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**NEW INSIGHTS FROM PIRRO NORD (SOUTHERN ITALY)
ON THE LONG DILEMMA OF EUROPEAN
*STEPHANORHINUS ETRUSCUS* AND *STEPHANORHINUS HUNDSHEIMENSIS***

Alpine and Mediterranean Quaternary, 39 (2), 2026, 1-31
https://doi.org/10.26382/AMQ.2026.06
ISSN 2279-7335

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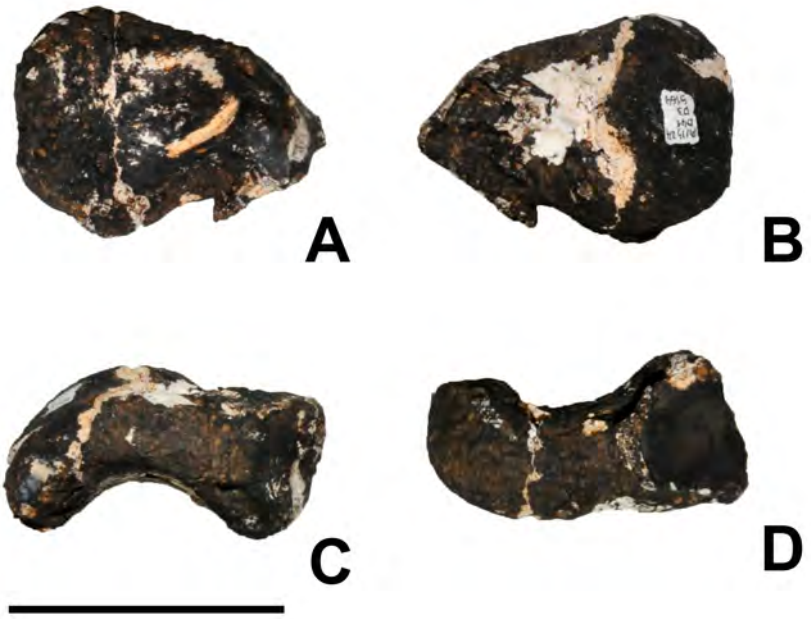



Fig. 1 - Postcranial remains of *Stephanorhinus hundsheimensis* from Pirro Nord: P13USD41QD3S164, right pisiform in lateral (A), medial (B), upper (C) and lower (D) views. Scale bar: 5 cm.

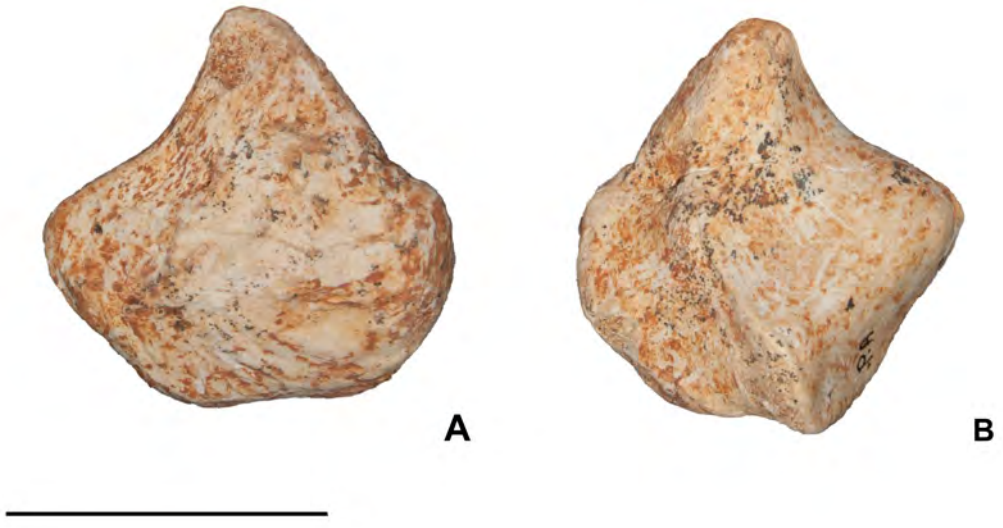



Fig. 2 - Postcranial remains of *Stephanorhinus etruscus* from Pirro Nord: MSTB – PN 20734, left patella in anterior (A) and posterior (B) views. Scale bar: 5 cm.

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| Taxon assigned | Catalogue numbers | Anatomical indication | Side | Storage place | Karst cavity | References |
|---|---|---|---|---|---|---|
| *Stephanorhinus* cf. *hundsheimensis* | IGF 2893 | Scapula | | Museum of Geology and Paleontology, Florence | P80 | Mazza et al. (1993) |
| *Stephanorhinus* cf. *hundsheimensis* | IGF 2894 | Scapula | | " " " | P80 | Mazza et al. (1993) |
| *Stephanorhinus* cf. *hundsheimensis* | IGF 2895 | Humerus | | " " " | P80 | Mazza et al. (1993) |
| *Stephanorhinus* cf. *hundsheimensis* | IGF 2896 | Humerus | | " " " | P80 | Mazza et al. (1993) |
| *Stephanorhinus* cf. *hundsheimensis* | IGF 2897 | Radio | Left | " " " | P80 | Mazza et al. (1993) |
| *Stephanorhinus* cf. *hundsheimensis* | IGF 2898 | Radio | | " " " | P80 | Mazza et al. (1993) |
| *Stephanorhinus* cf. *hundsheimensis* | IGF 2899 | Radio | | " " " | P80 | Mazza et al. (1993) |
| *Stephanorhinus* cf. *hundsheimensis* | IGF 2900 | Ulna | | " " " | P80 | Mazza et al. (1993) |
| *Stephanorhinus* cf. *hundsheimensis* | IGF 2901 | Ulna | | " " " | P80 | Mazza et al. (1993) |
| *Stephanorhinus* cf. *hundsheimensis* | IGF 2905 | Scaphoidae | Right | " " " | P80 | Mazza et al. (1993) |
| *Stephanorhinus* cf. *hundsheimensis* | IGF 2906 | Magnum | Right | " " " | P80 | Mazza et al. (1993) |
| *Stephanorhinus* cf. *hundsheimensis* | IGF 2907 | Uncinate | | " " " | P80 | Mazza et al. (1993) |
| *Stephanorhinus* cf. *hundsheimensis* | IGF 2909 | Third metacarpal | | " " " | P80 | Mazza et al. (1993) |
| *Stephanorhinus* cf. *hundsheimensis* | IGF 2910 | Third metacarpal | | " " " | P80 | Mazza et al. (1993) |
| *Stephanorhinus* cf. *hundsheimensis* | IGF 2911 | Femur | Left | " " " | P80 | Mazza et al. (1993) |
| *Stephanorhinus* cf. *hundsheimensis* | IGF 2913 | Tibia | Left | " " " | P80 | Mazza et al. (1993) |
| *Stephanorhinus* cf. *hundsheimensis* | IGF 2915 | Second metatarsal | Right | " " " | P80 | Mazza et al. (1993) |
| *Stephanorhinus* cf. *hundsheimensis* | IGF 2916 | Fourth metatarsal | Left | " " " | P80 | Mazza et al. (1993) |
| *Stephanorhinus* cf. *hundsheimensis* | IGF 2919 | Fourth metacarpal | | " " " | P80 | Mazza et al. (1993) |
| *Stephanorhinus etruscus* | N.n | Lower molar | | Sapienza University, Rome | Near P10 | Pandolfi & Petronio (2011) |
| *Stephanorhinus etruscus* | N.n | Fragmented mandible | Right | " " " | Near P10 | Pandolfi & Petronio (2011) |
| *Stephanorhinus etruscus* | N.n | Fourth metacarpal | Right | " " " | Near P10 | Pandolfi & Petronio (2011) |
| *Stephanorhinus etruscus* | PU106664 | $D^3$ | Left | Museum of Palaeontology, Turin | P10 or P13 | Pandolfi & Petronio (2011) |
| *Stephanorhinus etruscus* | PU123658 | $M^1$ | Left | " " " | P10 or P13 | Pandolfi & Petronio (2011) |
| *Stephanorhinus etruscus* | N.n | $P_2$ | Right | " " " | P10 or P13 | Pandolfi & Petronio (2011) |
| *Stephanorhinus etruscus* | PU106398 | Third metacarpal | | " " " | P10 or P13 | Pandolfi & Petronio (2011) |

Tab. 1 - The rhinoceros finds from Pirro Nord studied and explicitly listed in previous works.

