



Arbovirus

Is a term used to describe a group of virus transmitted to humans from arthropods.

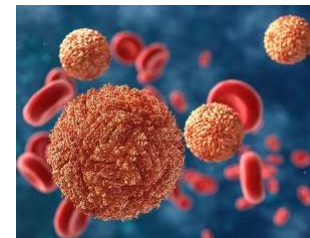
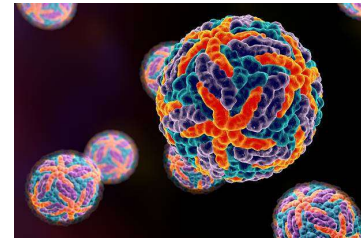
There are more than 534 known arboviruses of which approximately 134 (25%) are capable of causing disease in humans.

These are transmitted principally by mosquitoes and ticks.

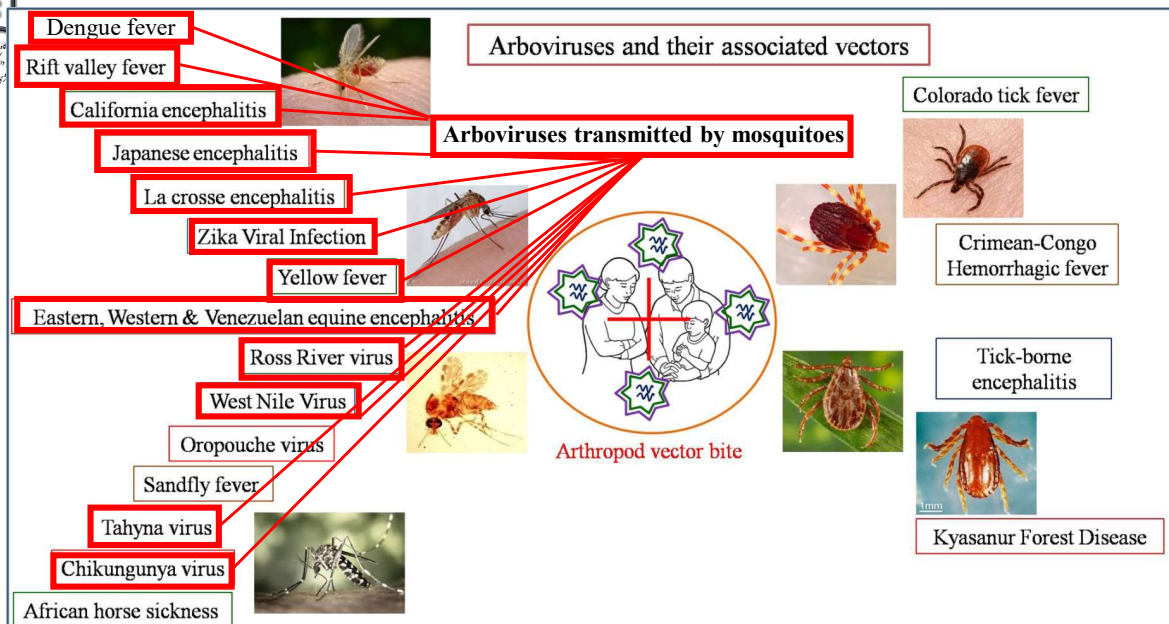
Arboviruses represent 30% of all emerging infectious diseases in the last decade



Arbovirus



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Aedes, genus of mosquitoes

- ***Aedes aegypti*** and ***Aedes albopictus*** have received a great deal of attention worldwide



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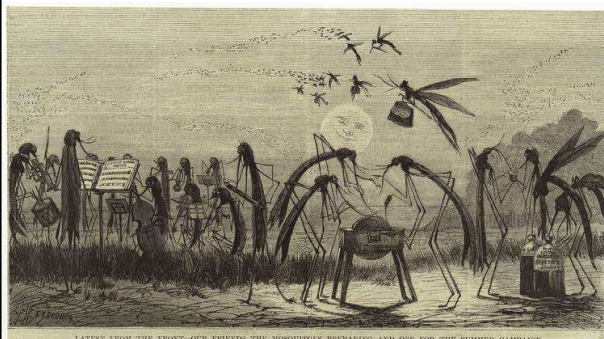
Both species are efficient vectors for human arboviral diseases such as

