

Contribution to the knowledge of *Euzophera pinguis* Haworth biology in Alentejo (Portugal)

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Abstract: The pest *Euzophera pinguis* Haworth is an enemy of the olive grove whose attacks have been a great concern for the last few years, in some Portuguese regions, namely in Alentejo. The recent availability of the sexual pheromone of synthesis for this species constitutes a relevant aspect in the protection of the olive grove on account of its potentialities in the identification of the periods of risk. The curve of the flight of the insect was studied aiming at getting information about these periods and it was obtained with the help of funnel traps, in an olive grove in Baixo Alentejo. The study occurred between 2004 and 2006, in a young olive grove located in the “Herdade dos Lameirões”. The analysis of the data shows variations in the line of the curve, during the spring until the middle of summer, with peaks of capture of variable intensity in different periods (beginning or end of May, mid June, mid July and beginning of September), suggesting overlaps of distinct generations. However, in any of the analysed situations there was a peak of captures in the beginning of September.

Key words: pyralid moth, monitoring, sexual pheromone, olive grove

Introduction

Euzophera pinguis Haw. is a pest which is to be found in the in Mediterranean region and which attacks the olive tree and others plants like *Fraxinus excelsior* (Durán *et al.*, 1998). Although present throughout the Mediterranean region and most of Europe, the pyralid moth is only reported in olive in Spain, Tunisia, Morocco and occasionally in Italy (COI, 2007). In Portugal, its presence is limited to the existence of specific conditions like a presence of wounds, new plantation and some varieties.

The adult shows 12-14mm long with a wingspan of 20-25mm, beige to dark brown. Forewings are marked with two pale zig zag lines. The females make the oviposition. The eggs are flattened oval shape like an onion bulb with a finely reticulated chorion, they are small (1mm*0.8mm), and deposited in the trunk with cracks or wounds (De Andrès, 1991). The larva possesses a whitish colour with yellow or greenish spots, with a dark head (Moreno, 2005) and when its larval development is completed it may reach between 20-25mm in length.. The larva has five larval stages followed by a pupal stage (Civantos, 1999, Ortiz *et al.*, 1999). The pupa is brown and develops itself in a thin cocoon (Bento *et al.*, 2007). Chrysalis in the gallery, near outside, it is possible to detect from the outside a little opening partly covered, through which it will come out. Generally it has two generations a year which overlap, the adults can fly for about ten months and the larvae are present all around the year (Civantos, 1999). It spends the whole winter in the phase of larva and in the phase of pupa usually during the month of March, and the pupa state lasts about one month. The adults begin to appear in April and emergency continues until June (De Andrès, 1991). The oviposition begins two days after the emergence of the adults and the female layss the eggs singly or in groups of 5-6 eggs, under the log, selecting protected places to lay the eggs, such as the tumors caused by the bacteria *Pseudomonas syringae* subsp. *savastanoi* (Smith) Janse,

wounds caused by frost, wind or hail, fusion of branches, etc. The hatching of eggs may last about two weeks in May and the new born larvae search for feeble places to penetrate, opening galleries inside which they finish their development as larvae (Civantos, 1999).

The losses may be very serious in the young olive trees, as in serious cases the tree can be lost (Alcalde, 2003). The diagnosis is made easy by observing hard sawdust produced by the larva when it opens the gallery. Another typical symptom is the appearance of a swelling in the place where the retention of the sap occurs in the branches attacked (Civantos, 1999). The olive trees attacked begin to lose their usual colour, some leaves fall down and become completely dry and that's why the branches get loose very easily.

The increase of the number of new plantations and consequently the increase of the number of young trees in formation, precisely those in which the pest causes greater damages, increases the problems due to *Euzophera pinguis*. The control is extremely difficult, because the larva develops inside the trunk of the host, where it is very difficult to be reached by the treatments. The present work contributes to the establishment of the biological cycle in the region, aiming at establishment a strategy of viable control.