| Measurement abbreviation | Measurement description | MSTB-PN 20723 |
|---|---|---|
| 1 | Total length | / |
| 2 | Distance from the back of the symphysis to the heel inflection point | / |
| 3 | Height of the horizontal branch taken between $P_2$ and $P_3$ | 66.54 |
| 4 | Height of the horizontal branch taken between $P_3$ and $P_4$ | / |
| 5 | Height of the horizontal branch taken between $P_4$ and $M_1$ | / |
| 6 | Height of the horizontal branch taken between $M_1$ and $M_2$ | / |
| 7 | Height of the horizontal branch taken between $M_2$ and $M_3$ | / |
| 8 | Height of the horizontal branch taken under the $M_3$ | / |
| 9 | Transverse diameter of the horizontal branch taken between $P_4$ and $M_1$ | / |
| 10 | Transverse diameter of the horizontal branch taken under $M_3$ | / |
| 11 | Length of the symphysis | / |
| 13 | Anterodistal diameter of the ascending branch at the level of the dental wear surface | / |
| 14 | Transverse diameter of the condyle | / |
| 15 | Distance from the condyle to the lower surface of the mandible | / |
| 16 | Height of the coronoid process | / |
| 17 | Width of the incisor body | / |
| 18 | Width of the mandible at the premolar inflection point | 89.62 |
| 19 | Width lateral gonion/lateral gonion | / |
| 20 | Width at coronoid processes | / |
| 21 | Width at the mandibular condyles | / |
| 22 | Length from the condyle to the infradental | / |
| 23 | Length of the distal edge of the $M_3$ to the infradental | / |
| 24 | Length from the caudal gonion to the mesial edge of the $P_2$ | / |
| 25 | Length of diasthema | / |
| 26 | Height from the sigmoid notch to the ventral gonion | / |
| 27 | Height of the horizontal branch in front of the $P_2$ | 52.09 |
| 28 | Transverse diameter of the horizontal branch under the $M_2$ | / |
| 30 | Length from the distal edge of the $M_3$ to the caudal gonion | / |

Tab. 2 - Details of the measurements used for the mandible. The measurements given are in mm.

| Measurement abbreviation | Measurement description | MSTB-PN 20723 (Left $P_2$) | MSTB-PN 20723 (Right $P_2$) | MSTB-PN 20723 (Left $P_3$) | MSTB-PN 20723 (Right $P_3$) | MSTB-PN 20723 (Left $P_4$) | MSTB-PN 20723 (Right $P_4$) | MSTB-PN 20723 (Left $M_1$) | MSTB-PN 20723 (Right $M_1$) | MSTB-PN 20723 (Left $M_2$) | MSTB-PN 20723 (Right $M_2$) | MSTB-PN 20723 (Left $M_3$) | MSTB-PN 20723 (Right $M_3$) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Vestibular length | 25.19 | 27.92* | 31.06 | 28.63 | 30.96 | 32.05 | 35.00 | 34.64 | 40.05 | 39.67 | 39.05 | 37.95 |
| 2 | Distal breadth taken to the collar | 17.47 | 16.98* | 21.40 | 22.48 | 24.55 | 25.77 | 25.86 | 26.48 | 26.84 | 27.19 | 26.22 | 26.24 |
| 3 | Mesial breadth, taken to the collar | 15.05 | 14.98 | 20.31 | 21.84 | 22.25 | 22.59 | 24.69 | 25.30 | 27.98 | 26.73 | 25.84 | 26.06 |
| 5 | Difference of height between the bottom of the posterior valley and the collar | / | / | / | / | 9.54 | 9.33 | 7.65 | 7.70 | 7.80 | 6.63 | 4.69 | 4.82 |
| 6 | Difference of height between the bottom of the anterior valley and the collar | / | / | / | / | 11.61 | 11.74 | 11.30 | 10.86 | 9.77 | 9.79 | 7.03 | 8.71 |
| 7 | Maximal length | 23.63(+) | 24.40(+) | 21.42(+) | 21.97(+) | 32.12 | 30.67 | 33.52 | 33.53 | 41.78 | 40.50 | 42.48 | 42.14 |
| 8 | Maximal breadth, taken to the collar | 16.75 | 16.63 | 21.87 | 23.61 | 24.01 | 23.63 | 24.58 | 25.09 | 26.06 | 26.91 | 25.67 | 25.84 |
| 9 | Vestibular length, taken to the collar | 25.78 | 24.92 | 30.67 | 29.23 | 32.60 | 32.44 | 35.50 | 36.15 | 38.45 | 38.06 | 36.80 | 36.24 |
| 10 | Lingual length, taken to the collar | 24.59 | 25.40 | 29.24 | 28.84 | 30.32 | 30.52 | 33.11 | 34.25 | 39.48 | 39.13 | 38.87 | 39.81 |
| 11 | Height of the crown, take lingual face | 15.21 | 13.23 | 15.89 | 16.17 | 16.27 | 17.20 | 15.05 | 14.02 | 20.32 | 17.91 | 20.53 | 19.52 |
| 12 | Height of the crown, take vestibular face | 15.16 | 14.44 | 16.04 | 17.05 | 18.75 | 18.71 | 16.98 | 18.26 | 19.59 | 20.19 | 22.41 | 22.41 |

Tab. 3 - Details of the measurements used for the mandibular teeth. The measurements given are in mm; those marked with * are estimated and those marked with (+) are estimated to be increased.

| **Measurement abbreviation** | **Measurement description** | **MSTB-PN 20723** (Left side) | **MSTB-PN 20723** (Right side) |
|---|---|---|---|
| 1 | Length of the dental row taken on the buccal side, at the collar | 201 | 204 |
| 2 | Length of dental row taken face lingual, at the collar | 206 | 204 |
| 3 | Length of the molar row taken on the buccal side, at the collar | 115.22 | 115.42 |
| 4 | Length of the molar row taken lingually, at the collar | 116.09 | 115.42 |
| 5 | Length of the premolar row taken on the buccal side, at the collar | 93.33 | 89.84 |
| 6 | Length of the premolar row taken lingually, at the collar | 89.91 | 87.34 |
| 7 | Length $P_3/P_4$ taken on the vestibular side, at the collar | 63.20 | 60.99 |
| 8 | Length $P_3/P_4$ taken on the lingual side, at the collar | 65.55 | 63.57 |

Tab. 4 - Details of the measurements used for the mandibular dental rows. The measurements given are in mm.

| Measurement abbreviation | Measurement description | MSTB-PN 20725 (Right $P^4$) | MSTB-PN 20726 (Right $M^2$) | MSTB-PN 20729 (Left $P^2$) | MSTB-PN 20724 (Left $P^3$) | MSTB-PN 20733 (Left $P^4$) | MSTB-PN 20730 (Left $M^2$) | MSTB-PN 20728 (Left $M^1$) | P13USD28 QC4S437 (Right $P^3$) | P13USD25 QC6S336 (Left $M^1$) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Maximal length | 43.08 | 53.91 | 33.82 | 40.89 | 42.34 | 54.02 | / | 40.73 | 52.55 |
| 2 | Maximal breadth | 50.65 | 53.43 | 39.18 | 48.95 | 52.96 | 54.46 | 55.74 | / | / |
| 5 | Height of the crown | 53.27 | 50.76 | 37.55 | 51.50 | 54.72 | 50.76 | 50.47 | 47.24 | 37.59 |
| 6 | Maximal length of the crochet | 17.94 | 20.09 | 11.07 | 15.96 | 14.94* | 22.33 | 18.35* | / | 14.44 |
| 7 | Mesial breadth, taken to the level of the collar | 48.55 | 55.18 | 39.60 | 46.86 | 49.11 | 49.95 | / | / | |
| 8 | Distal breadth, taken to the level of the collar | 54.29 | 48.93 | 36.00 | 49.35 | 54.34 | 54.79 | / | 39.35 | 53.79 |
| 9 | Vestibular length, taken to the level of the collar | 35.16 | 42.84 | 27.71 | 32.10 | 39.58 | 44.35* | / | 43.74 | 38.05 |
| 10 | Lingual length, taken to the level of the collar | 32.20 | 36.19 | 25.23 | 30.45 | 30.25 | 36.40 | / | / | / |

Tab. 5 - Details of the measurements used for the isolated upper teeth. The measurements given are in mm; those marked with * are estimated.

