These experiments establish that the ovipositional factor(s) isolated (by fractionation tests) in the present investigation is heat-stable and soluble in organic solvents, indicating lipid nature. Chemical characterization of the isolated attractant(s) is pursued.

From experiments with *Ma. annulifera* on forced oviposition in tapwater, Ikeshoji[12] suggested the probable role of some chemical factors in field water which can stimulate/attract mosquitoes for oviposition as demonstrated in *Culex pipiens fatigans*[16]. Our report also shows that some chemical factor(s) in the natural breeding source attract *Ma. uniformis* to their oviposition site. This study also shows that selection of oviposition site by *Mansonia* mosquitoes is not a function of the type of aquatic vegetation, egg cluster densities or topographical markers alone, as described by some authors[7–11]; but organic matter (putrefying) has also an important role to play. The possibility of microbial activity in the production of an attractant/stimulant for *Ma. uniformis*, as shown by some authors[14–17] in *Culex* and *Aedes* species, is now being studied.

The authors thank ICMR, New Delhi for financial support.

20 December 1986; Revised 5 January 1987

1. Maire, A., *Rev. Can. Biol. Exp.*, 1983, **42**, 235.
2. Ahmadi, A. and McClelland, G.A.H., *Mosq. News*, 1983, **43**, 343.
3. Laurence, B. R. and Pickett, J. A., *Bull. Entomol. Res.*, 1985, **75**, 283.
4. Maire, A., *Mosq. News*, 1984, **44**, 325.
5. Maire, A., *Am. Mosq. Control. Assoc.*, 1985, **1**, 320.
6. Maire, A. and Langis, R., *J. Med. Entomol.*, 1985, **22**, 111.
7. Iyengar, M.O.T., *Indian J. Med. Res.*, 1933, **21**, 101.
8. Iyengar, M.O.T., *Indian J. Med. Res. Mem.*, 1938, **30**, 1.
9. Laurence, B. R., *Proc. R. Entomol. Soc. London*, 1959, **A34**, 161.
10. Laurence, B. R. and Samarawickrema, W. A., *J. Med. Entomol.*, 1970, **7**, 594.
11. Gass, R. F., Deesin, T., Surathin, K., Vutikes, S., Sucharit, S. and Harinasuta, C., *Ann. Trop. Med. Parasitol.*, 1983, **77**, 605.
12. Ikeshoji, T., *Jpn. J. Exp. Med.*, 1966, **36**, 61.
13. Sasikumar, P. S., Cheriyan Thomas and Prasad, R. S., *Curr. Sci.*, 1986, **55**, 111.
14. Ikeshoji, T., Umino, T. and Hirakoso, S., *Jpn. J. Exp. Med.*, 1967, **37**, 61.
15. Ikeshoji, T., Saito, K. and Yano, A., *Appl. Entomol. Zool.*, 1975, **10**, 239.
16. Ikeshoji, T., *Jpn. J. Exp. Med.*, 1966, **36**, 49.
17. Hazard, E. I., Turner, R. B. and Lofgron, C. S., *J. Med. Entomol.*, 1967, **4**, 455.

EFFECT OF AMINOGLUTETHIMIDE PHOSPHATE ON ADRENAL GLANDS OF THE MUSK SHREW, *SUNCUS MURINUS* L

N. MOHANTY and G. B. N. CHAINY
Department of Zoology, Utkal University, Bhubaneswar 751 004, India.

THE musk shrew belongs to the order Insectivora and is considered to be a primitive eutherian mammal[1]. Recently, much attention has been paid to understand its biology. Most of the above studies are confined to its husbandry and reproduction[2–10]. It has been reported that the species is resistant to many antispermatogenic drugs which are effective on the rodents[11,12]. Besides this, the corticosterone and cortisol levels and the corticosterone/cortisol ratio of the plasma of *Suncus* are nearer to the human value than to that of rats or mice[13]. Thus the species exhibits many characters which deviate from the normal laboratory rodent. Though the seasonal and age-related variations in the weight[14], and histology and histochemistry[15] of the adrenal gland have been studied, the information on biochemical aspects of the gland is inadequate. In this investigation, we have compared some basic biochemical constituents of the adrenal glands of both the sexes of the musk shrew. Aminoglutethimide phosphate is a drug which inhibits steroidogenesis of the adrenal glands of the rodents by blocking the conversion of cholesterol into pregnenolone[16,17]. The ability of this drug in inhibiting steroidogenesis of the adrenal glands of the shrew is also evaluated.

