

# First Report on *Adedes albopictus* Subgroup Species in India- Short Communication

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## ABSTRACT

*Adedes albopictus* is the most advanced stable species trophic level. It is acquired by after great nurture microevolution includes behavioral changes and survivability. In this evolutionary cascade, *Ae. albopictus* species diverged from its complex species lineage (reported in Kerala *Ae. novalbopictus*, *Ae. pseudalbopictus* and *Ae. subalbopictus*). Without any vestigial the species are pivotal in all the advanced measures include competition, adaptations, reproduction, and intelligence.

**Key-words:** *Adedes albopictus*, Evolutionary cascade, Microevolution, Subgroup, Taxonomic study

## INTRODUCTION

In Kerala taxonomic studies of mosquitoes started in 20<sup>th</sup> century by British pioneers with robust vector surveillance [1]. *Ae. albopictus* is common vector in epidemics of Kerala. It is highly tolerant against adverse conditions and competitive with co-inhabitants, since it was reported. The sylvatic mosquito highly dynamic in their habitats preference and they incubate any sort of water filled sources, they feed on vast range of mammal hosts [2]. Likewise *albopictus* highly potential vector to carrying viral pathogens [3]. In rural/urban regions of Kerala *Ae. albopictus* is principle vector of Dengue/Chikungunya [4]. In 2006, 70, 731 Chikungunya suspected cases reported from 3 coastal districts of Kerala [5].

In public health sector major percentage of health burden is from *Ae. albopictus* transmitted disease. Due to their rapid global expansion of territory they sow high toll disease burdens in public health [6].

Recent arose of ZIKA is best example for this study. In India it is reported in Gujarat, on 2017 May 26 WHO confirmed the cases [7]. Control measures (Insecticide) also challenging and lacking due to resistance [8]. The invasive species definitely a combatant vector [9].

In Kerala most of the areas dominated by *Ae. albopictus*. In some areas *albopictus* immature seen with *Ae. aegypti* or *albopictus* complex immatures. In other areas, there is no trace of *Ae. aegypti* in human prevalence. It shows co-inhabitant species exclusion and domination of *Ae. albopictus*.

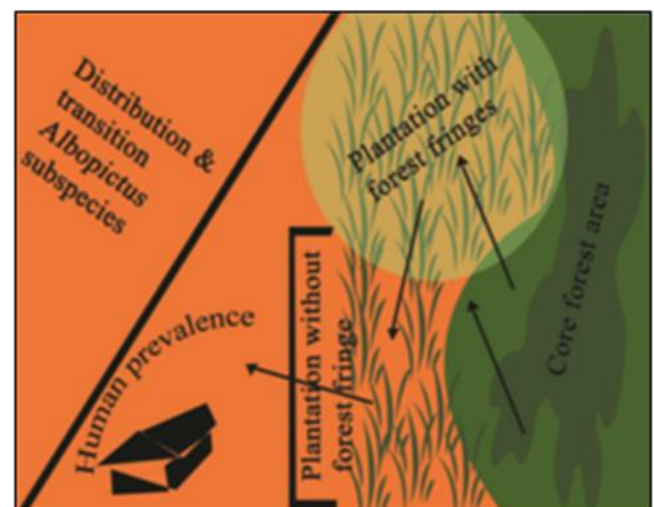


Fig. 1: Distribution and transition of *Albopictus* subspecies

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*Ae. albopictus* is one of the subspecies of the *albopictus* subgroup complex. It has 8 subspecies in oriental region [10]. They are very similar in their appearance and they are rare in occurrence except *Ae. albopictus*. Their bionomic and ecology are also not well understood. So here I would like share some facts and hypothesis about the *albopictus* subspecies. It is helpful to the subspecies future perspectives.

**Keys of four *albopictus* subspecies known to occur in India** [Adopted from: The Subgenus *Stegomyia* of *Aedes* in The Oriental Region with Keys to the Species (Diptera: Culicidae) by Yiau-Min Huang].

