J. Agric. Sci. Mansoura Univ., 31 (3): 1779 - 1790, 2006

EFFECT OF METHOMYL ON SOME BIOCHEMICAL PARAMETERS AND PHYSIOLOGICAL FUNCTIONS ON ALBINO RATS

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ABSTRACT

The effect of long-term administered of methomyl on biochemical aspects, thyroid function and reproductive system was studied in male albino rats treated with methomyl soluble powder (90% SWP). Four groups of male mature albino rats (10 each) were administered 5, 10 and 20ppm of methomyl through drinking water for 90 days.

The investigation results revealed that the methomyl significantly decrease the (ALT) activity after 90 days at 10 and 20ppm of tested compound, while the activity of (AST) and total protein were no affect all over the period. The treatment of methomyl led to decrease the albumin level. The effect of tested material on thyroid function was assessed using measuring the thyroxin (T_4) and tri-iodothyronine (T_3) levels and histopatholological examination of thyroid gland. The effect of methomyl on male fertility was assessed using the mating method, spermatozoal, testosterone level and histopathological examination of the testis.

The administration with methomyl caused decline in thyroxin (T_4) and tri-iodothyronine (T_3) levels. Methomyl treatment caused reduction in sperm motility and concentration in male albino rats, in addition to homogenous eosinophelic material and hyperemic blood vessels inbetween the seminiferous tubules of testis. Moreover a reduction pregnant rats, litter size per pregnant females and litter size per females available were recorded.

Keyword: Rat, Insecticide, Methomyl, Carbamate, Biochemical aspects, Thyroid function, Fertility, Reproductive system.

INTRODUCTION

Pesticides are essential for agricultural crops protection in Egypt as well as in other countries in the world. On the other hand, accidental toxicity from pesticides may occur to the workers during the application, or to animals present in the fields during application. Contamination is one of the most important problems resulting from pesticides residues. Pesticides are widely used for agricultural purposes, as insecticides, herbicides and fungicides. They may become environmental pollutants if they are transferred outside the area of international application, and if thy persist in the environment longer than necessary. Carbamate insecticide are widely used in industry, agriculture and for public health purpose.

Numerous incidents of acute carbamate poisoning have resulted from inhalation of sprays or contamination of crops or food Mahgoub and El-Medany (2001).

Previous studies on methomyl Saiyed *et al.* (1992); Porter *et al.* (1993); Fayez and Bahig (1991) showed effect on biochemical properties in albino rats. Also, Abdel-Rahim *et al.* (1994); Kuopp and Olass (1997)

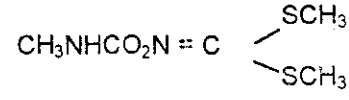
reported that, the total protein content was significantly reduced in the rats administrated pesticides as result of degradation process for energy production that was needed mainly in nucleic acids and protein biosynthesis. Hassan *et al.* (2002) and El-Demerdash *et al.* (2003) reported that, the serum enzymes routinely used in clinical diagnosis are present in high concentration in the liver. Petrelli *et al.* (2001) reported the results of study on fertility of couples in whom the man was occupationally exposed to pesticides caused delay in conception at the time of their waves first pregnancy. Moreover, Sheiner *et al.* (2003) investigated the influence of working condition and occupational exposure potential chemical during work on male fertility. Significant association were reported between empairid semen parameters and some chemical exposures of such pesticides.

The study was initiated to evaluate the effect of methomyl on some biochemical aspects, related to the liver function and the male reproductive system.

MATERIALS AND METHODS

1- The tested compound:

The insecticide used was the methomyl (Kuik). The formulation was soluble powder (90% SWP) containing 90% active ingredient (a.i). Methomyl formula, [S-methyl N-(methylcarbamoyloxy) thio acetimidate].



2- Animal and procedures:

The effect of methomyl on male fertility was assessed by several ways included hormonal monitoring method, semen examination and histopathological changes in the testis.

