



# ISOLATION OF AN **ANTIBIOTIC** PRODUCER FROM **SOIL**

“ 240 MIC ”

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2021

# **Soil is the major reservoir of microorganisms that produce antibiotics.**

An antibiotic made by a microbe can **inhibit** many other soil microbes.




The bacterial genera *Bacillus* and *Streptomyces* along with the fungal genera *Penicilium* and *Cephalosporium* are commonly found in soil.

The genus *Streptomyces* are the most prolific antibiotic producers, although bacteria are a unique subgroup of bacteria called the **actinomycetes**.

**They have yielded most of the antibiotics used in clinical medicine today.**



A microscopic image showing a dense cluster of branching, filamentous structures. The filaments are light brown to tan in color and have a slightly fuzzy or granular texture. They branch out in various directions, creating a complex, tree-like or coral-like appearance. The background is dark and out of focus.

**Actinomycetes** are **bacteria** that produce **branching filaments** rather like fungal hyphae, but only about 1 micrometer diameter.

They also produce large numbers of **dry, powdery spores** from their aerial hyphae.

**In this experiment you will try to isolate an antibiotic producing bacterium from the soil.**

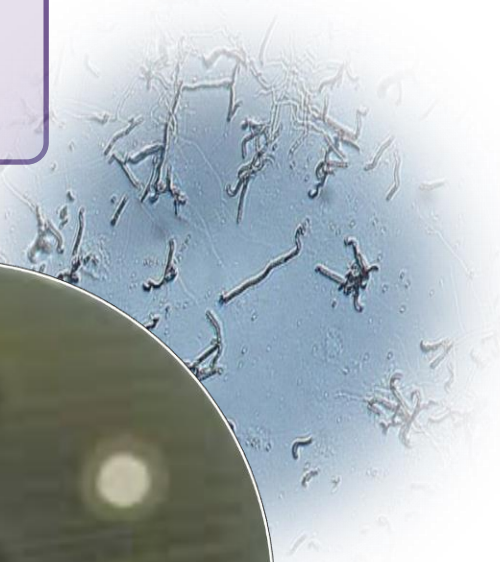
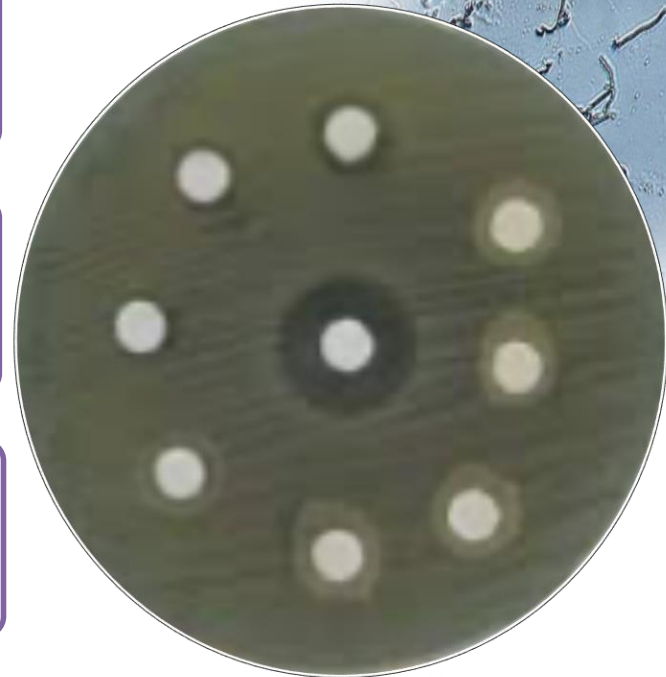
If you succeed at that you will then test that isolate to determine what organisms might be inhibited by the antibiotic that it makes.

## **ISOLATION OF ANTIBIOTIC PRODUCER THREE STEPS**

1. Primary isolation

2. Colony selection & Inoculation

3. Evidence of antibiosis & Confirmation



**3**

A tenfold aerial dilution of the soil is made by transferring 1.0 ml of solution from each tube to the next one to achieve a final dilution of 1:1,000,000 in tube 6.

**1**

One gram of soil is added to tube 1, containing 9 ml of saline solution.