- **Dengue**
- **Chikungunya**
- **Zika**
- **Yellow fever**

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Aedes aegypti, originating from African forests, is currently found in most tropical and subtropical regions worldwide



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The habitat suitability model indicated that of the **250** countries considered, **215 (86%)**

are potentially suitable for the existence and development of *A. aegypti* and/or *A. albopictus*

Table 1

Number of countries/territories suitable for the vectors and number of countries/territories affected by the diseases, by region.

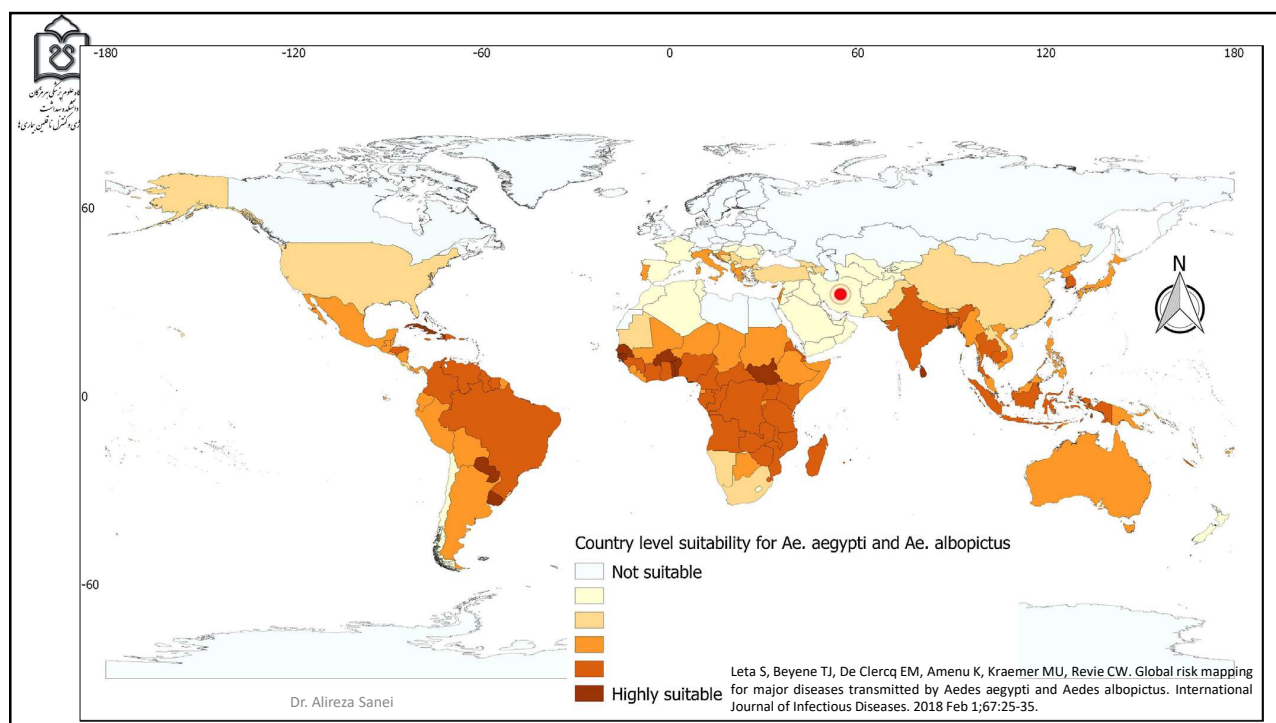
Region	Number of countries/ territories	Number of countries/territories suitable for			Number of countries/territories affected by				
		<i>Aedes aegypti</i>	<i>Aedes albopictus</i>	Either vector	Zika	Dengue fever	Yellow fever	Chikungunya fever	RVF
Africa	58	56	56	57	14	36	30	26	36
Americas ^a	56	52	44	52	48	46	13	46	0
Asia	52	45	43	49	11	15	0	20	3
Europe	56	12	32	32	0	3	0	3	0
Oceania ^b	28	23	22	25	12	11	0	11	0
Overall number of countries/ territories	250	188	197	215	85	111	43	106	39

