

IX. Pathogenicity testing

To test pathogenicity, susceptible plant species are grown under controlled conditions and inoculated with a suspected pathogenic organism. Pathogenicity tests can provide information to:

- a. Confirm an isolated organism as a plant pathogen using Koch's postulates
- b. Determine the host range of a pathogen
- c. Measure the virulence of different isolates of a pathogen.

Since cultivars can differ significantly in susceptibility, it is important to use the same cultivar (variety) from which the pathogen was isolated when choosing healthy plants to inoculate for a pathogenicity test to confirm Koch's postulates. High levels of moisture facilitate the infection and spread of many diseases. Mist sprays or humid chambers (made from plastic bags covering pots) can create a moist environment and significantly increase the success rate of pathogenicity tests. Pots in moist chambers or with plastic bag covers should not be placed in direct sunlight.

Steps to perform Koch's postulates

- a. Describe the symptoms expressed by the diseased crop plants.
- b. Isolate the suspected pathogen—the same cultures should be isolated from plants with similar symptoms.
- c. Obtain a pure culture and use it to inoculate healthy plant material.
- d. Observe the symptoms expressed by the inoculated plants—symptoms should be the same as those observed originally in the crop plants.
- e. Re-isolate the pathogen from the newly diseased material—the culture should be the same as the original purified culture.

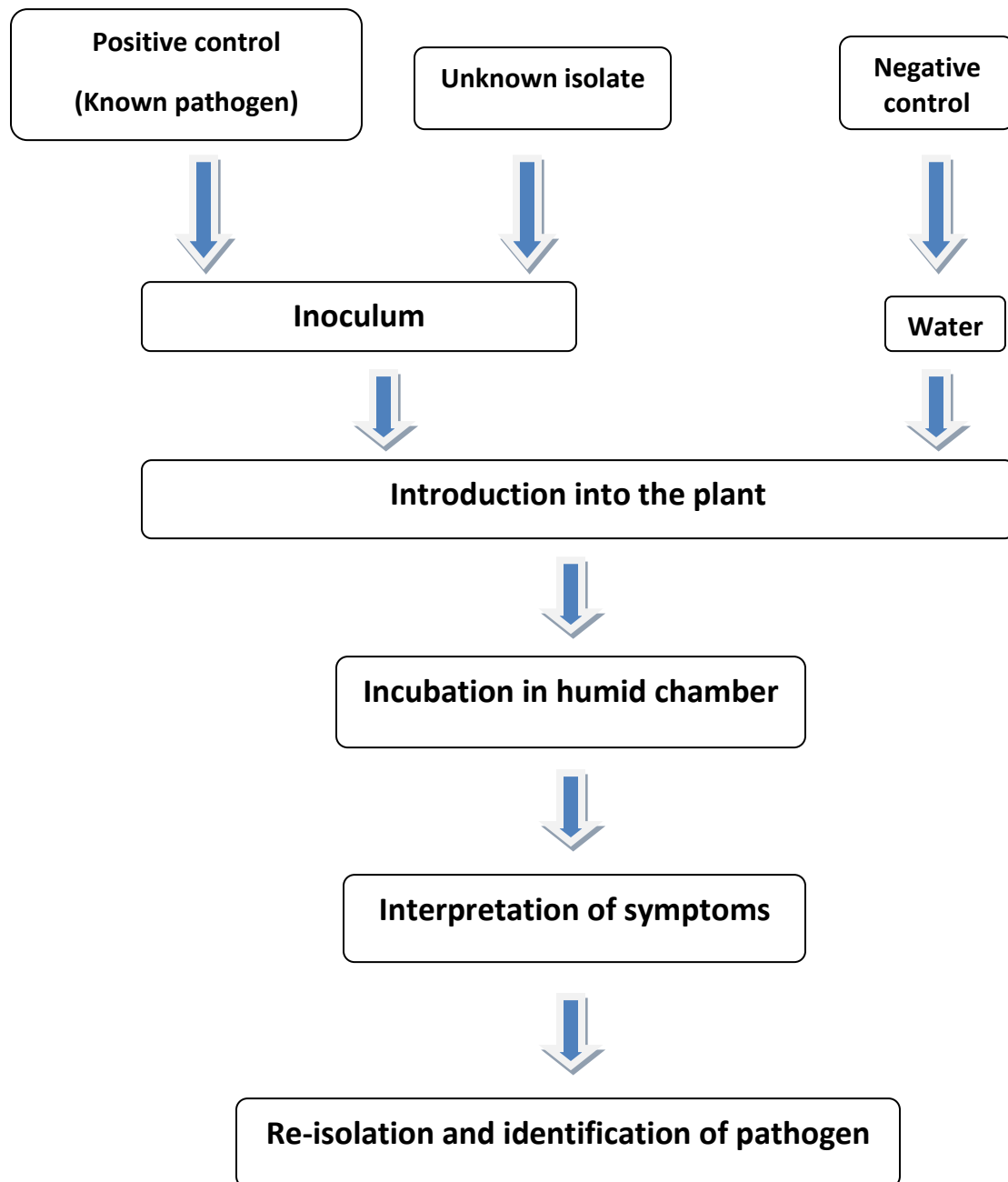


Figure 7. General steps in pathogenicity tests (Koch's postulate)