Environmental effects on the induction of wheat chemical defences by aphid infestation

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The effects of temperature and photoperiod on the ability of wheat (Triticum aestivum L.) seedlings to show induced responses (increased accumulation of hydroxamic acids, Hx) upon infestation by the bird cheery-oat aphid. Rhopalosiphum padi L. were evaluated under laboratory conditions. Induction of Hx was significantly higher at lower temperature. No such clear trend was found for the photoperiod effect. The significant effect of environmental conditions on growth rate of seedlings and the significant negative correlation between growth rate prior to infestation and induction of Hx suggested that environmental effects on induced responses were at least partially mediated through their effect on plant growth rate. After statistically uncoupling the effect of environmental conditions from the effect of plant growth rate, the effect of temperature on induction of Hx was no longer significant. Therefore, the temperature effect was mediated by plant growth rate.