Material and methods

The experiments took place from 2004 to 2006 in a young olive grove, planted in 2001, with the varieties Galega, Verdeal and Cordovil, in an area of 27ha. For monitoring pest proceeded to the placement of sexual funnel traps, green, containing a capsule with sexual pheromone of synthesis of the insect and an insecticide pill of DDVP, to assure the immediate death of the insects (Mendes & Cavaco, 2008). The traps were placed at 1m from the soil in the tutor of the tree since the trees were very small. The replacement of the pheromone capsule and of the insecticide pill was performed every six weeks.

Results and discussion

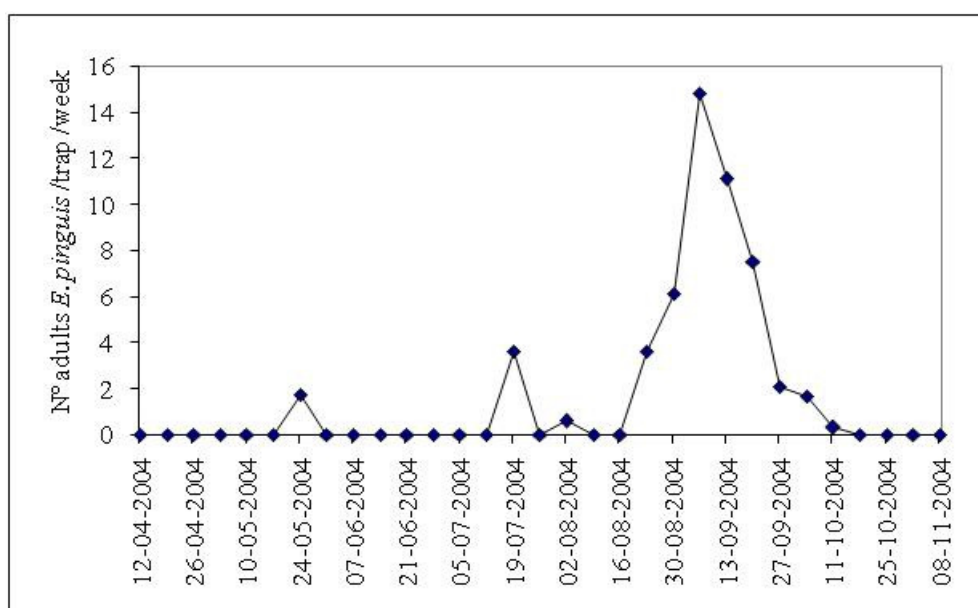


Figure 1. Evolution of populational dynamics of *Euzophera pinguis* in the year 2004.

In Figure 1 are observed the captures obtained in the sexual traps all along the first year of testing, in Figure 2 those obtained in the second year of experiment and the third year of trial is presented in Figure 3.

