

RODENT

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**ALL INDIA COORDINATED
RESEARCH PROJECT ON
RODENT CONTROL**

**Central Arid Zone Research Institute
Jodhpur - 342 003, India**

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AICRP on Rodent Control
Central Arid Zone Research Institute
Jodhpur - 342 003, India

Some observations on the intraspecific variations in house rat (*Rattus rattus*) inhabiting poultry farms

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The intraspecific variation among house rats (*Rattus rattus*) was studied by trapping rats live from the poultry farms situated at Punjab Agricultural University, Ludhiana. Total 111 rats were collected, of them 95 adult rats were selected for this study. Each rat was mildly anaesthetized with ethyl ether and then different morphological measurements were taken, along with its body weight and sex (Table). On the basis of body colour (dorsal and ventral), the rats were categorized into 5 main groups:

- Group 1: Body colour dark brown on dorsal side and dark cream on ventral side.
- Group 2: Body colour mixture of brown and black on dorsal side and dark cream on ventral side.
- Group 3: Body colour mixture of brown on dorsal side and light cream on ventral side.
- Group 4: Body colour black on dorsal side and light cream on ventral side.
- Group 5: Body colour dusky brown both on dorsal and ventral sides.

The number of rats in group 1,2,3,4 and 5 were 22,38,24,5 and 6 respectively. Samples of these 5 groups were sent to Zoological Survey of India, Calcutta for identification. All the rat samples were identified as *Rattus rattus alexandrinus*, showing that there are variations in the different morphological parameters even within the same sub-species (Table), this may be due to existence of genetic heterogeneity.

Table. Measurements (Mean±SD cm) of different morphological parameters of *Rattus rattus alexandrinus*

Parameters	Group 1	Group 2	Group 3	Group 4	Group 5
N(M+F)	22(10+12)	38(19+19)	24(10+14)	5(1+4)	6(3+3)
HB	19.16±2.27	18.93±6.73	18.46±4.79	17.43±7.06	18.55±8.65
T	19.88±3.94	18.94±4.38	18.67±7.03	17.80±1.41	19.05±4.05
E	2.16±0.63	2.10±0.39	2.06±0.87	2.08±0.70	3.32±0.64
HF	3.45±0.19	3.37±0.33	3.43±0.70	3.32±0.64	3.53±0.88
BW	136.62±11.47	142.91±10.68	131.94±19.52	135.83±14.77	162.67±12.13

N-Number of rats; M-Male; F-Female; HB- Head and Body length; T - Tail length; E - Ear length; HF - Hind foot length; BW - Body weight.

Porcupine (*Hystrix indica Kerr.*) damage to three coconut varieties in coastal Karnataka

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Porcupine (*Hystrix indica*) is a nocturnal animal. While surveying for vertebrate depredation on coconut, porcupine damage in three varieties of coconut (Table) was recorded at Kidu Farm (12° 27' N Lat. 74° 35' Long.), coastal Karnataka. Field observations on porcupine damage to coconut was recorded on palm basis and expressed as per cent palms damaged irrespective of extent of damage on each palm.

Porcupine damage on coconut palms was identified by debarking of palms from the base, burrowing, scooping out the soil at the base and presence of spiny quills around damaged palms.

Table. Porcupine damage to three varieties of coconut

Months	Coconut varieties					
	Benalium		East Coast Tall		Malayan Dwarf Yellow	
	No. of trees Damaged	Damage (%)	No. of trees damaged	Damage (%)	No. of trees damaged	Damage (%)
May 1997	12	8	18	7.2	20	10.81
June	15	10	12	4.8	12	6.48
July	10	6.6	22	8.8	9	4.86
August	8	5.33	8	3.2	14	7.56
September	14	9.33	10	4.0	7	3.78
October	5	3.3	14	5.6	15	8.1
November	11	7.33	6	2.4	6	3.24
December	16	10.66	16	6.4	13	7.02
January 1988	9	6	4	1.6	12	6.48
February	4	2.66	9	3.6	10	5.4
March	6	4	5	2.0	4	2.16
April	3	2	2	0.8	5	2.7
Total trees per plot		150		250		185
Total trees per plot	113		126		127	
Mean	9.41	6.26	9.66	4.2	10.58	5.71
Std.	4.35	2.9	6.08	2.43	4.67	2.52
ANOVA (5%)			NS		NS	NS

Observations revealed that porcupines almost equally preferred the three coconut varieties for feeding, which resulted in damage to bark. None of the palms in all three varieties showed burrowing symptoms. The percent damage in the three varieties varied from 4.2 to 6.26 with non significant differences amongst each other.

