

Bioecology of the invasive B biotype compared to the indigenous Ms biotype of *Bemisia tabaci* on tomato

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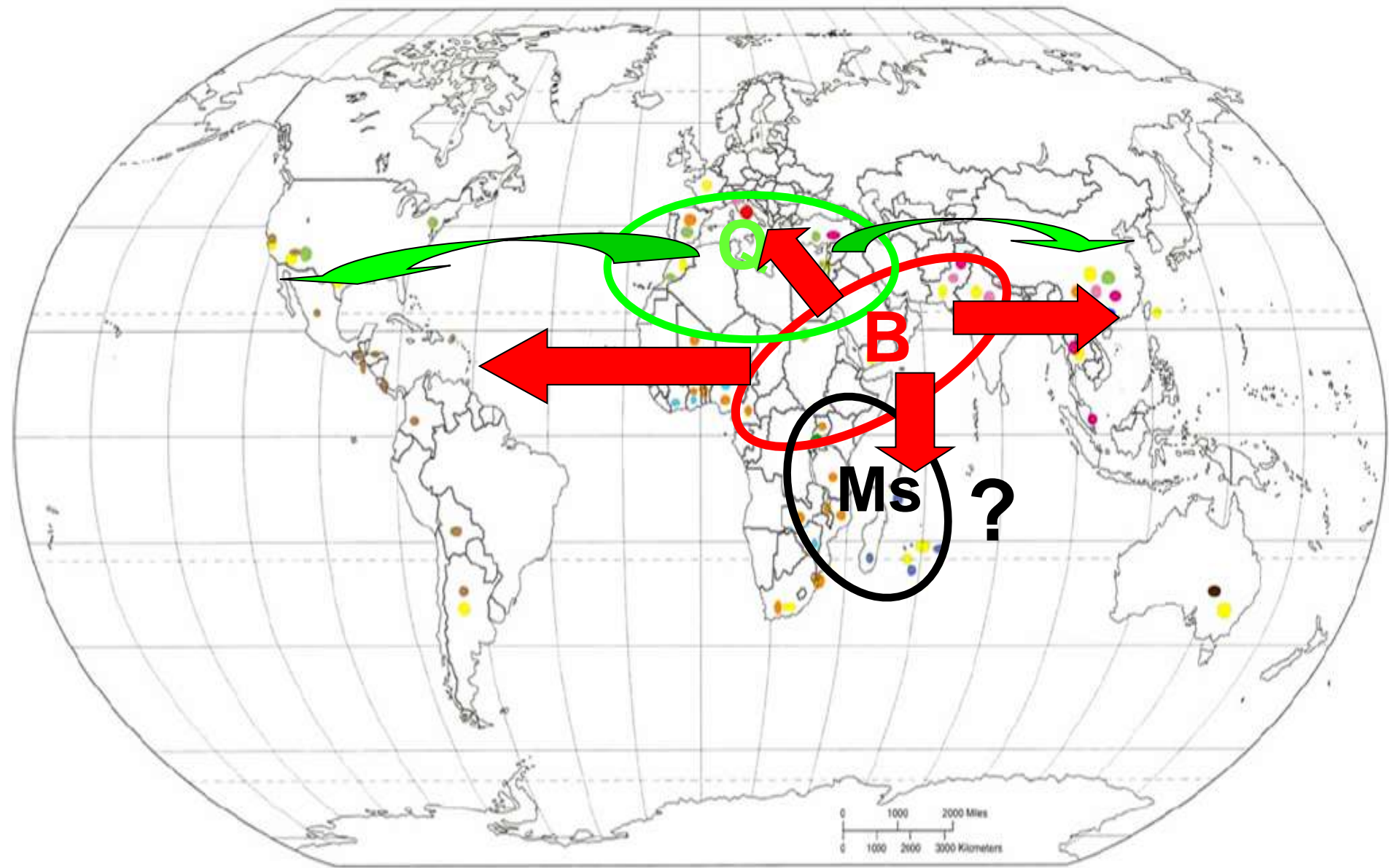
Bemisia tabaci an invasive pest

