

In the nephroblastoma of *Mastomys*, there was no activity of acetylcholinesterase. However, a diffuse pseudocholinesterase activity of moderate intensity was evident in most lobules of the tumour, and was more dense around the differentiating tubules (Figure 3).

Discussion. In the 14 sacrificed *Mastomys*, one male animal, aged 19 months, showed squamous cell carcinoma of the skin, while 5 others, 3 males and 2 females, aged from 19–24 months showed nephroblastoma, in which one was associated with a thymoma. To our great disappointment, we did not observe any malignant argyrophil carcinoid tumour of the stomach in our colony of *Mastomys*.

STEWART and SNELL⁶ had observed 27 thymomas and 11 cases of hyperplasia of the thymus in one series of 113 *Mastomys*. 22 animals with thymomas also had tumours

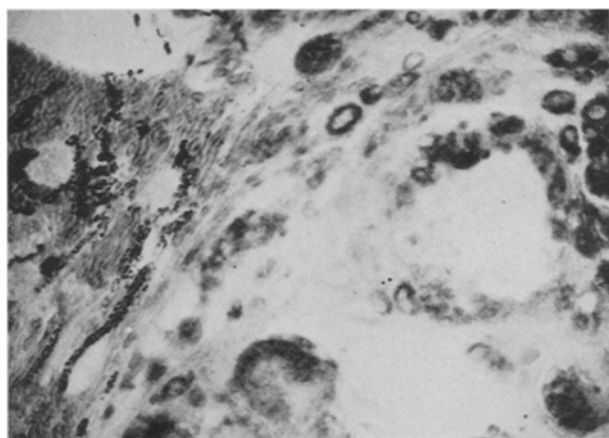


Fig. 3. Evidence of pseudocholinesterase (KOELLE-FRIEDENWALD⁴). To the left, the renal parenchyma shows black localization in the loop of Henle and distal convoluted tubules. To the right, the tumour shows the pseudocholinesterase activity which is more diffuse and less intense. It is more marked in the periphery of the differentiating tubules.

of one or more extra thymic sites. Extra thymic neoplasms were judged to be no more frequent than in their entire colony. SNELL and STEWART⁷ observed 5 renal tumours in one series of 188 *Mastomys* (2 papillary clear-cell adenocarcinoma, 1 papillary serous cystadenocarcinoma, 1 cystadenoma and 1 hemangioma) but without nephroblastoma. WILLIS⁸ reported that tumours undoubtedly comparable to the human nephroblastoma occur in the pig, sheep, rabbit and hare, rat and fowl. Most of the affected animals are young.

The high proportion of renal tumours of the nephroblastoma type in the relatively old animals of our *Mastomys* colony appears remarkable. This might be dependant on genetic or infective factors in this particular colony. The evidence of the relatively intense pseudocholinesterase activity in the walls of tubular structures of nephroblastoma may indicate that this enzymatic activity appears at quite a precocious stage of the renal organogenesis.

Résumé. 5 néphroblastomes ont été observés dans une série de 14 *Praomys (Mastomys) natalensis*. Une activité pseudocholinestérasique diffuse a été mise en évidence dans ces tumeurs, tandis que dans le parenchyme rénal normal, cette activité est localisée dans la partie terminale des néphrons.

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⁶ H. L. STEWART and K. C. SNELL, J. natn. Cancer Inst. 40, 1135 (1968).

⁷ K. C. SNELL and H. L. STEWART, J. natn. Cancer Inst. 39, 95 (1967).

⁸ R. A. WILLIS, *Pathology of Tumours* (Butterworths, London, 1960), p. 936.

Sterilization by Irradiation of *Cadra cautella* (Wlk.) (Lepidoptera, Pyralidae) Males Increased by Female Sex Pheromone

The high doses of γ -irradiation needed to induce sterility in Lepidoptera¹ result in somatic damage, which in the context of the 'Sterile insect release technique' interferes with competitiveness².

