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MCDB 187AL

Background and Introduction

Introduction •

Clearly state the:

– Background that explains the problem (Use what is below for

Your official Background):

Maintaining oak ecosystems (Sork et al. 2016) is economically valuable.

It is a natural resource for hardwood lumber (Luppold and Bumgardner 2013)

in hunting and range lands (Standiford and Howitt 1993; Kroeger et al. 2010) and

as a source of nutrition (Dahlgren et al. 1997; Herman et al. 2003).

Thirdly, oaks

are an important means of stabilizing the habitats of aquatic and terrestrial

animals (Dosskey et al. 1997; Kroeger et al. 2010).

Fourthly, oaks are used to beautify modern civilized areas and

As food by native cultures (Pavlik et al. 1991; Anderson 2005).

And thus, the maintenance of oak ecosystems is essential.

Oaks are planted by selective harvesting and their natural

reproduction, however a problem with selective harvesting

is how to do this locally taking rapid climate change into

consideration (Spittlehouse and Stewart 2004; Millaret al. 2007; Aitken and Whitlock 2013; Aitken et al. 2008).

Climates around the world are quickly changing due to industrialization.

And this may disrupt the health of oak ecosystems. Researchers wish

To better understand the genes that control the oak’s adaptation to

Climate change. This will allow genetic engineers to engineer seeds

That are resistant to extremes in climate change (Sork et al 2016).

– Problem being investigated:

Annotate genome that we may perform epigenetic experiments on Quercus lobata.

– Reasons for conducting the research:

Since rapid climate change affects effectiveness

Of selective harvesting as a means to preserve

Oak ecosystems, understanding the genes that

Affect Oak’s adaptations to the environment

Will allow researchers to engineer oak seeds

That may be exposed to much warmer climates,

especially in the next fifty years (Sork et al. 2010)

Management and maintenance of oak ecosystems is a high

Priority (see Background That Explains the Problem), it is essential to ensure they are optimally doing this.

Annotating their genome will allow us to perform epigenetic

Experiments on the Valley Oak genome to determine if this

Is the case.

• Summarize relevant research to provide context:

The Pelligrini Lab and others have:

Published a reference transcriptome assembly for Q. lobata.

This is signficiant because lenty of studies have taken advantage of conventional genetic

Approaches to analyzing the Oak genome, but many of those

Did not have access to the reference genome e (e.g., Derory et al. 2006; Gugger et al. 2016a; Spiess et al. 2012; Sork et al. 2016).

Reference genomes allow genetic scientists design reliable

Gene models and understand the evolution of the species.

So Sork et al 2016 set out to publish a DRAFT genome of the nuclear

And chloroplast DNA sequences of Q. lobata.

• HOW DOES IT?: State how your work differs from published work:

Work differs by:

• Identify the questions you are answering

• Explain what other findings, if any, you are challenging or extending

• Briefly describe the experiment, hypothesis(es), research question(s); general experimental design or method

Study Intro papers of Valley Oak

CITE AUTHORS IN YOUR BACKGROUND:

Read Publications on Valley Oak made by the professor

Our classes purpose:

­­Have a well-annotated genome to do experiments on how the Valley Oak is responding

To climate changes in the environment (for instance climate change and the effect on the Valley

Oak epigenome. To perform these epigenetic experiments, we need a well annotated genome.

And by annotation, I meant identifying the genes possibly responsible for adaptation to climate

change?

OUR CLASS IS TRYING TO REVISE THE DRAFT OF THE Q. lobata nuclear and chloroblast genomes and possibly identify new gene sequences responsible for the plant’s adaptation to climate change.