- *B. tabaci* a polyphagous insect:
 - > 900 plants host species belonging to more than 74 botanical families (Cook, 1986)
- The main insect pest of solanaceous crops

Vector of more than 111 viruses belonging to 5 virus genus (*Begomovirus*, *Crinivirus*, *Closterovirus*, *Ipomovirus*, *Carlavirus*)(Jones, 2003)

TYLCV infected tomato plant

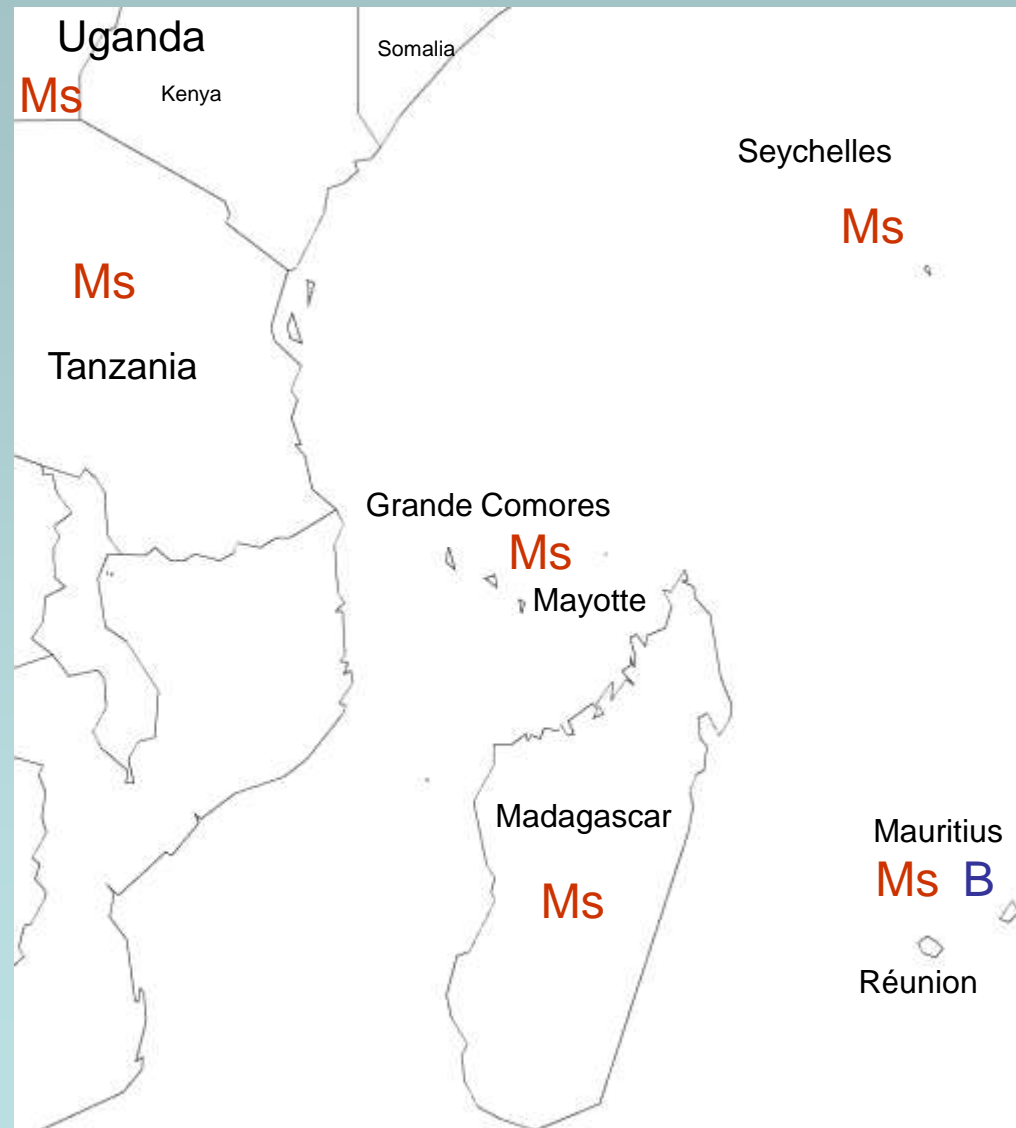




- The biotype B and recently the biotype Q invading the major agricultural areas

Introduction	<i>Mat & Met</i>	<i>Results: Lab study</i>	<i>Results: Field survey</i>	<i>Conclusion</i>
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Biotypes of B. tabaci in the area of the South West Indian Ocean

