

Natural alternatives to antiseptics

Antibacterial effects of plants (United Kingdom)

Background

Antiseptics are used to disinfect living tissue – both prophylactically to prevent infection and therapeutically to treat infection. Any given antiseptic is usually more effective against some microbes than others. Its activity may be affected by factors such as dilution, temperature, pH, and the presence of detergent or organic matter.

You will need...

- ✓ Petri dish containing agar covered with a bacterial lawn
- ✓ two named spices
- ✓ 3 small discs of filter paper
- ✓ sticky tape
- ✓ marker pen
- ✓ forceps
- ✓ ethanol

Follow these steps

1. Keeping the lid on the Petri dish, turn the Petri dish upside down. Use the marker pen to draw on the base and divide it into three sections, as shown in the diagram. Label one section 'control' and the other two sections with the name of each spice. Turn the dish the right way up.

2. Pick up a filter paper disc with the forceps and dip it into the ethanol. Carefully place the disc on the section of agar labelled 'control'. Replace the lid.
3. Using the forceps, pick up another filter paper disc and dip it into the ethanol and then the spice.
4. Carefully remove the paper disc and shake off any excess. Place the disc onto the section of agar labelled with the name of the spice. Replace the lid.
5. Repeat step D with the other spice.
6. Tape the lid onto your Petri dishes with two pieces of sticky tape, as shown in the diagram and invert the dish. Write your initials on the base of the dish. Leave it in a warm place (20–25 °C) for two to three days.
7. Look carefully at your dish. Do not open it.

So what happened?

The four spices with the most potent antibacterial effects tested were garlic, onion, allspice and oregano. These four spices inhibited the most bacterial growth. Many spices with relatively weak antibacterial effects become much more potent when combined; examples are in chilli powder (typically a mixture of red pepper, onion, paprika, garlic, cumin and oregano) and five-spice powder (pepper, cinnamon, anise, fennel and cloves).

What next?

1. Combine spices (as above) and repeat the experiment.
2. Repeat the experiment using different diluted percentages of mouthwash to test its antibacterial properties.
3. Examine plants with other medicinal properties.

