



Rural buyers' perception about mosquito repellants

*Percepția cumpărătorilor rurali față de insectifugii
contra țânțarilor*

Reader D. MEHTA, Ph.D.

FMS Pt. JNIBM, Vikram University, Ujjain (M.P.), India
e-mail: mehtadnm007@rediffmail.com

Anand GARG

Canara Bank, Ahemdabad (Gujarat), India
e-mail: garg1963@gmail.com

Naveen K. MEHTA, Ph.D.

The Institute of Chartered Accountants of India, New Delhi, India
e-mail: drnknmehta73@gmail.com

Abstract

Mosquito repellants prevent mosquito bites and prevention of "man-mosquito contact" is a critical factor in transmission and spread of any disease through mosquitoes particularly in rural area. There has been a long standing 'bias' towards rural buyers. The rural markets are considered rigid in the nature but it is not the case in real sense. Marketing to rural buyers is not only a challenge to the marketers but to the manufacturers, communicators, national planners and economists as well. That is why it has been necessary to understand the various aspects of selected rural areas and consumption pattern for such a fast growing market i.e. mosquito repellants and rural buyers' perception towards such urban products. The present paper aims to find out the factors influencing the purchase decisions of rural buyers for mosquito repellants and to study the perceptions of present and potential rural buyers' of selected mosquito repellent brands.

Keywords: *mosquito, repellent, malaria, rural market, buyers*

Rezumat

Insectifugii contra țânțarilor previn înțepăturile de țânțar, iar prevenirea "contactului om-țânțar" este un factor critic în transmiterea și răspândirea bolilor prin țânțari, în special în mediul rural. A existat o "prejudecată" de lungă durată față de cumpărătorii rurali. Piețele rurale sunt considerate de natură rigidă, dar nu este cazul în sens real. Marketingul pentru cumpărătorii rurali nu este numai o provocare pentru specialiștii în marketing, ci și pentru producători, pentru specialiștii în comunicare, planificatorii naționali și economiști, de asemenea. De aceea a fost necesar înțelegerea atât a diferitelor aspecte ale unor zone rurale cât și a modelului de consum pentru o astfel de piață în creștere rapidă pentru produsele contra țânțarilor și percepția cumpărătorilor rurali față de astfel de produse urbane. Lucrarea de față își propune să determine factorii care influențează deciziile de cumpărare a produselor contra țânțarilor de către cumpărătorii rurali și să studieze percepția cumpărătorilor rurali actuali și potențiali față de anumite branduri de insectifugi contra țânțarilor.

Cuvinte-cheie: *fântar, insectifug, malarie, piața rurală, cumpărători*

JEL Classification: M10, M30, M31, M37

Introduction

Study of rural buyers' perception is significant for a country like India as majority of our population resides in villages. The buying patterns of rural buyers, problems of classifying rural buyers on their income patterns, uses patterns and language patterns offers great challenges to market researchers. There are various peculiarities of the rural buyers which must be considered before devising marketing strategies to penetrate the rural market.

Now a days rural marketing and rural buyers are definitely gaining importance. Not only indigenous company are concentrating their marketing activities in rural markets (which have been neglected so far) but MNCs (Colgate, Palmolive etc.) have penetrated in the remote rural Indian villages. Due to fast socio-economic changes and huge market, rural buyer has become very important. There has been definitely up gradation in rural villagers' standard of living. The Indian market is undergoing vast changes especially after economic reforms of 1990. The Indian rural market has grown in following ways: (i) size; (ii) range; (iii) sophistication; (iv) agricultural changes; (v) technological changes.

Undoubtedly, Indian rural market remained backward till recently and considered as sluggish but now the wind of change is blowing. Transforming the rural market incomes are increasing, literacy level is going up, transport and communication facilities are improving, credit facilities are substantially increasing. These all indicators indicate that the demand is on the rise for urban goods in rural markets i.e. products like mosquito Repellants, mats, coils are being purchased.

