

ABSTRACT

Genetic Diversity of Kenyan Native Oyster Mushroom (*Pleurotus*)

Ojwang D. Otieno, Calvin Onyango, Justus Mungare Onguso, Lexa G. Matasyoh,
Bramwel W. Wanjala, Mark Wamalwa & Jagger J.W. Harvey

Members of the genus *Pleurotus*, also commonly known as oyster mushroom, are well known for their socioeconomic and biotechnological potentials. Despite being one of the most important edible fungi, the scarce information about the genetic diversity of the species in natural populations has limited their sustainable utilization. A total of 71 isolates of *Pleurotus* species were collected from three natural populations: 25 isolates were obtained from Kakamega forest, 34 isolates from Arabuko Sokoke forest and 12 isolates from Mount Kenya forest. Amplified fragment length polymorphism (AFLP) was applied to thirteen isolates of locally grown *Pleurotus* species obtained from laboratory samples using five primer pair combinations. AFLP markers and internal transcribed spacer (ITS) sequences of the ribosomal DNA were used to estimate the genetic diversity and evaluate phylogenetic relationships, respectively, among and within populations. The five primer pair combinations generated 293 polymorphic loci across the 84 isolates. The mean genetic diversity among the populations was 0.25 with the population from Arabuko Sokoke having higher (0.27) diversity estimates compared to Mount Kenya population (0.24). Diversity between the isolates from the natural population (0.25) and commercial cultivars (0.24) did not differ significantly. However, diversity was greater within (89%; $P > 0.001$) populations than among populations. Homology search analysis against the GenBank database using 16 rDNA ITS sequences randomly selected from the two clades of AFLP dendrogram revealed three mushroom species: *P. djamor*, *P. floridanus* and *P. sapidus*; the three mushrooms form part of the diversity of *Pleurotus* species in Kenya. The broad diversity within the Kenyan *Pleurotus* species suggests the possibility of obtaining native strains suitable for commercial cultivation.

Keywords: DNA polymorphism, genetic variability, molecular phylogeny, oyster mushroom