

SUPPLEMENTARY INFORMATION

The largest theropod track site in Yunnan, China: a footprint assemblage from the Lower Jurassic Fengjiahe Formation

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Table S1. Measurements of the tridactyl tracks from the Xiyang track site

Table S2. Preservation scale

Table S3. Specimen numbers and measurements of theropod ichnospecies holotypes from the Jurassic of China

Table S4. Comparison of morphotype A with theropod ichnospecies reported from the Fengjiahe Formation

Table S5. Calculated hip heights and body lengths for the 3 morphotypes



Figure S1. Lower-Middle Jurassic boundary relative to the Xiyang track site. The car in the green square indicates scale.

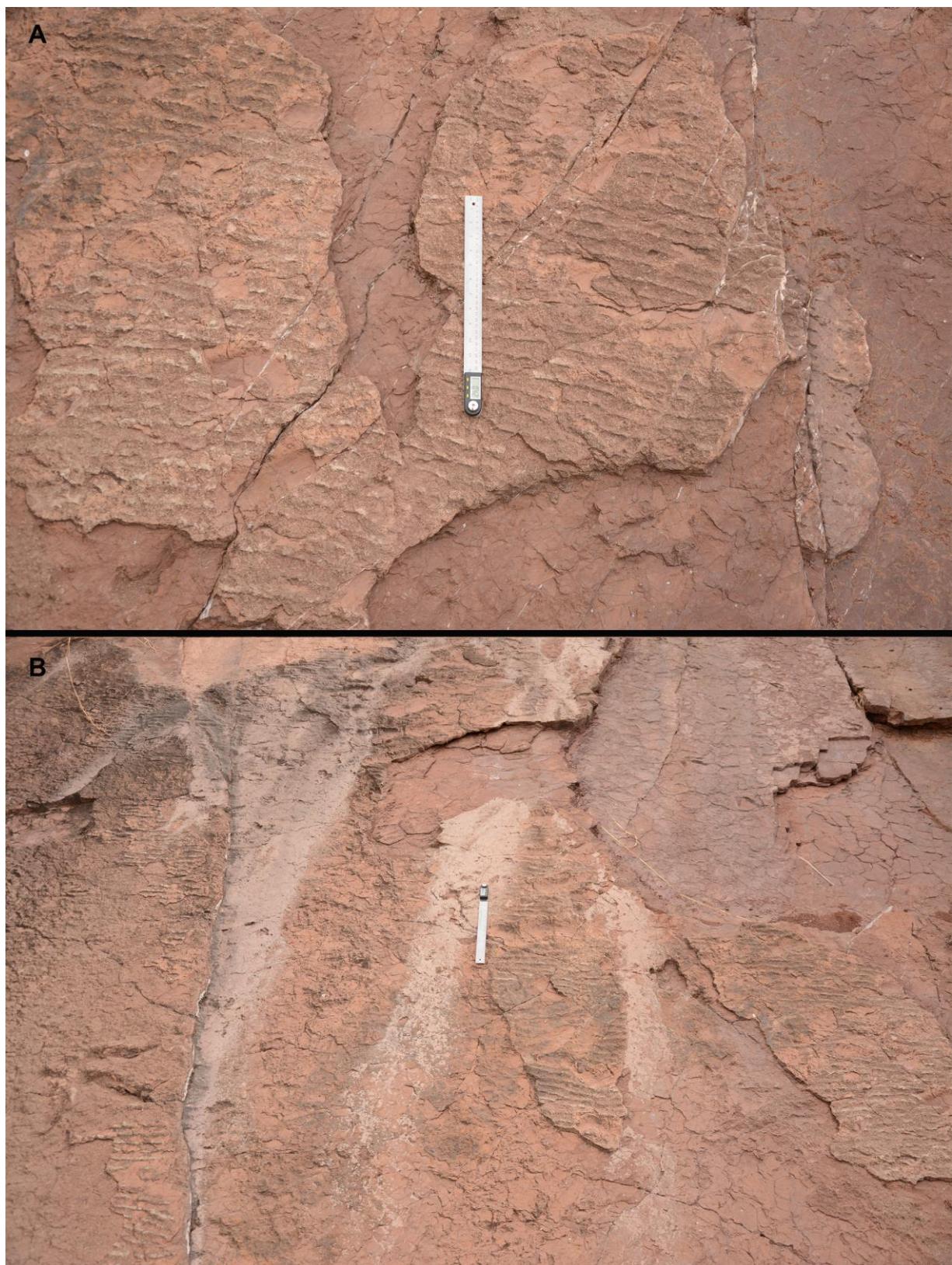


Figure S2. Ripple marks on the layers of the Xiyang track site. Scale bar is 30 cm.

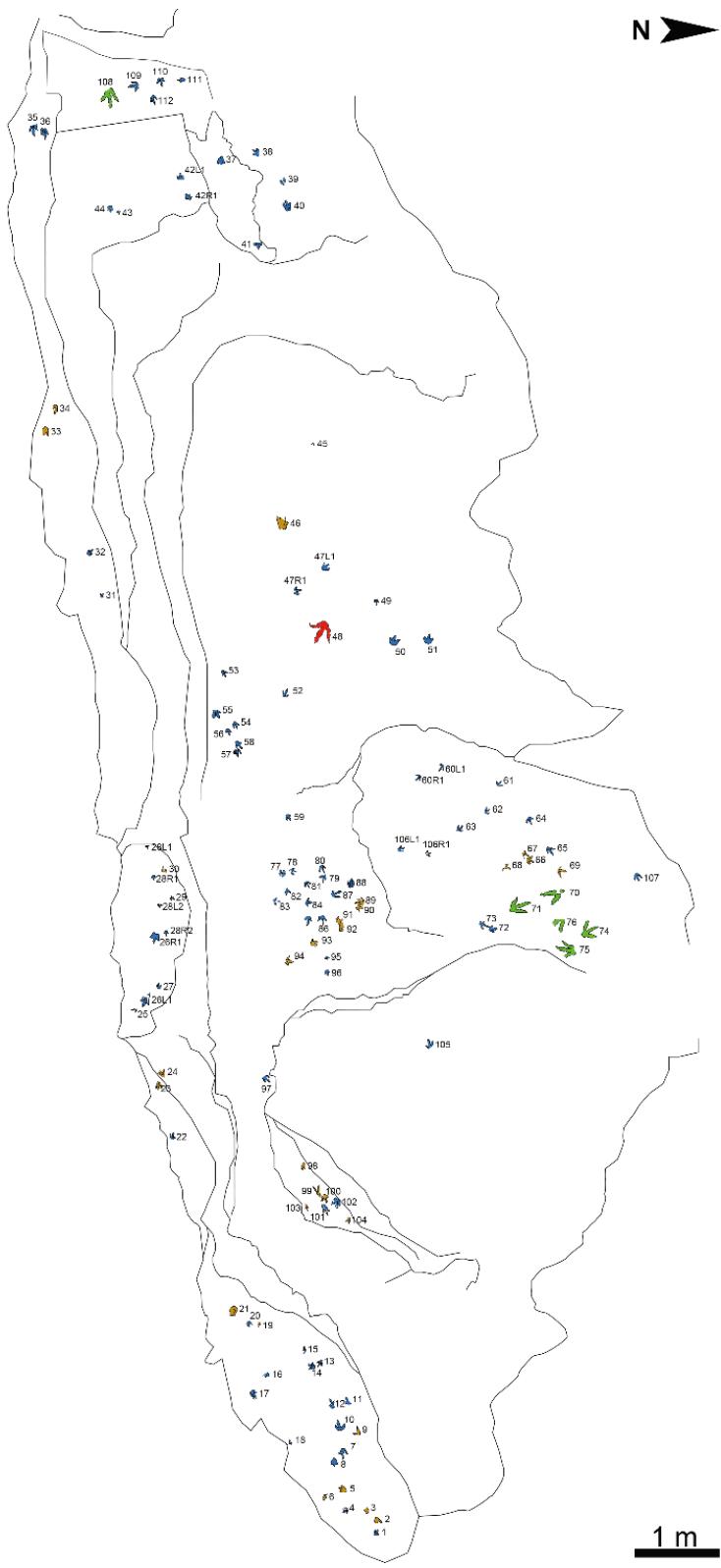


Figure S3. Overview of the Xiyang track site. Outline drawing showing the distribution and catalogue number of the tracks. Morphotypes A, B and C are painted in blue, green, and red, respectively; unidentified tracks appear in brown.

