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Effect of different temperatures on germination of pea powdery mildew

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Abstract

Maximum germination of conidia (70.56 %) was observed at 20°C, while minimum germination of conidia (6.40 %) observed at 5°C. The germination of conidia increased progressively with an increase in temperature from 5°C to 20°C but decreased further significantly.

Keywords: Powdery mildew, *Erysiphe polygoni* Dc, *Pisum sativum*, sowing dates

Introduction

Powdery mildew of Pea (*Pisum sativum* L.) caused by *Erysiphe polygoni* DC is one of the severe disease causing considerable losses during rabi in the state of Maharashtra (Moghe *et al.*, 1982 and Dhutraj *et al.*, 2005). Powdery mildew generally appears from the early flowering to pod maturity stage and its development depends upon the cultivars used, date of sowing and prevailing weather conditions. Therefore, present study was undertaken to find out the effect of different temperature on powdery mildew development.

Material and Methodology

Effect of temperature on spore germination was studied using cavity slide germination method. The powdery mildew spore masses of the pathogen were collected from heavily infected pea plants. Fresh spores from recently captured spore masses were taken for all treatments. Spores from samples were separated from the diseased tissue by shaking the exposed end of the powdery masses with a needle. The germination of conidia was studied in distilled water. Spores from the leaf surface were transferred with the help of camel hair brush to the cavity slide containing distilled water so as to get about 25 spores per microscopic field. Spores were dusted with the help of camel hair brush on the cavity slide and placed in the incubator for 24 hours at 20 ± 1°C temperature. Later cavity slides were removed from the incubator and observed under low power of the microscope. Total numbers of conidia and numbers of conidia germinated were recorded in each microscopic field. The cardinal temperature required for conidial germination was carried out on cavity slides. Three replications were maintained for each temperature. Per cent germination was calculated by counting 100 spores using following formula.

$$\text{Per cent germination} = \frac{\text{No. of spore germinated}}{\text{Total no. of spores}} \times 100$$

Result and Discussion

In-vitro effect of temperature on spore germination

The data on the effect of temperature on germination of conidia of *Erysiphe polygoni* are presented in Table 1, Fig. 1. Maximum germination of conidia (70.56 %) was observed at 20°C, while minimum germination of conidia (6.40 %) observed at 5°C. The germination of conidia increased progressively with an increase in temperature from 5°C to 20°C but decreased further significantly. Similar trend was followed in both the years 2016-17 and 2017-18. These results are in accordance to those reported by Yarwood *et al.* (1954)^[8], Paulech (1969)^[4], Kothari and Verma (1977)^[2], Mittal and Sharma (1992)^[3], Thakur and Agarwal (1995)^[5], Venkatrao (1997)^[7] and Kenyon *et al.*, (1998)^[1].

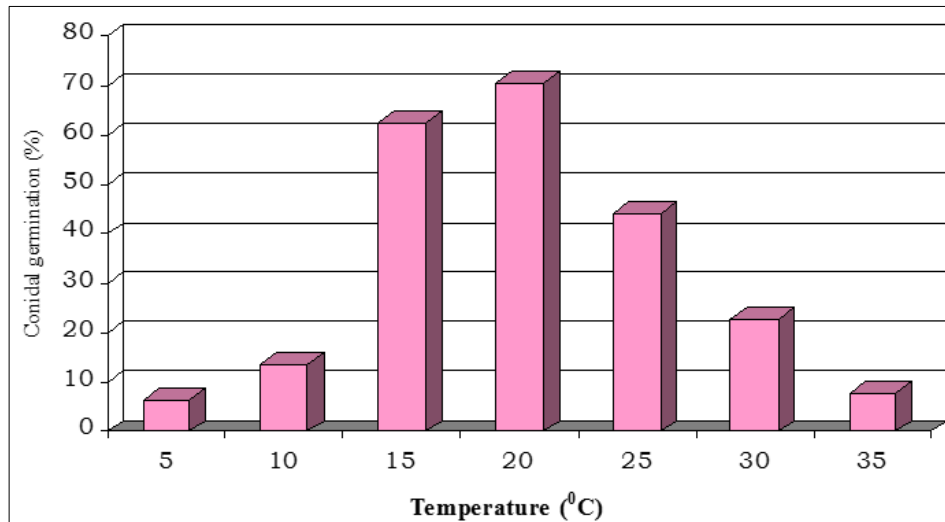
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Table 1: *In-vitro* effect of temperature on germination of conidia of *Erysiphe polygoni* DC.

Temperature (°C)	Conidial germination (%) 2016-17	Conidial germination (%) 2017-18	Mean Conidial germination (%)
5	6.61 (14.86)	6.20 (14.41)	6.40
10	13.25 (21.33)	13.66 (21.68)	13.45
15	61.61 (51.72)	63.56 (52.88)	62.58
20	70.01 (56.80)	71.11 (57.50)	70.56
25	44.20 (41.67)	44.07 (41.59)	44.13
30	22.73 (28.47)	22.84 (28.55)	22.78
35	7.85 (16.21)	7.39 (15.67)	7.62
SE±	0.55	0.606	0.578
CD at 5%	1.63	1.784	1.707

Figures in parenthesis are arc sin transformed values

**Fig 1:** *In-vitro* effect of temperature on germination of conidia of *Erysiphe polygoni* DC

Conclusions

Maximum germination of conidia was recorded at 20 °C, while minimum germination at 5 °C.

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