REPELLENT ASSAYS 2023

Version: 2.1
March 2023

Legal / Shipping address

INVENesis Sàrl
Rue de Neuchâtel 15A
2072 St-Blaise (NE)
Switzerland

Tick larvae deterrent / repellent

INV-T-022

Ectoparasites / vectors - repellency

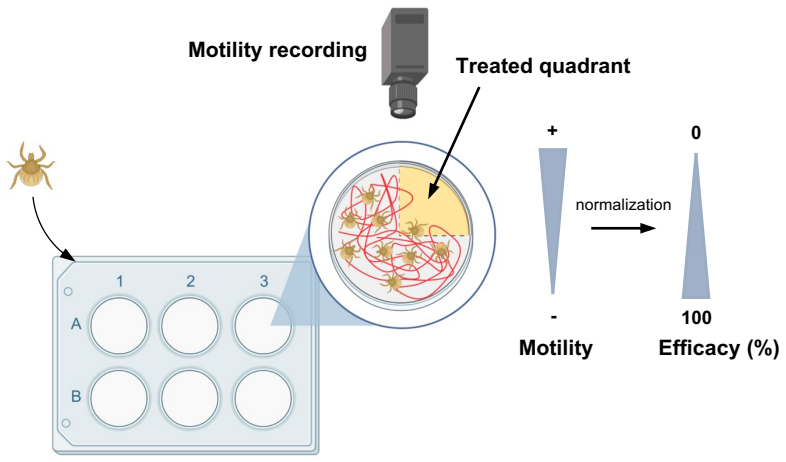
Treatment exposure modality:	**Tarsal with choice**
Efficacy type:	**Deterrency (%)**
Stock solution	**20 mM in EtOH or MeOH**
Volume / datapoint	**30 µL (triplicates)**

HTS

Rs (*Rhipicephalus sanguineus*)
Ir (*Ixodes ricinus*)

In brief:

The INVENesis tick repellent assay evaluates both deterrent & fast toxicity effects of a treated surface with test compounds on larvae of hard ticks (*Ixodidae*). 30-60 tick larvae are deposited in a circular arena where one quadrant of the surface is treated. Ticks are deposited in the non-treated area. After 1 minute, the distribution of ticks in the treated and untreated areas is measured for a duration of 2 minutes. Deterrent effect is expressed in %. 100% means that ticks completely avoided the treated surface. Toxicity is measured in the same setup over a duration of 8 minutes and the mortality is expressed in % motility reduction between the beginning and the end of the 8 minutes.



Tick nymph vertical deterrent / repellent

INV-T-021

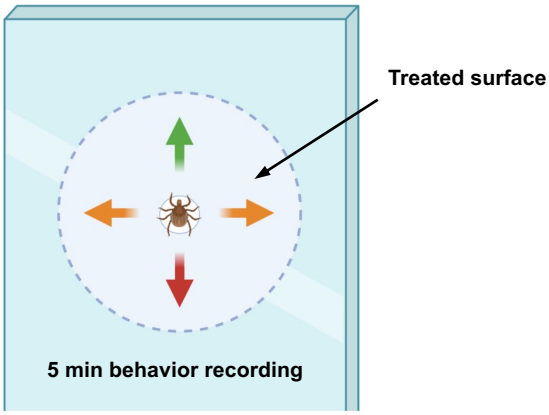
Ectoparasites / vectors - repellency

Treatment exposure modality:	**Tarsal with choice**
Efficacy type:	**Deterrency (%)**
Stock solution	**20 mM in EtOH or MeOH**
Volume / datapoint	**360 µL (monoplicates)**

Ir (*Ixodes ricinus*)

In brief:

The INVENesis tick nymphs vertical deterrent/repellent assay evaluates the deterrent effect of a treated glass plate on walking *Ixodes ricinus* nymphs. Individual ticks (15 per dose) are deposited in an untreated surface surrounded by a treated ring. The behaviour of the tick following deposition is annotated. Ticks climbing through the treatment are considered non affected by the treatment. Ticks walking down or letting themselves fall to the ground are considered repelled. Ticks not walking or walking horizontally are considered inconclusive and discarded from the experiment.



