

**SPATIAL DISTRIBUTION AND TEMPORAL OUTBREAKS OF MEDFLY –
Ceratitis capitata Wied. (Diptera, Tephritidae) IN REPUBLIC OF CROATIA**

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ABSTRACT

Medfly - *Ceratitis capitata* Wied. (Tephritidae) is the pest of increasing economic importance in Croatia. Since the first appearance more than fifty years ago, this pest has been spread in almost the whole region of Dalmatia and in Istria. In Dalmatia it is area from Konavle to Šibenik neighbourhood including islands, where this pest causes important damages on fruits of numerous cultivated and wilde sorts. The most imperilled fruit sorts are: fig tree – *Ficus carica*, peach - *Prunus persicae*, plum – *Prunus domestica*, apricot – *Prunus armeniaca*, mandarine tree – *Citrus reticulata* and kaki – *Dyopirus lotus*. In Istria, although pest presence, the damages are of lower importance. Outbreak, fly duration and medfly capture ammount may be very different on particular areas through the years. Beside climatic conditions, it considerably depends on number of host plants on which this pest might be reproduced. Therefore, first outbreak takes place in the very south of Dalmatia already by the end of July, namely Župa dubrovačka, Dubrovnik seaside and area of Ston. In Split area medfly appears by the beginning of September, but the flight may be continued even till the end of December. In the appearance, attack intensity and fly duration monitoring programme during four years, traps type Chromotrap-M with parapheromone trimedlure added and traps type Modified Liquidbaitor Trap with parapheromone ceralure and insecticide DDVP added were used.

Key words: fruit hosts, *Ceratitis capitata*, medfly, outbreak, population dynamic

IZVLEČEK

PROSTORSKA RAZPOREDITEV IN ČASOVNI IZBRUHI BRESKOVE MUHE (*Ceratitis capitata* Weid., Diptera, Tephritidae) V REPUBLIKI HRVAŠKI

Breskova muha (*Ceratitis capitata* Wied.) je škodljivka s čedalje večjim gospodarskim pomenom na Hrvaškem. Od njenega prvega pojava pred več kot petdesetimi leti, se je ta škodljivka razširila po celem območju Dalmacije in Istre. V Dalmaciji so to kraji od Konavelj do Šibenika, vključno s sosednjimi otoki, kjer ta škodljivka povzroča pomembne škode na številnih gojenih in samoniklih sortah. Najbolj ogrožene sadne vrste so: smokve – *Ficus carica*, breskev - *Prunus persicae*, sliva oz. češplja – *Prunus domestica*, marelica – *Prunus armeniaca*, mandarinovec – *Citrus reticulata* in kaki – *Dyopirus lotus*. V Istri so škode, čeprav je škodljivka zastopana, manj pomembne. Izbruh, trajanje leta in obseg plenjenja so lahko zelo različni med letom v raznih krajih. Razen podnebnih razmer so ti znatno odvisni od števila gostiteljskih rastlin, na katerih se škodljivka lahko razmnožuje. Zato so prvi zbruhi v skrajni južni Dalmaciji že proti koncu julija, posebno v Župi

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dubrovački, v Dubrovniku ob morju in na območju Stona. V dolini Neretve, kjer se je breskova muha pojavila pred četrstoletja, se v večjem obsegu pojavlja v septembru in oktobru, manj pa v novembru. Na območju Splita se začne muha pojavljati v začetku septembra, toda njen let lahko traja do konca decembra. Za ugotavljanje pojave, intenzivnosti napada in trajanje leta so bili izvedeni programi monitoringa skozi štiri leta z vabami Chromotrap-M z dodanim paraferomonom in vabami tipa Modified Liquidbaitor Trap s paraferomonom cerealure in insekticidom DDVP.

