

**Research Note :**

EVALUATION OF TARO (*Colocasia esculenta* var. *antiquorum*) GENOTYPES AGAINST LEAF BLIGHT (*Phytophthora colocasiae*) UNDER EASTERN UTTAR PRADESH CONDITION

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Taro (*Colocasia esculenta* var. *antiquorum*) is one of the major root crops in India as well as world and is an important source of food and income. Corms are high in carbohydrates and the leaves are an excellent source of vitamins. In addition to its nutritional and economic importance, taro plays a significant role in the cultural heritage of the different parts of India, and is considered an essential component of many traditional ceremonies. Marian Raciborski (1900) first described *Phytophthora colocasiae* causing leaf blight of Taro in 1900 from Java. The pathogen probably spread from Java to the North Pacific; from Java to the Central Pacific; and from Java to the South Pacific (Trujillo, 12). It was first reported from India in 1911 (Butler and Kulkarni, 3). It is the most destructive fungal disease responsible for heavy yield losses (25 to 50%) of taro in India (Misra, 5; Grade and Joshi, 2). In addition, this pathogen causes a serious post-harvest decay of taro corms. Some fungicides can be used but are generally too expensive for the majority of growers. Breeding plants with resistance to the disease offers the best long-term strategy for the management of the disease.

Ninety genotypes of taro were planted at Main Experiment Station of Vegetable Science Department, NDUAT Kumarganj Faizabad, Uttar Pradesh during *Kharif* 2006 and 2007. The experiments were conducted in augmented design.

All the recommended package and practices were followed for raising a good crop except plant protection. The disease was scored on 0-5 scale (Prasad, 7). Disease incidence was determined by given formula :

$$\text{Disease incidence} = \frac{\text{Infected plants}}{\text{Total plants}} \times 100$$

The use of resistant genotypes is considered to be the best method for disease management. Therefore, the present study was carried out to determine source of resistance against *P. colocasiae*. Ninety taro genotypes were evaluated under natural epiphytotic conditions during *Kharif* 2006 and 2007 cropping season. Out of the ninety genotypes evaluated none was found highly resistant, resistant and moderately resistant. Only seven genotypes were recorded moderately susceptible namely NDC-1, NDC-2, NDC-3, PKS-1, NDC-61, NDC 68 and NDC-84. Twenty three genotypes viz., NDC-4, NDC-5, NDC-7, NDC-8, NDC-9, ND-10, NDC-11, NDC-13, NDC-14, NDC-15, NDC-16, NDC-17, NDC-18, NDC-19, NDC-25, NDC-27, NDC-28, NDC-29, NDC-31, NDC-37, NDC-41, NDC-43, and NDC-44 gave susceptible reaction. Sixty genotypes viz., NDC-6, NDC-12, NDC-20, NDC-21, NDC-22, NDC-23, NDC-24, NDC-26, NDC-30, NDC-32, NDC-33, NDC-34, NDC-35, NDC-36, NDC-38, NDC-39, NDC-40, NDC-42, NDC-45, NDC-46, NDC-47, NDC-48, NDC-49, NDC-50,

Table 1: Performance of Taro (*Colocasia esculenta* var. *antiquorum*) genotypes against leaf blight (*Phytophthora colocasiae*) under Eastern Uttar Pradesh condition during *Kharif* 2006 and 2007.

S.No.	Scale	Range of DI (%)	Reaction	No. of genotypes	Name of genotypes
1.	0	0.00	HR	Nil	Nil
2.	1	1-5	R	Nil	Nil
3.	2	6-25	MR	Nil	Nil
4.	3	26-50	MS	7	NDC-1, NDC-2, NDC-3, PKS-1, NDC-61, NDC-68, NDC-84,
5.	4	51-75	S	23	NDC-4, NDC-5, NDC-7, NDC-8, NDC-9, NDC-10, NDC-11, NDC-13, NDC-14, NDC-15, NDC-16, NDC-17, NDC-18, NDC-19, NDC-25, NDC-27, NDC-28, NDC-29, NDC-31, NDC-37, NDC-41, NDC-43, NDC-44,
6.	5	76-100	HS	60	NDC-6, NDC-12, NDC-20, NDC-21, NDC-22, NDC-23, NDC-24, NDC-26, NDC-30, NDC-32, NDC-33, NDC-34, NDC-35, NDC-36, NDC-38, NDC-39, NDC-40, NDC-42, NDC-45, NDC-46, NDC-47, NDC-48, NDC-49, NDC-50, NDC-51, NDC-52, NDC-53, NDC-54, NDC-55, NDC-56, NDC-57, NDC-58, NDC-59, NDC-62, NDC-63, NDC-64, NDC-65, NDC-66, NDC-67, NDC-69, NDC-70, NDC-71, NDC-72, NDC-73, NDC-74, NDC-75, NDC-76, NDC-77, NDC-78, NDC-79, NDC-80, NDC-81, NDC-82, NDC-83, NDC-85, NDC-86, NDC-87, NDC-88, NDC-89, NDC-90

DI = Disease incidence; HR = Highly resistant; R = Resistant; MR = Moderately resistant;

MS = Moderately susceptible; S = Susceptible and HS = Highly susceptible.

