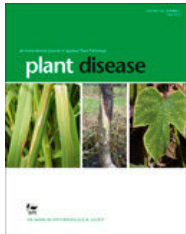


**APS Journals**

The premier source for peer-reviewed plant pathology research since 1911.

[Journals Home](#) [Books Home](#) [APS Home](#) [IS-MPMI Home](#) [My Profile](#) [Subscribe](#) [Search](#) [Advanced Search](#) [Help](#)[Share](#)[Subscribe](#) [Free alerts](#) [RSS](#)

About the cover for May 2018

ISSN: 0191-2917
e-ISSN: 1943-7692**SEARCH**

Enter Keywords

- MPMI
- Phytobiomes
- Phytopathology
- Plant Disease

search[Advanced Search](#)**Resources**

- [Subscribe](#)
- [About Plant Disease](#)
- [First Look](#)
- [Most Downloaded Articles](#)
- [Journals Impact](#)
- [Submit a Manuscript](#)
- [Customer Care](#)
- [About My Password](#)
- [Rights and Permissions](#)
- [Plagiarism and Ethics](#)
- [Advertise](#)
- [e-Xtra](#)
- [Open Access](#)
- [ORCID Registry](#)

ORCID
Connecting Research and Researchers

REGISTRATION IS FREE AND FAST.

ORCID is an open, non-profit, community driven organization.

Your ORCID ID ensures you get credit for your work throughout your career.

id Register today at orcid.org

plant disease

Editor-in-Chief: Alison E. Robertson
Published by The American Phytopathological Society[Home](#) > [Plant Disease](#) > [Table of Contents](#) > [Full Text HTML](#)[Previous Article](#) | [Next Article](#)

May 2018, Volume 102, Number 5

Page 1042

<https://doi.org/10.1094/PDIS-09-17-1449-PDN>**DISEASE NOTES**

First Report of *Phytophthium* sp. Causing Storage Root Rot and Foliage Blight of Cassava in Brazil

A. J. Boari,[†] **E. M. Cunha**, and **A. F. F. Quadros**, Embrapa Amazônia Oriental, 66095-100 Pará, Brazil; and **R. W. Barreto** and **A. F. Fernandes**, Departamento de Fitopatologia, Universidade Federal de Viçosa, Minas Gerais, 36570-900, Brazil.**Funding:** Conselho Nacional de Desenvolvimento Científico e Tecnológico
Grant/Award Number: 408042/2013-3[Citation](#) |[Open Access](#).

Soft root rot of cassava (*Manihot esculenta*) has been regarded as the predominant cassava disease in the Amazon (Poltronieri et al. 1996). Several soilborne pathogens may be involved in causing the disease (Massola et al. 2016). Proper clarification of the etiology is still lacking. In 2014, cassava plants were collected in a plantation at Ipixúna (state of Pará, Brazil). These plants had wilt, foliage yellowing, blight, and defoliation, in association with soft rot of roots. Necrotic fragments of storage roots were surface disinfected with 2% sodium hypochlorite and plated in tap water agar. Mycelium emerging from the samples was transferred to V8 juice agar plates. A representative isolate was deposited in the local culture collection (accession no. COAD 2088). Colonies were fast-growing on potato dextrose agar (26 to 32 mm diameter in one day), white, flat, and cottony. Structures formed in culture were mounted in lacto-fuchsin and observed under a microscope (Olympus BX51) and were as follows: Mycelium coenocytic, hyaline; sporangia subglobose, papillate, terminal, with internal proliferations, 14 to 22.5 × 11 to 19 μm, germinating directly through a germ tube or indirectly through zoospore release, hyaline, smooth; oogonia globose, smooth, formed laterally on short stalks, occasionally terminal, 13 to 21 μm diameter, hyaline, smooth. Oospores spherical, 11 to 19 μm diameter, mostly plerotic or nearly plerotic, walls 1 to 2.5 μm thick, hyaline, smooth. Extracted DNA was amplified, and the ITS, LSU, and coxI regions were sequenced with the following primers: ITS4/ITS5, LR0R/LR7, and OomCoxI Levup/Fm85mod, respectively. The resulting sequences were deposited in GenBank (accession nos. KM591579, MF062522, and MF062523, respectively). National Center for Biotechnology Information BLAST results showed 98, 99, and 100% identity with the ITS, coxI, and LSU sequences of *Phytophthium cucurbitacearum* (CBS748.96) in GenBank. Additionally, a phylogenetic analysis was performed (Bayesian inference) indicating that COAD 2088 belongs to the *P. vexans* clade

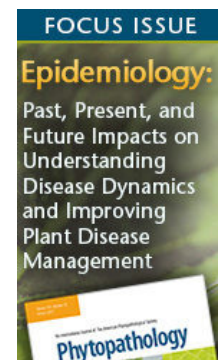
Quick Links[Add to favorites](#)[E-mail to a colleague](#)[Alert me when new articles cite this article](#)[Download to citation manager](#)[Related articles found in APS Journals](#)**Article History**