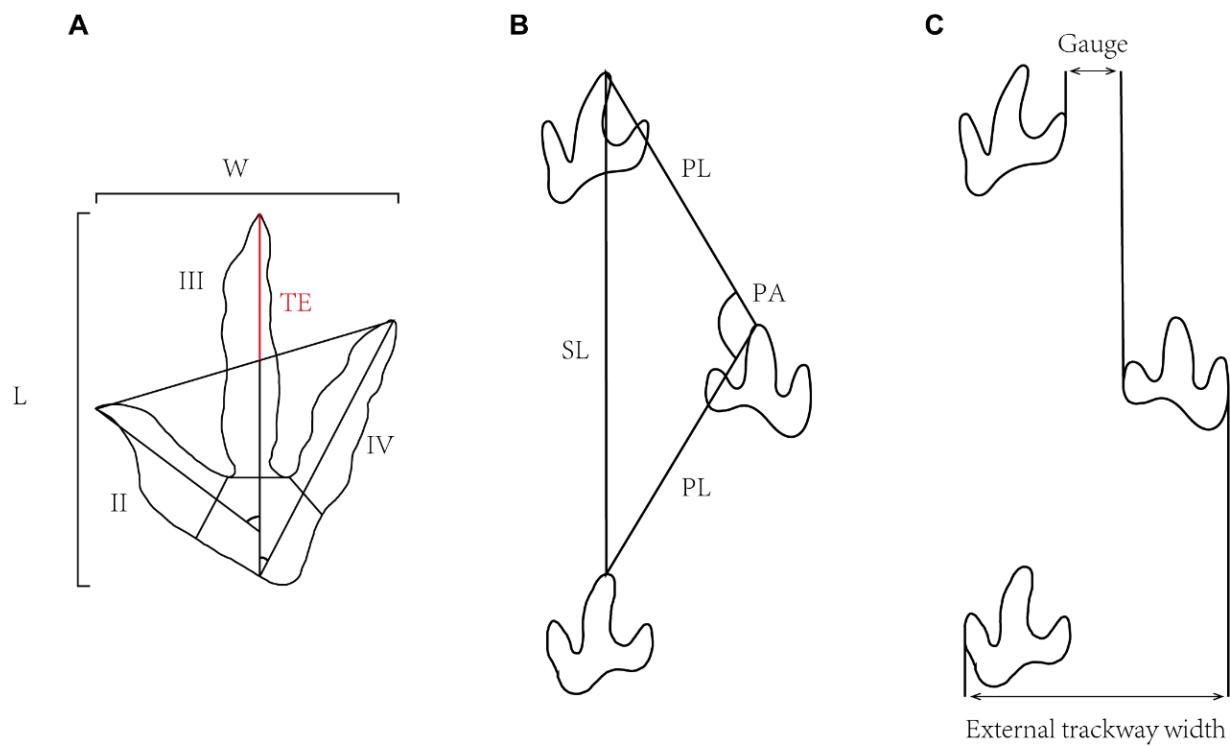


Figure S4. Measurement guidelines. (A) Measurements for isolated tracks. The track displayed is XIY-071(Morphotype B). (B-C) Measurements for trackways and track associations. Drawings from Thulborn (1990).

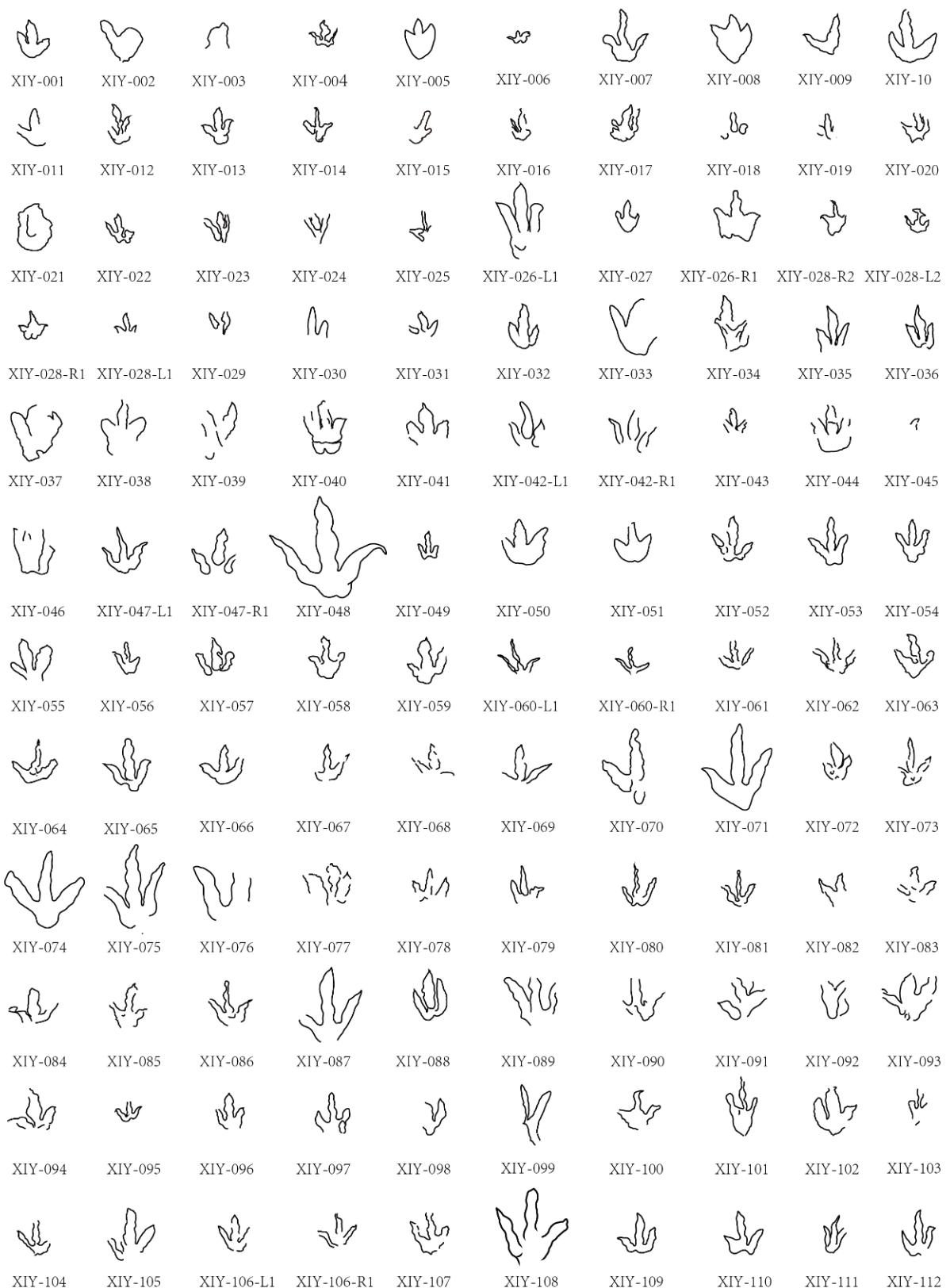


Figure S5. Interpretative outline drawings of all tridactyl dinosaur tracks from the Xiyang track site. Scale bar is 10 cm.