Tick adult vertical deterrent / repellent

INV-T-029

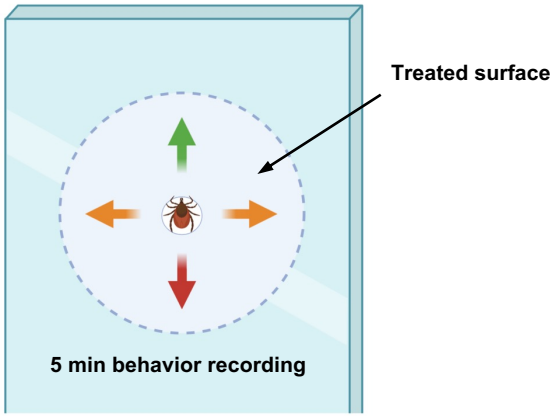
Ectoparasites / vectors - repellency

Treatment exposure modality:	**Tarsal with choice**
Efficacy type:	**Deterrency (%)**
Stock solution	**20 mM in EtOH or MeOH**
Volume / datapoint	**360 µL (monoplicates)**

Ir (*Ixodes ricinus*)

In brief:

The INVENesis tick adult vertical deterrent/repellent assay evaluates the deterrent effect of a treated glass plate on adult *Ixodes ricinus*. Individual ticks are deposited in an untreated surface surrounded by a treated ring. The behaviour of the tick following deposition is annotated. Ticks climbing through the treatment are considered non affected. Ticks walking down or letting themselves fall to the ground are considered repelled. Ticks walking not walking or walking horizontally are considered inconclusive and discarded from the experiment.



Mosquito adult deterrent repellent (1 warm body)

INV-T-025

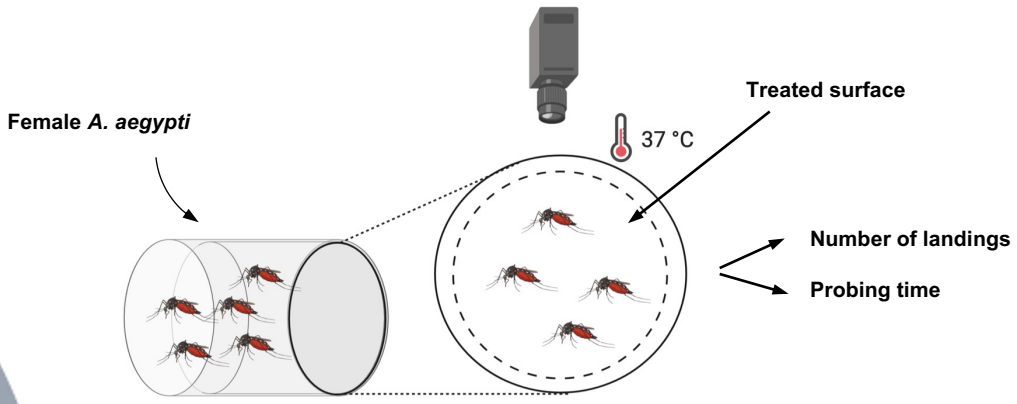
Ectoparasites / vectors - repellency

Treatment exposure modality:	**Olfaction / Contact with choice**
Efficacy type:	**Repellency (%)** **Duration on warm body**
Stock solution	**20 mM in EtOH or H_2O**
Volume / datapoint	**300 µL (triplicates)**

Ae (*Aedes aegypti*) / tobd

In brief:

The INVENesis mosquito adult deterrent/repellent assay evaluates the effect of treated surfaces on the number of landing of adults *Aedes aegypti* and the total time spent by mosquitoes on a warm body. Adult mosquitoes are offered a treated heated surface (warm body) and the number of landing and the time spent on the warm body is recorded automatically by machine vision. Repellency (based on the number of landings) is expressed in % of the negative controls, 100 % meaning no landings on the warm body. The time spent on the warm body is also expressed in % of the negative controls, 100 % meaning that the mosquitoes spent the same time as on a warm body treated with a placebo.



