Who is the master?!
Trade-off between competitive ability and resistance to elevated pCO₂

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Background

Ocean acidification (OA) negatively affects calcifying phytoplankton species, but studies show that evolutionary adaptation is possible. Under future conditions genotypes that are more resistant towards OA should thus have an advantage for this trait. Theory, however, states that “a jack in every trait is a master of none”. This suggest, highly OA-tolerant genotypes might be weaker in other traits as for example competition (Fig. 1).

Stress tolerance to OA

For the stress tolerance to OA, we ranked genotypes by the mean difference in growth rate under ambient and high CO₂ (400, 1200 ppm).

Competitive ability

Competitive ability will be ranked by the change in density of each genotype with competitor relative to densities reached without competition (Relative Yield; Carrara 2015)

Conclusion

• Existence of trade-off not certain
  • competitive ability not yet assessed

But:...

• Strong difference in growth rate of genotypes in ambient and high CO₂ conditions
  • Cryptic genetic variation expressed at high CO₂
  • Cost of similar growth rate under both CO₂ levels?
  → Trade-off might exist