**Scientific question**

We here aim to assess if a host plant change of the mother and the larva affects different characteristics of the development of the larva.

**Methods**

To analyse the effect of changing the host plant of the mother and the larva we focused on two different characteristics: the growth rate of the larva and the resulting adult weight. For the growth rate, we fitted a linear model with the growth rate as the dependent variable and the larval host and maternal host as the two possible explanatory variables. We checked the significance of each dependent variable as well as their interaction. We did a similar approach for the resulting adult weight, switching the explanatory variable to the resulting adult weight.

**Results**

We analysed the data of a total of 287 larvae coming from 16 different mothers. Among our studied larvae, approximately 45% (130 individuals) of individuals came from mothers that had Berteroa as a host plant and the rest came from mothers that had Barbarea as a host plant. We start our results by focusing on the growth rate of the larva we can see that both the larvae growing on Barbarea as host plants have higher growth rates (around 0.08 g.day-1) than the ones growing in Berteroa as a host plant (around 0.06 g.day-1 ) (Fig. 1, F-value = 875 table 1). Likewise, the maternal host appears to affect the growth rate of larvae as a larva that had mothers with Barbarea as a host plant seem to have a higher growth rate than ones with mother that had Bertorea as a host plant (Fig. 1, F-value = 101, table 1). For growth rate, we also find an interaction between the mother host plant and larval host plant to be significant, as, despite maternal larvae growing in Barbarea as host plants, it appears that larvae with mothers that had Barbarea as a host plant have a higher growth rate than their Berteroa counterparts for both larval host plants (Fig. 1, F-value = 5.86, table 1). The resulting adult weight after growth appears to also be affected by the larval host plant with larvae having Barbarea as host plants having a higher adult weight of around 65g as compared to their Berteroa counterparts with weights of around 55g (Fig. 2, F-value = 145, table 2). Nonetheless, adult weight doesn’t appear to be affected by the maternal host plant nor the interaction between the maternal growth plant and larval host plant (Fig. 2, table 2), meaning that regardless of the maternal host plant, larvae will grow to similar adult weights in their respective host plants.

**Figures**



Figure 2: Adult weight of larvae in grams for different larval and maternal hosts

Figure 1: Growth rate of larvae in grams per day for different larval and maternal hosts

***Tables***

Table 1: Anova statistics of the effect of maternal and larval host plants on the growth rate of the larvae

|  |  |  |  |
| --- | --- | --- | --- |
| Explanatory variable | Df | Mean sq | F value |
| Maternal host | 1 | 0.0310561 | 875.4154 |
| Larval host | 1 | 0.0035847 | 101.0475 |
| Maternal:Larval host | 1 | 0.0002080 | 5.8621 |
| Residuals | 283 | 0.0000355 |  |

Table 2: Anova statistics of the effect of maternal and larval host plants to the adult weight

|  |  |  |  |
| --- | --- | --- | --- |
| Explanatory variable | Df | Mean sq | F value |
| Maternal host | 1 | 13086.0 | 145.6248 |
| Larval host | 1 | 7.5 | 0.0833 |
| Maternal:Larval host | 1 | 336.7 | 3.7471 |
| Residuals | 283 | 89.9 |  |