**Appendix S2. UPGMA analysis**

**“Specimen-level” matrix:** 44 rows with 23 variables in each row have been analyzed.

**Table S2.1.** Distance matrix based on Euclidean coefficient for the 44 vouchered specimens.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **VB 1046048** | **VB 1046049** | **VB 1046050** | **VB 1046184** | **VB 1046185** | **VB 1046186** | **VB 1046308** | **VB 1046309** | **RG 1046126** | **RG 1046127** | **RG 1046128** | **RG 1046129** | **RG 1046130** | **RG 1046285** | **RG 1046286** | **RG 1046287** | **RG 1046288** | **RG 1046289** | **LA 1046131** | **LA 1046132** | **LA 1046133** | **LA 1046134** | **LA 1046135** | **LA 1046290** | **LA 1046291** | **LA 1046292** | **VL 1046136** | **VL 1046137** | **HV 1046138** | **HV 1046139** | **HV 1046140** | **HV 1046141** | **HV 1046142** | **HV 1046293** | **HV 1046294** | **HV 1046295** | **AZ 1046143** | **AZ 1046144** | **AZ 1046145** | **AZ 1046146** | **AZ 1046147** | **AZ 1046296** | **AZ1046297** | **AZ1046298** |
| **VB1046048** | 0 | 2.236 | 2.236 | 1 | 2.449 | 2 | 1.732 | 2 | 4.243 | 4.123 | 4.243 | 4.123 | 3.873 | 3.873 | 3 | 3.606 | 3.742 | 3.464 | 3 | 3 | 3.162 | 3 | 3.317 | 2.828 | 3.317 | 3 | 3 | 3 | 4.472 | 4.796 | 4 | 4.899 | 4.796 | 4.472 | 4.583 | 4.359 | 4 | 3.742 | 3.873 | 3.606 | 4.359 | 4.243 | 3.742 | 4 |
| **VB1046049** |  | 0 | 1.414 | 2.449 | 3 | 2.646 | 2.449 | 2.646 | 4.796 | 4.69 | 4.796 | 4.69 | 4.472 | 4.472 | 3.464 | 4.243 | 4.359 | 4.123 | 2.828 | 3.162 | 3.317 | 3.464 | 3.742 | 3 | 2.828 | 2.449 | 2.828 | 2.828 | 5.196 | 5.477 | 4.583 | 5.385 | 5.477 | 5 | 5.292 | 5.099 | 4.359 | 4.359 | 4.472 | 4.243 | 4.899 | 5 | 4.359 | 4.359 |
| **VB1046050** |  |  | 0 | 2 | 2.646 | 2.236 | 2 | 2.236 | 4.359 | 4.243 | 4.359 | 4.243 | 4 | 4 | 3.162 | 4 | 3.873 | 3.873 | 2.828 | 2.828 | 3 | 3.162 | 4 | 2.646 | 3.464 | 3.162 | 2.828 | 3.464 | 5 | 5.657 | 4.359 | 5.745 | 5.292 | 4.796 | 5.477 | 5.292 | 4.359 | 4.123 | 4.243 | 4.472 | 4.69 | 5.196 | 4.583 | 4.796 |
| **VB1046184** |  |  |  | 0 | 2.236 | 1.732 | 1.414 | 1.732 | 3.873 | 3.742 | 3.873 | 3.742 | 3.464 | 3.464 | 2.828 | 3.464 | 3.317 | 3.317 | 2.828 | 2.828 | 3 | 2.828 | 3.742 | 2.646 | 3.742 | 3.464 | 2.828 | 3.464 | 4.359 | 5.099 | 3.873 | 5.196 | 4.69 | 4.123 | 4.899 | 4.69 | 3.873 | 3.606 | 3.742 | 4 | 4.243 | 4.583 | 4.123 | 4.359 |
| **VB1046185** |  |  |  |  | 0 | 2 | 2.236 | 1.414 | 3.742 | 3.873 | 3.742 | 3.606 | 3.317 | 3.606 | 3 | 3.317 | 3.464 | 3.464 | 3 | 2.646 | 2.828 | 3 | 3.606 | 2.828 | 3.873 | 3.317 | 2.646 | 3.606 | 4.243 | 4.796 | 3.464 | 4.899 | 4.123 | 4 | 4.359 | 4.359 | 3.742 | 3.464 | 3.606 | 3.873 | 4.359 | 4.472 | 4 | 4.243 |
| **VB1046186** |  |  |  |  |  | 0 | 1.732 | 2 | 4.472 | 4.359 | 4.472 | 4.359 | 4.123 | 4.359 | 3.317 | 4.123 | 4 | 4 | 3 | 3 | 3.162 | 3.317 | 4.123 | 3.162 | 3.606 | 3.606 | 3 | 3.317 | 4.899 | 5.568 | 4.243 | 5.657 | 5.196 | 4.69 | 5.385 | 5.196 | 3.742 | 3.464 | 3.606 | 4.123 | 4.796 | 4.69 | 4.243 | 4.69 |
| **VB1046308** |  |  |  |  |  |  | 0 | 1.732 | 3.606 | 3.464 | 3.606 | 3.464 | 3.162 | 3.464 | 2.449 | 3.162 | 3 | 3 | 2.449 | 2.449 | 2.646 | 2.449 | 3.464 | 2.646 | 3.464 | 3.162 | 2.449 | 3.464 | 4.359 | 5.099 | 3.873 | 5.196 | 4.69 | 4.123 | 4.899 | 4.69 | 4.123 | 3.873 | 4 | 4 | 4 | 4.796 | 4.123 | 4.359 |
| **VB1046309** |  |  |  |  |  |  |  | 0 | 3.464 | 3.606 | 3.464 | 3.317 | 3 | 3.317 | 2.646 | 3 | 3.162 | 3.162 | 2.646 | 2.236 | 2.449 | 2.646 | 3.606 | 2.449 | 3.606 | 3.317 | 2.646 | 3.317 | 4 | 4.583 | 3.162 | 4.69 | 4.123 | 3.742 | 4.359 | 4.123 | 3.742 | 3.464 | 3.606 | 3.873 | 4.123 | 4.472 | 4 | 4.243 |
