**Supplementary Material 2**

**Supplementary Table 1:** Principal component (PC) loadings for landmark character data of shark pectoral fin morphology. Each of the six landmarks is represented by an x and y component, corresponding to the x and y position of a given landmark in Cartesian coordinate space.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Landmark Character** | **Principal Component (PC) Axis** | | | | | |
|  | **PC1** | **PC2** | **PC3** | **PC4** | **PC5** | **PC6** |
| **1.X** | -0.121644 | -0.3043625 | 0.25325712 | 0.22293141 | -0.1865075 | -0.6588455 |
| **1.Y** | -0.2617726 | -0.0102149 | 0.60749649 | 0.30590395 | 0.23133728 | 0.32458961 |
| **2.X** | 0.17609348 | -0.0635086 | 0.3478841 | -0.4791026 | -0.0725804 | 0.41736793 |
| **2.Y** | -0.4180956 | 0.0868273 | -0.3668871 | -0.4931501 | 0.02043879 | -0.0671198 |
| **3.X** | -0.4694308 | -0.0401213 | -0.0695357 | -0.1726628 | -0.1162591 | -0.0096409 |
| **3.Y** | -0.1455886 | -0.0406538 | -0.2608508 | 0.35505976 | 0.23079432 | -0.0025212 |
| **4.X** | 0.27342366 | 0.57052991 | -0.0605095 | 0.01271025 | 0.58136413 | -0.2038135 |
| **4.Y** | 0.28269933 | 0.50156621 | 0.08918809 | 0.05875875 | -0.6550277 | -0.107963 |
| **5.X** | 0.14155766 | -0.1625374 | -0.471096 | 0.41612374 | -0.2060172 | 0.45493197 |
| **5.Y** | 0.5427575 | -0.5375248 | -0.0689467 | -0.2265724 | 0.17245731 | -0.1469857 |

**Supplementary Table 2:** Principal component (PC) loadings for skeletal morphology data of shark pectoral fins.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Internal Anatomy Character** | **Principal Component (PC) Axis** | | | | | | | | | | | | | |
|  | **PC1** | **PC2** | **PC3** | **PC4** | **PC5** | **PC6** | **PC7** | **PC8** | **PC9** | **PC10** | **PC11** | **PC12** | **PC13** | **PC14** |
| **Perc.Skeletal.extent\_area** | -0.223378 | -0.5705693 | 0.43532812 | -0.4038175 | 0.39123902 | -0.0738657 | -0.2023906 | 0.01689297 | -0.0381484 | -0.1543725 | -0.0595697 | 0.1426061 | 0.07568668 | -0.1194595 |
| **Perc.Skeletal.extent\_longest.radial** | -0.1087673 | -0.4555434 | 0.13262388 | 0.56966242 | 0.05696032 | 0.04504142 | 0.20536415 | 0.3019051 | 0.14636858 | 0.17271608 | 0.05704395 | -0.0188394 | -0.0078139 | 0.47983706 |
| **Aspect.Ratio\_base** | -0.0002312 | -0.0009377 | 0.0031012 | -0.0165379 | 0.01376027 | -0.0022367 | 0.00487425 | -0.0120809 | 0.02128205 | -0.0256629 | -0.0096001 | 0.00822303 | -0.0552444 | 0.09229169 |
| **Aspect.Ratio\_fork** | -0.00601 | -0.0136797 | 0.00730299 | 0.0348145 | 0.00557514 | -0.0232863 | 0.05171346 | 0.04049837 | -0.1262543 | 0.14296209 | 0.04072388 | -0.0358932 | -0.2673567 | -0.2925896 |
| **Leading.edge.degree.of.taper** | -0.00137 | -0.002454 | 0.00150615 | 0.01123501 | -0.0033 | -0.0176 | 0.01218947 | -0.0303967 | 0.0221903 | 0.021064 | 0.06829852 | -0.1003849 | 0.1289634 | -0.0192293 |
