



## The Gnatwork

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<b>Title of resource</b>
GN_01: Key characteristics of vector species
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<b>Description</b>
Key characteristics of Diptera and the two major divisions: Nematocera and Brachycera. Protocol from the Gnatwork Bangladesh workshop, September 3-6 <sup>th</sup> 2018.
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<b>Resource history</b>
N/A



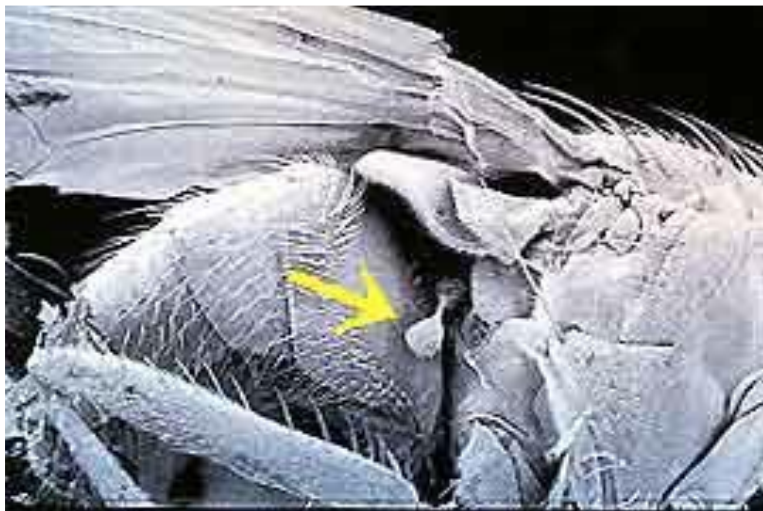
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## GN\_01: Key characteristics of vector species

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### **Diptera**

All Diptera have only two wings, as their hind wings have been modified into a pair of club-like halteres. This separates Diptera from all other insect Orders.

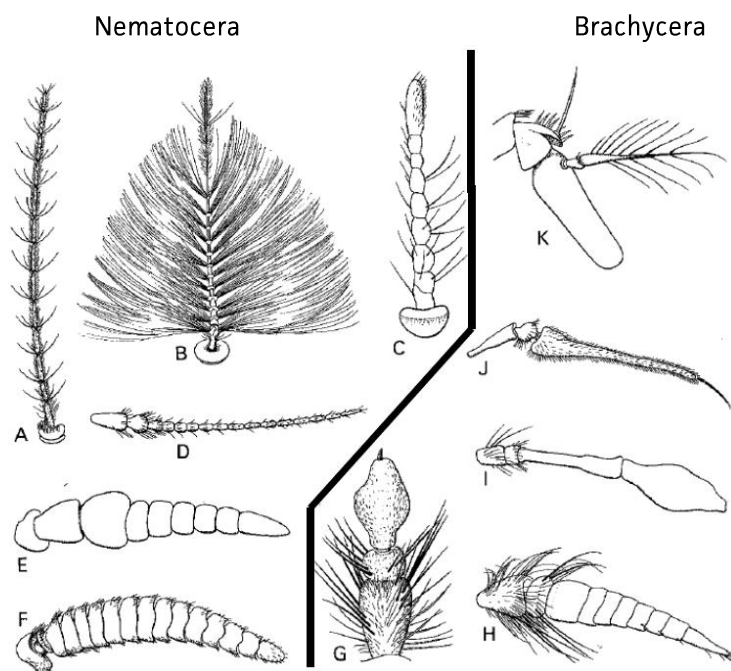


Hamilton *et al.* (2006)

Diptera are separated into 2 major Divisions. These are most easily separated on the shape of the antenna although body shape and wing venation are also useful.

**Nematocera** are the more primitive group. Most species are slender, delicate flies which have many (usually more than 6) antennal segments of fairly uniform shape. Biting midges, sandflies and blackflies all belong to the Nematocera.

**Brachycera** are more specialised. Most species are robust and have fewer antennal segments which are usually not of uniform shape. House flies, blow flies and march flies all belong to the Brachycera.



CSIRO (1991). Antennae of various Diptera. A: *Aedes alternans*, Culicidae (female); B: *A. alternans* (male); C: *Heptagyia tasmaniae*, Chironomidae (female); D: *Sylvicola dubius*, Anisopodidae (female); E: *Austrosimulium bancrofti*, Simuliidae (female); F: *Keroplatus mastersi*, Mycetophilidae (male); G: *Aplocera asilica*, Apioceridae (female); H: *Scaptia maculiventris*, Tabanidae (female); I *Miltinus viduatus*, Mydidae (male); J: *Rhaphium pudicum*, Dolichopodidae (male); K: *Musca vetustissima*, Muscidae (male).

## Nematocera

Include the:

<b>Ceratopogonidae</b> (contains <i>Culicoides</i> biting midges)	<b>Psychodidae</b> (contains phlebotomine sandflies)	<b>Simuliidae</b> (contains blackflies)
<p>All species have 2 forked veins distally and posteriorly on the wing which separates them from other Nematoceran families</p>	<p>Wings are hairy and veins are numerous, parallel and have no cross-veins in the outer two-thirds of wing</p>	<p>Wings are clear, broad and without hairs or scales. Heavy veins are present near the anterior wing margin, weak veins are present posteriorly</p>