**a) *Aedes (Stegomyia) albopictus* Skuse, 1895**

1. Scutum with long longitudinal white stripe of narrow scales extending from anterior margin to about level of wing root.
2. Supraalar white line in complete
3. Scutum with patch of broad flat white scales on lateral margin just before the level of wing root.

**b) *Aedes (Stegomyia) novalbopictus* Barraud, 1931**

1. Scutum with long longitudinal white stripe of narrow scales extending from anterior margin to about level of wing root.
2. Supraalar white line in complete, not clearly defined and with only narrow scales over wing root.
3. Scutum with patch of narrow curved yellowish scales on lateral margin just before level of wing root.
4. Fore and midfemora with some pale scales scattered on anterior surface.

**c) *Aedes (Stegomyia) pseudalbopictus* (Borel, 1928)**

1. Scutum with long longitudinal white stripe of narrow scales extending from anterior margin to about level of wing root.
2. Supraalar white line in complete, not clearly defined and with only narrow scales over wing root.
3. Scutum with patch of narrow curved white scales on lateral margin just before level of wing root.
4. Scutum with patch of broad dark scales on each side of prescutellar space between prescutellar white line and post dorsocentral white line.
5. Postspiracular area with scales.

**d) *Aedes (Stegomyia) sub Albopictus* Barraud, 1931**

1. Scutum with long longitudinal white stripe of narrow scales extending from anterior margin to about level of wing root.
2. Supraalar white line in complete, not clearly defined and with only narrow scales over wing root.
3. Scutum with patch of narrow curved white scales on lateral margin just before level of wing root.
4. Scutum without broad dark scales on each side of prescutellar space.

**Scope of *Albopictus* subspecies study**

**Virus isolation in *Albopictus* subspecies-** *Albopictus* subspecies also carry the virus of Dengue/ Chikungunya and persist in nature via trans-ovarial transmission or reserve hosts of forest fringes. The subspecies are endemic in certain natural habitat. They bite human host in their prevalence. This is the cause of randomly reported Dengue/Chikungunya cases from forest areas. If we get a virus isolation positive pool we can prove carriage of Dengue/ Chikungunya virus among subgroup.

**Microevolution of *Albopictus* subspecies-** *Ae. albopictus* is the most successive, recent, and stable species of the evolutionary strip of *albopictus* subspecies. Other racks of the micro-evolutionary strip we can find, if amplify and sequence other *albopictus* subspecies Cytochrome oxidase fragment.

**CONCLUSIONS**

The subgroup species of Oriental region viz *Ae. albopictus* (Skuse), *Ae. downsi* Bohart and Ingram, *Ae. novalbopictus* Barraud, *Ae. patriciae* Mattingly, *Ae. pseudalbopictus* (Borel), *Ae. seatoi* Huang, *Ae. subalbopictus* Barraud and *Ae. unilineatus* (Theobald). The taxonomically different species have their own ecology and bionomics. In each geographical region the number of subspecies reported might be different. The very similar species product of a microevolution has its own adaptation and survivability. The identical species generated from most conserved ancestral species level. Survivability makes an ancestral species unstable then it put forth evolution to a stable species trophic level. The stable species trophic level has high adaptability and survivability. After the stable species level, it infiltrate into more behavioral changes for their adaptation. In *Albopictus* subgroup *Ae. albopictus* is the most stable tropic level with high tolerance. About this dominant

species, we have plenty of information's. Other sub-species information's are very limited. Their rare occurrence in the environment is the main hurdle of studies about the *Albopictus* subspecies. The sylvatic mosquito species prefer only natural habitats for their inhabitation (mainly tree holes) except *Ae. albopictus* (At once *Ae. albopictus* conserved in natural habitat only. Adaptability change the species more dynamic both artificial and natural habitats). They are capable of transmitting viruses. There are four subspecies reported in Kerala. They are *Ae. albopictus*, *Ae. novalbopictus*, *Ae. pseudalbopictus* and *Ae. subalbopictus*. Further, any detailed distribution or data not available about these subspecies so the taxonomic combing study for *albopictus* subgroup is essential for their necessities findings.

### CONTRIBUTION OF AUTHORS

All authors equally contributed in this article.

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