**Supplement**

Unravelling the trophic interaction between a parasitic barnacle (*Anelasma squalicola*) and its host the Southern lanternshark (*Etmopterus granulosus*) using stable isotopes

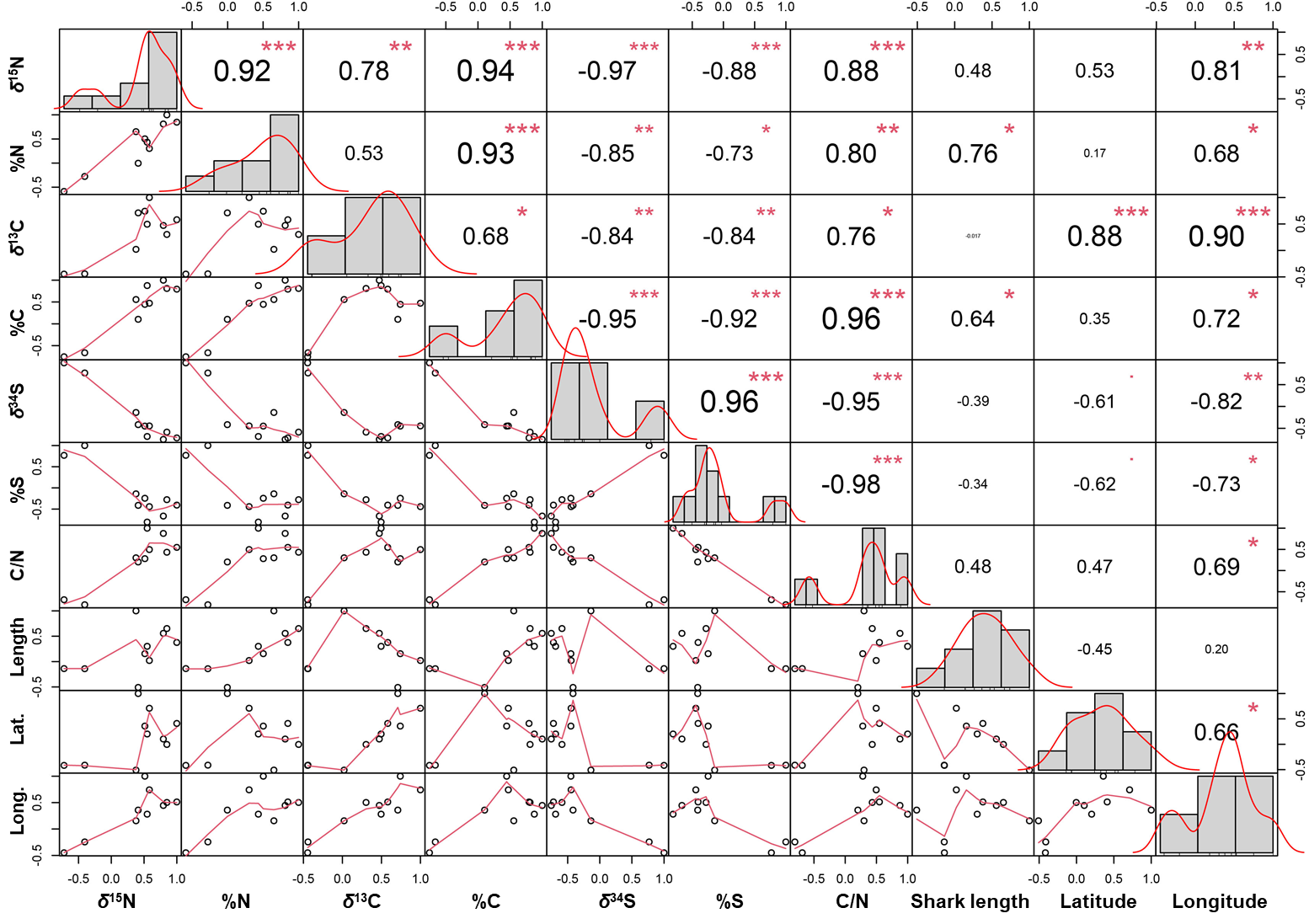
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