

Summary

RESPONSE OF EGGS OF *CORCYRA CEPHALONICA* TOWARDS SULFURYL FLUORIDE

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Introduction and Method

Sulfuryl fluoride has become the major replacement gas for methyl bromide that was banned for pest control in industrialised countries in 2005 and will be phased out in non industrialised countries (so called Article 5 countries of the Montreal Protocol) in 2015 at the latest. Especially in African in cocoa producing areas but also in the rice industry around the world, the rice moth *Corcyra cephalonica* causes severe losses and is cause of expensive control measures. This applies very often in the course of quarantine, export and import.

During her stay in the laboratory of the department for Stored Product Protection of the Institute for Ecological Chemistry, Plant Analysis and Stored Product Protection, the first author investigated for the first time in detail the response of eggs of this species towards fumigation with sulfuryl fluoride.

The method followed the description of Baltaci et al. (2006), Eggs of different age - with different waiting period after egg laying for one day - were glued on sticky tape to bioassay the hatch of young larva. In this way, the final determination of the mortality could be carried out within a few days after the treatment.

Results and Discussion

The results of the fumigations are presented in the table and figures 1 to 4. The eggs of different age respond obviously differently to the fumigation with sulfuryl fluoride. One day exposure at 27°C shows one day old eggs to be most susceptible compared to the other eggs, with the four days old eggs to be fairly tolerant as well. With increasing exposure time, this clear tendency of difference between the egg ages is reduced and disappears. Full control was achieved at a concentration of 4.19 mg/l only after 5 days of fumigation (ct=120 x 4.19mgh/l=502mgh/l) 5.24 mg/l were sufficient to control all investigated eggs with exposure of 4 days (ct=503 mgh/l) and 5 days (ct=628

mg/h/l), as well as three days old eggs with 3 d fumigation (ct=377 mg/h/l). 3 days fumigation served to kill all eggs of all ages with 6.24 mg/l (ct=449mg/h/l).

These ct-products are in range with corresponding values for lethal ct products for the other related stored product pest moths *Ephesia kuehniella*, *Plodia interpunctella* and *Ephesia elutella* (Baltaci et al., 2006).

Table: Mortality for *Corcyra cephalonica* eggs after fumigation with sulfuryl fluoride for different exposure times at 27°C and 70%r.h.; 0% = 30 eggs

conc. g/m ³	Exposure time in days															
	1				2				3				4		5	
	% -mortality of different ages of eggs in days															
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	1	2
1.00	18	16	14	20	26	30	22	24	32	44	46	58	44	44	58	50
1.48	30	16	22	20	46	30	28	42	56	52	64	84	76	62	88	70
1.99	38	22	24	40	54	54	46	66	64	62	68	92	88	78	94	88
4.19	48	30	36	52	88	82	78	90	96	94	98	96	98	96	100	100
5.24	78	36	44	62	98	92	94	92	98	96	100	96	100	100	100	100
6.24	88	52	56	66	100	98	96	94	100	100	100	100	100	100	100	100
Control	10	12	10	8	6	2	10	10	8	8	10	10	2	2	6	6

It was confirmed that sulfuryl fluoride is quite suitable to control also the most tolerant egg stages of the rice moth *Corcyra cephalonica* as replacement for methyl bromide with ct-products significantly below 1,500 mg h sulfuryl fluoride/l

Reference

Baltaci, D., Klementz, D., Gerowitt, B., Drinkall, M., Reichmuth, Ch. (2006) Sulfuryl difluoride to control toward premature life stages of *Ephesia elutella* (HÜBNER). In: Annual International Research Conference on Methyl Bromide Alternatives and Emissions Reductions. November 6-9, 2006, Orlando, USA., 106-1 – 106-4.

