

Short report

Biological activity of *Schinus molle* on *Triatoma infestans*

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Abstract

Hexanic extracts from leaves and fruits of *Schinus molle* were tested for repellent and insecticidal properties against first instar nymphs and eggs of *Triatoma infestans*, the vector of Chagas' disease.

Leaf and fruit extracts were highly repellent for first nymphs. Fruit extracts had also ovicidal activity.

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Keywords: *Schinus molle*; *Triatoma infestans*; Repellent activity; Ovicidal activity

1. Plant

Schinus molle L. var: areira (Anacardiaceae): leaves and fruits collected at Bahía Blanca City, South Argentina, in November 2003 and identified at the Herbarium of the Departamento de Biología, Bioquímica y Farmacia, UNS (Herbarium Voucher Number, BBB 10444).

2. Uses in traditional medicine and other reported activities

Astringent, antibacterial, diuretic, digestive stimulant, tonic, antiviral, purgative, for fractures, topical antiseptic, wound healer, to stop bleeding, for toothaches, for rheumatism, stimulant, antidepressant, for menstrual disorders, for respiratory and urinary tract infections and insecticidal activity [1–8].

3. Previously isolated classes of constituents

Tannins, alkaloids, flavonoids, steroidal saponins, sterols, terpenes, gums, resins and essential oil [9,10].

4. Tested material

Hexanic extracts of leaves and fruits (yields: 0.88% and 0.12%, respectively).

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Table 1
Repellent effect of the *S. molle* leaves and fruits hexanic extracts on first instar nymphs

Treatment 0.5% (w/v)	Repellency index (RI)
Fruits hexanic extract	0.12±0.109 a
Leaves hexanic extract	0.14±0.219 a
DEET	0 a
Control	0.9±0.223 b

Values are mean±S.D. $N=5$ replicates of six individuals each. Values followed by the same letter are not significantly different (DMS, $P>0.05$).

5. Studied activity

Repellency test [11] using a circular white filter paper #1 (9 cm diameter, Whatman International Ltd., Maidstone, England) divided in two halves. One of the halves was treated with 0.5 ml of acetone and the other with 0.5 ml acetone solutions of hexanic plant extracts. After solvent evaporation (60 min), the filter paper were fitted together to make a single layer and used to cover the floor of Petri dish. As control, circular white filter papers divided in two halves, one treated with solvent and the other untreated were used. As positive control diethyltoluamide (DEET) was used. Six nymphs were released in the centre of each Petri dish and their distribution was recorded at 1 h later (five replicates). A repellency index was calculated as:

$$RI = TNT$$

where: T =number of insects on the treated zone and NT =number of insects on the untreated zone.

Ovicidal activity. Batches of 10 eggs were topically applied on opercule with leaf and fruit extracts or acetone (controls), and hatching was recorded (three replicates).

6. Used insect

Eggs of 14 days of development [12] and first nymphal instar of *Triatoma infestans* Klug (Hemiptera: reduviidae), from the laboratory colony of Zoología de Invertebrados II, UNS, were used.

7. Results

Reported in Tables 1 (repellency) and 2 (ovicidal effects).

8. Conclusion

Leaf and fruit extracts assayed on *T. infestans* nymphs produced repellent effect significantly higher than the control treatment. Both extracts caused the same effect. Repellency on *T. infestans* has being previously reported used ethanolic extract from unripened fruit of *Melia azedarach* for first and fourth instar nymphs [13]. Hexanic extracts from leaves and fruits of *S. molle* have showed repellent effect on neonate larvae of *Cydia pomonella* [8]. At the same concentration as in this study, no repellency was observed on fifth instar nymphs of *T. infestans* for the flowable formulation of deltamethrin [14].

Table 2
Ovicidal effect of the *S. molle* leaves and fruit extracts on eggs of 14 days of development

Treatment	Extracts concentration (w/v % in acetone)			
	3	1.5	0.75	Control
Fruits hexanic extract	20±10 a	36.6±15.3 a	76.6±23.1 b	100±0 c
Leaves hexanic extract	96.6±5.7 a	100±0 a	100±0 a	100±0 a

Egg hatching (%). Values are mean±S.D. $N=5$ replicates of 10 eggs each. Values followed by the same letter are not significantly different (DMS, $P>0.05$).

Ovicidal activity was observed using fruit extracts. No effects on egg hatching were detected using leaf extracts. When ethanolic extracts from unripe fruits of *M. azedarach* were evaluated on eggs of *T. infestans*, at the same concentration as in our bioassay, no ovicidal activity was found [13].

These results suggest that *S. molle* extract must be taken into account in Chagas' vector control.

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