| **Measurement abbreviation** | **Measurement description** | **MSTB-PN 20731** (Left $P_4$) | **MSTB-PN 20732** (Left $M_1$) | **MSTB-PN 20738** (Left $M_1$) | **P13USD13 QA5S33** (Left $P_2$) | **P13USD22 QB5S159** (Left $M_1$) | **P13USD34 QC2S157** (Left $M_1$) | **P13USD24 QC6S241** (Right $M_1$) |
|---|---|---|---|---|---|---|---|---|
| 1 | Vestibular length | 37.33 | 45.80 | 45.78 | 28.21 | 43.55 | 43.8 | 42 |
| 2 | Distal breadth, taken to the collar | 28.86 | 31.67 | 33.79 | 21.57 | 28.14 | 28 | 27 |
| 3 | Mesial breadth, taken to the collar | 25.01 | 31.94 | 30.94* | 18.02 | 26.59 | 30.2 | / |
| 5 | Difference of height between the bottom of the posterior valley and the collar | 14.57 | 7.81 | 11.62 | / | 8.22 | 5.35 | / |
| 6 | Difference of height between the bottom of the anterior valley and the collar | / | 11.56 | 14.10 | / | 11.5 | 3.45 | / |
| 7 | Maximal length | 35.98 | 47.45 | 45.60 | 35 | 44.98 | 46.16 | / |
| 8 | Maximal breadth, taken to the collar | 27.00 | 32.09 | 32.15 | 19.71 | 28.70 | 27.78 | 26 |
| 9 | Vestibular length, taken to the collar | 35.99 | 43.94 | 46.34 | 30.14 | 41.13 | 41.8 | / |
| 10 | Lingual length, taken to the collar | 32.81 | 45.63 | 45.14 | / | / | / | / |
| 11 | Height of the crown, take lingual face | 18.91 | 25.37 | 22.94 | 27.78 | 12.39 | 29.8 | 14 |
| 12 | Height of the crown, take vestibular face | 19.89 | 27.76 | 27.55* | 20.09 | 15.16 | 26.94 | 12 |

Tab. 6 - Details of the measurements used for the isolated lower teeth. The measurements given are in mm; those marked with * are estimated.

| **Measurement abbreviation** | **Measurement description** | **P13USD41QD3S164** (Right Pisiform) |
|---|---|---|
| 1 | Maximum length | 51.92 |
| 2 | Maximum width | 39.29 |
| 3 | Maximum height | 28.86 |

Tab. 7 - Details of the measurements used for the pisiform. The measurements given are in mm.

| Measurement abbreviation | Measurement description | MSTB-PN 20736 (Left second metacarpal) | MSTB-PN 20737 (Left third meta-carpal) | MSTB-PN 20735 (Left fourth meta-carpal) |
|---|---|---|---|---|
| 1 | Maximum length of the bone | / | / | / |
| 2 | Transverse diameter of the proximal articular surface | 21.05 | 43.02 | 32.92 |
| 2bis | Maximum transverse diameter of the proximal end | 24.81 | / | / |
| 3 | Antero-posterior diameter of the proximal end | 36.49 | 39.73 | 35.26 |
| 4 | Transverse diameter of the diaphysis | 22.28 | 38.74 | 28.67* |
| 5 | Antero-posterior diameter of the diaphysis | 23.51 | 21.5 | 19.59 |
| 6 | Maximum transverse diameter of the distal end | / | / | / |
| 7 | Transverse diameter of the distal articular surface | / | / | / |
| 8 | Maximum antero-posterior diameter of the distal end | / | / | / |
| 9 | Transverse articular diameter of the proximal end | / | / | / |
| 10 | Antero-posterior diameter of the proximal articular surface | / | / | / |

Tab. 8 - Details of the measurements used for the metacarpals. The measurements given are in mm; those marked with * are estimated.

| Measurement abbreviation | Measurement description | MSTB-PN 20734 (Left patella) |
|---|---|---|
| 1 | Maximum length | 62.16 |
| 2 | Maximum transverse diameter | 57.75 |
| 3 | Maximum anteroposterior diameter | 36.83 |
| 4 | Articular length | 49.86 |
| 5 | Articular transverse diameter | 43.23 |

Tab. 9 - Details of the measurements used for the patella. The measurements given are in mm.

