

## Development of a Sporeless Strain of Oyster Mushroom (*Pleurotus ostreatus*)

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The enormous amounts of spores produced by oyster mushroom (*Pleurotus ostreatus*) cause lung-related health problems among employees working in oyster mushroom cultivation. If sporeless varieties are used for large-scale cultivation, these lung problems can be avoided.

For development of a commercially attractive strain of sporeless oyster mushroom, strain ATCC 58937, a sporeless strain of oyster mushroom was used as a donor of the trait. Microscopic analysis of basidia showed that meiosis was aborted at an early stage. Both nuclear types that constitute strain ATCC 58937 could be retrieved by protoplasting. Protoplasting commercial strain HK35 yielded only one of its nuclear types. Crosses between the ATCC nuclear types and the HK35 nuclear types (either directly or using the Buller phenomenon) yielded normal sporulating strains, indicating that sporelessness was caused by a recessive trait. Among the offspring of crosses between the ATCC nuclear types and the HK35 nuclear types the sporeless trait segregated in a 1 to 1 ratio. The sporeless trait could be mapped and strongly linked genomic markers were developed.

The breeding strategy was to successfully introduce sporelessness into both nuclear types of a commercial variety, to achieve a sporeless variety. In a first cross between a sporeless culture and a commercial strain, not only sporelessness was transferred to the commercial variety. Therefore, repeatedly backcrossing the progeny of the first cross with the commercial variety is used to try to restore the original genetic material from the commercial strain as much as possible. Performance of a number of “prototypes” of a sporeless oyster mushroom was tested on commercial mushrooms farms and proved to be satisfactory.