

*Materials of Conferences***ASCORBATE LEVEL IN REPRODUCTIVE ORGANS OF MALE RATS IN ACUTE DELTAMETHRIN INTOXICATION**¹Chigrinski E.A., ²Conway V.D., ¹Metrinskiy Y.Y.¹Omsk State Medical Academy, Omsk;²Omsk State Agrarian University named after P.A. Stolypin, Omsk, e-mail: chigrinski@list.ru, chigrinski@dr.com

It has been determined by the studies carried out by M.F. Ismail and H.M. Mohamed [4] that deltamethrin (DM) ($C_{22}H_{19}Br_2NO_3$) negatively exposes on the reproductive system of the mammals. Disturbances in the reproductive organs are probably associated with the oxidative stress after DM exposure [5]. Ascorbic acid is a part of the non-enzymatic antioxidant system and prevents the enhancement of the lipid peroxidation of the cell membranes observed while the oxidative stress. In this regard, relevant is to study ascorbate level and other non-enzymatic antioxidants in the reproductive organs of the experimental animals in DM intoxication.

The aim of our study was to determine the effect of DM acute intoxication on the ascorbic acid level in the reproductive organs of male rats.

The study has been carried out on 24 male rats of Wistar weighing 240 ± 10 g rats divided into two groups: Group 1 ($n = 12$) – the control rats; Group 2 ($n = 12$) – animals exposed to acute intoxication DM. Rats of Group 2 were orally administered once at a dose of DM 43,5 mg/kg body weight ($\frac{1}{2}$ LD 50) using a metallic probe and the animals of the 1st group in the same manner were administered an equivalent volume of saline. The experiment used a formulation of DM under the brand name “Butox 50” of the firm “Intervet International BV” (Netherlands).

Testes, epididymis and prostate gland were extracted 24 hours after DM administration followed by homogenization. Total protein was measured in the supernatant applying the biuret reagent and ascorbic acid by the H. Varley method [6]. The experiment was conducted in accordance with the European Convention for the Protection of Vertebrate Animals used for Experimental and other Scientific Purposes (Council of Europe No 123, Strasbourg, 1985).

Statistic data processing was performed using non-parametric U–Mann–Whitney test.

The study results indicate that ascorbate deficiency is developing in the reproductive organs of the experimental animals within one day after DM administration. DM concentration in the testes of rats in group 2 was reduced by 32% compared with the control group. In the epididymis and prostate gland of rats in group 2 the ascorbic acid ratio was reduced by 27 and 23%, respectively, compared to the 1st group.

Ascorbate reduction was occurred due to its intensive involvement into the inactivation process of reactive oxygen species including the reactions

transforming tocopheryl quinone into tocopherol. Reinforced lipid peroxidation of the cell membranes under the free radicals effect stimulates tocopheryl quinone accumulation. One of the major sources of reactive oxygen species in the cells of the reproductive organs in DM intoxication can be an acute disorder of purine metabolism described previously in various pathological conditions [1; 2; 7]. The acute disorder of purine metabolism is characterized by nucleic acids damage, impaired energy metabolism with subsequent AMP accumulation triggering a profound catabolism of purine mononucleotides up to uric acid. Our hypotheses are matched with the studies conducted by M.M. Hossain and J.R. Richardson [3] on the cell cultures found that DM causes damage and fragmentation of DNA.

Thus, the results revealed that the decrease of ascorbic acid in the testes, epididymis and prostate gland of rats is observed in a day after a single administration of deltamethrin in a dose of 43,5 mg/kg body wt.

References

1. Chigrinskiy E.A., Conway V.D. Protective effect of D-ribose against inhibition of rats testes function at excessive exercise // *J. Stress Physiol. Biochem.* – 2011. – Vol. 7, № 3. – P. 242–249.
2. Conway V.D., Race B.A., Chigrinskiy E.A. Role of ribose deficit in rat testicular metabolism under conditions of overtraining // *Bull. Exp. Biol. Med.* – 2011. – Vol. 150, № 5. – P. 649–651.
3. Hossain M.M., Richardson J.R. Mechanism of pyrethroid pesticide-induced apoptosis: role of calpain and the ER stress pathway // *Toxicol. Sci.* – 2011. – Vol. 122, № 2. – P. 512–525.
4. Ismail M.F., Mohamed H.M. Modulatory effect of lycopene on deltamethrin-induced testicular injury in rats // *Cell Biochem. Biophys.* – 2013. – Vol. 65, № 3. – P. 425–432.
5. Issam C., Samir H., Zohra H. et al. Toxic responses to deltamethrin (DM) low doses on gonads, sex hormones and lipoperoxidation in male rats following subcutaneous treatments // *J. Toxicol. Sci.* – 2009. – Vol. 34, № 6. – P. 663–670.
6. Varley H. Practical clinical biochemistry. – New Delhi : CBS publisher, 1988. – 438 p.
7. Zolin P.P., Conway V.D. Disturbances of hypoxanthine metabolism in the liver of resuscitated rats // *Bull. Exp. Biol. Med.* – 1997. – Vol. 124, № 12. – P. 1180–1182.

The work is submitted to the International Scientific Conference “Fundamental and applied research in medicine”, France, Paris, October 14–21, 2014 came to the editorial office on 12.09.2014.

EXPERIMENTAL SUBSTANTIATION OF THE ROLE OF FREE RADICAL MECHANISM OF NEUROTOXICITY IN REDUCING THE QUANTITY OF STURGEON POPULATION

Loshenko V.I., Sakharov A.V., Prosenko A.E.

Novosibirsk State Pedagogical University,
Novosibirsk, e-mail: vitalina_loshenk@mail.ru

Influence of fluctuations the hydrothermal regime in the system “reservoir – hydroelectric