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| Species | Age | Site | Catalogue Number | 1 | 2 | 2bis | 3 | 4 | 5 | 6 | 7 | 8 | 10 | Source | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *S. etruscus* | Late Pliocene | Castelnuovo Barardenga Scalo | 7130, MSNAF | 176.96 | 37.86 | 43.11 | 35.45 | 35.4 | 24.47 | 43.1 | 33.83 | 36.24 | 26.38 | Pandolfi et al., (2017) | |
| *S. etruscus* | Early Pleistocene | Senèze | 1923-8 | 173 | 39.03 | 42.83 | 43.89 | / | / | 46.27 | 36.08 | 38.77 | 42.98 | Lacombat, (2005) | |
| *S. etruscus* | Early Pleistocene | Senèze | Se1703, NMB | 177.1 | / | 37.4 | 42.6 | 32 | 18.9 | 41.5 | 39.9 | / | 36.5 | Pandolfi et al., (2017) | |
| *S. etruscus* | Early Pleistocene | Poggio al Pero, Upper Valdarno | IGF 716, MGPF | 166 | 39 | 44 | 32 | 31 | 19 | 39 | 31 | 37 | 32.4 | Fortelius et al., (1993) | |
| *S. etruscus* | Early Pleistocene | Il Tasso, Upper Valdarno | IGF 2230 v, MGPF | / | / | 46 | 40 | / | / | / | / | / | 39.3 | Fortelius et al., (1993) | |
| *S. etruscus* | Early Pleistocene | Figline, Upper Valdarno | IGF 1355 v, MGPF | 173 | 39 | 43 | 39 | 33 | 37 | 40 | 33 | 37 | 37.8 | Fortelius et al., (1993) | |
| *S. etruscus* | Early Pleistocene | Olivola, Valle Magra | IGF 1935, MGPF | / | 37* | 41 | 37 | 36* | 15* | / | / | / | 33.5 | Fortelius et al., (1993) | |
| *S. etruscus* | Early Pleistocene | Casa Inferno, Upper Valdarno | IGF 488 v, MGPF | / | / | / | / | / | / | 41 | 33 | 37 | / | Fortelius et al., (1993) | Juvenile |
| *S. etruscus* | Early Pleistocene | Capitone | 1500, MPUR | 172 | 40 | 44 | 40 | 30 | 25 | 44 | 36 | 37 | / | Ambrosetti, (1972); Pandolfi et al., (2017) | |
| *S. etruscus* | Early Pleistocene | La Puebla de Valverde | / | / | / | 47 | 39 | / | / | / | / | / | / | Guérin & Heintz, (1971); Pandolfi et al., (2017) | |
| *S. etruscus* | Early Pleistocene | La Puebla de Valverde | / | / | / | 45 | 39 | / | / | / | / | / | / | Guérin & Heintz, (1971); Pandolfi et al., (2017) | |
| *S. etruscus* | Early Pleistocene | Saint Vallier | / | 184 | 43 | / | / | / | / | / | 48 | 39 | / | Ambrosetti, (1972); Pandolfi et al., (2017) | |
| *S. etruscus* | | Cullar de Baza I | 13144, MNCN | / | 40.79 | 49.07 | 44.26 | / | / | / | / | / | / | Pandolfi et al., (2017) | |
| *S. etruscus* | | Venta Micena | / | / | / | 39.2 | 36 | 28 | 19 | / | / | / | / | Santafè-Llopis & Casanovas-Cladellas, (1987); Pandolfi et al., (2017) | |
| *S. hundsheimensis* | Early Pleistocene | Untermassfeld | IQW 1980/15469 | 189.2 | 36.9 | 55.8 | 45.5 | 39.6 | 25.4 | 50.2 | 39.5 | 45.5 | / | Kahlke, (2001) | |
| *S. hundsheimensis* | Early Pleistocene | Untermassfeld | IQW 1980/15882 | 175.1 | 36.5 | 44 | 44.9 | 31.9 | 24.3 | 42.2 | 33.8 | 40.4 | / | Kahlke, (2001) | |
| *S. hundsheimensis* | Early Pleistocene | Untermassfeld | IQW 1989/23 389 | 189.2 | 41.3 | 56.2 | / | 37.5 | / | / | / | / | / | Kahlke, (2001) | |
| *S. hundsheimensis* | Early Pleistocene | Untermassfeld | IQW 1990/23 597 | 184.5 | 38.2 | 50.7 | 46.8 | 39.7 | 27 | 50.5 | 42.9 | 45.5 | / | Kahlke, (2001) | |
| *S. hundsheimensis* | Early Pleistocene | Vallonet | A5 333 | 163.5 | / | / | 38.76 | 32.38 | 21.42 | / | / | / | / | Lacombat, (2005) | |
| *S. hundsheimensis* | Middle Pleistocene | Mosbach | 1961 /119, NMM | 174 | 31 | 43.4 | 42 | 34.2 | 23.7 | 43.5 | 33.6 | 41.2 | 38.5 | Fortelius et al., (1993) | |
| *S. hundsheimensis* | Middle Pleistocene | Mosbach | 1954/368, NMM | / | 31.4 | 43.5 | 44.6 | 34 | 19.8 | / | / | / | 40.5 | Fortelius et al., (1993) | |
| *S. hundsheimensis* | Middle Pleistocene | Soleilhac | Sol 123 | 179 | 34.09 | 47.09 | 39.31 | 33.66 | 21.27 | 42.44 | 35.65 | 40.2 | 37.08 | Lacombat, (2005) | |
| *S. hundsheimensis* | Middle Pleistocene | Soleilhac | 2003-4-333-Sol | 192 | 35.43 | 41.8 | 42.22 | 35.2 | 20.46 | 44.1 | 40.43 | 38.6 | 39.3 | Lacombat, (2005) | |
| *S. hundsheimensis* | Middle Pleistocene | Isernia La Pineta | 140B28 | 181 | / | / | / | / | / | / | 39.3 | 40.6 | / | Lacombat, (2005) | |
| *S. hundsheimensis* | Middle Pleistocene | Isernia La Pineta | 8Q225 | 174.6 | 40.5 | 44 | 36.7 | 34.2 | 21.7 | / | 37.9 | / | 39 | Lacombat, (2005) | |
| *S. hundsheimensis* | Middle Pleistocene | Cesi | Uncatalogued | 189.9 | / | 47.2 | 37.1 | 38 | 23.5 | 48.6 | 41.6 | 41.4 | / | Mazza, (1996) | |
| *S. hundsheimensis* | Middle Pleistocene | Contrada Monticelli | MSTB - CM 30702 | 173 | 39.2 | 48.1 | 40.8 | 35.2 | 23.6 | 39.8 | 35.3 | 43.5 | 35.8 | Stefanelli et al., (2024) | |
| *S.* cf. *hundsheimensis* | Early Pleistocene | Westerhoven | RGM 14194 | 159 | 23.4 | 35 | 42.2 | 30.5 | 19.2 | 40 | 32 | 34.7 | 36 | Mazza et al., (1993) | |
| *S.* cf. *hundsheimensis* | Middle Pleistocene | West Runton | M19516, NHML | / | / | 43.4 | 41.5 | / | / | / | / | / | / | Breda et al., (2010) | |
| *S.* cf. *hundsheimensis* | Middle Pleistocene | Cava di Breccia - Casal di Selce 2 | CS209 | 167.4 | 35.9 | 38.7 | / | / | 32.1 | 29.4 | / | / | / | Stefanelli et al., (2024) | |
