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# Repellent effect of basil (*Ocimum* spp) on pea aphid (*Acyrthosiphon pisum* Harris) and potential use in crops

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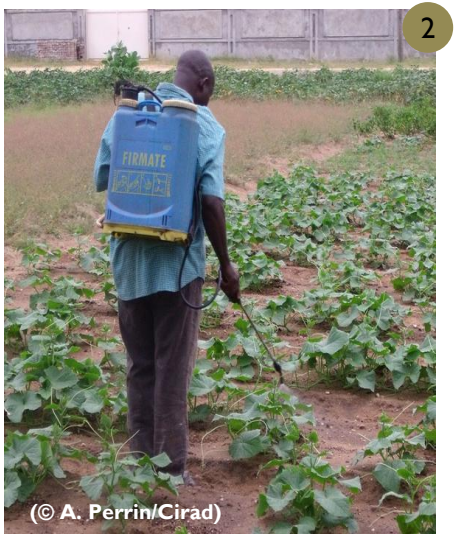
insects
MDPI

# Background


1 Aphids are one of the most important crop pests in the world (Blackman & Eastop, 2007)




2 Synthetic :

- Induce resistance effects on aphid (Diabaté et al., 2014; Nikolova & Georgieva, 2014)
- Produce negative effects on non-target organisms
- Produce harmful effects on environment and human health (Ndakidemi et al., 2016; Sankoh et al., 2016).

3 Environmental-friendly agricultural practices have become attractive in order to solve these problems.

4 An interesting approach in this respect is the use of pesticide plants (Mkindi et al., 2017; Yarou et al., 2017)

**Objective: Evaluate the repellent activity of *Ocimum basilicum* L. and *Ocimum gratissimum* L. on the pea aphid under laboratory conditions using an Y-tube olfactometer.**

# Materials & Methods

## Aphids


Aphids (*Acyrthosiphon pisum)* were reared on *Vicia faba* L.

