

## THREAT OF TERRESTRIAL GASTROPODS DISTRIBUTING AT OLIVE AND CITRUS ORCHARDS IN ADANA PROVINCE, TURKEY

R. BOZBUGA and N. Z. ELEKCIOGLU

*Plant Protection Research Institute, Entomology Laboratory, Koprukoy - Yuregir, Adana, Turkey*

### Abstract

BOZBUGA, R. and N. Z. ELEKCIOGLU, 2008. Threat of terrestrial gastropods distributing at olive and citrus orchards in Adana province, Turkey. *Bulg. J. Agric. Sci.*, 14: 445-448

Olive and citrus orchards have been scanned around Adana in 2006 and 2007. Total of 2 species were determined *Xeropicta derbentina* (Phylum: Mollusca, Class: Gastropoda, Family: Hygromiidae) and *Eobani vermiculata* (Phylum: Mollusca; Class: Gastropoda; Order: Stylommatophora; Family: Helicidae) in Adana, Turkey. Although from both species *X. derbentina* is the dominant species of olive orchards, *E. vermiculata* is the dominant species in citrus orchards in this region. Also, damages of both species was watched over on citrus and olive trees. In this paper, we present the gastropoda species which are determined in olive and citrus growing areas.

*Key words:* *Xeropicta derbentina*, *Eobani vermiculata*, olive, citrus

### Introduction

Adana is located Mediterranean region that Mediterranean coasts have cool, rainy winters and hot, moderately dry summers (Figure 1). There is a mild Mediterranean climate with average temperatures of 9°C in winter and 29°C in summer. Situated in the middle of the Cukurova Plain nestled in the most fertile agricultural area of the whole country which is fed by the life-giving waters of the Seyhan river. Adana is the commercial center of a farm region where cotton, grains, and fruits are grown. One of the most important fruits is citrus. Citrus is an economically important crop in east Mediterranean region of Turkey (in which citrus is widely cultivated) where 75% of the production is conducted in this region. The citrus grow-

ing area has considerably increased within last few years. Aspect of olive; Turkey ranks fifth among the world olive grower countries (Tunisia (1.500.000 ha), Spain (1.199.090 ha), Italy (1.167.980), Greece (784.500 ha), Turkey (649.350 ha)), it has the potential of exporting a great majority of her production of olive fruit Turkey. (FAO, 2005). Olive growing areas in Turkey are located along the Aegean region (55.11%), the Marmara region (27.72%) and the Mediterranean region (14.94%) (DIE, 2000). Adana is one of the olive grovers city in the Mediterranean Region. The olive growing areas have considerably increased within the last few years and further future expansion is expected.

Olive and citrus orchards provides shelter many kinds of living organisms. Among these, terrestrial



Fig. 1. Adana City Position

gastropods *Xeropicta derbentina* and *Eobani vermiculata* distribute on these planting.

## Materials and Methods

Field research carried out during the 2006-2007. Terrestrial snails were collected in olive and citrus orchards, Adana Province. Samples were gathered different time of both years. Olive and citrus trees was different ages and orchards that sample were collected not only nurseries and natural growed young plants but commercial orchards and natural planting areas (especially olive) as well.

Then they were brought to laboratory and snails were dried on shadow. Samples were sent to identify to Dr. Ridvan Sesen, Biology Department, Dicle University. Materials were also deposited in Adana Plant Protection Research Institute.

## Results and Discussion

All samples identified two different species as *X. derbentina* and *E. vermiculata* (Figure 2).

During investigations area of the Adana, a total of 2 species of terrestrial snails were determined. *E. vermiculata* and *X. derbentina* species previously recorded in Turkey (Cook, 1997; Yildirim et al., 2004).

*E. vermiculata* distributes all costal parts of Turkey (Yildirim et al., 2004). General distribution of it circummediterranean area, but not rare in synanthropic or agricultural areas (Kerney and Cameron, 1979). *E. Vermiculata*'s habitats are fields, countryside, vineyards, gardens. It climbs up trees, palms, bushes and fences on hot daytime (Yildirim e al., 2004).