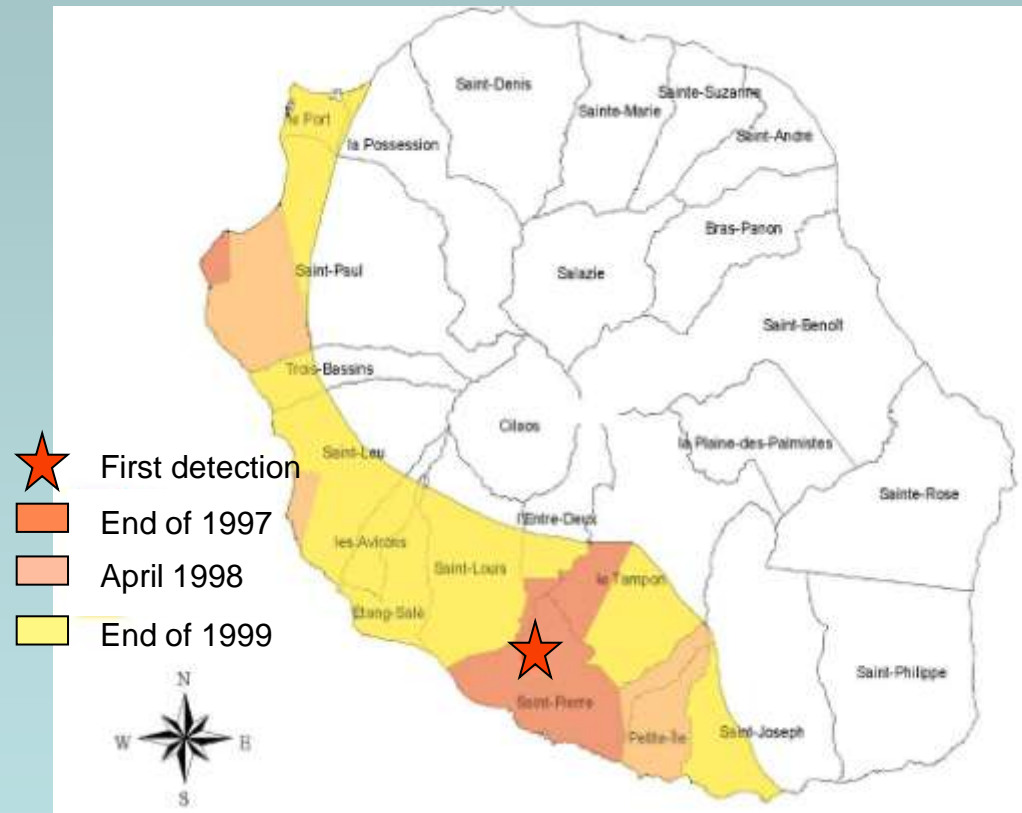


- Ms biotype, a clade originating from the SWIO region
- Recent introduction of biotype B in Réunion and Mauritius (Ganeshan and Abeeluck, 2000 Delatte *et al.*, 2005 *Bull. Ent. Res.*)

1997 : TYLCV introduction in la Réunion

- The TYLC epidemic revealed the pullulation of *Bemisia tabaci* in vegetable crops

(Peterschmitt et al.,
1999, *plant dis.*)



(Reynaud et al., 2003 *Phytoma*)

Questions

- Is the success of invasion of biotype B in the island of la Réunion linked to better life-history traits (/Ms) ?
- Are biotypes repartition differential around la Réunion ? (segregating niche habitats according to host plants / abiotic factors?)

