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PROBABLE STEGOSAUR TRACKS (*DELTAPODUS*) FROM THE JURASSIC MORRISON FORMATION, CURECANTI NATIONAL RECREATION AREA, COLORADO

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Abstract—Stegosaurs are prominently represented in many Jurassic paleoecological reconstructions, yet track morphologies with characteristics corresponding to stegosaur anatomy are less frequently observed than the bones of these animals. A majority of the vertebrate ichnofossils that are attributable to stegosaurian thyreophorans are European and Chinese tracks assigned to *Deltapodus*. This study documents thirty-six pes prints and four potential manus prints assignable to *Deltapodus* from the Kimmeridgian–Tithonian Brushy Basin Member of the Morrison Formation in Curecanti National Recreation Area (CURE) of southwest Colorado. The tracks occur as natural casts infilled with very fine- to fine-grained sandstone in a 20 m^2 area slumped from the bases of thin sandstone beds that are interpreted as crevasse splay deposits. The natural casts of the pes specimens are preserved in a wide variety of taphonomic/toponomic states, from elongate ovate outlines to the characteristic triangular shape bearing short toe impressions from which the ichnogenus *Deltapodus* name is defined. The well-defined pes tracks have a mesaxonic tridactyl morphology, and potential manus prints are entaxonic crescent forms occasionally with a pollex trace preserved. Several pes tracks display 1–3 mm-wide striations along the lateral margins interpreted as frictional slide marks generated by the trackmakers' skin tubercles moving against the muddy substrate during emplacement. Slide marks and the morphology of several pes tracks show evidence of lateral motion, indicating rotation of the foot on emplacement or withdrawal.

The CURE specimens are attributable to *Deltapodus brodricki* based on length-to-width ratio data, which is a key morphological character in defining the three *Deltapodus* ichnospecies. The length-to-width ratios of the CURE pes prints fall towards the middle of known *Deltapodus* values and are most consistent with *D. brodricki*. *Deltapodus curriei* pes tracks differ from the CURE specimens in that they have smaller length-to-width ratio values. *Deltapodus ibericus* pes tracks have similar length-to-width ratios as the CURE tracks, but the manus of *D. ibericus* does not have a prominent pollex. Potential associated CURE manus specimens in some cases display a pollex feature, with manus length-to-width ratios within known *Deltapodus* manual examples. The CURE manus prints share a crescent shape and potential pollex feature associated with known *D. brodricki* examples. Globally, there are few specimens of tracks attributable to stegosaurians such as *Deltapodus*. The CURE specimens provide more morphological examples, which will contribute to defining allometric relationships in these ichnogenera and kinematics of the trackmakers, as well as helping to understand the taphonomic/toponomic variations of the ichnospecies *D. brodricki*.

INTRODUCTION

The study area is located within Curecanti National Recreation Area (CURE) (Fig. 1A) approximately 32 km to the west of Gunnison, Colorado. The heterolithic Upper Jurassic Morrison Formation strata in the study area lie over Uncompahgre Highland Precambrian rocks and the Jurassic Junction Creek Sandstone, and lie under Cretaceous Burro Canyon and Naturita (Dakota) sandstones (Fig. 1B). The Morrison Formation in CURE is partly equivalent to the Kimmeridgian–Tithonian Brushy Basin Member farther to the west in the Sevier Basin (Bartleson and Jensen, 1988). The Brushy Basin at CURE is composed of red to greenish-grey paleosols that could be classified as ultisols or argillisols, suggesting humid climate conditions (Fiorillo and McCarty, 1996). Most paleontological studies in CURE have focused on vertebrate body fossils (theropod, sauropod, stegosaur, and crocodilian) (Fiorillo and May, 1996; Fiorillo et al., 1996; Koch et al., 2006; Foster et al., 2015; Wood et al., 2021), invertebrate trace fossils (Fiorillo, unpubl report for National Park Service,1999; Fiorillo and Harris, 2000), or potential vertebrate burrows (Koch et al., 2006); herein is the first report detailing vertebrate tracks in CURE.

The tracks in CURE are slumped from a very fine-grained sandstone with faint planar and ripple texture, overlying a thin (<10 cm) laminated grey mudstone and a several-meter-thick blocky maroon mudstone. In situ tracks can be seen as sandstone natural casts in cross-section, often exceeding half a meter in depth from the sandstone body. The lateral discontinuity of the sand body and its fine grain size suggests a crevasse splay filling the mud-impressed tracks with sand; subsequent erosion exposed the sand-filled casts in reverse relief of the original structures. Most of these natural casts have weathered down the hill, resulting in difficulty establishing original relationships, but allowing for individual track morphologies to be studied and compared. The tracks occupy a rather small area (<20 m^2) allowing for association by proximity of manus and pes prints.