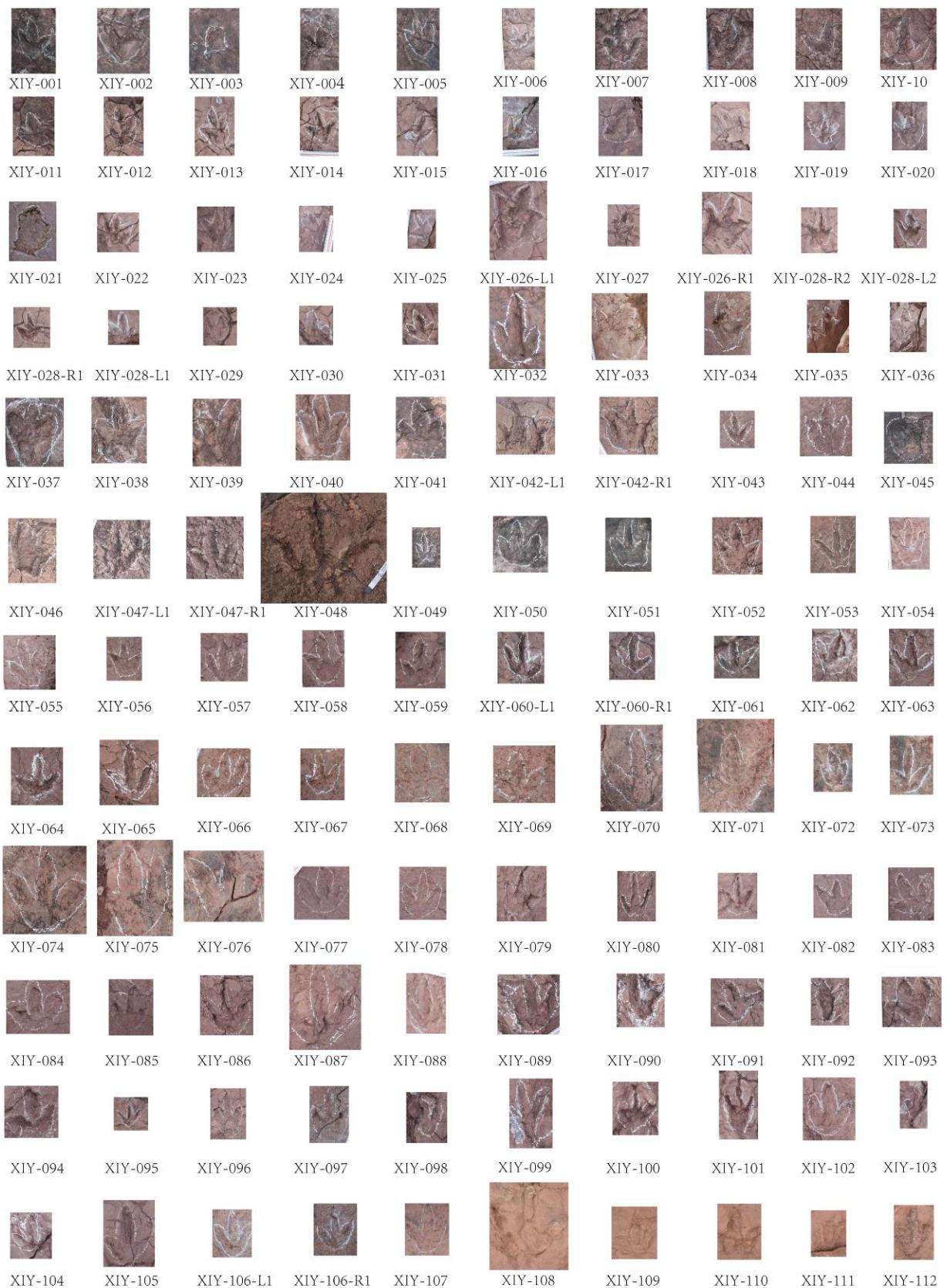


Figure S6. Photographs of all tridactyl dinosaur tracks from the Xiyang track site. Scale bar is 10 cm.

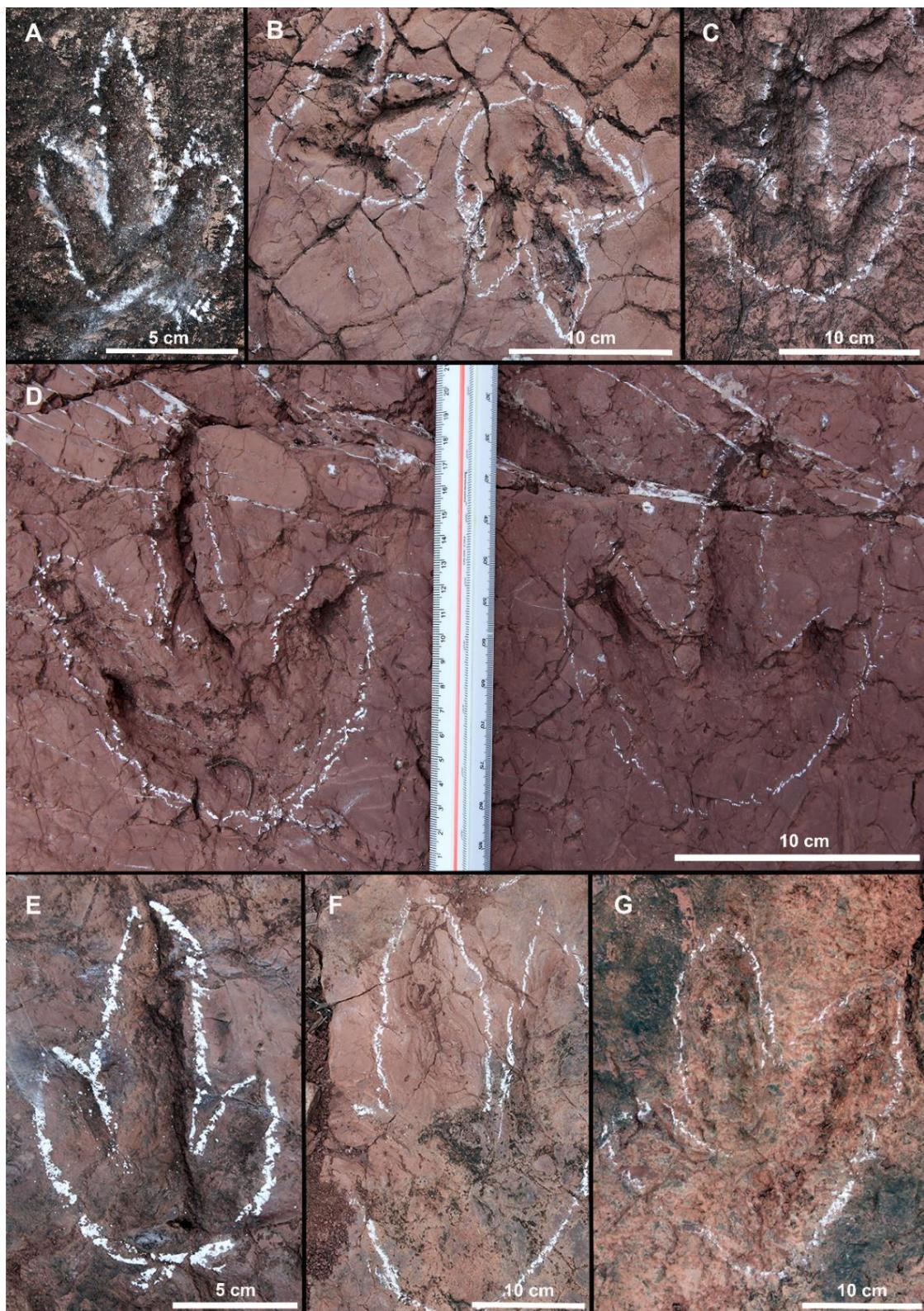


Figure S7. Photographs of some of the well-preserved tracks from the Xiyang track site.

(A-E) Tracks referred to morphotype A (from A to E: XIY-049, 013 & 014, 007, 085 & 086, 032). (F-G) Tracks referred to morphotype B (XIY-075 and 071).

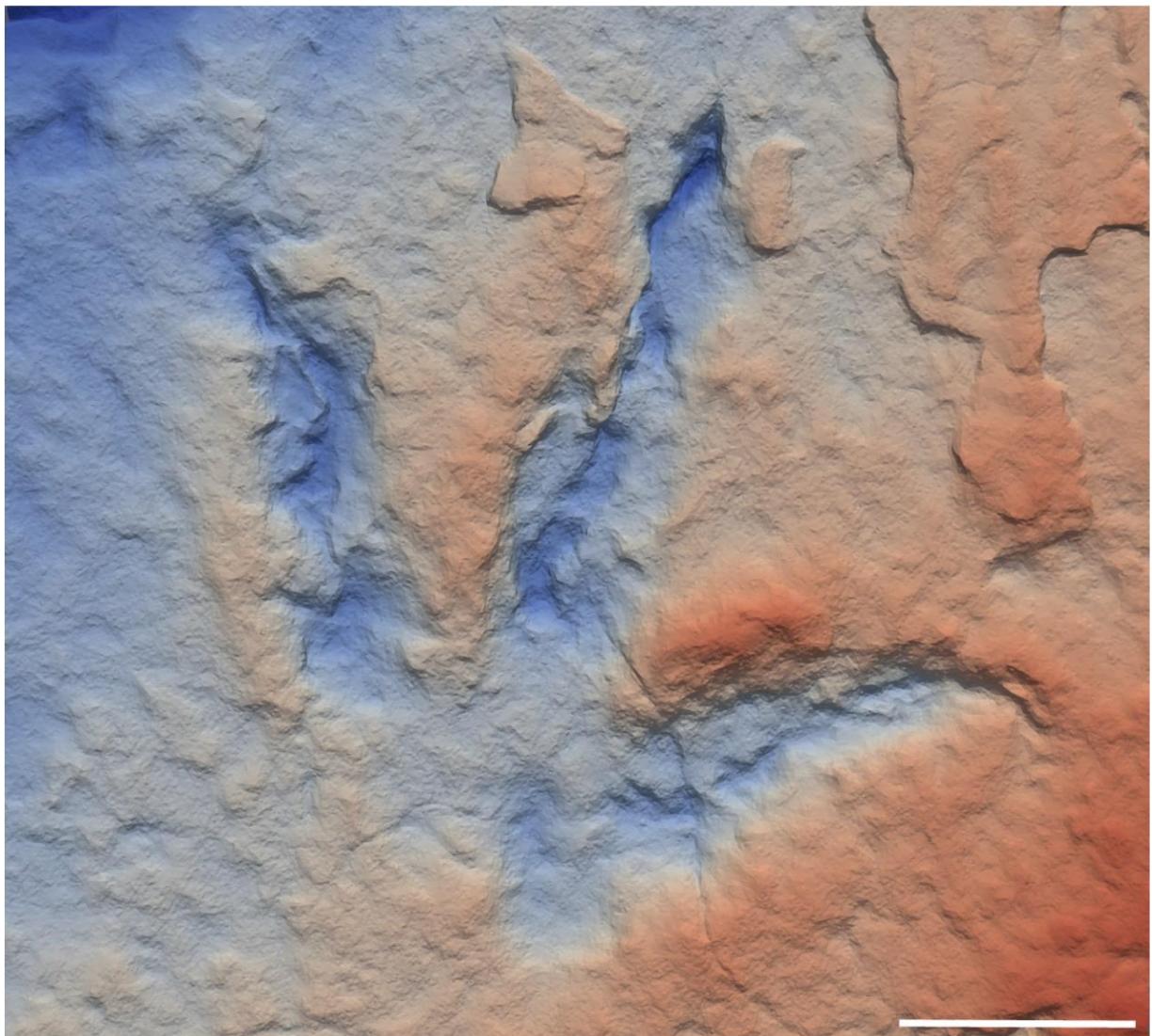


Figure S8. False-color depth map of track XIY-048 (morphotype C). Scale bar is 10 cm.