Knowing that the partial pressure of oxygen in the tissue is one of the most important factors in radiation sensitivity³⁻⁶, and subsequent recovery⁷⁻⁹, we speculated that any preferential increase of oxygen tension in the genital tissues, such as may occur in males exposed to female sex pheromone, will interact with irradiation to bring about sterility at lower doses, thus avoiding somatic damage.

To investigate this we exposed 0–24 h old males of *Cadra cautella* [= *Ephestia cautella*] to 40 krad of γ -radiation from a 60 Co source (Gammacel 200 Atomic Energy of Canada Ltd.) at a dose rate of 2250–2200 rad/min. in the presence of female sex pheromone.

This radiation dose fails to induce the desired degree of sterility in the absence of pheromone, although in a previous work, when the dose rate was 5000–4300 rad/min., the same dose was established as the sterilizing dose for *C. cautella* males^{10,11}.

Female sex pheromone, extracted from virgin females¹², was applied on filter paper at doses of 0.1, 0.5 and 1.0 female equivalent (FE) which was introduced into plastic containers of 7.2 cm³ containing 15–18 males 3 min. prior to irradiation.

¹ L. E. LACHANCE, C. H. SCHMIDT and R. C. BUSHLAND, in *Pest Control-Biological, Physical and Selected Chemical Methods*. Eds. W. W. KILGORE and R. C. DOUTT, Academic Press, New York and London (1967), p. 145.

² D. T. NORTH and G. HOLT, J. econ. Ent. 61, 928 (1968).

³ H. DERTINGER and H. JUNG, *Molecular Radiation Biology* (Springer-Verlag, New York 1970), p. 237.

⁴ D. JAEMISON and H. A. S. VAN DEN BREK, Int. J. Radiat. Biol. 6, 529 (1963).

⁵ K. G. LUNING, J. cell. comp. Physiol. 58, Suppl. 1, 197 (1961).

⁶ I. I. OSTER, J. cell. comp. Physiol. 58, Suppl. 1, 203 (1961).

⁷ F. H. SOBELS, Mutation Res. 2, 168 (1965).

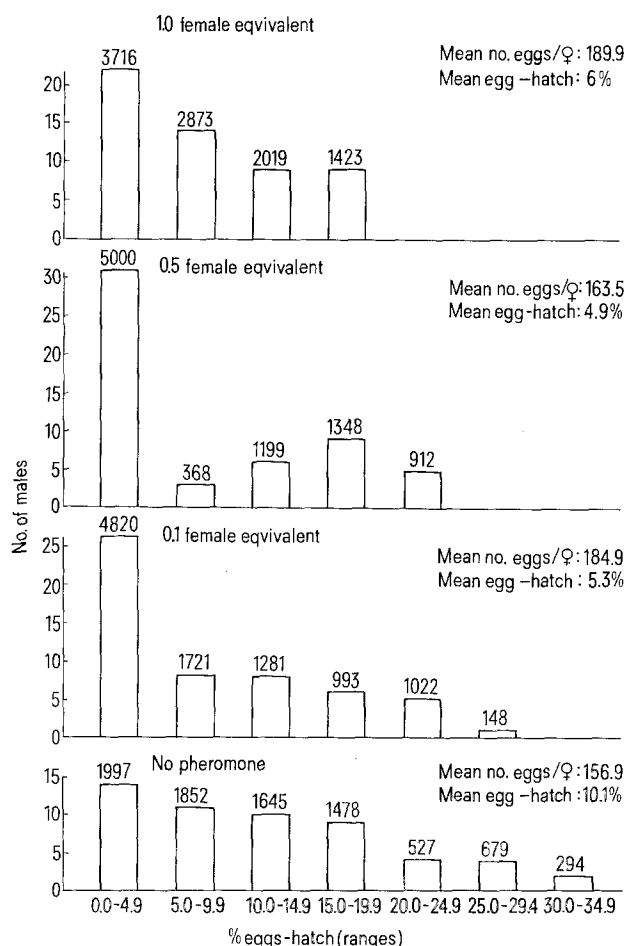
⁸ F. H. SOBELS, Proc. XII Int. Congr. Genetics 3, 205 (1969).

