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An approach to develop better strains of *Ganoderma lucidum* via breeding technology

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Ganoderma lucidum or Reishi is a polypore mushroom with medicinal properties and is also known as King of Herbs. Reishi is estimated to have approximately 200 medicinal constituents and more are being discovered with new researches. In recent years its active ingredients have been the subject of intensive research regarding their apparent ability to help prevent various diseases along with certain types of cancers. The industrial use of fungi requires the initial selection of the strain of interest, and the subsequent breeding of the selected strain to improve its yield in terms of secondary metabolite production or biomass yield. Eight isolates were collected from different parts of Himachal Pradesh and Delhi NCR region on the basis of morphological characteristics during month of August-September. All had been morphologically identified as *Ganoderma* spp. Molecular analyses were based on sequences of the ribosomal internal transcribed spacers (ITS). ITS has been successfully used as a genetic marker for molecular validation and identification of several medicinal plants and fungi, such as G. lucidum. ITS analysis is useful in distinguishing between *Ganoderma* species. Length of ITS PCR product is used for the identification of the species and for *G. lucidum* it is nearly between 750-800 bp. The isolated DNA of all isolates were subjected to analysis of ITS1-5.8S rDNA-ITS-2 using universal primers ITS-1 and ITS -4 and authenticity of all nine amplified product was ascertained by comparing the band lengths produced by PCR product on agarose gel with the band length of identified G2 culture (Obtained from Amity Institute of Microbial Technology, Amity University Noida). The band length of G2 is nearly 750bp. Some of the collected isolates showed a different band length of 850 bp, which may be a different strain of *Ganoderma*. Out of the eight specimens tested four turned out to be true *G. lucidum* and rest four were identified as *Ganoderma* species. Out of these strain two most diversed parents were selected for inter and intra species cross and developed hybrids. Domestication of hybrids is under progress for its commercialization and reach to common man, which is further utilized by pharma-industry to isolate some novel secondary metabolites. Generally, *Ganoderma* metabolites function as an immune booster and utilized in various disease treatment. The potential constrain in transferring this mushroom to common man is its non popularity compared to other common mushrooms in market.

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