

ABSTRACT

Stripe rust, caused by the fungal pathogen *Puccinia striiformis* f. sp. *tritici*, is a major threat to wheat (*Triticum* spp.) production worldwide. The objective of this study was to determine the virulence of *P. striiformis* f. sp. *tritici* races prevalent in the main wheat growing regions of Kenya, which includes Mt. Kenya, Eastern Kenya, and the Rift Valley (Central, Southern, and Northern Rift). Fifty *P. striiformis* f. sp. *tritici* isolates collected from 1970 to 1992 and from 2009 to 2014 were virulence phenotyped with stripe rust differential sets, and 45 isolates were genotyped with sequence characterized amplified region (SCAR) markers to differentiate the isolates and identify aggressive strains *PstS1* and *PstS2*. Virulence corresponding to stripe rust resistance genes *Yr1*, *Yr2*, *Yr3*, *Yr6*, *Yr7*, *Yr8*, *Yr9*, *Yr17*, *Yr25*, and *Yr27* and the seedling resistance in genotype Avocet S were detected. Ten races were detected in the *P. striiformis* f. sp. *tritici* samples obtained from 1970 to 1992, and three additional races were detected from 2009 to 2014, with a single race being detected in both periods. The SCAR markers detected both *Pst1* and *Pst2* strains in the collection. Increasing *P. striiformis* f. sp. *tritici* virulence was found in the Kenyan *P. striiformis* f. sp. *tritici* population, and different *P. striiformis* f. sp. *tritici* race groups were found to dominate different wheat growing regions. Moreover, recent *P. striiformis* f. sp. *tritici* races in East Africa indicated possible migration of some race groups into Kenya from other regions. This study is important in elucidating *P. striiformis* f. sp. *tritici* evolution and virulence diversity and useful in breeding wheat cultivars with effective resistance to stripe rust.