Adult and sexually mature male and female shrews were trapped and kept in wooden cages individually for one month prior to experimentation. They were fed with minced goat meat twice and milk and rice once daily. Tapwater was supplied *ad libitum*. Three males and three females were injected subcutaneously with 0.05 ml solution of aminoglutethimide phosphate (8 mg/100 g body wt/

day, for 4 days). Corresponding groups of control animals were administered with the vehicle solution only. The drug was dissolved in dilute acetic acid (0.05 M) and the pH was adjusted to 6.0. All the animals were killed 24 hr after the last injection by an overdose of ether anaesthesia. The adrenal glands were dissected out, cleaned and weighed. The protein, nucleic acids and cholesterol were extracted and estimated[18–20]. Student's t test was applied to test the level of significance between the two groups of data.

Despite their higher body weight, the weight of the adrenal glands of the males was comparatively lower than that of the females (table 1). This is consistent with the earlier report of Pucek on the shrew *Sorex araneus*[14] This is mainly due to the presence of higher number of cells in the adrenal gland of the female as evident by their higher DNA content (female = 7.05 ± 1.05 and male = 5.52 ± 0.25). However, lack of any difference among the other macromolecular contents of the adrenals of both the sexes suggests similar metabolic activities (table 1). Cholesterol is known to be the precursor in the steroid biosynthesis. Aminoglutethimide phosphate is known to selectively inhibit the conversion of cholesterol into pregnenolone in adrenal and gonadal tissues of many animals resulting in an increase in their cholesterol content[16,17,21,22]. Therefore, the increase in the cholesterol content of the adrenal gland of the shrew in response to the drug suggests that aminoglutethimide phosphate is capable of inhibiting steroidogenesis in the musk shrew.

The authors thank Prof. D. R. Naik for valuable suggestions. Aminoglutethimide phosphate was a generous gift from CIBA-GEIGY, Basel, Switzerland.

9 September 1986; Revised 9 January 1987

1. Simpson, G. G., *Bull. Am. Mus. Nat. Hist.*, 1945, 85, 1.
2. Dryden, G. L., *J. Reprod. Fert.*, 1969, Suppl. 6, 377.
3. Dryden, G. L. and Anderson, J. N., *Science*, 1977, **197**, 782.
4. Hasler, M. J. and Nalbandov, A. V., *Biol. Reprod.*, 1978, **19**, 407.
5. Hasler, M. J. and Nalbandov, A. V., *Biol. Reprod.*, 1980, **22**, 377.
6. Keefer, D. A. and Dryden, G. L., *Gen. Comp. Endocrinol.*, 1982, **47**, 125.
7. Furumura, K., Ota, K., Yokoyoma, A. and Oda, S., *Endocrinol. Jpn.*, 1983, **30**, 621.
8. Mohanty, N. and Chainy, G. B. N., *J. Zool. Soc. India*, 1985, **37**, 45.
9. Furumura, K., Ota, K. and Yokoyoma, A., *Endocrinol. Jpn.*, 1985, **32**, 537.
10. Furumura, K., Ota, K. and Yokyoyma, A., *Theriogenology*, 1985, **24**, 319.
11. Singh, S. K. and Dominic, C. J., *Biol. Reprod.*, 1981, **24**, 655.
12. Singh, S. K. and Dominic, C. J., *Arch. Androl.*, 1983, **20**, 91.
13. Lin, S.-C., Shiga, H., Kato, Y., Saito, H. and Kamei, S., *Exp. Anim.*, 1986, **35**, 77.
14. Pucek, Z., *Acta Theriol.*, 1965, **10**, 369.
15. Balkrishnan, M., Seshadri, M. and Alexander, K. M., *J. Anim. Morphol. Physiol.*, 1972, **19**, 213.

Table 1 *Effect of aminoglutethimide phosphate on the weight and certain constituents of adrenal glands of musk shrews. All values are mean ± SEM of three observations*

Parameters	Female		Male	
	Control	Treated	Control	Treated
Animal wt (g)	38.0 ± 1.15	36.0 ± 2.52	71.0 ± 3.79	69.0 ± 5.51
Adrenal wt (mg/100 g body wt)	11.83 ± 0.66	16.74 ± 2.56	6.79 ± 0.19[a]	10.02 ± 1.54
Protein: DNA	20.56 ± 3.28	23.41 ± 2.75	28.13 ± 0.60	25.35 ± 0.10
RNA: DNA	0.28 ± 0.06	0.32 ± 0.03	0.30 ± 0.04	0.22 ± 0.01
DNA (μ g/mg tissue wt)	7.05 ± 1.05	5.76 ± 0.54	5.52 ± 0.25	5.39 ± 0.21
Cholesterol (μg/mg tissue wt)	25.02 ± 0.89	46.09 ± 2.52[b]	23.46 ± 1.38	42.97 ± 1.18[b]

[a] $P < 0.001$ in comparison to control females; [b] $P < 0.001$ in comparison to respective control animals.

