|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Taxon | Epoch | Locality | Element(s) | Source(s) |
| *Tupaia* sp. | Pliocene | Upper Siwaliks of India | Rib cage | Dutta (1975) |
| *Tupaia sivalicus* | Miocene | Middle Siwaliks of India | Skull frag., left maxillary frag., right m2 | Chopra and Vasishat (1979); Chopra et al., (1979); Luckett and Jacobs (1980) |
| Tupaiidae | Miocene | Siwaliks of Pakistan | Skull frag., left m1, lower molar talonid | Jacobs (1980) |
| *Tupaia miocenica* | Miocene | Li Mae Long, Thailand | Left M2 | Mein and Ginsburg (1997) |
| *Prodendrogale yunnanica\** | Miocene | Lufeng, China | 17 isolated teeth | Qiu (1986) |
| *Prodendrogale engesseri* | Miocene | Yuanmou, China | 2 m2 frags., m3 frag., p3 frag., p4 frag., 3 M2 frags., M1 frag., right P4, left P4, left M3, right p4, left M1, right M1/M2, left p4, right m2, right m1/m2talonid, right M1 | Ni and Qiu (2002); Ni and Qiu (2012) |
| *Tupaia storchi* | Miocene | Yuanmou, China | Right P4, right p4, left m3 | Ni and Qiu (2012) |
| Ptilocercidae gen. et. sp. nov? | Miocene | Yuanmou, China | Dentary with m1 and p4 frag., lower molar frag. | Ni and Qiu (2002) |
| *Ptilocercus kylin\** | Oligocene | Lijiawa Mammalian Fossil locality, China | 4 M1frags., 2 M2frags., M3frag., right M2, right c1, right dentary frag. with p3-4 and m1, left c1, right p4, left m1, left m2, left m3, right dentary frag. with m2, left dentary frag. | Li and Ni (2016) |
| *Eodendrogale parvum* | Eocene | Henan, China | Upper left molar, right M1 and M3, 2 lower molar talonids | Tong (1988) |

**Table S1**. Currently known treeshrew fossil record modified from Sargis (2004).

**Table S2.** List of specimens included in the analyses and results of the topographic analysis for Dirichlet normal energy (DNE), three-dimensional orientation patch count rotated (3D-OPCR), and relief index (RFI). DOI/ MorphoSource information is given when available.