| *S. hemitoechus* | Middle Pleistocene | Grays (Thurrock) | 19834, MNHL | 157 | 29 | 33.5 | 39 | 29.7 | 22 | 41.5 | 34.5 | 39 | / | Fortelius et al., (1993) | |
| *S. hemitoechus* | Middle Pleistocene | Grays (Thurrock) | 45264, MNHL | / | 39.5 | 43 | 41.5 | 34 | 19 | / | / | / | / | Fortelius et al., (1993) | |
| *S. hemitoechus* | Middle Pleistocene | Maastricht-Belvéderè | no number, IAU | 167 | 33.5 | 37.3 | / | 33.3 | 23 | 43.2 | 38 | 41.7 | / | Fortelius et al., (1993) | |
| *S. hemitoechus* | Middle Pleistocene | Caune de l'Arago | I16 1450 | / | 41.05 | 45.24 | 39.15 | / | / | / | / | / | / | Lacombat, (2005) | |
| *S. hemitoechus* | Middle Pleistocene | Caune de l'Arago | C20 298 | / | 39.41 | 42.23 | 40.55 | / | / | / | / | / | / | Lacombat, (2005) | |
| *S. hemitoechus* | Middle Pleistocene | Lunel-Viel | LVI-10-1490 | 165.5 | 42 | 45 | 39.5 | 36.3 | / | 45 | 34 | 42.5 | / | Bonifay, (1973); Lacombat, (2005) | |
| *S. hemitoechus* | Middle Pleistocene | Atapuerca | / | / | / | / | / | 34.6* | 22* | 42 | 35 | 37.6 | / | Cerdeño, (1989) | |
| *S. hemitoechus* | Middle Pleistocene | Pinilla Del Valle | / | 164.7 | 44 | 36.7 | 45.8 | 38.5 | 22.7 | 41.7 | 36.4 | 42.6 | 43 | Cerdeño, (1989) | |
| *S. hemitoechus* | Middle Pleistocene | Pinilla Del Valle | / | 165 | 23.7 | 38 | 44.3 | 33.6 | 21.8 | 42.3 | 35.5 | 40.52 | 41 | Cerdeño, (1989) | |
| *S. hemitoechus* | Middle Pleistocene | Grays (Thurrock) | 19834b NHML | 157.33 | 37.27 | / | 40.2 | 31.69 | 23.79 | 40.83 | 32.9 | 38.97 | / | Schreve (2001); Pandolfi & Tagliacozzo, (2015) | |
| *S. hemitoechus* | Middle Pleistocene | Grays (Thurrock) | PV OR 20816 d NHML | 154 | 43* | / | 41.35 | 37.41 | 24.63 | 40.32 | 35.95 | 40.56 | / | Schreve (2001); Pandolfi & Tagliacozzo, (2015) | |
| *S. hemitoechus* | Middle Pleistocene | Ilford, Essex | 45264 NHML | / | 41.24 | 40.87 | 40.49 | / | / | / | / | / | / | Schreve (2001); Pandolfi & Tagliacozzo, (2015) | |
| *S. hemitoechus* | Middle or Late Pleistocene | Ilford, Essex | no number, MNHL | 153.5 | / | / | 38* | 37.7 | 22 | 40 | 36 | 40 | / | Fortelius et al., (1993) | |
| *S. hemitoechus* | Middle or Late Pleistocene | La Fage | 42003 | / | / | / | / | 51.5 | 19.5 | 56 | 49 | 45.5 | / | Guérin, (1973) | |
| *S. hemitoechus* | Middle or Late Pleistocene | La Fage | 42004 | / | / | / | / | / | / | 54 | 49 | 46 | / | Guérin, (1973) | |
| *S. hemitoechus* | Late Pleistocene | Observatorie | / | 148.5 | / | 46.53 | / | 36.77 | 21.44 | / | / | / | / | Lacombat, (2005) | |
| *S. hemitoechus* | Late Pleistocene | Cueva Horà | / | 168 | / | 44.5 | 38 | 37.3 | 21.9 | 46.6 | 32* | 40.9 | / | Cerdeño, (1990) | |
| *S. hemitoechus* | Late Pleistocene | Cova del Gegant | / | / | 24 | 34 | 40.3 | 36.5 | 24 | / | / | / | 36.4 | Cerdeño, (1990) | |
| *S. hemitoechus* | Late Pleistocene | Valle Radice | P40/11 MNPELP | 173.57 | 39.56 | 45.71 | 44.87 | 39.77 | 26.91 | 49.52 | 41.6 | 43.04 | / | Pandolfi & Tagliacozzo, (2015) | |
| *S. hemitoechus* | Late Pleistocene | Cova del Gegant | 18970 MNCN | / | 41.1 | 39.57 | 38.84 | 36.24 | 23.93 | / | / | / | / | Lopez-Garcia et al., (2008); Pandolfi & Tagliacozzo, (2015) | |
| *S. hemitoechus* | Late Pleistocene | Melpignano | MPA R18 | 130 | 28 | 33 | 33 | 28 | 17 | 33 | 27 | 35 | 35 | Petronio & Pandolfi (2008) | |
| *S. kirchbergensis* | Early Pleistocene | Westerhoven | RGM 1724 14, RML | 182 | 26 | 37.8 | 49 | 33.2 | 28.3 | 43.4 | 38.8 | 46 | 39 | Fortelius et al., (1993) | |
| *S. kirchbergensis* | Middle Pleistocene | Mauer | Mau 149, HLD | 204 | 35 | 48.3 | 43 | 39.7 | 24.2 | 53.3 | 42.5 | 44.5 | / | Fortelius et al., (1993) | |
| *S. kirchbergensis* | Middle Pleistocene | Mosbach | 1961/958, NMM | / | 36 | 54 | 55 | 38.6 | 26.3 | / | / | / | 49.3 | Fortelius et al., (1993) | |
| *S. kirchbergensis* | Middle or Late Pleistocene | Atlay Territory | NSMLL-102 | 187.5 | 48 | 46 | 40 | / | / | 52 | / | 44 | / | Lobachev et al., (2021) | |
| *S. kirchbergensis* | Middle or Late Pleistocene | Atlay Territory | GR PC-203 | 186 | 58.5 | 62.5 | 40 | / | / | 52 | / | 51.5 | / | Lobachev et al., (2021) | |
| *S. kirchbergensis* | Middle or Late Pleistocene | Atlay Territory | GR PC-214 | 194* | 61 | 59 | 44 | / | / | 57 | / | / | / | Lobachev et al., (2021) | |
| *S. kirchbergensis* | Late Pleistocene | Taubach | IQW 1969/11341 | 191.5 | 41 | 51.6 | 44.2 | 36.2 | / | 43.8 | 38.2 | 47.8 | / | Kahlke, (1977) | |
| *S. kirchbergensis* | Late Pleistocene | Taubach | IQW 1968/9855 | / | 45.2 | 53.1 | 45.1 | / | / | 42.4 | 49.4 | 48.2 | / | Kahlke, (1977) | |
| *S. kirchbergensis* | Late Pleistocene | Taubach | IQW 1969/11757 | / | 36.2 | 44.9 | 44.8 | 32.6 | / | / | / | / | / | Kahlke, (1977) | |
| *S.* cf. *hundsheimensis* | Early Pleistocene | Pietrafitta | 750, Boldrini Collection | 159.5 | 40 | 41 | 34.9 | 31 | 17.7 | 40.5 | 35 | 34.5 | / | Mazza et al., (1993); Lacombat, (2005) | |

Tab. 10 - Data used to build scatterplot for the second metacarpal. The measurements given are in mm; those marked with * are estimated.

