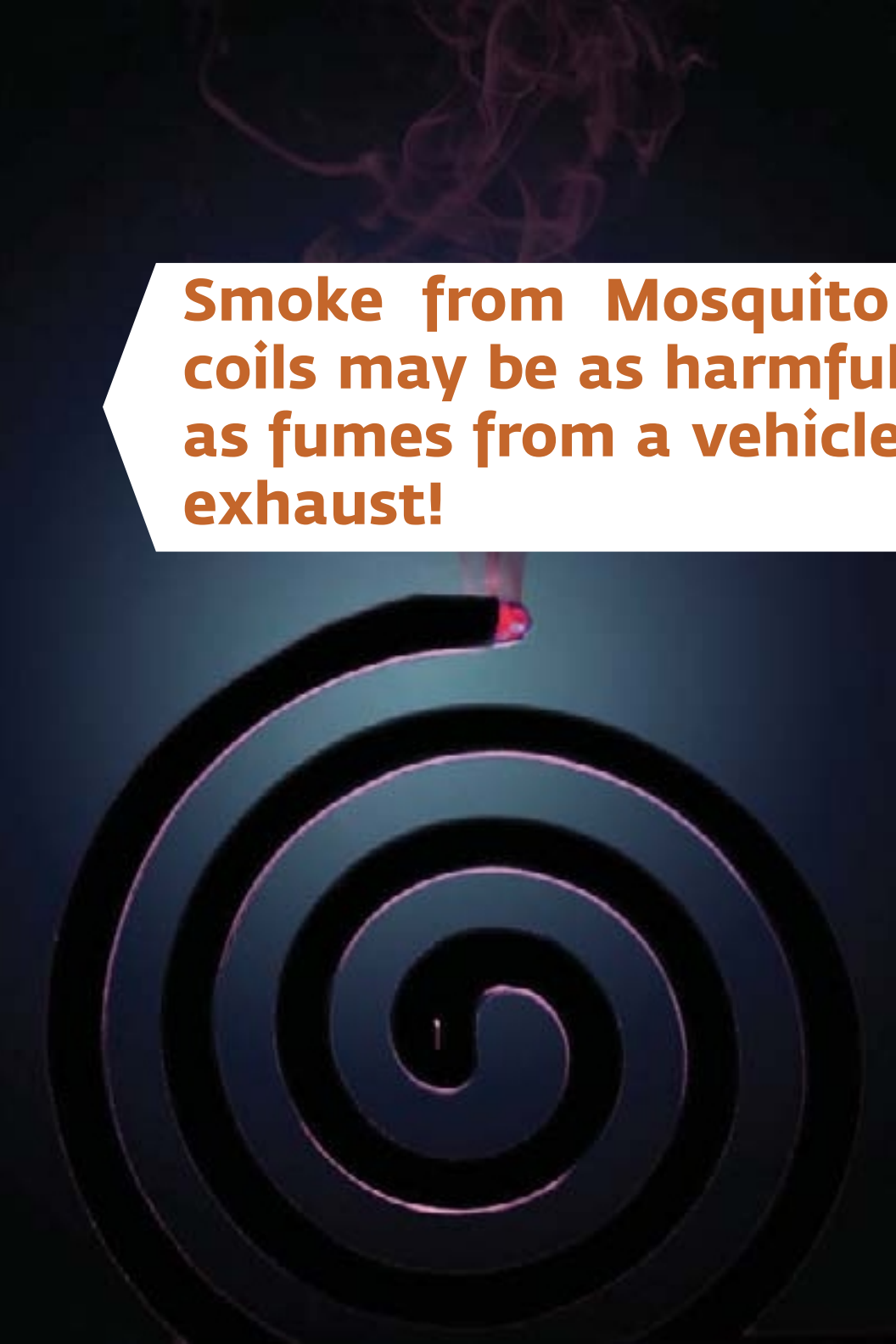
Smoke from Mosquito coils may be as harmful as fumes from a vehicle exhaust!



*Scientists say that fine particulate matter found in the smoke from mosquito coils may not be very different from the particulate matter in automobile exhaust. Epidemiologists say the smoke from one coil has as much particulate matter as the smoke from 100 cigarettes.**

Scientists from NIE (National Institute of Epidemiology)say that they conducted a preliminary study on the use of household pesticides and found that 96% of households use at least one of these pesticides. Of these 75% used mosquito coils and nearly 59% of them used coils daily. They propose doing a study on use of mosquito coils and the release of particulate matter.