Fourty mature male albino rats were allocated randomly into four groups of 10 rats each and treating as follows:

1- Group A: rats were kept as control (untreated).

2- Groups B, C, D: rats were treated with methomyl through drinking water at concentrations of 5, 10 and 20ppm (a.i) for 90 days.

The blood samples were taken after 30, 60 and 90 days for biochemical and hormonal analysis. On day 90, three male rats from each experimental group were taken and kept with untreated mature females (1 male / 2 female) for 7 days and separated. The pregnant females and the pups were counted to calculate the pregnancy rate, average litter size per pregnant female and average litter size per females available per group after 90 days of treatment, the male rats were decapitated for epididymal spermatozoal examination, weights of testis and accessory glands [seminal vesciles and prostate gland].

The progressive motility of sperm and concentration were measured according Bearden and Faquay (1980).

3- Blood sampling:

The blood samples were collected from orbital sinus vein by hyparinized capillary tubes at 30, 60 and 90 days into clean, dry and labeled

eppendorf tubes. The tubes contained heparin as anticoagulant (10 I.U./ml blood) according to Schelm (1986).

Plasma samples were divided into aliquats to avoid repearted freezing and kept at (-20°C) until biochemical and hormonal assays were performed.

4- Biochemical analysis:

The ALT and AST activities were determined according to Reitman and Frenkel (1957). Plasma total protein (T.P.) was determined according as described by Weichsebaum (1964). Albumin was determined according to Drupt (1974).

5- Hormonal analysis:

The thyroxin (T_4); tri-iodothyronine (T_3) and testosterone level were determined by using the coat –A- count procedure, which is solid radioimmunoassy (RIA). The thyroxin (T_4) was carried out according to the method adopted by Britton *et al.* (1957). The free-tri-iodothyronine (T_3) was performed according to the method adopted by Beck-Pecco and Romelli (1982).

The testosterone level was carried using the method adopted by Jaffe and Behrman (1974).

6- Histopathological investigation:

The animals were sacrificed at the end of the experimental (90 days), and the thyroid gland, testis were collected and fixed in 10% neutral buffered formalin solution, embedded in paraffin, sectioned at 4.00 µm and stained with haematoxylin and eosin Lina (1968).

7- Statistical analysis:

The results are presented as the mean of five samples with standard error. The significance of the values obtained were tested using student's test Gad and Weil (1989).

RESULTS AND DISCUSSION

1- Effect of treatment with different concentration of methomyl on biochemical parameter:

1.1- Effect of plasma ALT and AST activity:

The effect of oral administration of different concentrations of methomyl to rats on ALT activity was evaluated and the results are shown in Table (1). The data clearly showed that, the activities of (ALT) were stimulated after 30 days at 5ppm and increased to a relative value of (121.5%), and after 60 days at 10 & 20ppm the relative values were 139.1% and 159.1%, respectively, relative to control but it is not significant. While after 90 days at (10 & 20) ppm the data showed that the activities of ALT were significant by decreased and the relative values were 54.5% and 51.3, respectively relative to control. This finding are in agreement with that reported by Fayez and Bahig (1991) on methomyl in rats; Gupta and Amma (1993) on carbamyl in mice, Ayyat *et al.* (2000) on prefenofos in rabbits, they reported that, the (ALT) activity was decreased markedly in treated animals with different pesticides.

Table (1): Effect of oral administration of methomyl in drinking water to male albino rats for 90 successive days on some biochemical parameters.