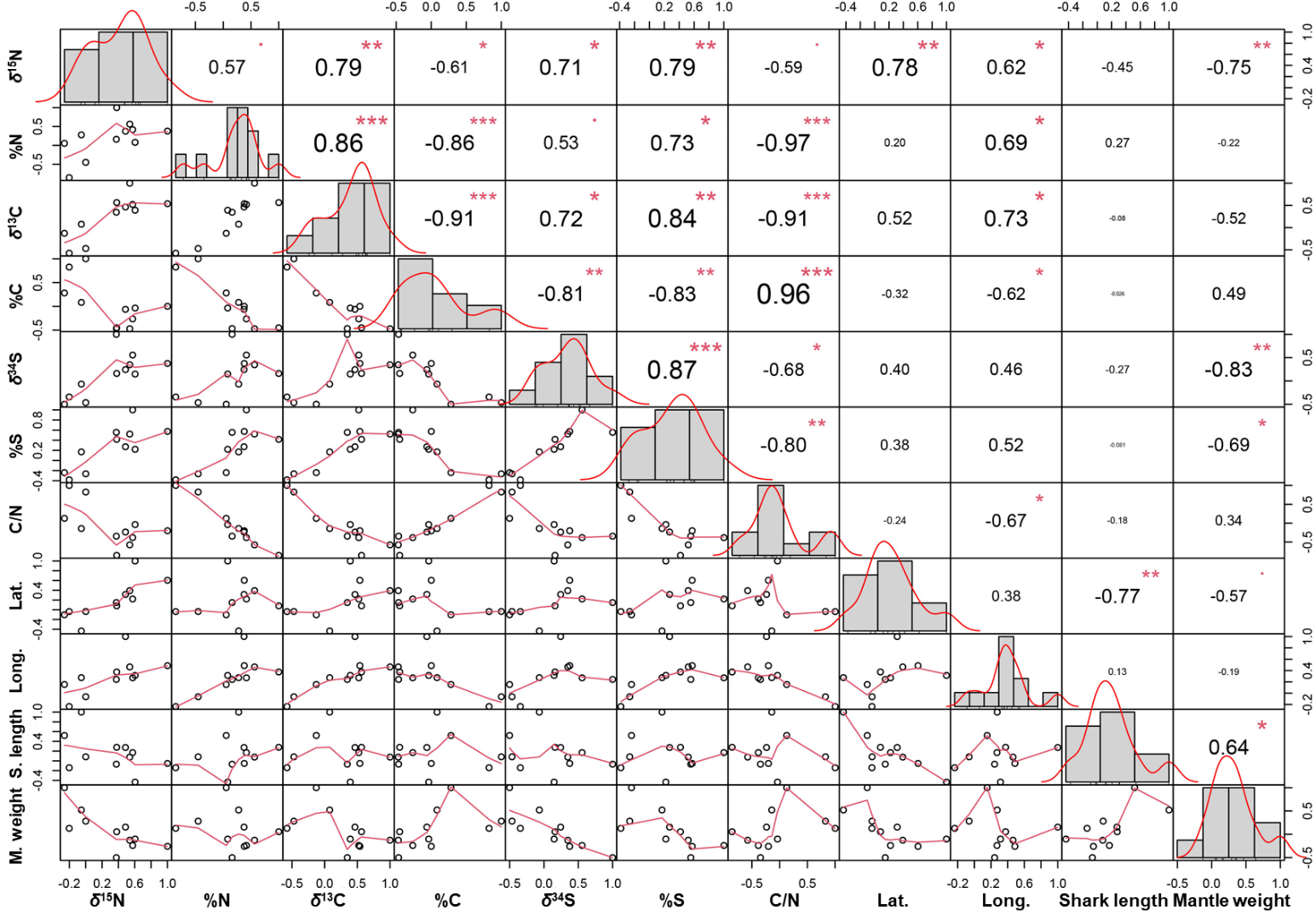
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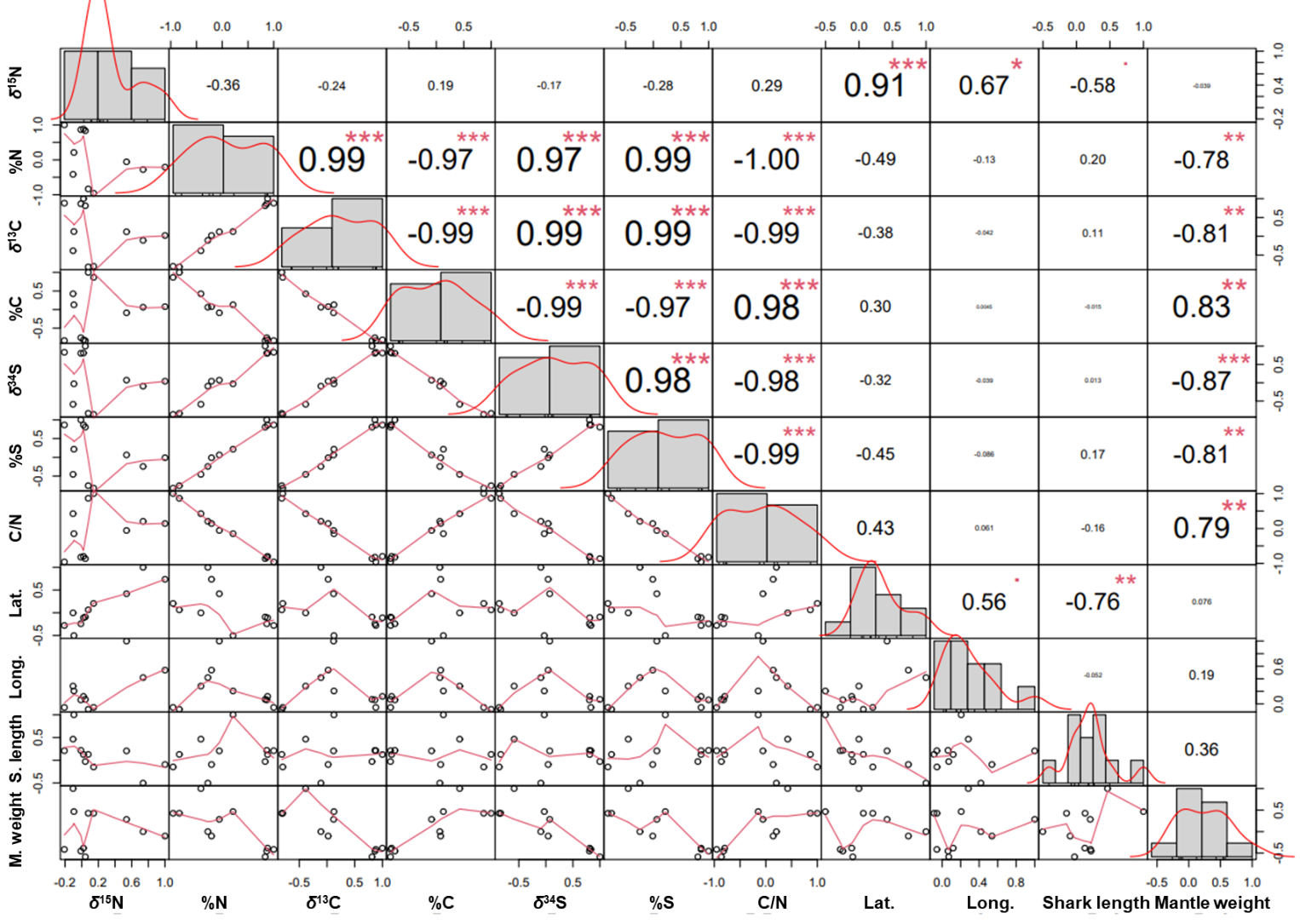
**Figures**