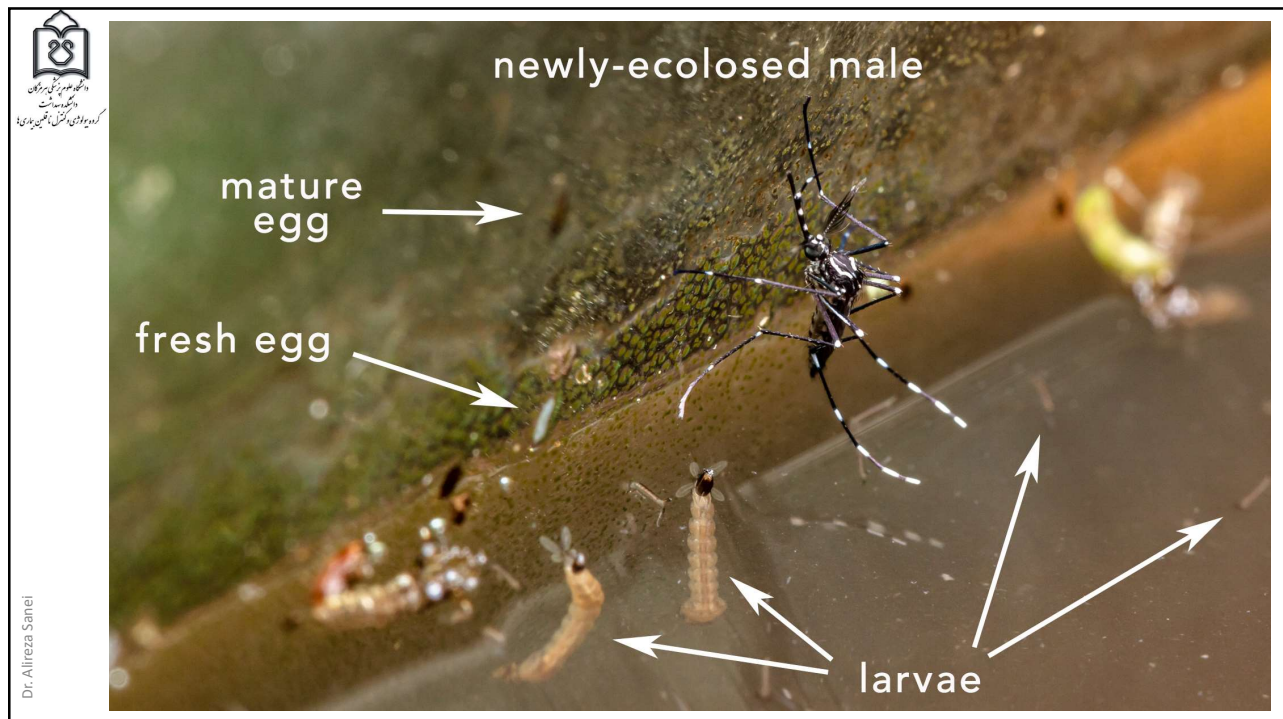
