4th International TEAM Meeting, 5-9 October 2020, La Grande-Matte, France

PO-09

ABSENCE OF PREMATING ISOLATION BETWEEN GEOGRAPHIC ISOLATED *RHAGOLETIS CERASI* POPULATIONS

Cleopatra A. Moraiti and Nikos T. Papadopoulos (nikopap@uth.gr)

Laboratory of Entomology and Agricultural Zoology, Department of Agriculture Crop Production and Rural Environment, School of Agricultural Sciences, University of Thessaly, 38446 Volos, Greece

Introduction

The geographical variation in dormancy termination of *Rhagoletis cerasi* pupae promotes allochronic isolation of adults from ecological divergent populations. However, the presence of premating isolation among populations with different adult phenology patterns has not been explored. In this sense, we compared the assortative mating patterns between population crosses with variable ecological and/or genetic characteristics.

Material and Methods

We run multiple mate choice experiments using five pairs of *R. cerasi* populations from Greece (Thessaloniki, Dafni, Pertouli, Agia, and Kala Nera) and Germany (Dossenheim) with different adult phenology patterns and gene flow rates (Fig. 1, Table 1).

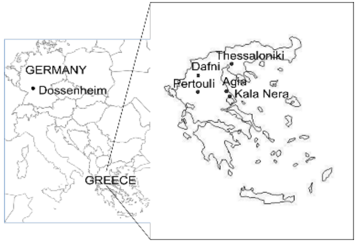

Figure 1. Map of *R. cerasi* populations origin.

Table 1. Ecological and genetic characteristics of *R. cerasi* populations.

Cross combinations	Adult emergence patterns in field	Gene flow rates
Dossenheim *vs* Dafni	same	low
Dossenheim *vs* Kala Nera	different	low
Dafni *vs* Kala Nera	different	moderate
Dafni *vs* Pertouli	same	high
Thessaloniki *vs* Agia	same	moderate

Multiple mate choice experiments

Laboratory conditions: 25 ± 1^{o}C, 65 ± 5% RH, photoperiod L14:D10
Experimental arena: Transparent Plexiglass cage (20x20x20cm) with a mesh window for ventilation. Water, adult food and 3-5 freshly cut leaves of *Ficus benzamina* (Moraceae). A pair of adults (one male and one female) from each of the two cross populations
Observations: From 14:00 to 18:00hrs, every 10 minutes
Records: Homotypic and heterotypic mating pairs in each cage
Replications: 70-103 (cages with adults) for each pair of cross populations

Statistical Analysis: We used the software JMATING ver. 1.0.8 to estimate a) the global I_{PSI} estimator of sexual isolation, and b) sexual selection estimates (W) for each population, in males and females separately.

Results & Conclusions

Table 2. Estimates of a) coefficients for sexual isolation (I_{PSI}) for each cross combination and b) cross product estimator (W) (±SD) for each sex and population as well as the corresponding P-values obtained from bootstrapping analysis (10,0000 resampling) with JMATING for mating pairs observed from 14:00 to 18:00hrs.

Population A	Population B	Replicates	N*	Sexual isolation		Mating propensities: Male			Mating propensities: Female		
				I_{PSI}	*P*	sexual successful/less sexual successful	*W*	*P*	sexual succesful/less sexual succesful	*W*	*P*
Dossenheim	Dafni	94	126	-0.031 ± 0.089	0.722	PopA/PopB	0.924 ± 0.168	0.326	PopA/PopB	1.017 ± 0.187	0.533
Dossenheim	Kala Nera	70	100	0.003 ± 0.109	0.982	PopB/PopA	0.523 ± 0.111	**0.001**	PopB/PopA	0.801 ± 0.165	0.135
Dafni	Kala Nera	103	128	-0.115 ± 0.090	0.195	PopA/PopB	0.957 ± 0.173	0.403	PopB/PopA	0.815 ± 0.145	0.118
Dafni	Pertouli	103	90	-0.034 ± 0.119	0.757	PopA/PopB	0.588 ± 0.132	**0.007**	PopB/PopA	0.534 ± 0.122	**0.002**
Thessaloniki	Agia	73	89	0.042 ± 0.108	0.705	PopB/PopA	0.875 ± 0.198	0.233	PopA/PopB	0.870 ± 0.189	0.221

*N, number of successful mates (lasting more than 10 min).

- Absence of sexual isolation among genetic or ecological different *R. cerasi* populations.
- Sexual selection was detected in "Dossenheim *vs* Kala Nera" and "Dafni vs Pertouli" crosses.
- Sexual selection is likely to eliminate other evolutionary forces favoring assortment, partially explaining the absence of sexual isolation among *R. cerasi* populations.