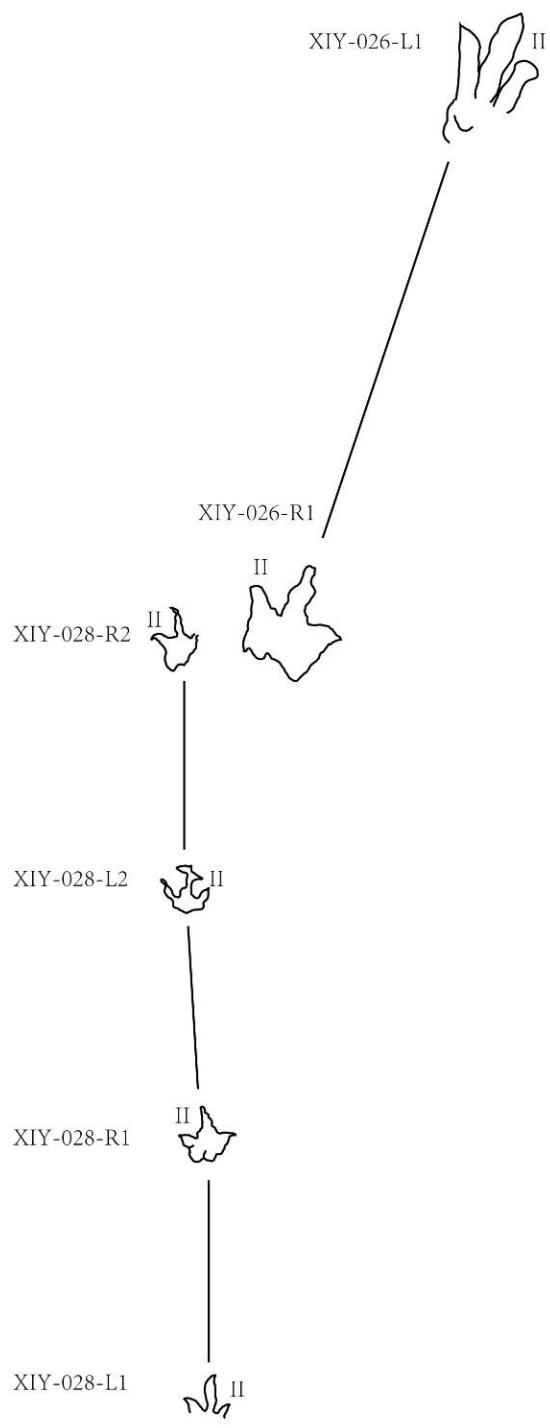


Figure S9. Photograph and interpretative outline drawing of track association 1 (XIY-026-R1 & L1) & trackway 1 (XIY-028-L1, R1, L2, & R2). Scale bar is 20 cm.

Abbreviations: L= left pes, R= right pes.

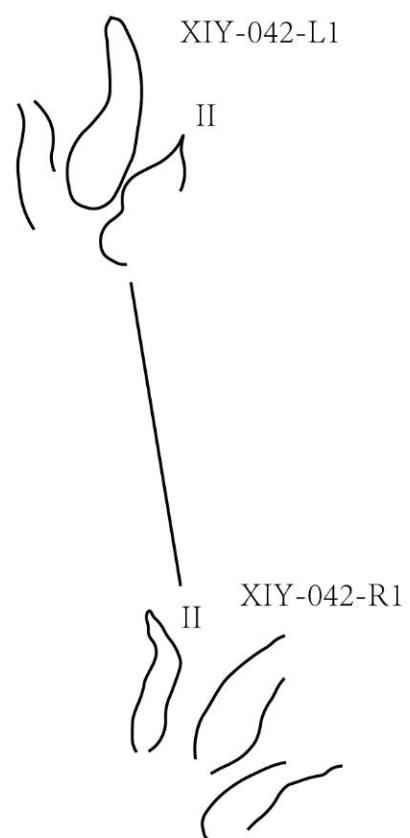


Figure S10. Photograph and interpretative outline drawing of track association 2 (XIY-042-R1 & L1). Scale bar is 20 cm. Abbreviations: L= left pes, R= right pes.

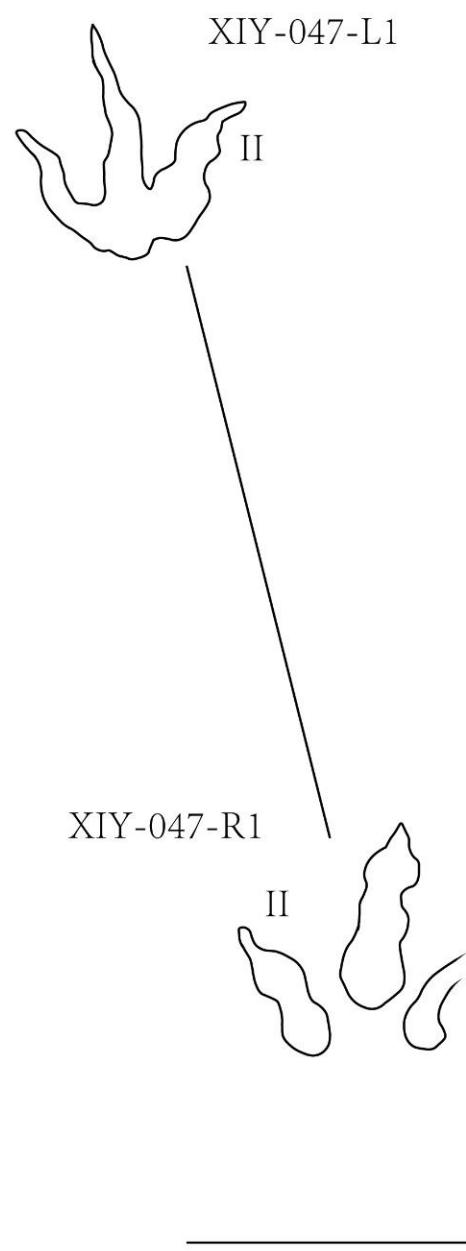


Figure S11. Photograph and interpretative outline drawing of track association 3 (XIY-047-R1 & L1). Scale bar is 20 cm. Abbreviations: L= left pes, R= right pes.

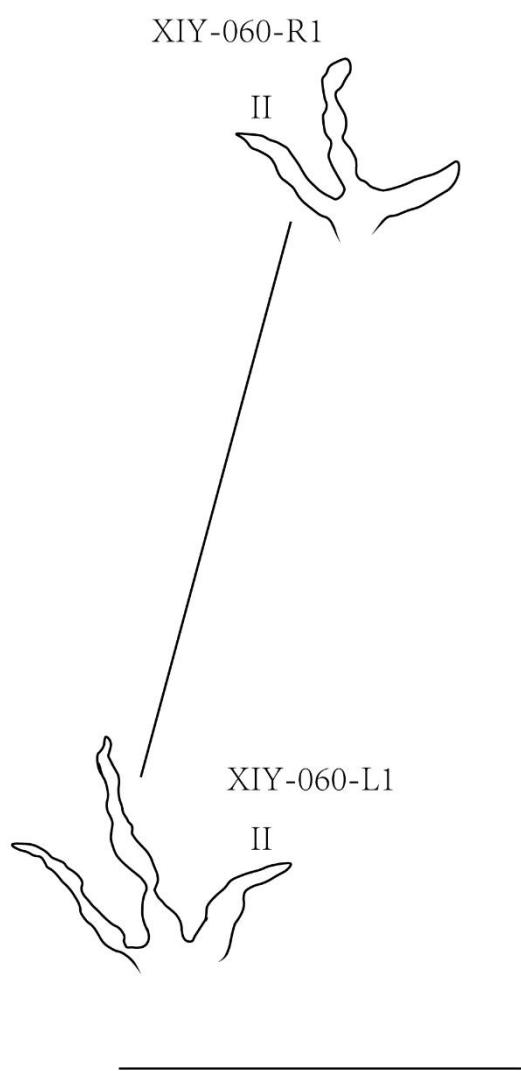
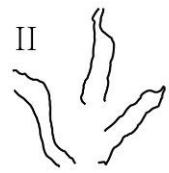


Figure S12. Photograph and interpretative outline drawing of track association 4 (XIY-060-L1 & R1). Scale bar is 20 cm. Abbreviations: L= left pes, R= right pes.



XIY-106-R1



XIY-106-L1

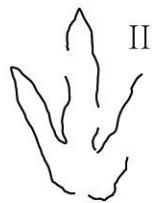


Figure S13. Photograph and interpretative outline drawing of track association 5 (XIY-

106-L1 & R1). Scale bar is 20 cm. Abbreviations: L= left pes, R= right pes.

