



Pathogenic diversity of *Puccinia kuehnii* strains, causal agent of sugarcane leaf rust and biological control approach using biopesticides under semi-controlled conditions

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1 SUMMARY

Context: In Côte d'Ivoire, sugarcane plays an important role in the economy. However, its production is constrained by biotic factors, particularly orange rust caused by *Puccinia kuehnii*. Pathogenic diversity of strains is not widely understood. Existing control methods are ineffective and limited. The aim of this study was to determine the pathogenicity of *Puccinia kuehnii* strains, and to evaluate anti-fungal activity of essential oil-based formulations against this disease. **Materials and methods:** Strains 51bB and 381Z were evaluated for infectivity by foliar spraying plants of variety SP711406 under semi-controlled conditions at the Université Félix Houphouët-Boigny in Abidjan (Côte d'Ivoire). Curative control was carried out by foliar spraying plants with formulations based on natural substances of *Ocimum gratissimum* L, *Zingiber officinale* and *Cymbopogon citratus*, at 1000 and 2000ppm. The synthetic product copper oxide was used at a single dose of 5000 ppm. **Results:** Strains 51bB and 381Z showed infection rates of 62.26 and 67.36% respectively after a four-month incubation period. Severities of 30.64% (51bB) and 30.23% (381Z) were observed. ZinC1 and ZinC2 treatments had an estimated incidence reduction rate of 64.28%. Treatments based on natural substances achieved a reduction in severity of over 50%. The CymC2 treatment was the most effective, with a reduction rate of 86.04% followed by ZinC1 with rates of over than 50% reduction rate of incidence and severity due to the synthetic product was 50 and 48.83% respectively. **Conclusion:** *Puccinia kuehnii* strains induced orange rust disease in sugarcane. The effect of essential oil-based formulations has been proven on the disease under semi-controlled conditions.