Parameters	Period (days)			
	30 days			
	Control	5ppm	10ppm	20ppm
ALT (µ/l)	10.20 ± 2.85	12.40 ± 0.97	8.80 ± 1.15	8.00 ± 1.70
AST (µ/l)	93.84 ± 8.53	72.40 ± 7.89	63.80 ± 12.10	99.40 ± 5.21
Total protein (g/dl)	7.14 ± 0.15	7.05 ± 0.26	7.50 ± 0.46	7.48 ± 0.29
Albumin (g/dl)	3.40 ± 0.14	3.11 ± 0.16	3.11 ± 0.17	3.20 ± 0.14
	60 days			
ALT (µ/l)	11.32 ± 2.80	9.40 ± 1.56	15.75 ± 2.81	18.00 ± 4.80
AST (µ/l)	68.08 ± 5.69	58.60 ± 8.58	62.8 ± 9.40	68.2 ± 3.12
Total protein (g/dl)	7.47 ± 0.23	7.44 ± 0.25	7.46 ± 0.32	7.81 ± 0.19
Albumin (g/dl)	3.61 ± 0.16	4.43 ± 0.67	3.48 ± 0.17	4.07 ± 0.16
	90 days			
ALT (µ/l)	22.36 ± 2.55	19.10 ± 1.75	12.20 ±2.20*	11.48 ±2.71*
AST (µ/l)	108.20 ± 6.18	111.20 ± 7.09	91.80 ± 3.70	111.60 ± 5.93
Total protein (g/dl)	6.97 ± 0.33	6.59 ± 0.16	6.20 ± 0.25	7.01 ± 0.24
Albumin (g/dl)	3.81 ± 0.13	3.02 ± 0.30	2.95 ± 0.08**	3.60 ± 0.13

Means ± S.E.; * : Mean significantly different from the control (P < 0.05);
**** : Mean significantly different from the control (P < 0.01).**

Meanwhile, aspartate amino transferase (AST) was not alter at 5ppm, 10ppm and 20ppm of methomyl. A reduction in plasma amino transferase (ALT) activities were prominent in animals treated with methomyl high doses after 90 days may be attributed to either the effect of pesticide metabolites which inhibited several endogenous enzymes particularly (ALT) and or to increased rate of the catabolism of these enzymes in plasma of treated animals. (AST) and (ALT) have been used as sensitive indicators of the liver disease in humans and have been regarded as being virtually liver specific Wills (1985).

1.2- Effect on plasma total albumin and total protein levels:

The data in Table (1) showed that the three doses of methomyl caused decrease in plasma albuin after 30days and 90days of experimental rats, there values were 88%, 87%, 91%, 78% and 91%, respectively compared with control. While the values of plasma albumin after 60 days were increased in the three treatments. Meanwhile data in Table (1) clearly showed that, the three doses did not affect in plasma total protein. It should be mentioned that, the present results are in a quite good agreement with those reported by Tuckova (2005) who mentioned that, serum total protein and albumin content were decrease after treatment with bediocarbamate in rabbits. Sogorb *et al.* (2004) observed that human serum albumin give a significant decrease after treatment with carbamyl. Also, Youssef *et al.* (2003) showed that, the concentration of plasma total protein and albumin were significantly decreased in rabbits when treatment with cypermethrin. The reduction in the albumin content of plasma may be due to increased globulin synthesis or increased the albumin loss through the kidney or may be due to increased albino catabolism.

2- Effect of prolonged oral administration of methomyl on thyroid function:

A significant decrease was observed with concentration of thyroxin (T_4) in rats treated with the low and high dose (5 and 20ppm) of methomyl after 30 and 90 days of treatment. Also, this trend was noted in concentration of tri-iodothyronine (T_3) in rats treated with methomyl at the three doses level after 30days and 90 days Table (2).

Table (2): Effect of oral administration of methomyl in drinking water to male albino rats for 90 successive days on thyroxin (T_4) and tri-iodothyronine (T_3).