Behavioural responses of the lesser bandicoot rat, *Bandicota bengalensis* towards insecticides and weedicides

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In bi-choice feeding experiments, the lesser bandicoot rat, *Bandicota bengalensis* rejected the food containing 0.25%, 0.5% and 1% concentrations of 4 insecticides namely Thiodon (Endosulfan 35% EC), RC POS (Monocrotophos 36% SL), Robon (Chlorpyrifos 20% EC) and Ekalux (Quinalphos 25% EC) and 3 weedicides namely Machete (Butachlor 50% EC), Dhar (Isoproturon 75% WP) and Arizin (Anilofos 30% EC). Repellency of insecticides against rats was more than of weedicides at any corresponding concentration. Analysis of the behavioural responses through a closed circuit television (CCTV) revealed that *B. bengalensis* discriminated between box containing food with 1% concentration of the pesticide and without it as indicated by significantly less number of food exploration visits and time spent in area near the food source with odour of the pesticide. On getting direct access to food the rats after sampling determined their choice for feeding based on both odour and taste cues.

Farmers' practices of the application of weedicides and insecticides resulted in decreased rodent infestation and damage in rice and wheat crops. Weedicides application reduced infestation and damage by rodents reducing their food source i.e. weeds. Results of treatment of Endosulfan @ 560 ml/acre in rice field, Monocrotophos @ 560 ml/acre in wheat field and in simulated field experiments showed that their application temporarily reduced activities of *B. bengalensis* for 3-4 days during which period the rodenticides application for rodent control may not be effective.

Why do rats have long tails?

(Courtesy : *The Hindu, New Delhi, December 20, 2001*)

Answer 1: Rats use their tails to balance and also to help maintain body temperature. The rat has specialized blood vessels, which control the amount of blood flowing to its tail. Blood flowing into the furless skin of the tail carries heat, which is then radiated out of the body.

The rat can direct anywhere between 0.1 and 10 per cent of its cardiac output to the tail. Under ideal conditions, it can get rid of up to 20 per cent of its

metabolic heat in this way. Conversely, restricting blood flow to the tail reduces heat loss in cold weather. It is interesting to note that the length of the rat's tail is partly determined by the temperature of the environment in which it is raised. Radiating heat through the skin plays a major part in regulating body temperature in humans as well.

Answer 2: Observing the rats suggests that the long tail - usually around the same length as the body - is used for balancing. Although rats cannot grasp objects with their tails, they do seem able to control the muscles along the tail's length with considerable precision. If a rat is running along a narrow surface such as a rope, the tail constantly flicks from side to side to steady them, in the same way tightrope walkers at the circus use a pole to help them stay on the wire. A cat walking along a fence does the same thing with its tail.

When rats are eating, they perch on the edge of the food bowl, which is about 20 cm from the floor of the cage, grasping it with their back paws and eating with their front paws. In this position their rear ends stick out quite a long way over the side of the bowl so that it looks as if they should fall off backwards. They manage to stay balanced by curling their tails under the bowl. This moves their centre of gravity below its back paws, keeping it balanced. The rat's centre of gravity is lower too, so it is more stable and less likely to fall.

