



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Allie I. Harrison	Project Number S1310
Project Title Identification of an Unknown Pathogen Causing Crown Rot in Castroville Artichokes, Cynara scolymus	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this project is to find the cause of crown rot disease in artichokes, Cynara scolymus, particularly in a Castroville, California field. There are many different kinds of bacteria on plants; some bacteria are pathogenic and others are nonpathogenic. Bacteria must be isolated until pure cultures are obtained and then tested for pathogenicity. The secondary goal of this project is to find a solution to manage the spread of this disease.</p> <p>Methods/Materials Following Koch's postulates, experiments were conducted to determine the cause of soft rot disease in artichokes. 1) Disease symptoms on artichokes were described and samples taken from a production field in Castroville, California and tissue of the diseased artichokes was compared to healthy artichokes. 2) The bacteria were isolated several times, on different kinds of media, until pure cultures were obtained. Once the pure cultures were obtained, the cultures were characterized as to their properties. 3) Healthy artichokes were then injected with suspended colonies of bacteria and observed for development of the disease symptoms. 4) Finally, new cultures, taken from the infected laboratory plants, were compared with the production field plants. PCR was also conducted for further identification to the strain of bacteria.</p> <p>Results In order to obtain a pure culture of bacteria, several different tests needed to be performed: CVP (Crystal Violet Pectate) medium; Erwinia Enrichment medium; Erwinia D3 Agar; Tryptic Soy Agar, and Potato Assay. The final isolates were then suspended in a sterile solution and injected into healthy artichokes. The bacteria grown on Plate 10 caused a definitive yellowing on the leaves of the healthy artichokes.</p> <p>Conclusions/Discussion It appears that the isolated culture, an Erwinia, is a primary pathogen that has infected the Castroville artichokes. Additionally, the bacteria seems to be an opportunist one that is transferred during harvest season by the field equipment.</p>	
Summary Statement This project was identification of an unknown pathogen that causes crown rot in Castroville artichokes, Cynara scolymus.	
Help Received Mrs. Harrison, my Biology teacher, taught me the basics of sterile laboratory technique. Dr. Carolee Bull showed me the additional tests and demonstrated how to do them. I performed all the microbiology tests myself. I also did inoculations of the healthy artichokes.	