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Review article

Health research

### New ideas on mosquito control

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#### ABSTRACT

This is a story of bringing together a tiny roundworm to eat the entire family of growing mosquitoes and their children in all the bushes, near our abode.. It is a problem worrying the human race for thousands of years and has never been solved. As the Principal of a medical college, one day I invited a learned Professor of Zoology of a nearby college to discuss with me how we could initiate a research work on the control of mosquitoes with psychedelic or drug LSD added to their food in captivity. He gladly dropped in my office for this particular subject when I told him that an assistant professor of mine has successfully killed hundreds of large garden rats with molasses- balls and Magnesium sulphate ( a severe Purgative) laced with tasty cheese that killed them with severe diarrhea and dehydration. My friend heard all this story and suggested that he had a better idea than all those carried out world-wide in the past, but for want of money and helping men he never could initiate and carry out this research work. He advised me to apply to Indian Council of Medical Research for a financial grant. So we jointly prepared a scheme and sent it to Delhi, I.C.M.R., Director for a suitable grant when I was convinced that his idea was an extra-ordinary one never thought of by any one. And this I shall discuss here.

**Keywords:** Nematodes; imago, psychedelic drug; arthropods; vector; dapping, eutely, ectoparasites, Anautogenous, bio-control, Printy Grant knots, Acetyl choline-esterase,

#### INTRODUCTION

We shall select some 100 to 200 types of Nematodes(Round worms) as a liquid culture from different soils of the earth and firms which grow them(culture them) artificially to supply to colleges and institutions for teaching and experiment at a nominal cost. We spray only one of them in selected places where mosquitoes breed and lay their eggs and where they swarm on fertile grounds, or suck juices from plants. Now it is a matter of time and we capture one group of some 50 to 100 mosquitoes and keep them in each of some 25 different nets to feed them for our experiment. Total mosq.number

100x25=2500 minimum in each Session of our experiment that lasts a week. For maximum no limit. Now which Nematode to select and breed is our experiment rests with my Zoolgy professor. He asserted that he will only try to find out by experiment which tiny or microscopic nematodes (Roundworms) are to be selected from some 30,000 members that would be available to us for the future use.as spray in selected places and bushes. They must be harmless to men and other animals of the ecosystem.

## NEMATODES

The nematodes or round worms are one of the most diverse of all animal phyla. Nematode species look very similar to one another. Over 80,000 have been described, of which over 15,000 are parasitic. The body structure is fairly constant. A thick cuticle is unique.

Nematode species look very similar to one another. Over 80,000 have been described, of which over 15,000 are parasitic both big and small. DNA sequence analysis of nematodes is quite advanced, Cell numbers in the organs are constant within a species. Nematodes have a fixed, genetically determined number of cells, a phenomenon known as eutely. The male *C. elegans* has 1031 cells, a number which does not change after cell division stops at the end of the larval period. Growth is solely due to an increase in the size of individual cells. Described and the undescribed roundworms may be 500000. The male *C. elegans* has 1031 cells, a number which does not change after cell division stops at the end of the larval period. Growth is solely due to an increase in the size of individual cells. .

## MATERIALS AND METHODS

This is the most ideal path for extermination of mosquitoes when we find out the real enemies are the nematodes. Once we select out some, we grow and culture the best ones for spray.. It will automatically guide us further ahead. If we are lucky we may succeed to discover some nematodes that are CONTAGIOUS to some mosquito families meaning there by that. the mosquitoes get infected readily and that infection spreads out in to their whole family far and near. We shall collect and capture selected mosquitoes on a wire loop snare-net of 12-15 inch diameter, attached to a tube of fine mosquito net of 2-3 feet length tube. Initially we shall have 20 large size nets,, 6 feet x 3 feet, which we use at home. Here they must be protected from wind ,rain and visitors both animal and man. Feeding them with natural honey, molasses or glucose on a plate and we have to look to other things to bring in a congenial atmosphere, suitable for each species in each of the large nets of their new shelter. After a couple of days feeding the food in each net will have on their plates a drop or two of a single nematode culture of choice all microscopic and invisible mixed with the

food. Stubborn groups of mosquitoes can have a fine spray of culture over them inside the net in selected cases from outside the net to infect them by the nematode spray. We shall try to get large suction syringes held on both hands to catch flying mosquitoes into the vacuum chamber and then empty them into their house net. Such transparent plastic syringes are freely available in research. The effectiveness varies with circumstances and all dead mosquitoes will have a post mortem by a group of trained micro biologists. In a lab.