Material and Method

I- Lab study

At 5 different constant temperatures (15 to 35°C) on tomato plants

Immature stages (daily records):

- Egg hatching, length of development, survival

Adult stage:

- Longevity, Fecundity
- Adult and egg sizes



II- Field survey

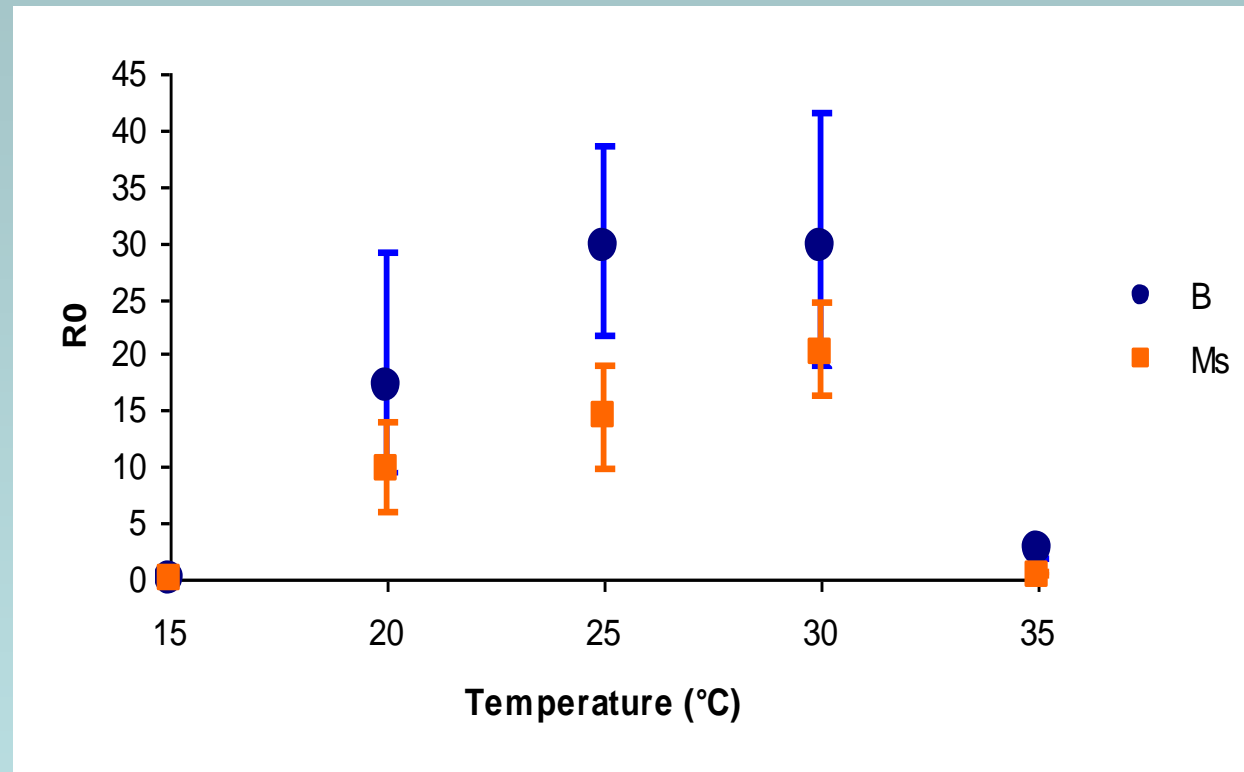
Field collect on different host plants: cultivated/weeds, in 18 sites