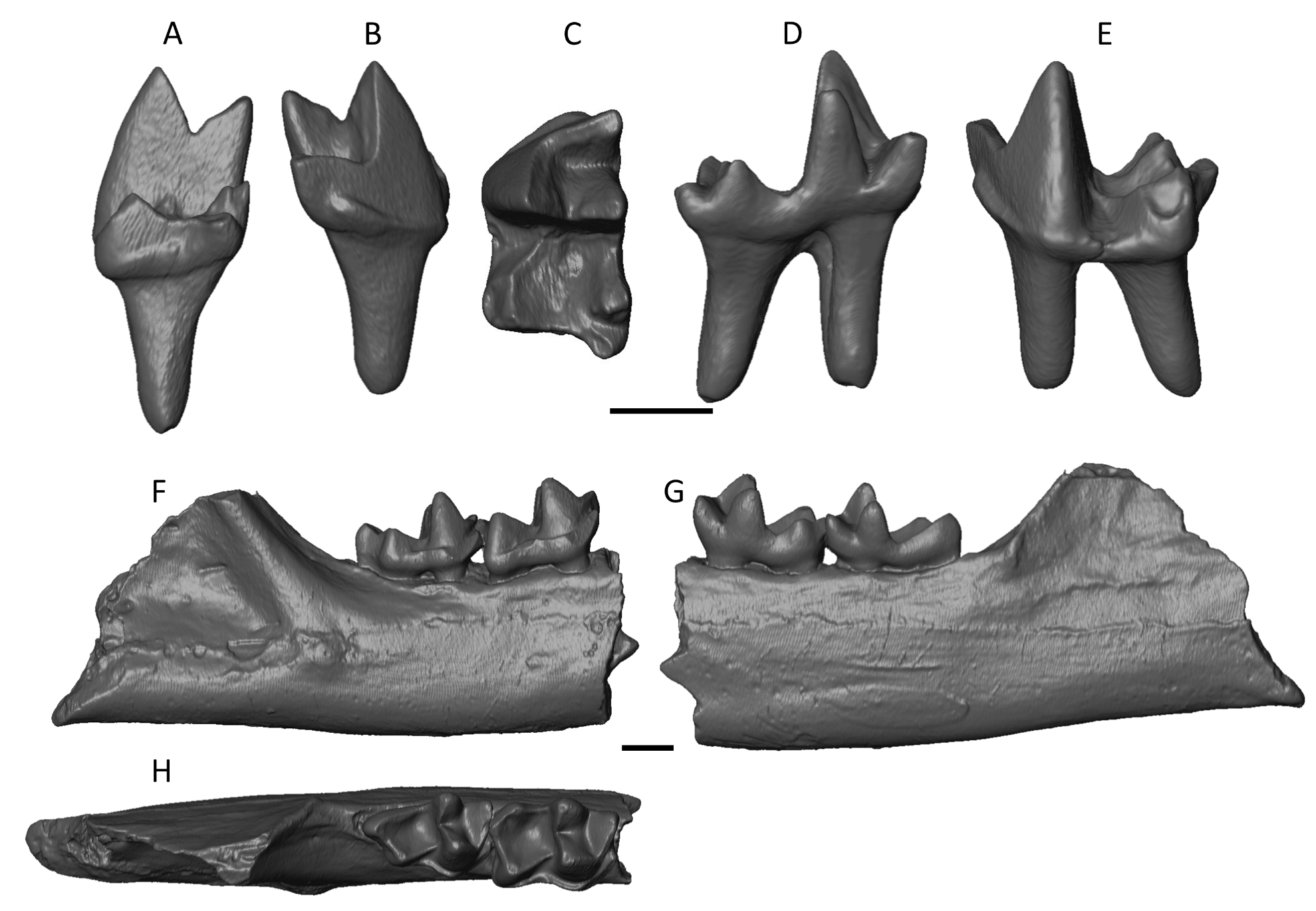
|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Specimen ID | Species | Both Analyses? | DNE | 3D-OPCR | RFI | DOI/ MorphoSource Code |
| USNM 481107 | *Ptilocercus lowii* | No | 370.128 | 75.625 | 0.53767 | doi:10.17602/M2/M6391 |
| USNM 488052 | *Ptilocercus lowii* | Yes | 379.562 | 78.125 | 0.55395 | doi:10.17602/M2/M6415 |
| USNM 488055 | *Ptilocercus lowii* | Yes | 362.591 | 76.625 | 0.56344 | doi:10.17602/M2/M6418 |
| USNM 481103 | *Ptilocercus lowii* | No | 364.716 | 75.625 | 0.5901 | doi:10.17602/M2/M6388 |
| USNM 481108 | *Ptilocercus lowii* | Yes | 421.374 | 93 | 0.59132 | doi:10.17602/M2/M6408 |
| YPM MAM 10179 | *Ptilocercus lowii* | Yes | 334.67 | 71.875 | 0.538354 | N/A |
| MCZ 36390 | *Dendrogale melanura* | Yes | 343.196 | 78.875 | 0.630791 | N/A |
| FMNH 49262 | *Dendrogale melanura* | No | 361.815 | 88.875 | 0.66367 | N/A |
| FMNH 46630 | *Dendrogale murina* | Yes | 317.582 | 71.25 | 0.656996 | N/A |
| FMNH 46629 | *Dendrogale murina* | No | 300.742 | 65 | 0.67611 | M12994-22150 |
| UAM:Mamm:103000 | *Dendrogale murina* | Yes | 359.359 | 63.375 | 0.64571704 | N/A |
| AMNH M-103110 | *Tupaia chrysogaster* | Yes | 332.942 | 69.5 | 0.621501 | doi:10.17602/M2/M59520 |
| AMNH M-103093 | *Tupaia chrysogaster* | Yes | 309.473 | 66.875 | 0.631357 | doi:10.17602/M2/M59550 |
| AMNH M-103101 | *Tupaia chrysogaster* | Yes | 346.114 | 70.125 | 0.647911 | doi:10.17602/M2/M58673 |
| AMNH M-103096 | *Tupaia chrysogaster* | Yes | 339.482 | 66.375 | 0.65322 | doi:10.17602/M2/M59075 |
| AMNH M-103095 | *Tupaia chrysogaster* | Yes | 357.632 | 63.875 | 0.664597 | doi:10.17602/M2/M59072 |
| AMNH M-103614 | *Tupaia salatana* | No | 295.734 | 68.75 | 0.573701 | doi:10.17602/M2/M59588 |
| AMNH M-103613 | *Tupaia salatana* | No | 285.186 | 71.125 | 0.588558 | doi:10.17602/M2/M59416 |
| AMNH M-103609 | *Tupaia salatana* | Yes | 331.949 | 67 | 0.593922 | doi:10.17602/M2/M59087 |
| AMNH M-103611 | *Tupaia salatana* | Yes | 309.336 | 63.375 | 0.624521 | doi:10.17602/M2/M59591 |
| AMNH M-103612 | *Tupaia salatana* | Yes | 323.095 | 71.375 | 0.641161 | doi:10.17602/M2/M59078 |
| USNM 311311 | *Tupaia glis* | Yes | 306.132 | 74.375 | 0.60269 | doi:10.17602/M2/M6602 |
| USNM 487950 | *Tupaia glis* | No | 303.424 | 76.125 | 0.61292 | doi:10.17602/M2/M6611 |
| USNM 112662 | *Tupaia glis* | Yes | 365.046 | 70.375 | 0.66101 | doi:10.17602/M2/M6465 |
| USNM 311305 | *Tupaia glis* | No | 321.18 | 71.375 | 0.66697 | doi:10.17602/M2/M6382 |
| USNM 320655 | *Tupaia belangeri* | Yes | 377.84 | 72.625 | 0.63796 | doi:10.17602/M2/M6583 |
| USNM 320690 | *Tupaia belangeri* | Yes | 351.873 | 73.75 | 0.66499 | doi:10.17602/M2/M6608 |
| USNM 320666 | *Tupaia belangeri* | Yes | 407.507 | 77.25 | 0.67182 | doi:10.17602/M2/M6604 |
| USNM 320689 | *Tupaia belangeri* | Yes | 389.733 | 77.125 | 0.72051 | doi:10.17602/M2/M6384 |
| USNM 320680 | *Tupaia belangeri* | Yes | 375.359 | 70.625 | 0.73313 | doi:10.17602/M2/M6606 |
| AMNH M-106110 | *Tupaia gracilis* | Yes | 342.648 | 64.75 | 0.586241 | doi:10.17602/M2/M59409 |
