

Gene-for-gene epidemic models, systemic acquired resistance, and the evolution of plant parasites

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Abstract (300 words limit)

Many plant parasites interact with their host through gene-for-gene interactions. Considerable polymorphism for virulence (defined as the ability to overcome a resistance gene) and resistance occurs in agricultural and wild ecosystems. Fitness costs of resistance and virulence are required for polymorphism to be maintained in the long run [1]. A previous study [2] showed that there exist virulence costs in the

Great Famine pathogen (*Phytophthora infestans*). These costs are mainly due to a lower spore production. However, virulent genotypes have a shorter latent period (time-to-sporulation). The latter observation is intriguing as virulent genotypes are expected to benefit from shorter latent periods.

A key component of plant immunity is termed systemic acquired resistance (SAR): this is a partial resistance response that occurs following an earlier exposure to a pathogen.

Through an adaptive dynamics approach, we show that SAR, by increasing the latent period of subsequent infections, may indeed select for shorter latent period in virulent genotypes. This way, we provide an original and possibly testable hypothesis to explain previously puzzling observations.

References

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