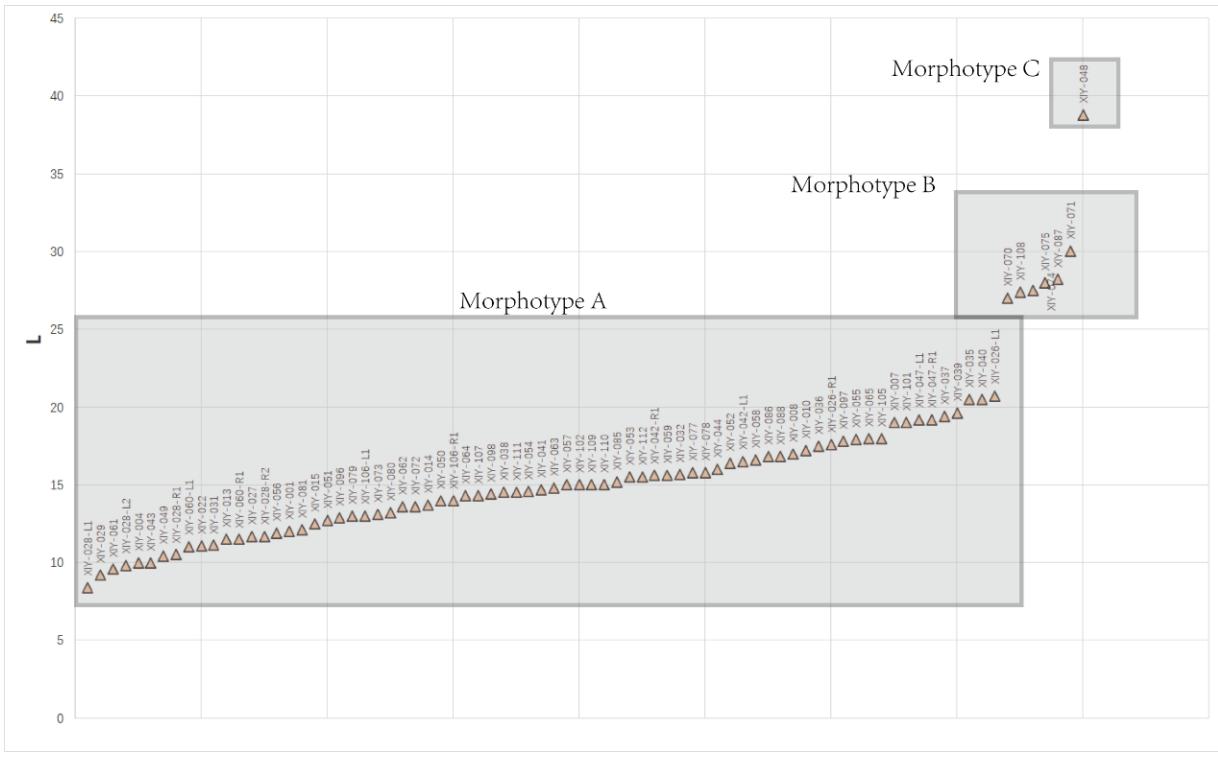


Figure S14. Graph of the lengths of all the most complete footprints. Tracks assigned to morphotype A are forming a continuum and clear gaps are visible between each morphotype.

Table S1. Measurements of the tridactyl tracks from the Xiyang track site. Abbreviations following the order of the table: M: Morphotype; L: maximum length (cm); W: maximum width (cm); LD: length of digit (cm); II-III to II-IV: angle between respective digits (degrees); PL: pace length (cm); SL: stride length (cm); PA: pace angulation (cm); L/W: length over width ratio; PR: projection ratio following Li, 2015 (p. 9); CPR: “corrected” projection ratio following Olsen, Smith & McDonald, 1998 (p. 586); LR: layer; *: incomplete; -: unavailable.

| Number | M | L | W | LD II | LD III | LD IV | II- III | III- IV | II- IV | P L | S L | P A | L/ W | PR | CP R | L R |
|---------|---|------|------|----------|-----------|----------|------------|------------|-----------|--------|--------|--------|---------|----|---------|--------|
| XIY-002 | - | - | 14* | - | - | - | - | - | - | - | - | - | - | - | - | 4 |
| XIY-003 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 4 |
| XIY-005 | - | - | 10.5 | - | 5* | - | - | - | - | - | - | - | - | - | - | 4 |
| XIY-006 | - | - | 7.6 | - | - | - | - | - | - | - | - | - | - | - | - | 4 |
| XIY-009 | - | 12.5 | * | - | - | - | - | - | - | - | - | - | - | - | - | 4 |
| XIY-011 | - | 12.8 | - | - | 6.8 | 6.4* | - | - | - | - | - | - | - | - | - | 4 |
| XIY-012 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 4 |
| XIY-016 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 4 |
| XIY-019 | - | - | - | - | 6.2* | - | 57* | - | - | - | - | - | - | - | - | 4 |
| XIY-021 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 4 |
| XIY-023 | - | - | 9.8* | - | - | - | - | - | - | - | - | - | - | - | - | 4 |
| XIY-024 | - | 10.1 | - | - | 5.3* | - | - | - | - | - | - | - | - | - | - | 4 |
| XIY-025 | - | 9.8* | - | 3.6 | 4.7* | - | 56 | - | - | - | - | - | - | - | - | 4 |
| XIY-030 | - | 10.7 | * | - | - | 9.9* | - | - | - | - | - | - | - | - | - | 4 |
| XIY-033 | - | 19* | - | - | - | 10* | - | - | - | - | - | - | - | - | - | 4 |
| XIY-034 | - | 21 | - | - | 11.3 | 8.9* | - | 35 | - | - | - | - | - | - | - | 4 |
| XIY-045 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 3 |
| XIY-046 | - | 17 | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 |
| XIY-066 | - | - | 13.9 | 7.6 | 8.6* | 8.3 | 56 | 21 | 77 | - | - | - | - | - | - | 2 |
| XIY-067 | - | 12.6 | - | 5.6 | 7.7 | - | 33 | 39 | 72 | - | - | - | - | - | - | 2 |
| XIY-068 | - | - | - | - | - | - | 30 | 30 | 60 | - | - | - | - | - | - | 2 |
| XIY-069 | - | - | 16* | - | - | - | 47* | 29* | 76* | - | - | - | - | - | - | 2 |
| XIY-082 | - | 11* | - | 7.1 | 7.7* | - | 38 | - | - | - | - | - | - | - | - | 2 |
| XIY-083 | - | 12.2 | * | - | 4.8 | 7.9* | 5.6 | - | - | - | - | - | - | - | - | 2 |
| XIY-084 | - | 12.7 | * | - | 6.4 | 9.2 | - | 26 | 24 | 50 | - | - | - | - | - | 2 |

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|-------------------|---|-----------|-----------|------|-----------|-------|----|----|----|----|---|---|----------|----------|----------|---|
| XIY-089 | - | - | 10.8 * | 7.74 | - | 9.2 | 19 | 19 | 38 | - | - | - | - | - | - | 2 |
| XIY-090 | - | - | 16* | 9.2 | - | 11.2* | 23 | 17 | 40 | - | - | - | - | - | - | 2 |
| XIY-091 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 |
| XIY-092 | - | 13.1 | - | 5 | 8.6 | - | 23 | - | - | - | - | - | - | - | - | 2 |
| XIY-093 | - | 16.2 * | - | 9 | 8.2* | - | 34 | 26 | 60 | - | - | - | - | - | - | 2 |
| XIY-094 | - | - | 17.9 | 8.5 | 11.2 | 7.1* | 39 | 32 | 71 | - | - | - | - | - | - | 2 |
| XIY-099 | - | 19.8 * | - | - | 10.2 * | 8.9* | - | 31 | - | - | - | - | - | - | - | 2 |
| XIY-100 | - | - | 13* | - | 9.6* | - | 22 | 34 | 56 | - | - | - | - | - | - | 2 |
| XIY-103 | - | 10.2 * | - | 4.3 | 7 | - | 22 | - | - | - | - | - | - | - | - | 2 |
| XIY-104 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 |
| XIY-001 | A | 12 | 10 | 4.5 | 8.2 | 5.8 | 37 | 25 | 62 | - | - | - | 1.2 | 1.6 | 1.5 | 4 |
| XIY-004 | A | 10 | 7.7 | 3.8 | 6.7 | 5 | 26 | 27 | 53 | - | - | - | 1.3 | 1.6 | 1.8 7 | 4 |
| XIY-007 | A | 19 | 16 | 6.4 | 13.0 * | 8.8 | 24 | 27 | 51 | - | - | - | 1.1 9 | 1.2 | 1.3 1 | 4 |
| XIY-008 | A | 17.0 * | 12 | 7.7 | 10.2 | 8.1 | 21 | 21 | 42 | - | - | - | - | 2.3 | - | 4 |
| XIY-010 | A | 17.2 | 15.8 | 6.6 | 11.8 | 6.6 | 18 | 40 | 58 | - | - | - | 1.0 9 | 1.3 0 | 1.6 0 | 4 |
| XIY-013 | A | 11.5 | 10.8 | 5.7 | 8.0 | 5.3 | 22 | 41 | 63 | - | - | - | 1.0 6 | 1.3 4 | 1.2 9 | 4 |
| XIY-014 | A | 13.7 | 10.5 | 6.8 | 9.3 | 7.2 | 15 | 33 | 48 | - | - | - | 1.3 0 | 1.9 0 | 1.6 2 | 4 |
| XIY-015 | A | 12.5 | - | - | 7.3 | - | - | 25 | - | - | - | - | - | - | - | 4 |
| XIY-017 | A | 10.6 * | 9.6* | - | - | - | 16 | 16 | 32 | - | - | - | 1.1 0 | - | - | 4 |
| XIY-018 | A | 12 | - | 6.8* | 6* | - | 25 | - | - | - | - | - | - | - | - | 4 |
| XIY-020 | A | 9.5 | 8.4 | - | - | - | - | - | - | - | - | - | 1.1 3 | - | - | 4 |
| XIY-022 | A | 11.1 * | 10.8 | 4.7 | 6.7* | 6 | 22 | 27 | 49 | - | - | - | 1.0 2 | 1.4 0 | 1.0 1 | 4 |
| XIY-026-R1 | A | 17.6 * | 15.4 | 5.6 | 9.3* | 5.1 | 27 | 25 | 52 | 94 | - | - | 1.1 4 | 0.9 8 | 2.8 5 | 4 |
| XIY-026-L1 | A | 20.7 | 15 | 10 | 16.5 | 15 | 9 | 15 | 24 | 94 | - | - | 1.3 8 | 1.8 0 | 2.0 8 | 4 |
| XIY-027 | A | 11.7 | 7.9 | 2.2 | 5.3 | 2.6* | 24 | 25 | 49 | - | - | - | 1.4 8 | 2.0 0 | 1.7 0 | 4 |

