

The S-methyl-(2-methoxycarbonylamino-benzoimidasole-5) thiosulfonate as potential antiparasitic agent – action on development of *Ascaris suum* eggs *in vitro*

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The standard approach for sulfur-containing organic compounds, including thiosulfonic acids and their derivatives are potential biologically active compounds with broad spectrum of action. More and more often the phenomenon of drug resistance of parasites is observed and new effective drugs are being sought for combating them. Eggs are the most resistant stage of nematodes development against anti-helmintic agents. Therefore, the goal of these studies was to demonstrate *in vitro* antiparasitic activity of the S-methyl-(2-methoxycarbonylamino-benzoimidasole-5) thiosulfonate (S-M-(-2MKA-BZ-5)TS) using *Ascaris suum* Goeze, 1782 developing eggs.

Fertilized eggs from the final uterine section of a single *A. suum* female were isolated and transferred into Falcon tubes (volume 15 ml) containing 5 ml of the drug at concentration of 0.625 mM, 1.25 mM, 2.5 mM, 5 mM and 10mM of S-M-(-2MKA-BZ-5)TS/0,1%DMSO. Controls were suspended with 0.1% DMSO. The eggs were incubated with the drug for 24, 48 and 72 hours at 27°C. For each concentration of the drug and appropriate control samples, eggs from three uterus were prepared separately. After 24, 48 and 72 h, the tubes were centrifuged, washed three times with distilled water and then 5 ml of 0.05 M HCl were added. After washing, eggs were incubated again for 20 days at 27°C. Eggs development was monitored 3 times a week under an optical microscope. At the end of the experiment, number of developed larvae in 1000 eggs (from each sample) was calculated.

It was demonstrated that both the exposure time and the concentration of the drug had an impact on the percentage of developed larvae in the *A. suum* egg culture. The best effects were achieved for the concentration of 5mM of the drug at 24, 48 i 72h exposure. 25.2%, 8.5% and 1.9% of eggs reached the larva stage, respectively (Table 1).

Table 1. Percentage of larvae (mean ± standard deviation) from *Ascaris suum* egg incubating according to time exposure and S-M-(-2MKA-BZ-5)TS concentration

Exposure time, h	Concentration, mM	1 sample, %	2 sample, %	3 sample, %	Mean of larvae, %	Standard deviation, %
24	**Control**	**46.8**	**52.4**	**58.7**	**52.6**	**5.9**
	0.625	41.4	53.6	45.7	46.9	6.2
	1.25	32.9	46.6	47.0	42.1	8.0
	2.5	32.0	42.6	40.8	38.4	5.6
	5.0	**23.6**	**26.6**	**25.5**	**25.2**	**1.5**
	10.0	27.4	24.9	31.2	27.8	3.1
48	**Control**	**41.4**	**32.6**	**53.2**	**42.4**	**10.3**
	0.625	17.6	17.3	19.4	18.1	1.1
	1.25	15.4	18.9	17.0	17.1	1.7
	2.5	13.6	15.5	12.6	13.9	1.4
	5.0	**6.9**	**6.9**	**11.9**	**8.5**	**2.9**
	10.0	23.9	23.5	22.7	23.3	0.6
72	**Control**	**33.2**	**30.7**	**40.8**	**34.9**	**5.2**
	0.625	28.7	16.0	18.9	21.2	6.6
	1.25	21.0	20.0	20.0	20.3	0.5
	2.5	13.9	15.6	21.3	16.9	3.9
	5.0	**0.0**	**0.0**	**57.0**	**1.9**	**3.3**
	10.0	0.3	15.4	17.1	10.9	9.2