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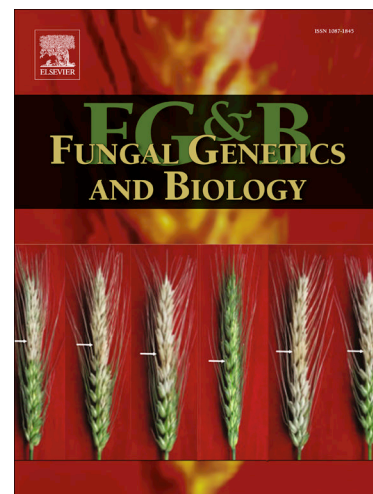
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**Evidence for local adaptation and pleiotropic effects associated with melanization in a
plant pathogenic fungus**

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Abstract:

We combined a common garden experimental design with digital image analysis to determine how melanization responds to temperature and fungicide stress in 126 strains of *Rhynchosporium commune* sampled from nine global field populations. We found that different temperatures and fungicide stress significantly affected the degree of melanization. The nine field populations showed similar patterns in response to the different temperatures. Significant correlations were found between the degree of melanization and the local environment, including mean annual temperature, latitude, and relative humidity, suggesting that melanization is a locally adaptive trait. We also found that melanization is positively correlated with both virulence and fungicide resistance. These findings suggest that melanization has pleiotropic effects in *Rhynchosporium commune*.

Keywords: melanization, virulence, fungicide resistance, local adaptation, *Rhynchosporium commune*

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