Mosquito adult deterrent repellent (2 warm bodies choice)

INV-T-030

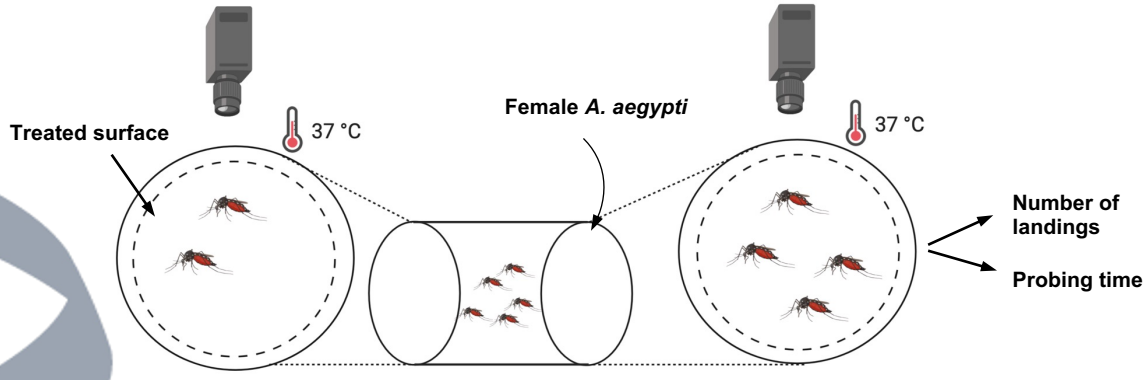
Ectoparasites / vectors - repellency

Treatment exposure modality:	**Olfaction / Contact with choice**
Efficacy type:	**Repellency (%)** **Duration on warm body**
Stock solution	**20 mM in EtOH**
Volume / datapoint	**300 µL (triplicates)**

Ae (*Aedes aegypti*) / tobd

In brief:

The INVENesis mosquito adult deterrent/repellent assay evaluates the effect of treated surfaces on the number of landing of adults *Aedes aegypti* and the total time spent by mosquitoes on a warm body. Adult mosquitoes are offered a treated heated surface (warm body) and a non-treated warm body separated by defined distances. The number of landing and the time spent on each warm body is recorded automatically by machine vision. For each of the 2 warm bodies, repellency (based on the number of landings) is expressed in % of the negative controls, 100 % meaning no landings on the warm body. The time spent on each warm body is also expressed in % of the negative controls, 100 % meaning that the mosquitoes spent the same time on the warm body as in an experiment with the treated warm body having received a placebo treatment. This assay allows to estimate the distance of protection induced by a treated surface.



Flea adult repellent

INV-T-043

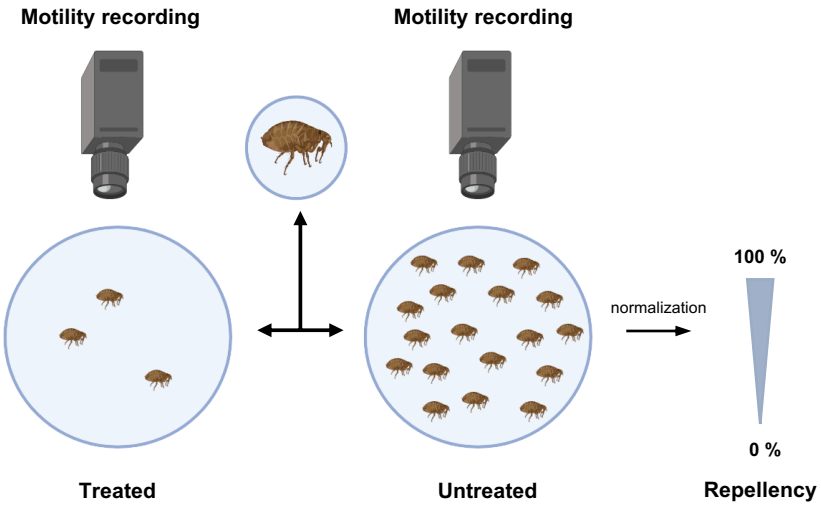
Ectoparasites / vectors - repellency

Treatment exposure modality:	**Tarsal with choice**
Efficacy type:	**Repellency (%)**
Stock solution	**20 mM in EtOH**
Volume / datapoint	**100 µL (triplicates)**

