$$∆Y= Y\_{O}-Y\_{E}=N\overline{∆RY} \overline{M}+ Ncov(∆RY, M)$$

𝑁 = number of species in mixed-species community

$M\_{i}=$ growth of species i in mono-species conditions

$RY\_{E,i}=$ expected relative biofilm growth of species i in mixed-species conditions, which is its proportion inoculated

$RY\_{O,i}=Y\_{O,i}/M\_{i} =$ observed relative growth of species i in mixed-species

$∆RY\_{i}= RY\_{O,i}-RY\_{E,i}$ = deviation from expected relative growth of species i in mixed-species conditions

This biodiversity effect measures how inter-species interactions differ from intra-species interactions based on the difference between the observed multi-species biofilm productivity and an expected value derived from the productivity in mono-species biofilms. The biodiversity effect is the sum of the selection effect $\left(Ncov\left(∆RY, M\right)\right)$ and the complementarity effect $(N\overline{∆RY} \overline{M})$.