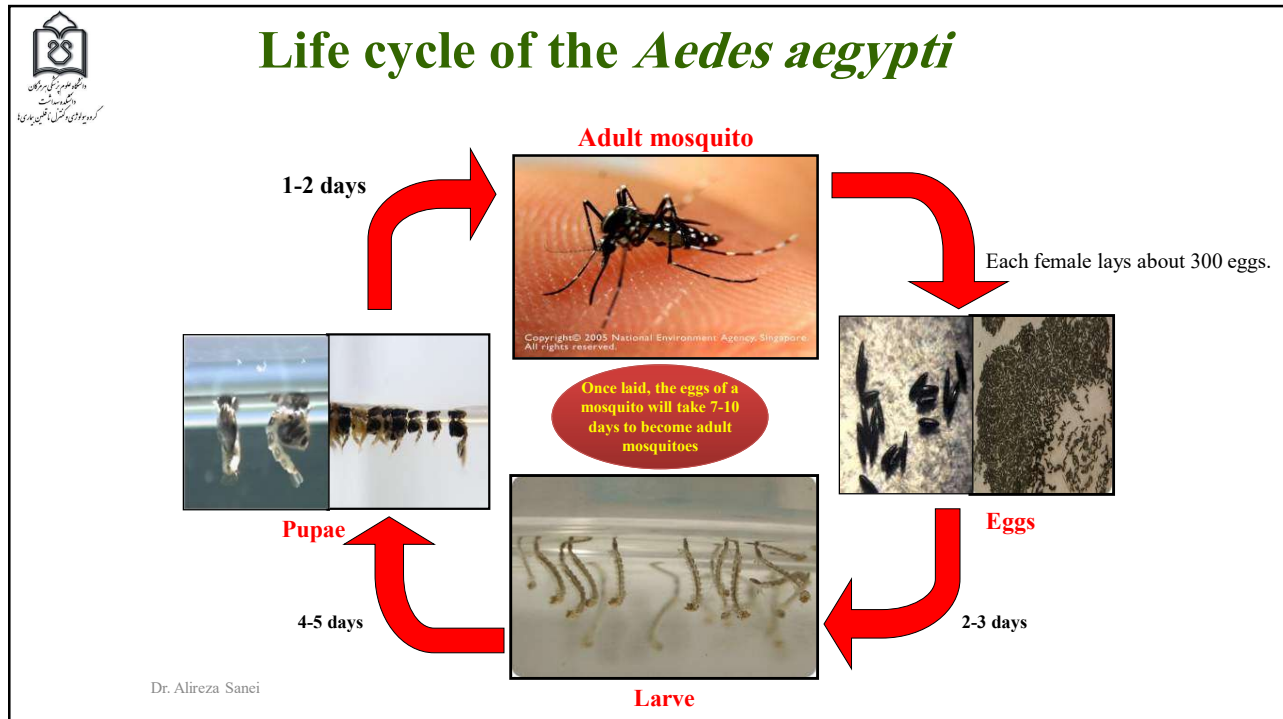
RVF, Rift Valley fever.