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|-----------------|---|------|------|------|------|-------|------|----|----|----|----|----|-----|-----|-----|-----|---|
| XIY-028- | | | | | | | | | | | | | | | | | |
| L1 | A | 8.4* | 7.2 | - | 7.2* | - | 22 | 27 | 49 | - | - | - | 1.1 | - | - | 4 | |
| XIY-028- | | | | | | | | | | | | | 7 | - | - | | |
| R1 | A | 10.5 | * | 9.2 | 5.1 | 6.5 | 5.9 | 28 | 15 | 43 | 43 | - | 17 | 1.1 | - | 4 | |
| XIY-028- | | | | | | | | | | | | | 6 | 4 | - | | |
| L2 | A | 9.8* | 8.3 | 4.2 | 5.7* | 5.3 | 24 | 20 | 44 | 41 | 84 | 17 | 1.1 | 1.5 | 0.9 | 4 | |
| XIY-028- | | | | | | | | | | | | 5 | 8 | 8 | 8 | | |
| R2 | A | 11.7 | 9 | 5 | 6 | 4.5 | 22 | 28 | 50 | 42 | 85 | - | 1.3 | 1.3 | 2.1 | 4 | |
| XIY-029 | A | 9.2* | 7.7 | - | 3.4* | 4.4 | 20 | 30 | 50 | - | - | - | 1.1 | - | - | 4 | |
| XIY-031 | A | 11.1 | * | 9.6 | 4.6 | 7.8 | 5.2 | 44 | 44 | 88 | - | - | 1.1 | 1.7 | 3.7 | 4 | |
| XIY-032 | A | 15.7 | 9.8 | 5.7 | 11.3 | 6.3 | 18 | 18 | 36 | - | - | - | 1.6 | 1.4 | 1.5 | 4 | |
| XIY-035 | A | 20.5 | 11.3 | 11.2 | 15.1 | | 35 | - | - | - | - | - | 1.8 | - | - | 4 | |
| XIY-036 | A | 13.7 | 7.7 | 6.4 | 11.4 | 6.7 | 11 | 13 | 24 | - | - | - | 1.7 | - | 1.1 | 4 | |
| XIY-037 | A | 19.4 | 15.3 | 7.4 | 11.3 | 11.8 | 23 | 19 | 42 | - | - | - | 1.2 | - | - | 4 | |
| XIY-038 | A | 14.5 | * | 11.8 | 6.7 | 11.7 | 6.3 | 23 | 19 | 42 | - | - | 1.2 | 1.4 | 1.5 | 4 | |
| XIY-039 | A | 19.6 | * | - | 12 | 15.4 | * | 30 | - | - | - | - | 3 | 0 | 5 | 4 | |
| XIY-040 | A | 20.5 | 15 | 8.3 | 13.2 | 9.2 | 20 | 17 | 37 | - | - | - | 1.3 | 2.2 | 1.6 | 4 | |
| XIY-041 | A | 14.7 | * | 14.7 | 6.6 | 12.2 | 8 | 30 | 20 | 50 | - | - | 0 | - | - | 4 | |
| XIY-042- | | | | | | | | | | | | | | | | | |
| R1 | A | 15.6 | * | 14.6 | 8.6 | 9.4* | 8.3* | 16 | 22 | 38 | 46 | - | - | 1.0 | - | - | 4 |
| XIY-042- | | | | | | | | | | | | | 7 | - | - | | |
| L1 | A | 16.5 | 11.2 | 9.4 | 13.6 | 10.9* | 15 | 14 | 29 | - | - | - | 1.4 | 1.2 | 1.4 | 4 | |
| XIY-043 | A | 10* | - | 4.5* | 7* | - | 30 | 31 | 61 | - | - | - | 7 | 9 | 6 | 4 | |
| XIY-044 | A | 16 | 12 | 7.5 | 11.5 | 8 | 17 | 19 | 36 | - | - | - | 1.3 | - | - | 4 | |
| XIY-047- | | | | | | | | | | | | | | | | | |
| R1 | A | 19.2 | 17.2 | * | 8.7 | 12.2 | 9.7* | 39 | 25 | 64 | 58 | - | - | 1.1 | - | 2.6 | 3 |
| XIY-047- | | | | | | | | | | | | | 2 | - | 9 | | |
| L1 | A | 19.2 | * | 18.7 | 6.2 | 10.4 | 9.9 | 32 | 33 | 65 | - | - | - | 1.0 | 1.2 | 3.4 | 3 |
| XIY-049 | A | 10.4 | 6.6 | 4.9 | 7.4 | 5.2* | 17 | 18 | 35 | - | - | - | 8 | 1.2 | 1.4 | 3 | |
| XIY-050 | A | 14 | 13 | 5.8 | 8.7 | 5.7 | 24 | 21 | 45 | - | - | - | 1.0 | 1.6 | 2.0 | 3 | |

| | | | | | | | | | | | | | | | | 8 | 0 | 8 |
|-------------------|---|-----------|-----------|------|-----------|------|----|----|-----|----|---|---|----------|----------|----------|---|---|---|
| XIY-051 | A | 12.7 * | 11.8 | 4.3 | 6.6 | 4.6 | 21 | 26 | 47 | - | - | - | 1.0 8 | 1.5 4 | 1.6 1 | 3 | | |
| XIY-052 | A | 16.4 | 15 | 9 | 12.3 | 12.4 | 48 | 26 | 74 | - | - | - | 1.0 9 | 1.0 0 | 1.7 6 | 2 | | |
| XIY-053 | A | 15.5 | 12.7 | 7.5 | 10.5 | 8.8 | 20 | 40 | 60 | - | - | - | 1.2 2 | 1.5 0 | 2.0 1 | 3 | | |
| XIY-054 | A | 14.6 | 10.8 | 5.6 | 8.5 | 5.8 | 27 | 20 | 47 | - | - | - | 1.3 5 | 2.6 5 | 2.8 0 | 2 | | |
| XIY-055 | A | 17.9 * | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 | |
| XIY-056 | A | 11.9 * | 9.5 | 9 | 7.7* | 12.5 | 21 | 21 | 42 | - | - | - | 1.2 5 | 1.9 0 | 2.1 0 | 2 | | |
| XIY-057 | A | 15* | 13 | 8.6 | 11.4 | 8.6 | 16 | 16 | 32 | - | - | - | 1.1 5 | - | - | - | 2 | |
| XIY-058 | A | 16.6 | 13 | 6.2 | 9.6 | 7 | 18 | 34 | 52 | - | - | - | 1.2 8 | 1.6 3 | 1.7 5 | 2 | | |
| XIY-059 | A | 15.6 | 13.2 | 5 | 10.9 | 6 | 28 | 24 | 52 | - | - | - | 1.1 8 | 1.6 4 | 2.3 9 | 2 | | |
| XIY-060-L1 | A | 11* | 9.6 | 4.6 | 7.8 | 6 | 46 | 20 | 66 | 44 | - | - | 1.1 5 | 0.8 5 | 1.1 2 | 2 | | |
| XIY-060-R1 | A | 11.5 * | 11 | 4.4 | 10 | 6.6 | 34 | 77 | 111 | - | - | - | 1.0 5 | 1.2 5 | 2.4 8 | 2 | | |
| XIY-061 | A | 9.6* | 11.3 6 | 4.2 | 7.4* | 5.8 | 27 | 43 | 70 | - | - | - | 0.8 5 | 1.4 0 | 2.1 4 | 2 | | |
| XIY-062 | A | 13.6 * | 13.2 | 7.6 | 10.6 * | 6.3 | 35 | 35 | 70 | - | - | - | 1.0 3 | 2.4 0 | 2.2 2 | 2 | | |
| XIY-063 | A | 14.8 * | 13 | 5.3 | 9.5 | 7 | 37 | 33 | 70 | - | - | - | 1.1 4 | 1.5 1 | 3.8 2 | 2 | | |
| XIY-064 | A | 14.3 * | 15 | 5.9 | - | 5.7 | 49 | 45 | 94 | - | - | - | 0.9 5 | - | - | - | 2 | |
| XIY-065 | A | 18 | 15 | 8 | 14.3 | 9.4 | 18 | 23 | 41 | - | - | - | 1.2 0 | 1.3 3 | 1.3 8 | 2 | | |
| XIY-072 | A | 13.6 | 9.4 | 4.8 | 7.1 | 3.9* | 28 | 20 | 48 | - | - | - | 1.4 5 | 1.4 7 | 1.3 0 | 2 | | |
| XIY-073 | A | 13.1 | 9.9* | 4.1* | 9.4 | 3.4* | 39 | 23 | 62 | - | - | - | 1.3 2 | - | - | - | 2 | |
| XIY-077 | A | 15.8 * | 13.4 | 7.6 | 10 | 9.6 | 16 | 23 | 39 | - | - | - | 1.1 8 | 1.6 7 | 1.9 4 | 2 | | |
| XIY-078 | A | 15.8 * | 16 | 7 | 10.2 * | 13.4 | 21 | 29 | 50 | - | - | - | 0.9 9 | - | - | - | 2 | |
| XIY-079 | A | 13* | 11 | 5.6 | 7.6 | 6.6 | 20 | 18 | 38 | - | - | - | 1.1 | 1.1 | 1.3 | 2 | | |

