ABSTRACT

Monascus purpureus (MTCC-410) when grown on PDA produced red colonies. The mycelia were coloured and clestothesia accumulated pigment. Rice fermented with the fungus turned red in colour due to polyketides production.

Solvent extracts of red rice resulted in the extraction of yellow coloured polyketides by hexane; yellow and orange polyketides by chloroform and red pigments by methanol. Each of the above had an absorption optima at 375 (yellow), 475 (orange) and 500 nm (red).

Though the extracts showed antioxidant properties, DPPH free radical scavenging activity was unique to methanol extract. Hence, the active component was purified by column chromatography and the purity was analysed by TLC and HPLC.

One and two dimensional ^{1}H and ^{13}C NMR were performed with the purified compound. Assignments of individual carbon and proton to the molecule along with λ max, mass and IR spectra identified the production of hitherto unreported dihydromonacolin-MV.

Efforts to improve the productivity of dihydromonacolin-MV by UV mutation and selection of mutant strains tolerant to temperature at 42°C did not yield the desired results. However it resulted in the isolation of an albino and hyper pigmentation mutants.

The hyper pigmentation mutant during rice fermentation secreted an antibacterial compound soluble in chloroform. Purification of this bioactive compound by column chromatography and TLC resulted in a HPLC pure compound.

One and two dimensional NMR spectra of the compound were used to assign carbon and proton to the molecule. This data and the λ max at 329 nm and 225 nm

together with IR spectrum showing OH, CH and carbonyl stretching identified dehydromonacolin-MV2. Direct mass spectrum of the sample showed parent ion at 335.

The wild type fungus and its mutants colonized rice due to their ability to secrete amylase. In western blot reactions, the amylase reacted with the antibody raised against *Aspergillus niger* glucoamylase. This suggested that the two enzymes are structurally similar. The 90 kDa *M. purpureus* enzyme had pH and temperature optima at 5 and 50°C respectively.

Amidases, produced by the wild type and mutants were identified by rapid plate assay methods. Estimations revealed their early production by hyper pigmentation mutant. Acid protease activities determined the release of the amino acids for the amidase activity.

Since *M. purpureus* used in this study did not produce citrinin toxin, its application as functional food is discussed.