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Effect of different temperatures on sporangial germination of *Phytophthora colocasiae* causing Phytophthora leaf blight of Colocasia

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Effect of nine temperatures viz., 10°, 12°, 15°, 20°, 25°, 30°, 35°, 37° and 40°C on direct sporangial germination and zoospore formation (indirect) was observed. Maximum direct sporangial germination was found at 30°C. It was totally checked below 20°C and above 37°C. Zoospore formation (indirect) was optimum at 15°C. Zoospore formation was favoured by the sucrose solution (2 %) as compared to distilled water.

Key words : *Phytophthora colocasiae,* Colocasia, temperature

Colocasia or Taro [*Colocasia esculenta* (L.) Schott] is one of the tropical tuber crops serving as food security as well as vegetable crop in many parts of the world. This crop is affected by many fungal diseases of which Phytophthora leaf blight caused by *Phytophthora colocasiae* Raciborski is the most important one. Some authors have reported the yield losses due to this disease (Gadre and Joshi, 2003; Misra, 1997). Epiphytotics is reported to be favoured by temperature of 20–22°C with 100 per cent RH during night and 25–28°C temperature with at least 65 per cent RH during the day. It is further favoured if accompanied by cloudy and rainy weather (Chauhan *et al.*, 2002). The present study has been undertaken, therefore, to investigate the effect of different temperatures on sporangial germination of the fungus *Phytophthora colocasiae.*

Colocasia crop was planted during 1st week of June at a spacing of 60 x 45 cm with sub-plots size of 3.0 x 2.25 m in the Agriculture Farm at Regional Centre of Central Tuber Crops Research Institute, Bhubaneswar. Sporangia produced in the *Phytophthora* leaf blight were collected and placed on distilled water or 2 per cent sucrose solution. The experiment was conducted by slide germination technique. Two drops of sporangial suspension were placed in each cavity of cavity slide. Cavity slides with sporangial suspension were incubated at 10°, 12°, 15°, 20°, 25°, 30°, 35°, 37° and 40°C for 90 and 180 minutes to study sporangial germination or zoospore formation. The experiment was replicated five times. The data were recorded.

The results revealed (Table 1) that direct sporangial germination was favoured between the temperature range of 25° to 35°C. Maximum direct sporangial germination was observed at 30°C. This germination was inhibited below 20°C and above 37°C. Direct sporangial germination was reduced by sucrose solution (2%) in comparison to distilled water. Zoospore formation (indirect) was favoured within the temperature range of 12°–25°C, optimum being at 15°C. There was no zoospore production at 10°C and above 30°C. Zoospore formation was favoured by the sucrose solution (2%) as compared to distilled water.

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Table 1. Effect of different temperatures on direct sporangial germination and zoospore formation (indirect) of *Phytophthora colocasiae*

Temp. (°C)	Distilled water (Av. no. of sporangia germinated)				Sucrose solution (2%) (Av. no. of zoospore formed)			
	Direct		indirect		Direct		Indirect	
	90 mm.	180 mm.	90 mm.	180 mm	90 mm	180 mm	90 mm	180 mm
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	20.36	24.56	0.0	0.0	20.48	28.58
15	0.0	0.0	33.78	48.80	0.0	0.0	35.85	53.31
20	2.42	5.88	16.71	26.89	2.02	5.56	19.32	32.42
25	8.37	11.43	5.90	9.60	6.28	9.06	8.27	12.85
30	24.31	45.42	0.0	1.19	20.85	37.25	1.11	3.42
35	9.26	30.98	0.0	0.0	5.96	19.79	0.0	0.0
37	2.38	2.26	0.0	0.0	0.0	1.64	0.0	0.0
40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

C.D. at (0.05) = 3.66

Hossain and Banik (1999) found that the optimum temperature for direct sporangial germination and zoospore formation (indirect) of the fungus *Phytophthora nicotianae var. nicotianae* was 25°–30°C and 20°C, respectively. The similar result was also reported by Singh *et al.* (2005) on direct sporangial germination in *Phytophthora colocasiae.*

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