

Development of Silafluofen-Based Termiticides in Thailand

by

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Abstract

Silafluofen (Katsuda *et al.* 2005) was invented by Katsuda *et al.* in 1984 by introducing a silicone atom into the pyrethroidal chemical structure. In addition to the high insecticidal activity and safety to mammals, this compound is featured by low fish toxicity, chemical stabilities under sunlight, in the soil and under alkaline environments, some of which are not common to pyrethroids. In Thailand, we proceeded with development works of silafluofen-based termiticides from 2005 by starting laboratory efficacy tests and field efficacy tests in Phuket. In 2008, a silafluofen EC formulation was applied for the FDA registration in Thailand, and it was approved in February of 2010. The marketing of the product is under preparation. With time passage of 5 years at the end of 2010, the field tests in Phuket still in continuation have confirmed the effectiveness in controlling termites for a long period. This time, the efficacy test results of the silafluofen EC are reported.

Key words: pyrethroid, silafluofen, termiticide, fish toxicity

Silafluofen EC formulation

This product contains silafluofen 15.0%(w/w) as termiticidal ingredient. Its use methods and application rates are as follows:

Use methods; Dilute the EC (1kg) with water (99L), and spray the dilution on the soil or timber at a concentration of 0.15% as silafluofen.

Application rates; 5L/m² for the soil treatment and 0.3L/m² on the timber treatment, respectively.

Laboratory efficacy tests

1. Standard laboratory efficacy test method in Thailand (Vongkaluang and Katsuda 2006)

Test procedures: Fig. 1

Test results: Table 1

Table 1 Test results of dilutions of silafluofen termiticide

Test termiticide	Mortality of termites days after treatment (%)							
	1d	3d	5d	7d	10d	14d	30d	60d
Silafluofen 0.10%	0	5	10	50	60	100	100	100
Silafluofen 0.15%	5	20	40	100	100	100	100	100
Control	0	0	0	10	10	20	50	80

As shown in Table 1, mortality of termites reached 100% within 2 weeks with no or slightly wood weight loss of wood piece at silafluofen plots treated with concentrations of 0.10% and 0.15% as active ingredient.