| **RG1046126** |  |  |  |  |  |  |  |  | 0 | 1 | 0 | 1 | 1.732 | 1.732 | 2.646 | 1.732 | 2 | 2 | 3.606 | 3 | 2.828 | 3 | 3.873 | 3.162 | 5 | 4.796 | 3.317 | 5 | 3.464 | 5 | 3.464 | 4.899 | 4.123 | 2.828 | 4.359 | 4.123 | 4.899 | 4.69 | 4.796 | 5 | 3.873 | 5.477 | 4.899 | 5.099 |
| **RG1046127** |  |  |  |  |  |  |  |  |  | 0 | 1 | 1.414 | 2 | 2 | 2.449 | 2 | 1.732 | 1.732 | 3.464 | 3.162 | 3 | 2.828 | 3.742 | 3.317 | 4.899 | 4.69 | 3.162 | 4.899 | 3.606 | 5.292 | 3.873 | 5.196 | 4.472 | 3 | 4.69 | 4.472 | 4.796 | 4.583 | 4.69 | 4.899 | 3.742 | 5.385 | 4.796 | 5 |
| **RG1046128** |  |  |  |  |  |  |  |  |  |  | 0 | 1 | 1.732 | 1.732 | 2.646 | 1.732 | 2 | 2 | 3.606 | 3 | 2.828 | 3 | 3.873 | 3.162 | 5 | 4.796 | 3.317 | 5 | 3.464 | 5 | 3.464 | 4.899 | 4.123 | 2.828 | 4.359 | 4.123 | 4.899 | 4.69 | 4.796 | 5 | 3.873 | 5.477 | 4.899 | 5.099 |
| **RG1046129** |  |  |  |  |  |  |  |  |  |  |  | 0 | 1.414 | 1.414 | 2.449 | 1.414 | 1.732 | 1.732 | 3.464 | 2.828 | 2.646 | 2.828 | 3.742 | 3 | 4.899 | 4.69 | 3.162 | 4.899 | 3.606 | 4.899 | 3.317 | 4.796 | 4 | 3 | 4.243 | 4 | 4.796 | 4.583 | 4.69 | 4.899 | 3.742 | 5.385 | 4.796 | 5 |
| **RG1046130** |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 1.414 | 2 | 1.414 | 1 | 1.732 | 3.464 | 2.828 | 3 | 2.828 | 4 | 3.317 | 5.099 | 4.69 | 3.162 | 5.099 | 3 | 4.243 | 2.646 | 4.359 | 3.162 | 2.236 | 4 | 3.742 | 4.359 | 4.123 | 4.243 | 4.472 | 3.162 | 5 | 4.359 | 4.583 |
| **RG1046285** |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 2.449 | 1.414 | 1.732 | 2.236 | 3.742 | 3.162 | 3 | 3.162 | 4 | 3 | 5.099 | 4.899 | 3.464 | 5.099 | 3 | 4.472 | 3 | 4.359 | 3.464 | 2.646 | 4 | 3.742 | 4.583 | 4.359 | 4.472 | 4.69 | 3.464 | 5.196 | 4.583 | 4.796 |
| **RG1046286** |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 2 | 1.732 | 1.732 | 2.449 | 2 | 2.236 | 2.449 | 3.162 | 3 | 3.742 | 3.742 | 2.449 | 4 | 3.317 | 4 | 2.646 | 4.359 | 3.742 | 3 | 4 | 3.742 | 3.873 | 3.606 | 3.742 | 3.742 | 3.162 | 4.359 | 3.606 | 3.873 |
| **RG1046287** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 1.732 | 1.732 | 3.464 | 2.828 | 2.646 | 2.828 | 3.162 | 3 | 4.472 | 4.243 | 3.162 | 4.472 | 2.646 | 3.742 | 2.646 | 3.606 | 3.162 | 2.646 | 3.162 | 2.828 | 4.359 | 4.123 | 4.243 | 4 | 3.162 | 4.583 | 3.873 | 4.123 |
| **RG1046288** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 1.414 | 3.317 | 3 | 3.162 | 2.646 | 3.873 | 3.464 | 5 | 4.583 | 3 | 5 | 3.162 | 4.583 | 3.162 | 4.69 | 3.606 | 2.449 | 4.359 | 4.123 | 4.243 | 4 | 4.123 | 4.359 | 3 | 4.899 | 4.243 | 4.472 |
| **RG1046289** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 3 | 2.646 | 2.828 | 2.236 | 3 | 3.162 | 4.359 | 3.873 | 2.646 | 4.359 | 3.742 | 4.583 | 3.464 | 4.69 | 4.123 | 3.162 | 4.123 | 3.873 | 4.472 | 4.243 | 4.359 | 4.123 | 3.317 | 4.69 | 4 | 4.243 |
| **LA1046131** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 2 | 2.236 | 2 | 3.162 | 2.236 | 2.449 | 2.828 | 2 | 2.828 | 5 | 5.292 | 4.123 | 5.385 | 5.099 | 4.359 | 5.099 | 5.099 | 4.123 | 4.123 | 4.472 | 4.243 | 4.243 | 5 | 4.359 | 4.359 |
| **LA1046132** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 1 | 2.449 | 3.162 | 2.236 | 3.162 | 3.464 | 2 | 3.464 | 4.359 | 4.69 | 3 | 5 | 4.472 | 3.873 | 4.472 | 4.243 | 4.123 | 3.873 | 4 | 4.243 | 4 | 4.796 | 4.123 | 4.359 |
| **LA1046133** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 2.646 | 3 | 2 | 3 | 3.606 | 2.236 | 3.317 | 4.243 | 4.796 | 3.162 | 4.899 | 4.583 | 4 | 4.359 | 4.123 | 4.243 | 4 | 4.123 | 4.359 | 4.123 | 4.899 | 4.243 | 4.472 |
