Table S2. Results from PCA on biological indicators

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| KMO |  |  |  |  |  |  |  |  | Total |
|  |  |  |  |  |  |  |  |  |  |
|  | S | EPT | A | %EPT | BI | BMWP | ASPT | DOMN |  |
|  | 0.548 | 0.601 | 0.411 | 0.516 | 0.926 | 0.548 | 0.441 | 0.462 | 0.561 |

eig

|  |  |  |  |
| --- | --- | --- | --- |
|   | eigenvalue | percentage of variance | cumulative percentage of variance |
| comp 1 | 4.5076 | 56.3455 | 56.3455 |
| comp 2 | 1.839 | 22.9881 | 79.3335 |
| comp 3 | 0.7494 | 9.3674 | 88.701 |
| comp 4 | 0.4431 | 5.5387 | 94.2397 |
| comp 5 | 0.2544 | 3.18 | 97.4197 |
| comp 6 | 0.1367 | 1.7087 | 99.1284 |
| comp 7 | 0.0674 | 0.8424 | 99.9708 |
| comp 8 | 0.0023 | 0.0292 | 100 |

var

coord

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   | Dim.1 | Dim.2 | Dim.3 | Dim.4 | Dim.5 |
| S | 0.9246 | 0.0684 | -0.2959 | -0.13 | -0.143 |
| EPT | 0.9112 | 0.0983 | 0.211 | -0.0659 | 0.1983 |
| A | 0.5191 | 0.656 | -0.2238 | 0.4925 | -0.0386 |
| X.EPT | 0.4265 | -0.7963 | 0.0917 | 0.3622 | 0.1789 |
| BI | 0.9057 | -0.0192 | -0.1389 | -0.2042 | 0.2448 |
| BMWP | 0.9709 | 0.1201 | -0.1265 | -0.0727 | -0.1144 |
| ASPT | 0.6478 | 0.1764 | 0.7126 | 0.0248 | -0.1689 |
| DOMN | -0.4343 | 0.8453 | 0.1256 | -0.0223 | 0.2441 |

cor

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   | Dim.1 | Dim.2 | Dim.3 | Dim.4 | Dim.5 |
| S | 0.9246 | 0.0684 | -0.2959 | -0.13 | -0.143 |
| EPT | 0.9112 | 0.0983 | 0.211 | -0.0659 | 0.1983 |
| A | 0.5191 | 0.656 | -0.2238 | 0.4925 | -0.0386 |
| X.EPT | 0.4265 | -0.7963 | 0.0917 | 0.3622 | 0.1789 |
| BI | 0.9057 | -0.0192 | -0.1389 | -0.2042 | 0.2448 |
| BMWP | 0.9709 | 0.1201 | -0.1265 | -0.0727 | -0.1144 |
| ASPT | 0.6478 | 0.1764 | 0.7126 | 0.0248 | -0.1689 |
| DOMN | -0.4343 | 0.8453 | 0.1256 | -0.0223 | 0.2441 |

cos2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   | Dim.1 | Dim.2 | Dim.3 | Dim.4 | Dim.5 |
| S | 0.8548 | 0.0047 | 0.0876 | 0.0169 | 0.0204 |
| EPT | 0.8302 | 0.0097 | 0.0445 | 0.0043 | 0.0393 |
| A | 0.2695 | 0.4303 | 0.0501 | 0.2425 | 0.0015 |
| X.EPT | 0.1819 | 0.6341 | 0.0084 | 0.1312 | 0.032 |
| BI | 0.8203 | 4e-04 | 0.0193 | 0.0417 | 0.0599 |
| BMWP | 0.9427 | 0.0144 | 0.016 | 0.0053 | 0.0131 |
| ASPT | 0.4197 | 0.0311 | 0.5078 | 6e-04 | 0.0285 |
| DOMN | 0.1886 | 0.7144 | 0.0158 | 5e-04 | 0.0596 |

contrib

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   | Dim.1 | Dim.2 | Dim.3 | Dim.4 | Dim.5 |
| S | 18.9639 | 0.254 | 11.6856 | 3.8165 | 8.033 |
| EPT | 18.4185 | 0.525 | 5.94 | 0.9809 | 15.4554 |
| A | 5.9784 | 23.398 | 6.6844 | 54.7325 | 0.5871 |
| X.EPT | 4.0361 | 34.4782 | 1.121 | 29.6116 | 12.5863 |
| BI | 18.1973 | 0.0201 | 2.573 | 9.4146 | 23.5568 |
| BMWP | 20.9125 | 0.784 | 2.1369 | 1.1933 | 5.1448 |
| ASPT | 9.3098 | 1.6918 | 67.7553 | 0.1389 | 11.2088 |
| DOMN | 4.1835 | 38.8488 | 2.1038 | 0.1118 | 23.4279 |

