

Good Practice for Essential Derivation of Button Mushroom Varieties

Agaricus bisporus

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INTRODUCTION

The breeders' exemption is an important aspect of the UPOV system allowing breeders to use protected varieties as sources of initial variation to create other varieties, and to commercially exploit such other varieties, in line with UPOV 1991.

In addition, the 1991 Act of the UPOV Convention introduced the concepts of essential derivation and dependency from an initial variety. The 1991 Act states that the scope of protection of a plant variety should extend to:

a) i) varieties which are essentially derived from the protected variety, where the protected variety is not itself an essentially derived variety.

Moreover, in Article 14 (5 b) the following provisions are made:

b) For the purposes of subparagraph (a) (i), a variety shall be deemed to be essentially derived from another variety ("the initial variety") when:

(i) it is predominantly derived from the initial variety, or from a variety that is itself predominantly derived from the initial variety, while retaining the expression of the essential characteristics that result from the genotype or combination of genotypes of the initial variety,

(ii) it is clearly distinguishable from the initial variety and

(iii) except for the differences which result from the act of derivation, it conforms to the initial variety in the expression of the essential characteristics that result from the genotype or combination of genotypes of the initial variety.

The ISF View on Intellectual Property (adopted in June 2012) supports the UPOV Convention and clarifies various technical and legal aspects of essentially derived varieties (EDV).

BACKGROUND & CURRENT CONTEXT

ISF recognizes the following points:

1. Where *plant* or *plants* are mentioned in UPOV 1991, this could also be read as *mycelium* or *button mushrooms*. In congruence, where "planting" is written, this could also be read as *cultivating*. Further terminology is in congruence with UPOV 1991 and its addenda.

2. The EDV concept does not cover the problem of plagiarism (or strain copies), which is covered by the DUS process in all cases. A strain copy is a direct somaclonal tissue culture of any structure of the initial strain that has not been subject to further natural or induced genetical adjustments, such as, but not limited to, recombination, mutation or crossing.

3. The selection methods named in Article 14 (5) (c) of UPOV 1991 (selection of a natural or induced mutant, ..., or transformation by genetic engineering) do indeed often, but not automatically, result in an essentially derived variety. This is an open list which does not exclude that also other

methods can result in essentially derived varieties provided that such methods include in any case the physical use of the initial variety or both its parental constituents.

4. Any variety that is developed using a method or combination of methods in which nuclear DNA of only one single initial variety is applied, resulting in a variety with strong phenotypic resemblance, is regarded explicitly as an Essential Derived Variety (EDV). This includes the generation of new varieties out of an initial variety by selecting fertile single spore cultures. Furthermore this includes, but is not limited to, application of the following methodologies: selection of natural or induced mutants, GMO, deheterokaryotisation and re-crossing, inbreeding, multispore cultures, altering the mitochondrial genotype and mushroom virus expression systems. These types of selection from an existing variety are quick and easy methods to generate small adaptations to the initial variety (Sonnenberg et al., 2016.). Strains developed using any of the methods above, have a genetic content that is very similar to the mushroom that has produced these spores.

5. An EDV in button mushrooms may, next to a strong resemblance in phenotype, also be characterized by a high genetic similarity to the initial variety. ISF supports a reversal of the burden of proof in favor of the holder of the breeders' rights of the initial variety once phenotypic and/or molecular markers' similarity between the initial variety and a suspected essentially derived variety is observed. At first observation of phenotypic and/or molecular marker similarities, the breeder of an initial variety can ask the owner of suspected essentially derived variety to prove that the new strain was not predominantly derived using the initial variety, and thus is not an EDV.

6. The breeder of an EDV must have an explicit authorization from the breeder of the initial variety before exploiting the EDV. This exploitation includes, but is not limited to: production of spawn or other carriers of the strain, multiplication and selling of the mycelium, button mushrooms on compost or any medium, selling and/or marketing of fruiting bodies, and importing to and exporting from the region / country of breeders' rights of the mycelium, or button mushrooms, on any carrier. This system is aimed at rewarding the work and financial effort done by the initial breeder, and at supporting further breeding efforts.

Annex 1: References

- Sonnenberg A.S.M., Gao W., Lavrijssen B., Hendrickx P., Sedaghat-Tellgerd N., Foulongne-Oriol M., Kong W.S., Schijlen E.G.W.M., Baars J.J.P. and Visser R.G.F. (2016). *A detailed analysis of the recombination landscape of the button mushroom Agaricus bisporus var. bisporus. Fungal Genetics and Biology*, 93 : 35-45.
- UPOV, 1991.
International Convention for the protection of new varieties of plants of December 2, 1961, as Revised at Geneva on November 10, 1972, on October 23, 1978, and on March 19, 1991. (<http://www.upov.int/upovlex/en/conventions/1991/content.html>, accessed on 02-09-2016).

Annex 2: List of Abbreviations

EDV	Essentially Derived Variety
UPOV	International Union for the Protection of new Varieties of plants (www.upov.int)

