

## Establishment of *Anopheles culicifacies* Sibling Species E not B as the Major Malaria Vector in the Country

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*Anopheles culicifacies* is well established as the predominant vector of malaria in Sri Lanka. This taxon comprises five sibling species namely A, B, C, D and E in the Indian subcontinent. Until recently, only sibling species B was reported to be present in Sri Lanka. The conundrum was that B is a poor vector of malaria in India. This was clarified by the identification through Y-chromosome morphology that what was reported as B in the island is really a mixture of B and E. Entomological parameters influencing vector potential such as fecundity, longevity and susceptibility to insecticides of B and E in the country are of paramount importance for the control of malaria and the details are described here for the first time. Mean egg production of these two sibling species are; species E,  $81.82 \pm 21.56$  (n=254), species B,  $80.53 \pm 14.16$  (n=40). Though, overall mean fecundity of species E was slightly higher than species B, the results were not significantly different between the two populations (F=0.13, P= 0.714). So far 214 females of species E and 47 females of species B were analyzed for age composition. Among species E, 15.9% (35/214) of field caught females had 3 or more dilatations while 4.3% (02/47) of the species B had 3 or more dilatations. Chi-square analysis showed that differences in the number of dilatations (i.e. age after maturity) is significant ( $\chi^2 = 4.6$ , DF=01, P=0.031). Of species E fed on malaria infected blood, 25% (08/32) developed *P. vivax* infection and 10.3% (03/29) developed *P. falciparum* infection. However no female of species B, fed on infected blood of *P. vivax* (00/13) or *P. falciparum* (00/06) infections. In all experiments number of oocysts varied from 07-47. Chi-square analysis showed a significant association (P<0.047) between sibling species and infection with *P. vivax*. 100% mortality was recorded for both siblings against lambda-cyhalothrin 0.05% and deltamethrin 0.05%, while 100% resistance was observed by both siblings against 4% DDT. Against 5% malathion, 54% resistance was recorded by sibling species E while 30.4% was recorded for sibling species B. Chi-square analysis showed differential sensitivity to malathion was significant ( $\chi^2 = 7.475$ , DF=01, P<0.006). The results demonstrate that species E can be infected with *P. vivax* as reported for Rameshwaram island, and for the first time that it can be infected with *P. falciparum*. The vectorial capacity of species B is low in Sri Lanka as reported many years ago for India. It is clear also that the spraying of malathion in the Jaffna Peninsula to control malaria transmission by species E is unlikely to be effective due to resistance and that pyrethroids have to be employed for this purpose.

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