Supplementary Information for “New records of theropods from New Jersey inform faunal interchange in Maastrichtian North America”

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This file includes:

1. Note on primary datasets.
2. Summary and loadings for the PCA of the Mt. Laurel tyrannosauroid tooth in a large matrix of theropod dentition.
3. Summary and loadings for the PCA of the Mt. Laurel dromaeosaurid tooth in a large matrix of theropod dentition.
4. Summary and loadings for the PCA of the Mt. Laurel dromaeosaurid tooth in a large matrix of North American paravian teeth.
5. Loadings and confusion matrix for the discriminant analysis of the Mt. Laurel dromaeosaurid tooth in a large matrix of North American paravian teeth.

Note on primary dataset number 1.

The modified dataset of Smith et al. (2005) (after Brownstein (2018a)) presented includes only the data for the Mt. Laurel dromaeosaurid tooth only. The analysis of the modified Smith et al. (2005) dataset with the Mt. Laurel tyrannosauroid tooth included used the measurements presented in Table 1 of the main text. Both primary dataset files are in .dat format, allowing them to be inserted into P.A.S.T by easily dragging them into the P.A.S.T interface.

Table 1. Loadings for the discriminant analysis of the Mt. Laurel dromaeosaurid tooth in a large matrix of theropod dentition.

|  | Axis 1 | Axis 2 | Axis 3 | Axis 4 | Axis 5 | Axis 6 | Axis 7 | Axis 8 | Axis 9 | Axis 10 | Axis 11 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E | 1.9732 | 2.1737 | -1.3971 | -0.96261 | 0.20518 | 2.7156 | -1.1334 | -1.9195 | -0.15326 | 0.23916 | 0.88876 |
| F | 1.4298 | 1.5523 | -1.153 | -0.56975 | 0.2744 | 2.0435 | -0.21883 | -2.3849 | -0.84038 | 0.15225 | 0.56897 |
| G | 3.8153 | 4.0056 | -2.6636 | -0.41396 | 0.19992 | 6.1943 | -3.5534 | -7.2749 | -1.3104 | 1.5251 | 2.4516 |
| H | 4.1232 | 4.3692 | -2.8791 | -0.69008 | 0.46843 | 6.4525 | -3.6736 | -7.132 | -1.8898 | 1.8462 | 5.0156 |
| I | 0.011076 | 0.0032784 | -0.020174 | 0.02615 | 0.01695 | -0.00029476 | 0.02662 | -0.029342 | -0.015934 | -0.007411 | 0.00042376 |
| J | 0.0030761 | 0.033027 | -0.016924 | 0.089193 | -0.021924 | 0.098936 | -0.055091 | -0.10818 | -0.010497 | 0.021251 | 0.055033 |
| K | 2.3717 | 1.1534 | 1.8955 | 0.81517 | -2.3595 | 1.0415 | -1.1566 | -0.46939 | 0.06961 | -0.52512 | 0.48912 |
| O | -0.12387 | -0.24959 | 0.55837 | -0.068578 | 0.56717 | 0.38893 | 0.38654 | 0.98605 | -1.4815 | 0.027467 | -0.50365 |
| Q | -0.68989 | 0.36734 | 0.40179 | -0.10668 | 0.44528 | -0.55632 | -1.1643 | 0.34864 | -0.62633 | 1.1396 | -0.45561 |
| R | -0.35675 | 0.016748 | 0.54158 | -0.27528 | 0.66573 | -0.44125 | -0.89322 | 0.18551 | -0.76833 | -2.0585 | 0.16919 |
| S | -0.47566 | -0.3232 | 1.6327 | -0.83131 | 1.6648 | 0.018355 | 0.48067 | -0.41637 | 0.56807 | 0.33408 | -0.030372 |
| T | -0.82618 | 0.52601 | 0.47978 | -0.10547 | 0.30618 | -0.68849 | 0.37635 | 0.2923 | -0.2489 | -0.029175 | -0.21358 |

Table 2. Confusion matrix for the discriminant analysis of the Mt. Laurel dromaeosaurid tooth in a large matrix of theropod dentition.