Metal poisons: Lithium salts, Barium, Mg., K, Cu, Sn, Ni, Rubidium (radio active) for marking out . the place where the hidden eggs have been laid.down unnoticed.

Mosquitoes have been around for over 30 million years. Heat sensors :- Mosquitoes can detect heat, so they can find warm-blooded mammals and birds very easily once they get close enough. mosquito bites ,mosquito repellent. mosquito life cycle. mosquito control, mosquito trap with a large transparent suction syringes and mosquito bites with a bleb is our business.

My Zoology professor asserted that he will only try to find out by experiment which tiny nematodes (Roundworms) are to be selected from some large members that would be available to us for the future use as spray in selected places and bushes. They must be harmless to men and other animals of the ecosystem. We shall have 20-30 large size nets which we use at home. Here they must be protected from wind ,rain and visitors both animal and men. Feeding them with natural honey, molasses or glucose on a plate and we have to look to other things to bring in a congenial atmosphere, suitable for each species in each of the large nets of their new home waiting to be infected by by a single species of nematodes. Feed some with blood. Mosquitoes are a family of small, midget like flies: the Culicidae. Although a few species are harmless, the females of most species are ectoparasites whose tube-like mouth parts pierce the hosts' skin to suck the blood. Thousands of species feed on the blood of various kinds of hosts, mainly vertebrates, including mammals, birds, reptiles, amphibians, and even some kinds of fish. Some mosquitoes also attack invertebrates, mainly arthropods. Many species of mosquitoes are vectors of diseases. In passing from host to host, some of them transmit extremely

harmful infections such as malaria, yellow fever, and filariasis . etc.

Over 3,5000 species of mosquitoes have been described from various parts of the world. Some mosquitoes that bite humans act as vectors for a number of infectious diseases affecting millions of people per year. Others that do not routinely bite humans, but are the vectors for animal diseases, may become disastrous agents for zoonosis of new diseases when their habitats are disturbed, for instance by sudden deforestation. Many scientists have suggested that complete eradication of mosquitoes would not have serious ecological consequences

Like all flies, mosquitoes go through four stages in their lifecycles: egg, larva, pupa, and adult or imago. In most species, adult females lay their eggs in stagnant water; adaptations. Some are generalists and are not very fussy. Some breed in marshes, some in salt-marshes. Among those that breed in salt water, some are equally at home in fresh and salt water. *Aedes* that transmit dengue and yellow fever. Some with such breeding habits are disproportionately important vectors because they are well-placed to pick up pathogens from humans and pass them on. In contrast the first three stages—egg, larva, and pupa—are largely aquatic. These stages typically last five to 14 days. Eggs hatch to become larvae, which grow until they are able to change Like all flies, mosquitoes go through four stages in their lifecycles: egg, larva, pupa, and adult or imago. In most species, adult females lay their eggs in stagnant water; adaptations. Some are generalists and are not very fussy. Some breed in marshes, some in salt-marshes. Among those that breed in salt water, some are equally at home in fresh and salt water. *Aedes* that transmit dengue and yellow fever. Some with such breeding habits are disproportionately important vectors because they are well-placed to pick up pathogens from humans and pass them on. In contrast the first three stages—egg, larva, and pupa—are largely aquatic. These stages typically last five to 14 days. Eggs hatch to become into pupae.

