

## Abstract

Kenya is one of the leading countries in Africa in tomato production. Production of tomato is 14% of the total vegetable and 6.72% of the horticultural crops produced in the country. It is a source of food, foreign exchange earnings and source of employment and income. The major factor that reduces the growth and yield of tomato production in Kenya are pathogenic microorganisms. For instance, *Fusarium oxysporum* is among the fungal pathogens that destroy the xylem of the plant hence causing Fusarium wilt due to poor transportation of water to various parts of the plant. Besides, it persists in the soil environment for a long period thus continuously infecting healthy plants grown in the site. The management practices that are mostly used to control the pathogen are ineffective and environmentally unfriendly. Therefore, plant products with antimicrobial properties present an affordable alternative solution to control such persistent pathogens. The objective of this study was to determine the incidence and prevalence of Fusarium wilt and the phytochemical composition of *Tithonia diversifolia* and *Kigelia africana* and their antimicrobial activity against fungal pathogen *F. oxysporum* in tomatoes. *Tithonia diversifolia* and *Kigelia africana* plants were selected because of their wide medicinal use, distribution and availability. A preliminary survey was carried out in Mwea, Kirinyaga County which is among the most common areas where tomatoes are grown. Questionnaires were used to evaluate the farmers' knowledge, perception and management practices of Fusarium wilt disease. A total of 80 respondents were interviewed. *K. africana* and *T. diversifolia* plant samples were collected for phytochemical analysis. The samples were ground into a fine powder and extracted using water. Phytochemical screening of the crude extract was done. Soil was used for *F. oxysporum* pathogen isolation. Antimicrobial test disc soaked with plant extract was placed on to the media cultured with *F. oxysporum* and incubated at 28 °C for a week to allow growth. Analysis of the collected data was done using SAS version 9.4 for analysis of variance and further subjected to a post adhoc test with  $\alpha = 0.05$  being considered significant. The results showed that the Rio Grande was the tomato variety widely grown; the preference for this variety was attributed due to its high marketability, high production, high quality, and early maturity. From the response, 92.5 % of the farmers had seen the symptoms of the pathogen while the rest had not seen the symptoms of the pathogen in tomatoes. The application of chemicals was widely used to control the pathogen, which contributes to environmental pollution. Screening of the plant extract revealed the presence of tannins, alkaloids, flavonoids, saponins, terpenoids, and glycosides. Each of the plant extract used had antimicrobial activity against *F. oxysporum*; this was due to the presence of phytochemicals that had an effect on the growth of the pathogen. *K. africana* exhibited the highest zone of inhibition while *T. diversifolia* had the lowest zones of inhibition. When each crude extract was used singly and in combination against the *F. oxysporum*, the zone of inhibition was found to be statistically significant at  $P < 0.05$ . The combined crude extract showed an increased antimicrobial activity against *F. oxysporum*. The results provide a potential application of the crude extract as an antifungal agent against *F. oxysporum*. It also provides scientific evidence that *K. africana* and *T. diversifolia* extract possess antifungal activity that can be used as a broad-spectrum in managing microbial diseases.