Parameters	Period (days)			
	30 days			
	Control	5ppm	10ppm	20ppm
Thyroxin [T_4] (ng/dl)	1.247 ± 0.111	0.831 ± 0.060*	1.026 ± 0.144	0.959 ± 0.203
Tri-iodothyronine[T_3] (pg/dl)	1.382 ± 0.130	0.503 ± 0.108**	0.316 ± 0.130**	0.964 ± 0.260
	60 days			
Thyroxin [T_4] (ng/dl)	1.606 ± 0.180	1.885 ± 0.296	1.608 ± 0.129	1.477 ± 0.250
Thyroxin [T_4] (ng/dl)	1.138 ± 0.140	1.070 ± 0.120	0.976 ± 0.049	0.807 ± 0.060
	90 days			
Thyroxin [T_4] (ng/dl)	1.407 ± 0.090	0.902 ± 0.0540**	1.157 ± 0.068	0.574 ± 0.094**
Thyroxin [T_4] (ng/dl)	0.893 ± 0.114	0.698 ± 0.070	0.776 ± 0.130	0.391 ± 0.109*

Means ± S.E.; * : Mean significantly different from the control (P < 0.05).
**** : Mean significantly different from the control (P < 0.01).**

Histopathological examination of thyroid gland revealed atrophy in thyroid follicle with absence of their colloid and degradation of thyroid acinic in rats treated with 5 and 20ppm of methomyl (Figs. 2, 3, 4, 5, and 6).

T_4 is the major hormone secreted by the thyroid gland. It influences in the rate of many metabolic reactions of the body and is required for normal mental development and growth. T_3 is found in the serum as a result of secretion by thyroid gland (where it is synthesized) and as result of the degradation of circulating thyroxin.

A remarkable reduction in the levels of T4 and T3 at low and high dose of methomyl may be due to the impairment in the synthesis of thyroid hormone by epithelium cells of follicles of thyroid gland. These results confirmed by the histopathological findings in thyroid gland of treated rats with methomyl.

These result are in agreement with these obtained by Porter *et al.* (1993) who observed a marked decrease in tri-iodothyronine (T_3) level after treatment with aldicarb and methomyl in rats. In addition, Farid (1997) reported that, buprofezin pesticide induced a marked decrease in (T_3) concentration. The results are in accordance with results reported by Nebbia *et al.* (1995) who observed a marked decrease in tri-iodothyronine (T_3) level after treatment with zineb pesticide in rats. Van-Leeuwen *et al.* (1995) also found that hypothyrodism may be caused by impaired liver for conjugation of thyroid hormones with glucouronic acid.

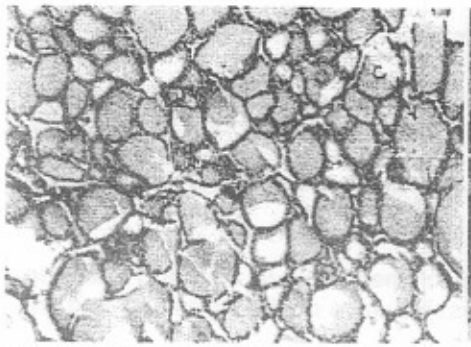


Fig. (1): Thyroid of control rat showing the normal Histopath-ological structure of the thyroid acini and stromal connective tissue in-between (H & E x 40).

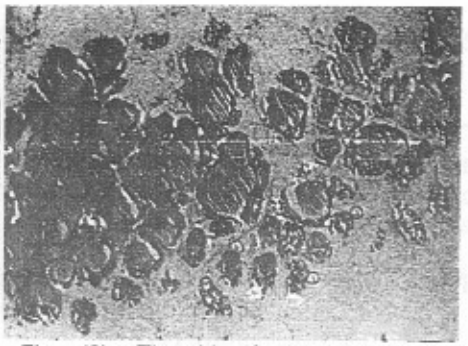


Fig. (2): Thyroid of rat treated with methomyl in concentration of 20ppm for 90 days showing atrophy in some of the thyroid follicles with absence of their colloid (H & E x 40).

Fig. (3): Thyroid of rat treated with methomyl in concentration of 20ppm for 90 days showing the high magnification of atrophied follicles with lose of their colloid while other showing flattening lining epithelium (H & E x 160) .