| AMNH M-103619 | *Tupaia gracilis* | Yes | 292.991 | 60.25 | 0.613209 | doi:10.17602/M2/M59379 |
| AMNH M-103620 | *Tupaia gracilis* | Yes | 314.55 | 67.75 | 0.616572 | doi:10.17602/M2/M59373 |
| AMNH M-103850 | *Tupaia gracilis* | Yes | 315.06 | 69.875 | 0.626239 | doi:10.17602/M2/M59350 |
| AMNH M-103892 | *Tupaia dorsalis* | No | 347.641 | 73.375 | 0.587323 | doi:10.17602/M2/M59400 |
| AMNH M-106107 | *Tupaia dorsalis* | Yes | 352.666 | 65.125 | 0.651864 | doi:10.17602/M2/M59370 |
| AMNH M-32631 | *Tupaia dorsalis* | Yes | 405.886 | 65.875 | 0.655381 | doi:10.17602/M2/M59090 |
| AMNH M-106104 | *Tupaia dorsalis* | Yes | 401.98 | 67.5 | 0.661011 | doi:10.17602/M2/M59406 |
| AMNH M-106106 | *Tupaia dorsalis* | Yes | 401.208 | 77.125 | 0.673387 | doi:10.17602/M2/M59361 |
| AMNH M-101670 | *Tupaia javanica* | No | 292.809 | 81.5 | 0.475056 | doi:10.17602/M2/M59364 |
| AMNH M-101663 | *Tupaia javanica* | Yes | 343.665 | 71.625 | 0.557407 | doi:10.17602/M2/M59412 |
| AMNH M-101672 | *Tupaia javanica* | Yes | 309.468 | 67.75 | 0.567472 | doi:10.17602/M2/M59376 |
| AMNH M-101664 | *Tupaia javanica* | Yes | 372.709 | 69.5 | 0.568756 | doi:10.17602/M2/M59367 |
| AMNH M-101832 | *Tupaia javanica* | Yes | 345.632 | 71.125 | 0.594074 | doi:10.17602/M2/M59388 |
| AMNH M-242088 | *Tupaia palawanensis* | No | 257.144 | 72.25 | 0.465294 | doi:10.17602/M2/M59403 |
| AMNH M-207597 | *Tupaia palawanensis* | No | 296.412 | 78.875 | 0.503431 | doi:10.17602/M2/M59397 |
| AMNH M-29725 | *Tupaia palawanensis* | No | 347.082 | 84 | 0.515167 | doi:10.17602/M2/M59391 |
| AMNH M-175465 | *Tupaia palawanensis* | No | 322.934 | 83.875 | 0.555929 | doi:10.17602/M2/M59523 |
| AMNH M-207599 | *Tupaia palawanensis* | No | 281.925 | 71.375 | 0.571474 | doi:10.17602/M2/M59356 |
| FMNH 62948 | *Tupaia palawanensis* | Yes | 343.778 | 66.625 | 0.64969 | M13013-22189 |
| AMNH M-102526 | *Tupaia minor* | Yes | 317.232 | 67.5 | 0.522606 | doi:10.17602/M2/M59382 |
| AMNH M-102527 | *Tupaia minor* | Yes | 307.54 | 67.625 | 0.539375 | doi:10.17602/M2/M59385 |
| AMNH M-103906 | *Tupaia minor* | No | 323.261 | 78.25 | 0.549639 | doi:10.17602/M2/M59353 |
| AMNH M-102529 | *Tupaia minor* | Yes | 366.905 | 69.375 | 0.574177 | doi:10.17602/M2/M59394 |
| FMNH 141464 | *Tupaia minor* | Yes | 326.098 | 72.875 | 0.61467 | M13037-22242 |
| UMZC E.4063.A | *Tupaia picta* | No | - | - | - | N/A |
| AMNH M-102830 | *Tupaia tana* | Yes | 314.964 | 62.75 | 0.586705 | doi:10.17602/M2/M59081 |
| AMNH M-102831 | *Tupaia tana* | Yes | 264.571 | 62 | 0.602236 | doi:10.17602/M2/M59084 |
| AMNH M-102829 | *Tupaia tana* | Yes | 303.78 | 67.875 | 0.613356 | doi:10.17602/M2/M59578 |
| AMNH M-102518 | *Tupaia tana* | Yes | 349.247 | 59.25 | 0.649551 | doi:10.17602/M2/M59422 |
| FMNH 68793 | *Tupaia tana* | No | 346.772 | 80.75 | 0.65349 | M13020-22205 |
| UMZC E.4062.A | *Tupaia montana* | No | - | - | - | N/A |
| IVPP V20696 | *Ptilocercus kylin†* | Yes | 343.994 | 66.25 | 0.551966 | N/A |
| IVPP V8282.13 | *Prodendrogale yunnanica†* | No | - | - | - | N/A |