**2**

Soil in tube 1 is thoroughly vortex-mixed.

Each tube contains 9 ml of saline solution.

**4**

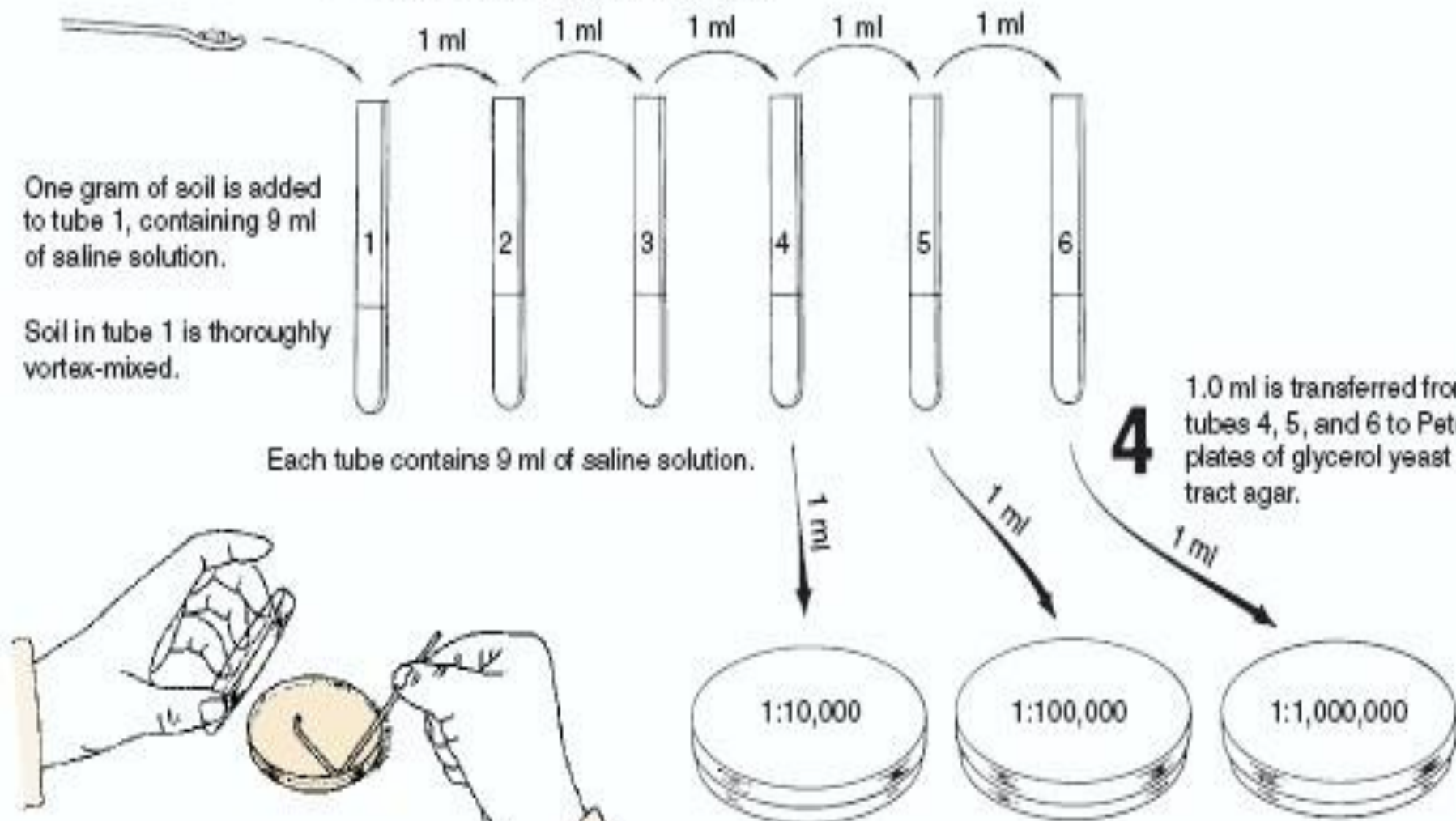
1.0 ml is transferred from tubes 4, 5, and 6 to Petri plates of glycerol yeast extract agar.

