ABSTRACT

Endophytes colonize living internal tissues of plants without causing any immediate or overt negative effect to the host. Five hundred and thirty fungal endophyte isolates from *Boswellia serrata* and 143 isolates from *Vitex negundo* were obtained from the bark, twig and leaf tissues. *Myrothecium verrucaria* from *B. serrata* and *Lasiodiplodia theobromae* from *V. negundo* were the dominant endophytes with a colonizing frequency of 10.37 % and 16.78 % respectively. Some other endophytes isolated from these medicinal plants were *Pithomyces* sp., *Phomopsis* sp., *C. gloeosporioidis*, *A. alternata*, *C. globosum*, *C. cassiicola* and *F. oxysporum*. Nineteen isolates of *Lasiodiplodia* sp. from *V. negundo* and four from *B. serrata* and one isolate of *C. cassiicola* were used to check the genetic diversity using random amplified polymorphic DNA (RAPD) and inter simple sequence repeats (ISSR). Cluster analysis with unweighted pair-group (UPGMA) using genetic distances was performed to generate a dendrogram demonstrating the overall genetic relationships within the species studied. The internal transcribed spacer (ITS) region of these isolates was amplified using ITS 1 and 4 primers, they were sequenced and these sequences were deposited in the DDBJ. Phylogenetic analysis of both RAPD and ISSR showed that the isolates were host-specific. Bark, leaf and twig from both the plants was serially extracted using solvents from low to high polarity and forty one endophyte ethyl acetate extracts were screened for their bioactive potentials. Both plant and endophyte extracts were tested for total phenol and flavonoid content, antioxidant, antimicrobial, anti-inflammatory properties. Ethyl acetate and methanol extracts from leaf and twig showed very good bioactivity when compared to other solvent extracts. Among endophytes, *Pithomyces* sp. and *C. gloeosporioidis* extracts from *B. serrata* and *C. globosum* and *A. alternata* extracts from *V. negundo* proved as potent bioactive isolates. Hence, these four endophytic extracts were carried for further assays viz. cytotoxicity, *in vivo* assays for anti-inflammatory properties and characterization by TLC, HPLC and LC-MS profiling. *Pithomyces* sp. extract was found to be potent when checked on anti-inflammatory and cytotoxicity activity. TLC was carried out for these endophytic extracts along the standards, and then subjected for HPLC and MS. The *Pithomyces* sp. had a metabolite matching with the boswellic acid standard and *C. globosum* had a metabolite matching with the standard catechin.