

**Natural and Artificial Hybridization of *Agaricus subrufescens* Peck
(= *A. Blazei* Murrill *Sensu* Heinemann):
Lessons from the Quasi-Alleles of the rDNA ITS1+2 Region.R.**

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Agaricus subrufescens Peck was described from both wild and cultivated specimens in 1893. It has been sporadically cultivated in various countries since that time, and is presently an economically important “nutriceutical” food. It is known by several names, including *A. rufotegulis* Nauta, *A. brasiliensis* Wasser et al., and *A. blazei* Murrill *sensu* Heinemann. A long-term study of diverse isolates and specimens, emphasizing cultural studies and analysis of rDNA ITS1+2 sequences, strongly indicates that a single phylogenetic entity exists. Some interpopulational interfertility has also been demonstrated. Yet the picture is not simple. The species is amphithallic, with complementary reproductive routes, producing recombinant spores with cryptic karyotic states and some self-fertility. Sequences from the Americas were always highly heteromorphic, while those from Hawaii and the UK were homomorphic. This implies that American isolates may be hybrids between (at least) two formerly isolated populations. To test that idea, ITS1+2 sequences from isolate SBS1, an SSI from a California strain, were amplified, cloned and sequenced. Both allelism and recombination are evident in these 711-713 nt sequences: 4 (3+1) parental and 11 recombinant sequences were recovered. The mechanism of fine-scale recombination is unknown (PCR artifacts have not been ruled out). Recombination events exceeded 1.0 per 700 nt. Physical linkage was apparent among 11 polymorphic characters distributed along the ITS1+2. On this basis the parental allelic sequences were deduced, and a comparison with the homomorphic UK sequence was made. The evidence suggests that a European-like strain may have contributed one ITS1+2 allele to an ancestor of the isolate from California. However, if true, “crossovers” must then occurred prior to the origin of the SBS1 SSI, possibly in the SBRF progenitor (or its progenitor(s)).