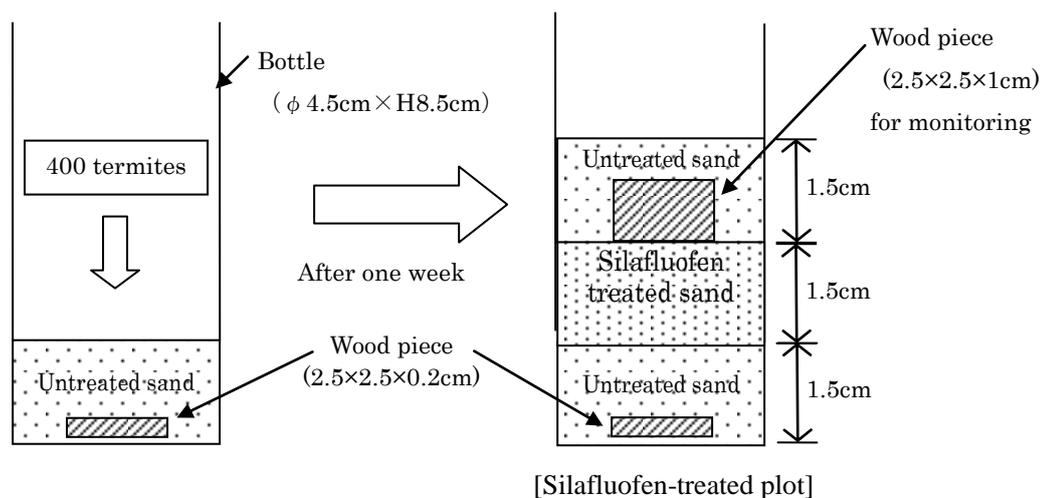


Fig. 1 Standard laboratory efficacy test method in Thailand

2. JWPA-S-13 (soil penetration test) method in Japan

Test procedures: Fig. 2

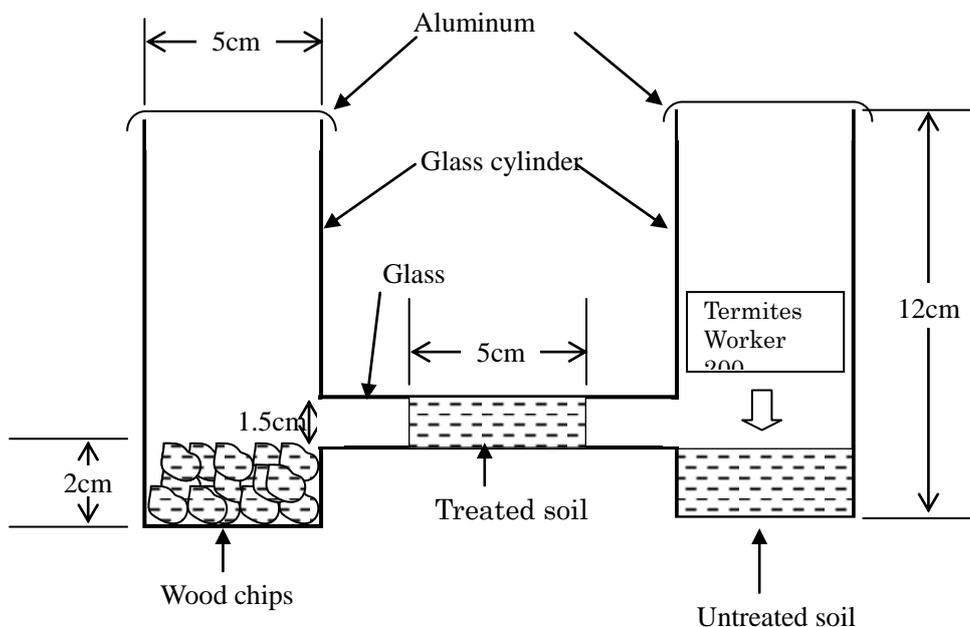


Fig. 2 JWPA-S-13 (soil penetration test) method in Japan

Test results: Table 2

Table 2 Test results of dilutions of silafluofen termiticide

Test termiticide	Mean penetration in the test tube (mm)	
	Non-weathered	Weathered (40°C, 4weeks)
Silafluofen 0.10%	2.5	0
Silafluofen 0.25%	0	3.5
Control	50	50

Silafluofen-based EC formulations for the soil treatment sufficiently prevented the termite penetration at a concentration of 0.1%.

Field efficacy tests

1. Standard modified ground board test method in Thailand (Vongkaluang and Katsuda 2009)

Test procedures: Fig. 3

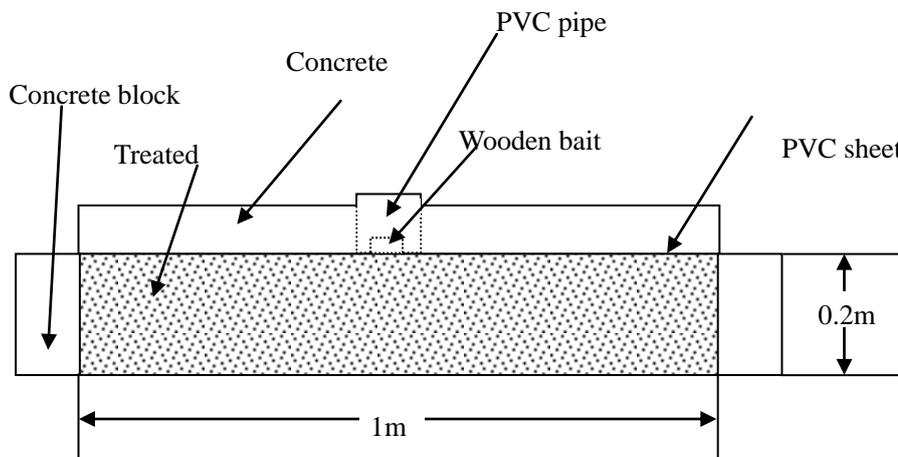


Fig. 3 Standard modified ground board test method in Thailand

Test results: Silafluofen at the concentrations of 0.10% and 0.15% performed well and prevented the underground tunneling of subterranean termites for a long period of time.

2. JWPA-S-13 method in Japan

Test procedures: Fig. 4

Test results: Silafluofen-based termiticides showed high residual efficacy against termites for 7 years.

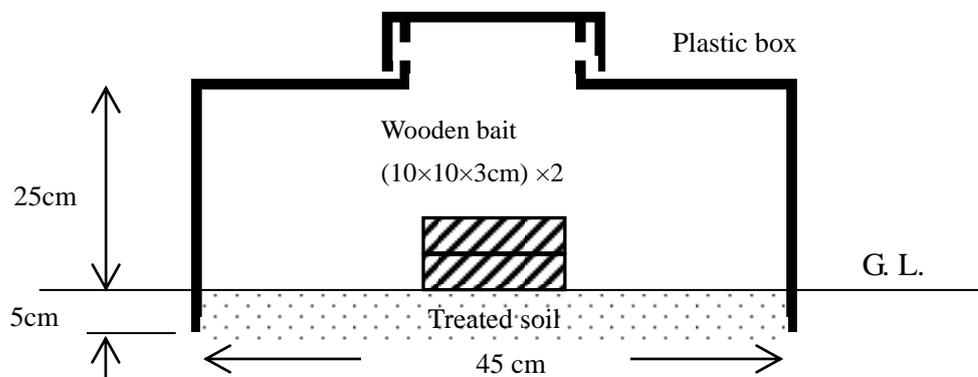


Fig. 4 JWPA-S-13 method in Japan

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