|  | North Carolina Tooth | Mt. Laurel | Gorgosaurus | Daspletosaurus | Tyrannosaurus | Troodon | Saurornithoides | Bambiraptor | Deinonychus |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| North Carolina Tooth | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mt. Laurel | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Gorgosaurus | 0 | 0 | 10 | 3 | 1 | 0 | 0 | 0 | 0 |
| Daspletosaurus | 0 | 0 | 3 | 4 | 0 | 0 | 0 | 0 | 0 |
| Tyrannosaurus | 0 | 0 | 2 | 0 | 112 | 0 | 0 | 0 | 0 |
| Troodon | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 |
| Saurornithoides | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 |
| Bambiraptor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 |
| Deinonychus | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |

Table 3. Summary for the PCA of the Mt. Laurel dromaeosaurid tooth in a large matrix of North American paravian teeth.

| PC | Eigenvalue | % variance |
| --- | --- | --- |
| **1** | 15.7735 | 73.121 |
| **2** | 3.88624 | 18.015 |
| **3** | 1.33538 | 6.1904 |
| **4** | 0.4057 | 1.8807 |
| **5** | 0.170992 | 0.79267 |

Table 4. Loadings for the PCA of the Mt. Laurel dromaeosaurid tooth in a large matrix of North American paravian teeth.

|  | PC 1 | PC 2 | PC 3 | PC 4 | PC 5 |
| --- | --- | --- | --- | --- | --- |
| CBL | 0.36311 | 0.052943 | 0.022109 | 0.81836 | -0.44176 |
| CH | 0.81685 | 0.39839 | 0.1497 | -0.38935 | 0.0053977 |
| CBW | 0.18577 | -0.0090199 | 0.022263 | 0.4015 | 0.8965 |
| MDM | -0.27315 | 0.83228 | -0.47123 | 0.097825 | 0.032865 |
| DDM | -0.30295 | 0.38172 | 0.86865 | 0.089049 | 0.0051655 |

Table 5. Loadings for the discriminant analysis of the Mt. Laurel dromaeosaurid tooth in a large matrix of North American paravian teeth.

|  | Axis 1 | Axis 2 | Axis 3 | Axis 4 | Axis 5 |
| --- | --- | --- | --- | --- | --- |
| CBL | -0.33692 | 0.84118 | -0.010799 | 0.78881 | 0.085099 |
| CH | -0.55682 | 2.0018 | 0.60065 | 1.1881 | -0.98783 |
| CH | -0.20735 | 0.56001 | -0.12018 | 0.00987 | 0.021182 |
| MDM | 0.65866 | -0.061665 | 0.99995 | -0.41246 | 0.80876 |
| DDM | 0.7894 | -0.19168 | -0.32626 | -0.17373 | 0.041271 |

Table 6. Confusion matrix for the discriminant analysis of the Mt. Laurel dromaeosaurid tooth in a large matrix of North American paravian teeth.

|  | Mt. Laurel | Tar Heel |  | s | a | d | z | t | Pectinodon bakkeri | Aquilan cf. Richardoestesia gilmorei | Total |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Mt. Laurel | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Tar Heel | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
|  | 0 | 0 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 34 |
| s | 10 | 1 | 90 | 183 | 18 | 16 | 66 | 1 | 8 | 37 | 430 |
| a | 1 | 0 | 2 | 1 | 15 | 4 | 4 | 2 | 2 | 0 | 31 |
| d | 2 | 3 | 11 | 5 | 13 | 80 | 12 | 3 | 2 | 0 | 131 |
| z | 0 | 0 | 9 | 0 | 2 | 3 | 20 | 0 | 1 | 0 | 35 |
| t | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 66 | 14 | 0 | 82 |
| Pectinodon bakkeri | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 43 | 0 | 45 |
| Aquilan cf. Richardoestesia gilmorei | 0 | 0 | 7 | 23 | 0 | 0 | 0 | 0 | 0 | 125 | 155 |
| Total | 14 | 5 | 155 | 212 | 50 | 103 | 102 | 72 | 70 | 162 | 945 |

Phylogenetic matrix

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