As an experiment, a food bowl was moved to about 10 cm above the floor of the cage, which is about the length of a rat's tail. Instead of curling their tails under the bowl when they are feeding, the rats stiffened their tails and pointed them straight down so that they touched the floor, propping themselves up with this "third leg". - **New Scientist**

NOTES AND NEWS

Apex Level Training on Rodent Pest Management at Maruteru

A four day Apex Level Training Programme on Rodent Pest Management was organized from 18th to 21st February 2002 at Agricultural Research Station, Acharya NG Ranga Agricultural University, Maruteru (West Godwari Dist.) in collaboration with National Plant Protection Training Institute (NPPTI), Hyderabad. Dr. P. Raghava Reddy, Principal Scientist (Rice) and the Course Director presided over the Inaugural function. Dr. P.R.M. Rao, Principal Scientist (Entomology) welcomed the participating trainees, resource persons, and other dignitaries. Dr. A.M.K. Mohana Rao, Rodent Specialist from NPPTI, Hyderabad delivered key note address on "Perspective National Plan on Rodent Pest Management as a component of Integrated Pest Management". Dr. G.V. Subbaratnam, Professor and University Head of Entomology spoke on the status of rodent control in IPM. Dr. R.S. Tripathi, Senior Scientist, CAZRI, Jodhpur briefed the activities and achievements of AICRP on Rodent Control at National level. Dr. Mohd. Idris, CAZRI also spoke on the occasion.

Eighteen trainees, one from Karnataka, five from Tamil Nadu, one from Delhi and eleven from Andhra Pradesh belonging from different departments/organizations, namely, Dept. of Agriculture, Dept. of Horticulture, State and Central Warehousing Corporations and National Institute of Communicable Diseases participated in the programme. Nine resource persons drawn from Acharya NG Ranga Agricultural University, Maruteru, Hyderabad, CAZRI, Jodhpur, IGSMRI and pesticides industries delivered theory lectures and demonstrated practical exercises in laboratory and field. A separate practical exercise on trapping, rodent damage diagnosis and assessment, poison baiting techniques and the use of "burrow fumigator" in smoking the rodent burrows were demonstrated.

Information on training needs of the participating trainees was elicited through interaction programme. In all, eleven training classes were conducted with emphasis on practical approaches in Rodent Pst Management. In the closing session, certificates were distributed to the trainees by Dr. P. Raghava Reddy. The training report was presented by Dr.V.Deva Prasad, Coordinator of the Training Programme.

OBITUARY NOTES

DR. ISHWAR PRAKASH

Dr. Ishwar Prakash, Ph.D., D.Sc., FNA left for heavenly abode on 14.5.2002. He was 71. He is survived by his wife, a son and two daughters.

Dr. Ishwar Prakash, popularly known as IP among his friends and colleagues was born on 17.12.1931 at Jaipur. He was educated at Mount Abu, Pilani and Jaipur. He took his M.Sc. (Zoology) degree in 1952 from University of Rajasthan, Jaipur. He was awarded Ph.D. in Zoology from the same University in 1957 on Ecology of desert mammals under a UNESCO Project. He was conferred with D.Sc. degree on his thesis on Ecology and Management of Desert rodents in 1983 by University of Rajasthan, Jaipur.



Dr. Prakash joined the Central Arid Zone Research Institute, Jodhpur as Animal Ecologist in 1961. CAZRI was his real "Karm Bhoomi" where he served for over three decades in different capacities and retired on 31.12.1991. Dr. Prakash has been instrumental in initiating an ICAR funded All India Coordinated Research Project on Rodent Control in 1977 and served as its founder Project Coordinator. The *Rodent Newsletter*, the only Newsletter/Journal on Rodents published from India was started by him, which is still in great demand from the rodentologists world over. Based on his outstanding contributions and leadership in the field of

rodent ecology, Dr. Prakash was awarded the prestigious chair of Professor of Eminence from 1980-1991. He was solely responsible for establishing the discipline of rodentology on a firm pedestal in India. After retirement also he was so active and dedicated scientist that he got selected as Senior Scientist of Indian National Science Academy and continued as Professor Emeritus of DST funded project on small mammals of Aravallies and worked at Desert Regional Station of Zoological Survey of India, Jodhpur.

