Evolution of thermal adaptation in the wheat pathogen *Mycosphaerella graminicola*

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Introduction

Species are adapted to limited range of temperature

Climate change has impacts on species distribution and survival

Genetic variation in temperature sensitivity is important for species to adapt to changing climates

Materials and Methods

Five populations of *M. graminicola* were sampled from low (Switzerland and Oregon) and high (Australia and Israel) temperature zones (n=141)

The populations were assayed for neutral (RFLP) and functional (temperature sensitivity) variation

Means and genetic variations in temperature sensitivity were compared

Results and conclusion

The populations from Oregon and Switzerland grew better at 17 °C

The populations for Israel and Australia grew better at 22 °C

The populations from Israel and Australia were more sensitive to the increase of temperature

Genetic differentiation in temperature sensitivity (Q_{ST}) is lower than genetic differentiation in RFLP (G_{ST}) between populations of the same temperature zone

Q_{ST} is higher than G_{ST} between populations of the different temperature zones

Table 1 **Growth rates**

Populations	Ave. T. (year)	Growth rates Low (17°C)	High (22°C)	High/Low
Israel	19.3	0.089 C	0.108 A	1.24 A
Australia	14.9	0.083 D	0.098 D	1.20 A
Oregon. S	10.3	0.094 A	0.101 C	1.08 B
Oregon R	10.3	0.093 A	0.101 C	1.08 B
Switzerland	9.8	0.096 A	0.105 B	1.10 B

Figure 1 **Genetic differentiation in temperature sensitivity and RFLP markers: A) colony size; B) growth rate**