I. Introduction

The Ocean:
- 71% of Earth
- Billions $$ - Tourism
- Millions tons - Food

Coral reefs provide:
- Protection
- Home
- Biodiversity

Common zooxanthellae genus:
*Symbiodinium*

Adaptations seen in *Symbiodinium* types:
- Clade A – Parasitic Characteristics
- Clade B – Slight thermo-tolerance
- Clade C – Temperate-tolerance
- Clade D – Most thermo-tolerance

II. Problem

Coral Bleaching with increasing Earth temperatures.
- Zooxanthellae leave coral
- Coral won’t survive

III. Research

Clade D most thermo-tolerant

Proteins help thermo-tolerance
Long-term dominance = decrease biodiversity
Clade D more abundant with high temperature, but reaching limit

Tolerance based within clade strains

Strain = a type of clades
Each strain has its own characteristic

Survivability in location and host species
- Locations vary in temperature and light intensity histories
- Coral hosts differ in tolerance and sensitivity

Juvenile Corals
- Smaller and more sensitive to change
- Produced late spring - max average temperatures
- “Switching” clades is more common in juveniles than adult corals

Minimize anthropogenic stressors
- Coastal development
- Burning fossil fuels
- Pollution and plastics

IV. Conclusion

Clade D is most generally thermo-tolerant. However, long-term dominance could decrease biodiversity
- Tolerances are based on clade strains
- Survivability is limited to type of clade, location, and host species
- Juvenile coral sensitivity is a good indicator for future corals
- Need to minimize anthropogenic stressors