Issue Date: 17 Apr 2018

Published: 19 Mar 2018

First Look: 1 Jan 2018

Accepted: 22 Dec 2017

Access provided by
EMPRESA BRASILEIRA DE
PESQUISA AGROPECUÁRIA

(which includes *P. cucurbitacearum*). Although the molecular studies indicate that the oomycete from cassava is close to *P. cucurbitacearum*, sizes of zoosporangia and oogonia given in the original description (Takimoto 1941) are much larger than in the cassava material. This isolate could represent a new species. Nevertheless, de Cock et al. (2015) regarded the *P. vexans* clade, containing the invalid taxon *P. cucurbitacearum* (Latin diagnosis not included in the original description), as in need of revision. Therefore, for the moment, we prefer to treat the oomycete from cassava as *Phytophthium* sp. Pathogenicity of COAD 2088 was verified by inoculating healthy roots (cultivar Rosinha) with culture disks. All roots inoculated with *Phytophthium* sp. had soft rot symptoms 7 days after inoculation, whereas noninoculated controls remained healthy. Typical *Phytophthium* sp. colonies were reisolated from the necrotic tissues, thus fulfilling Koch's postulates. To our knowledge, this is the first worldwide report of *Phytophthium* sp. causing root rot in cassava.



References:

Section:

-
- de Cock, A. W. A. M.**, et al. 2015. *Persoonia* 34:25. <https://doi.org/10.3767/003158515X685382> [Crossref] [ISI]
- Massola, N. S., Jr.**, et al. 2016. Page 515 in: *Manual de Fitopatologia*. Vol. 2. Editora Agronômica Ceres, São Paulo, Brazil.
- Poltronieri, L. S.**, et al. 1996. *Fitopatol. Bras.* 22:111.
- Takimoto, S.** 1941. *Ann. Phytopathol. Soc. Jpn.* 11:91. <https://doi.org/10.3186/jjphytopath.11.89> [Crossref]

[Citation](#) |

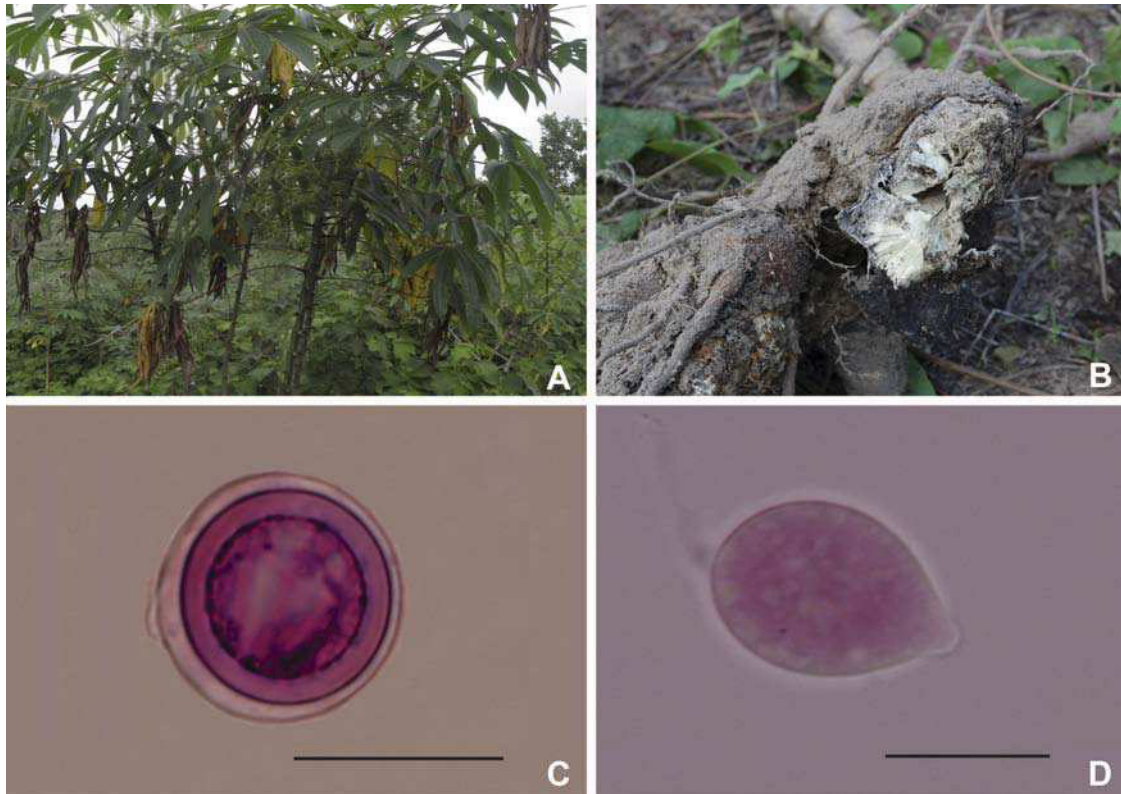


Figure 1. *Phytophthium* on cassava. (A) Cassava plants (*Manihot esculenta*) showing foliage blight, reflecting root infection by *Phytophthium* sp., in the field at Ipixúna (state of Pará, Brazil); (B) Rotting cassava roots from which *Phytophthium* sp. was isolated; (C) Oogonium with one oospore of *Phytophthium* sp.; (D) Sporangium of *Phytophthium* sp. Scale bars = 10 μ m