⁹ I. I. OSTER, Rec. Genet. Soc. Am., 26, 387 (1957).

¹⁰ M. CALDERON and M. GONEN, J. stored Prod. Res. 7, 85 (1971).

¹¹ M. GONEN and M. CALDERON, J. stored Prod. Res. 9, 105 (1973).

¹² Y. KUAHARA, C. KITAMURA, S. TAKAHASHI, H. HARA, S. ISHII and H. FUKAMI, Science 177, 801 (1971).



Hatch of eggs laid by *C. cautella* females mated to males irradiated with 40 krad in the presence of the female pheromone. (Total No. of eggs laid in each fertility group is indicated above the columns).

Filter papers treated with the solvent alone were introduced into the control group containers. Excitation and increased activity of the insects was observed in cages containing pheromone within seconds of its application. Subsequently, after irradiation, the treated males were paired individually with virgin females, 0–24 h old, and kept at constant conditions ($26 \pm 1^\circ\text{C}$, 60–70% RH). Oviposition and egg hatch were recorded for 54 pairs from each treatment, in which mating took place (spermatophore observed in each female's bursa copulatrix).

Tests of significance, based on normality criteria, are inappropriate because of the skewness of the data. However, it is clear, from the histogram (Figure 1) that the proportion of low percentage hatch increases with increased pheromone presence. The difference between absence and presence of pheromone is most marked, whereas this is not apparent between the different pheromone doses.

The above results are evidence of the value of this approach of preconditioning to irradiation, especially when induction of sterility is the objective.

Résumé. L'irradiation des mâles de la teigne *Cadra cautella* (Lepidoptera, Pyralidae) en présence de phéromone sexuelle féminine a provoqué une stérilité plus élevée que l'irradiation sans phéromone. Il est à noter que cette méthode de préconditionnement peut permettre d'obtenir des insectes stériles à l'aide de doses de radiation diminuées.

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Inflamed-Tissue Factor(s):

An Autoregulatory Mechanism of some Acute Inflammatory Responses

The term 'counter-irritation' indicates the phenomenon that irritation leading to local inflammation will counteract the inflammatory response to subsequent irritation in the same organism. The postulation that irritation may result in discharge of some anti-inflammatory substance(s) obtained support when it was shown that administration of the extracted inflamed-tissue factor results in suppression of experimental inflammation¹⁻⁹. The recognition of the role of complement in acute non-immune inflammations led to the concept that fixation at the irritated site may leave insufficient complement available to trigger inflammatory responses of subsequent irritation^{10,11}. The present work was aimed to investigate the underlying anti-inflammatory mechanism of inflamed-tissue factor (ITF), and an attempt is made to explain how this mechanism might be interrelated with the counter-irritant principle.

Material and methods. The source of ITF was exudate from inflamed air-carrageenin pouches of rats produced by the method of BORIS and STEVENSON¹². Six days following the induction of the pouch, the rats were sacrificed to collect exudates which were filtrated, centrifuged, dialyzed and lyophilized. Previously we have

shown that the anti-inflammatory factor was mostly retained within the dialysis sac⁹ and at present only the retentate was used. For testing anti-inflammatory activity, the hind-paw inflammations of rats and mice were evaluated by measuring the diameter of the paws. Complement was measured in serum of blood obtained by cardiac puncture of rats, and the total complement was titrated by establishing the volume of serum giving 50% hemolysis of sheep erythrocytes to which antiserum of rabbits was added¹³. Complement activity was expressed as CH50/ml serum. For complement activity by ITF retentate in vitro, a range of different concentrations of the retentate was used and the concentration causing 50% inhibition was interpolated. Significance was calculated by Student's *t*-test.

Results and discussion. Anti-inflammatory effect of i.p. administered ITF retentate was observed on the rat-hind paw inflammation induced by carrageenin or kaolin, but no significant effect was found on histamine- or serotonin-induced inflammation. The reproducibility of this preference to selective inhibition is indicated by the great similarity of 2 independent experimental series, as shown in Table I. Not shown in the Table are the data to dem-