



International Journal of Engineering Sciences & Management Research

GEOGRAPHICAL DISTRIBUTION AND AREA OF AEADES

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ABSTRACT

Aedes aegypti mosquito originated in Africa, but *Aedes aegypti* is now found in Asian temperate, tropical and subtropical region including Indian Territory. *Aedes aegypti* is the vector for transmitting several diseases like Dengue fever, Chikungunya. In these respect an another information DEET treated skin repelled these mosquito although DEET does not appear to have very successful results. ^[1]

INTRODUCTION

Aedes aegypti mosquito originated in Africa, but *Aedes aegypti* is now found in Asian temperate, tropical and subtropical region including Indian Territory.

In Indian region mainly including Bihar, Uttar Pradesh, Delhi, Haryana, West Bengal, Jharkhand and others *Aedes* can spread dengue fever, Chikungunya and yellow fever viruses. In Indian region dengue spreading is just now created havoc and also more death causes.

These mosquitoes can be recognized by white line mark on its body and legs.

Related issue - Spread of diseases and preventive method-

Aedes aegypti is the vector for transmitting several diseases like Dengue fever, Chikungunya. When the female mosquito is in state of laying eggs, she needs additional nutrition and energy, for which these female mosquitoes do the work of sucking blood and in this sequence the Dengue viruses enter into human body. In these respect an another information DEET treated skin repelled these mosquito although DEET does not appear to have very successful results. ^[1]

As a separate idea, a fish called *Gambusia affiu*, also known as mosquitofish, was used to reduce the number of mosquito larvae left in the ponds to prevent mosquito population growth. *Gambusia affiu* and *Gambusia holbrooki* are considered effective in controlling the population of mosquitoes. ^{[2][3]}

REVIEW OF LITERATURE

Gambusia becomes a biocontrol which were introduced directly into ecosystem in different region of the world to reduce mosquito population. As a mosquito prevention program, *gambusia* fish were distributed among local people in some provinces of California to prevent mosquito larvae from growing in their ponds. ^[4]

Mosquito fish (*Gambusia affinis*) are tiny fishes that are natural predators of mosquito larvae. These are environmental friendly because they control mosquito population by eating larvae naturally in these conditions there are no need of any chemical insecticides. ^[5]

In 2014, *Gambusia* fish were released by the Chennai Corporation of India into more than 600 pond of the region to prevent the growing population of mosquitoes and to protect the residents of the corporation from mosquito-borne diseases. ^[6]

DATA COLLECTION

My research is based on primary data and secondary data collection.

For my primary data I had spent 21 days to the various place or vulnerable area related to dengue or mosquito spread to get vital information related to my study.

During these 21 days of research, in order to collect primary data, members of the service trust visited the respective areas and spent time with the local people as well as discussed things related to the effect of mosquitoes in the area. In the course of field visits and discussions, the trust found that mosquitoes in these areas start growing after a few days of the rains begin and cases of diseases caused by mosquitoes such as dengue, malaria, filariasis, chikungunya also increase in the area.

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The Trust, as part of its research work, tried to find out why dengue-like diseases start appearing in these rural areas more than a few weeks after the rainy season. The Trust, after its intensive study, found that during the rainy months, clear rainwater starts to accumulate on the roadside and other places in the rural areas of the district and at the same time the villagers begin to exploit the fish produced in those pits. Gradually, all kinds of small and big fish are taken out from the pits of rural areas, due to which a lot of mosquito larvae are seen in those pits in which clear rainwater is stored. And thus outbreaks of diseases caused by mosquitoes like dengue start appearing in the areas. In this context, the Trust visited the pits of those areas and found that a large number of mosquito larvae were present in these pits. For further intensive analysis on this subject, the trust obtained information from the district hospitals of the area whether the dengue patients have been admitted to the hospital from these respective areas then Trust found that yes, dengue patients came from rural areas of more blocks and panchayats from urban areas. The trust visited 16 blocks of Bhagalpur district Bihar to collect information for appropriate data and collected relevant data.

I have consulted various literature, websites and books these are the major source of my secondary data collection.

The Trust gathered information related to the development of dengue mosquito larvae in conditions of clear rainwater, as well as the following reference to the mosquito larvae being eaten by the fishes -

1. Talwar PK and Jhingran AG (1991a) Inland fishes of India and adjacent countries, volume 1. Oxford & IBH Publishing Co Pvt Ltd, New Delhi- Calcutta. 542 pp.
2. Ref ^ Wikipedia
3. Ref ^ Alameda county Mosquito abatement program
<http://www.mosquito.org>
4. Ref ^ Mosquitofish to fight mosquito breeding in Chennai, India

Based on the above references, the trust found that *Gambusia affinis* plays a very good role in reducing the number of mosquito larvae. But as far as the experiments conducted in Chennai are seen in the Indian environment, *Gambusia* could not achieve complete success in playing his role model. The trust behind this does not seem to have *Gambusia* as a Mosquito fish balanced in the context of the Indian climate and the trust is skeptical of its hundred percent results. This works more or less but does not complete the work, so a research was started on the fishes found in the areas from which the trust collected its primary data.