16. Dexter, R. N., Fishman, L. M., Ney, R. L. and Liddle, G. W., *J. Clin. Endocrinol. Metab.*, 1967, **27**, 473.
17. Cash, R., Brough, A. J., Cohen, M. N. P. and Satoh, P. S. *J. Clin. Endocrinol. Metab.*, 1967, **27**, 1239.
18 Lowry, O. H., Rosebrough, N. J., Farr, A. L. and Randall, R. J., *J. Biol. Chem.*, 1951, **193**, 265.
19. Schneider, W. C., *Methods Enzymol.*, 1957, **3**, 680.
20. Stadman T. C., *Methods Enzymol.*, 1957, **3**, 392.
21. Flint, A. P. F., Grinwich, D. L. and Armstrong, D. T., *Biochem. J.*, 1973, **132**, 313.
22. Bartke, A., *J. Endocrinol.*, 1971, **49**, 317.

ANNOUNCEMENTS

AWARD OF F. R. S. TO PROF. C. GOPALAN

We are glad to announce that Prof. Gopalan has been elected a Fellow of the Royal Society, London, this year. Dr Gopalan was born in Salem Town in November 1918 and took the M.B.B.S. and M.D. degrees from the Madras University, the Ph.D. and D.Sc. Degrees from the London University and the Fellowship of the Royal College of Physicians (F. R. C. P) from Edinburgh. He was awarded D.Sc.(Hon. Cause) by the Banaras Hindu University. He was the first recipient of Nuffield Foundation Fellowship from India and while on this Fellowship, joined the Medical Research Council (Human Nutrition Unit) in London. His work there led to his Ph.D. Degree of the London Universi y. On return to India, he was appointed Deputy Director, Nutrition Research Laboratories (now the National Institute of Nutrition) where he was responsible for the promotion of clinical and field research in nutrition. When the Institute was shifted to Hyderabad, he became its Director and continued in this post for 15 years. He became the Director General of the Indian Council of Medical Research, a position which he held for over five years. He is a Fellow of the Indian National Science Academy, Indian Academy of Sciences and the National Academy of Medical Sciences. He is currently the President of the Nutrition Foundation of India and in this capacity, he is organising, directing and coordinating a number of community studies on nutrition in different parts of the country. He founded the Nutrition Society of India and initiated the series of Asian Congresses. He was the first President of the Indian Dietetic Association, President of the First Asian Congress of Nutrition, First Chairman of the Regional Advisory Committee of Medical Research of WHO, Chairman of the Technical Session of World Health Assembly in 1977 and was President, International Union of Nutrition Sciences (affiliated to ICSU) from 1975 to 1979. He is currently Honorary President of the IUNS affiliated to ICSU. He is a member of the WHO Expert Panel on Nutrition continuously from 1953.

Dr Gopalan's research contributions relate to the currently widespread problems of Human Nutrition among underprivileged communities. These include over 200 papers in journals in India and abroad, and the contributions to over a dozen books on Nutrition (mostly published in Europe and U. S. A.). His researches have been directed to the elucidation of the pathogenesis of some of the major nutritional disorders widely prevalent in this country and in arriving at practical approaches towards their solution.

His studies on the problem 'of protein-calorie-malnutrition provided convincing demonstration that the basic deficiency underlying kwashiorkor, marasmus (and PCM in general) was calorie deficiency and *not* protein deficiency as was till then generally believed, and that there was no basic difference in this regard as to the dietary background between kwashiorkor and marasmus. Though this view was strongly opposed at the time of its announcement, it is now widely accepted and has changed the concept and strategy with regard to the prevention and control of this major nutrition problem of children.

Dr Gopalan's studies on the effects of chronic starvation and Famine Oedema have provided insight into the clinical, biochemical effects of chronic famine.

Studies in the area of human milk and lactation have provided important data on the output and chemical composition of human milk of Indian mothers of poor socio-economic groups, and have