Taxonomic studies on cantharellus (mushrooms) from the Miombo woodlands of Tanzania

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Species in the genus *Cantharellus* are common ectomycorrhizal symbionts in miombo woodland of Tanzania with very little information about its number of taxa, diversity, and undoubtedly more undiscovered species. Only two studies done in the country on the genus used morphological characters which are sometime unstable, environmentally influenced and fall short of resolving species complexes. Lack of a central source of comprehensive taxonomic information about the genus hinders progressive study on the genus. This study therefore used both molecular and morphological characters to delimit species of *Cantharellus* from Tanzania, infer their phylogency in the 'cantharelloid clade,' evaluate utility of their morphological characters, resolve some taxonomic ambiguities, compare molecular clades with morphological infragenerics and gathered information for a web based data. Several new species were discovered and described. They included C. fistulosus, C. miomboensis sp. Nov., C.morogoroents sp. Nov., and the elevation of *C. rufopunctatus* var. ochraceous to species *C. ochraceous* comb. Nov. three more new species nicknamed Cantharellus species 2, 3 and 4 were discovered and are potential for publication according to International Code for Botanical *Nomenclature*. A review of the utility of morphological characters revealed some character to be most useful, least useful while one character 'scales on the cap' was found to be previously overemphasized. New sequences (123) of the Internal Transcribed spacer (Rdna 5.8S-ITS2) and nuclear large subunit (Rdna lsu) were produced. Phylogenetic analyses of Rdna LSU) were produced. Phylogenetic analyses of Rdna LSU the 'cantharelloid clade' demonstrated two strongly supported clades, and the elevation of the subgenus Afrocantharellus to genus level is proposed. Comparing molecular phylogenies with the traditional infrageneric groups of *Cantharellus,* revealed many discrepancies and some morphological features used in the traditional infrageneric classification such as presence or absence of clamp connections, a thickened pilleic wall and black colour were partially or completely inconsistent with clades discovered in the molecular analysis. A review of *Cantharellus* infrageneric using both morphological and molecular characters is recommended together with the application of other

molecular markers especially protein coding gene to ascertain the taxonomic status of *C. splendens* Vs *C. symoensil; C. platyphyllus* Vs *Cantharellus platyphyllus f. cyanescens.*