Understanding the evolutionary patterns of genetic diversity of cultivated plants and their wild relatives is a fundamental aspect of agrobiodiversity research. Documenting genetic diversity and understanding the evolutionary histories of crops will have important impacts in terms of food security in southern countries such as Africa. In this study, we develop a generalized method for sequencing full chloroplast genomes via hybridization enrichment suitable for multiplexing a large number of individuals. We will present application of the method to the study of wild pearl millet, wild and cultivated yams, fonio and to African rice.