Eggs raft of a *Culex* species, partly shows individual egg shapes when examined carefully. Some other species, habits of oviposition, the ways in which they lay their eggs, vary considerably in species, and the morphologies of the eggs vary accordingly. The simplest procedure is that followed by many species

of *Anopheles*; like many other gracile species of aquatic insects, females just fly over the water, bobbing up and down to the water surface and dropping eggs more or less singly. The bobbing behavior occurs among some other aquatic insects as well, for example in many flies and dragon flies; it is sometimes called "dapping". The eggs of *Anopheles* species are roughly cigar-shaped and floats down their sides. Females of many common species can lay 100–200 eggs during the course of the adult phase of their lifecycles. Even with high egg and mortality, over a period of several weeks, a single successful breeding pair can create a population of thousands, for example members of the genus *Mansonia*, lay their eggs in arrays, attached usually to the under-surfaces of waterlily pads. Their clo Eggs and ovipositiosquito habits of oviposition, the ways in which they lay their eggs, vary considerably in species, and the morphologies of the eggs vary accordingly. The simplest procedure is that followed by many species of *Anopheles*; like many other gracile species of aquatic insects, females just fly over the water, bobbing up and down to the water surface and dropping eggs more or less singly. The bobbing behavior occurs among some other aquatic insects as well, for example many flies and dragon flies; it is sometimes called "dapping". Some other species, for example members of the genus *Mansoniase* relatives, the genus *Coquillettidia*, lay their eggs similarly, but not attached to plants. Instead, the eggs form layers called "rafts" that float on the water. This is a common mode of oviposition, and most species of *Culex* are known for the habit, which also occurs in some other genera, such as *Culiseta* and *Uranotaenia*. *Anopheles* eggs may on occasion cluster together

Feeding by adults :--The mosquito has a variety of ways of finding their prey, including chemical, visual, and heat sensors but in many species the mouth parts of the females are adapted for piercing the skin of animal hosts and sucking their blood as ectoparasites. In many species, the female needs to obtain nutrients from a blood meal before she can produce eggs, whereas in many other species, she can produce more eggs after a blood meal. The feeding preferences of mosquitoes include those with type O blood, heavy breathers, those with a lot of skin bacteria, people with a lot of body heat, and the pregnant. Both plant materials and blood are useful

sources of energy in the form of sugars, and blood also supplies more concentrated nutrients, such as lipids, but the most important function of blood meals is to obtain proteins as materials for egg production. Anautogenous; they do not need a blood meal for their first cycle of egg production, which they produce autogenously;

### **Mosquito control**

Many methods are used for mosquito control. Depending on the situation, the most important usually include:source reduction (e.g., removing stagnant water)biocontrol (e.g. importing natural predators such as dragonflies).----trapping, and/or insecticides to kill larvae or adults----exclusion (mosquito nets and window screening).---- Anautogenous; they do not need a blood meal for their first cycle of egg production, which they produce autogenously;

*Gambusia affinis* (Mosquito fish), a natural mosquito predator. Biological control or "biocontrol" is the use of *Gambusia affinis* f natural enemies to manage mosquito populations. There are several types of biological control including the direct introduction of parasites, pathogens and predators to target mosquitoes. With regard to host location, female mosquitoes hunt

*Gambusia affinis* (Mosquito fish), hunt their host blood by detecting organic substances such as carbon dioxide (CO<sub>2</sub>) and 1-octen-3-ol produced from the host, and through optical recognition. Mosquitoes prefer some people over others. The preferred victim's sweat simply smells better than others because of the proportions of the carbon dioxide, octenol and other compounds that make up body odor. The most powerful semiochemical that triggers the keen sense of smell of *Culex quinquefasciatus* is nonanal Another compound identified in human blood that attracts mosquitoes is sulcatone or 6-methyl-5-hepten-2-one, especially for *Aedes aegypti* mosquitoes with the odor receptor gene Or4.The bump left on the victim's skin after a mosquito bites is called a wheal, which is caused by histamines trying to fight off the protein left by the attacking insect.Two species of fungi can kill adult mosquitoes: *Metarhizium anisopliae* and *Beauveria bassiana*. as can nematodes.Metal poisons: Lithium salts, Barium,Mg.,K, Cu, Sn, Ni, Rubidium (radio active) )for egg marking, etc. My Zoolgy professor

asserted that he will only try to find out by experiment which tiny nematodes (Roundworms) are to be selected from members. that would be available to us for the future

