EXPLORING THE ROLE OF GUT MICROBIOME ON AVIAN PLUMAGE

Kartikey Sharma, Undergraduate researcher, Baiz Lab

Mentor: Dr. Marcella Baiz

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University at Buffalo The State University of New York

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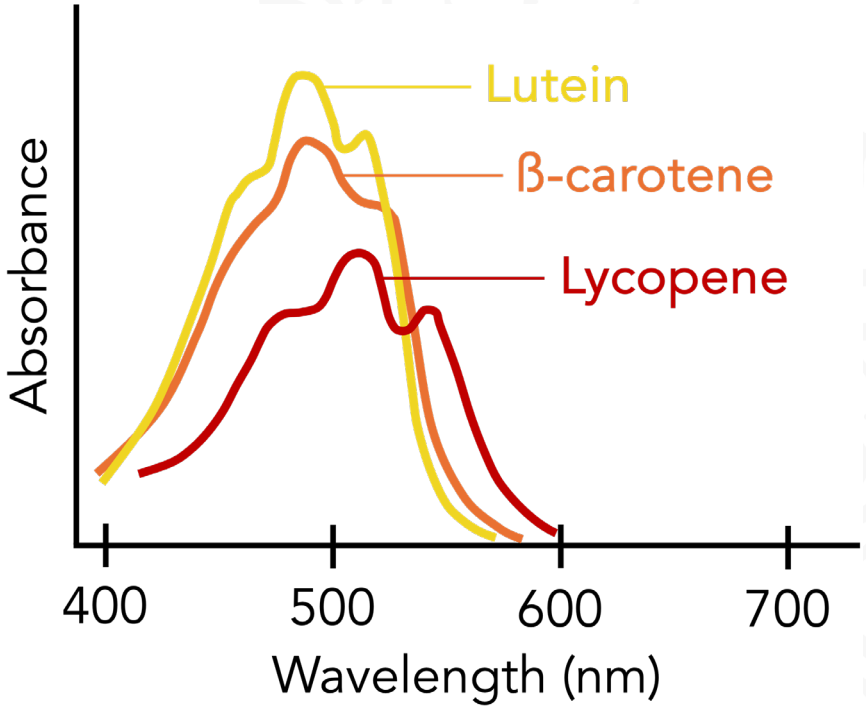
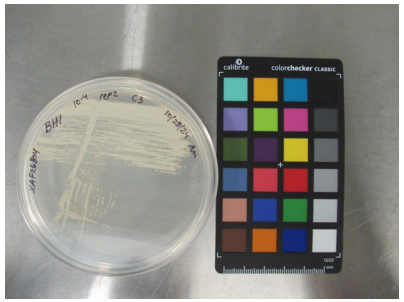
Background

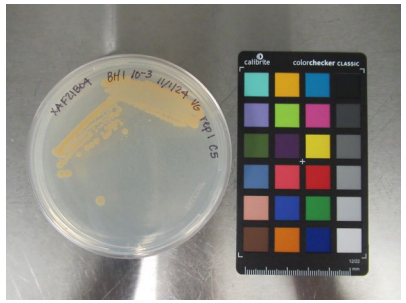
- Carotenoids: naturally occurring pigments which give vibrant yellow, orange and red colors
- Birds rely on environmental sources to attain the colors in their feathers
- Previous research found link between gut bacteria and feather color
- **Hypothesis:** *Bacteria composing bird gut microbiome synthesize carotenoids.*



Methods

Faecal samples from field





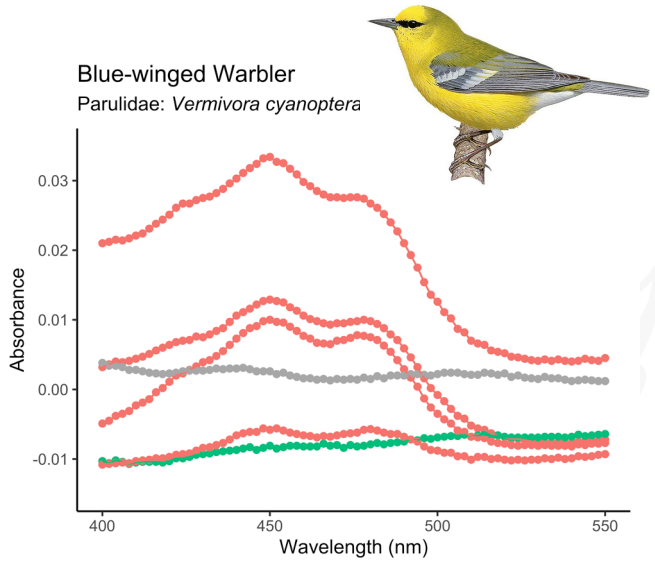
Cultured bacteria, isolated unique colonies and extracted pigments