^a Includes Central America, North America, the Caribbean, and South America.

^b Includes Australia and the Pacific islands.

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- **Transovarial transmission of viruses on *Aedes aegypti* was reported**
- ***Aedes aegypti* eggs can survive desiccation for months (Up to a year)**



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The major production places are

Natural: Tree holes and bamboo internodes holding water



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The major production places are
Artificial: human-made containers



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Most containers with water used for immature development
are within or in close proximity to households



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Artificial Containers Provide Water For Mosquitoes During Drought

Mosquitoes need just two tablespoons of water to lay their eggs.



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Size approximately 2 to 3 millimeters.



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- Has bright silvery lyre-shaped dorsal pattern
- Has white banded legs



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Only the **female mosquito** transmits pathogens, while the male plays a vital role in mating and species continuity.

- ✓ Unlike most mosquitoes, Aedes species are **daytime feeder**
Sunrise and before sunset
- ✓ The mosquito attacks generally from below or behind, and mainly at the feet and ankles.



Occupies urban areas with or without vegetation



**Bites, rests, and lays
eggs both indoors
and outdoors**

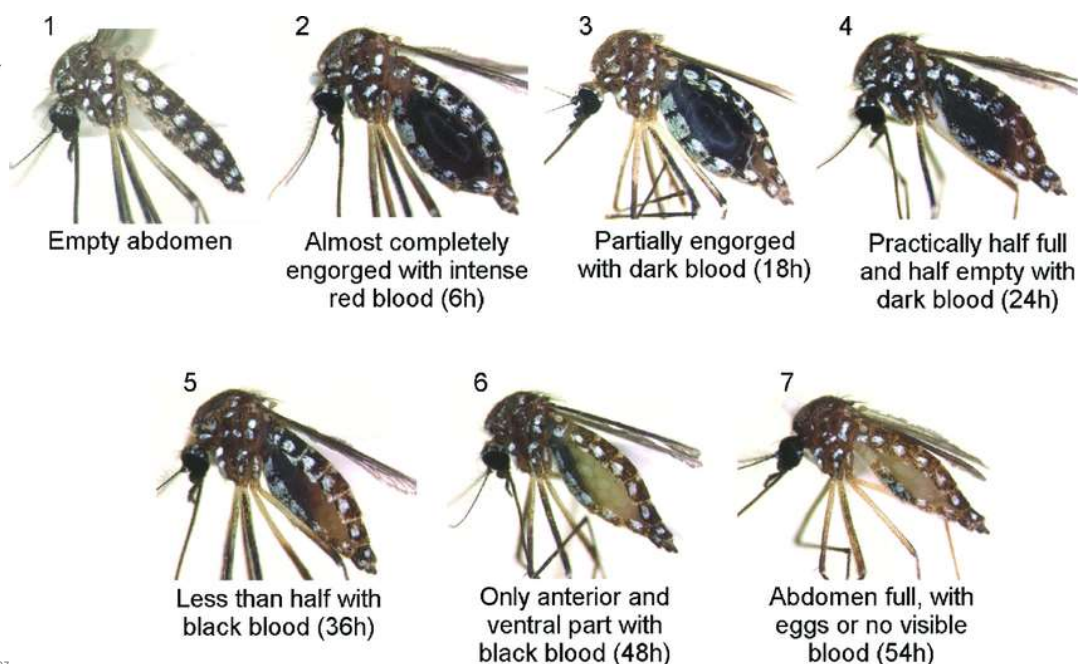


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- Flight distance of *Ae. aegypti* is about 500 meter
- High preference for taking blood meals from humans
- Endophilic and Endophagic behavior (Resting AND Feeding inside)
- *Ae. aegypti* females might bite several people before obtaining a full blood meal (Usually 2 people)

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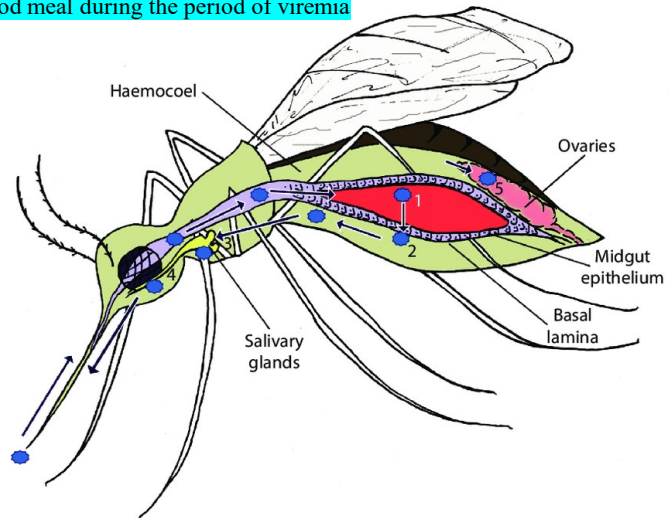
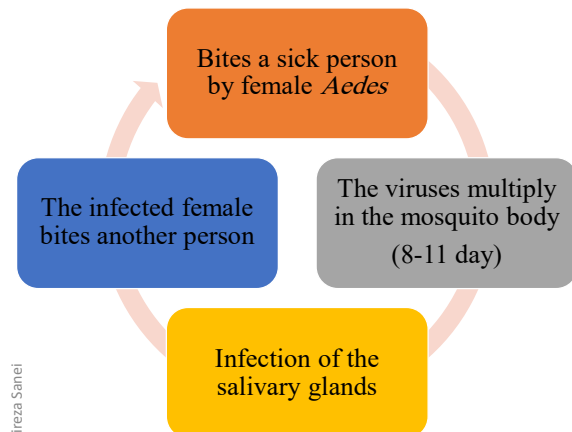
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How do mosquitoes transmit the virus?

