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### **OP-3.9: Yam anthracnose resistance in *Dioscorea alata* L. – Genetic mapping and QTL analysis**

**Dalila Pétro**<sup>1\*</sup>, Abou Kouassi<sup>2</sup>, Joseph Onyeka<sup>3</sup>, Sandrine Etienne<sup>1</sup>, Denis Lafortune<sup>1</sup> and Sébastien Guyader<sup>1</sup>

<sup>1</sup>INRA, UR1321, Agrosystèmes tropicaux, F-97170, Petit-Bourg, Guadeloupe, France

<sup>2</sup>Université Félix Houphouët-Boigny, UFR Biosciences, Laboratoire de Génétique, 22BP 582 Abidjan22, Côte d'Ivoire

<sup>3</sup>National Root Crops Research Institute, Umudike, Umuahia, Abia State, Nigeria

\*Dalila.Petro@antilles.inra.fr

Food yam is a multi-species crop, cultivated for its tuber production in the tropics and subtropics. Greater yam (*Dioscorea alata*,  $2n = 2x = 40$ ) is the most widely cultivated yam species. In spite of its importance, the development of its production is limited by anthracnose disease caused by *Colletotrichum gloeosporioides* (Penz. & Sacc.). This is the most important disease of *D. alata*, with yield losses of up to 85% under favourable condition. Severe damages have been reported on susceptible varieties in the Caribbean, South Pacific, West Africa and India. Considering the high genetic diversity of *C. gloeosporioides* from yam, the use of durable resistant yam varieties is the most reliable approach to disease management. However, breeding in water yam, a heterozygous plant with an erratic flowering, is a difficult and long process. The speed and precision of breeding can be improved by the development of genetic linkage maps which would provide the basis for locating and hence manipulating quantitative traits such as anthracnose resistance in breeding programmes. Two F1 populations were developed using two different sources of resistance, 'Boutou' and 'Oriental' (female clones showing field resistance to anthracnose) crossed by the susceptible male clone 'Pyramide'. Genetic linkage maps were generated with polymorphic AFLP and microsatellite markers. The resulting maps are the most saturated of all yam maps to date. QTL analysis of anthracnose resistance was performed based on response to two pathogen isolates under controlled inoculations. QTLs detected for anthracnose resistance explained 7 to 40 % of the phenotypic variation. These QTLs displayed isolate-specific resistance as well as broad-spectrum resistance. Validation of the identified QTLs was performed based on the reactions of one mapping population in field conditions. This work constitutes a first step towards the use of QTLs in selection programmes aimed durable resistance to yam anthracnose.



***‘to harness research innovations to  
unleash the potential of yam’***

**PROGRAM AND BOOK OF ABSTRACTS**



**RESEARCH  
PROGRAM ON  
Roots, Tubers  
and Bananas**