ind

coord

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   | Dim.1 | Dim.2 | Dim.3 | Dim.4 | Dim.5 |
| GK1\_17 | -3.8709 | 0.1082 | -0.8562 | 0.0512 | 0.158 |
| GK1\_18 | -3.242 | 0.3997 | 1.8978 | -0.0503 | -0.3508 |
| GK1\_19\_6 | -2.4939 | -0.4872 | -0.0592 | -0.1922 | -0.162 |
| GK1\_19\_10 | -0.8475 | -0.129 | -0.615 | -0.5123 | -0.7751 |
| GK1\_20 | -0.7123 | -3.5289 | -0.1951 | 1.5391 | 0.4594 |
| GK1\_21 | -2.0421 | -0.3702 | -0.8563 | -0.3188 | -0.7477 |
| GK2\_17 | -0.8959 | 1.7305 | 1.0748 | 0.9169 | -0.3466 |
| GK2\_18 | -1.0393 | 0.4986 | -0.7525 | -0.0673 | 0.2405 |
| GK2\_19\_6 | 0.3673 | 1.8791 | -0.9702 | 1.0475 | 0.7957 |
| GK2\_19\_10 | 1.9138 | 1.1453 | -0.5265 | -0.8121 | 0.2693 |
| GK2\_20 | 1.4398 | -0.4072 | 1.3875 | -0.1799 | 0.0791 |
| GK2\_21 | 2.1092 | 1.3682 | -0.9017 | 0.5732 | -0.3482 |
| GK3\_17 | 2.159 | -1.1926 | 0.4371 | -0.142 | 0.2884 |
| GK3\_18 | -0.9673 | 0.4856 | 0.9269 | -0.3432 | 0.4472 |
| GK3\_19\_6 | 1.169 | -0.6299 | 0.5762 | -0.9205 | 0.91 |
| GK3\_19\_10 | 3.4644 | -2.3032 | -0.2172 | -0.077 | -0.8125 |
| GK3\_20 | -0.0962 | -0.1716 | -0.8202 | -1.0028 | 0.2982 |
| GK3\_21 | 3.5848 | 1.6044 | 0.4697 | 0.4907 | -0.4029 |

cos2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   | Dim.1 | Dim.2 | Dim.3 | Dim.4 | Dim.5 |
| GK1\_17 | 0.9359 | 7e-04 | 0.0458 | 2e-04 | 0.0016 |
| GK1\_18 | 0.7265 | 0.011 | 0.249 | 2e-04 | 0.0085 |
| GK1\_19\_6 | 0.9151 | 0.0349 | 5e-04 | 0.0054 | 0.0039 |
| GK1\_19\_10 | 0.3613 | 0.0084 | 0.1903 | 0.1321 | 0.3023 |
| GK1\_20 | 0.0322 | 0.7893 | 0.0024 | 0.1501 | 0.0134 |
| GK1\_21 | 0.7257 | 0.0238 | 0.1276 | 0.0177 | 0.0973 |
| GK2\_17 | 0.1353 | 0.5048 | 0.1947 | 0.1417 | 0.0203 |
| GK2\_18 | 0.4472 | 0.1029 | 0.2345 | 0.0019 | 0.0239 |
| GK2\_19\_6 | 0.0205 | 0.5375 | 0.1433 | 0.167 | 0.0964 |
| GK2\_19\_10 | 0.5666 | 0.2029 | 0.0429 | 0.102 | 0.0112 |
| GK2\_20 | 0.4441 | 0.0355 | 0.4124 | 0.0069 | 0.0013 |
| GK2\_21 | 0.5677 | 0.2389 | 0.1038 | 0.0419 | 0.0155 |
| GK3\_17 | 0.7209 | 0.2199 | 0.0295 | 0.0031 | 0.0129 |
| GK3\_18 | 0.3869 | 0.0975 | 0.3553 | 0.0487 | 0.0827 |
| GK3\_19\_6 | 0.3512 | 0.102 | 0.0853 | 0.2177 | 0.2128 |
| GK3\_19\_10 | 0.6587 | 0.2911 | 0.0026 | 3e-04 | 0.0362 |
| GK3\_20 | 0.0041 | 0.0132 | 0.3009 | 0.4498 | 0.0398 |
| GK3\_21 | 0.7984 | 0.1599 | 0.0137 | 0.015 | 0.0101 |