If we are lucky we may discover some that are CONTAGIOUS to mosquitoes of our choice then we shall reach our goal in a very short time," is all he said. "We shall collect selected species on a wire loop of 12-15 inch diameter and attached to a tube of fine mosquito net of 2-3 feet length tube. Initially we shall have 20 large size nets which we use at home. Here they must be protected from wind ,rain and visitors both animal and man. Feeding them with natural honey, molasses or glucose on a plate and we have to look to other things to bring in a congenial atmosphere, suitable for each species in each of the 25-30 large nets of their new shelter. The selected ones will be starved initially for a few hours each in their own ways. We shall consult Bayer who discovered the famous 'Tugon bait' in 1962. We have to collect suitable cultures with an appeal world wide", as he ended. Later I also thought of requesting similar and allied organizations through the govt. These will come up later after we start an initial job on our scheme chart prepared by us for the ICMR (Indian Council of Medical Research) Chief at Delhi. When I proceeded to Delhi to attend the Indian Medical Council as a member in 1981, I went also to meet the chief of ICMR for a talk, as my papers had already reached him a month earlier. He stood firm on this matter saying, "The head of the institution and the top surgeon must not play with ugly insects and so on. He assured me he would write a letter very soon. It seemed to me he wanted research on Diamond and Gold.

Some estimated that the total number of described may be 500000.

The World Health Organization (WHO) is a specialized agency of the United Nations... Since its creation, it has played a leading role in the eradication of smallpox .The Role of the World Health Organization in the ... - Chatham House.The Role of the World. Health Organization in the International. System. Charles Clift. February 2013. Chatham House, 10 St James's Square, London SW1Y.

The role of WHO in public health WHO fulfils its objectives through its core functions:providing

leadership on matters critical to health and engaging in partnerships where joint action is needed;

You might enjoy reading Malaria likes warm temperatures Where are the ways to combat malaria, filaria etc. in different schemes? Just go on repeating, "Kill all larva in stagnant water and old car tyres. That never helped. Human beings serve as intermediate hosts to the pathogen, a parasite of the genus Plasmodium. The final host is the mosquito. After the infected mosquito bites, the pathogen moves to the liver of its human host. In this first stage, it matures and multiplies there before spreading throughout the bloodstream and ultimately attaching to the receptor molecules of red blood cells. After further growth, it triggers the periodic fever typical of malaria from within the blood of the human host. The cycle of this fever is 48 to 72 hours in duration, depending on which type of pathogen is involved.

Some of the pathogens develop further into their primary sexual form, the gametocytes. If a mosquito then bites the infected person again, it takes up these gametocytes, which mature into new pathogens inside the mosquito and are soon ready to spread new infection through its saliva. A minimum temperature of 15 degrees Celsius is required for the cycle inside the mosquito, which is why malaria primarily occurs in tropical areas of South America and Asia as well as Africa. Malaria kills a child every minute in Africa. New medicines are urgently needed. Over the last 100 years, the most effective way to fight malaria has proven to be "vector control", i.e., fighting the pathogens on a large scale with insecticides, as well as personal protection against mosquitoes. At the therapeutic level, combination drugs with artemisinin, which is obtained from the Chinese plant *Artemisia annua*, are the most effective treatment. The biggest problem here, however, is the emergence of resistance to artemisinin and related active ingredients. Reports of such resistance are now becoming increasingly common for Southeast Asia, which is putting the World Health Organization (WHO) on alert.

The malaria parasite: extremely agile and quick to react.