| **LA1046134** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 2.828 | 2.236 | 3.464 | 3.162 | 2.449 | 3.464 | 4.583 | 5.099 | 4.123 | 5.196 | 4.69 | 4.123 | 4.69 | 4.69 | 4.123 | 4.123 | 4.472 | 4 | 3.742 | 4.583 | 4.123 | 4.123 |
| **LA1046135** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 3 | 2.828 | 2.449 | 2.828 | 2.828 | 4.583 | 4.472 | 4.359 | 4.359 | 4.69 | 4.796 | 3.464 | 3.742 | 4.583 | 4.359 | 4.69 | 3.464 | 4 | 4.123 | 3.317 | 3.317 |
| **LA1046290** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 3 | 3.317 | 2.646 | 3 | 4.69 | 5.196 | 4 | 5.099 | 4.796 | 4.472 | 4.583 | 4.583 | 4.472 | 4.243 | 4.583 | 4.359 | 4.359 | 5.099 | 4.472 | 4.69 |
| **LA1046291** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 2.449 | 3.162 | 1.414 | 5.745 | 5.477 | 5 | 5.385 | 6 | 5.745 | 5.099 | 5.099 | 4.796 | 4.796 | 5.099 | 4.243 | 5.292 | 5 | 4.359 | 4.359 |
| **LA1046292** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 2.828 | 2.449 | 5.568 | 5.292 | 5 | 5.196 | 5.477 | 5.385 | 4.69 | 4.899 | 4.796 | 4.796 | 5.099 | 4 | 4.899 | 4.796 | 4.123 | 3.873 |
| **VL1046136** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 3.162 | 4.583 | 5.292 | 3.873 | 5.196 | 4.69 | 3.873 | 4.69 | 4.69 | 3.873 | 3.873 | 4 | 4.243 | 4 | 4.796 | 4.123 | 3.873 |
| **VL1046137** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 5.568 | 5.477 | 5 | 5.196 | 5.831 | 5.568 | 4.899 | 4.899 | 4.359 | 4.359 | 4.69 | 4 | 5.292 | 4.583 | 4.123 | 4.123 |
| **HV1046138** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 3 | 2.449 | 2.828 | 2.236 | 2 | 3 | 2.646 | 4 | 3.742 | 3.873 | 4.123 | 3.317 | 4.243 | 3.742 | 4 |
| **HV1046139** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 2.646 | 1.732 | 2.449 | 3.873 | 2 | 2 | 4.583 | 4.359 | 4.69 | 3.742 | 4 | 3.873 | 3.317 | 3.606 |
| **HV1046140** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 3.162 | 2.236 | 2.449 | 3 | 2.646 | 3.742 | 3.464 | 3.606 | 4.123 | 3.606 | 4.243 | 3.742 | 4 |
| **HV1046141** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 2.646 | 3.742 | 1.732 | 1.732 | 4.472 | 4.472 | 4.796 | 3.873 | 4.123 | 4 | 3.464 | 3.464 |
| **HV1046142** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 2.646 | 2.449 | 2.828 | 4.123 | 3.873 | 4.243 | 4.243 | 3.464 | 4.359 | 3.873 | 3.873 |
| **HV1046293** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 3.873 | 3.606 | 3.742 | 3.742 | 3.873 | 4.583 | 3.317 | 4.69 | 4.243 | 4.243 |
| **HV1046294** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 1.414 | 4.583 | 4.359 | 4.69 | 3.742 | 4 | 3.873 | 3.317 | 3.317 |
| **HV1046295** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 4.583 | 4.359 | 4.472 | 3.742 | 4 | 3.873 | 3.317 | 3.606 |
| **AZ1046143** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 1.414 | 2.236 | 3.317 | 3.606 | 2.828 | 2.828 | 2.828 |
| **AZ1046144** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 1.732 | 3 | 3.317 | 2.828 | 2.449 | 3.162 |
| **AZ1046145** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 2.828 | 3.162 | 2.646 | 3 | 3.606 |
| **AZ1046146** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 2.828 | 1.732 | 1.732 | 2.646 |
| **AZ1046147** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 3.317 | 3 | 3.317 |
| **AZ1046296** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 2 | 2.449 |
| **AZ1046297** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 2 |
| **AZ1046298** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 |