contrib

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   | Dim.1 | Dim.2 | Dim.3 | Dim.4 | Dim.5 |
| GK1\_17 | 18.467 | 0.0354 | 5.4349 | 0.0328 | 0.5452 |
| GK1\_18 | 12.9542 | 0.4827 | 26.7013 | 0.0317 | 2.6873 |
| GK1\_19\_6 | 7.6656 | 0.7171 | 0.026 | 0.4631 | 0.5728 |
| GK1\_19\_10 | 0.8851 | 0.0503 | 2.8038 | 3.2912 | 13.1206 |
| GK1\_20 | 0.6252 | 37.62 | 0.2823 | 29.7003 | 4.6087 |
| GK1\_21 | 5.1397 | 0.414 | 5.436 | 1.2744 | 12.21 |
| GK2\_17 | 0.9892 | 9.0468 | 8.564 | 10.5409 | 2.6241 |
| GK2\_18 | 1.3312 | 0.751 | 4.1983 | 0.0568 | 1.2628 |
| GK2\_19\_6 | 0.1663 | 10.6667 | 6.9786 | 13.7582 | 13.8252 |
| GK2\_19\_10 | 4.5139 | 3.9628 | 2.0548 | 8.2694 | 1.5833 |
| GK2\_20 | 2.5548 | 0.5009 | 14.2726 | 0.4059 | 0.1367 |
| GK2\_21 | 5.4829 | 5.6553 | 6.0277 | 4.1192 | 2.6479 |
| GK3\_17 | 5.7451 | 4.2963 | 1.4164 | 0.2527 | 1.8169 |
| GK3\_18 | 1.1533 | 0.7124 | 6.3696 | 1.4766 | 4.3682 |
| GK3\_19\_6 | 1.6843 | 1.1988 | 2.4612 | 10.6245 | 18.0859 |
| GK3\_19\_10 | 14.7926 | 16.0247 | 0.3497 | 0.0744 | 14.4168 |
| GK3\_20 | 0.0114 | 0.0889 | 4.9872 | 12.6094 | 1.9424 |
| GK3\_21 | 15.8382 | 7.7761 | 1.6358 | 3.0185 | 3.5451 |

dist

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 4.001272 | 3.803614 | 2.607111 | 1.409809 | 3.971997 | 2.397161 | 2.435715 | 1.554073 | 2.56314 | 2.542536 | 2.160531 | 2.79923 | 2.542848 | 1.555164 | 1.972711 | 4.268692 | 1.495216 | 4.011907 |

svd

vs

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 2.12312 | 1.356114 | 0.8656765 | 0.665655 | 0.5043807 | 0.3697279 | 0.2595999 | 0.04830155 |

U

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| -1.8232 | 0.0798 | -0.9891 | 0.0768 | 0.3133 |
| -1.527 | 0.2948 | 2.1923 | -0.0755 | -0.6955 |
| -1.1747 | -0.3593 | -0.0683 | -0.2887 | -0.3211 |
| -0.3992 | -0.0951 | -0.7104 | -0.7697 | -1.5368 |
| -0.3355 | -2.6022 | -0.2254 | 2.3122 | 0.9108 |
| -0.9618 | -0.273 | -0.9892 | -0.4789 | -1.4825 |
| -0.422 | 1.2761 | 1.2416 | 1.3774 | -0.6873 |
| -0.4895 | 0.3677 | -0.8693 | -0.1011 | 0.4768 |
| 0.173 | 1.3856 | -1.1208 | 1.5737 | 1.5775 |
| 0.9014 | 0.8446 | -0.6082 | -1.22 | 0.5338 |
| 0.6781 | -0.3003 | 1.6028 | -0.2703 | 0.1569 |
| 0.9934 | 1.0089 | -1.0416 | 0.8611 | -0.6904 |
| 1.0169 | -0.8794 | 0.5049 | -0.2133 | 0.5719 |
| -0.4556 | 0.3581 | 1.0708 | -0.5155 | 0.8867 |
| 0.5506 | -0.4645 | 0.6656 | -1.3829 | 1.8043 |
| 1.6318 | -1.6984 | -0.2509 | -0.1157 | -1.6109 |
| -0.0453 | -0.1265 | -0.9475 | -1.5066 | 0.5913 |
| 1.6885 | 1.1831 | 0.5426 | 0.7371 | -0.7988 |

V

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0.4355 | 0.0504 | -0.3418 | -0.1954 | -0.2834 |
| 0.4292 | 0.0725 | 0.2437 | -0.099 | 0.3931 |
| 0.2445 | 0.4837 | -0.2585 | 0.7398 | -0.0766 |
| 0.2009 | -0.5872 | 0.1059 | 0.5442 | 0.3548 |
| 0.4266 | -0.0142 | -0.1604 | -0.3068 | 0.4854 |
| 0.4573 | 0.0885 | -0.1462 | -0.1092 | -0.2268 |
| 0.3051 | 0.1301 | 0.8231 | 0.0373 | -0.3348 |
| -0.2045 | 0.6233 | 0.145 | -0.0334 | 0.484 |