Fig. (4): Thyroid of rat treated with methomyl in concentration of 20ppm for 90 days showing the high magnification of degenerated acuni with desquamated cells in their lumen and absence of colloid (H & E x 160).

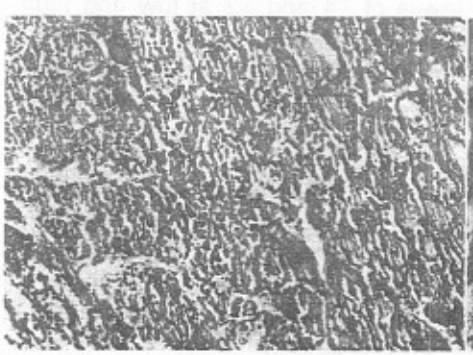


Fig. (5): Thyroid of rat treated with methomyl in concentration of 5ppm for 90 days showing degradation and atrophy in thyroid acini (H & E x 40).

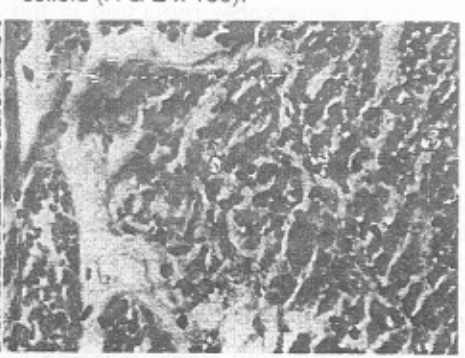


Fig. (6): Thyroid of rat treated with methomyl in concentration of 5ppm for 90 days showing degenerated acini with extravested red blood cells (H & E x 160)

3- Effect of methomyl on male reproductive system:

The administration of male albino rats with methomyl should no differences in sexual organs weights [testis, seminal visciles and prostote gland] Table (3).

Table (3): Effect of oral administration of methomyl in drinking water to male albino rats for 90 successive days on testis, seminal vesicles and prostate gland weights (g/100g B.Wt.).

Parameters	Methomyl concentration (ppm)			
	Control	5	10	20
Testis	5.69 ± 0.200	5.97 ± 0.260	5.62 ± 0.220	5.47 ± 0.110
Seminal viscles	3.33 ± 0.250	3.11 ± 0.120	2.97 ± 0.055	3.25 ± 0.150
Prostate gland	0.98 ± 0.069	0.98 ± 0.069	0.90 ± 0.051	0.92 ± 0.080

Means ± S.E.

In methomyl treated rats, a significant decrease in sperm motility occurred with the there concentration after 90 days of administration. A significant decrease in sperm count was noted in rats treated with 10ppm and non-significant decrease in 20ppm of methomyl (Table, 4). Prolonged administration of methomyl with 5 and 20ppm caused marked reduction in pregnancy rate and litter size per females available (Table, 5). Concerning testosterone level after insecticide treatment for 90 days, data in (Table, 6) indicated a significant elevation in hormonal level with 10 and 5ppm after 60 and 90 days from treatment.

Table (4): Effect of oral administration of methomyl in drinking water to male albino rats for 90 successive days on mass sperm motility and sperm concentration.

Parameters	Methomyl concentration (ppm)			
	Control	5	10	20
Sperm motility (%)	65.47 ± 2.03	48.16 ± 5.26*	52.49 ± 3.89*	35.93 ± 5.18**
Sperm concentration (10^6/ml)	45.25 ± 188	32.75 ± 4.73	37.25 ± 1.60*	34.00 ± 4.22

Means ± S.E. * : Mean significantly different from the control (P < 0.05).
** : Mean significantly different from the control (P < 0.01).

Table (5): Effect of oral administration of methomyl in drinking water to male albino rats for 90 successive days on [pregnant rats, litter size per pregnant female and litter size per females available.

Parameters	Methomyl concentration (ppm)			
	Control	5	10	20
Pregnant rat (%)	83.30	33.30	66.60	66.60
Litter size per pregnant female	6.40	4.50	5.50	5.66
Litter size per female available	5.33	1.50	3.66	2.83

Table (6): Effect of oral administration of methomyl in drinking water to male albino rats for 90 successive days on testosterone levels.

