First Report of Erysiphe quercicolca Causing Powdery Mildew on Cashew in Brazil

J. E. Cardoso, F. M. P. Viana, M. A. Ootani, M. V. V. Martins, and F. S. A. Araújo,
Embrapa Agroindústria Tropical, CEP 60605111, Fortaleza, CE Brazil.

Due to conspicuous differences between these and commonly known symptoms from early
infected flushing leaves of BRS 189 cashew clone were collected in Pacajus county, Ceará
State, and introduced into the Laboratory of Plant Pathology, Embrapa, for further studies.

Cashewnut (Anacardium occidentale L.) is a very important crop plant native to northern
Brazil. In 2010 and following years, a powdery mildew outbreak was observed in over 60%
of cashew growing areas in coastal and highland fields in Ceará and Piauí states, which
account for over 70% of Brazilian cashewnut production. Disease symptoms commonly
appeared as white to gray powder on young shoots, inflorescences, young fruits, and
leaves, reducing fruit onset and severely damaging apple and kernels. Highest level of
infection was observed by the time of flowering and fruiting plant stages, which occurs
from June to September in those particular states. Today, powdery mildew is the main
pathological constraint of cashew production in Brazil, as it affects mature trees, nursery
stocks, and new plantings. Although there is great variability within cashew genotypes,
most growing varieties are susceptible. From 2012 until 2014, field surveys were
conducted to collect samples from different environments and host genotypes. Severely
infected flushing leaves of BRS 189 cashew clone were collected in Pacajus county, Ceará
State, and introduced into the Laboratory of Plant Pathology, Embrapa, for further studies.
Due to conspicuous differences between these and commonly known symptoms from early
described powdery mildew (Noack 1898), morphological and sequence data molecular
studies were then conducted in order to determine the causal fungus. Conidiophores were
erect with cylindrical foot cells, average size 100.2 µm. Chasmothecia were absent.
Primary conidia were ellipsoid, with a rounded apex and truncate base. Mature conidia
were mainly dolioform and formed singly (no catenescence), measuring 26.9 to 31.7 µm
long x 14.3 to 20.4 µm wide (avg. 29.9 x 14.8 µm), with length/width ratio of 1.8 on
average. The internal transcribed spacer (ITS) region, including 5.8S and partial 28S from
genomic DNA extracted, was amplified with ITS1F (5' - TCCGTAAGTGAACCTGCGG-3') and
P3 (5' - GGCCTTCACTGCGGTATAC-3') primers. The amplicon was sequenced by external
service (Macrogen, Seoul, South Korea). BLASTn analysis of the ITS sequence (661 pb)
showed a high homology (identity: 100%, e-values: 0.0, coverage: 100%) with *Erysiphe quercicola* (GenBank accession no. KY172852). Five young 75-day-old grafted plants of cv BRS 189 were artificially inoculated and five noninoculated plants served as control, all grown under glasshouse conditions at 26 ± 2°C. Inoculations were made by brushing conidia from naturally disease leaves onto flushing young leaves. All inoculated plants developed powdery mildew symptoms after 10 days, whereas the control plants remained symptomless. Therefore, on the basis of morphological features and sequence data analysis, the causal fungus causing powdery mildew on young organs of cashew plants was determined to be *E. quercicola*. This fungus has been reported to cause powdery mildew on several tropical plant species including cashew reported in Tanzania (Voucher MUMH781, Mie University, Mycological Herbarium, Japan) ([Limkaisang et al. 2006](https://doi.org/10.1007/S10267-006-0311-Y)) under the anamorphic name of *Pseudoidium anacardii*, which is presently assigned as *E. quercicola* ([Braun and Cook 2012](https://doi.org/10.1007/S10267-006-0311-Y)). This is the first report of powdery mildew on young organs of cashewnut plants caused by *E. quercicola* in Brazil.

**References:**


**Cited by**

Influência das épocas de floração e dos períodos de proteção fenológica à infecção do oídio no clone de cajueiro-anão BRS 189

Marlon Vagner Valentim Martins, Joilson Silva Lima, Francisco Marto Pinto Viana, José Emilson Cardoso, Francisca Samara de Assunção Araújo, and Márcio Akio Ootani

*Revista Ceres* Dec 2017, Volume 64, Number 6, 574-581