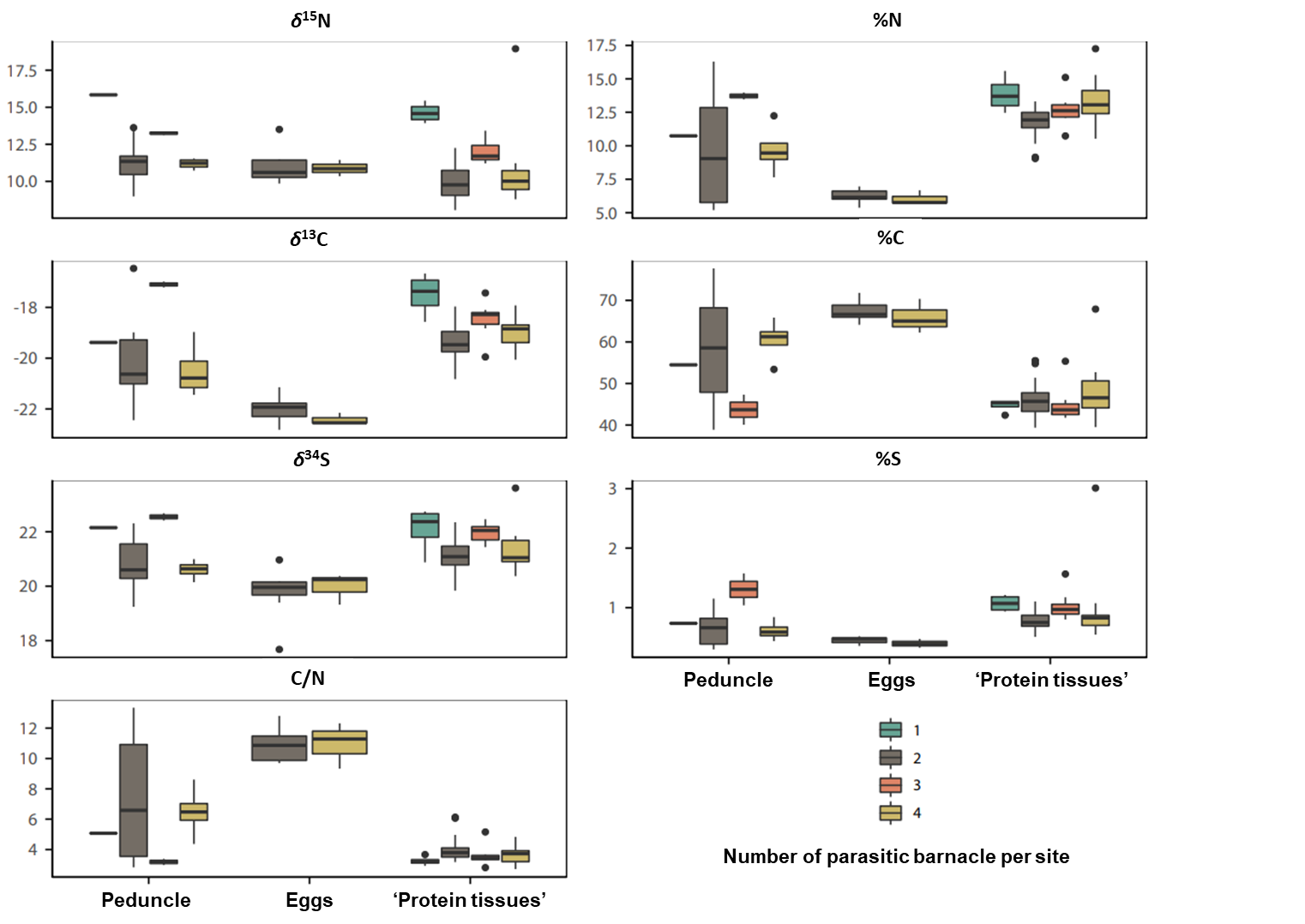
**Figure S1.** Correlation table of *E. granulosus*’ muscle tissues stable isotope values, elemental compositions and C/N ratios. Values were also compared with shark length (Length) and shark location: latitude (Lat.) and longitude (Long.). Coefficients in upper triangle corresponds to R values and red stars represents the level of significance: no star = not significant, \* = p value < 0.05, \*\* = 0.05 <p value < 0.001 and \*\*\* = p values << 0.001.