Purported stegosaur tracks were first reported from the Morrison Formation in 1998 as *Stegopodus* (Lockley and Hunt, 1998). Previously, *Deltapodus* had been reported from four localities in the Morrison Formation, ranging from the Tidwell Member up into the Salt Wash and Brushy Basin members, all in Utah (Milàn and Chiappe, 2009; Gierliński et al., 2010; Lockley et al., 2017, 2018). The Sternberg–Bramkamp site in the Salt Wash near Green River, Utah, includes an 11-step *Deltapodus*

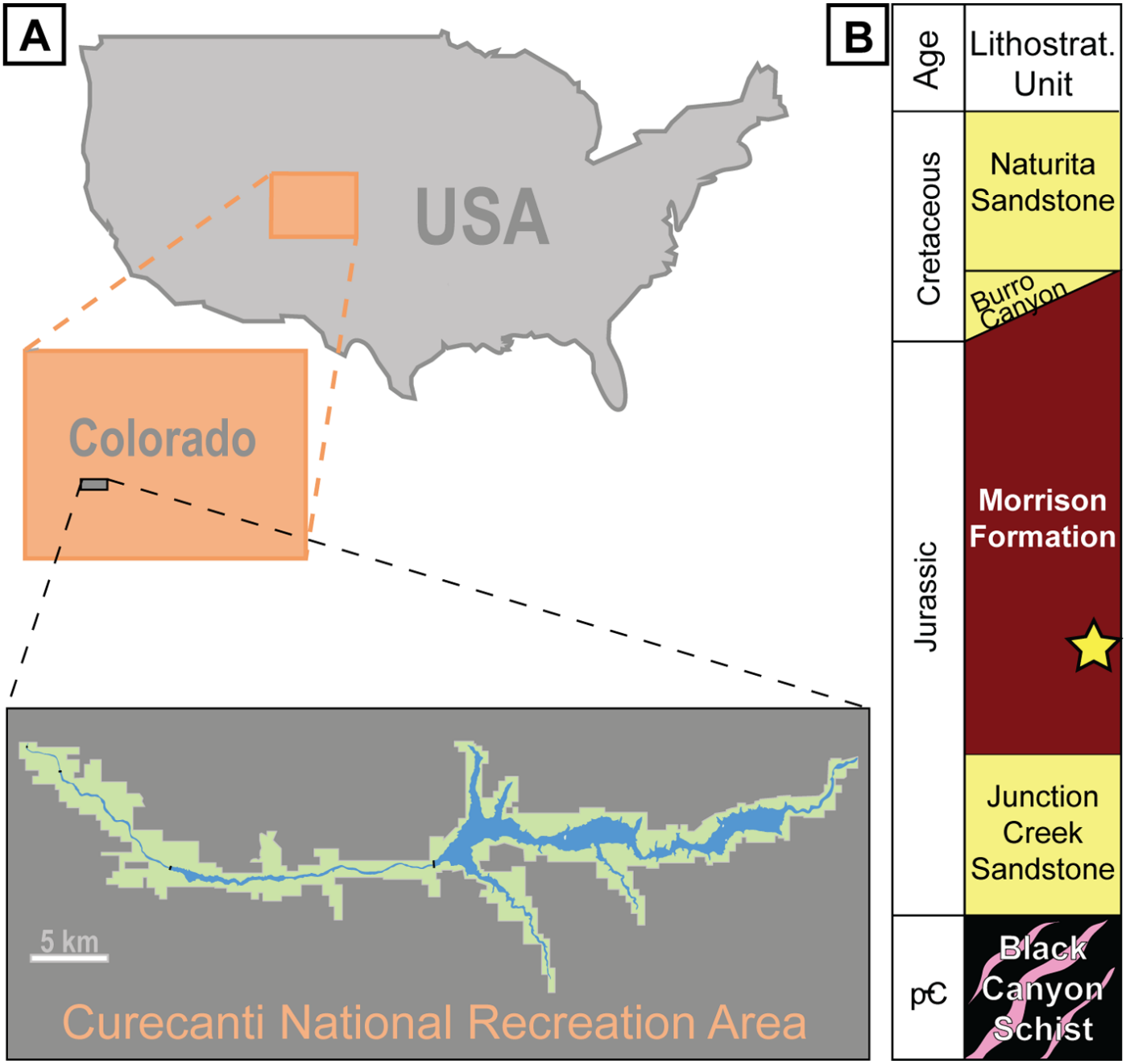


FIGURE 1. Geographic and stratigraphic location of the study area. **A,** Location map of Curecanti National Recreation Area. Green represents land area and blue indicates water bodies within the park; **B,** The generalized stratigraphy of Curecanti National Recreation Area, with the approximate stratigraphic interval of the study area indicated by star, based on Hedlund and Olson, 1973; Hedlund, 1974).

trackway, the first in North America (Lockley et al., 2018).