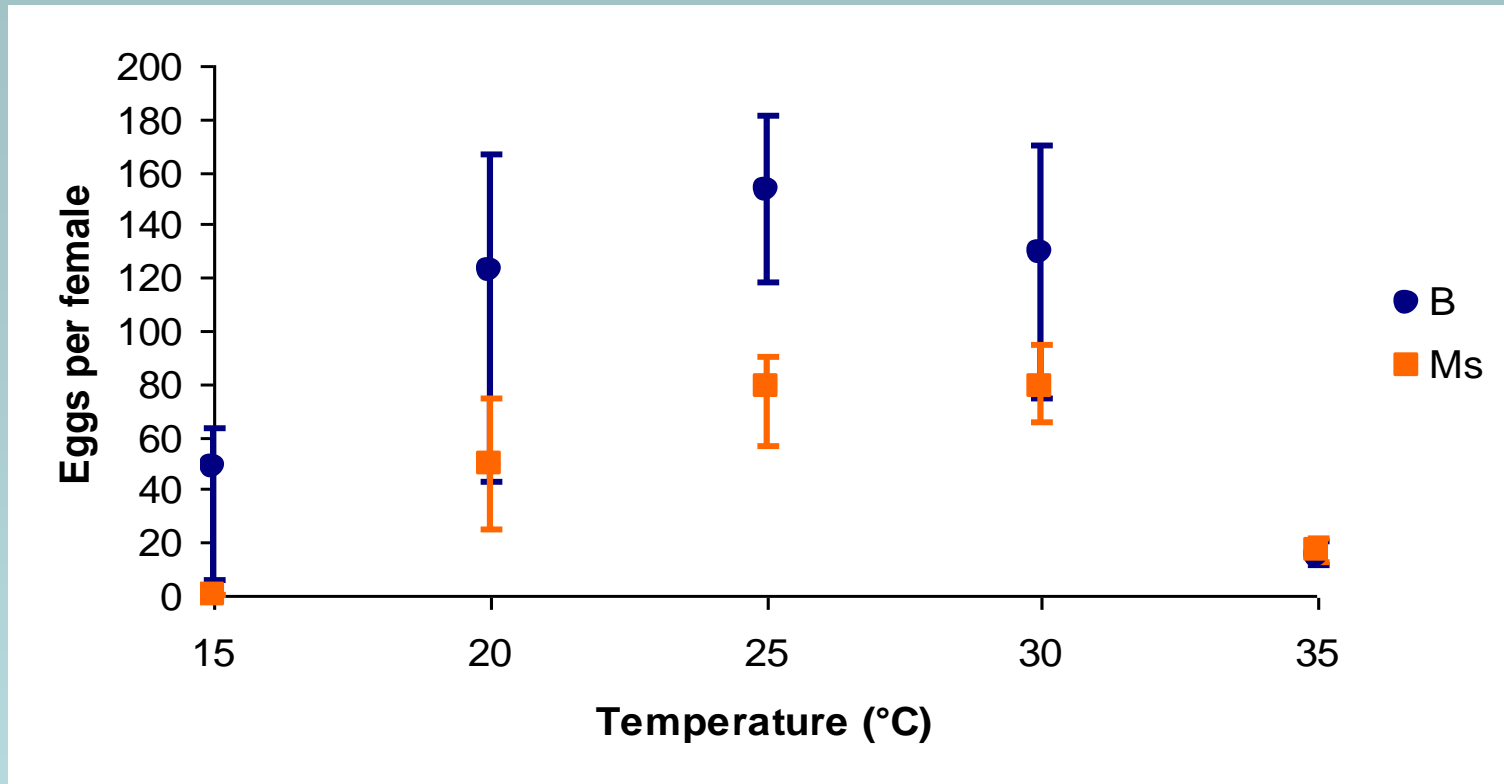
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Net reproductive rate (Ro)

