



Crossing two strains of *Anastrepha fraterculus* infected with different variants of *Wolbachia*



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Introduction

Wolbachia are intracellular Alpha-proteobacteria widespread among arthropods. These maternally inherited bacteria are often associated to reproductive phenotypes.

In *A. fraterculus* from Argentina, two genetic variants of *Wolbachia* have been identified.

Objectives

- To test the occurrence of cytoplasmic incompatibility between the two *Wolbachia* strains present in *A. fraterculus* strains.



Methodology

Wolbachia detection and characterization (16S rDNA, wsp and MLST)

Two *A. fraterculus* strains harboring different *Wolbachia* genetic variants

Wolbachia strain	Wsp Nucleotide	Accession number NCBI	<i>A. fraterculus</i> strain
wAfraCast1_A	T	KC589026.1	Af-Cast-1
wAfraCast2_A	C	KC589027.1	Af-Cast-2

Mating experiments			
Crosses (male X female)	N	Pre-zygotic isolation parameters	Post-zygotic isolation parameters
Af-Cast-1xAf-Cast-1	54	<ul style="list-style-type: none"> Percentage of mating Latency Mating duration 	<ul style="list-style-type: none"> Fertility Larval survival Pupae viability Female sex ratio
Af-Cast-2xAf-Cast-1	60		
Af-Cast-2 xAf-Cast-2	64		
Af-Cast-1 xAf-Cast-2	54		

Results

Pre-zygotic isolation analysis

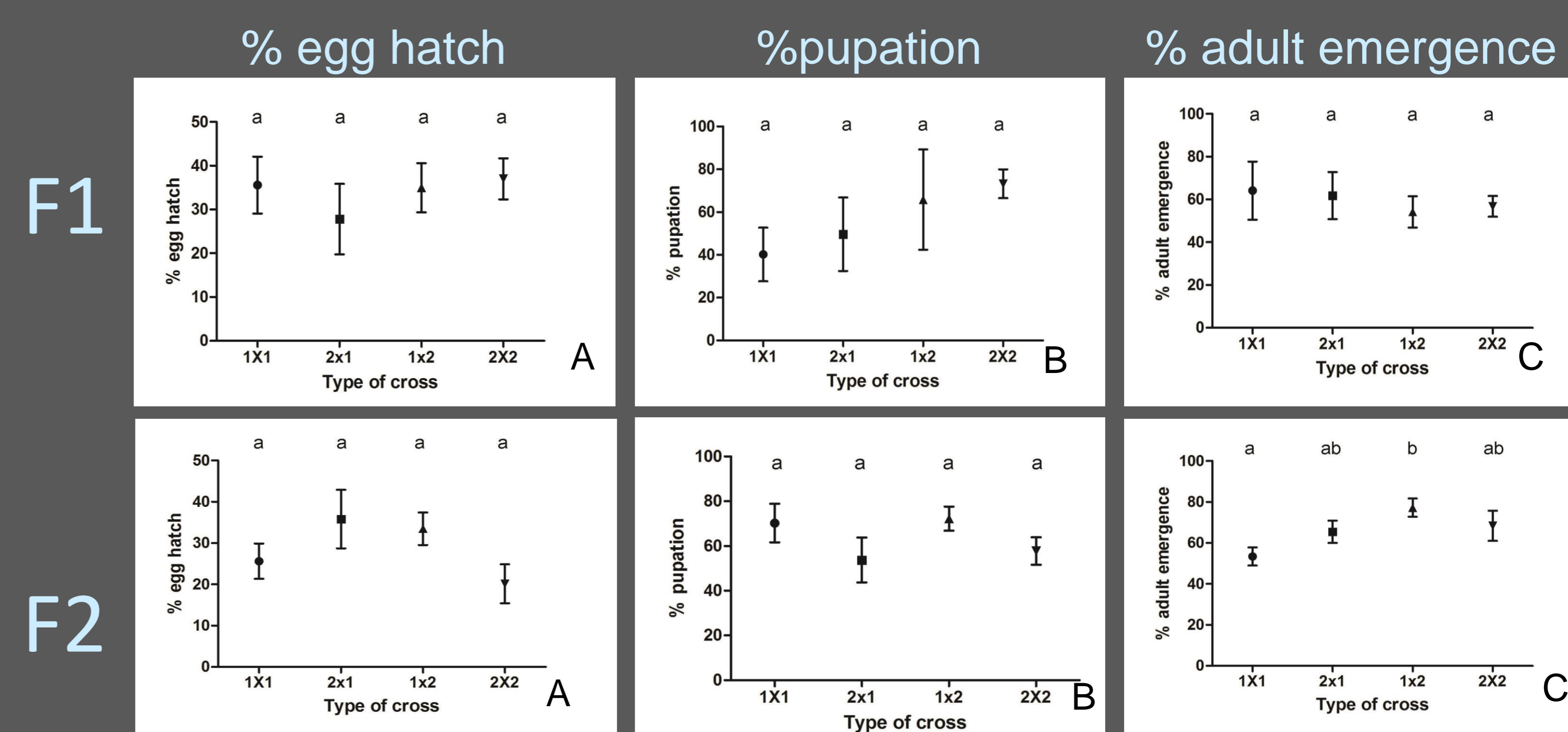
Mating combination	% Mating success (N)	Latency in min (S.E.)	Duration in min (S.E.)	Offspring female proportion	
				F1	F2
Af-Cast-1xAf-Cast-1	68.5 (54)	22.78 (2.53)a	67.50 (4.93)a	0.55a*(506)	0.58a**(429)
Af-Cast-2xAf-Cast-1	70.4 (60)	19.23 (2.51)a	73.60 (3.90)a	0.62b**(535)	0.61b**(306)
Af-Cast-2 xAf-Cast-2	78.0 (64)	22.65 (3.58)a	76.54 (4.56)a	0.48c(1013)	0.47c(164)

Values followed by the same letter did not differ statistically. Statistical significance in the case of proportion of females: * P < 0.05; ** P < 0.01.

Sex ratio in laboratory strains		
Strain ID	N	Female proportion
Af-Cast-1	125	0.65* *p<0.01
Af-Cast-1Rif	118	0.42
Af-Cast-2	72	0.54
Af-Cast-2 Rif	70	0.46

A bias in the sex ratio was observed in crosses involving Af-Cast-1 females. Remarkably, after antibiotic (Rifampicin) treatment, the 1:1 sex ratio was restored.

Post-zygotic isolation analysis



Points sharing a letter did not differ statistically.

No significant difference in % egg hatch and larval viability in F1 and F2 were observed. Pupae viability showed a significant difference in F2 of Af-Cast-1xAf-Cast-1 crosses.

Conclusions

- No evidences of bi-directional cytoplasmic incompatibility were found
- A sex ratio distortion in favor of females was observed in crosses involving Af-Cast-1 females.
- Further analyses are required to confirm the absence of other symbionts involved frequently in sex ratio distortion.
- Crosses between infected and not infected *A. fraterculus* strains will be assessed to clarify the nature of *Wolbachia* - *A. fraterculus* interaction