**Additional Data:**

> res.desc\_Bio\_St

Link between the variable and the continuous variables (R-square)

=================================================================================

|  |  |
| --- | --- |
| **$Dim.1** | **$Dim.2** |
|  | correlation  | p.value |  | correlation | p.value |
| BMWP  | 0.9709062 | 2.356113e-11 | DOMN | 0.84525001 | 1.005520e-05 |
| S  | 0.9245671 | 4.152349e-08 | A | 0.65597247 | 3.115382e-03 |
| EPT  | 0.9111746 | 1.470213e-07 | ASPT | 0.17638674 | 4.838393e-01 |
| BI  | 0.9056876 | 2.333099e-07 | BMWP | 0.12007682 | 6.350773e-01 |
| ASPT | 0.6478061 | 3.649166e-03 | EPT | 0.09826407 | 6.980823e-01 |
| A  | 0.5191205 | 2.726855e-02 | S | 0.06835015 | 7.875592e-01 |
| X.EPT  | 0.4265343 | 7.753476e-02 | BI | -0.01922411 | 9.396482e-01 |
| DOMN  | -0.4342533 | 7.175354e-02 | X.EPT | -0.79628501 | 7.694265e-05 |

> Cam4ia\_Bio\_St

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | S | EPT | A | X.EPT  | BI | BMWP | ASPT | DOMN |
| GK1\_17 | 0.1428571 | 0.0000000 | 0.12221338 | 0.000000000 | 0.00 | 0.02678571 | 0.0000000 | 0.9235019 |
| GK1\_18 | 0.0000000 | 0.1111111 | 0.00000000 | 0.006713440 | 0.00 | 0.00000000 | 0.7428571 | 0.9777727 |
| GK1\_19\_6 | 0.1904762 | 0.2222222 | 0.08996815 | 0.047284658 | 0.25 | 0.10714286 | 0.2971429 | 0.6502674 |
| GK1\_19\_10 | 0.5714286 | 0.2222222 | 0.22452229 | 0.018057126 | 0.50 | 0.43750000 | 0.4023810 | 0.5980486 |
| GK1\_20 | 0.3333333 | 0.2222222 | 0.10429936 | 1.000000000 | 0.50 | 0.22321429 | 0.3142857 | 0.2501858 |
| GK1\_21 | 0.4285714 | 0.1111111 | 0.15883758 | 0.003393786 | 0.25 | 0.27678571 | 0.2228571 | 0.6010239 |
| GK2\_17 | 0.3333333 | 0.4444444 | 0.68391720 | 0.016932358 | 0.25 | 0.32142857 | 0.7857143 | 1.0000000 |
| GK2\_18 | 0.4285714 | 0.2222222 | 0.43312102 | 0.042055365 | 0.75 | 0.30357143 | 0.3342857 | 0.7922151 |
| GK2\_19\_6 | 0.5238095 | 0.6666667 | 1.00000000 | 0.082217606 | 0.75 | 0.50000000 | 0.3342857 | 0.9645038 |
| GK2\_19\_10 | 0.9523810 | 0.7777778 | 0.46536624 | 0.090335566 | 1.00 | 0.82142857 | 0.5714286 | 0.8814133 |
| GK2\_20 | 0.5238095 | 0.6666667 | 0.28542994 | 0.342345644 | 1.00 | 0.55357143 | 0.9722689 | 0.5836653 |
| GK2\_21 | 0.9047619 | 0.5555556 | 0.94625796 | 0.145095188 | 1.00 | 0.80357143 | 0.6314286 | 0.7338541 |
| GK3\_17 | 0.7142857 | 0.8888889 | 0.27786624 | 0.491329850 | 1.00 | 0.66071429 | 0.7163265 | 0.4072573 |
| GK3\_18 | 0.3333333 | 0.5555556 | 0.18113057 | 0.097889235 | 0.50 | 0.28571429 | 0.6142857 | 0.9143827 |
| GK3\_19\_6 | 0.5714286 | 0.8888889 | 0.06687898 | 0.314298728 | 1.00 | 0.56250000 | 0.6142857 | 0.6521028 |
| GK3\_19\_10 | 1.0000000 | 0.8888889 | 0.29617834 | 0.618315684 | 1.00 | 0.92857143 | 0.7222222 | 0.0000000 |
| GK3\_20 | 0.6190476 | 0.3333333 | 0.16799363 | 0.094004117 | 1.00 | 0.46428571 | 0.3616541 | 0.6860205 |
| GK3\_21 | 0.9523810 | 1.0000000 | 0.94984076 | 0.194961035 | 1.00 | 1.00000000 | 1.0000000 | 0.7284895 |