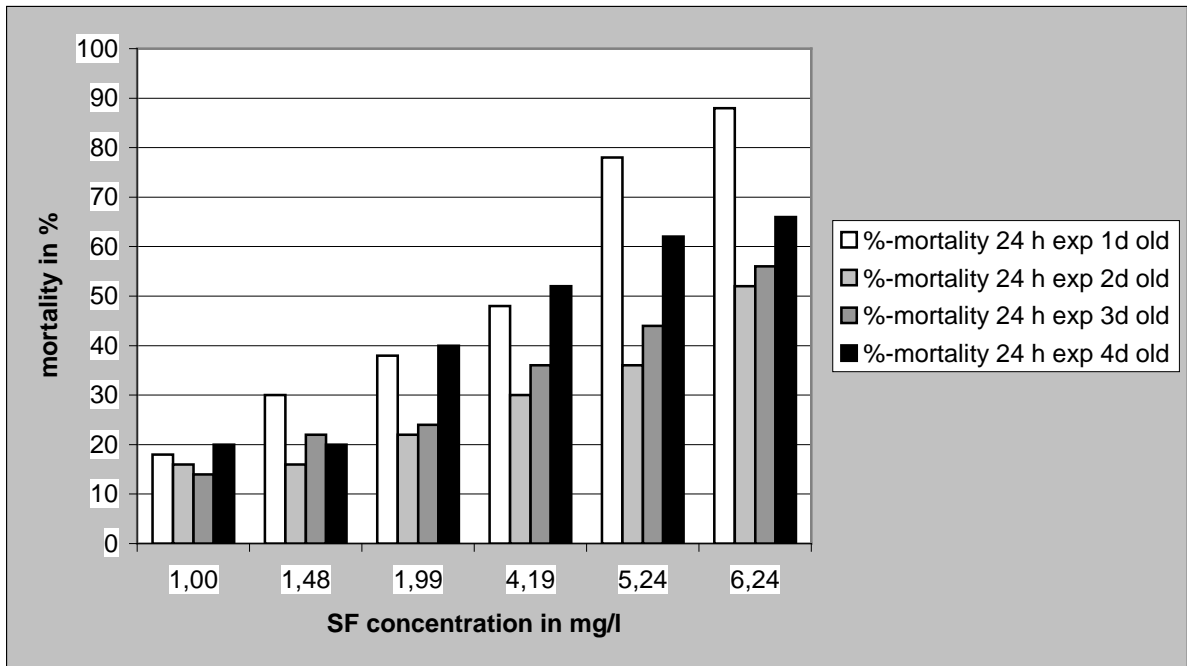


Figure 1: 24h treatment

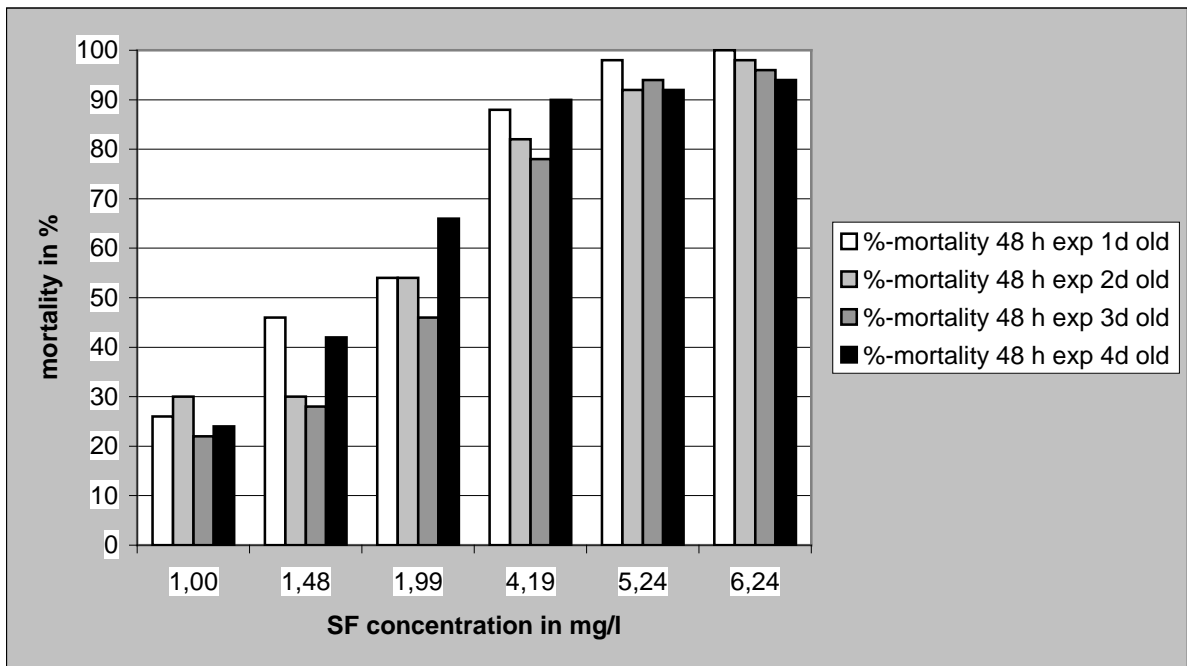


Figure 2: 48h treatment

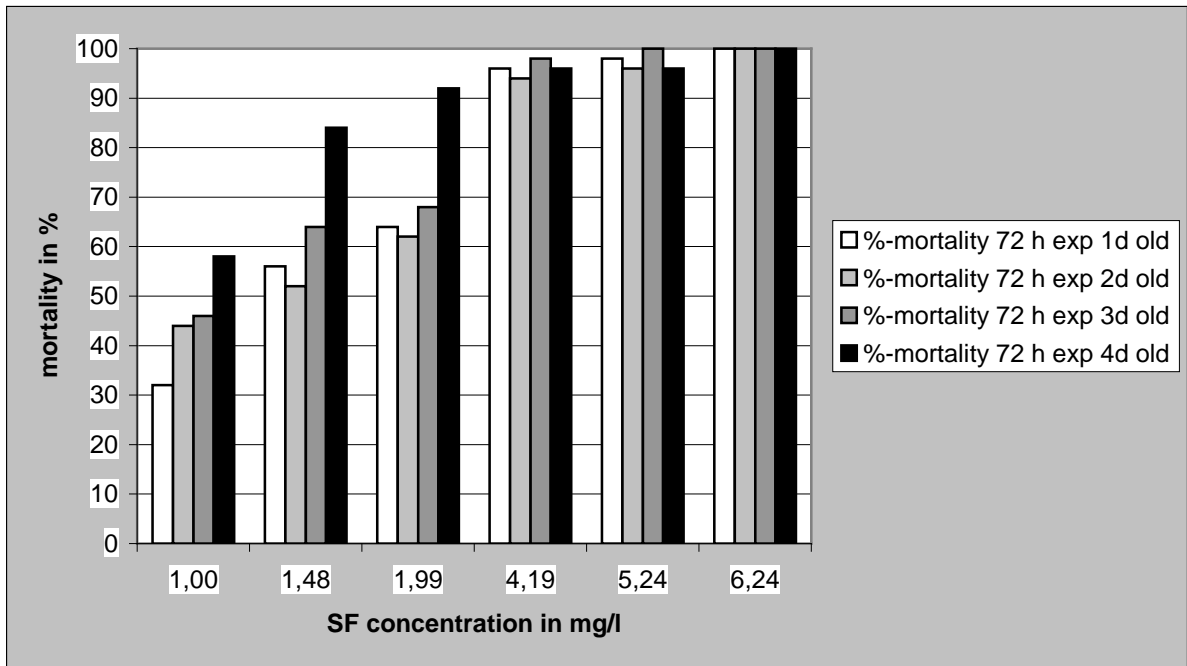


Figure 3: 72 h treatment

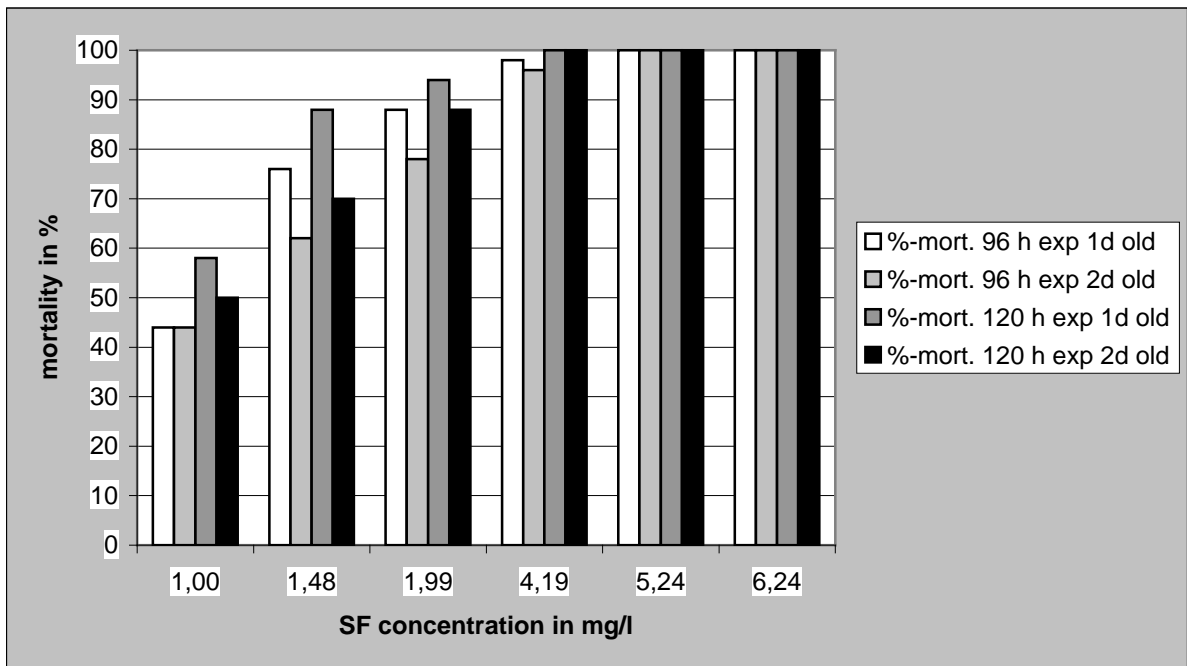


Figure 4: 96h and 120h treatment

Figure 1-4: Mortality of 1-4 days old eggs of the rice moth *Corcyra cephalonica* after fumigation in the laboratory for 24h, 48h, 72h, 96h and 120h, respectively, at 27°C, 70%rh