## Plants

*O. basilicum*

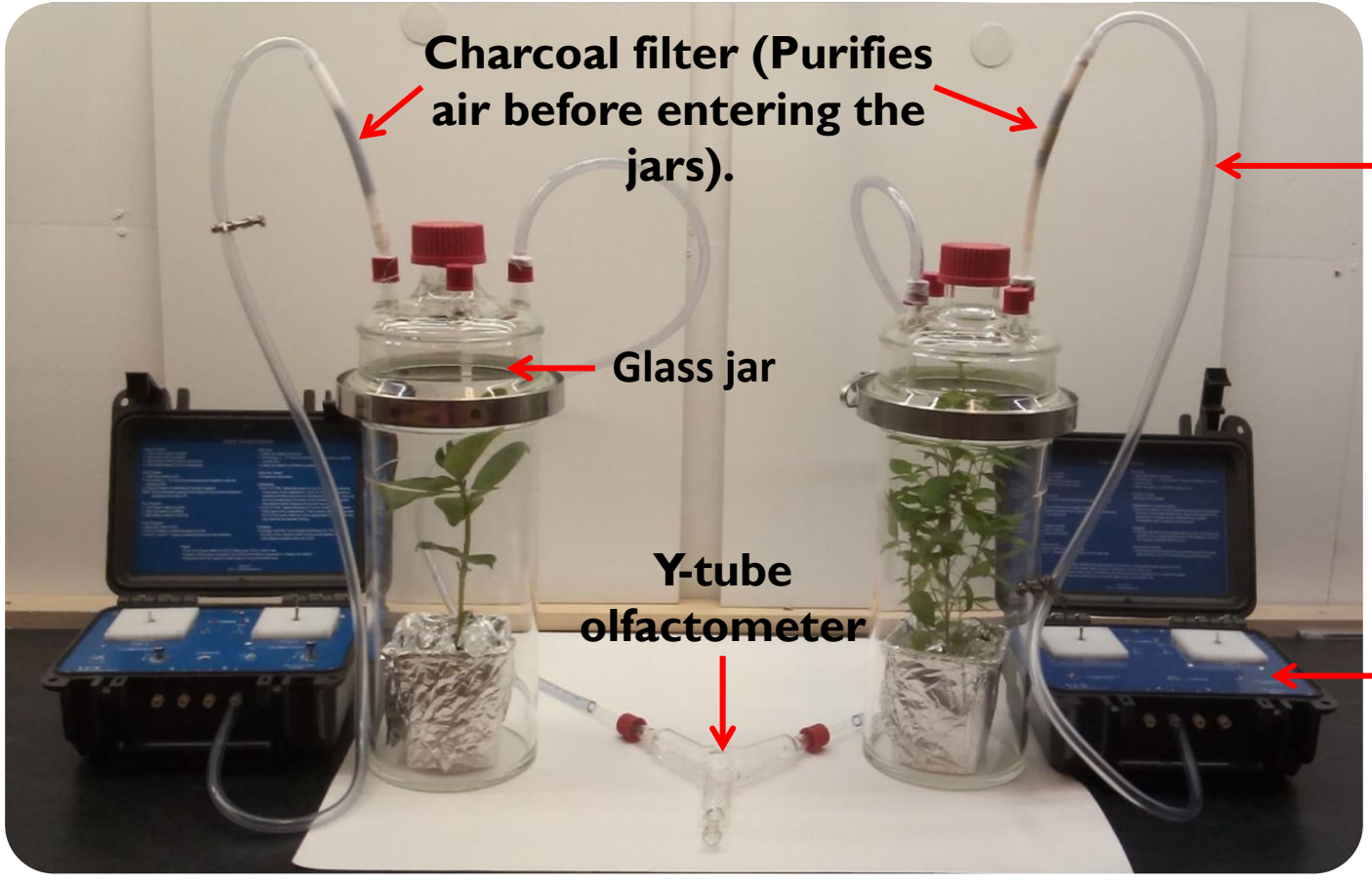
*O. gratissimum*

- Plants were individually grown.
- They were used in experiments once they reached four and five weeks after seeding for *O. basilicum* and *O. gratissimum* respectively.

**Temperature (T) :25 ± 5°C - Relative humidity (RH), 50-70% - Photoperiod: 16:8-h light: dark**

# Materials & Methods

## *Olfactometer tests : Experimental design*




Airflow through the arms was maintained at 100 mL.min$^{-1}$.