Ključne besede: sadni gostitelji, *Ceratitis capitata*, breskova muha, izbruh, populacijska dinamika

1 INTRODUCTION

Medfly - *Ceratitis capitata* Wied. (Tephritidae) is the pest of increasing economic importance in Croatia. Since the first appearance more than fifty years ago (Tominić 1959, Kovačević 1960), this pest has been spread in almost the whole region of Dalmatia (Pelicarić *et al.* 2001) and in Istria. In Dalmatia it is area from Konavle to Šibenik neighbourhood including islands (Bjeliš and Pelicarić 2002, 2004), where this pest causes important damages on fruits of numerous cultivated and wild specieses. The most imperilled fruit specieses are: fig tree – *Ficus carica*, peach - *Prunus persicae*, plum – *Prunus domestica*, apricot – *Prunus armeniaca*, mandarine tree – *Citrus reticulata* and kaki – *Dyopirus lotus*. In Istria, although pest presence, the damages are of lower importance. Outbreak, fly duration and medfly capture ammount may be very different on particular areas through the years. Beside climatic conditions, it considerably depends on ammount of host plants on which this pest might be reproduced.

2 MATERIALS AND METHODS

2.1 Locations

Chosen locations are basicly mixed orchards, typical for geographical areas on which the researches have been done. Present fruit species are: fig – *Ficus carica*, peach – *Prunus persicae*, plum – *Prunus domestica*, apricot – *P. armeniaca*, mandarine tree – *Citrus reticulata*, orange – *C.sinensis* and kaki – *Dyospirus lotus*.

Starting from the south of Croatia, in Dubrovnik-Neretva district three typical locations were chosen for pest monitoring. The first location is in Čibača near Dubrovnik (Ragusa), a collected orchard of the Station for southern varieties- Dubrovnik, spread on few hectares.

Also, about 100 kilometers west by the coast, second location was chosen near the place Ston (Stagnum), located closed to Ston bay, known by the salt factory from 13th century. Close to the town of Split, another observation point was chosen, under the Marjan hill, located near the old monastery, with different fruit varieties present. No measures have been practiced against medfly in described locations orchards, but other measures that have been practiced assure normal crop yield.

2.2 Traps and attractants

Traps and attractants: for outbreak and fly duration monitoring Chromotrap-type traps were used (Isagro, Italy). These traps are basicly yellow three-side glue-covered traps with parapheremone trimedlure added in tampone form in the ammount of 1 ml per trap. Beside this, food attractant amonium-bycarbonate was added in capsula form (Isagro, Italy).

Traps were changed twice during the season while the both attractants were changed once a month. Traps were put in the southern part of the tree canopy, about 2 meters above the ground. Traps density was about 5 per hectare.

2.3 Trapping data

Data collection were repeated weekly. According to the attractant type, in this case trimedlure that mostly attracts males, less females, capture data represent the number of male individuals of medfly. Caught flies were removed from the traps together with other caught insects, leaves and any other dirty elements.

3 RESULTS AND DISCUSSION

The first captures in the area of city of Dubrovnik and Ston are usually recorded from the beginning of July, in peach plantations, while in the area of the city of Split, the first captures are usually recorded almost two months later, means in the early September, till the end of November or beginning of December.

After the four years of experiments, it has been found the peak of the pest population dynamic is between half of the September until half of October.

