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Post harvest biological control of blue mold on apple by four isolates of *Candida membranefaciens* and *Pichia guilliermondii*

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In studies two genera of biocontrol yeasts were isolated from apple surface. They were three isolates of *Candida membranefaciens* and one isolate of *Pichia guilliermondii*. They distinctly controlled *Penicillium expansum*, the cause of blue mold of apple fruit isolated from apple surface. Treatments were studied in vitro and in vivo after artificial inoculation and storage at 5 and 20° C. Dual culture, cell free metabolite (coloroform) and volatile metabolite tests were carried out *in vitro*. At 20° C, the area of lesion in treatment including the antagonist and pathogen, was 17-21 cm in comparison to 31 cm of the control treatment. A5 had the highest level and A6 had the lowest level of efficacy. At 5° C, on day 32 after infection, the area of lesion treated by the pathogen and antagonist was 2.4-10.22 cm in comparison to 22 cm of the pathogen infected control. In the test, A5 had the highest level and A6 had the lowest level of efficacy also. The efficacy of *C. membranefaciens* on two isolates of pathogen was better than that of *P. guilliermondii* in storage. Dual culture, cell free metabolite and volatile metabolite tests were carried out *in vitro*, in addition to storage assays. Percentage of growth inhibition by *C. membranefaciens* on the pathogen ranged from 21.14 to 57.9 and *P. guilliermondii* could be controlled between 44.39 and 61.87% in dual culture. In this test, A6 had the highest level and A5 had the lowest level of efficacy. In cell free metabolite, it ranged from 38.58 to 84.71% and from 65.54 to 73.97% for *C. membranefaciens* and P. guilliermondii, respectively. In this test, A6 had the lowest level and A4 had the highest level of efficacy. In volatile metabolite test, it ranged from 54.81 to 84.8% for *C. membranefaciens*. Percentage of growth inhibition of *P. guilliermondii* ranged from 85 to 89% in this test. A4 had the lowest level and A5 had the highest level of efficacy.

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Isolation, biofilm formation and other issues related to filamentous fungi in drinking water

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Filamentous fungi (ff) are notorious for the biodeterioration of numerous food and drink commodities. Often the problem is of an organoleptic nature such as appearance, taste and aroma. However, ff produce a range of toxic metabolites referred to as mycotoxins which contaminate such consumables. They are also responsible increasingly for a range of serious diseases especially of immunocompromised patients. Furthermore, drinking water (DW) can be considered to be a food commodity and which is also affected by ff. The growth of ff in DW has been known for a many years. However, the quantity of scientific literature on the subject is only beginning to increase from a low base. Indeed, in the past, ff have been considered as only annoying contaminants of agar plates used to count bacteria from water. Traditionally, it has been bacteria which have received most of the attention. There are various potential issues associated with the ff-in-DW phenomenon including, blockage of water pipes, odours, taste, biofilm formation, spread of pathogenic fungi, and mycotoxin production. The base line levels of ff in these commodities require to be established before it can be assessed if there are particular problems, and this involves the use of various technologies. Data on ff isolated from Portuguese DW will be presented including how the quantity of ff relate to other microorganisms present. In particular, biofilm formation by ff is an area of great interest in microbiology although the available information is low. Two staining methods have proved invaluable in obtaining evidence for this mode of existence by ff in DW. These are FISH employing an rRNA probe for staining active protoplasm, and calcofluor White stain: Calcofluor white has a high affinity for chitin in fungal walls. These methods have provided convincing evidence of biofilm formation in DW by ff. There are few data on mycotoxin production in DW: The oestrogenic compound zearalenone was shown to be capable of being so produced after aflatoxins were demonstrated to be present in stored water. Previous data will be reviewed with emphasis on (a) methods of isolation, (b) fungi detected, (c) which problems occur, (d) avoidance or removal of ff, and (e) methods to detect biochemicals such as mycotoxins. Suggestions for future collaborative work will be made which will include the use of standardised methodology for isolation and identification of ff, the use of "ring tests" and standard biochemical analysis.

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Microbiological challenges of shell eggs production in Lithuania

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The risk of getting a foodborne illness from eggs is very low. There are many factors that affect the overall quality of the eggshell. Contamination of the shell surface occurs principally after laying and originates from the environment. The aim of the study was to show influence of the changes in the housing systems on egg production in Lithuania, with emphasis on microbiological contamination farm level. Many cultures of fungi and bacteria were isolated from different substrates in laying hens barns: indoor air, litter, feed and water (samples of at least 100 ml each, were taken from the water tanks and from the drinkers) and were put to Petri dishes with PDA (Potato Dextrose Agar) or Sabouraud medium. The experiments were done at the 25-30° C. After incubation the fungi colonies

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