Marketers in rural India are facing many challenges such as: (i) scattered location of villages; (ii) heterogeneous market; (iii) seasonal demand dependence on agricultural diversity; (iv) erratic transportation; (v) low literacy; (vi) improper warehousing and lack of communication facilities; (vii) lack of awareness towards healthcare and hygienic environmental benefits.

Review of Literature

According to a study conducted by Nasci et al.(1995), Belton (1981), Curtis and White (1982) and Foster and Lutes (1985), it is revealed that in most urban and rural areas of the country, mosquito populations are menacing throughout the year, except for some attenuation during summer and winter. Mosquitoes transmit diseases such as malaria, filariasis and many viral diseases

such as the Japanese encephalitis, dengue hemorrhagic fever, yellow fever (in Africa) etc. Mosquito coils containing DDT and other organ phosphorus compounds were not effective in repelling mosquitoes. Buzzers and electrocuting devices are also useless, just as mosquito repellents. Currently Cheng *et al.* (1992) highlighted male ICR mice to mosquito coil smoke with *d*-allethrin and reported histo-pathological lesions, including the loss of cilia and an increase in vascularity of the alveolar wall. Liu and Sun (1998) disclosed that mosquito coils also contain aromatic and aliphatic hydrocarbons, which are combustion products of wood dust, fillers and dyes in the mats. Menon and Halarnker (1998) cautioned and highlighted that: Repellents – the Danger Within. There could be danger from mosquito-repelling creams, mats, oils and lotions. The principal class of chemicals they use pyrethrums, could lead to running nose and wheezing, prolonged use could lead to corneal damage, asthma and liver damage, foreign studies warn. Indian ENT surgeons are now reporting similar symptoms in their patients. Not surprising, given our mosquito-ridden cities. Sharma (2001) stated that the Industrial Toxicological Research Institute, Lucknow recorded serious health consequences of the use of repellents. Different brands of Electronic Mosquito Repellents have been examined for their efficacy under laboratory conditions, none of which showed any effects for the devices tested (Singleton 1977; Curtis and White 1982; Iglisch 1983; Foster 1985; Jensen et al. 2000; Andrade and Bueno 2001; Cabrini and Andrade 2006).

Mosquito Repellent Market in India

The Mosquito Repellents market is valued at Rs 1600 crores and is increasing at the compounded annual growth rate (CAGR) of 15%. This segment is characterized by low competition and high consumption. As people are conscious of the diseases (like yellow fever, dengue hemorrhagic fever, and many forms of encephalitis) caused by mosquitoes, the demand will keep on increasing, which is a positive sign for the manufacturers, entrants as well as the existing players. Liquid electronic Repellants, coils, mats and creams are proving to be fast movers, particularly in the rural market. Leading brands in the market include:

- i) Reckitt Coleman's Mortein,
- ii) Jyothy Lab's Maxo, Jet Jumbo Mat
- iii) Godrej's Jet Jumbo Mat, Good Night,
- iv) Godrej Sara Lee Ltd's Hit Champion
- v) Karamchand Appliances Pvt. Ltd's All Out (Brought out by SC Johnson.).
- vi) Bombay Chemicals Ltd's Tortoise Brand of coils
- vii) Godrej Sara Lee Ltd's Electronic Mosquito Destroyer machines
 - a. Good Night Classic
 - b. Good Night Supreme
- viii) GSSL's Thermister Pills developed by Siemens

Research Design

A research design is a framework for collection & analysis of data, basically there are three basic research designs viz.:

- i) Exploratory
- ii) Descriptive
- iii) Experimental Research Design.

The research is descriptive in nature since it is probably for the first time that any survey has been conducted in selected rural areas of Ujjain to study rural buyers' perception towards mosquito repellants. It lays emphasis on the discovery of ideas and insights, which may be helpful in formulating hypothesis for further research.

Data Collection Method

Data collection method can be majorly divided into two categories viz. - Primary Data - Secondary Data. Primary data has been collected from the rural buyers' purchasing different brands of mosquito repellants - coils, mats, refills, lotions, liquids/machines. Primary data has been collected through survey method. The researcher has used a structured questionnaire keeping in mind the objectives of the study as well as the background of the respondents. Secondary data has been collected from the newspapers, economic and business journals and various journals related to insecticides/mosquito repellent industries.