# Materials & Methods

## *Olfactometer tests*

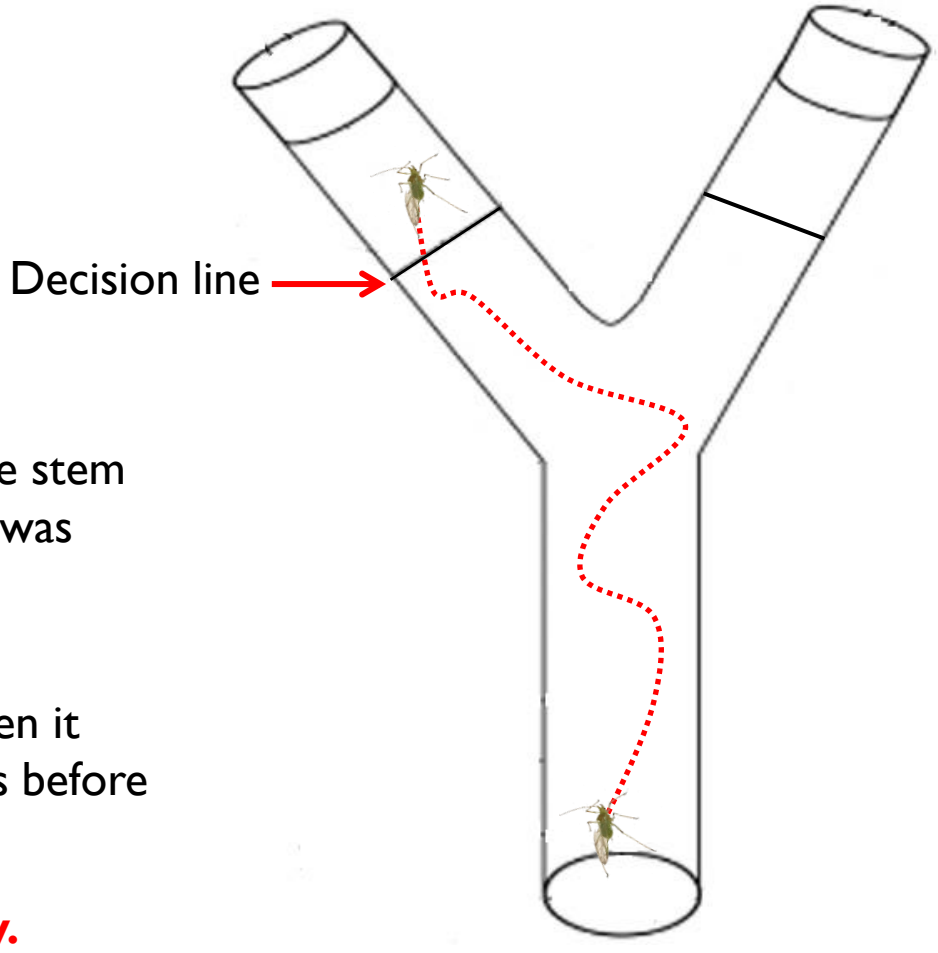
**Tested modalities:**

- Soil pot versus *O. gratissimum*.
- *V. faba* versus *O. gratissimum*.
- Soil pot versus *O. basilicum*.
- *V. faba* versus *O. basilicum*.

- Aphids were individually introduced into the stem part of the olfactometer and their position was recorded during 3 min.

- An aphid was considered as responding when it crossed the line marked on one of the arms before the end of the 3 min.

**60 aphids were tested for each modality.**



# Materials & Methods

## *Olfactometer tests*

**After every 10 aphids**

- The glass jars and the olfactometer were cleaned with pure n-hexane and dried at room temperature for 5 min.
- Potting soil and plants were replaced.
- The position of the jars was switched to avoid bias.

**Observed parameters**

- First entered zone.
- Last entered zone.
- Zone where aphids stayed for the longest time period.
- Number of visits in each olfactometer arm.