Distribution of *X. derbentina* (Phylum: Mollusca, Class: Gastropoda, Family: Hygromiidae) is found Libya, Turkey, Bulgaria, Romania, Ukraine. Size of it about 8-12 x 15-20 mm is (<http://www.animalbase.uni-goettingen.de/zooweb/servlet/AnimalBase/home/species?id=3192>). *X. derbentina* occurs in diverse land snail communities in France. At the local scale, its large populations could result in a significant decrease in species richness and diversity. At the regional scale, however, the introduction of *X. derbentina* seems to have increased land snail species richness (Aubry and Et al. 2005).



**Fig. 2. *Xeropicta derbentina* on olive buds  
(Photographed by Refik Bozbuga)**

*X. derbentina* could not find any serious damages on olive fruits from both species but many number of them are found on olive shoots. *E. vermiculata* was observed every parts of citrus trees. It is thought that these species where are located on shoots and leaves can cause of decrease of photosynthesis level in olive and citrus plant.

*E. vermiculata* was also observed on fruits and it gave little damages on citrus fruits. For this reason population density of these snails should be observed year by year.

Aubry and et al. (2005) indicated that their work shows the wide ecological tolerance of that invasive species, which can integrate into Mediterranean but also European communities and they show that *X. derbentina* is restricted to open environments such as cultivated crops, pastures and fallow lands at St-Michel-l'Observatoire. *X. derbentina* strictly occurs in olive orchards and agricultural land.

The number of *X. derbentina* in which was collected on olive planting areas is more than collected in citrus planting, but *E. vermiculata* is the most counted number of species in citrus orchards.

These species should not be neglected not only in the olive and citrus orchards but also other fruit or-

chards gastropod communities subsequent to disturbances.

## Conclusion

Turkey has an important potential land aspects of citrus and olive production in the world. It has many kind of olive and citrus pests changing in number not only year by year but also region by region. Turkish citrus and olive fauna are also very rich in their pests complex. Among these, two Gastropoda species were determined during 2006–2007 in Adana region of Turkey. *X. derbentina* was dominant, according to surveys, in both years. More attention should be given to the knowledge of the biology and ecology of olive gastropoda species. This paper submits gastropoda species in olive orchards in Adana, Turkey. By this way this paper ensures to researchers jointly knowledge their future studies. Furthermore, it is believed that this study shines a light on later studies in this region.

## Acknowledgements

The authors would like to thank Dr. Ridvan Sesen (Dicle University, Biology Department) for identifying samples and for much helpful personality.

## References

- Aubry, S., C. Labaune, F. Magnan and L. Koss,** 2005. Habitat and integration within indigenous communities of *Xeropicta derbentina* (Gastropoda: Hygromiidae) a recently introduced land snail in south-eastern France. vol.11, pp. 539-547. (<http://cat.inist.fr/?aModele=afficheN&cpsid=17255140>).
- Cook, L. M.,** 1997. Geographic and ecological patterns in Turkish land snails. *Journal of Biogeography*, **24**: 409-418.
- Devlet Istatistik Enstitusu,** 2000. Tarimsal Yapi ve Uretim. T.C. Basbakanlik D.Ö.E. yayinlari, <http://www.die.gov.tr/> Ankara.
- FAO, 2005. FAO Tarım Istatistikleri.
- Kerney, M. P. and R. A. D. Cameron,** 1979. A field guide to the landsnails of Britain and North-west Europe. London . 24 pl. 288 pp.
- Yildirim, M. Z., U. Kebapci and B. A. Gьmьs,** 2004. Edible Snails (Terrestrial) of Turkey. *Turk. J. Zool.*, Ankara. **28**: 329-335.

*Received June, 12, 2007; accepted for printing June, 12, 2008.*