Supplementary material 10/13

## Supplementary Tab. 11 (1/2)

| Species | Age | Site | Catalogue Number | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Source | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *S. etruscus* | Early Pleistocene | Poggio al Pero, Upper Valdarno | IGF 716, MGPF | 200 | / | 53 | 48 | 20 | 58 | 42 | 42.3 | Fortelius et al., (1993) | |
| *S. etruscus* | Early Pleistocene | Figline, Upper Valdarno | IGF 1355 v, MGPF | 200 | 45 | 53 | 45 | 19 | 54 | 41 | 41 | Fortelius et al., (1993) | |
| *S. etruscus* | Early Pleistocene | Il Tasso, Upper Valdarno | IGF 223 1 v, MGPF | / | 39 | 53 | 47* | 18* | / | / | / | Fortelius et al., (1993) | |
| *S. etruscus* | Early Pleistocene | Olivola, Valle Magra | IGF 1928, MGPF | / | 43 | 52 | / | 20* | / | / | / | Fortelius et al., (1993) | |
| *S. etruscus* | Early Pleistocene | Olivola, Valle Magra | IGF 1925, MGPF | 197 | / | / | / | / | / | / | / | Fortelius et al., (1993) | |
| *S. etruscus* | Early Pleistocene | Olivola, Valle Magra | IGF 1926, MGPF | / | 42 | 58 | / | 17* | / | / | 40 | Fortelius et al., (1993) | |
| *S. etruscus* | Early Pleistocene | Olivola, Valle Magra | IGF 1926, MGPF | 194 | 45 | 51 | 49 | 20 | 54 | 39 | / | Fortelius et al., (1993) | |
| *S. etruscus* | Early Pleistocene | Olivola, Valle Magra | IGF 1929, MGPF | / | / | / | 48 | / | 58* | / | / | Fortelius et al., (1993) | |
| *S. etruscus* | Early Pleistocene | Casa Inferno, Upper Valdarno | IGF 488 v, MGPF | 189 | / | 49 | 44 | 17 | 59 | 39 | 38.2 | Fortelius et al., (1993) | Juvenile |
| *S. etruscus* | Early Pleistocene | Senèze | 1923-8 | 191 | 56.5 | 48.93 | 45.51 | 21.94 | 58.24 | 48.24 | 40.97 | Lacombat, (2005) | |
| *S. etruscus* | Early Pleistocene | Castelnuovo Barardenga Scalo | 7138, MSNAF | 203.97 | 57.09 | 42 | 51.32 | 21.89 | 57.48 | 44.79 | 37.63 | Pandolfi et al., (2017) | |
| *S. etruscus* | Early Pleistocene | Upper Valdarno | 2231v, IGF | / | 53.42 | 40.07 | 49.41 | 18.5 | / | / | / | Pandolfi et al., (2017) | |
| *S. etruscus* | Early Pleistocene | Capitone | 1500, MPUR | / | 52 | 45 | 47 | 18 | 58 | / | 40 | Ambrosetti, (1972); Pandolfi et al., (2017) | |
| *S. etruscus* | Early Pleistocene | La Puebla de Valverde | / | 196 | 52 | 46 | 48 | 20 | 55 | 47 | 41 | Guérin & Heintz, (1971); Pandolfi et al., (2017) | |
| *S. etruscus* | Early Pleistocene | La Puebla de Valverde | / | 198 | 52 | 45 | 49 | 21 | 54 | 44 | 39 | Guérin & Heintz, (1971); Pandolfi et al., (2017) | |
| *S. etruscus* | Early Pleistocene | Senèze | Se1756, NMB | 219.2 | 63 | 52.7 | 53.5 | / | 63.5 | 50.5 | / | Pandolfi et al., (2017) | |
| *S. etruscus* | Early Pleistocene | Senèze | Se1756, NMB | 199 | 53.8 | 42.7 | 43.6 | / | 59.7 | 49.4 | / | Pandolfi et al., (2017) | |
| *S. etruscus* | Early Pleistocene | Senèze | Se1756, NMB | 188.4 | / | / | 43.4 | / | 59.5 | 47.6 | / | Pandolfi et al., (2017) | |
| *S. etruscus* | Early Pleistocene | Senèze | Se1756, NMB | 202.4 | 55.2 | / | 47.1 | / | 60 | 48.4 | / | Pandolfi et al., (2017) | |
| *S. etruscus* | Early Pleistocene | Senèze | Se1703, NMB | 181.4 | 51.4 | 42.7 | 46.7 | 16.4 | 55.9 | 46.8 | / | Pandolfi et al., (2017) | |
| *S. etruscus* | Early Pleistocene | Huescar V | 55139, MNCN | / | 49.15 | / | 46.52 | / | / | / | / | Pandolfi et al., (2017) | |
| *S. etruscus* | Early Pleistocene | El Rincon | 41870, MNCN | / | 48.31 | 43.46 | / | / | / | / | / | Pandolfi et al., (2017) | |
| *S. etruscus* | Early Pleistocene | Pirro Nord | PU106398, MSNT | / | / | / | / | / | 54.55 | / | 37.2 | Pandolfi et al., (2017) | |
| *S. etruscus* | Early Pleistocene | Tsiotra Vryssi | TSR–36 | / | 59.2 | 52.62 | / | 23.76 | / | / | / | Chitoglou et al., (2025) | |
| *S. hundsheimensis* | Early Pleistocene | Vallonet | IND-R14066 | 199.7 | 53.07 | 44.19 | 47.82 | 19.48 | 58.04 | 46.46 | 45.22 | Lacombat, (2005) | |
| *S. hundsheimensis* | Early Pleistocene | Vallonet | D8-B1-351 | / | 54.48 | / | / | / | / | / | / | Lacombat, (2005) | |
| *S. hundsheimensis* | Early Pleistocene | Vallonet | Z6-ZG15-694 | / | 50.19 | / | / | / | / | / | / | Lacombat, (2005) | |
| *S. hundsheimensis* | Early Pleistocene | Vallonet | C8-B1-1768 | 203.1 | 53.97 | 45.31 | 47.39 | 20.6 | 58 | 46.76 | 41.77 | Lacombat, (2005) | |
| *S. hundsheimensis* | Early Pleistocene | Vallonet | A6-AG18-8795 | / | 46.69 | 44.19 | / | / | / | / | / | Lacombat, (2005) | |
| *S. hundsheimensis* | Early Pleistocene | Untermassfeld | IQW 1980/16503 | 215.5 | 60.5 | 53.5 | 53 | 24.4 | 64.6 | 55.5 | 49.2 | Kahlke, (2001) | |
| *S. hundsheimensis* | Early Pleistocene | Untermassfeld | IQW 1980/15412 | 216.6 | 66.3 | 51.8 | 50.4 | 22.7 | / | 51.2 | 47.4 | Kahlke, (2001) | |
| *S. hundsheimensis* | Early Pleistocene | Untermassfeld | IQW 1980/17452 | 203.9 | 55.2 | 58.8 | 45.1 | 20.5 | 52 | 47.2 | 42.5 | Kahlke, (2001) | |
| *S. hundsheimensis* | Early Pleistocene | Untermassfeld | IQW 1985/20738 | 200.5 | 54.7 | 49.4 | 48.4 | 22.8 | 54.4 | 50.3 | 45 | Kahlke, (2001) | |
| *S. hundsheimensis* | Early Pleistocene | Untermassfeld | IQW 1989/23313 | 221.6 | 60.8 | 53 | 51.2 | 23.7 | 60.2 | 54 | 46.1 | Kahlke, (2001) | |
| *S. hundsheimensis* | Early Pleistocene | Untermassfeld | IQW 1990/23514 | 204 | 58.5 | 52.4 | 53.6 | 23.5 | 59.3 | 52.8 | 48 | Kahlke, (2001) | |
| *S. hundsheimensis* | Middle Pleistocene | Contrada Monticelli | MSTB - CM 30698 | 206 | 57.7 | 41.1 | 64.8 | 24.1 | 74 | 56.2 | 50.5 | Stefanelli et al., (2024) | |
| *S. hundsheimensis* | Middle Pleistocene | Mauer | Mau 150, HLD | 201 | 47.5 | 52* | 50.8 | 23.7 | 56.8 | 43.8 | 45.5 | Fortelius et al., (1993) | |
| *S. hundsheimensis* | Middle Pleistocene | Mosbach | 1956/28, NMM | 201 | 47 | 52.8 | 51.8 | 26.4 | 62* | 45 | 50 | Fortelius et al., (1993) | |
| *S. hundsheimensis* | Middle Pleistocene | Mosbach | 1959/791 , NMM | / | 46 | 54.5 | 48.6 | 23 | / | / | | Fortelius et al., (1993) | |
| *S. hundsheimensis* | Middle Pleistocene | Mosbach | 1963/518 , NMM | 214 | 48.1 | 51.3 | 46 | 23.1 | 53.7 | 42.1 | 44.1 | Fortelius et al., (1993) | |
| *S. hundsheimensis* | Middle Pleistocene | Mosbach | 1962/931 , NMM | / | 45.2 | 56* | / | / | / | / | / | Fortelius et al., (1993) | |
| *S. hundsheimensis* | Middle Pleistocene | Mosbach | 1958/322, NMM | / | 47* | 57* | 53 | 20 | / | / | / | Fortelius et al., (1993) | |
| *S. hundsheimensis* | Middle Pleistocene | Mosbach | 1955 /1226, NMM | / | 50.3 | 57 | / | / | / | / | / | Fortelius et al., (1993) | |
| *S. hundsheimensis* | Middle Pleistocene | Mosbach | 1955/276, NMM | / | 48.2 | 59* | / | / | / | / | / | Fortelius et al., (1993) | |
| *S. hundsheimensis* | Middle Pleistocene | Mosbach | 1955/73, NMM | / | 49.7* | 50.5* | / | / | / | / | / | Fortelius et al., (1993) | |