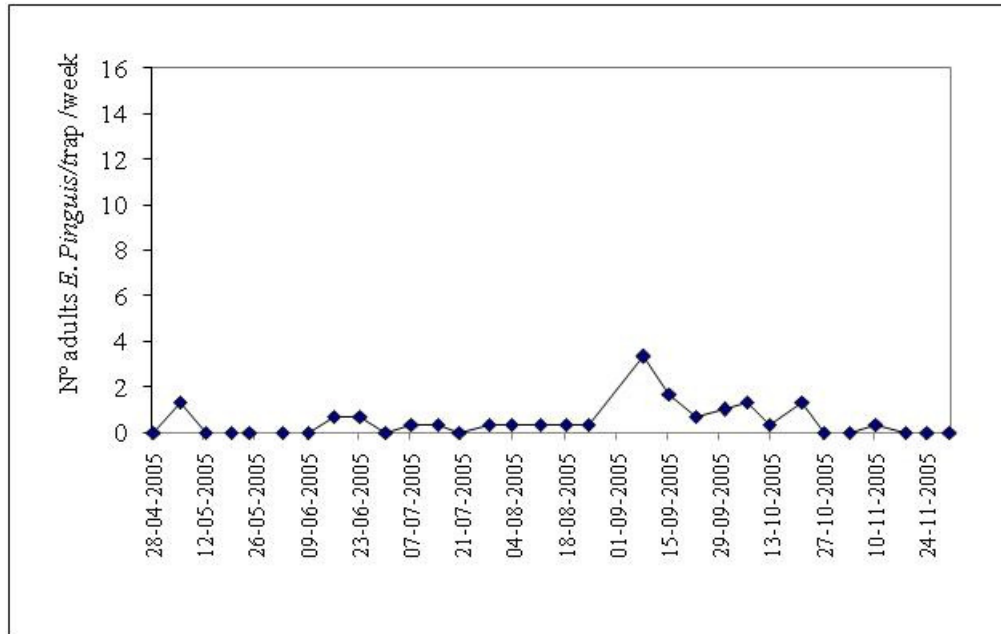


Figure 2. Evolution of populational dynamics of *Euzophera pinguis* in the year 2005.

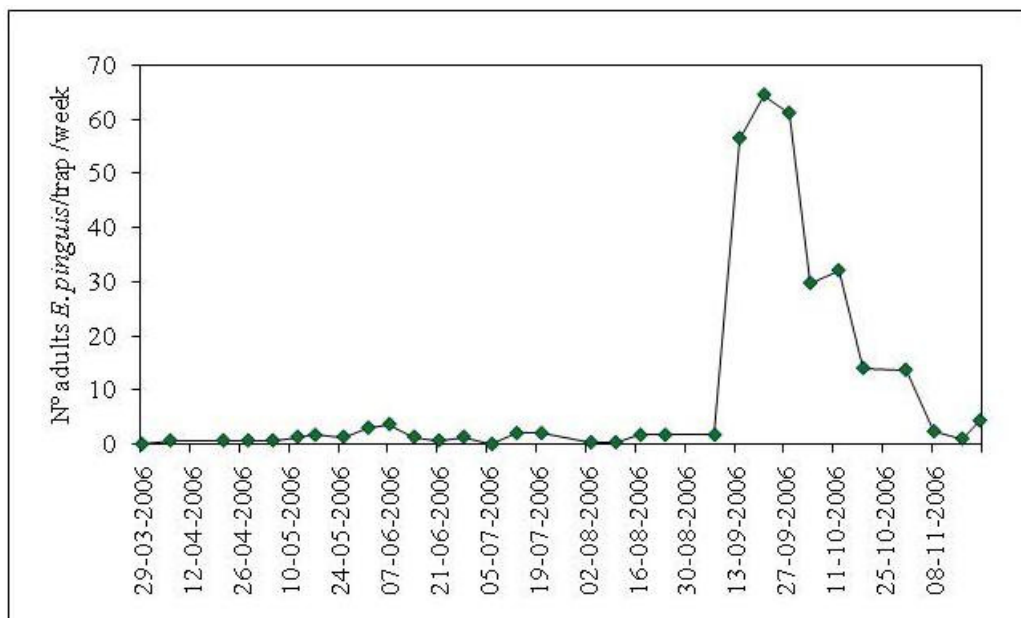


Figure 3. Evolution of populational dynamics of *Euzophera pinguis* in the year 2006.

The flight of adults of *Euzophera pinguis* is very much influenced by temperature, and it usually begins at the beginning of March and finishes in June (Durán *et al*, 1998). The ideal temperature for the emergency of the adults is between 20-25°C. Concerning precipitations,

several days of rain affect negatively the flight of adults, especially if accompanied by wind. In the three years studied it was verified that the beginning of the flight occurred in the end of May in the first year and the end of April in the second year, being the flight peaks of relatively low. The duration of pheromones in the field is six weeks, and so two pheromones capsules are necessary to cover the spring flight. The third pheromone capsule will eventually be placed in the end of July because the autumn flight usually begins in August and finishes in October. In the years 2004-2006, this flight had its peak in the first week of September, the same was verified by Sánchez & Ortiz (2004) in the region of Málaga and Jaén.

The low levels of the adults' captures as well as the low incidence of the damages in trees, verified during the three years of our study allowed us to dismiss any phytosanitarian intervention. However, the use of insecticides is very laborious and has a high economic and environmental cost that's the reason why at the moment a method is being developed which consists of an alternative method to the chemical control, known as the method of mating disruption.

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