Dr. Prakash has done pioneering research on Ecology of desert mammals, Environmental Analysis and Desertification studies. In addition to his accomplishments in rodent research, for which he was referred as "*Father of Indian Rodentology*", Dr. Prakash was responsible for establishing the school of agricultural rodentology in India. He successfully organized a Summer Institute on Rodentology at CAZRI, Jodhpur in 1975 and was instrumental formulating the National Programme on Rodent Management. Under his able leadership, *Rodent Newsletter* was borne in 1977. Rodent Newsletter has completed 25 years of its publication. Even after retirement, he continued to provide his valuable suggestions, guidance and blessing for the improvement of the Newsletter. Besides being the founder editor of Rodent Newsletter, Dr Prakash was secretary of the Arid Zone Research Association of India for over two decades and worked as the Editor of its official journal '*Annals of Arid Zone*' for ten years. He had also functioned as Editor of the '*Journal of Arid Environment*' published by Academic Press, London.

During his professional career, honours and awards continued to chase Dr. Prakash. He was the recipient of prestigious Rafi Ahmad Kidwai Award of ICAR for the biennium 1974-75 and the Har Swarup Memorial Award of INSA in 1990. He was also an elected Fellow of INSA and a foreign Fellow of International Theriological Society. He had the distinction of being invited to serve on a number of National and International Committees, viz., UGC, ICAR, DST, ICMR, Planning Commission, Wildlife Institute of India, MAB Committee, Ministry of Environment, FAO/DANIDA panel etc.

A prodigiously hard working man, Dr. Prakash has over 500 research publications to his credit. He had authored/edited several books. Dr. Prakash was a widely traveled scientist. In pursuance of the knowledge of Mammalian Ecology of Thar Desert, he visited several countries as far away as Australia, New Zealand, USA, Thailand, Philippines, U.K., France, China, USSR, Kuwait and Italy.

Dr. Prakash was a combination of an eminent scientist, a great administrator and a perfect gentleman. He will always be remembered not only by those who had the privilege of working with him but also by those who had ever corresponded with him.

Rodent Newsletter family prays the Almighty to grant peace to the departed soul.

DR. CHANDER SHEIKHER

Dr. Chander Sheikher, Principal Investigator of the Rodent Control Project at Dr Y.S. Parmar University of Horticulture and Forestry, Nauni, Solan Left for heavenly abode on 2.8.2002. He was 53 and is survived by his wife and two children, a son and a married daughter.



Dr. Sheikher was born on October 15, 1948 in Gurdaspur, Punjab. He did his M.Sc in 1971 and Ph.D 1976 in Zoology from Punjab University, Chandigarh. He started his career as Lecturer in Zoology at Garhwal University, Srinagar on September 15, 1978. On January 4, 1978, he joined the Rajendra Agricultural University, Pusa, Bihar as Associate Professor and served there till February, 1988 before joining the Department of Entomology, Dr. Y.S. Parmar University of Horticulture & Forestry, Nauni, Solan. He was promoted to the rank of Professor on July 27, 1998 and served this post till his death on August 2, 2002.

Dr. Sheikher was a great human being, ever smiling and a dedicated rodent researcher. During his 14 years association with the AICRP on Rodent Control he has made excellent contributions in the field of rodent pest management. Dr. Sheikher worked out the rodent fauna and its population composition in the North-West Himalayas (Himachal Pradesh and Utranchal) with respect to various agro climatic regions and crops and identified the major rodent pest species of cereals, vegetables and orchards. He worked out the nature and extent of rodent damage and economics of rodent management. He standardized the most suitable and effective mode of rodenticides application in vegetables, cereals and fruit crops for effective rodent pest management. He evolved an integrated rodent management models for cauliflower (both curd and seed crops) and for orchards (apple and pecanut) and quantified the role of rodents in soil erosion on hilly slopes. He has more than 80 research publications to his credit which appeared Journals of National and International repute. His sudden demise has been an irreparable loss not only to his family but also to all the rodent researchers of the country and abroad.

Rodent Newsletter family prays the Almighty to grant peace to the departed soul.

Contributions for inclusion in the Newsletter may please be forwarded along with 1-2 good black & white photographs to :

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