**Figure S2.** Correlation table of *A. squalicola*’s ‘protein tissues’ stable isotope values, elemental compositions and C/N ratios. Values were also compared with shark length (Length) and shark location: latitude (Lat.) and longitude (Long.) and barnacle weights (Mantle weight). Coefficients in upper triangle corresponds to R values and red stars represents the level of significance: no star = not significant, \* = p value < 0.05, \*\* = 0.05 <p value < 0.001 and \*\*\* = p values << 0.001.



**Figure S3.** Correlation table of *A. squalicola*’s peduncle tissues stable isotope values, elemental compositions and C/N ratios. Values were also compared with shark length (Length) and shark location: latitude (Lat.) and longitude (Long.) and barnacle weights (Mantle weight). Coefficients in upper triangle corresponds to R values and red stars represents the level of significance: no star = not significant, \* = p value < 0.05, \*\* = 0.05 <p value < 0.001 and \*\*\* = p values << 0.001.

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**Figure S4.** Boxplot highlighting the relationship between the number of *A. squalicola* per infection site on stable isotope values (*δ*15N, δ13C and δ34S), elemental compositions (%N, %C and %S) and the C/N ratio.

**Tables**

**Table S1.** Difference between host shark or parasitic barnacle tissues vs host shark ‘healthy’ muscle tissues for the different stable isotope values, elemental composition, and C/N ratio.



|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Host Shark** |  | **δ15N (‰)** | **%N** | **δ13C (‰)** | **%C** | **δ34S (‰)** | **%S** | **C/N** |
| Δ‘unhealthy'-‘healthy’ muscle | Avg. | -1.0 | -3.3 | -0.7 | 0.7 | 0.7 | -0.1 | 0.8 |
|  | SD | 0.9 | 1.5 | 0.4 | 1.6 | 0.6 | 0.2 | 0.4 |
| ΔEye-‘healthy’ muscle | Avg. | -0.7 | 2.1 | 0.5 | n/a | -1.9 | -0.3 | n/a |
|  | SD | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| **Parasitic barnacle** |  |  |  |  |  |  |  |  |
| ΔPeduncle-‘healthy’ muscle | Avg. | -0.4 | -5.6 | -1.1 | 9.2 | 1.0 | -0.1 | 3.2 |
|  | SD | 1.4 | 3.0 | 1.8 | 11.2 | 1.0 | 0.3 | 3.1 |
| ΔEggs-‘healthy’ muscle | Avg. | -1.2 | -9.6 | -3.6 | 19.5 | 0.0 | -0.4 | 7.7 |
|  | SD | 1.1 | 1.5 | 0.5 | 4.4 | 0.4 | 0.1 | 1.1 |
| ΔProtein tissues-‘healthy’ muscle | Avg. | -1.8 | -3.7 | -0.4 | -0.9 | 1.2 | -0.1 | 0.8 |
|  | SD | 1.3 | 1.1 | 0.7 | 4.4 | 0.7 | 0.2 | 0.5 |

**Table S2.** ANOVA tests isotopic ratios. Results for eyes should be taken with caution, as based on only one value.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable | Statistic | p value |  | Post hoc |
| δ15N | F109,8 = 2.14 | 0.04 | \* | Eyeab = Inner mantlea = MCPab = Rootletsab = Mantleab = Eggsab = ‘Unhealthy' shark muscleab = Peduncleab = ‘Healthy' shark muscleb |
| %N | F109,8 = 24.64 | <2.2 10-16 | \*\*\* | Eggsa< Peduncleb< Mantlec = Inner mantlec = MCPcd = Rootletsc = ‘Unhealthy' shark musclecd = Eyeabc < ‘Healthy' shark muscled |
| δ13C | F108,8 = 14.16 | 6.3 10-14 | \*\*\* | Eggsa < Peduncleb= ‘Unhealthy' shark musclebc = Inner mantlebc = Eyebc = Rootletsbc = Mantlebc < MCPc = ‘Healthy' shark musclec |
| %C | F109,8 = 18.48 | <2.2 10-16 | \*\*\* | MCPa = ‘Healthy' shark muscle a = Eyea = Inner mantlea = Rootletsa = Mantlea = ‘Unhealthy' shark musclea < Peduncleb < Eggsc |
| δ34S | F109,8 = 7.78 | 3.2 10-8 | \*\*\* | Eggsa ≤ Eyeab = ‘Healthy' shark muscle ab = ‘Unhealthy' shark muscleab < Pedunclebc = Rootletsbc = Inner mantlebc = Mantlebc = MCPbc |
| %S | F109,8 = 3.98 | 3.6 10-4 | \*\*\* | Eggsa ≤ Peduncleab = Inner mantleab ≤ Rootletsb = MCPb ≤ ‘Unhealthy' shark muscleab < Mantleb = ‘Healthy' shark muscle b = Eyeab |
| C:N | F109,8 = 32.43 | <2.2 10-16 | \*\*\* | ‘Healthy' shark muscle a = Eyea = MCPa = Rootletsa = ‘Unhealthy' shark musclea = Inner mantlea = Mantlea < Peduncleb < Eggsc |