| **LE.taper.angle** | -0.0571587 | -0.0007651 | -0.08819 | -0.0553195 | -0.1119916 | 0.24752997 | -0.4151006 | -0.5075247 | 0.07365841 | -0.1788333 | 0.18608003 | 0.21547245 | -0.0324504 | 0.52123815 |
| **Trailing.edge.degree.of.taper** | -0.0045115 | -0.0066162 | 0.00568308 | 0.01523406 | -0.0027029 | 0.00729227 | -0.0130821 | -0.0101033 | -0.0063457 | 0.00423948 | 0.00207977 | -0.0153587 | 0.0017376 | -0.1284358 |
| **TE.taper.angle** | -0.1281868 | -0.1667959 | 0.15849785 | 0.20337894 | -0.0376992 | 0.16571302 | -0.2205082 | -0.3425721 | 0.01823578 | 0.07106301 | 0.07182088 | -0.556121 | -0.3779726 | -0.1664375 |
| **LE.P.perc.cal** | 0.28389516 | 0.1067019 | 0.32349403 | 0.27498459 | -0.192918 | 0.26712067 | -0.3977092 | 0.35659474 | 0.24842169 | -0.444881 | -0.0924572 | 0.03872297 | 0.06038473 | -0.222008 |
| **LE.P.Shape** | 0.02303738 | 0.00477295 | -0.0454787 | -0.0012397 | -0.0079672 | -0.1036008 | -0.0290027 | 0.01395708 | -0.0328465 | -0.0842214 | -0.6918965 | 0.07164913 | -0.5905393 | 0.15686078 |
| **LE.IM.perc.cal** | 0.39110804 | -0.293167 | 0.2080377 | 0.1564049 | -0.2737465 | 0.08123757 | 0.15663157 | -0.487249 | 0.01130159 | 0.30763736 | -0.2285355 | 0.17173316 | 0.22729711 | -0.2493399 |
| **LE.IM.shape** | -0.0149869 | 0.06322421 | 0.0164386 | -0.1171654 | 0.0027457 | -0.0167411 | -0.2119729 | 0.03729215 | -0.168201 | 0.12619932 | -0.4302385 | -0.5333902 | 0.37193796 | 0.2349848 |
| **LG.P.perc.cal** | 0.42400584 | 0.29341968 | 0.61212032 | -0.094679 | 0.11471307 | -0.1518846 | 0.21982456 | -0.0662214 | -0.2592659 | -0.0533691 | 0.13360633 | -0.0660268 | -0.1041847 | 0.34599807 |
| **LG.P.Shape** | 0.0285745 | -0.0070338 | -0.0857927 | -0.0362702 | -0.0221387 | 0.00513116 | -0.0402704 | 0.01315143 | 0.15376368 | 0.04771108 | -0.3632268 | 0.08392662 | 0.36119386 | 0.10787605 |
| **LG.IM.perc.cal** | 0.45632904 | -0.2602628 | -0.264346 | -0.3967236 | 0.12053773 | 0.56217716 | 0.23903114 | 0.15214336 | 0.12920213 | -0.0211527 | 0.02686132 | -0.1487939 | -0.1532969 | 0.08789696 |
| **LG.IM.shape** | 0.01672972 | 0.02402326 | 0.0149138 | -0.0535607 | 0.04315057 | 0.00267033 | 0.00680614 | 0.02468427 | 0.12378075 | -0.0370273 | 0.16088884 | -0.4643206 | 0.1444141 | -0.0076643 |
| **TE.P.perc.cal** | 0.52512014 | -0.137232 | -0.3308686 | 0.22051598 | 0.45153483 | -0.4132193 | -0.3948556 | -0.0349424 | -0.0190961 | 0.05318931 | 0.10103264 | -0.0080111 | -0.0145938 | -0.0248699 |
| **TE.P.Shape** | 0.01159878 | 0.09533417 | 0.10957491 | -0.1050655 | -0.0752579 | 0.26343079 | -0.4345943 | 0.31535066 | -0.2713441 | 0.65810392 | 0.09171823 | 0.17836279 | -0.0812742 | 0.03334175 |
| **TE.IM.perc.cal** | 0.13500329 | -0.3806197 | -0.1042435 | -0.2137345 | -0.6824872 | -0.3752348 | -0.0910008 | 0.18793462 | -0.2244706 | -0.1504179 | 0.15819036 | -0.0960527 | -0.0597294 | 0.09731623 |
| **TE.IM.shape** | 0.0311793 | 0.10133265 | 0.15854605 | -0.2765038 | -0.1090106 | -0.3062907 | -0.0651357 | 0.01898638 | 0.78483709 | 0.32660481 | 0.04853824 | -0.0327125 | -0.1438278 | 0.05903361 |