Japanese encephalitis (JE) is an arboviral disease, spread to humans by infected mosquitoes. Entomological assessment indicates that *Culex tritaeniorhynchus* and *Cx. gelidus* are the major vectors in Kurnool district, Andhra Pradesh, based on relative abundance and more number of virus isolations. Hence, the present study is carried out on biochemical and biophysical parameters of JE vectors, *Cx. tritaeniorhynchus* and *Cx. gelidus* in Andhra Pradesh.

The suburban localities located on the margin of Kurnool were monitored for the collection, identification and transportation of *Cx. tritaeniorhynchus* and *Cx. gelidus* mosquitoes during experimental period. Wing beat frequency of *Cx. tritaeniorhynchus* and *Cx. gelidus* were measured experimentally using stroboscopic flash method and compared with wing beat frequency values of various theoretical models. The present study on wing beat frequency of *Cx. tritaeniorhynchus* and *Cx. gelidus* suggests that the values of wing beat frequency computed by the theories proposed by Greenewalt, Deakin and Crawford are not in agreement, while the mass flow theory shows significantly good agreement with the experimental values.

For computing moment of inertia of flight surface (wing), wings were removed from the body, fixed on a graph sheet and were made into number of strips. The masses of the wing strips were
measured using a sensitive balance (SARTORIUS ME-5) of least
count 0.001 mg and the area of the strips were measured by
keeping them under an enlarger, projecting on a graph sheet.
Theoretical determination of basic and derived parameters of a flier
is similar to that of Adeel Ahmad. It is observed that static
parameters differ considerably in males and females of both Cx.
tritaeniorhynchus and Cx. gelidus, more in females than males.

In order to study the flight performance of mosquitoes under
well defined aerodynamic conditions, a wind tunnel was designed
and constructed in the laboratory. The forward velocity of
mosquitoes, Cx. gelidus and Cx. tritaeniorhynchus was studied
under the wind tunnel. Power requirement studies of Cx.
tritaeniorhynchus and Cx. gelidus were carried out by the theoretical
equations given by Puranik. In the present investigation, helicopter
theory was considered for the calculation of induced power, while
inertial power is determined by considering the differential equation
related to oscillatory motion of the wing when the mosquito is in the
state of its hovering flight.

In the present study, biochemical analysis of Cx.
tritaeniorhynchus and Cx. gelidus was carried out with Van handel
and day method and role of carbohydrates and lipids in the flight was
discussed. In conclusion, the present study provided the valuable
information on biophysical and biochemical parameters of JE vectors,
Cx. tritaeniorhynchus and Cx. gelidus.