- $Ro_B > Ro_{Ms}$
at any
temperature
- Ro significantly
different at 25°C

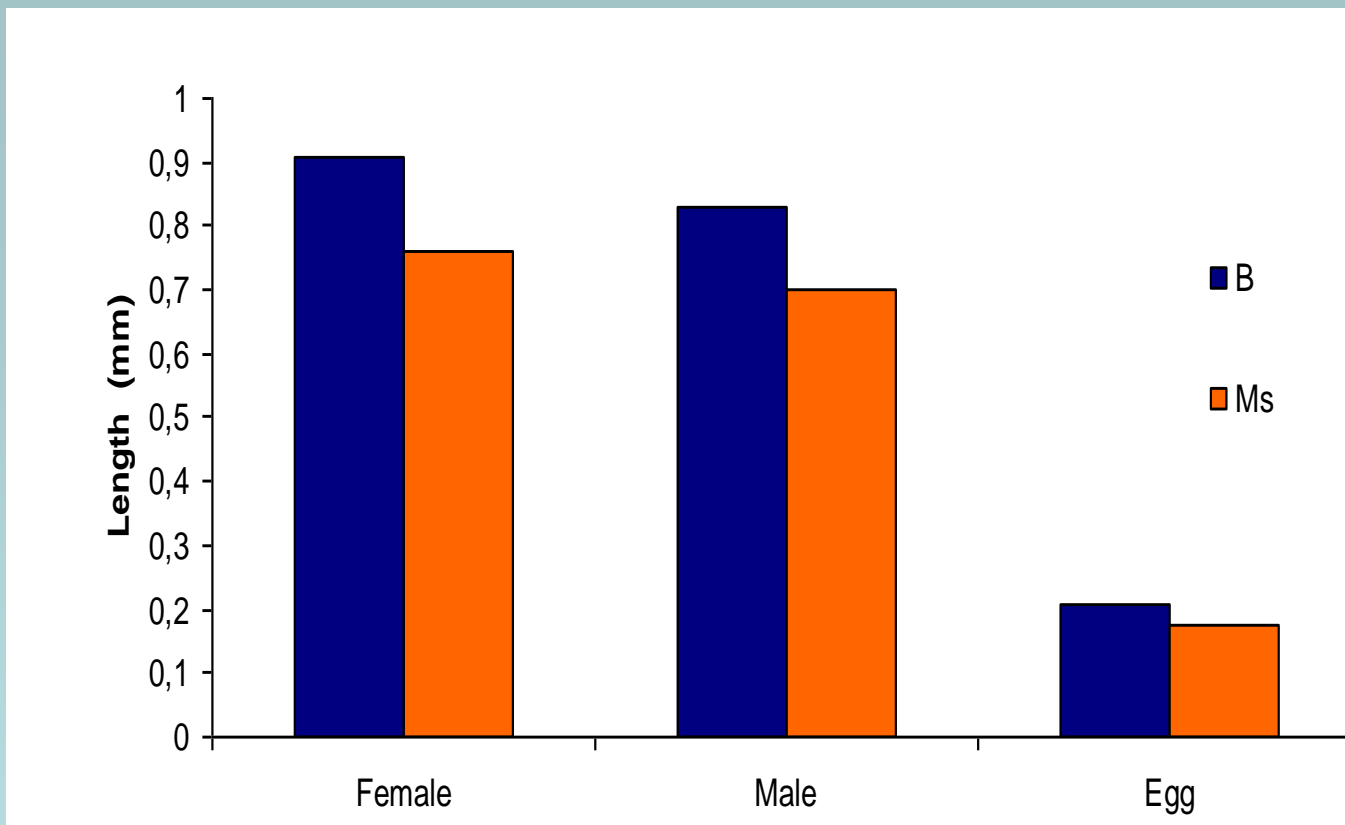


Fecundity



- B(fecundity) > Ms(fecundity) at any temperature
- At 25°C 160 eggs/female for B and only 80 for Ms females
- High fecundity = r traits (good colonist)

