

SULFOTINE™ (LITHIUM PERFLUOROOCCTANESULFONATE): A NEW ACTIVE FOR BAITS AGAINST DOMESTIC CRAWLING INSECTS

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Lithium perfluorooctanesulfonate (LPOS, proposed common name Sulfotine™) is an isomeric mixture containing approximately 70% of the linear isomer and 30% branched isomers. Molecular formula for LPOS is $C_8F_{17}LiO_3S$, and acute oral LD_{50} is greater than 5,000 mg/kg. LPOS exhibits promising oral toxicity to various domestic insect pests, mainly cockroaches and ants. In laboratory conditions, an experimental solid cockroach bait containing 1% LPOS has been evaluated against laboratory (susceptible) and wild strains (pyrethroids tolerant) of the German cockroach, *Blattella germanica* (L.). The bait has also been evaluated against laboratory susceptible Oriental and American cockroaches, *Blatta orientalis* L., *Periplaneta americana* (L.).

Laboratory tests were performed in large glass arenas (1 x 1 m) with adequate competitive food, water and shelter. Mixed populations with naturally developed nymph, male and female ratios (approx. 200 per arena) were tested. Pre-counted cohorts of males, females and nymphs were also tested. In both tests, insects were acclimated for 3 days before the bait was introduced. Mortality was recorded daily.

LT_{50} and LT_{90} values (with 95% fiducial limits) are summarized in Table 1. The first dead individuals of *B. germanica* were found 4-6 hrs. after LPOS bait introduction. Initial mortality of males started sooner than the other life stages, although this speed of kill was not reflected in the LT_{50} data. The initial kill of *B. orientalis* and *P. americana* was slower, starting about 8-12 hrs after initial exposure. All individuals of tested populations died usually during 10-15 days post initial exposure.

The LPOS bait exhibited a single feeding feature. When males and females of *B. germanica*, *B. orientalis* and *P. americana* were fed the bait for 2 hrs. (and then the baits were removed), mortality was 100%, 92-100% and 100% respectively, after a 5-7 day holding period. LPOS exhibited distinct secondary kill. *B. germanica* and *B. orientalis* that fed on feces and regurgitated intestinal contents were killed during a 3-5 day period.

Experimental bait with LPOS has been tested in the field (hospital kitchens and laboratories) in doses of 4-5 baits per 10 square meters of area. Reduction of *B. germanica* (based on sticky trap counts) ranging from 92 to 100% were observed during a one month to one year post-treatment period.

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Table 1. Speed of kill of *B. germanica*, *B. orientalis* and *P. americana* populations exposed to an experimental LPOS bait in the laboratory. LT₅₀ and LT₉₀ values in days (95% fiducial limits in parentheses); F females, M males, A nymphs (L3-L5), T total.

Species	Strain	sex	LT 50	LT 90
<i>B. germanica</i>	NIPH	F	0.7(0.5-0.9)	5.3(4.1-7.6)
		M	0.8(0.6-1.0)	4.0(3.3-5.3)
		A	0.9(0.7-1.2)	5.5(4.1-8.6)
		T	0.8(0.6-1.0)	5.0(4.0-6.9)
<i>B. germanica</i>	Rejmontova	T	0.9(0.7-1.1)	3.3(2.7-4.5)
	Soldanova	T	0.6(0.5-0.7)	2.5(2.1-3.3)
	Radlice	T	0.7(0.5-1.0)	2.5(2.1-3.4)
	Suchdol	T	0.4(NPA-0.8)	2.2(1.3-10.8)
	Homolka	T	1.4(1.2-1.6)	5.1(4.3-6.4)
<i>B. orientalis</i>	NIPH	F	1.2(0.9-1.6)	6.1(4.1-11.7)
		M	3.0(2.6-3.4)	11.1(9.7-14.5)
		N	1.1(0.9-1.4)	4.9(4.1-6.5)
		T	1.5(1.3-1.8)	6.5(5.5-8.1)
<i>P. americana</i>	NIPH	F	0.8(0.7-0.8)	1.1(1.0-1.3)
		M	0.8(0.7-0.8)	1.2(1.1-1.4)