Fungi are under-explored with respect to novel species. A new genus, *Allobotryotrichum*, typified by *A. blastospora* sp. nov., is proposed based on distinct morphological characters and phylogenetic replacement. This genus collected from Guangxi Province (China) on sugarcane roots and characterized by its short conidiophore partitioned with septum, hyaline and broad irregular conidiogenous cells usually containing drop-like masses, hyaline to pigmented conidia with smooth or appearing to have concave dimple and sessile. Molecular phylogenetic analyses using rDNA internal transcribed spacer regions (ITS), large subunit (LSU), beta-tubulin (TUB2) and (RPB2) gene revealed that this genus sister to the genus *Myceliophthora* and *Thielavia* (Chaetomiaceae), but morphologically it is distinct from *Myceliophthora* and *Thielavia* in sterile setae and production of asexual morph, respectively. Morphologically, *Allobotryotrichum* should be compared to *Botryotrichum* (Chaetomiaceae) in its tuft of setae and globose or subglobose conidia, but they were phylogenetically distant. Photogenicity test confirmed that this genus is pathogenic to sugarcane plant.