The mosquito must take its blood meal during the period of viremia



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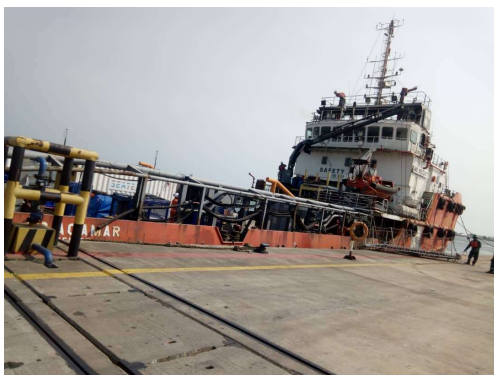
- Once infected, the mosquito female becomes a virus vector until its death (Lifespan of about 1 month)



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Extension of *Ae. aegypti*

In all stages (Egg, Larvae, Pupa, Adult)



Dr.





Combating the mosquito! *This is our great challenge!*



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How to combat the *Aedes aegypti*

- We may think **Wrong** combat eliminating adults by spraying insecticides.
- Nowadays the spraying with insecticides should be made only in special situations because:
 - The mosquitoes **hide** inside the houses, hide in the middle of the plants and in other places, avoiding the contact with the insecticide
 - The adult mosquitoes are becoming **resistant**

Side effect on environment and non target organism



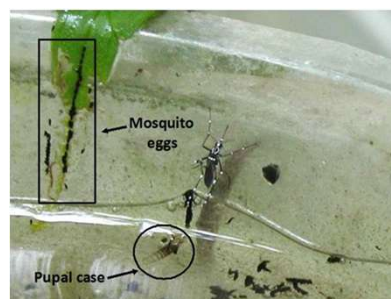
Still strategies to eliminate the mosquito

- Killing at the stage of larva. If there is no larva, adults will not be produced. However, even the process of eliminating the larvae with insecticides is not efficient



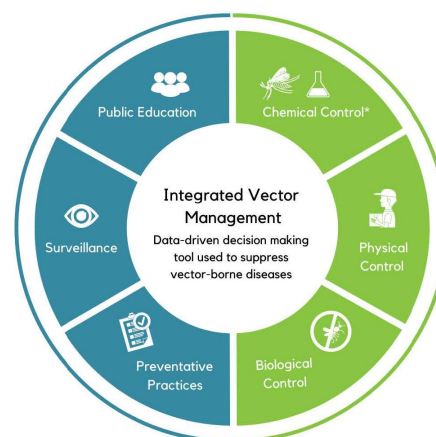
Because

- The Larva habitats are very diverse
- The larvae are also becoming resistant to the insecticides.



Integrated vector management (IVM)

Health education, environmental management and improvement, use of effective insecticides, modern vector control methods





Program of surveillance and control of Aedes Borne Disease



Such care is for today, tomorrow and the future

- The care with the *Aedes aegypti* does not have time established to finish.
- We must teach this to our children and our grandchildren and they may have to continue to transmit this knowledge to their offspring.
- Just a neglect and the mosquitoes become again very numerous.
- Moreover, in today's world, where people (healthy or sick) and objects (often containing eggs of mosquitoes, such as tires and others) travel among very distant places, it is always possible that new epidemics emerges.