[Cophenetic Correlation Coefficient (CP)](http://en.wikipedia.org/wiki/Cophenetic_correlation) = 0.817514191718578

**Fig. S2.1.** “Specimen-level” UPGMA dendrogram clustering the 44 vouchered specimens by morphological similarity according to 23 characters. Numbers at each node represent bootstrap values (over 100).

 **“Population-level” matrix:** 6 rows with 23 variables in each row have been analyzed.

**Table S2.2.** Distance matrix based on Euclidean coefficient for the 6 studied populations.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **VB** | **RG** | **LA** | **VL** | **HV** | **AZ** |
| **VB** | 0 | 3.606 | 2.828 | 2.646 | 5.000 | 4.359 |
| **RG** |  | 0 | 3.606 | 3.464 | 4.000 | 5.099 |
| **LA** |  |  | 0 | 2.236 | 5.568 | 5.000 |
| **VL** |  |  |  | 0 | 5.292 | 4.690 |
| **HV** |  |  |  |  | 0 | 4.000 |
| **AZ** |  |  |  |  |  | 0 |

[Cophenetic Correlation Coefficient (CP)](http://en.wikipedia.org/wiki/Cophenetic_correlation) = 0.935819872263508

****

**Fig. S2.2.** “Population-level” UPGMA dendrogram clustering the 6 studied populations by morphological similarity according to 23 characters. Numbers at each node represent bootstrap values (over 100).