One important fact that came to light is that customers do not use coils as instructed on the pack. Though the directions clearly mention all doors and windows should not be closed, 60% of people surveyed used coils in closed rooms and alarmingly several of them kept the coils close to the children.

Extract from an article in TOI dated 27the June 2012

Mosquitoes top the list of pests and are the most dreaded!!. Pests like termites, bed bugs, cockroaches can be controlled and kept at bay for at least a given period of time. But the fight with the mosquitoes seems endless. In spite of all technical advancement we are nowhere near curbing this menace. Instead we try to take cover by masking oneself, by using repellent creams and so on.

The mosquitoes have honed their hunting skills and we have not been quite successful in this attempt. They use chemical, visual and heat sensors to locate their prey. They use their chemical sensors to detect carbon dioxide and lactic acid from up to 100 feet away. Certain chemicals in sweat can also trigger their sensors. Their visual sensors aren't very sharp, but they can see you moving if you are wearing clothing that contrasts the background. They use their heat sensors to detect warm-blooded mammals and birds in their vicinity, so they can always locate humans when they are near enough to sense body heat.

There are apparently 2,700 species of mosquitoes with the majority belonging to 3 major genera: aedes (eggs are laid in floodwater areas), anopheles (eggs are laid in permanent fresh water) and culex (eggs are laid in quiet, standing water). In terms of development, all mosquitoes start as eggs and then go through life as larva, pupa and then the adult when they become human tormentors.

One small behavioural shift in mosquitoes can indeed endear them to man*!!!*

If the mosquitoes sucked fat from our body instead of blood they would be reared with great care, we would have mosquito filled jackets, trousers and belts which when worn would enable them to suck all fat from the various parts of our body. In which case, I am sure such robes would be priceless possessions. Unfortunately mosquitoes suck blood and spread all kinds of diseases and of course, disturb us from our good night's sleep.

Major diseases that can be caused by a mosquito bite are Malaria, Yellow Fever, Encephalitis and Dengue Fever.

The human immunodeficiency virus *(HIV)* that causes AIDS cannot survive in a mosquito, and therefore cannot be transmitted from one person to another through mosquito bites.

How can we control or repel these mosquitoes?

The best way to reduce mosquito borne diseases *(*and to have peaceful sleep*)* is through mosquito control and personal protection.

It is best to exterminate the pests which is more easily said than done - after all we have been battling these pests for thousands of years. But there are a few things we can do. The mosquitoes need stagnant water to lay eggs in. We can reduce the breeding ground by eliminating the stagnant water or adding special chemicals to the standing water to kill the eggs and larvae.

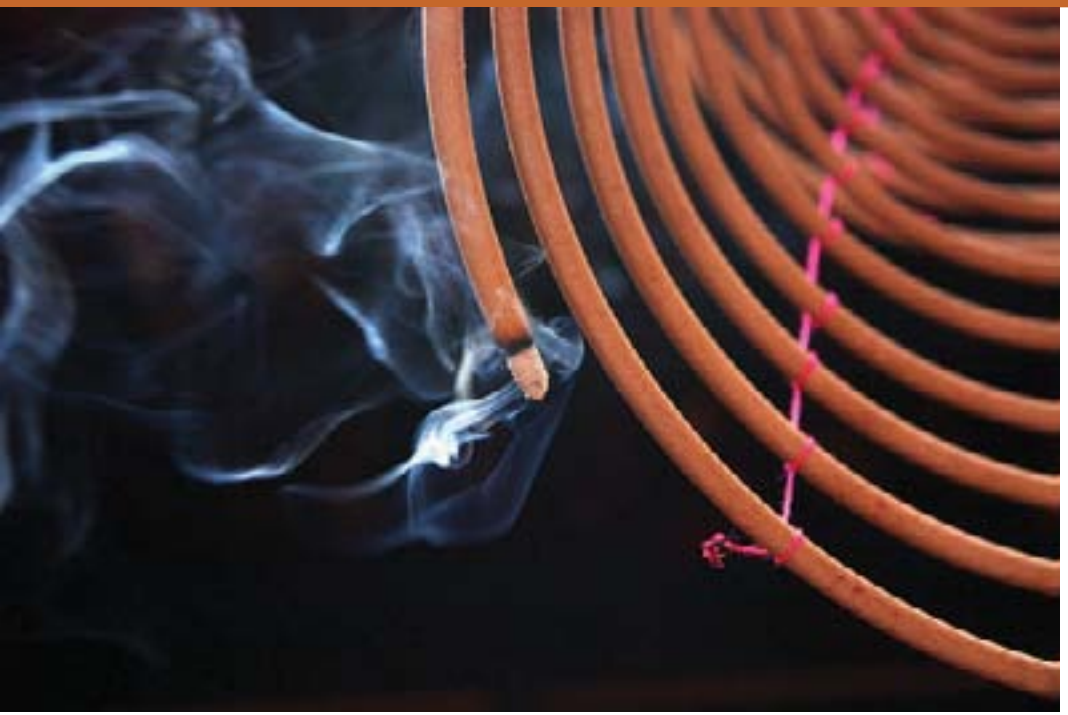
Personal protection is the next. There are many methods - physical, chemical, electrical. Each has their benefits and limitations.

