

# Koch's postulates essay sample



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Abstract: It is important to be able to identify pathogenic bacteria that may be causing harm. Tomato crops can be affected by several different pathogenic bacteria. By using Koch's postulates, it was determined that *Pseudomonas syringae* was the bacteria causing rot. There are four criteria that must be met when using Koch's postulates. They are that the organism must be found in all infected, the organism must be isolated in pure culture then once reinnoculated in a healthy host, must cause the same symptoms and last, the organism must be reisolated in pure culture. All of Koch's postulates were demonstrated with the tomato. Introduction: Koch's postulates is important to determine various pathogens. There are 4 criteria must be met to determine a pathogen.

1) Presence of organism in all hosts, 2) isolation of pathogen in pure culture, 3) pathogenic when introduced into healthy host, 4) reisolated in pure culture. A tomato will be used to test Koch's Postulates. The bacteria from a rotten tomato will be isolated and grown in pure culture. A healthy tomato will be reinoculated with the grown bacteria. The tomato that shows that same rot as the initial tomato will have the bacteria reisolated and grown under pure culture. If the bacterial colonies look the same, biochemical testing will be done to determine the species of bacteria. It is predicted that *Pseudomonas syringae* will be the pathogenic bacteria. Materials and Methods:

The bacteria from a rotten tomato was streaked on nutrient agar plate. The different colonies were then isolated and grown on nutrient agar slants. Slices of healthy tomato were inoculated using the grown bacteria (one type of bacteria per slice) and, there was a control which was not inoculated. The

slices of tomatoes were allowed to incubate but, water was added to make sure the slices did not dry out. Once the same signs of rot were present on one of the inoculated tomatoes that was present on the original rotten tomato, the bacteria was reisolated on a nutrient agar plate. Various biochemical tests were also done to determine which bacteria was present.

Gram Stain (Mason)

41° (Mason)

Nitrate (Mason)

Starch (Mason)

Oxidase (Mason)

PsF (Mason)

FTM (Mason)

Results:

TestReaction

41 degreeNegative

Nitrate ReductionPositive

Starch HydrolysisNegative

OxidaseNegative

PsFPositive: Fluorescent, Diffusible pigment

FTMGrowth at top: Aerobic

Gram StainNegative: rods

It was determined through Gram staining that the organism was Gram -. It was also determined that the organism was aerobic (FTM tube) and, fluoresced, had diffusible pigment and was Pseudomonas(PsF plate). From that point, various biochemical tests (listed above) were performed to narrow

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down the exact species of *Pseudomonas*. Discussion: Plant pathogens can not only cause illness when ingested but, certain ones can also destroy an entire field of crops. It is important to be able to determine which bacteria is causing the rot. The attached flow chart shows the route by which the organism was determined to be *P. syringae*. The organism fulfilled all of the Koch's postulates criteria. It was present, isolated in pure culture, reinnoculated and produced the same symptoms then isolated in pure culture again.