**Appendix S3. Discriminant Analysis.**

Classification variable: Species

Independent variables: C1, C2, C3, C4, P6, P7, P8, P9, E10, E11, E12, E14, L16, L17

Number of complete cases: 44 Number of groups: 3

|  |  |  |  |
| --- | --- | --- | --- |
| *Discriminant Function* | *Eigenvalue* | *Relative Percentage* | *Canonical Correlation* |
| 1 | 16.0719 | 83.27 | 0.97027 |
| 2 | 3.22866 | 16.73 | 0.87380 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Functions Derived* | *Wilks Lambda* | *Chi-Square* | *DF* | *P-Value* |
| 1 | 0.0138521 | 164.7539 | 12 | 0.0000 |
| 2 | 0.236481 | 55.5126 | 5 | 0.0000 |

**Stepwise regression**

Method: backward selection F-to-enter: 4.0 F-to-remove: 4.0

 **Step 0:** 15 variables in the model.

 Wilk's lambda = 0.00824853 Approximate F = 18.0191 with P-value = 0.0000

 **Step 1:** Removing variable E14 with F-to-remove = 0.262535 14 variables in the model.

 Wilk's lambda = 0.00840894 Approximate F = 19.8102 with P-value = 0.0000

 **Step 2:** Removing variable L16 with F-to-remove = 0.300675 13 variables in the model.

 Wilk's lambda = 0.00858953 Approximate F = 21.8389 with P-value = 0.0000

 **Step 3:** Removing variable P6 with F-to-remove = 0.527538 12 variables in the model.

 Wilk's lambda = 0.00890204 Approximate F = 23.9969 with P-value = 0.0000

 **Step 4:** Removing variable E10 with F-to-remove = 0.683417 11 variables in the model.

 Wilk's lambda = 0.00930762 Approximate F = 26.393 with P-value = 0.0000

 **Step 5:** Removing variable L17 with F-to-remove = 1.01133 10 variables in the model.

 Wilk's lambda = 0.00991492 Approximate F = 28.937 with P-value = 0.0000

 **Step 6:** Removing variable C4 with F-to-remove = 0.83642 9 variables in the model.

 Wilk's lambda = 0.0104332 Approximate F = 32.2307 with P-value = 0.0000

 **Step 7:** Removing variable C2 with F-to-remove = 3.46087 8 variables in the model.

 Wilk's lambda = 0.0126216 Approximate F = 33.5796 with P-value = 0.0000

 **Step 8:** Removing variable P8 with F-to-remove = 1.64205 7 variables in the model.

 Wilk's lambda = 0.0138407 Approximate F = 37.5002 with P-value = 0.0000

 **Step 9:** Removing variable C1 with F-to-remove = 1.66483 6 variables in the model.

 Wilk's lambda = 0.0151574 Approximate F = 42.7347 with P-value = 0.0000

 **Step 10:** Removing variable P7 with F-to-remove = 3.42745 5 variables in the model.

 Wilk's lambda = 0.0180436 Approximate F = 47.6896 with P-value = 0.0000

 **Step 11:** Adding variable L16 with F-to-enter = 5.44672 6 variables in the model.

 Wilk's lambda = 0.0138521 Approximate F = 44.9793 with P-value = 0.0000

 Final model selected.