## DISCUSSION

It is therefore all the more important to pursue new research and create new compound portfolios, such

as the one being developed by the non-profit organization Medicines for Malaria Venture (MMV) with the support of Merck Serono. MMV sees its primary objective as discovering, developing, and making available new treatments for malaria, and also medicines to protect vulnerable populations, particularly small children and expectant mothers. The ultimate aim is to support the eradication of the disease. "The malaria parasite is extremely agile and reacts very quickly to new active ingredients," says Beatrice Greco, who is the Head of Malaria & Diagnostics in the recently created Research & Development department dedicated to Tropical diseases at Merck Serono. A range of different drugs that act in different ways are needed to fight Malaria. Furthermore, combination therapies are highly recommended by the WHO. "So collaborations between organizations is essential to create the necessary variety of drugs." The main component of the cooperation between Merck Serono and MMV is, initially, a chemical series that caught the attention of researchers at Merck Serono during the screening of its library. "These synthetic molecules harbors enormous potential as a malaria drug, because they are especially suitable for use as a long-term active ingredient," says Beatrice Greco. "At an early stage in the research, we approached MMV with it and asked them whether they would be interested in a partnership, and whether we should join together to make this project a success." Merck Serono team estimate that this could be done in just three years. New exciting experimental medicine models developed in Australia enable testing in volunteers with an extremely low level, sub-clinical infection. As well as being faster, it's a way of rapidly testing on people who are completely naïve from an immune perspective: knowing that the final patients, African children, also have no immune protection. Although the research on the molecule is still at an early stage, the partners Merck Serono and MMV are both enthusiastic. "We are still in an early stage, but the program was launched with great energy and has been eagerly welcomed — including by the scientific advisory committee of MMV, to which we have presented the project twice now," says Beatrice Greco. Pre cooperation with MMV is one of a series of projects that marks the successful launch of a new form of organization, the external Translational Innovation Platform (eTIP) Global Health.

Interdisciplinary approaches involving different divisions of the company — such as Merck Millipore with its developments in diagnostics, or the research groups involved in the insect repellent IR3535 — are opening new doors in the fight against tropical diseases such as malaria or filarial schistosomiasis. "We have experts that we can rely on in every field that is needed," says Jutta Reinhard-Rupp, Head of eTIP Global Health. "When it comes to fighting resistances, you have to cover all the bases. You need insect repellents as well as diagnostics and combined drug therapies. Offering the right treatment for the right patient and against the right pathogen - that is one of the big jobs we have taken on."The malaria parasite: extremely agile and quick to react Malaria occurs mainly in the tropical regions of South America, Asia and Africa — as well as here in Benines.

In the year 1970 I had to operate on many emergency patients day and night when one day a hoard of mosquitoes entered my operation theatre and just sat down on my hand and blood soaked incision wound drinking blood voraciously, and preventing me from tying Printy Grant knots with an eyeless needle. They had all entered the O.T. through some small slit hole

near the joint of glass panel never noticed earlier. Which chemical in blood smells and invites them ? We have named them earlier. A gust of air from a table fan at last came to our help and drove them out. Instead of using foul smelling materials we must learn some thing more from Bayer's past achievements. They will select out the CONTAGIOUS form of Nematode that will exterminate the the entire race of mosquitoes from earth. They have the expertice and the right move within their ambit. We can collect a few buckets of pure blood from the slaughter house, add some chemicals that blocks the vital enzymes of the particular mosquito and spray it over all unused trees and plants nearby to stay on as potent killer for 7-15 days to feed our enemies for weeks. How to map vital enzymes of a mosquito that keeps it fit ?. We shall also try to paralyze its wing muscle which we tried earlier with a detergent mixed wth some oil for spray from the top of a building. By bubbling through tiny globules of hydrogen gas so that they float about for hours to catch the wings one might trap them. Merck and Bayer can identify and isolate the enzymes that help their wings to flap at more than 300 times per second.

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