**Seasonal Distribution of *Culex tritaeniorhynchus* Giles (Diptera: Culicidae), the Vector of Japanese Encephalitis in Kathmandu Valley**

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Date: 2009

**Background**

Japanese encephalitis (JE) is common mosquito-borne viral encephalitis found in Asia, and is widespread throughout Asia. It is principally a disease of rural agricultural areas and primarily a zoonotic disease infecting mainly vertebrate animals, e.g. pigs, birds, horses etc. Pigs, wading birds and ducks have been incriminated as important vertebrate amplifying hosts for Japanese encephalitis virus due to viremia in them. Man is involved in transmission cycle as an accidental host and plays no role in perpetuating the virus. The disease was first recorded in Nepal in 1978 as an epidemic in Rupandehi district of the Western Development Region (WDR) and Morang of the Eastern region (EDR). At present the disease is endemic in 24 districts. Japanese encephalitis was confirmed in 40 residents of the Kathmandu valley, including 30 cases that had no history of travel outside the valley during the incubation period. However, there is little information on the occurrence of this disease in the densely populated Kathmandu valley. The species *Culex tritaeniorhynchus* is suspected to be the principal vector of Japanese encephalitis in Nepal as the species is abundantly found in the rice field ecosystem of the endemic areas during the transmission season and Japanese encephalitis virus isolates have been obtained from a pool of *Culex tritaeniorhynchus* females. No study so far has been carried out regarding seasonal distribution of *Culex tritaeniorhynchus* in Kathmandu valley.

**Methods**

Entomological studies were conducted in Kathmandu, Lalitpur and Bhaktapur district of Kathmandu valley, in order to determine the abundance and seasonal distribution of *Culex tritaeniorhynchus*. Emphasis was given to select the villages located on the river side, pond, agro-field ecosystem areas and presence of cattle on the areas. During the study period altogether 4 man hours were spent searching mosquitoes in 16 houses by two collectors in Balkot (Bhaktapur district), Gothatar and Nepaltar (Kathmandu district) and Godavari (Lalitpur district) of Kathmandu valley in indoor and outdoor hand collection to collect adult mosquitoes resting inside the houses. Adult mosquitoes were captured using mouth aspirators, animal baited net trap and CDC light trap. Different breeding places like paddy field, puddles, ponds, river bed, swamps, drain etc. were searched for larvae of *Culex* mosquitoes in Balkot, Gothatar, Nepaltar and Godavari taking dips. Collections were carried out in sequence daily along the block from the start house between 6:00 AM and 10:00 AM.

**Results**

Of the total 37018 adults and 10071, larvae *Culex quinquefaciatus*, the principal filarial vector, was the most commonly captured culicine mosquito (81.83% adult and 83.82% larvae) in Kathmandu valley followed by *Cx. fuscocephala* (adult 6.91% and larvae 6.02 %), *Culex tritaeniorhynchus* (2.24 % adult and 3.27% larvae), *Cx. vishnui* (1.58 % adult), *Cx. pseudovishnui* (1.06 % adult and 1.57% larvae). The least density was found to be for *Cx. gelidus* (0.45% adult) and *Cx. vishnui* (0.23% larvae). Other associated culicine mosquitoes recorded were *Culex hutchinsonie*, *Cx. edwardsii*, *Culex barraudi* and *Armigeres spp*. in different months. Vector control is largely achieved through the use of chemical pesticides and still playing an important role. Mosquitoes have developed resistance to many pesticides, whereas the predators are still highly susceptible. The biological insecticide such as Bacillus *thuringiensis* serotype H-14 (B.t. H- 14) can be applied through community participation. Rice cultivation in study areas has a marked effect on *Culex* mosquito species diversity. In the periphery of the city, there are a number of ponds, infested with aquatic floating weeds supporting mosquitoes. So the reduction in mosquito densities is to be realized through larval management. Mosquitoes in these ponds can be controlled by physical removal of weeds and fishes, nematode parasite, *Toxorhynchites*, a non-biting predatory mosquito can be used if necessary to control tree hole breeding mosquitoes. The local community can be motivated to remove or empty the receptacles around the premises.

**Conclusions**

*Culex quinqefasciatus* is not only the vector of filariasis but also a serious nuisance. Health education would promote the type of low-cost sanitation that doesnot favour mosquito breeding.

**Keywords:** *Culex tritaeniorhynchus*; Japanese encephalitis; seasonal distribution; vector.