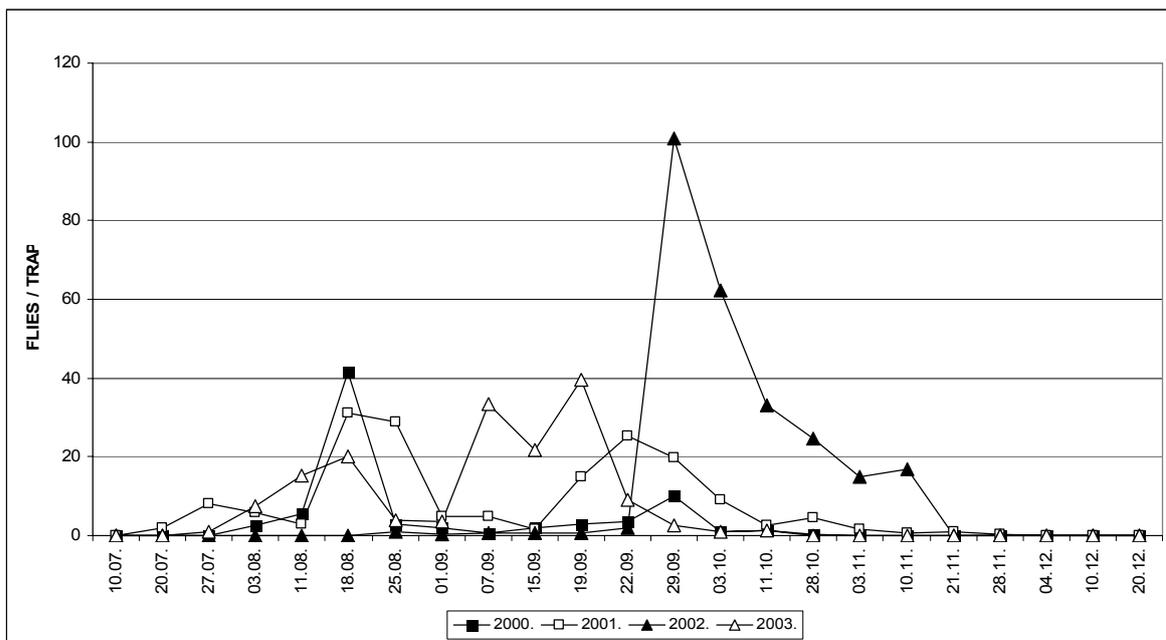


Figure 1: Medfly population dynamic on Pelješac peninsula, city of Ston, 2000.-2003. year.

Some small exceptions were recorded for the location Čibača-Dubrovnik during the 2002. year. It is interesting to notice, that the highest captures on the southern locations in Čibača-Dubrovnik and Ston were during the 2002. year, while during the same year, the captures on the location Split were the lowest between all four years of experiments. The highest captures on the location Split were during the 2001. year.

Some oscillation of the pest outbreak between the four years were recorded. For example, the captures data on Ston location were the lowest during the 2001. year. Also, the captures were recorded only in August and later on almost none. Next 2002. year was almost different, means that the first captures start from third decade of September as a peak of population.

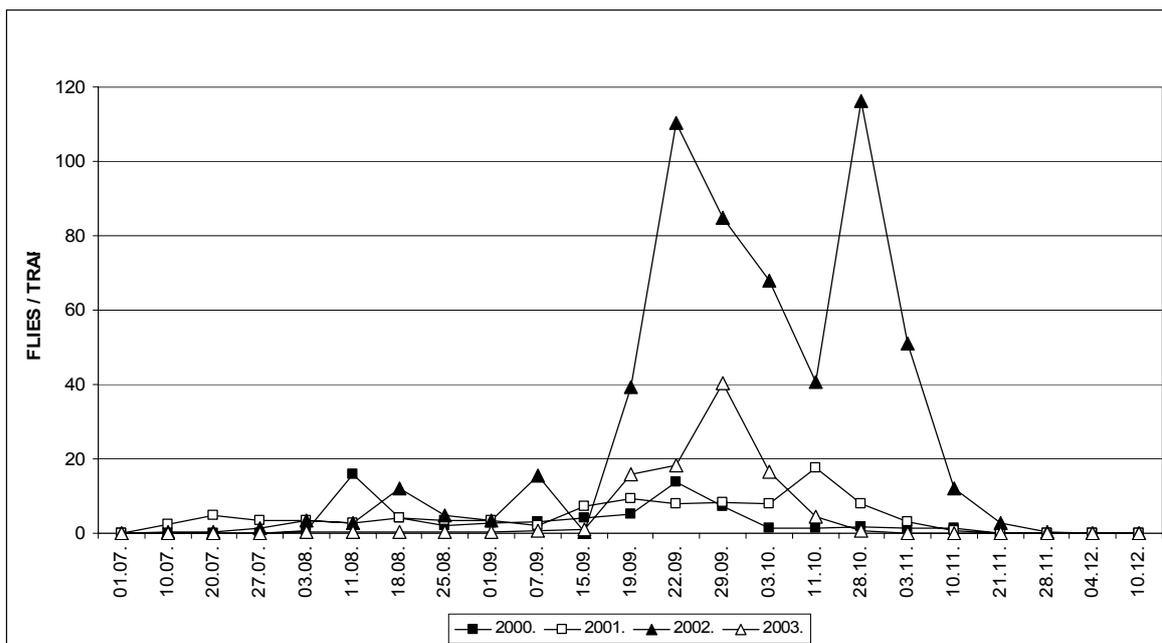


Figure 2: Medfly population dynamic in southern Dalmacija, city of Dubrovnik-Čibača, 2000.-2003. year.