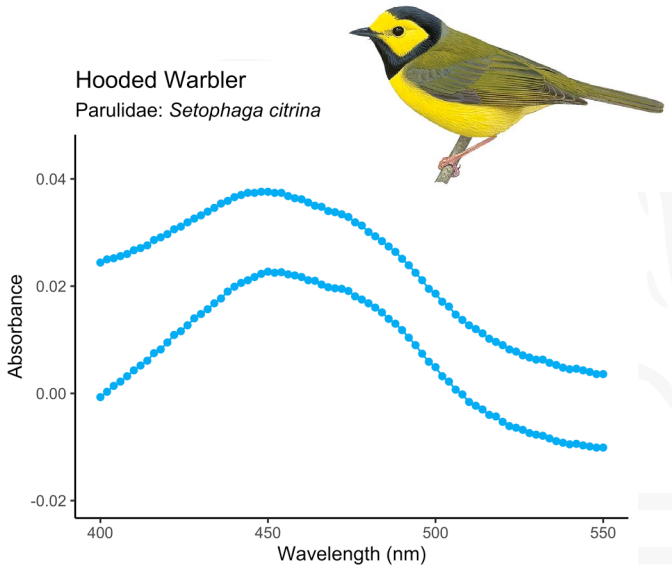
DNA sequencing

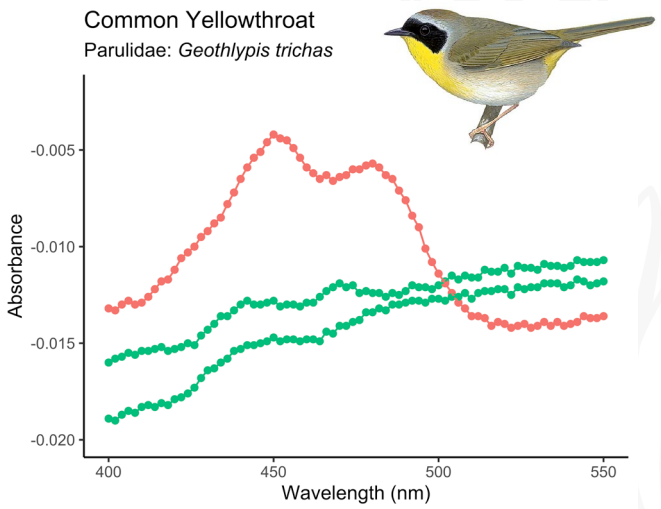
Microplate reader

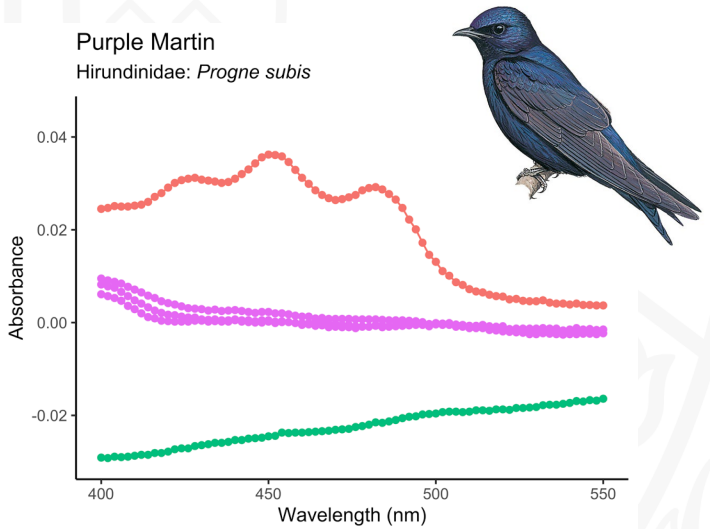
Gut microbiome synthesizes multiple carotenoids

- 4 unique profiles out of 109 isolates with absorbance wavelength between 400-550 nm (yellow to orange absorption range)