**Laboratory condition :T: 24±1˚C , RH: 45±5% RH.**

# Results

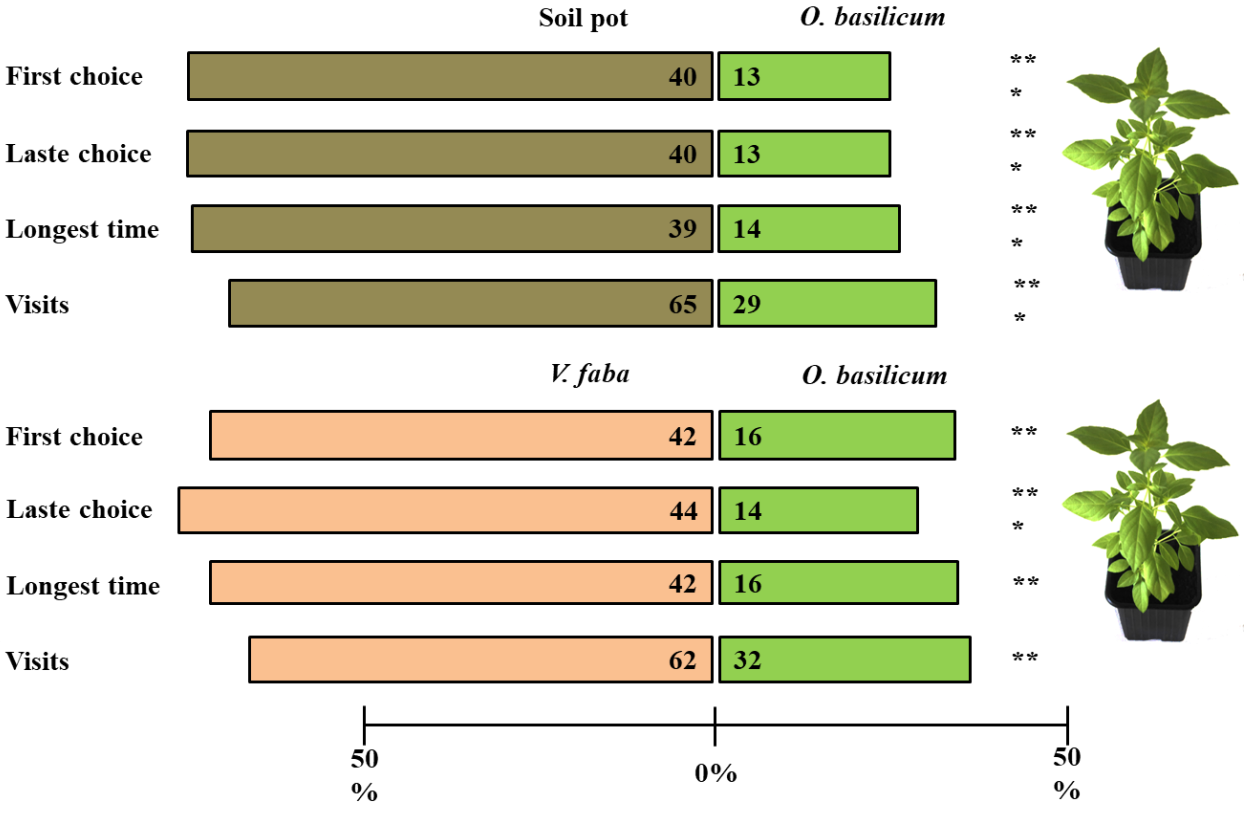
## *O. basilicum* effect on aphids

**Responding aphids (%)***

**53 (88)**

**Responding aphids (%)***

**58 (97)**




*Responding insects include living individuals present in one of the two side areas of the olfactometer.