ANALYSIS AND DISCUSSION

During its primary data collection of Trust, it was found that the areas where dengue mosquitoes were seen to have more effect were evidence of excessive fish exploitation by local people. Therefore the Trust decided that in the same manner as fishes of the *Gambusia* species eat mosquito larvae, so are the fish in these areas that can eat mosquito larvae.

The Trust first built a 10-foot-tall, 3-foot-wide and 4-foot-deep pound in its administrative office premises. And then fresh water has been deposited in it, since most of the dengue mosquito larvae and other mosquito larvae are also produced in the collection of clear water, so the trust thought it appropriate to do so keeping this in mind.

Now the trust started to select the fish which were selected for this experiment and which are found in the respective area. In this sequence, various fish and their species were placed in the pound and it was inspected every week to see whether mosquito larvae were present in the pound or not.

During its research, the Trust found that mosquitoes of larvae were found in the pounds of fish of different species, in which case that species of fish was removed from the pound and after freeing the larvae from the pound Fishes of another species were introduced into them. In the table below, all those fish are mentioned in view of their control of mosquito larvae.

	Total no.	Class	Order	Family	Larvae Found
Heteropneustes fossilis	10	Actinopterygii	Siluriformes	Heteropneustidae	Few
Labeo rohita	10	Actinopterygii	Cypriniformes	Cyprinidae	More
Labeo catla	10	Actinopterygii	Cypriniformes	Cyprinidae	More

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Clarias batrachus	10	Actinopterygii	Siluriformes	Clariidae	More
Anabas punctata	10	Actinopterygii	Anabantiformes	Channidae	More
Anabas striata	10	Actinopterygii	Anabantiformes	Channidae	Few
Anabas testudineus	10	Actinopterygii	Anabantiformes	Anabantidae	No

During the last 2 years of research, the Trust found that the Anabas fish is completely effective in eating the larvae of mosquito-borne mosquitoes. The Trust conducted further experiments on the Anabas fish. The Trust started reducing the number of Anabas fishes out of the pond and continued to monitor the conditions for mosquito larvae to flourish. Gradually the Trust released just one Anabas fish in that whole pond so that it could be fully understood about Anabas's ability to eat and not grow larvae.

The Trust found complete success in this experiment when no single mosquito larvae were found while living in just one Anabas fish in pond. Thus the Trust observed and found that the Anabas fish is more suitable and effective than Gambusia for the complete control of mosquito larvae which was also considered suitable for the Indian environment. In this context, the survival of the Anabas fish was also included by the trust in its experiment. In this regard, during the winter season, the Anabas fish was released in the same pond for the entire season, while the temperature was recorded in the external environment up to 6 ° C. Even then the Anabas fish was found to be fully active and healthy and not a single larva was found in the pond.

Pictures



Water Tank



Anabas testudineus



Scientific Classification	
Kingdom:	Animalia
Phylum:	Chordata
Class:	Actinopterygii
Order:	Anabantiformes
Family:	Anabantidae
Genus:	Anabas
Species:	A. testudineus

Habitat and Biology

Common habitat of **A. testudineus** is ponds, canals, lakes, flooded fields and ditches. Adults occur in medium to large canals, ponds, ditches. Also found in water accumulated lowland agricultural fields. They are more efficient to tolerate extremely unfavorable water condition. They remain buried under the mud during dry season or summer.

Size- Common length: 10-13 cm TL

FINDINGS & CONCLUSION

The Trust, during its 2 years of research, found that the Anabas fish found in the Indian environment proved to be the most efficient in terms of larva control. The ability of this fish was found to be very high in larval control as well as the survival ability of this species of fish is also very high.

The trust considers Anabas testudineus fish to be much more effective and suitable than Gambusia in the Indian Territory, to reduce the outbreak of dengue and other mosquitoes and eliminate their larvae early on the findings found during 2 years of research.

REFERENCE

1. ^" *Gambusia: A little fish that helps solve big mosquito problems*" Alabama vector management society. 24 December 2009 Archived from the original on September 7, 2008 retrieved 10 June 2011.
2. <http://animaldiversity.org>
3. http://en.m.wikipedia.org/wiki/Anabas_testudineus
4. <http://youtu.be/TbxLW4Brfms>
5. http://youtu.be/U5eiiL7Mf_A
6. <http://www.mosquitoes.org>
7. ^ *Mosquitofish to fight mosquito breeding in Chennai, India*
8. www.fishbase.in