**Discriminant Function Coefficients for Species**

|  |  |  |
| --- | --- | --- |
|  | 1 | 2 |
| C3 | 0.079865 | 0.751644 |
| P9 | -1.30521 | -0.387094 |
| E11 | -0.304221 | -0.53831 |
| E12 | -0.811566 | 0.380917 |
| E13 | 0.673566 | 0.407859 |
| L16 | 0.576732 | -0.00547559 |

Unstandardized Coefficients

|  |  |  |
| --- | --- | --- |
|  | 1 | 2 |
| C3 | 0.178817 | 1.68293 |
| P9 | -2.97815 | -0.883249 |
| E11 | -1.06315 | -1.88122 |
| E12 | -1.73563 | 0.814637 |
| E13 | 1.70104 | 1.03002 |
| L16 | 1.29555 | -0.0123002 |
| CONSTANT | 3.60897 | -1.03216 |

First standardized discriminating function is

0.079865\*C3 - 1.30521\*P9 - 0.304221\*E11 - 0.811566\*E12 + 0.673566\*E13 + 0.576732\*L16

**Classification Table**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Actual* | *Group* |  | *Predicted Species* |  |
| *Species* | *Size* | *A* | *B* | *C* |
| A | 28 | 28 (100.00%) | 0 (0.00%) | 0 (0.00%) |
| B | 8 | 0 (0.00%) | 8 (100.00%) | 0 (0.00%) |
| C | 8 | 0 (0.00%) | 0 (0.00%) | 8 (100.00%) |

Percent of cases correctly classified: 100.00%

|  |  |
| --- | --- |
| *Group* | *Prior Probability* |
| 1 | 0.3333 |
| 2 | 0.3333 |
| 3 | 0.3333 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | *Actual* | *Highest* | *Highest* | *Squared* |  | *2nd Highest* | *2nd Highest* | *Squared* |  |
| *Row* | *Group* | *Group* | *Value* | *Distance* | *Prob.* | *Group* | *Value* | *Distance* | *Prob.* |

\* = incorrectly classified.

**Group Centroids for Species**

|  |  |  |
| --- | --- | --- |
| Group | 1 | 2 |
| A | 2.88755 | -0.210143 |
| B | -4.02467 | 3.20693 |
| C | -6.08176 | -2.47143 |

**Summary Statistics by Group**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Species | A | B | C | TOTAL |
| COUNTS | 28 | 8 | 8 | 44 |
| MEANS |  |  |  |  |
| C3 | 0.392857 | 1.75 | 0.0 | 0.568182 |
| P9 | 0.5 | 2.0 | 1.875 | 1.02273 |
| E11 | 0.0714286 | 0.0 | 0.75 | 0.181818 |
| E12 | 0.464286 | 2.5 | 2.0 | 1.11364 |
| E13 | 0.357143 | 1.0 | 0.0 | 0.409091 |
| L16 | 0.75 | 0.5 | 0.125 | 0.590909 |
| STD. DEVIATIONS |  |  |  |  |
| C3 | 0.497347 | 0.46291 | 0.0 | 0.728098 |
| P9 | 0.509175 | 0.0 | 0.353553 | 0.820908 |
| E11 | 0.262265 | 0.0 | 0.46291 | 0.390154 |
| E12 | 0.507875 | 0.534522 | 0.0 | 0.993371 |
| E13 | 0.48795 | 0.0 | 0.0 | 0.49735 |
| L16 | 0.440959 | 0.534522 | 0.353553 | 0.49735 |

**Pooled Within-Group Statistics for Species**

Within-Group Covariance Matrix

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | C3 | P9 | E11 | E12 | E13 | L16 |
| C3 | 0.199477 | 0.0609756 | 0.00522648 | -0.00261324 | 0.0505226 | 0.0182927 |
| P9 | 0.0609756 | 0.192073 | -0.0304878 | -0.0365854 | 0.121951 | 0.0640244 |
| E11 | 0.00522648 | -0.0304878 | 0.0818815 | 0.0261324 | -0.0174216 | 0.0182927 |
| E12 | -0.00261324 | -0.0365854 | 0.0261324 | 0.218641 | 0.0087108 | 0.054878 |
| E13 | 0.0505226 | 0.121951 | -0.0174216 | 0.0087108 | 0.156794 | 0.0609756 |
| L16 | 0.0182927 | 0.0640244 | 0.0182927 | 0.054878 | 0.0609756 | 0.198171 |

Within-Group Correlation Matrix

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | C3 | P9 | E11 | E12 | E13 | L16 |
| C3 | 1.0 | 0.311513 | 0.0408949 | -0.0125132 | 0.285676 | 0.0920049 |
| P9 | 0.311513 | 1.0 | -0.243108 | -0.178529 | 0.702728 | 0.328165 |
| E11 | 0.0408949 | -0.243108 | 1.0 | 0.195308 | -0.153755 | 0.143603 |
| E12 | -0.0125132 | -0.178529 | 0.195308 | 1.0 | 0.0470465 | 0.263641 |
| E13 | 0.285676 | 0.702728 | -0.153755 | 0.0470465 | 1.0 | 0.345916 |
| L16 | 0.0920049 | 0.328165 | 0.143603 | 0.263641 | 0.345916 | 1.0 |