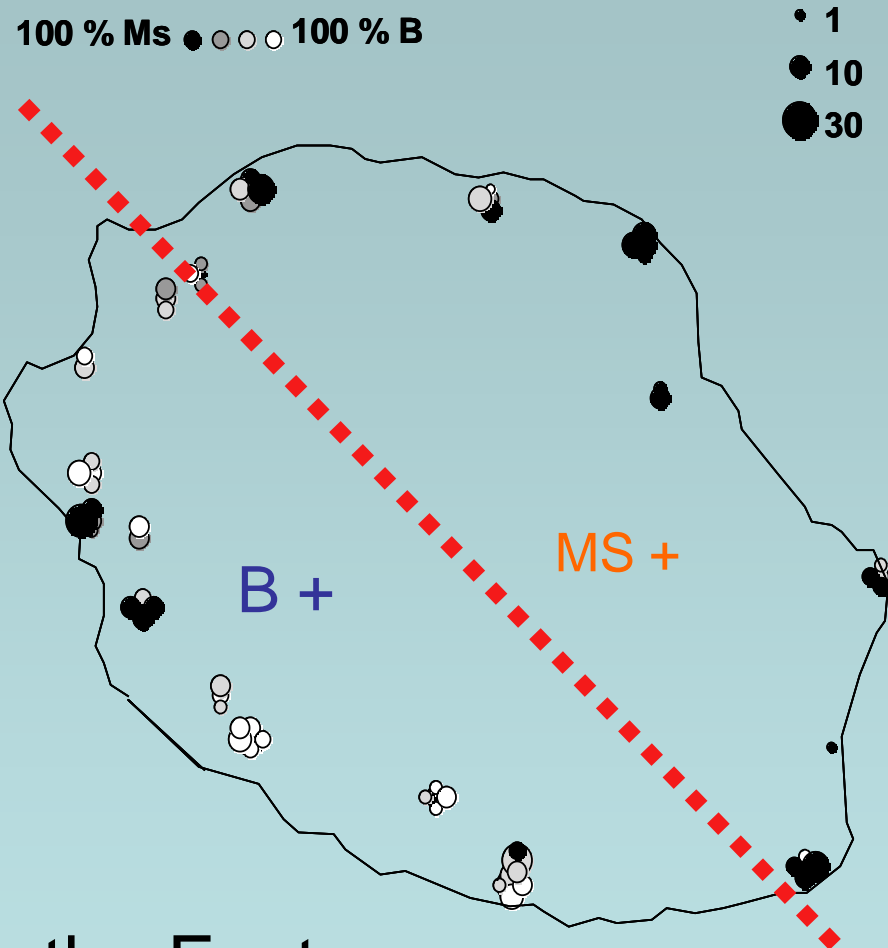
Adult and egg sizes



- $B(\text{size}) > Ms(\text{size})$
- Bigger size = K traits (good competitor)

Biotype repartition

- 700 adults
- 12 different host plants weeds/cultivated
- Biotype differentiation by microsatellite markers (*Delatte et al., 2006, Genet. Res.*)