- Physical*:* One is swatting the mosquito. Second is to electrocute them by the electric bat which is so popular these days. The crackling noise is music and it may kill mosquitoes too. But it will certainly improve your back hand*!*
- Electrical*:* some gadgets are available which like the fly-zapper, has the ultra violet light luring the insects. There are also ultra-sonic sound generators which are supposed to confuse the mosquitoes.
- Chemical*:* These are chemical insecticides; application is either as a spray; as smoke or odour less vapour which repels mosquitoes.
- Repellent creams*:* There are creams and gels with safe-on-humans chemicals. You apply these on the body; the smell of confuses the mosquitoes and makes you invisible to them.

When applying any repellent, follow directions. Use your hands to apply it to your face, avoiding your eyes and mouth, and don't apply it on cuts. Use just enough to cover exposed skin. For extra protection, wear light-coloured, loose clothes and avoid using scented products when outdoors, especially at peak feeding hours—dusk to dawn for most mosquitoes.

COMPARATIVE TESTING

Comparative Testing is a formal process by which different brands of a product category are tested for Quality, for conformance to the minimum standards laid down by Bureau of Indian Standards. Such a test also reveals if a particular tested brand exceeds such minimum standards, whether there can be potential health and safety hazards even under not-normal usage of the product and verification of special claims by manufacturers, if any. The results for all the tested brands are published in a Comparative Test Report which would provide consumers information to make an informed choice.



CONCERT has undertaken this project of Comparative Testing for Southern Region under a grant from Department of Consumer Affairs, Government of India. In the first year, Concert will be testing 7 products and 3 services. One of the products selected for testing is the Mosquito coils and mats.

Mosquito Coils

Mosquito Coils are a form of mosquito-repelling incense, usually shaped into a spiral, and typically made from a dried pyrethrum (a flower). The chemical pyrethrin is an insecticide. In recent years another chemical, d-Allethrin is also being used. The coil is usually held at the centre of the spiral suspending it in the air to allow continuous smouldering, producing a mosquito repellent smoke. A typical mosquito coil can measure up to 15 cms in diameter or more and can last from 8 hrs to 10 or 12 hrs. The advantages are that the coils need no power supply; therefore highly preferred in rural areas, areas with frequent power shedding, by pavement dwellers, construction workers. They are cheap and need no special equipment. They are portable and fit into normal household practices of lighting candles and incense. The disadvantages are that the smoke that emanates might cause allergy by burning of these coils. Keeping the windows partially open however, drives the smoke away. Now-a-days no smoke or less smoke emitting coils are also being manufactured and marketed.

Electric Vaporizing Mats

Electric vaporizing mats have become increasingly popular since the early 1980s and consist of a mat heater and a vaporizing mat. The mat is made from fibreboard impregnated with insecticides, stabilizers, slow-releasing agents, perfumes, and colouring agent. The heater is plugged into an ordinary household electric socket and heats up to an optimum temperature of 110° C, depending upon the type of heater and accompanying mats.

When the mat is heated, insecticide vapour is released to provide a low aerial concentration of insecticide. This induces behavioural change in the flying mosquitoes through a sequence of sub-lethal effects including deterring them in entering the room, bite inhibition, and knock down. Continued exposure results in the death of the insect.

The size of the mat is compatible with the associated brand of heater for easy insertion and removal. The advantage of using mats over coils is that there is no unpleasant smoke. The disadvantages are that electricity is required and replacement of mats are, generally, more expensive than coils.

As the power shortages, power cuts and load shedding will be in existence for another few years to come, the demand for Mosquito Coils is bound to increase in the days to come.

The usage of Mosquito Mats instead of Mosquito Coils necessitates the investment in the Mosquito Destroyer Machine (MDM) which is a costly item for low income groups. Therefore in rural areas and low income households, mosquito coils are preferred.

