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First sharpshooter species proven as vectors of *Xylella fastidiosa* subsp. *multiplex* in *Prunus salicina* trees in Brazil

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INTRODUCTION

- **Plum leaf scald (PLS)** was detected in *P. salicina* trees in Brazil in the 70s (Frenck; Kitajima 1978);
- PLS is the most destructive disease affecting plum trees in Brazil;
- **Symptoms:** leaf marginal chlorosis, leaf necrosis, branch dieback, reduced size fruits, and sometimes premature plant death (Hickel et al. 2001);
- Despite the importance of PLS, the vector species responsible for bacterial spread in plums remain unknown;
- **Purpose of the study** => to determine the *X. fastidiosa* transmission ability of three sharpshooter species commonly found in plum orchards in Brazil.

MATERIAL AND METHODS

Common species in plum orchards in southern and southeastern Brazil

Macugonalia leucomelas (Walker)

Sibovia sagata (Signoret)

Macugonalia cavifrons (Stål)

3) Individual transmission efficiency

$$P=(1 - (1-I)^{1/k}) \times 100$$

Where:
P = transmission efficiency
I = proportion of positive plants
K = number of insects per plant

Swallow (1985)

1) Obtaining source-plants

X. fastidiosa subsp. *multiplex* ST67

Mechanical inoculation by pinprick method

2) Transmission trials

Acquisition access period (72h)
70 adults of each species

Source plant (Xf-infected plum)

Inoculation access period (96h)
4 adults of each species/test plant

Test plant (healthy plum)

Evaluation of test plants for Xf infection

Leaf samples (0.1–0.12 g)

DNA extraction

PCR primers HL5/HL6 (Francis et al., 2006)

*Experiment repeated 2x per trial with 10 plants per repetition

RESULTS

Transmission rates of *Xylella fastidiosa* subsp. *multiplex* to *Prunus salicina* cv. Reubennel by sharps

Trial	Sharpshooter species	Infected plants/inolulated plants[a]	Transmission probability per insect[b]
I	*Macugonalia cavifrons*	5/10	0.160
	Macugonalia leucomelas	5/10	0.160
II	*Sibovia sagata*	6/10	0.204
	Macugonalia leucomelas	4/10	0.119
	Sibovia sagata	5/10	0.159

[a]The proportion of plum plants positive for *X. fastidiosa* by polymerase chain reaction (PCR) at 7 months after an inoculation period access (IAP) of 96 h with four insects per plant. Before the IAP, the insects were allowed an acquisition access period of 72 on infected plum trees;
[b] Estimated probability of transmission by a single insect, as described by Swallow (1985), since each test plant was inoculated by four insects.

CONCLUSION

- The sharpshooters *M. cavifrons*, *M. leucomelas* and *S. sagata* transmit *X. fastidiosa* to plums with mean transmission efficiencies by single insects of 16, 14 and 18% respectively;
- This is the first study to identify vector species and prove the transmission of a PLS strain of *X. fastidiosa* subsp. multiplex by sharpshooters in Brazil;
- The identification of insect vectors improves our understanding of PLS epidemiology, aiding the development of more efficient control strategies to reduce losses caused by this disease.

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