Research Framework

Sampling Method: The sampling method in the undertaken study is combination of convenience & judgmental sampling through which researcher has selected most accessible rural population members which were considered appropriate prospects for accurate information.

Sampling Unit: Drawn from 05 rural areas of Ujjain belonging to middle class & lower class i.e. small farmers, petty traders, unskilled workers and other sections of selected rural areas.

Sample Size: 100 respondents from 05 rural areas.

Methodology:

During the survey initially 150 questionnaires were distributed and 121 were returned. Remaining 29 questionnaires were not returned by the targeted rural buyers. Out of 121 returned questionnaires, 103 were filled up completely and properly. Hence to have uniformity in sample only 100 were questionnaires were retrieved for final analysis - selecting 20 each from five rural areas.

Data Analysis and Interpretation

After collecting the data from the respondents an analysis of the data was carried out.

Preferred category of mosquito repellants

Table 1

S.No.	Type	Respondents (%)
1.	Coils	53
2.	Mats	26
3.	Refills	11
4.	Hits	07
5.	Other indigenous types (Neem smoke etc.)	03

Source: Calculated and compiled on the basis of questionnaires filled up by the respondents

Table 1 shows that 53% of rural buyers prefer using coils due to the undeclared power cuts in rural areas. The most popular category of mosquito repellants being used is the coils. 53% of buyers were using it, followed by 26% using mats, 11% using refills, 07% using hits and others representing 03%.

Brand Preference

Table 2

S.No.	Brand	Respondents (%)
1.	Good Knight	20
2.	All Out	13
3.	Mortein	08
4.	Jet	16
5.	Baygon	03
6.	Kachhua Chhap (Tortoise Brand)	40

Source: Calculated and compiled on the basis of questionnaires filled up by the respondents

Table 2 shows that most of the respondents 40% prefer "Kachhua Chhap Brand'. In measurement of brand preference effect, the Kachhua Chhap (Tortile) brand had first position as 40% of rural buyers recalled it, followed by Good Knight as 20% buyers could recall it. Baygon had a 03% recalling effect. Jet was recalled by 16% rural buyers providing it 3rd popular recalling brand. The above table & chart very clearly reflects that most of rural buyers 40% are able to recall Kachhua Chhap.

Reasons for using specific mosquito repellants

Table 3

S.No.	Reasons	Coil Users	Mat Users	Refill Users	Hit Users	Others
1.	Low Price	81	42	-	16	02
2.	Effectiveness	64	58	51	54	02
3.	Easy to Use	38	34	30	10	02
4.	Use anywhere	40	-	-	31	10
5.	Quality	44	51	41	26	02
6.	No Smoke	-	46	42	21	-

Source: Calculated and compiled on the basis of questionnaires filled up by the respondents

According to Table 3, rural buyers prefer "Low Price" for coils followed by "Effectiveness" of the coil. Mat users also find the "Effectiveness" as a major reason. Hit is also considered effective as it has a mean score of 54. Qualitywise mat has got a weightage of 5%. Mat users also have a weightage of 46 against the 42 score of refills. "Easy to use" reason is indicative in case of coils.

Factor Influencing Purchase Decision of Mosquito Repellants

Table 4

S.No.	Factor	Respondents (%)
1.	Price	33
2.	Advertisement	35
3.	Effectiveness	08
4.	Quality	10
5.	Special Offer Scheme	02
6.	Smell	04
7.	Retailers Opinion	05
8.	Color	01
9.	Quantity	02

Source: Calculated and compiled on the basis of questionnaires filled up by the respondents

Smell, quantity and offer schemes have not been proven major factors in purchase decision of mosquito repellants. Color is not a major factor in rural buyer's decision as it has the least 1%, 33% rural buyers find price as the most important factor for their purchase decision of mosquito repellants. On the other advertisements are also influencing maximum number of rural buyers who account as much as 35% of total source. Data also reveals that retailers' opinion is affecting 5% buyers' decision.