| | | | | | | | | | | | | | | 8 | 7 | 1 | |
|-------------------|---|-----------|-----------|------|------|-------|----|----|----|----|---|---|---|----------|----------|----------|---|
| XIY-080 | A | 13.2 * | 11 | 5.2 | 9.6 | 7.2 | 22 | 24 | 46 | - | - | - | - | 1.2 0 | 1.2 3 | 1.4 6 | 2 |
| XIY-081 | A | 12.1 | 9.6 | 5 | 9 | 5.6 | 27 | 31 | 58 | - | - | - | - | 1.2 6 | 1.5 2 | 1.9 0 | 2 |
| XIY-085 | A | 15.2 * | 11.7 * | 4.4 | 10.9 | 6.6* | 40 | 37 | 77 | - | - | - | - | 1.3 | - | - | 2 |
| XIY-086 | A | 16.8 | 13 | 5.8 | 10.5 | 8.2 | 37 | 22 | 59 | - | - | - | - | 1.2 9 | 1.5 1 | 1.8 6 | 2 |
| XIY-088 | A | 16.8 | 14.2 | 7.1 | 12.7 | 8.3 | 17 | 16 | 33 | - | - | - | - | 1.1 8 | 1.8 4 | 1.5 5 | 2 |
| XIY-095 | A | - | 8.4* | 3.8 | 4.3 | 3.6* | 34 | 31 | 65 | - | - | - | - | - | - | - | 2 |
| XIY-096 | A | 12.9 | 9.1 | 6.7 | 9.6 | 7.4 | 16 | 17 | 33 | - | - | - | - | 1.4 2 | 1.6 5 | 1.4 8 | 2 |
| XIY-097 | A | 17.8 | 11.5 | 8.4 | 9.8 | 9.2* | 25 | 21 | 46 | - | - | - | - | 1.5 5 | 1.8 2 | 2.5 8 | 2 |
| XIY-098 | A | 14.4 * | - | - | 8.8 | 1.8* | - | 23 | - | - | - | - | - | - | - | - | 2 |
| XIY-101 | A | 19 | 9 | 6.3 | 10.9 | 7.6 | 19 | 16 | 35 | - | - | - | - | 2.1 1 | 2.1 6 | 1.8 0 | 2 |
| XIY-102 | A | 15* | 13 | 6.3 | 9.6 | 7.6 | 22 | 24 | 46 | - | - | - | - | 1.1 5 | 2.0 0 | 2.0 7 | 2 |
| XIY-105 | A | 18* | 15.6 | 4.6 | 10 | 7.8 | 41 | 31 | 72 | - | - | - | - | 1.1 5 | 1.5 7 | 2.4 1 | 1 |
| XIY-106-L1 | A | 13 | 7.7* | - | 9.6 | 9.3 | 30 | 21 | 51 | 42 | - | - | - | 1.6 9 | - | - | 1 |
| XIY-106-R1 | A | 14 | 12 | 5.6 | 11.3 | 7.3 | 42 | 32 | 74 | - | - | - | - | 1.1 7 | 1.5 0 | 1.4 0 | 1 |
| XIY-107 | A | 14.3 * | 12.7 | 7.3* | 10* | 10.5* | 31 | 15 | 46 | - | - | - | - | 1.1 3 | 1.2 7 | 1.6 0 | 2 |
| XIY-109 | A | 15 | 14 | 8 | 9 | 8* | 17 | 11 | 28 | - | - | - | - | 1.0 7 | - | 1.1 2 | 4 |
| XIY-110 | A | 15 | 14 | 8 | 10 | 9 | 15 | 30 | 45 | - | - | - | - | 1.0 7 | - | - | 4 |
| XIY-111 | A | 14.5 * | 13 | 8.5 | 11 | 8.5* | 19 | 24 | 43 | - | - | - | - | 1.1 2 | - | - | 4 |
| XIY-112 | A | 15.5 | 11 | 6.5 | 10.5 | 7.5 | 15 | 17 | 32 | - | - | - | - | 1.4 1 | 1.3 8 | 1.4 1 | 4 |
| XIY-070 | B | 27 | - | - | 18 | 16 | - | 32 | - | - | - | - | - | - | - | - | 2 |
| XIY-071 | B | 30 | 26 | 15 | 20 | 18 | 39 | 31 | 70 | - | - | - | - | 1.1 5 | 2.3 0 | 4.5 9 | 2 |

| | | | | | | | | | | | | | | | | | |
|----------------|---|------|------|------|------|------|----|----|----|----|---|---|-----|-----|-----|-----|---|
| XIY-074 | B | 27.5 | 25.8 | 13 | 18 | 15.5 | 31 | 38 | 69 | - | - | - | 1.0 | 2.3 | 4.5 | 2 | |
| XIY-075 | B | 28 | 24* | - | 24.6 | 20.7 | 45 | 25 | 70 | - | - | - | - | - | - | 2 | |
| XIY-076 | B | - | - | 14.2 | * | - | - | 33 | - | - | - | - | - | - | - | 2 | |
| XIY-087 | B | 28.2 | 23.4 | 10.4 | 18.8 | 15.2 | 40 | 22 | 62 | - | - | - | 1.2 | - | - | 2 | |
| XIY-108 | B | 27.4 | * | 25 | 17 | 17 | 10 | 44 | 25 | 69 | - | - | - | 1.1 | 1.8 | 3.6 | 4 |
| XIY-048 | C | 38.8 | 40.4 | 17 | 24.5 | 23 | 34 | 38 | 74 | - | - | - | 0.9 | 1.6 | 3.1 | 3 | |

Table S2. Preservation scale for the tridactyl tracks from the Xiyang track site. Grades range from 0 to 2.5, following Marchetti et al. (2019). *: incomplete track.

| Track number | Grade |
|----------------------|-------|
| NO MORPHOTYPE | |
| XIY-002 | 0.5 |
| XIY-003 | 0 |
| XIY-005 | 1 |
| XIY-006 | 1 |
| XIY-009 | 1 |
| XIY-011 | 1 |
| XIY-012 | 1 |
| XIY-016 | 0.5 |
| XIY-019 | 0.5 |
| XIY-021 | 0 |
| XIY-023 | 0.5 |
| XIY-024 | 0.5 |
| XIY-025 | 0 |
| XIY-030 | 0.5 |
| XIY-033* | 0.5 |
| XIY-034* | 0.5 |
| XIY-045* | 0 |
| XIY-046* | 0 |
| XIY-066* | 0.5 |
| XIY-067* | 0.5 |
| XIY-068* | 0 |
| XIY-069* | 0.5 |
| XIY-082* | 0.5 |
| XIY-083* | 0.5 |
| XIY-084* | 0.5 |
| XIY-089* | 1 |
| XIY-090* | 1 |
| XIY-091* | 0.5 |
| XIY-092* | 0 |
| XIY-093* | 1 |
| XIY-094* | 1 |
| XIY-099* | 1 |
| XIY-100* | 1 |
| XIY-103* | 1 |
| XIY-104* | 1 |