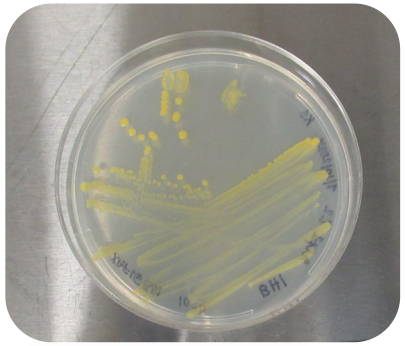




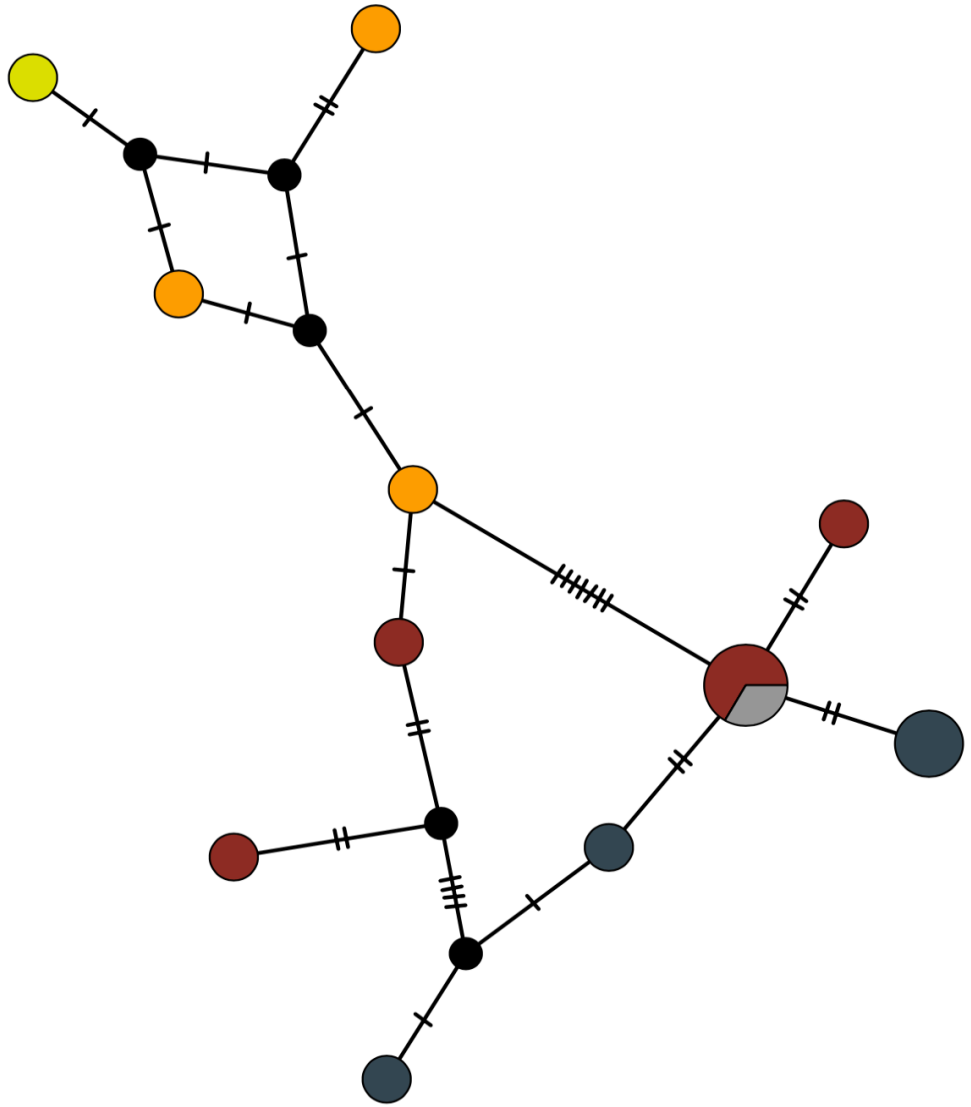




Pantoea

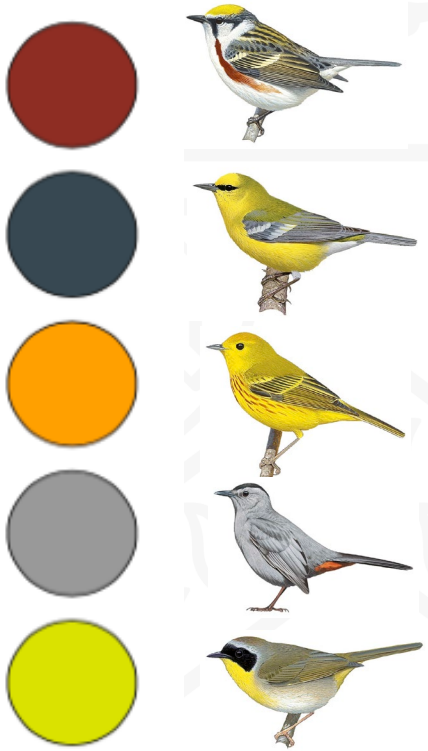


Yellow bacteria turned out to be primarily *Pantoea*



Haplotype network

Genus-specific "evolutionary tree"



Carotenoid-producing bacteria in avian guts exhibit high phenotypic and genotypic diversity

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