Change in type of mosquito repellants

Table 5

S.No.	Change	Respondents (%)
1.	No Change	46
2.	Mat to Coil	34
3.	Coil to Refill	12
4.	Mat to Refill	08

Source: Calculated and compiled on the basis of questionnaires filled up by the respondents.

Table 5 shows that 46% rural buyers have not changed their mosquito repellants while remaining 54% have changed at least once. It is clearly evincing that 34% buyers have switched over from Mat to Coil, followed 12% from Coil to Refill and 08% rural buyers have shifted from Mats to Refills.

Reasons for change of mosquito repellants

Table 6

S.No.	Reasons	Respondents (%)
(i)	Mat to Coil	
	(a) Frequent undeclared power cuts (Saving Electricity)	62
	(b) Can be used anywhere	21
	(c) Low price (Economical)	17
(ii)	Coil to Refill	
	(a) Good odour	41
	(b) Effectiveness and last long	59
(iii)	Mat to Refill	
	(a) Good for Health (no fumes)	24
	(b) No need to change daily	42
	(c) Easy to use	34

Source: Calculated and compiled on the basis of questionnaires filled up by the respondents

Mat is not considered a good option as against the refill i.e. it has no fume according to 24% buyers. 62% of rural buyers claim that preference for Mat is due to saving of electricity. On the other 59% claim Coils are more effective than Refills as they last long and provide good odour. Mats are easy to use in their opinion of 34% rural buyers.

Satisfaction/Dissatisfaction towards repellants

Table 7

S.No.	Level	Respondents (%)
1.	Satisfied	56
2.	Dissatisfied	44

Source: Calculated and compiled on the basis of questionnaires filled up by the respondents

Table 7 clearly indicates that even rural buyers are able to express their level of satisfaction or dissatisfaction. Among 100 rural respondents 56% are satisfied with the mosquito repellants while 44% are not satisfied with their mosquito repellants. Further we have investigated the reasons of dissatisfaction.

Reasons of dissatisfaction

Table 8

S.No.	Reason	Respondents (%)
1.	High Price (due to Advertisements)	56
2.	Not effective for long periods	33
3.	Unavailability in Rural Areas	07
4.	Harmful to Health	04

Source: Calculated and compiled on the basis of questionnaires filled up by the respondents

Many times rural buyers have not able to purchase their mosquito repellants because of non-availability as it is evident with 07% buyers have blamed it being a reason.

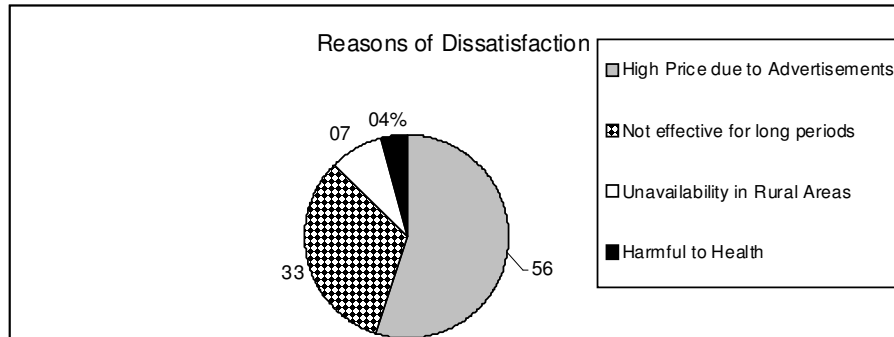


Figure 1. Reasons of dissatisfaction

The Table 8 and Figure 1 clearly show that rural buyers are able to communicate their dissatisfaction. 56% of rural buyers are not satisfied with the pricing and they find advertisement as a major cause. Rural buyers are alert that even 04% find repellants harmful to health.

