The ecology and origins of Diplolepis rosae in Washington

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Natural History of Diplolepis rosae

Diplolepis rosae is a gall wasp indigenous to Europe and was accidentally introduced to the United States through its host plant the dogwood rose.

The female wasp induces the creation of galls on the host plant by injecting some eggs into a leaf bud. The larvae feeding on the sap then triggers the plant to create the gall.

The larvae overwinter in the gall and emerge as an adult in the spring. Diplolepis rosae is able to reproduce parthenogenetically (without males).

Parasitoid Wasps

O. rosae galls are susceptible to attacks from the parasitoid wasps that inject their eggs directly into the developing larva. There is high positive correlation between gall size with smaller galls being more susceptible to parasitism (Laslo et. al 2014).

Roso Gall Ecology

Methods:

Galls were collected from a residential area (January 2020), Snoo Creek trails (June 2019, November 2020) and Green River and allowed to over winter in laboratory settings. Gall size and number of open chambers was recorded. After the wasps emerged in the spring the species and total number of emerged wasps were recorded.

Guaranteed reproducibility of galls and the origin of the parasitoid wasp (Laslo et. al 2014)

Figure 1: There is a trend that the size of the gall increased the lower the proportion of the parasitoids that emerged was in most cases.

Figure 2: Graph of predicted by birds. The surface area of each gall was calculated. Overall there seems to be a negative correlation between gall size and the proportion of open chambers per area.

Results

- Rough phylogenetic tree of Diplolepis
- Parasitism rate decreases slightly as galls got larger
- The site with the largest galls (Neighbor) had smallest parasitism rate
- Based on data collected there does not seem to be more rates of bird predation for larger galls however we are not able to account for missing gall volume
- Collected wasp samples had high percent identity when compared to other studies.

Table 1: Number of emerged gall inducers and parasitoid specimens in the observational study. Neighbor also generally had larger galls and experienced a slightly lower parasitism rate.

Table: A common way researchers determine the identity of newly created species by sequencing the chloroplasts and cytoplasmic DNA. This is known as plastidial DNA. The standard plastid DNA barcode of the wasp Diplolepis rosae

References


Special thanks to Jeremy Davis Ph.D. for monitoring and advising me throughout the entirety of this project and to Sarah Haffner for helping with the process of sending out samples for sequencing, cleaning up the genetic data, and providing some alcohol for storing specimens.