MORPHOTYPE A

| | |
|------------|-----|
| XIY-001 | 1.5 |
| XIY-004 | 0.5 |
| XIY-007 | 1.5 |
| XIY-008 | 1 |
| XIY-010 | 1.5 |
| XIY-013 | 1.5 |
| XIY-014 | 2 |
| XIY-015* | 1.5 |
| XIY-017* | 1 |
| XIY-018* | 1 |
| XIY-020 | 1 |
| XIY-022 | 1 |
| XIY-026-L1 | 1.5 |
| XIY-026-R1 | 1.5 |
| XIY-027 | 1.5 |
| XIY-028-L1 | 1.5 |
| XIY-028-R1 | 1.5 |
| XIY-028-L2 | 1.5 |
| XIY-028-R2 | 1.5 |
| XIY-029 | 1.5 |
| XIY-031 | 1.5 |
| XIY-032 | 2 |
| XIY-035 | 2 |
| XIY-036 | 2 |
| XIY-037 | 1 |
| XIY-038 | 1.5 |
| XIY-039* | 1 |
| XIY-040 | 1.5 |
| XIY-041 | 1.5 |
| XIY-042-L1 | 1 |
| XIY-042-R1 | 1 |
| XIY-043* | 1.5 |
| XIY-044 | 1.5 |
| XIY-047-L1 | 1.5 |
| XIY-047-R1 | 1.5 |
| XIY-049 | 2 |
| XIY-050 | 1.5 |
| XIY-051 | 1.5 |
| XIY-052 | 1.5 |
| XIY-053 | 2.5 |

| | |
|------------|-----|
| XIY-054 | 2 |
| XIY-055* | 1.5 |
| XIY-056 | 1.5 |
| XIY-057 | 1.5 |
| XIY-058 | 1.5 |
| XIY-059 | 1.5 |
| XIY-060-L1 | 1 |
| XIY-060-R1 | 1 |
| XIY-061 | 1 |
| XIY-062 | 1 |
| XIY-063 | 1.5 |
| XIY-064 | 1 |
| XIY-065 | 2 |
| XIY-072 | 1.5 |
| XIY-073 | 1.5 |
| XIY-077 | 1 |
| XIY-078 | 1 |
| XIY-079 | 1.5 |
| XIY-080 | 1.5 |
| XIY-081 | 2 |
| XIY-085 | 1.5 |
| XIY-086 | 2 |
| XIY-088 | 2 |
| XIY-095* | 1.5 |
| XIY-096 | 1.5 |
| XIY-097 | 2 |
| XIY-098 | 1.5 |
| XIY-101 | 2 |
| XIY-102 | 1.5 |
| XIY-105 | 1.5 |
| XIY-106-L1 | 1.5 |
| XIY-106-R1 | 1.5 |
| XIY-107 | 1 |
| XIY-109 | 2 |
| XIY-110 | 1.5 |
| XIY-111 | 1 |
| XIY-112 | 2 |

MORPHOTYPE B

| | |
|----------|-----|
| XIY-070* | 1 |
| XIY-071 | 2 |
| XIY-074 | 1.5 |

| | |
|----------|-----|
| XIY-075* | 1.5 |
| XIY-076* | 0.5 |
| XIY-087 | 1 |
| XIY-108 | 2 |

MORPHOTYPE C

| | |
|---------|---|
| XIY-048 | 2 |
|---------|---|

Table S3. Specimen numbers and measurements of theropod ichnospecies holotypes from the Jurassic of China (except *Therangospodus* and *Gigandipus*, which are the paratypes).

Abbreviations following the order of the table: L: maximum length (cm); W: maximum width (cm); PR: projection ratio following Li, 2015 (p. 9); CPR: “corrected” projection ratio following Olsen, Smith & McDonald, 1998 (p. 586).

| Ichnospecies | Specimen number | L | W | PR | CPR |
|----------------------------|-----------------|------|------|------|-------|
| <i>Changpeipus</i> | | | | | |
| <i>C. carbonicus</i> | IVPP2472 | 40 | 24 | 1.91 | 2.87 |
| <i>C. longweimaoensis</i> | NWUV 1407 | 25.4 | 18 | 1.92 | 3.01 |
| <i>Eubrontes</i> | | | | | |
| <i>E. monax</i> | BPV-FP2 | 27.5 | 19 | 1.76 | 2.13 |
| <i>E. platypus</i> | BPV-FP5 | 27 | 24 | 2.23 | 2.86 |
| <i>E. xiyangensis</i> | BPV-FP6 | 26.5 | 17.5 | 2.15 | 2.48 |
| <i>E. zigongensis</i> | ZDM 0032 | 42.1 | 30.5 | 1.80 | 2.51 |
| <i>E. glenrosensis</i> | 24-1 | 23 | 20 | 2.15 | 2.90 |
| <i>E. nianpanshanensis</i> | CFZJ6 | 46 | 34 | 3.59 | 7.78 |
| <i>Gigandipus</i> | | | | | |
| <i>G. hei</i> | CFZW46 | 49 | 37 | 3.08 | 3.21 |
| <i>Grallator</i> | | | | | |
| <i>G. limnosus</i> | BPV-FP1 | 27.5 | 18.5 | 1.37 | 1.46 |
| <i>G. microiscus</i> | CFZW176 | 14.5 | 8.5 | 1.64 | 1.71 |
| <i>G. wuhuangensis</i> | CFNY8 | 17.8 | 12 | 1.54 | 2.73 |
| <i>G. yemiaoxiensis</i> | CFZW101 | 9.8 | 5.5 | 1.45 | 1.81 |
| <i>Jialingpus</i> | | | | | |
| <i>J. yuechiensis</i> | BMNH-Ph000467 | 20 | 12 | 1.35 | 1.98 |
| <i>Kayentapus</i> | | | | | |
| <i>K. xiaohebaensis</i> | BPV-FP4 | 29 | 25 | 2.20 | 5.01 |
| <i>K. jizhaoshiensis</i> | CFZW164 | 38.5 | 28 | 1.77 | 3.85 |
| <i>K. hailiutuensis</i> | 4-4 | 23 | 24 | 1.30 | 2.71 |
| <i>K. wumaensis</i> | CFZW19 | 30 | 36.5 | 1.50 | 2.19 |
| <i>K. nananensis</i> | CFNy1 | 30 | 25 | 2.30 | 4.12 |
| <i>Lufengopus</i> | | | | | |
| <i>L. dongi</i> | LDRC028 | 40 | 35 | 3.40 | 10.33 |
| <i>Shensipus</i> | | | | | |
| <i>S. tuchuangensis</i> | NWUV 1416 | 9.4 | 8.7 | 1.47 | 7.25 |
| <i>Therangospodus</i> | | | | | |
| <i>T. pandemicus</i> | CU-MWC 186.2 | 28 | 20 | 2.20 | 2.91 |

| <i>Zhengichnus</i> | | | | | |
|----------------------|-----------|----|------|------|------|
| <i>Z. jinningsis</i> | BPV-FP7 | 28 | 19 | 0.40 | 0.92 |
| <i>Zizhoupus</i> | | | | | |
| <i>Z. wangi</i> | NWUV 1404 | 40 | 36.8 | 1.85 | 3.61 |

Table S4. Comparison of morphotype A with theropod ichnospecies reported from the Fengjiahe Formation. Abbreviations following the order of the table: L: maximum length; L/W: length over width ratio; div.: divarication angle; PR: projection ratio following Li, 2015 (p. 9). The main differences with morphotype A are in color.

| | Average L | Average L/W | Average div. II^IV | Average PR |
|---|----------------|----------------|-----------------------|---------------|
| Xiyang Morphotype A | 14.4 cm | 1.24 | 50° | 1.6 |
| <i>Eubrontes platypus</i> | 26.7 cm | 1.12 | 34° | 2.2 |
| <i>Eubrontes monax</i> (ex <i>Paracoelurosaurichnus monax</i>) | 27.5 cm | 1.45 | 10° | 1.8 |
| <i>Eubrontes xiyangensis</i> (ex <i>Youngichnus xiyangensis</i>) | 26.5 cm | 1.51 | 21° | 2.1 |
| <i>Grallator limnosus</i> | < 15 cm | > 2.00 | 35° | 1.4 |
| <i>Kayentapus xiaohebaensis</i> (ex <i>Schizograllator xiaohebaensis</i>) | 29 cm | 1.16 | 75° | 2.2 |
| <i>Zhengichnus jiningensis</i> | 28 cm | 1.47 | 100° | 0.4 |

Table S5. Calculated hip heights and body lengths for the 3 morphotypes. Values presented for morphotypes A and B are averages. Hip height is calculated following two different approaches (see material & methods).

| | Morphotype | Hip height | Body length |
|------------------------|------------|------------|-------------|
| Thulborn, 1990 | A | 0.7 m | 2.6 m |
| | B | 1.4 m | 5.5 m |
| | C | 1.9 m | 7.3 m |
| Alexander, 1976 | A | 0.6 m | 2.3 m |
| | B | 1.4 m | 4.5 m |
| | C | 1.6 m | 6.6 m |

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