NDC-51, NDC-52, NDC-53, NDC-54, NDC-55, NDC-56, NDC-57, NDC-58, NDC-59, NDC-62, NDC-63, NDC-64, NDC-65, NDC-66, NDC-67, NDC-69, NDC-70, NDC-71, NDC-72, NDC-73, NDC-74, NDC-75, NDC-76, NDC-77, NDC-78, NDC-79, NDC-80, NDC-81, NDC-82, NDC-83, NDC-85, NDC-86, NDC-87, NDC-88, NDC-89 and NDC-90 were recorded highly susceptible against *Phytophthora* leaf blight of taro during both the years.

These present findings are in accordance with the reports of earlier workers Goswami *et al.*, 1; Misra, 4; Okpul *et al.*, 6; Shukla, 8; Singh *et al.*, 9 and Thankappan, 11. Yadav *et al.*, 8 studied the coefficient of infection (per cent disease infection as well as per cent disease severity). Out of 34 genotypes evaluated, three were found to be highly resistant, twelve resistant, nine moderately

resistant, three moderately susceptible, two susceptible and five highly susceptible against leaf blight disease. Sugha and Gurung (10) made similar studies and reported that none of the genotypes evaluated were free from disease. However, thirteen lines were found to be susceptible, forty seven moderately susceptible and two lines highly susceptible against taro blight. Yadav and Aggarwal (14) reported fourteen resistant, thirty three moderately resistant, forty two moderately susceptible and twelve susceptible genotypes against leaf blight of colocasia.

REFERENCES

- Goswami, B.K., Zahid, M.I. and HAG-MO (1993). Screening of *Colocasia esculenta* (L.)

- germplasms to *Phytophthora* leaf blight. *Bangladesh J. Pl. Patho.*, **9**(1-2):21-24.
2. Grade, U.A. and Joshi, M.S. (2003). Influence of weather factors on the incidence of leaf blight of colocasia. *Ann. Pl. Prot. Sci.*, **11** (1): 168-170.
 3. Butler, E.S. and Kulkarni, G.S. (1913). Colocasia blight caused by *Phytophthora colocasiae*. *Agric. India*, **5**: 233-261.
 4. Misra, R.S. (1996). A note on zoosporogenesis in *Phytophthora colocasiae*. *Indian Phytopath.* **49**(1):80-82.
 5. Misra, R.S. (1997). Disease of tuber crops in Northern and Eastern India. *Technical Bulletin Series*: **22**. CTCRI, Kerala. India: 5-29.
 6. Okpul, T., Ivancic, A. and Simin, A. (1997). Evaluation of leaf blight resistant taro (*Colocasia esculenta*) varieties for Bubia, marobe province, Papua New Guinea, *Popua New Guinea J. Agric. Forestry & Fisheries*, **40**(1-2): 13-18.
 7. Prasad, S.M. (1982). National survey for diseases of tropical tuber crops. Regional centre of CTCRI, Bhubaneswar, (India): 49.
 8. Shukla, Nandani (2006). Management of colocasia blight caused by *Phytophthora colocasiae* Racib. *M.Sc. (Ag). Thesis* submitted to NDUA & T, Faizabad. (U.P.)
 9. Singh, H.K., Gupta, Savita and Singh, P.K. (2004). Field evaluation of colocasia genotypes against *Phytophthora* leaf blight. *Farm Sci. J.*, **13** (1) : 75-76.
 10. Sugha, S.K. and Gurung, Kusum (2007). Evaluation of taro (*Colocasia esculenta*) germplasm against leaf blight (*Phytophthora colocasiae*). *India J. Agril. Sci.*, **77** (2): 68-70.
 11. Thankappan, M. (1985). Leaf blight of taro-a review. *J. Root Crops*, **11**(1&2): 1-8.
 12. Trujillo, E.E. (1967). The effect of humidity and temperature on *Phytophthora* blight of taro. *Phytopath.*, **55**:183-188.
 13. Yadav, R.K., Yadav, D.S., Sanwal, S.K. and Sarma, Prnabjyoti (2006). Reaction of colocasia genotypes against leaf blight under Meghalaya condition. *India J. Agril. Sci.*, **76**(12): 770-772.
 14. Yadav, V.K. and Aggarwal, A.P. (2008). Screening of germplasm of colocasia against *Phytophthora colocasiae*. *Ann. Pl. Prot. Sci.*, **16** (1): 261.