BRANDS CHOSEN FOR TESTING

Coils:

1. Good Knight Maha Jumbo Coil
2. GoodLuck Gold Maha Jumbo Coil
3. Maxo - A Grade Coil
4. All Out Low Smoke Coil
5. Mortein Power Gard Coil

Mats:

1. Good Knight
2. Mortein Power Gard

3. Banish

4. All Out High Power

PARAMETERS TESTED

PACKAGING AND LABELLING

A complete label should contain the following information. Available information was verified and scored.

- Name of the Material
- Listing of the ingredients
- Name and Address of the Manufacturer
- Manufacturer's Licence Number
- Number of Coil/Mats
- Batch Number
- Date of Manufacturing
- Date of Expiry
- Instructions for use
- Standard mark - Insecticide triangle with appropriate colour code
- Cautionary Notice as worded in Insecticide Act 1968 and Rules

QUALITY for coils

- Burn Quality -

The Burn time and burn rate were ascertained and scored. This gives an indication of the period for which the coil will be effective in keeping the mosquitoes away.

- Active Ingredient –

Allethrine/Prallethrin content and concentration was checked.

- Tensile Strength-

Tensile strength/Elasticity is measured by Push-Pull meter and is measured in grams .It should not be less than 100gm and not more than 200gm

- Ease of separating the coils

Coils must be easily separable without breakage

- Weight

Weight of Double Coil – should not be less than 25 gm for 8 hrs burning time,

30 gm for 10 hrs, 36 gm for 12 hrs Jumbo coils

- Length of Coil

QUALITY of Mats

- Active ingredient Allethrine/ Pralletherin content
- Evaporation Time

This gives an indication of the period for which the mat will be effective in keeping the mosquitoes away.

- Physical Description and Dimensions Size of Mat *(* Mat size is 35mm x 22 mm, 2.6 mm thick*)*

EFFICACY /PERFORMANCE

Bio-Efficacy Test in Room Chamber

Bio-efficacy studies for the coils and mats were conducted in 30 cubic meter chamber at temperature of 26 to 29 C with relative humidity of 62-79% for coils and at a temperature of 25 to 30 C with a relative humidity of 60 -80% for mats.

The studies were conducted against susceptible laboratory bred mosquitoes of three species namely- Aedes aegypti, Culex quinquefasciatus and Anopheles stephensi at two time points. Mosquitoes were exposed to coils/mats between 0-2 hours for the first time interval and between 4-6 hours for the second time interval. Knock-down times were recorded during these intervals and translated into KT50 and KT90 values by regression analysis. Percentage mortality of mosquitoes was recorded after 24 hours.

PRICE – MAXIMUM RETAIL PRICE.

This was not considered for rating the product.

Scoring and Rating Method

Three Major Criteria against which mosquito coils and mats were rated were Packaging and Labelling, Quality and Efficacy.

Every test parameter was evaluated/ tested, and scored. These were then added to give the scoring to the criterion.

Each criterion and parameter has been rated individually on a 5 point scale. The rating given is 1 *(*Poor*)*, 2 *(*Fair*)*, 3 *(*Good*)*, 4 *(*Very Good*)*, and 5 *(*Excellent*)*.

- Any parameter, which in our tests meets the defined standards, will be given the scoring of Good.
- When it exceeds the minimum standards substantially, it will be rated Very Good.
- When it exceeds the standards significantly and shows appreciable innovation, it will be rated Excellent.
- In case it fails to meet the standard it will be rated Fair or Poor based on the extent of deviation from the standard.

We present the results against these major criteria, which in our opinion is fair, and without any subjective element. The user is encouraged to study these results and make his buying decisions based on his requirements and judgment.

Rating Tables
Mosquito Coil

Brand name	Packaging and Labeling	Quality	BioEfficacy/ Performance	MRP (in Rs)
Goodknight Maha Jumbo	Good	Fair	Very Good	27
Mortein Powergard	Good	Fair	Good	26
Maxo "A" Grade	Good	Good	Good	26
Goodluck Gold Maha Jumbo	Good	Good	Good	25
All out Low Smoke	Good	Very Good	Fair	20.25

Mosquito Mat

Brand name	Packaging and Labeling	Quality	BioEfficacy/ Performance	MRP (in Rs)
Goodknight Mat	Good	Good	Fair	36 (10 mat+ machine)
All out High power mat	Good	Good	Very Good	45
Mortein powergard	Good	Good	Good	45
Banish	Good	Good	Good	36

COMPARATIVE TEST TEAM

Trustee in charge of project	Mr. S. Ramani
Program Manager	Mr. M. Mohan
Report compiled by Consultant Editor	Ms. S. Srirpriya
Edited by	Ms. Nirmala Desikan
Special supplement designed by	Mr. S. Baskar Rao, Webmoksha