**5**

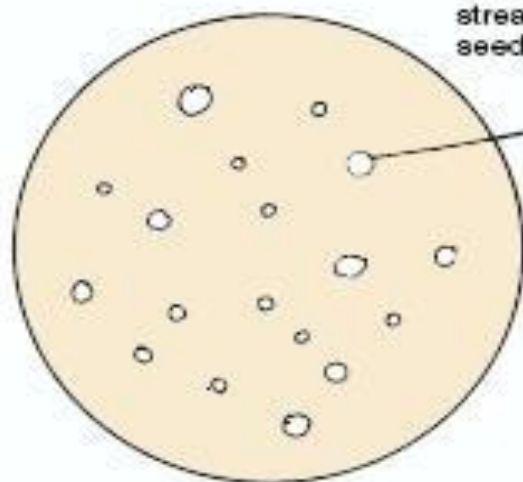
An alcohol-flamed glass rod is used to spread the 1.0 ml of soil suspension on the surface of each of the agar plates.

**6**

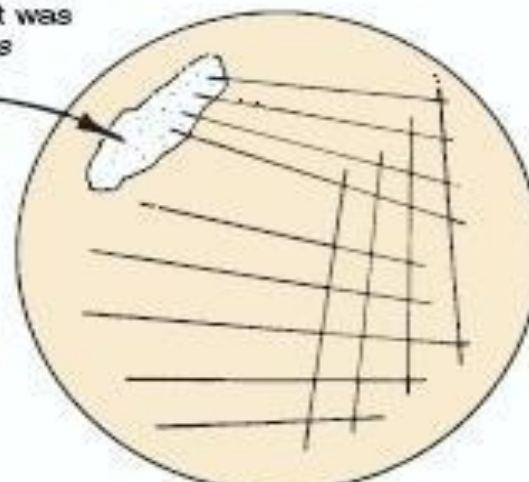
The three primary isolation plates of glycerol yeast extract agar plates are incubated at 30° C for 7 days.



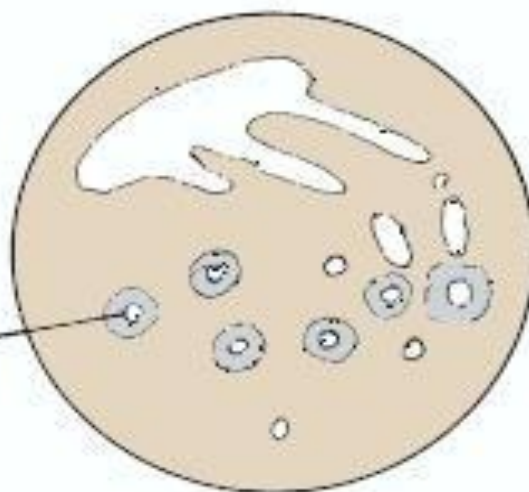
Spores from primary isolate are streaked on TSA plate that was seeded with *S. epidermidis*



PRIMARY ISOLATION PLATE



30° C 48 Hours

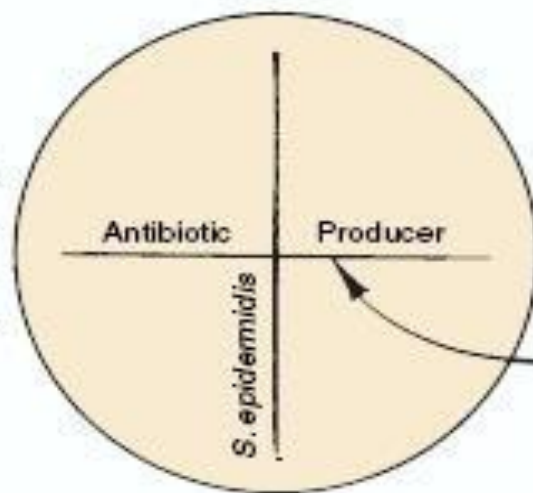


SECOND PERIOD

THIRD PERIOD

TO FOURTH PERIOD

30° C 2-7 days



Antibiotic producer is cross-streaked with *Staphylococcus epidermidis* on TSA plate.

**The End**

