- Karenia brevis is a species of bloom-forming phytoplankton in the Gulf of Mexico that produce a neurotoxin called brevetoxin. The toxin build up in shellfish and other filter feeders. Its effects spread outward to marine and terrestrial vertebrates and can even aggravate respiratory problems in humans.

- Amoebophrya is a widespread genus of parasitic dinoflagellates that are well known to infect HAB species.

**Introduction**

- Challenge Study 1 was the main experiment testing K. brevis against both S. trochoidea and Alexandrium strains of Amoebophrya. Culture flasks set up as follows with associated abbreviations:
  - Kb CT: K. brevis control
  - Ax CT: Alexandrium sp control
  - St CT: S. trochoidea control
  - AmexAx CT: Amoebophrya infected Ax control
  - AmexSt CT: Amoebophrya infected St control
  - AmexAx Kb: AmexAx with K. brevis (both Kb and Ax counts respectively)
  - AmexSt Kb: AmexSt with K. brevis (both Kb and St counts respectively)

**Challenge Study 1**

- To determine why the growth of K. brevis had been restrained in Challenge Study 1, K. brevis in culture with uninfected Alexandrium was observed. Any growth different than the control would be from Alexandrium or the small dinoflagellate contaminant present in Ax CT cultures.

**Conclusion**

- Growth of K. brevis in culture was negatively affected by Amoebophrya. In both AmexSt and AmexAx, the growth rate of K. brevis was inhibited compared to the control.

**Challenge Study 1.2**

- In case K. brevis was affected by toxins released from Alexandrium cells lysed by Amoebophrya, Ax culture was lysed using a sonicator, filtered, and then added to Kb culture.

**Challenge Study 1.3**

- Discussion
  - Toxins released by lyed Alexandrium or a dinoflagellate contaminant could have decreased K. brevis growth. However, since K. brevis growth was affected in both AmexSt and AmexAx, it is possible the decrease is due to Amoebophrya.
  - Some K. brevis cells in AmexSt and AmexAx observed to be misshapen and, under epifluorescence, contain pale green dots not observed in the control Kb cultures.

**Future Research**

- Use CARD-FISH to determine if infection occurred
  - Filter Amoebophrya from host then add to K. brevis culture
  - Test K. brevis against additional strains of Amoebophrya
  - Test for Amoebophrya infection in various phytoplankton from the Gulf of Mexico, including K. brevis
  - Determine if Amoebophrya can survive at normal Mote Research Laboratory culturing temperature of 24°C.

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