IECPS 2020
1st International Electronic Conference on Plant Science
01–15 DECEMBER 2020 | ONLINE
plants MDPI

Lippia spp. essential oil as a control agent against *Acanthoscelides obtectus*, an insect pest in *Phaseolus vulgaris* beans

Álvaro Rodríguez-González [1,*], Franceli Da Silva [2], Santiago Gutiérrez [3], and Pedro A. Casquero [1]

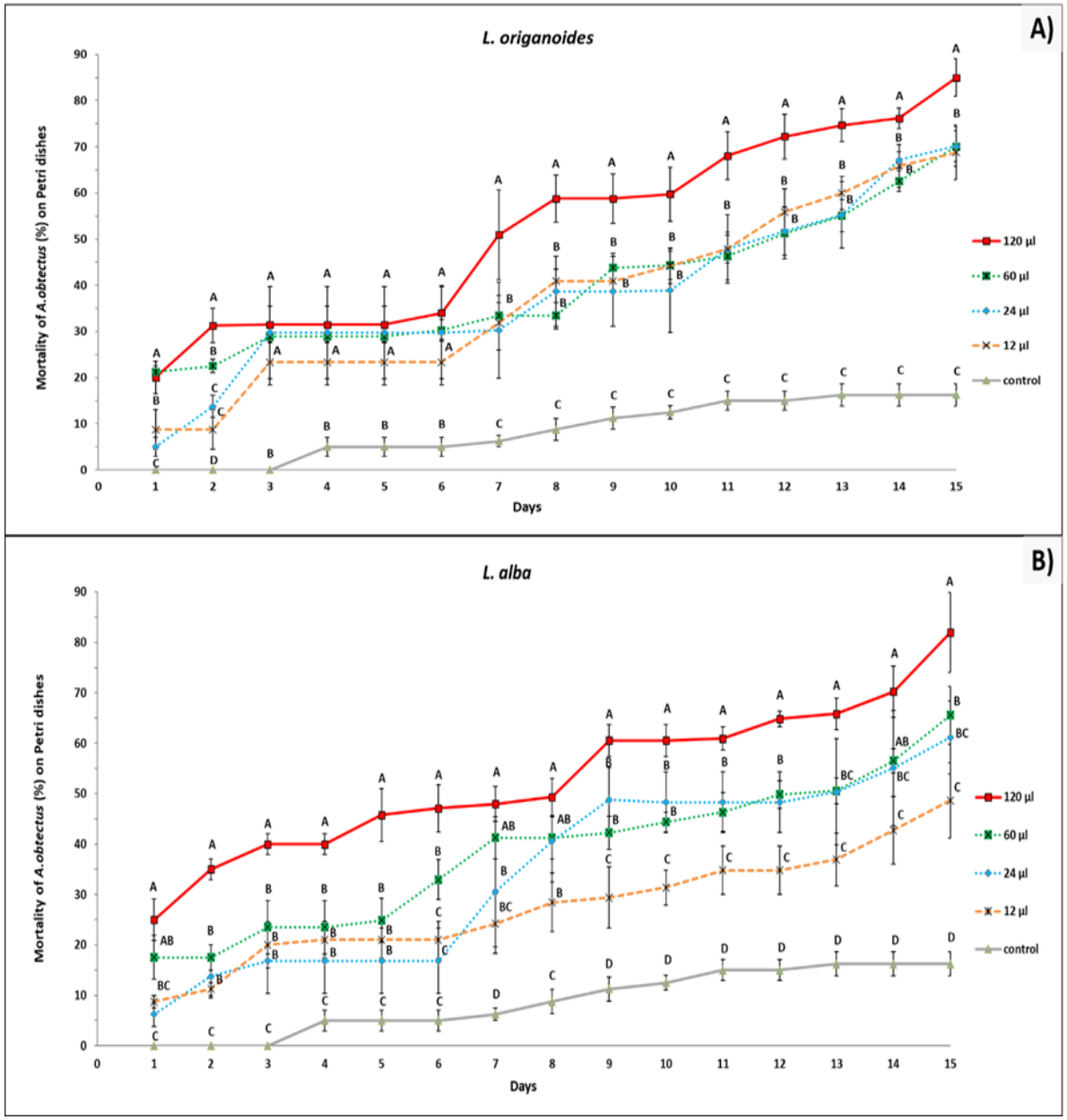
[1] Grupo Universitario de Investigación en Ingeniería y Agricultura Sostenible (GUIIAS). Instituto de Medio Ambiente Recursos Naturales y Biodiversidad (INMARENBIO). Escuela de Ingeniería Agraria y Forestal (EIAF). Universidad de Leon. Avenida de Portugal 41, 24071, León, Spain.
[2] Universidad Federal de Reconcavo de Bahia, Rui Barbosa 710, CEP 44380-000 Cruz das Almas, Brazil.
[3] Area de Microbiología. Escuela de Ingeniería Agraria y Forestal (Campus de Ponferrada). Universidad de León (EIAF). Avenida de Astorga s/n, 24401, Ponferrada, Spain.
* Corresponding author: alrog@unileon.es

universidad de león
UFRB Universidade Federal do Recôncavo da Bahia

Abstract: *Acanthoscelides obtectus* Say (Coleoptera: Chrysomelidae: Bruchinae), know as the bean weevil, causes severe post-harvest losses in common bean (*Phaseolus vulgaris* L.). The control of this insect pest is still poor and involves the use of conventional insecticides. Besides, there is an increasing demand in the search for new active substances and natural plant products for pest control towards the reduction of adverse effects on human health and the environment. Four doses (12, 24, 60 and 120 µL) of *Lippia origanoides* and *Lippia alba* essential oils were evaluated on Petri dishes against *A. obtectus* insects during 15 days. *L. origanoides* and *L. alba* oils exhibited similar patterns of insecticidal activity over the insect. *L. origanoides* and *L. alba* accumulated an insect mortality of 85.00 and 81.94% at dose 120 µL. However, all the lower doses applied of each oil produced significantly higher effects than the control treatment, with an accumulated mortality of 16.25%. The results prove the insecticidal capacity of the essential oils of *Lippia* spp. genus and hence their potential as active substances against *A. obtectus* in environmentally low-risk pest control strategies. Supplementary trials should be conducted under real storage conditions.

Keywords: Essential oils; stored bean pest; *Lippia alba*; *Lippia origanoides*; Insecticidal activity

Results and Discussion



- *L. origanoides* and *L. alba* essential oils exhibited similar patterns of insecticidal activity over the insect.
- *L. origanoides* and *L. alba* accumulated an insect mortality of 85.00 and 81.94%, respectively, significantly greatest than the lower applied doses of each essential oil.
- All the lower doses applied of each oil were significantly greatest than the control treatment, with an accumulated mortality of 16.25%.

IECPS 2020

Conclusions

- *L. origanoides* and *L. alba* accumulated an insect mortality of 85.00 and 81.94%, respectively.
- All the lower doses applied of each oil were significantly greatest than the control treatment, with an accumulated mortality of 16.25%.
- These essential oils affected the survival of *A. obtectus* since the greatest doses applied on insects decreased the life of the bean weevil.
- The results prove the insecticidal capacity of essential oils of *Lippia* spp. genus and hence their potential as active substances against *A. obtectus* in environmentally low risk pest control strategies.
- Supplementary trials should be conducted under real storage conditions.

IECPS 2020

Acknowledgments

This work was funded by the Ministry of Science, Innovation and Universities (Government of Spain), according to the Resolution of July 27, 2018, (BOE No. 184, of July 31) through the grant awarded to Álvaro Rodríguez González (PTA2017–14403-I).

IECPS
2020