**Aphid distribution in dual choice tests**

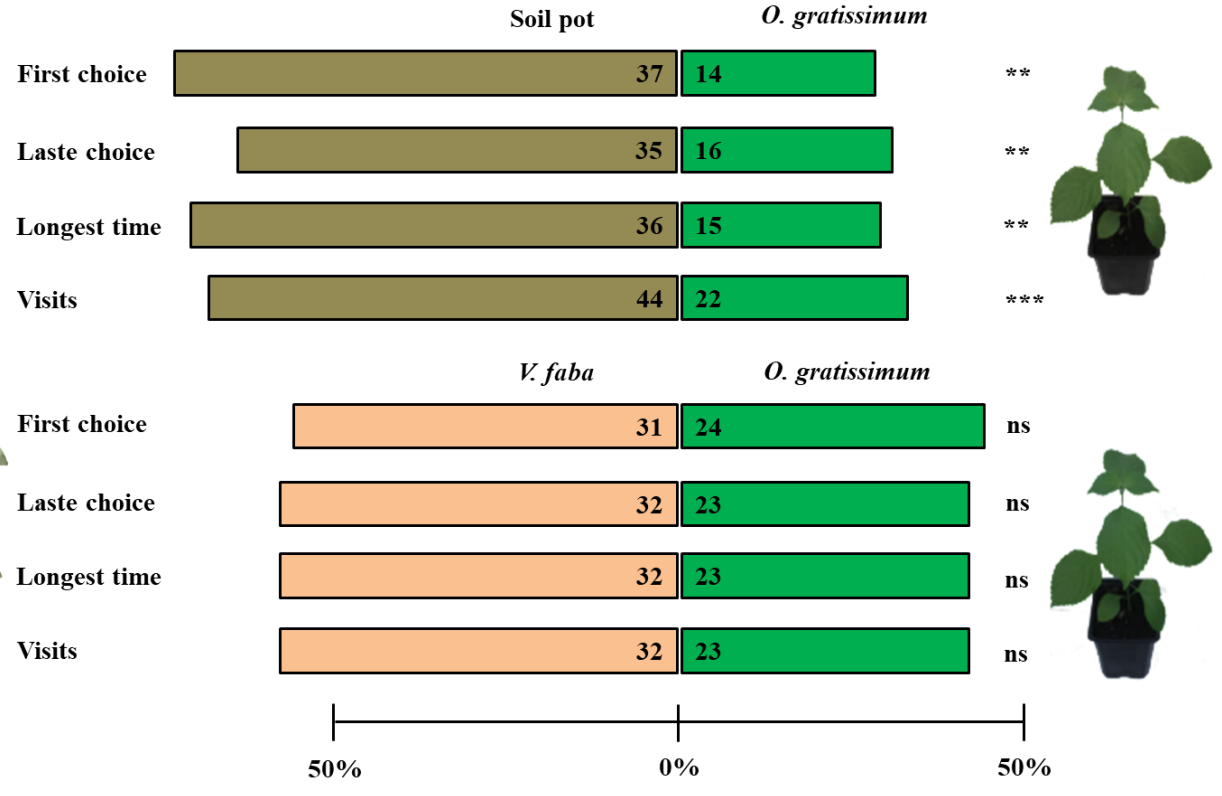
**** = p < 0.05, ***** = p < 0.001**

# Results

## *O. gratissimum* effect on aphids

**Responding aphids (%)***

**51 (85)**




**Responding aphids (%)***

**55 (92)**

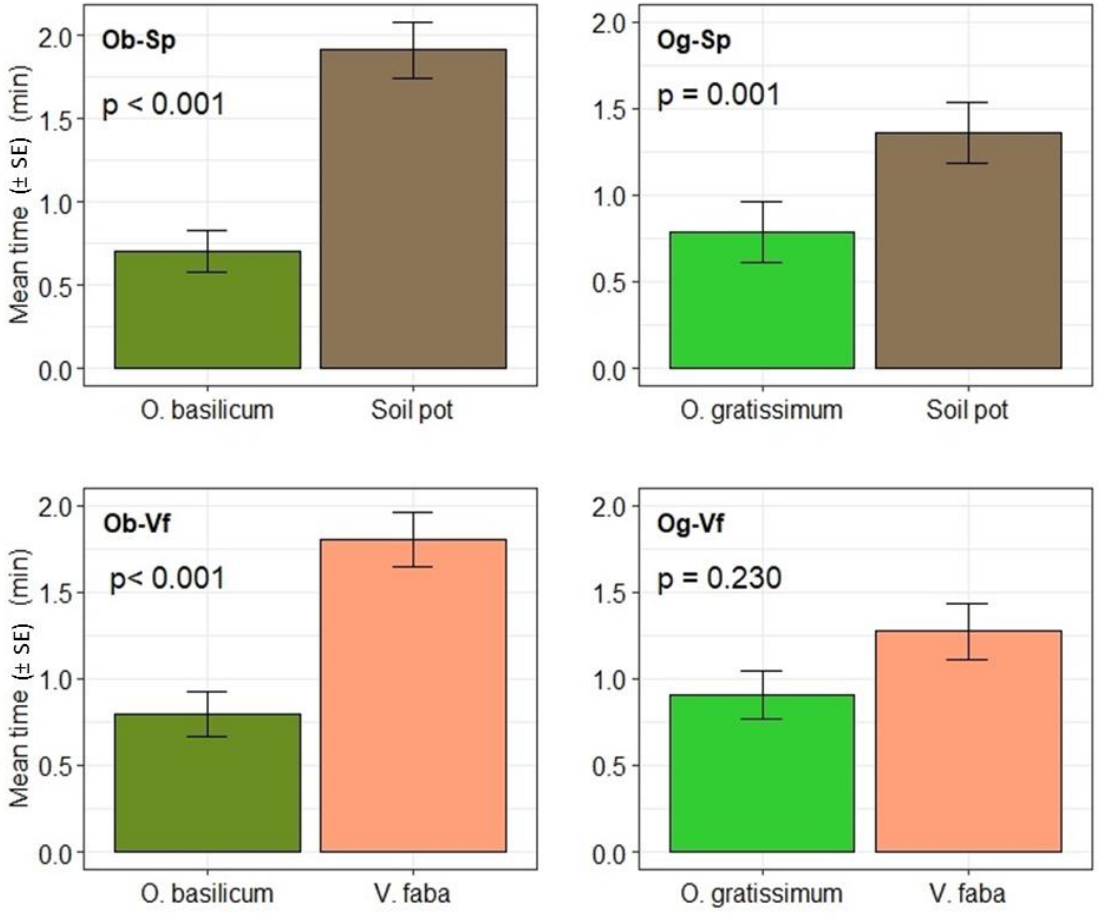


*Responding insects include living individuals present in one of the two side areas of the olfactometer.

**Aphid distribution in dual choice tests. ** p < 0.05, *** p < 0.00, ns =not significant**

# Results

***Mean time spent by aphids***




**Legend**

- Ob-Sp : *O. basilicum* versus soil pot
- Ob-Vf : *O. basilicum* versus *V. faba*
- Og-Sp : *O. gratissimum* versus soil pot
- Og-Vf : *O. gratissimum* versus *V. faba*

**Duration (mean ± SE) spent in each olfactometer arm**

# Conclusion & Perspectives

*O. basilicum*

*O. gratissimum*

***O. basilicum*** **induced a stronger repellent effect on** ***A. pisum*** **compared to** ***O. gratissimum*****.**

❖ **Carry out assays under field conditions to validate the results.**

DREAMACP

Erasmus Mundus

*Thanks*

Gembloux Agro-Bio Tech
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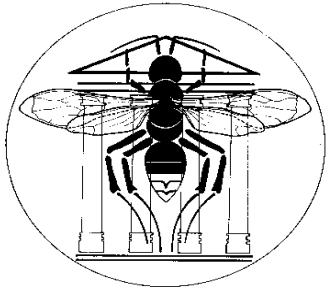

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