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AUSTRALIAN SCHOOL SCIENCE
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Growing mould on bread

Posted by Anonymous on Mon, 2016-06-06 11:54

Growing mould on bread: Hi..I have some students wanting to grow mould on bread then inoculate agar plates with the mould from the bread then add different oils to see how they react to the mould..these are yr 12 students doing their eei..Would this be allowed?

Voting:



No votes yet

Year Level:

Senior Secondary

Laboratory Technicians:

Laboratory Technicians

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Growing mould on bread

Submitted by sat on 17 June 2016

In brief:

A student experimental investigation studying the effect of oils on moulds is an interesting exercise. Essential oils are known to possess antiviral, antibacterial, antifungal and insecticide properties¹ and have become popular as a natural, non-toxic agent for cleaning and sanitising.

The method described does not align with all jurisdictional policies and safe procedures for microbiological work in schools. The main concerns are:

1. **Opening cultures:** The opening of zip-lock bags or Petri dishes containing mould growth by students will allow aerosols of fungal spores to be released into the environment with the risk of causing allergic reactions and /or asthmatic attacks. All plates and bags used for growing fungi and moulds **should be kept closed** immediately after inoculation and incubation **and never reopened** to prevent the dispersal of fungal spores. Growth should only be viewed in unopened containers in which they were grown.
2. **Unknown microorganisms:** The identity of mould and micro-organisms grown on the bread will be unknown and cannot be guaranteed to be classified as Risk Group 1 micro-organisms. The majority of school laboratories are classified as Physical Containment 1 (PC1) laboratories where only Risk Group 1 microbes are allowed. If the organisms are unknown, then the containers should not be opened and not subcultured.
3. **Subculturing:** The method requires students to perform subculturing. Subculturing of micro-organisms is where a new microbial culture is made by transferring some cells from a previous culture to a fresh growth medium. Subculturing is a specialised technique not allowed in some jurisdictions. Persons should have training in handling microorganisms to an appropriate level of microbiological understanding and technical expertise in order to manipulate microorganisms and apply correct aseptic techniques. Subculturing should only be conducted using known microorganisms, which are RG1. Students should not subculture from cultures that they have inoculated because of the risk of contamination of unknown micro-organisms.
4. **Waste disposal:** an autoclave or pressure cooker is required to sterilise agar plates before disposal.

Alternative Method:

Methods using commercially available pure non-pathogenic cultures are recommended. Paper discs saturated with essential oils may be placed on agar plates by students prior to mould inoculation by microbiologically trained teachers or technicians. See our list of [School science suppliers](#) for suppliers of suitable Risk Group 1 cultures, agar plates and paper discs.

Additional information:

Please refer to previous questions to ASSIST on growing bread moulds:

students investigating mould and bacterial growth on food items

Mould investigations extra questions

Most school laboratories are classified as Physical Containment Level 1 (PC1) if they conform to the requirements set out in Section 5 of Australian and New Zealand Standard AS/NZS 2243.3:2010 Safety in Laboratories. This means they are suitable for work with microorganisms where the hazard levels are low and require no special containment equipment, and is suitable for work with microorganisms from Risk Group 1²

Bread slices for mould growth should be placed in zip lock bags or Petri dishes that have been sealed with 4 pieces of sticky tape. These containers should never be re-opened. A closed container reduces the liberation of spores grown from moulds that cause contamination in the laboratory and are a hazard to human health. It is highly probable that unknown micro-organisms will grow in addition to the anticipated mould. Until further classification and identification has taken place,

Science ASSIST recommends that before schools embark on working with microorganisms they should ask the following questions and perform a site specific biological risk assessment:

- Do the school facilities comply with the requirements of PC1 laboratories? Generally, Australian school science laboratories are classified as Physical Containment level 1 (PC1) and this is only **if** they conform to the requirements specified in Section 5 of AS/NZS 2243.3:2010 Safety in Laboratories – Microbiological safety and containment. At this level they are only suitable for work with microorganisms where the hazard levels are low, and where laboratory personnel can be adequately protected by standard laboratory practice³. Microorganisms that are classified as Risk Group 1 are the only group that should be handled in PC1 laboratories.
- Does the school have the necessary equipment for sterilisation and decontamination

procedures?

- Does the staff have training in microbiological skills?
- What microorganism is being used? Is the strain of microorganism likely to harm human health?
- What manipulations are being performed with the microorganism? Are methods being used to eliminate or minimize exposure to potentially infectious material via aerosols, splashes, ingestion, absorption and accidental inoculation?
- Are any staff or students wishing to participate in microbiological activities immunocompromised or immunosuppressed (Include those who are pregnant or may become pregnant, or are living with or caring for an immunocompromised individual)? These individuals are more prone to infections. If so, it has been suggested that they should consult a doctor to determine whether their participation is appropriate⁴.

Useful websites:

- 'Health effects of mould – What are the risks?', Mould assessment Australia website, <http://mouldassessment.com.au/> (Accessed June 2016)
- Society for General Microbiology. 2006. *Basic Practical Microbiology: A Manual*, Microbiology Online website, <http://www.microbiologyonline.org.uk/file/ca2189fba3b39d24c5a44c1285d008...>
- [Internet Journal of Microbiology](#)

References

¹ Krisch J, Tserennadmid R, Vágvölgyi C. 2011. 'Essential oils against yeasts and moulds causing food spoilage' in Méndez-Vilas, A (Ed.) *Science against microbial pathogens: communicating current research and technological advances*, Formatex website, <http://formatex.info/microbiology3/book/1135-1142.pdf>

² Australian Standards AS NZS 2243.3-2010. *Safety in Laboratories. Microbiology safety and containment*. Sydney.

³ 'Microbiology', University of Sydney WHS website, <http://sydney.edu.au/whs/guidelines/biosafety/microbiol.shtml> (Accessed June 2016)

⁴ American Society for Microbiology. 2012. *Guidelines for Biosafety in Teaching Laboratories*, Universitat Autònoma de Barcelona website, http://www.uab.cat/doc/teaching_lab_ASM

Society for General Microbiology. 2006. *Basic Practical Microbiology: A Manual*, Microbiology Online website, <http://www.microbiologyonline.org.uk/file/ca2189fba3b39d24c5a44c1285d008...>

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