continued on the next page > > > > >

Tab. 11 - Data used to build scatterplot for the third metacarpal. The measurements given are in mm; those marked with * are estimated.

## Supplementary Tab. 11 (2/2)

| Species | Age | Site | Catalogue Number | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Source | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *S. hundsheimensis* | Middle Pleistocene | Vitinia | 2768, MPUR | 196 | 46.2 | 51 | 45.3 | 19 | 55* | 42 | 47.7 | Stefanelli et al., (2024) | |
| *S. hundsheimensis* | Middle Pleistocene | Soleilhac | sol 122 | 198 | 53.4 | 48.2 | 45.65 | 19.9 | 54.6 | 45.5 | 42.5 | Lacombat, (2005) | |
| *S. hundsheimensis* | Middle Pleistocene | Soleilhac | 2003-4-332-Sol | 218 | 55.08 | / | 52.1 | 20.52 | 59.17 | 52.2 | / | Lacombat, (2005) | |
| *S.* cf. *hundsheimensis* | Middle Pleistocene | West Runton | M19513, NHML | / | 59.2 | / | / | / | 65.1 | / | / | Breda et al., (2010) | |
| *S. hemitoechus* | Middle Pleistocene | Clacton | 27846, MNHL | 198 | 48 | 52 | 48 | 21 | 55 | 43 | / | Fortelius et al., (1993) | |
| *S. hemitoechus* | Middle Pleistocene | Caune de l'Arago | D17 3018 | / | 56.98 | 52.08 | / | / | / | / | / | Lacombat, (2005) | |
| *S. hemitoechus* | Middle Pleistocene | Caune de l'Arago | D20 1906 | / | 54.16 | 50.66 | / | / | / | / | / | Lacombat, (2005) | |
| *S. hemitoechus* | Middle Pleistocene | Lunel-Viel | LVI 8-2870 | / | 51.7 | / | 50.2 | / | / | / | / | Bonifay, (1973); Lacombat, (2005) | |
| *S. hemitoechus* | Middle Pleistocene | Lunel-Viel | LVI-11-3164 | / | 59.8 | 53.2 | 48.5 | / | / | / | / | Bonifay, (1973); Lacombat, (2005) | |
| *S. hemitoechus* | Middle Pleistocene | Atapuerca | / | 188 | / | 43.8 | 46.7 | 21.4 | / | 53.2* | / | Cerdeño, (1989) | |
| *S. hemitoechus* | Middle Pleistocene | Pinilla Del Valle | / | 201.5 | 61.8 | 50.6 | 52.7 | 21.1 | 53 | 58.2 | 49.7 | Cerdeño, (1989) | |
| *S. hemitoechus* | Middle Pleistocene | Grotta Lina | GL206, MPUR | / | 60 | 51 | / | / | / | / | / | Pandolfi & Tagliacozzo, (2015) | |
| *S. hemitoechus* | Middle Pleistocene | Ilford, Essex | 45265, NHML | 188.14 | 58.5 | 49.71 | 51.44 | 18.98 | 58.13 | 50.7 | 44.08 | Schreve, (2001); Pandolfi & Tagliacozzo, (2015) | |
| *S. hemitoechus* | Middle Pleistocene | Clacton, Essex | 27846, NHML | 195.52 | 53.38 | 48.3 | 48.36 | 21.25 | 55.01 | 49.55 | 43.41 | Schreve, (2001); Pandolfi & Tagliacozzo, (2015) | |
| *S. hemitoechus* | Middle or Late Pleistocene | Grays (Thurrock) | 45265, MNHL | 189 | 48.5 | 58.3 | 51 | 19 | 58.5 | 44 | 49.5 | Fortelius et al., (1993) | |
| *S. hemitoechus* | Middle or Late Pleistocene | Ilford, Essex | no number, IAU | / | 43 | 57 | / | 19.7 | / | / | / | Fortelius et al., (1993) | |
| *S. hemitoechus* | Late Pleistocene | Observatorie | / | 188.07 | 60.39 | / | 54.33 | / | 65.86 | 53.66 | 46.1 | Lacombat, (2005) | |
| *S. hemitoechus* | Late Pleistocene | Cova del Gegant | / | 184.3 | 53.6 | 45* | 47.2 | 19.7 | 48.2 | >51 | 44 | Cerdeño, (1989) | |
| *S. hemitoechus* | Late Pleistocene | Valle Radice | P40/12, MNPELP | 208.04 | 58 | 55.95 | 59.65 | 21.26 | 65.5 | 57.8 | 50.33 | Pandolfi & Tagliacozzo, (2015) | |
| *S. hemitoechus* | Late Pleistocene | Valle Radice | P40/13, MNPELP | 199.03 | 55.62 | 54.08 | 54.27 | 21.25 | 61.52 | 55.54 | 47.06 | Pandolfi & Tagliacozzo, (2015) | |
| *S. hemitoechus* | Late Pleistocene | Valle Radice | P2664, MNPELP | / | / | / | 53.4 | 21.5 | 61.8 | 54.54 | 45.84 | Pandolfi & Tagliacozzo, (2015) | |
| *S. hemitoechus* | Late Pleistocene | Cova del Gegant | 18969, MNCN | 183.57 | 52.89 | 44.05 | 46.81 | 19.79 | 51* | 46.97 | 44.42 | Lopez-Garcia et al., (2008); Pandolfi & Tagliacozzo, (2015) | |
| *S. hemitoechus* | Late Pleistocene | Joint Mitnor Cave | PV M 92827, NHML | 183.21 | 60.07 | 46.07 | 51.94 | 22.27 | 62.91 | 53.71 | 44.19 | Stuart, (1995); Schreve, (2001); Pandolfi & Tagliacozzo, (2015) | |
| *S. kirchbergensis* | Middle Pleistocene | Mosbach | 1961/241 , NMM | / | 51.2 | 60* | 60 | 23.2 | / | / | / | Fortelius et al., (1993) | |
| *S. kirchbergensis* | Middle Pleistocene | Mosbach | 1955/520, NMM | 252 | 57.5 | 69 | 61.2 | 26.1 | 78 | 57.7 | 62.1 | Fortelius et al., (1993) | |
| *S. kirchbergensis* | Middle Pleistocene | Mosbach | 1959/299, NMM | / | 60.6 | 71.3 | 66 | 23.2 | / | / | / | Fortelius et al., (1993) | |
| *S. kirchbergensis* | Middle Pleistocene | Mosbach | 1961/71 , NMM | / | 53 | 73* | 62 | 24 | / | / | / | Fortelius et al., (1993) | |
| *S. kirchbergensis* | Middle Pleistocene | Clacton, Essex | 19838, MNHL | / | 56 | 66 | / | 24 | / | / | / | Fortelius et al., (1993) | |
| *S. kirchbergensis* | Middle Pleistocene | Clacton, Essex | 22024, MNHL | 223 | 51.2 | 60 | 59.5 | 21.2 | 72 | 51 | 57 | Fortelius et al., (1993) | |
| *S. kirchbergensis* | Middle Pleistocene | Clacton, Essex | 22024, MNHL | 227 | 53 | 63 | 59 | 21.5 | 73 | 53 | 58* | Fortelius et al., (1993) | |
| *S. kirchbergensis* | Middle Pleistocene | Neumark-Nord | NN50 | / | / | / | / | / | 63.5 | / | 56.3 | van der Made, (2010) | |
| *S. kirchbergensis* | Middle or Late Pleistocene | Grays (Thurrock) | 21286c, MNHL | / | 50 | 62 | 48.5 | 21 | / | / | / | Fortelius et al., (1993) | Juvenile |
| *S. kirchbergensis* | Late Pleistocene | Taubach | IQW 1968/9755 | 204.2 | 63.7 | 53.3 | 53.5 | / | 73.9 | 59.1 | 54.2 | Kahlke, (1977) | |
| *S. kirchbergensis* | Late Pleistocene | Taubach | IQW 1968/10064 | / | 67.8 | / | 55.7 | / | / | / | / | Kahlke, (1977) | |
| *S. kirchbergensis* | Late Pleistocene | Eurogeulgebied Noordzee | CM-DM 140-1 | 220 | 61 | 60 | 59 | 22 | 67 | 58 | 50 | Mol et al., (2012) | |
| *S. kirchbergensis* | Late Pleistocene | Tomsk Provin-ce, Krasniy Yar | PM TSU 5/5197 | 186* | 70 | 50* | 67.5 | | | | | Lobachev et al., (2021) | |
| *S. kirchbergensis* | Late Pleistocene | Krasniy Yar | PM TSU 5/2723 | 229 | 63 | 56.6 | 60.5 | | 80.4 | 64 | 56 | Shpansky & Billia, (2012); Lobachev et al., (2021) | |
| *S. kirchbergensis* | Late Pleistocene | Rybinsk | / | 225 | 80 | 64 | 72 | | 90 | 70 | 64 | Belyaeva, (1940); Lobachev et al., (2021) | |
| *S.* cf. *hundsheimensis* | Early Pleistocene | Pietrafitta | 512, Boldrini Collection | 182 | 49.5 | 43.2 | 43.6 | 16.6 | 51.8 | / | 40.3 | Mazza et al., (1993); Lacombat, (2005) | |
| *S.* cf. *hundsheimensis* | Early Pleistocene | Pietrafitta | 508, Boldrini Collection | 196 | 51 | 46.2 | 45.3 | 19 | 55 | 47.7 | 42 | Mazza et al., (1993); Lacombat, (2005) | |
| *S.* cf. *hundsheimensis* | Early Pleistocene | Pirro Nord | IGF 2909 v, MGPF | / | 52 | 45.7 | 49 | 20.4 | / | / | / | Mazza et al., (1993) | |
| *S.* cf. *hundsheimensis* | Early Pleistocene | Pirro Nord | IGF 2910 v, MGPF | / | / | / | 46.3 | 20.8 | / | / | / | Mazza et al., (1993) | |