**Table S3.** Eigenvalues and percent variance explained for the first four principal components (PC) in the geometric morphometric analysis (GMA) and the three PCs in the dental topographic analysis (DTA).

|  |  |  |  |
| --- | --- | --- | --- |
| Principal Component | Eigenvalue | % Variance Explained | |
| GMA |  |  |
| PC 1 | 0.003394 | 22.56 |
| PC 2 | 0.002359 | 15.68 |
| PC 3 | 0.001676 | 11.14 |
| PC 4 | 0.001551 | 10.31 |
| DTA |  |  |
| PC 1 | 1.475330 | 49.18 |
| PC 2 | 1.042890 | 34.76 |
| PC 3 | 0.481776 | 16.06 |

**Table S4**. Loadings of the PCA of the topographic variables Dirichlet normal energy (DNE), three-dimensional orientation patch count rotated (3D-OPCR), and relief index (RFI).

|  |  |  |  |
| --- | --- | --- | --- |
|  | PC 1 | PC 2 | PC 3 |
| DNE | 0.72215 | 0.012114 | -0.69163 |
| 3D-OPCR | 0.52768 | -0.65614 | 0.53948 |
| RFI | 0.44727 | 0.75454 | 0.48022 |



**Figure S1.** Top: micro-CT rendering of *Prodendrogale yunnanica* left m2 (IVPP V8282.13) in **A**, distal; **B**, mesial; **C**, occlusal; **D**, lingual; and **E**, buccal views. Bottom: micro-CT rendering of *Ptilocercus kylin* right partial dentary cast (IVPP V20696, holotype) in **F**, buccal; **G**, lingual; and **H**, occlusal views. Scale bars equal 1 mm.