 B in the West, Ms in the East

Introduction

Mat & Met

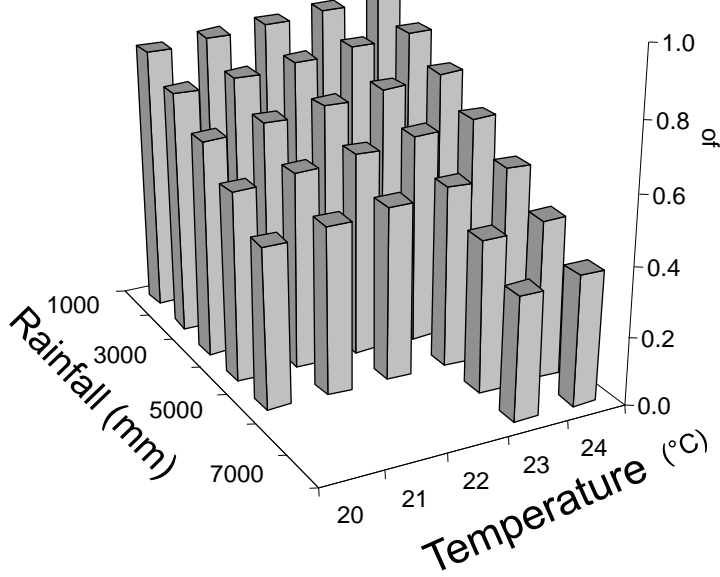
Results: Lab study

Results: Field survey

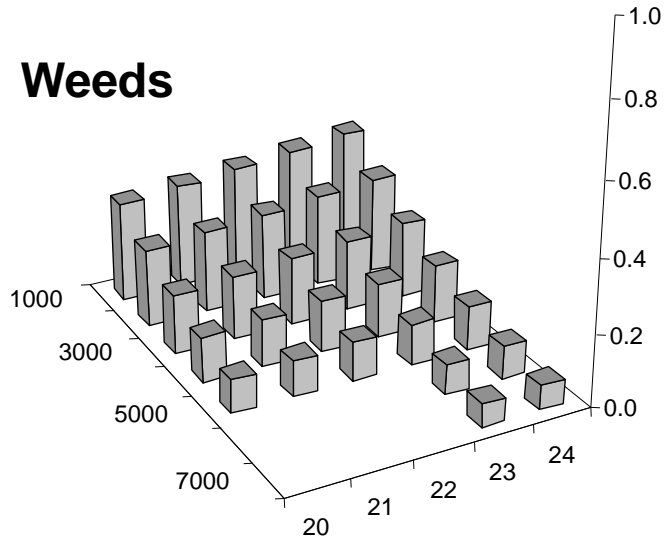
Conclusion

Host plants and abiotic factors

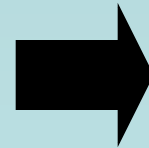
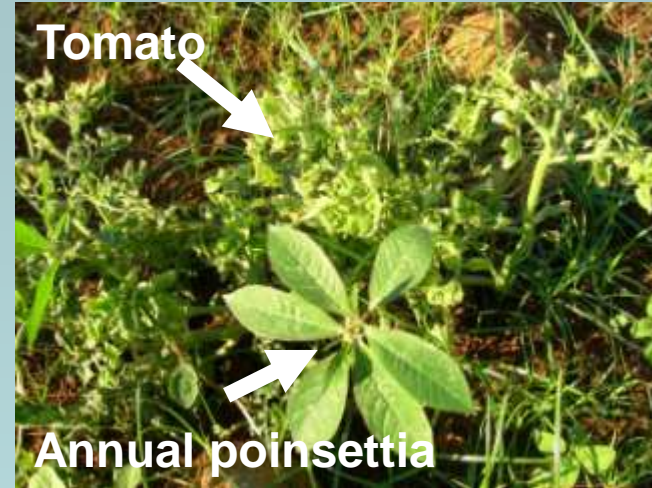
Cultivated plants



Weeds



Proportion of B biotype / total



Distribution of Biotypes depending on the host plants and rainfall

Conclusion

- Biotype B is a good invader on tomato plants with no trade off between r –traits (high: R_0 , fecundity, survival) and K-traits (size, longevity)
- Biotype Ms is potentially invasive in more humid areas
- Human-altered environments (with low plant biodiversity) favour biotype B invasions

Delatte et al., accepted Biol. Invasion

Introduction

Mat & Met

Results: Lab study

Results: Field survey

Conclusion

Future prospects

B x Ms hybrids had been described in the field in Reunion (Delatte et al. , 2006, Genet. Res.) and different endosymbiontes composition between B and Ms populations observed

→ Are gene flow and/or endosymbiontes acquisition allow to acquire rapidly a better adaptation to host plants and/or climatic conditions ?

Thanks for your attention