Cf (*Ctenocephalides felis*) / sensitive

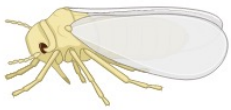
In brief:

The INVENesis flea adult repellent assay measures the effect of deterrent/repellent compounds on adult fleas. Insects are deposited in an untreated area with access to a control (untreated) well and a treated one. Motility in each well is measured over a 3 min period and efficacy is expressed in % repellency.



Whitefly adult deterrent / repellent

INV-T-040



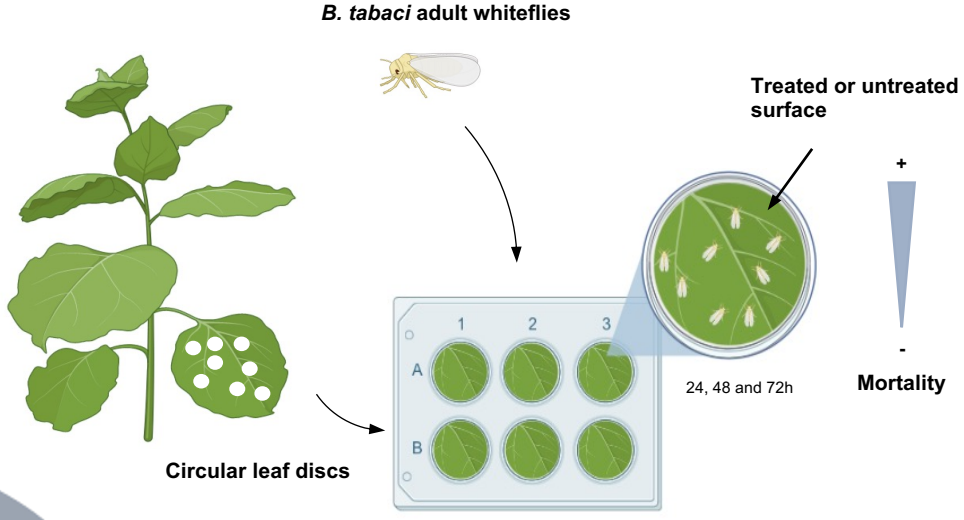
Ectoparasites / vectors - repellency

Treatment exposure modality:	**Repellent**
Efficacy type:	**Deterrency (%)**
Stock solution	**20 mM in H_2O or EtOH**
Volume / datapoint	**300 uL (triplicates)**

Bt (*Bemisia tabaci*) / MED (Q)

In brief:

The INVENesis whitefly repellent assay evaluates the effect of a treated plant leaf on *Bemisia tabaci* adult whiteflies. Flies are distributed on a treated (dipping) leaf disc and left to incubate for up to 72h. Mortality of the fleas are manually quantified after 24h, 48 and 72h exposure.



Assay throughput

Assay	Test ID	Replicates / datapoint	Max datapoint / year	Assay throughput	Price discount (HTS)
Tick larvae repellent *	INV-T-022	3	Project-based	++	++
Tick nymph vertical repellent	INV-T-021	15	Project-based	+	+
Tick adult vertical repellent	INV-T-029	15	Project-based	+	+
Mosquito adult repellent 1 *	INV-T-025	6	Project-based	+	+
Mosquito adult repellent 2	INV-T-030	6	Project-based	+	+
Flea adult repellent *	INV-T-043	3	Project-based	+	+
Whitefly adult repellent *	INV-T-040	3	Project-based	+	+

** Assays performed on a weekly basis*

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