Conclusions and Suggestions

Conclusions

- Our findings confirm that rural buyers prefer "Coils" as these are economical and cover their monthly expenditure budgets. Every class of rural society (be it farmers, unskilled workers, rural traders) can use it.
- Rural buyers claim that coils are more effective and last long. Rural buyers did not worry about undeclared power cuts as coils usage is not affected due to these power cuts.
- The study also reveals that graduate level rural buyers prefer mats since it has a good odour and produces no smoke and give them relief from suffocation.
- Mat is not becoming as popular in rural areas as in the urban markets due to its dependency on electricity.
- The study infers that the rural society is undergoing a change. Ruralites, as never before are more open to changing themselves to adopt new environment.
- The impact of advertising is clearly visible.
- Magazines and newspapers even today are not the popular choice of even few educated rural buyers.
- Rural buyers are not able to take the benefits of incentives provided by the marketers.

Suggestions

- It is suggested that coil manufacturers should be encouraged to market their coil as easy to use and electricity saver products.
- Manufacturers of Mosquito Repellants should highlight precautions/instructions regarding the usage of these products particularly for rural buyers.
- Rural buyers have been searching reasonably priced mosquito repellants so while designing pricing strategy due care should be taken in offering more schemes/freebies to rural buyers.
- On the basis of findings, it is suggested that the distribution channel be made more effective and efficient in given rural areas so that none of them is deficient of necessary goods.
- Buyers awareness must be created by way of imparting consumer education. It was observed that comparatively less number of respondents had brand loyalty.
- Majority of respondents stated that brand does not matter to them. What they want is to fulfill their needs.
- Since some respondents had been using only specific brands of repellants and did not shift to other brands, in this regard it is suggested that marketers should concentrate on rural brand value.
- Rural buyers purchase required goods mainly from nearest local bazars or shandy or retail shops in the villages. Whenever purchasing is done from weekly bazars and rural buyers are prone to cheating by way of similar packing, color and size. So consumer protection movement should also be activated in the rural areas.
- Our study suggests that companies marketing mosquito repellants should try to provide small packs of repellants due to economic considerations.

References

- Andrade, C. F. S. and Bueno, V. S. (2001). Evaluation of electronic mosquito-repelling devices using *Aedes albopictus* (Skuse) (Diptera: Culicidae). *Neotropical Entomology*, 30(3), 497-499
- Belton, P. (1981). An acoustic evaluation of electronic repellents. *Mosquito News*, 1981, 41, 751-755
- Cabrini, I. and Andrade, C. F. S. (2006). Evaluation of seven new electronic mosquito repellents. *Entomologia Experimentalis et Applicata*, 121(2), 185-188
- Curtis, C. F. and White, G. B. (1982). Once bitten, twice shy. *New Scientist*, 93, 328
- Cheng, V., Lee, H. R. and Chen, C. S. (1992). Morphological changes in the respiratory system of mice after inhalation of mosquito coil smoke. *Toxicol Lett*, 62, 163-177

- Foster, W. W. and Lutes, K. I. (1985). Tests of ultrasonic emissions on mosquito attraction to hosts in a flight chamber. *Journal of the American Mosquito Control Association*, 1(2), 199-202
- Iglisch, V. I. (1983), Mosquito-repellent efficacy of sound-wave-emitting apparatus [Zur stechmückenabweisenden Wirksamkeit von schallwellenerzeugenden Geräten]. *Anzeiger für Schadlingskde, Panzenschutz, Umweltschutz*, 56, 135-140
- Jensen, T., Lampman, R, Slamecka, M. C., Novak, R. J. (2000). Field Efficacy of Commercial Antimosquito Products in Illinois. *Journal of the American Mosquito Control Association*, 16(2), 148-152
- Liu, W. K. and Sun, S. E. (1998). Ultrastructural changes of tracheal epithelium and alveolar macrophages of rats exposed to mosquito coil smoke. *Toxicol Lett*, 41, 145-157
- Menon, S. and Halarner, S. (25 May 1998). *India Today*, p. 70
- Nasci, R. S., Hara, C. W. and Porter, C. K. (1995). *Sangyo Eiseigaku Zasshi*, 37(1), 5-8
- Sharma, V. P. (10 february 2001). Health hazards of mosquito repellents and safe alternatives. *Current Science*, 80(3), 341-343
- Singleton, R. E (1977). Evaluation of Two Mosquito-Repelling Devices. *Mosquito News*, 37(2), 195-199