Parameters	Period (days)			
	30 days			
	Control	5ppm	10ppm	20ppm
Testosterone (ng/dl)	47.98 ± 10.05	42.6 ± 4.29	159.2 ± 43.10	46.6 ± 14.21
	60 days			
Testosterone (ng/dl)	32.60 ± 10.16	111.00 ± 31.60	155.80 ± 37.76*	78.80 ± 25.13
	90 days			
Testosterone (ng/dl)	83.00 ± 12.92	275.50 ± 41.69**	191.60 ± 48.60	59.00 ± 7.43

Means ± S.E.; * : Mean significantly different from the control (P < 0.05); ** : Mean significantly different from the control (P < 0.01).

On the other hand, no significant differences were shown with other treatments.

The histopathological examination of the testes with 20ppm showed homogenous eosinophelic material inbetween the semineferous tubules (Fig.,8).

Hyperemic blood vessels inbetween the seminiferous tubules with homogenous eosinophilic materials were noted in the testis of rats treated with methomyl at 5 and 10ppm (Fig., 9 and 10).

In addition, a multinumber of spermatognial cells with abnormal shapes were observed in testis of rats treated with 5ppm (Fig., 11 and 12).

Among the potential hazardous effects of pesticides, reproductive toxicity is of special concern Dunnick *et al.* (1984). However, many pesticides have been used for several years or have been recently discovered without any suggestion of their influence on male fertility. The studies on laboratory animals have become the main source of toxicological data. A toxicant may induce several types of injury and the severity of effects is usually related to the dose and duration of exposure for assessment of safety /risk of the chemical under specific exposure Frank and Selier (1991).

Attention is focused primarily on toxic effects that involve testosterone and spermatogenic processes that are essential for reproduction success Harold *et al.* (1994).

In the present work, oral administration of methomyl in different doses 5, 10 and 20ppm to male rats for 90 successive days significantly decrease sperm motility and sperm concentration and pregnancy rats. The Histopathological examination of the testis showed homogenous eosinophilic material in between the semiferous tubules, hyperemic blood vessels inbetween the seminiferous tubules and multinumber of spermatognial cells with abnormal shapes. These results are in agreement with these of Krouse and Homala (1974) they reported that, oral treatment of male mice with dichlorvos decreased fertility. These effects have been attributed to a direct cytotoxic action, degeneration of seminiferous tubules and disappearance of spermatozoa and spermitide associated with damage of lydige cells. Moreover, Dunnick *et al.* (1984) concluded that, the decrease in fertility rate in dimethyl methyl phosphate (DMMP) treated rats might be due to the depressed sperm motility and the lowered sperm concentration as well as the increased sperm cell abnormalities, thus the sperm were incapable fertilization.

Similar findings were reported by Raizada *et al.* (1979) who stated that, treatment of male albino rats with zinb at dosage level of 1000mg/kg/day for 30 days produce Histopathological changes in the characterized by degeneration in the seminiferous tubules with necrosed cells. These results are in agreement with Ali (1998) and Srivastava *et al.* (1995), they mentioned that, administration of trichloroform and carbaryl to male albino rats led to increase in total sperm abnormalities and decrease in the sperm motility and sperm count.

Fig. (7): Cross section of testis of rat represented as control showing normal histological pattern of the seminiferous tubules (H & E x 40) .

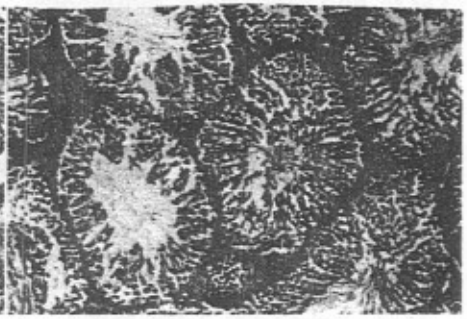


Fig. (8): Cross section of testis of rat treated with methomyl in concentration of 20ppm for 90 days, showing homogenous eosinophilic material inbetween the functioning seminiferous tubules (H & E x 40) .