Supplementary material 12/13

| Species | Age | Site | Catalogue Number | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Source | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *S. etruscus* | Early Pleistocene | Poggio al Pero, Upper Valdarno | IGF 716, MGPF | 165 | 37 | 37 | 32 | 17 | 42 | 33 | 39 | Fortelius et al., (1993) | |
| *S. etruscus* | Early Pleistocene | Upper Valdarno | IGF 2232 v, MGPF | 169 | 43 | 38 | 39 | 20 | 46 | 35* | 39 | Fortelius et al., (1993) | |
| *S. etruscus* | Early Pleistocene | Olivola, Valle Magra | IGF 1945, MGPF | 176 | 40 | 41 | 36 | 19 | 42 | 36 | 36 | Fortelius et al., (1993) | |
| *S. etruscus* | Early Pleistocene | Olivola, Valle Magra | IGF 1944, MGPF | 157 | 37* | 40 | 35 | 17 | 40 | 32 | 36 | Fortelius et al., (1993) | |
| *S. etruscus* | Early Pleistocene | Olivola, Valle Magra | IGF 1946, MGPF | / | / | / | 34 | 19 | 37 | 34 | 35 | Fortelius et al., (1993) | |
| *S. etruscus* | Early Pleistocene | Olivola, Valle Magra | IGF 1949, MGPF | / | / | / | 39* | / | / | / | / | Fortelius et al., (1993) | |
| *S. etruscus* | Early Pleistocene | Olivola, Valle Magra | IGF 1948, MGPF | / | 36* | 29* | 37* | 12* | / | / | / | Fortelius et al., (1993) | |
| *S. etruscus* | Early Pleistocene | Olivola, Valle Magra | IGF 1936, MGPF | 149* | 38 | 32 | 32 | 21 | 33 | 32* | 34 | Fortelius et al., (1993) | |
| *S. etruscus* | Early Pleistocene | Olivola, Valle Magra | IGF 1947, MGPF | / | 39 | 31* | 36* | 17* | / | / | / | Fortelius et al., (1993) | |
| *S. etruscus* | Early Pleistocene | Casa Inferno, Upper Valdarno | IGF 488 v, MGPF | 161 | 38 | 37 | 30 | 16 | 42 | 33 | 37 | Fortelius et al., (1993) | Juvenile |
| *S. etruscus* | Early Pleistocene | Senèze | 1923-8 | 158 | 39.21 | 37.52 | 35 | 20.72 | 41.6 | 38.14 | 38.4 | Lacombat, (2005) | |
| *S. etruscus* | Early Pleistocene | Crespià | / | 146.6 | 38 | 32.4 | 23.2 | 20 | 35 | 30 | 27 | García-Fernández et al., (2003); Pandolfi & Petronio, (2011) | |
| *S. etruscus* | Early Pleistocene | Capitone | 1500, MPUR | / | 43* | 40.7 | 29 | 25 | 40 | 38 | 37 | Ambrosetti, (1972); Pandolfi et al., (2017) | |
| *S. etruscus* | Early Pleistocene | La Puebla de Valverde | / | 162 | 42 | 32 | 30 | 22 | 38 | 35 | 36 | Guérin & Heintz, (1971); Pandolfi et al., (2017) | |
| *S. etruscus* | Early Pleistocene | La Puebla de Valverde | / | / | 44 | 35 | / | / | / | / | / | Guérin & Heintz, (1971); Pandolfi et al., (2017) | |
| *S. hundsheimensis* | Early Pleistocene | Vallonet | A7 3649 | 153.2 | 39.52 | 37.55 | 33.22 | 20.44 | 45.59 | 38.02 | 39.2 | Lacombat, (2005) | |
| *S. hundsheimensis* | Early Pleistocene | Untermassfeld | IQW 1983/19030 | 176.7 | 43.9 | 43.2 | 33.4 | 21.5 | 41.7 | 38.4 | 41 | Kahlke, (2001) | |
| *S. hundsheimensis* | Early Pleistocene | Untermassfeld | IQW 1980/15413 | 176.8 | 43 | 42.6 | 34.1 | 21.5 | 45 | 42.5 | 43.2 | Kahlke, (2001) | |
| *S. hundsheimensis* | Early Pleistocene | Untermassfeld | IQW 1980/17118 | 175.2 | 38.6 | 41.2 | 31.6 | 19 | / | 35.9 | 41 | Kahlke, (2001) | |
| *S. hundsheimensis* | Early Pleistocene | Untermassfeld | IQW 1982/17954 | 186.3 | 45.5 | 43.9 | 34.5 | 21.9 | 47.3 | 42.7 | 41.8 | Kahlke, (2001) | |
| *S. hundsheimensis* | Early Pleistocene | Untermassfeld | IQW 1985/20 739 | 162.9 | 37.8 | 42.8 | 32.8 | 21 | 41.5 | 38.8 | 40.3 | Kahlke, (2001) | |
| *S. hundsheimensis* | Early Pleistocene | Untermassfeld | IQW 1990/23 612 | 166.2 | 43.3 | 48.4 | 34.8 | 19.8 | 48.4 | 44.9 | 44 | Kahlke, (2001) | |
| *S. hundsheimensis* | Middle Pleistocene | Contrada Monticelli | MSTB - CM 30703 | 186* | 33.6* | 46.9 | / | / | 48.2* | 44.2 | 50.8* | Stefanelli et al., (2024) | |
| *S. hundsheimensis* | Middle Pleistocene | Mosbach | 1959/555 , NMM | 164 | / | 41 | 36 | 23 | / | / | 40.4 | Fortelius et al., (1993) | |
| *S. hundsheimensis* | Middle Pleistocene | Mosbach | 1955/1343, NMM | 176 | 43 | 38.5 | 34.6 | 20 | 42.1 | 34 | 39.6 | Fortelius et al., (1993) | |
| *S. hundsheimensis* | Middle Pleistocene | Mosbach | 1958/644, NMM | 181.3 | 41* | 42* | 37.2 | 22 | 47.1 | 38 | 39.6 | Fortelius et al., (1993) | |
| *S. hundsheimensis* | Middle Pleistocene | Mosbach | 1957/121 , NMM | 172 | 41* | 43 | 35 | 23.1 | 45.5 | 41 | 37.2 | Fortelius et al., (1993) | |
| *S. hundsheimensis* | Middle Pleistocene | Mosbach | 1959/195, NMM | 177.3 | 42.8 | 41.5* | 39 | 23 | 50.2 | 39.1 | 41.2 | Fortelius et al., (1993) | |
| *S. hundsheimensis* | Middle Pleistocene | Mosbach | 1956/606, NMM | / | 44 | 44 | 39.8 | 23.1 | / | / | / | Fortelius et al., (1993) | |
| *S. hundsheimensis* | Middle Pleistocene | Isernia La Pineta | IS I 383 , MNI | / | 42 | 44 | / | / | / | / | / | Fortelius et al., (1993) | |
| *S. hundsheimensis* | Middle Pleistocene | Isernia La Pineta | IS F 382, MNI | / | 41.8 | 44.3 | / | / | / | / | / | Fortelius et al., (1993) | |
| *S. hundsheimensis* | Middle Pleistocene | Isernia La Pineta | IS 28926, MNI | 167 | 45.5 | 44.5 | 33.7 | 22 | 42.2 | 37 | 42 | Fortelius et al., (1993) | |
| *S. hundsheimensis* | Middle Pleistocene | Soleilhac | 2003-4-329-Sol | 181 | 41.92 | / | 37.06 | 17.82 | 47.67 | 44.54 | / | Lacombat, (2005) | |
| *S. hundsheimensis* | Middle Pleistocene | Soleilhac | Sol 124 | 165 | 37.02 | / | 37.17 | 19.67 | 41.82 | 36.37 | 38.45 | Lacombat, (2005) | |
| *S. hundsheimensis* | Middle Pleistocene | Isernia La Pineta | 28926 | 167.1 | 41.9 | 40.5 | 35 | 22.7 | 47.4 | 35.7 | 41.9 | Lacombat, (2005) | |
| *S.* cf. *hundsheimensis* | Early Pleistocene | Westerhoven | RGM 14189 | 147 | 38.8 | 31.7 | 27.2 | 15.5 | 36 | 31.5 | 33.6 | Mazza et al., (1993) | |
| *S.* cf. *hundsheimensis* | Middle Pleistocene | Boxgrove | F 3090, NHML | / | 40 | 41* | / | / | / | / | / | Breda et al., (2010) | Juvenile |
| *S.* cf. *hundsheimensis* | Middle Pleistocene | Boxgrove | F 2455, NHML | / | 45 | 47 | / | / | / | / | / | Breda et al., (2010) | |
| *S.* cf. *hundsheimensis* | Middle Pleistocene | West Runton | M18138, NHML | / | 38 | 43.4 | / | / | / | / | / | Breda et al., (2010) | |
| *S.* cf. *hundsheimensis* | Middle Pleistocene | Pakefield | Mutch no #, NHML | / | 40 | 46 | / | / | / | / | / | Breda et al., (2010) | |
| *S. hemitoechus* | Middle Pleistocene | Caune de l'Arago | I16 4113 | / | 45.44 | 37.6 | / | / | / | / | / | Lacombat, (2005) | |
| *S. hemitoechus* | Middle Pleistocene | Lunel-Viel | LVI-5-684 | 155.2 | 44.8 | 41 | 35.1 | / | 50.4 | 33.7 | 38.8 | Bonifay, (1973); Lacombat, (2005) | |
| *S. hemitoechus* | Middle Pleistocene | Atapuerca | / | / | 36.4 | / | 28.6 | 18 | / | / | / | Cerdeño, (1989) | Juvenile |
| *S. hemitoechus* | Middle Pleistocene | Pinilla Del Valle | / | / | / | 36.2* | / | / | / | / | / | Cerdeño, (1989) | |
| *S. hemitoechus* | Late Pleistocene | Observatorie | / | 170.35 | 47.13 | / | / | / | / | / | / | Lacombat, (2005) | |
| *S. hemitoechus* | Late Pleistocene | Cova del Gegant | / | 155 | 41.2 | 35.5 | 32.8 | 17.8 | 41.8 | 39 | 37.1 | Cerdeño, (1989) | |
| *S. hemitoechus* | Late Pleistocene | Valle Radice | P40/30 MNPELP | 162.5 | 49.12 | 43.16 | 36.55 | 22.68 | 46.05 | 37.85 | 40.94 | Pandolfi &Tagliacozzo, (2015) | |
| *S. hemitoechus* | Late Pleistocene | Valle Radice | P40/14 MNPELP | 163.98 | 49.56 | 43.25 | 35.4 | 22.85 | 46.38 | 39.03 | 41.69 | Pandolfi &Tagliacozzo, (2015) | |
| *S. hemitoechus* | Late Pleistocene | Valle Radice | P40/29 MNPELP | 164.79 | 48.16 | 44.75 | 36.06 | 22.08 | 47.63 | 39.95 | 41.35 | Pandolfi &Tagliacozzo, (2015) | |
| *S. hemitoechus* | Late Pleistocene | Valle Radice | P2665 MNPELP | / | 42.7 | 48.05 | / | / | / | / | / | Pandolfi &Tagliacozzo, (2015) | |
| *S. hemitoechus* | Late Pleistocene | Cucigliana | 6630v IGF | 152.1 | 42.95* | / | 38 | 24.2 | 45.5* | 37.95 | / | Farina, (2011); Pandolfi &Tagliacozzo, (2015) | |
| *S. hemitoechus* | Late Pleistocene | Cova del Gegant | 18968 MNCN | 155 | 41.2 | 35.5 | 32.8 | 17.8 | 42.17 | 37.25 | 37.1 | Lopez-Garcia et al., (2008); Pandolfi &Tagliacozzo, (2015) | |
| *S. kirchbergensis* | Middle Pleistocene | Mosbach | 1956/928, NMM | / | 53.5 | 53 | 44.2 | 24 | / | / | / | Fortelius et al., (1993) | |
| *S. kirchbergensis* | Middle or Late Pleistocene | Novosibirsk Province | IAE TRD-17 | 199 | 55.5 | 52 | 44.5 | / | 56 | / | 51 | Lobachev et al., (2021) | |
| *S. kirchbergensis* | Middle or Late Pleistocene | Novosibirsk Province | IAE TRD-18 | 188.5 | 51 | 51.5 | 40 | / | 52.5 | / | / | Lobachev et al., (2021) | |
| *S. kirchbergensis* | Late Pleistocene | Taubach | IQW 1969/11342 | 182.6 | 46.2 | 49.8 | 37.8 | / | 44.3 | 36.8 | 48* | Kahlke, (1977) | |
| *S. kirchbergensis* | Late Pleistocene | Taubach | IQW 1968/9753 | 188.8 | 48 | / | 36.7 | / | 43.4 | 40.1 | 49.7 | Kahlke, (1977) | |
| *S.* cf. *hundsheimensis* | Early Pleistocene | Pietrafitta | 840, Boldrini Collection | 150 | 38 | 35.2 | 29 | 16.6 | 37 | 35.3 | 33 | Mazza et al., (1993); Lacombat, (2005) | |
| *S.* cf. *hundsheimensis* | Early Pleistocene | Pirro Nord | IGF 2919 v, MGPF | / | / | / | 32.6 | 19 | 36.1 | 34 | 37.8 | Mazza et al., (1993) | |
| *Stephanorhinus* sp. | Early Pleistocene | Tsiotra Vryssi | TSR–F18–67 | / | 44.71 | 41.61 | / | 21.5 | / | / | / | Chitoglou et al., (2025) | |

Tab. 12 - Data used to build scatterplot for the fourth metacarpal. The measurements given are in mm; those marked with * are estimated.

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