

## Abstract

Fusarium bark disease (FBD) of coffee caused by *Fusarium stilboides* Steyaert has been associated with yield losses and tree death in coffee-growing countries, including Kenya. Varietal resistance is of utmost importance in managing the disease, and the continued increase in host resistance is considered sufficient to control the disease. Therefore, this study investigated the response of four coffee cultivars to *F. stilboides*. Fifteen hypocotyls from *Coffea arabica* (Ruiru 11, Batian and SL 28), plus two other coffee species, *Coffea canephora* (Robusta coffee) and *Coffea liberica* (Liberica coffee), were inoculated with various concentrations of three *F. stilboides* isolates (NRF 930/18, TN002B (I), BS008B (A)) using both the injection and drenching methods. The stem injection method was performed by injecting one microliter of the *F. stilboides* spore solution into the hypocotyl. In the drenching method, coffee seedlings had their roots cut and transplanted in a transplanting mixture, after which 10 mL of the *F. stilboides* spore solution was applied to the soil surface in each pot. The inoculated hypocotyls were incubated at  $24 \pm 2$  °C for 105 days. The plants were watered regularly as necessary while the development of symptoms was observed and assessed weekly. Disease severity was evaluated using a modified scale of 0–4, while incidence was scored as a percentage of infected seedlings. Coffee seedlings inoculated with *F. stilboides* developed symptoms such as wilting, stunted growth and defoliation. In the first season, the coffee cultivars of Ruiru 11 and Liberica inoculated with *Fusarium stilboides* had pronounced severity compared to other cultivars. In the second season, the coffee cultivars Batian and Ruiru 11 had pronounced severity compared to other cultivars. The isolate TN002B (I) was observed to be highly virulent as compared to other isolates. The variation in response to disease infection exhibited by the four cultivars presents a key input in breeding programs for resistance to *F. stilboides*.

**Keywords:** Fusarium-bark disease; inoculation; resistance; pathogenicity; severity