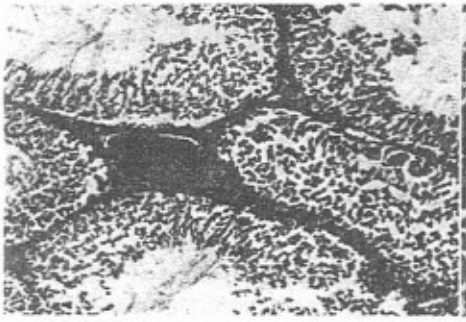


Fig. (9): Cross section of testis of rat treated with methomyl in concentration of 10ppm for 90 days, showing hyperemic blood vessels inbetween seminiferous tubules associated with homogenous eosinophilic material (H & E x 40) .

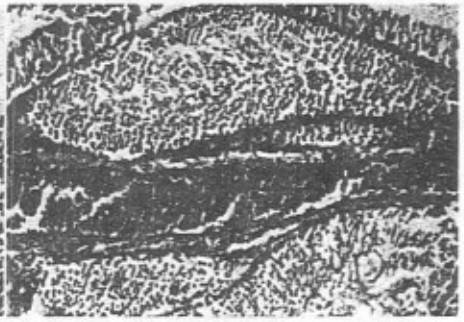


Fig. (10): Cross section of testis of rat treated with methomyl in concentration of 5ppm for 90 days, showing sever hyperemia of the blood vessels inbetween the functioning seminiferous tubules (H & E x 40) .

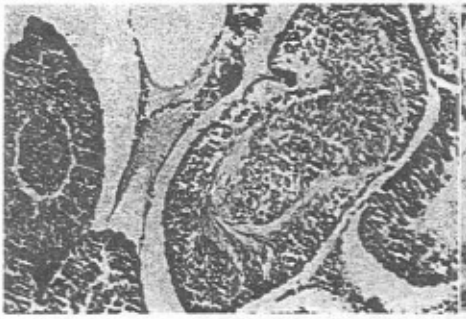


Fig. (11): Cross section of testis of rat treated with methomyl in concentration of 5ppm for 90 days, showing multi-number of primary and secondary spermatogonal cells with abnormal male shapes sperms in the central portion of seminiferous tubules (H & E x 40).

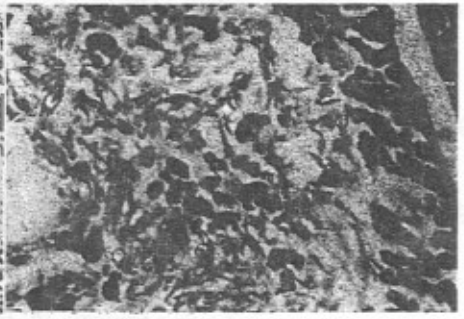


Fig. (12): Cross section of testis of rat treated with methomyl in concentration of 5ppm for 90 days, showing sever abnormal shapes sperms with spermatogonial cells in the central portion of seminiferous tubules (H & E x 160).

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دراسة تأثير المثيوميل علي بعض المعايير البيوكميائية والوظائف الفسيولوجية في ذكور الفئران البيضاء

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أظهرت الدراسات السابقة أن التعرض المستمر للمبيدات قد يسبب تأثيرات ضارة علي بعض المعايير البيوكميائية والوظائف الفسيولوجية الخاصة بحيوانات التجارب.

