



Title:

Fungi Associated with Cannabis Inflorescences (Buds) Pre- and Post-Drying and Evaluation of an Advanced Oxidative Process as a Mould Reduction Step

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Abstract:

Fungal levels are part of Health Canada's microbiological quality assurance criteria for Cannabis flowers. Of key concern is the presence of moulds that represent a direct health hazard through inhalation, and indirectly as an index for the presence of mycotoxins. There are numerous types and sources of moulds encountered in marijuana production, a proportion of which can be regarded as plant pathogens with others being opportunistic contaminants. Visibly diseased plants are removed from production, but less visible infections and dormant opportunistic fungi can proliferate during post-harvest handling, especially during drying/curing that can take >28h to complete. The objective of the study was to assess the levels and composition of fungal populations associated with buds pre- and post-drying. More fungi were recovered on Bengal Agar and Potato Dextrose Agar compared to Malt Extract Agar or Yeast Peptone Dextrose Agar. The fungal levels of buds at pre-drying ranged between 4.41-4.70 log CFU/g dw and 1.48 - 4.42 log CFU/g dw post-drying. The three dominant fungi associated with buds prior to drying were *Fusarium spp*, *Penicillium spp* and the yeast, *Cystobasidium spp* with an abundance of 38%, 38% and 18% respectively. In comparison, *Fusarium spp* dominated (52% abundance) post-dried buds with *Penicillium spp* remaining unchanged and abundance of *Cystobasidium spp* decreasing <1%. An Advanced Oxidation Process based on 2% hydrogen peroxide in combination with UV-C (90 mJ/cm²) resulted in a 62% reduction of *Fusarium* spores introduced onto post-dried buds. In conclusion, the study illustrates that the recovery of moulds from buds is dependent on the recovery media applied and levels remain stable during drying although

yeast populations decrease. The AOP process reduced mould levels although further optimization is required. The recovered moulds can potentially produce mycotoxins although if this occurs during drying needs to be further investigated.