**Classification Function Coefficients for Species**

|  |  |  |  |
| --- | --- | --- | --- |
|  | *A* | *B* | *C* |
| C3 | 1.29083 | 5.80548 | -4.11862 |
| P9 | 2.42191 | 19.9895 | 31.1312 |
| E11 | 0.245135 | 1.16564 | 14.0349 |
| E12 | 1.88514 | 16.6659 | 15.6105 |
| E13 | -1.14581 | -9.38416 | -18.7321 |
| L16 | 2.69089 | -6.30628 | -8.9015 |
| CONSTANT | -3.2085 | -40.7316 | -50.6013 |

Function used for the first level of Species (A) is

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Population** | **Sex** | **3** | **9** | **11** | **12** | **13** | **16** | A | B | C | Predicted species |
| VB | ♂ | **1** | **0** | **0** | **1** | **0** | **1** | 2.65836 | -24.5665 | -48.01092 | A |
| VB | ♂ | **0** | **0** | **0** | **1** | **0** | **1** | 1.36753 | -30.37198 | -43.8923 | A |
| VB | ♂ | **0** | **0** | **0** | **1** | **0** | **1** | 1.36753 | -30.37198 | -43.8923 | A |
| VB | ♂ | **1** | **0** | **?** | **1** | **0** | **1** | 2.65836 | -24.5665 | -48.01092 | A |
| VB | ♂ | **0** | **0** | **0** | **1** | **0** | **1** | 1.36753 | -30.37198 | -43.8923 | A |
| VB | **♀** | **0** | **0** | **0** | **1** | **0** | **1** | 1.36753 | -30.37198 | -43.8923 | A |
| VB | **♀** | **0** | **0** | **0** | **1** | **0** | **1** | 1.36753 | -30.37198 | -43.8923 | A |
| VB | **♀** | **1** | **0** | **0** | **1** | **0** | **1** | 2.65836 | -24.5665 | -48.01092 | A |
| VB | **♀** | **0** | **0** | **0** | **1** | **0** | **1** | 1.36753 | -30.37198 | -43.8923 | A |
| VB | **♀** | **0** | **0** | **0** | **1** | **0** | **1** | 1.36753 | -30.37198 | -43.8923 | A |
| RG | ♂ | **0** | **0** | **0** | **1** | **1** | **1** | 0.22172 | -39.75614 | -62.6244 | A |
| RG | ♂ | **0** | **0** | **0** | **1** | **1** | **1** | 0.22172 | -39.75614 | -62.6244 | A |
| RG | ♂ | **0** | **1** | **0** | **1** | **1** | **1** | 2.64363 | -19.76664 | -31.4932 | A |
| RG | ♂ | **1** | **1** | **0** | **1** | **1** | **1** | 3.93446 | -13.96116 | -35.61182 | A |
| RG | ♂ | **1** | **1** | **0** | **1** | **1** | **1** | 3.93446 | -13.96116 | -35.61182 | A |
| RG | **♀** | **1** | **1** | **0** | **1** | **1** | **1** | 3.93446 | -13.96116 | -35.61182 | A |
| RG | **♀** | **1** | **0** | **0** | **1** | **1** | **1** | 1.51255 | -33.95066 | -66.74302 | A |
| RG | **♀** | **1** | **1** | **0** | **1** | **1** | **1** | 3.93446 | -13.96116 | -35.61182 | A |
| RG | **♀** | **1** | **1** | **0** | **1** | **1** | **1** | 3.93446 | -13.96116 | -35.61182 | A |
| RG | **♀** | **1** | **0** | **1** | **1** | **1** | **1** | 1.757685 | -32.75802 | -52.70812 | A |
| LA | ♂ | **0** | **1** | **0** | **1** | **0** | **1** | 3.78944 | -10.38248 | -12.7611 | A |
| LA | ♂ | **0** | **1** | **0** | **1** | **0** | **0** | 1.09855 | -4.0762 | -3.8596 | A |
| LA | ♂ | **0** | **0** | **0** | **1** | **0** | **0** | -1.32336 | -24.0657 | -34.9908 | A |
| LA | ♂ | **0** | **0** | **0** | **1** | **0** | **1** | 1.36753 | -30.37198 | -43.8923 | A |
