

## ORIGINAL RESEARCH ARTICLE

# Effects of Propoxur on the Reproductive System of Male Rats

*Ferdinand Ngoula<sup>1</sup>, Pierre Watcho<sup>2</sup>, Tepi Serges Bouseko<sup>2</sup>, Augustave Kenfack<sup>1</sup>, Joseph Tchoumboué<sup>1</sup> and Pierre Kamtchouing<sup>3</sup>*

University of Dschang, Faculty of Agronomy and Agricultural Sciences, Department of Animal Productions . PO. Box: 222 Dschang-Cameroon<sup>1</sup>; University of Dschang, Faculty of Science, Department of Animal Biology, PO. Box: 67 Dschang-Cameroon<sup>2</sup>; University of Yaoundé I, Faculty of Science, Department of Animal Biology and physiology, PO. Box: 812 Yaoundé-Cameroon<sup>3</sup>.

**\*For Correspondence: E-mail:** fngoula@yahoo.fr **and Phone:** (237) 512 54 43

## Abstract

The reproductive toxicity of propoxur (2-isopropoxy-phenyl-N-methylcarbamate), a carbamate pesticide, was investigated in adult male Wistar rats exposed to 0, 1.73, 2.6, and 5.2 mg/kg body weight/day for 90 successive days. Results obtained from this study showed a significant ( $p < 0.05$ ) concentration-dependent increase in food consumption, relative weights of testis, epididymis and kidneys with maximum effects observed at the highest dose of propoxur (5.2 mg/kg) compared to the control. On the contrary, there was a significant ( $p < 0.05$ ) decrease in the body weight gain, sperm density, serum and intratesticular total cholesterol concentrations, and intratesticular total proteins in rats treated with propoxur at the dose of 5.2 mg/kg body weight. Propoxur had no significant effect on gestation, fertility and parturition indices, average birth weight, litter size and pups sex ratio of untreated female rats mated with treated males rats. These results suggested that propoxur increased food consumption, relative weight of reproductive and detoxication organs, decreased body weight gain and sperm density per gram of cauda epididymis without affecting the reproductive performances.

**Keywords:** *propoxur, fertility, male rats*

## References

1. Baron, R. L. Carbamate insecticides. In Handbook of Pesticide Toxicology. Hayes, W. J., Jr. and Laws, E. R., Jr., Eds. Academic Press, New York, NY, 1991: 3-6.
2. EXTOXNET. PIP-Propoxur. USDA/Extension Service/National Agricultural Pesticide Impact Assessment Program, 1996; 6p.
3. Mc Ewen, F L and Stephenson GR. The Use and Significance of Pesticides in the Environment. John Wiley and Sons, Inc., New York, NY, 1979, 3-41.
4. Baron R L. Carbamate insecticides. In: Handbook of Pesticide Toxicology. Hayes W J Jr and Laws E R Jr (Eds). Academic Press, New York, NY, 1991, pp 3-6.
5. Timbrell J. Principles of Biochemical Toxicology. 3<sup>rd</sup> ed., Taylor & Francis, London, 2000. 138-184.
6. Taylor P. Anticholinesterase agents. In: Goodman Gilman A, Rall TW, Nies AS, Taylor P. (Eds). The pharmacological Basis of therapeutics, Pergamon Press Inc New-York, 1990, 131 - 147.
7. U.S. Environmental Protection Agency. Integrated Risk Information system (IRIS) on Baygon. National Center for Environmental Assessment, Office of Research and Development, Washington, DC, 1999; 6p.
8. Löser, E BAY 39 007/Generationsversuche an Ratten. Unpublished report submitted by Bayer AG, 1968; 23p.
9. WHO/FAO. 1973 Evaluations of some pesticide residues in food, W.H.O. Pesticides Residues Series, No. 3. World Health Organization, Geneva, 1974; 49p.
10. Kennedy, GL. Jr, John, P, Frawley, J, Calandra, JC Multigeneration reproductive effects of three pesticides in rats. Toxicol. Appl. Pharmacol., 1973; 25: 589-596.
11. Wernik T, Lamman BM, Franx JL. Chronic toxicity Teratologic and reproduction studies with hair dyes. Toxicol appl pharmacol, 1975; 32: 450-60.
12. Gornal AG, Bardwil GS, David MM. Determination of serum proteins by mean of Biuret reactions. Biochemistry, 1949; 177: 751-766.
13. Bradford MN. A rapid and sensitive method for the quantification of microgram quantity of protein-dye binding. Analytical Biochemistry, 1976; 72: 248-254.
14. Van Hamme ML and Wttiez C. Pesticides a usage domestique. Pesticide Action Network Belgium, 1999 ; 47p
15. Blanchet G, Carpentier P, Lallement G. Vulnérabilité du système nerveux central vis-à-vis des neurotoxiques organophosphorés. Méd. Armées, 1991; 19: 403-407.

16. Saïssa JM and Rüttimann M. Intoxication par les organophosphorés. Médecine d'urgence, Elsevier, Paris, et SFAR, 1999, 103-120.
17. Psychoyos A. La reproduction. In : Meyer P, ed. Physiologie Humaine. Paris: Flammarion Médecine-Sciences; 1983: 471-493.
18. Fox SI. Human Physiology. Sixth edition, Boston: Mc. Graw-Hill; 1999: 612-614.
19. Ganong WF. Physiologie médicale. Masson, Paris, 2001, 408-411.
20. Mommsen TP and Walsh PJ. Biochemical and environmental perspectives on nitrogen metabolism in fishes, *Experientia*, 1992; 48: 583-593.
21. Palanichamy B.S. Impact of agricultural (ammonium chloride) fertilizer on physiology and biochemistry of fresh water teleost fish, *Oreochromis mossambicus*, *J. Ecobiol.*, 1990; 2: 97-106.
22. Vasanthi R, Baskaran P and Palanichamy S. Influence of carbofuran on growth and protein conversion efficiency in some fresh water fishes. *J Ecobiol.*, 1990; 2: 85-88.
23. Emerson FS, Shadara AC and Devi PU. Toxic effects of Crude extract of *Plumbago rosea* (Rokta chitraka). *J. Ethnopharm.*, 1993; 38: 79-84.
24. Gatsing D, Aliyu R, Kuate JR, Garba IH, Jaryum KH, Tedongmo N, Tchouanguép F and Adoga GI. Toxicological evaluation of the aqueous extract of *Allium sativum* bulbs on laboratory mice and rat, *Cameroon Journal of Experimental Biology*, 2005; 1: 39-45.
25. Short P, Colborn T. Pesticides use in the U.S. and polity implications. *Toxicology and Industrial Health*, 1999; 15: 240-275.
26. Gwynne L. Mixed messages: Pesticides that confuse hormones. Pesticide Action Network (P.A.N.) U.K. Briefing paper, 2000, 6 p.
27. Dadoune JP, Demoulin A. Structure et fonction du testicule. In: Thibault C and Levasseur M C (Eds). La reproduction chez les mammifères et l'Homme. Nouvelle édition, Ellipses éditions, Paris, 2001; 256-289.
28. Kimmel GL, Clegg ED, and Crisp TM. Repro-ductive toxicity testing: A risk assessment perspective. In: Witorsch RJ (ed.). Reproductive toxicology, second edition, Raven Press, Ltd., New York, 1995; 75-98.