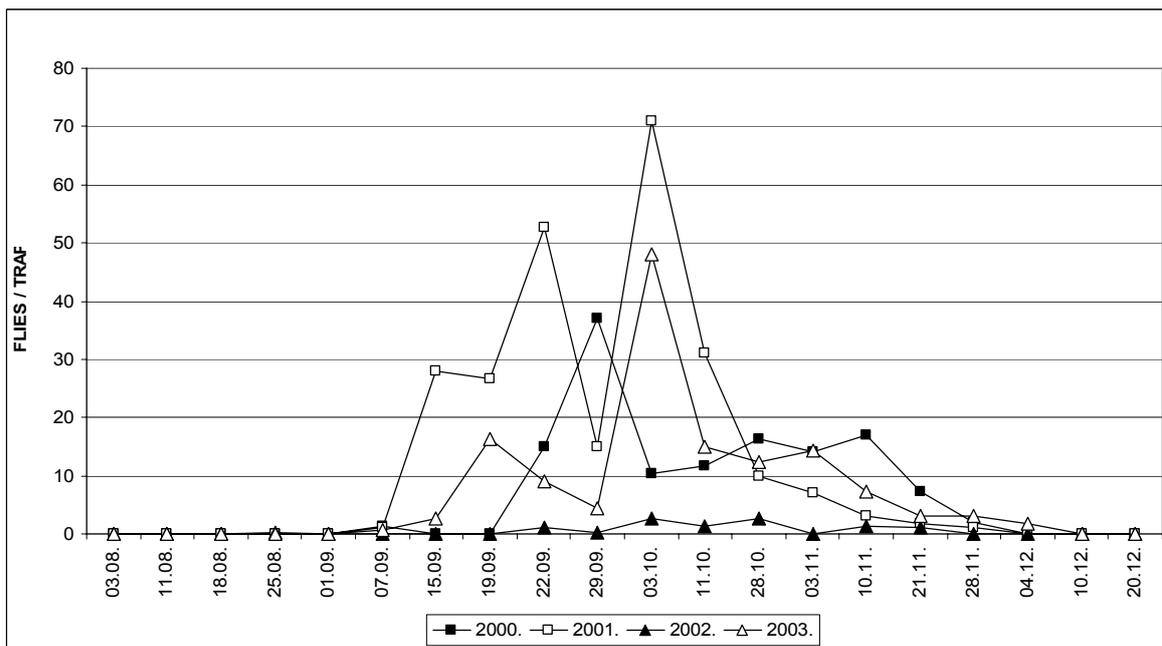


Figure 3: Medfly population dynamic in central Dalmacija, city of Split, 2000.-2003. year.

The pest population dynamic on the Čibača-Dubrovnik location were very similar for 2000., 2001. and 2003. years, while very high population density were recorded in 2002. year, from half September until bebegining of October.

4 CONCLUSIONS

The mediteranean fruit fly – *Ceratitis capitata* Wied. is regular pest in the Croatian sea side lowlands. The flight period of the pest was recorded from early July till early December, with some oscilations between the season and between the years.

The question about zero earlier captures of the pest, specialy in June, could be explained with the low density of the traps in the observation plots. Anyhow, it is well known that pest adults are present in the nature from June (Tominić 1959, Kovačević 1960, Tominić and Brnetić 1960)

The collected data shows, that seasonal outbreak could be explained with the figs – *Ficus carica* and peach – *Prunus persicae* ripening period, and those two host plants are imported for the new generations outbreak starting from the Septembar. The large availability of this hosts in the commertial orchards, backyards, but also the presence of the wild host plants, allow the pest to reproduce itself and produce high population density in the favourable climatic conditions during the summer period.

Later on, during the September and October, the most interesting hosts for the pest are kaki – *Dyospirus lotus* and different cultivars of mandarines – *Citrus reticulata*. Anyhow, the experiments on the mediteranean fruit fly overwintering should be observed.

5 ACKNOWLEDGMENTS

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