alternative strategies are needed which can be implemented through participation continuous participation of people in the community and which compliment the efforts of the vector control teams. The Aedes aegypti control programme is needed to make people aware of the threat poses to their health, and to educate them on how they can reduce this threat by either eliminating the potential breeding habitats which harbour the mosquito larvae or by preventing mosquitoes from having access to water-holding containers for egg-laying that are used in or around houses.

**Keywords:** *Aedes aegypti*; breeding habitat; Dengue; larvae; seasonal prevalence.