| LA | ♂ | **0** | **0** | **0** | **1** | **0** | **1** | 1.36753 | -30.37198 | -43.8923 | A |
| LA | **♀** | **0** | **1** | **0** | **1** | **0** | **?** | 1.09855 | -4.0762 | -3.8596 | A |
| LA | **♀** | **1** | **1** | **0** | **1** | **0** | **0** | 2.38938 | 1.72928 | -7.97822 | A |
| LA | **♀** | **0** | **1** | **0** | **1** | **0** | **1** | 3.78944 | -10.38248 | -12.7611 | A |
| LA | **♀** | **0** | **1** | **0** | **1** | **0** | **1** | 3.78944 | -10.38248 | -12.7611 | A |
| LA | **♀** | **0** | **0** | **0** | **1** | **0** | **0** | -1.32336 | -24.0657 | -34.9908 | A |
| HV | ♂ | **1** | **2** | **0** | **2** | **1** | **0** | 5.55062 | 29.00052 | 20.03138 | B |
| HV | ♂ | **2** | **2** | **0** | **3** | **1** | **0** | 8.72659 | 51.4719 | 31.52326 | B |
| HV | ♂ | **2** | **2** | **0** | **3** | **1** | **1** | 11.41748 | 45.16562 | 22.62176 | B |
| HV | ♂ | **2** | **2** | **0** | **3** | **1** | **0** | 8.72659 | 51.4719 | 31.52326 | B |
| HV | ♂ | **2** | **2** | **0** | **2** | **1** | **0** | 6.84145 | 34.806 | 15.91276 | B |
| HV | **♀** | **2** | **2** | **0** | **3** | **1** | **1** | 11.41748 | 45.16562 | 22.62176 | B |
| HV | **♀** | **1** | **1** | **0** | **3** | **1** | **1** | 7.70474 | 19.37064 | -4.39082 | B |
| HV | **♀** | **2** | **2** | **0** | **3** | **1** | **1** | 11.41748 | 45.16562 | 22.62176 | B |
| HV | **♀** | **2** | **2** | **0** | **3** | **1** | **1** | 11.41748 | 45.16562 | 22.62176 | B |
| HV | **♀** | **1** | **2** | **0** | **3** | **1** | **1** | 10.12665 | 39.36014 | 26.74038 | B |
| AZ | **♀** | **0** | **1** | **1** | **2** | **0** | **0** | 3.228825 | 13.75534 | 25.7858 | C |
| AZ | **♀** | **0** | **2** | **1** | **2** | **0** | **0** | 5.650735 | 33.74484 | 56.917 | C |
| AZ | **♀** | **0** | **2** | **1** | **2** | **0** | **0** | 5.650735 | 33.74484 | 56.917 | C |

-3.2085 + 1.29083\* C3 + 2.42191\* P9 + 0.245135\* E11 + 1.88514\* E12 - 1.14581\* E13 + 2.69089\* L16

Function used for the second level of Species (B) is

-40.7316 + 5.80548\* C3 + 19.9895\* P9 + 1.16564\* E11 + 16.6659\* E12 - 9.38416\* E13 - 6.30628\* L16

Function used for the third level of Species (C) is

-50.6013 - 4.11862\* C3 + 31.1312\* P9 + 14.0349\* E11 + 15.6105\* E12 - 18.7321\* E131 - 8.9015\* L16

**Table S3.1.** Results of applying the Classification Functions obtained by the Discriminant Analysis to the 43 additional specimens coded in Table S5. In grey, characters recovered as significant predictor variables. In red, values of the predicted group for each specimen.

**Appendix S4. AMOVA Analysis**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Source of variation** | **d.f.** | **Sum of squares** | **Variance components** | **Percentage of variation** |
| Among groups | 2 | 244.219 | 12.10987 Va | **66.29** |
| Among populations within groups | 7 | 130.943 | 5.08525 Vb | **27.84** |
| Within populations | 24 | 25.750 | 1.07292 Vc | **5.87** |

In bold, statistically significative.