

# 1. PaDIL Species Factsheet



## Scientific Name:

*Ralstonia solanacearum* (Smith 1896) Yabuuchi et al. 1996 race 2  
(Bacteria: Proteobacteria: Burkholderiales: Burkholderiaceae)

## Common Name

Moko disease of banana

Live link: <http://www.padil.gov.au:80/pests-and-diseases/Pest/Main/136650>

## Image Library

Australian Biosecurity

Live link: <http://www.padil.gov.au:80/pests-and-diseases/>

## Partners for Australian Biosecurity image library



Museum Victoria

<http://museumvictoria.com.au/>



CRC National Plant Biosecurity

<http://www.crcplantbiosecurity.com.au/>



Plant Health Australia

<http://www.planthealthaustralia.com.au/>



Department of Agriculture, Fisheries and Forestry

<http://www.daff.gov.au/>



Department of Agriculture and Food, Western Australia

<http://www.agric.wa.gov.au/>

## 2. Species Information

### 2.1. Details

**Specimen Contact:** Dr Jose R. Liberato - jose.liberato@dpi.qld.gov.au

**Author:** Liberato JR & Gasparotto L

**Citation:** Liberato JR & Gasparotto L (2006) Moko disease of banana (*Ralstonia solanacearum*) Updated on 10/21/2011 Available online: PaDIL - <http://www.padil.gov.au>

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### 2.2. URL

Live link: <http://www.padil.gov.au:80/pests-and-diseases/Pest/Main/136650>

### 2.3. Facets

**Status:** Exotic Regulated Pest - absent from Australia

**Group:** Bacteria

**Commodity Overview:** Horticulture

**Commodity Type:** Fresh Fruit

**Distribution:** USA and Canada, Central and South America, Africa, South and South-East Asia

### 2.4. Other Names

*Burkholderia solanacearum* (Smith 1896) Yabuuchi et al. 1993 race 2

*Pseudomonas solanacearum* (Smith 1896) Smith 1914 race 2

### 2.5. Diagnostic Notes

The bacteria:

Moko disease is a bacterial wilt caused by *Ralstonia solanacearum* invading the vascular tissues of hosts. *Ralstonia solanacearum* is a species complex with exceptional diversity amongst strains from different hosts and geographical origins. Many strains have less than 70% DNA-DNA homology, which has been considered a threshold level within a species. A general description of this species was provided by Saddler (1994). A detailed summation of identification techniques for *R. solanacearum* can be found in the European and Mediterranean Plant Protection Organisation Bulletin (2005). Strains of *R. solanacearum* have been divided into five host-specific races and five biovars based on biochemical properties. Both classifications do not consistently correspond with each other (Hayward 1991, 1994). The term race is misused for *R. solanacearum* and means pathovar. Race 2 is pathogenic to banana and Heliconia. The race 2 strains cluster into three multi-locus genotypes: MLGs 24, 25 and 28 (Cook & Sequeira 1994); and are also classified in nine ecotypes groups: A, AFV, B, D, H, R, SFR, SFR-C and T (Thwaites et al. 2000, French & Sequeira (1970). Fegan & Prior (2005) proposed a hierarchical classification for *R. solanacearum*, based on phylogenetic analysis of 16S-23S ITS and endoglucanase gene sequences, where race 2 strains belong to Phylotype II, sequevars 3, 4 and 6. Prior & Fegan (2005) has developed a multiplex PCR technique for identification of the race 2 strains. Race 2 occurs mainly in tropical areas from South and Central America causing moko and in the Philippines, causing bugtok disease. According to Fegan (2005), bugtok, which is only known in the Philippines, and moko are one and the same disease. </p></div>

## 2.6. References

Alvarez AM (2005) Diversity and diagnosis of *Ralstonia solanacearum*. In Allen C, Prior P & Hayward AC (eds). Bacterial wilt disease and the *Ralstonia solanacearum* species complex. (APS Press: St. Paul) p.437-447. Buddenhagen IW (1961) Bacterial wilt of bananas: history and known distribution. Tropical agriculture, Trinidad, 38: 107-121. CABI/EPPO (1999). Distribution Maps of Plant Diseases. *Ralstonia solanacearum* (Smith) Yabuuchi et al. race 2. Map 784. Cook D & Sequeira L (1994) Strain differentiation of *Pseudomonas solanacearum* by molecular genetic methods. In Hayward AC & Hartman GL (eds) Bacterial wilt: the disease and its causative agent, *Pseudomonas solanacearum*. Wallingford, UK: CAB International. P. 77-94. Crop Protection Compendium 2005 Edition. *Ralstonia solanacearum* race 2 (moko disease) CAB International, Wallingford, UK. European and Mediterranean Plant Protection Organization (2005). *Ralstonia solanacearum*. EPPO Bulletin 34: 155-157. Fegan M (2005) Bacterial wilt d

## 2.7. Web Links

**EPPO Data Sheets on Quarantine Pests:**

[http://www.eppo.org/QUARANTINE/bacteria/Ralstonia\\_solanacearum/PSDMSO\\_ds.pdf](http://www.eppo.org/QUARANTINE/bacteria/Ralstonia_solanacearum/PSDMSO_ds.pdf)

**NC State University:** [http://www.cals.ncsu.edu/course/pp728/Ralstonia/Ralstonia\\_solanacearum.html](http://www.cals.ncsu.edu/course/pp728/Ralstonia/Ralstonia_solanacearum.html)

**Western Australia – Moko disease:**

<http://www.agric.wa.gov.au/pls/portal30/docs/folder/ikmp/pw/ph/dis/fn/fs02101.pdf>

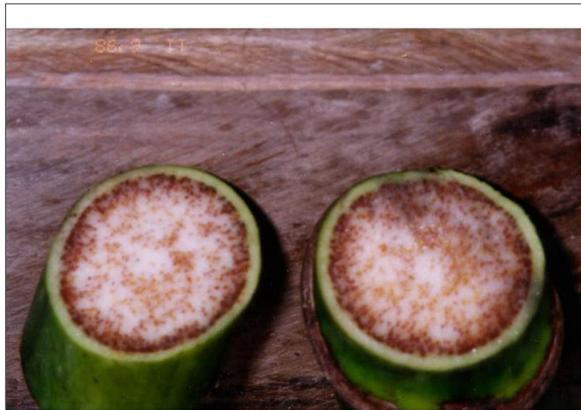
### 3. Diagnostic Images



Wilting of adult plants  
**Host Symptoms:** Dr Luadir Gasparotto  
Embrapa



Wilting of young plant  
**Host Symptoms:** Dr Luadir Gasparotto  
Embrapa



Vascular discoloration on peduncle  
**Host Symptoms:** Dr Luadir Gasparotto  
Embrapa



Vascular discoloration on peduncle  
**Host Symptoms:** Dr Luadir Gasparotto  
Embrapa



Fruit internal rot  
**Host symptoms - fruit:** Dr Luadir Gasparotto  
Embrapa



Fruit internal rot  
**Host symptoms - fruit:** Dr Luadir Gasparotto  
Embrapa



Vascular discoloration on pseudostem  
**Host symptoms - stem:** Dr Luadir  
Gasparotto Embrapa



Vascular discoloration on rhizome  
**Host symptoms - stem:** Dr Luadir  
Gasparotto Embrapa

## Results Generated:

Tuesday, January 6, 2015

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