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***Research Note* :**

FIRST EVALUATION OF TARO (*Colocasia esculenta*) GENOTYPES AGAINST LEAF BLIGHT (*Phytophthora colocasiae*) IN GHANA

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ABSTRACT : Taro genotypes were collected and evaluated to determine their resistance in the Aowin Suaman district of Ghana. Twenty five (25) genotypes of taro from both the Ashanti and Western Region were evaluated for six months in a location for resistance to the leaf blight disease in the study area. The Randomized Complete Block Design was used with each accession replicated three times. The results revealed that of the 25 accessions evaluated, no accession was completely resistant to the disease in the study area, though some were moderately resistant, and that the only solution to the disease is to breed for resistance.

Keywords: *Colocasia, genotype, accession, Phytophthora, colocasiae, resistance.*

Taro (*Colocasia esculenta*) is an important staple crop for several hundred million small-scale farmers and is widely grown throughout Asia and the Pacific, the Americas and Africa. About 10% of the world's population uses taro or taro-like plants (Araceae) as a staple food in their diets, and for 100 million people this is an important daily food (Jeri and Barry, 4). It is an important food crop cultivated for its edible corms in Ghana. Its corms are baked, roasted, or boiled and the leaves are frequently eaten as a vegetable and represent an important source of vitamins, especially folic acid.

Taro is affected by at least 10 major diseases and pests in different parts of the World (Kohler *et al.,* 5). Of the various taro diseases, taro leaf blight (TLB) caused by the fungus-like Oomycete *Phytophthora colocasiae* Racib is of prime importance (Jackson, 3). It has been found in various parts of Asia and the Pacific (Brooks, 2), and has also been reported in some countries in Africa including Nigeria, Cameroun and Ghana (Bandyopadhyay *et al.,* 1; Omane *et al.,* 6).

Though some fungicides have been reported to be effective in managing this disease, they are generally too expensive for the majority of growers, besides most farmers in Ghana cultivate them on subsistence bases and normally around water bodies. The use of resistant genotypes is considered to be the best method for disease management. That was the purpose for the evaluation of germplasm from two major taro growing areas in the country.

Twenty four (25) taro accessions were collected from twelve communities in two Regions in Ghana (Ashanti and the Western region). They were then established in Yakasi, a hot spot area of the disease in the Aowin Suaman District of Ghana. The Randomized Complete Block Design was used with three replications of each genotype. Data collection was started two weeks of establishment when the leaves had started unfolding and at two weeks interval for twelve weeks. 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 by Shakywar *et al*. (8).

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

Table 1 shows the resistance and the susceptibility levels of the 25 taro genotypes evaluated on a 0-100% incidence scale against TLBD. An incidence level of less than 5% represents resistance and more than 24% also represents susceptibility (Shakywar *et al.,* 8). It was clear that none of the accessions was completely resistant against the disease with an incidence of less than 5%. Seven out of the 25 accessions were moderately resistant with an incidence range of 6-25%. All the rest were susceptible because they recorded an incidence level of more than 25%.

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Table 1 : Level of resistance of taro accessions against the taro leaf blight disease on field condition.

Scale	Range of DI (%)	Level of Resistance	Number of accessions	Accession number
0	0.00	HR	NIL	
1	1-5	R	NIL	
2	6-25	MR	7	FKA12/AJ001, FKA12/E002, FKA12/J001, FKA12/NT001, FKA12/NT003, FKA12/OK001, FKA12/P004
3	26-50	MS	16	FKA12/AB001,FKA12/AG001,FKA12/AK001,FKA12/AK002,FKA12/E001,FKA12/NT002,FKA12/P001,FKA12/P002,FKA12/P005,FKA12/P006,FKA12/T001 SAO12/NY001, SAO12/NY002,SAO12/NY004,SAO12/NY005,SAO12/NY006
4	51-75	S	1	SA012/NY003
5	76-100	HS	1	FKA12/P003

DI=Disease Index, HR=Highly Resistance, H=Resistance, MR=Moderately Resistance, MS=Moderately Susceptible, S=Susceptible, HS=Highly Susceptible. Level of Resistance was Determined using the scale of Shakywar et al. (8).

Evaluation of genotypes in this study revealed that some cultivars with meaningful resistance can be found in local germplasm in Ghana. It was evident that none of the germplasm evaluated in this study was completely resistant to the disease. The findings also indicates that there may be no accession of taro in both the Western and Ashanti Region of Ghana that may be completely resistant to the taro leaf blight disease. With the current spread of the TLBD in the country, there is the likelihood that all taro genotypes may be attacked. This corroborates finding of Shakywar *et al* (8), who after evaluating ninety taro genotypes in India observed that none was completely resistant. Sugha and Gurung (9) made similar studies and reported that none of the genotypes evaluated in India were free from the taro leaf blight disease.

However, the identification of genotype to be moderately resistant to the disease is encouraging. It is recommended that these seven genotypes are evaluated further in taro leaf blight endemic areas to examine the durability of this moderate resistance. If these genotypes continue to show moderate resistance, then they could be use alongside fungicides and farm sanitation in an integrated management system. Evaluating a greater number of genotypes from a wider region would contribute to identification of resistant materials. Taro genotypes from production areas in different countries with known resistance to taro leaf blight could be collected and evaluated in Ghana to facilitate the search for resistance materials.

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