Diseases Caused by Bacteria and Phytoplasmas

First Report of Bacterial Leaf Streak Disease of Rice Caused by *Xanthomonas oryzae* pv. *oryzicola* in Ivory Coast

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Bacterial leaf streak (BLS) of rice caused by *Xanthomonas oryzae* pv. *oryzicola* is considered as the third emerging infectious disease of rice in Africa. First reported in Africa in the 1980s, the disease is now present in at least eight African countries including Burundi, Burkina Faso, Kenya, Madagascar, Mali, Nigeria, Senegal, and Uganda. Yield loss caused by BLS is estimated at 20 to 30% (Sileshi and Gebeyehu 2021). To our knowledge, BLS has so far not been reported in Ivory Coast. Although BLS has not been described in the adjacent rice-growing countries Ghana and Liberia, *X. oryzae* pv. *oryzicola* strains isolated from samples collected between 2003 and 2011 in Burkina Faso and Mali have been characterized (Wonni et al. 2014). *X. oryzae* pv. *oryzicola* is transmitted through rice seeds, which favors its spread through trading (Sileshi and Gebeyehu 2021). Given the extensive rice trade between Burkina Faso, Mali, and Ivory Coast, we hypothesized that BLS might also be present in this country. Field surveys were carried out in 15 sites between Korhogo in the north and Gagnoa in the south of Ivory Coast in October 2018 during the rainy season. Typical symptoms of the disease (e.g., translucent lesions in the form of yellow-brown to black streaks, sometimes with droplets of exudates on the leaf surface) were observed in the area of Korhogo. Five-centimeter-long leaf pieces were successively

disinfected, rinsed in sterile water, and then ground using the Tissue Lyser System (Qiagen, Courtaboeuf, France). Leaf powder was resuspended in 1.5 ml of sterile water and incubated at room temperature for 30 min. Then, 10 µl of the suspension was streaked on semiselective peptone sucrose agar medium and incubated at 28°C for 3 to 7 days. Colonies characteristic of *X. oryzae* pv. *oryzicola* (i.e., round, convex, mucous, and straw yellow in color) were purified from six individual samples from two distinct sites in Korhogo. To confirm their identity, isolated strains underwent a pathogenicity and molecular characterization test. The multiplex PCR developed for the identification of *X. oryzae* pathovars (Lang et al. 2010) revealed for all the isolates the characteristic PCR profile of *X. oryzae* pv. *oryzicola* (two amplicons of 324 and 691 base pairs). Strains of *X. oryzae* pv. *oryzicola* BLS256 and *X. oryzae* pv. *oryzae* PXO99 were used as controls. The pathogenicity test was performed on 5-week-old plants of *Oryza sativa* 'Azucena' leaves by infiltration with a needleless syringe of a bacterial suspension at an optical density of 0.5. After 7 days of greenhouse incubation (27 ± 1°C with a 12-h photoperiod), all infiltration points (2 infiltrations × 3 plants per isolate) developed water-soaked lesions identical to the one challenged with BLS256, whereas water-infiltrated leaves remained asymptomatic. These lesions were collected and subjected to the isolation and multiplex PCR processes described above, thus fulfilling Koch's postulates. Finally, three of the isolates were subjected to sequencing of the housekeeping gene *gyrB* by PCR amplification using the primers XgyrB1F and XgyrB1R (Young et al. 2008). Analysis of 780 bp of the *gyrB* sequence of strains CI_k1-1, CI_k2-2, and CI_k3-2 revealed 100% identity with the *gyrB* sequence of *X. oryzae* pv. *oryzicola* reference strain BLS256 (accession no. CP003057) and 10 polymorphic nucleotides compared with the *X. oryzae* pv. *oryzae* reference strain PXO99^A (accession no. CP000967). To our knowledge, this is the first report of BLS in Ivory Coast supported by diagnostic methods. New surveys in Ivory Coast and neighboring countries where the disease has not been reported will allow the extending of strain collections and assessing of disease incidence as part of future control strategies.

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