ونظرا لعدم وجود معلومات عن احتمالات التأثيرات الضارة لمركب المثيوميل علي كل من وظائف الغدة الدرقية والخصوبة في الذكور لذا فقد أجريت هذه الدراسة لإلقاء الضوء عن تأثير مركب المثيوميل علي بعض المعايير البيوكميائية التي لها علاقة بوظائف الكبد وكذلك بض الهرمونات الخاصة بالغدة الدرقية و خصوبة ذكور الفئران البيضاء حيث قسمت ذكور الفئران البيضاء إلي أربعة مجموعات متساوية (١٠ حيوانات) و اعتبرت المجموعة الأولي كمجموعة ضابطة - أما المجموعة الثانية والثالثة والرابعة فقد عوملت بمستحضر المثيوميل (كويك) عن طريق مياه الشرب بالتراكيزات ٥ ، ١٠ ، ٢٠ جزء في المليون وذلك لمدة ٩٠ يوميا. وقد تم أخذ عينات الدم من الحيوانات المعاملة وغير المعاملة وذلك بعد ٣٠، ٦٠، ٩٠ يوما من بداية المعاملة وذلك لتقدير نشاط كل من الإنزيمات الناقلة للأمين (ALT & AST) ومستوي كل من البروتين الكلي والالبيومين وكذلك تم تقدير مستوي كل من هرمون الثيروكسين (T_4)، التراي - أيودوثيرونين و التستستيرون.

و في نهاية المعاملة تم ذبح كل الحيوانات المعاملة و غير المعاملة و تم وزن كل من الخصية، الحويصلات المنوية و غدة البروستاتا و كذلك إجراء الفحوصات الهستوباثولوجية لكل من الخصية و الغدة الرقية لمعرفة الأضرار التي لحقت بالأنسجة الداخلية بها.

أيضا تم الحصول علي السائل المنوي من البربخ ثم اختبار حركة الحيوانات المنوية و عدد الحيوانات المنوية. أيضا قد تم عمل جماع بين ذكور الفئران المعاملة و اناث الفئران غير المعاملة و ذلك لمعرفة تأثير المركب المختبر علي معدل الحمل و نسبة المواليد بالنسبة إلي عدد الإناث الحوامل و كذلك نسبة المواليد بالنسبة إلي عدد الإناث الكلي.

و قد أظهرت النتائج أن المعاملة بالمركب المختبر قد أدت إلي نقص في نشاط إنزيم (ALT) بعد ٩٠ يوم. أما بالنسبة إلي نشاط إنزيم (AST) فلم يتأثر طوال فترة التجربة. كما أنة لم يحدث تأثير بالنسبة إلي مستوي البروتين الكلي. أما بالنسبة إلي مستوي الألبيومين فقد لوحظ حدوث نقص معنوي عند إستخدام التركيز ١٠جزء في المليون بعد ٩٠ يوما من المعاملة.

كما أظهرت النتائج أن المعاملة بالمركب المختبر أدت إلي نقص مستوي هرمون الثيروكسين و التراي-أيودوثيرونين و ذلك بعد ٣٠، ٩٠ يوم يوما من المعاملة. أما بالنسبة إلي الفحص الهستوباثولوجي للغدة الدرقية فقد أوضحت النتائج حدوث ضمور و تحلل للحويصلات.

و قد أوضحت النتائج أن المعاملة بالمركب المختبر قد أثر علي التكاثر بصورة واضحة و ذلك من خلال تأثيره علي كل من حركة و عدد الحيامن حيث أدي إلي حدوث نقص معنوي، كما لوحظ نقص في معدل الحمل و عدد الأجنة بالنسبة إلي عدد الإناث الكلي.

أما بالنسبة لتأثير الميثوميل علي مستوي هورمون التستستيرون فقد أظهرت النتائج حدوث زيادة في كل من التركيزين ١٠ ، ٥ جزء في المليون و ذلك بعد ٦٠، ٩٠ يوما من المعاملة. و بالنسبة إلي الفحص الهستوباثولوجي لأنسجة الخصية فقد أدت المعاملة بالمركب المختبر إلي حدوث إرتشاحات مع حدوث احتقان للأوعية الدموية بين القنيات المنوية.