Ichnotaxonomic Background

The ichnogenus *Deltapodus* was defined by Whyte and Romano (1994) as having crescentic entaxonic manus tracks that are convex, sometimes with an inward digit impression that was most likely a pollex. The pollex was suggested to be located anteriorly and rotated inward, or medially and convex. The pes tracks are described as a triangular outline with three blunt lateral digit impressions. The pes of *Deltapodus* has also been described as ovular and mesaxonic, with three blunt toe impressions (Cobos et al., 2010). Pes tracks are longer than wide by a slight margin with the inside being barely concave (Whyte and Romano, 1994). *Deltapodus* was originally believed to be a sauropod track, but was later reinterpreted as stegosaurian (Lockley and Meyer, 2000; Whyte and Romano, 2001). Very few examples of *Deltapodus* are known (Table 1; Fig. 2), making additional examples of morphology important for recognizing variation of taphonomic expression of these ichnospecies.

The three currently recognized ichnospecies of *Deltapodus* are *D. brodricki*, *D. ibericus*, and *D. curriei* (Fig. 3). *D. brodricki* is typically found in Upper Jurassic strata. *Deltapodus ibericus* (Tithonian–Berriasian; Spain) is distinguished from *D. brodricki* by differing posterior and anterior pace angulation and divergence angles between tracks from their trackways (Cobos et al., 2010). However, there is very limited trackway data on *D. brodricki* and no individual track data provided for *D. ibericus* other than one print, so validation of *D. ibericus* as a disparate ichnospecies requires further data and analysis. Taphonomically, *D. brodricki* examples exhibit a more pronounced pollex than *D. ibericus* (Cobos et al., 2010). *D. curriei* is younger than *D. ibericus* and *D. brodricki*, which are Aalenian–Barremian in age. Additionally, *D. curriei* has manus and pes tracks that are smaller than the spectrum shown by *D. brodricki* and *D. ibericus*. The manus track of *D. curriei* has well-defined digits I and II, which *D. brodricki* and *D. ibericus* do not have (Xing et al., 2013), and exhibits a more rounded posterior margin. *Stegopodus* has more distinct digits on the manus and an anteroposteriorly shorter pes with more widely diverging digits than *Deltapodus* (Fig. 3).

METHODOLOGY

For this study, methods from Whyte and Romano (1994) were used for taking measurements. Length, width, and depth of the manus and pes tracks were recorded in the field (Tables 2 and 3) and field numbers were assigned to all surveyed tracks. Length-to-width ratios were a primary measurement used for determining probable ichnospecies. Depth was recorded in the field, but not utilized in a quantitative nature herein because in slumped specimens the depth does not represent depth from the original surface, nor total depth from the associated lithologic bed. Measurements for stride and pace were not able to be taken due to the isolated and slumped nature of the tracks causing them to be disassociated. Divarication angles were not taken on digits due to preservation obscuring interdigital areas. Photogrammetry was accomplished following the field methodology of Matthews et al. (2016) utilizing a Canon 5D Mark iii camera. Digital elevation models were created, calibrated to photographic scales, and extrapolated into contour lines in Agisoft Metashape version 2.0.2.

RESULTS

The four potential manus tracks from CURE (Fig. 4) are crescentic in shape, convex, and two have an inward projection that most likely comes from the pollex (Fig. 4B-D). The manus tracks are entaxonic and there are no clear digit impressions visible. Manus tracks measure between 11.4–18.8 cm in length (13.0 cm average) and 15.1–29.1 cm in width (24.1 cm average), and have length-to-width ratios between 0.48–0.61 (0.6 average). The CURE pes tracks are mesaxonic from being longer than wide and have a triangular outline, but more acute in triangular appearance than *Stegopodus* (Fig. 3). Some of the tracks have three blunt digit impressions (Fig. 5A, B, F, and H), while other taphonomic variations are more amorphous, only having an elongate ovate outline (Fig. 5C, D, and G). Others have a sharp

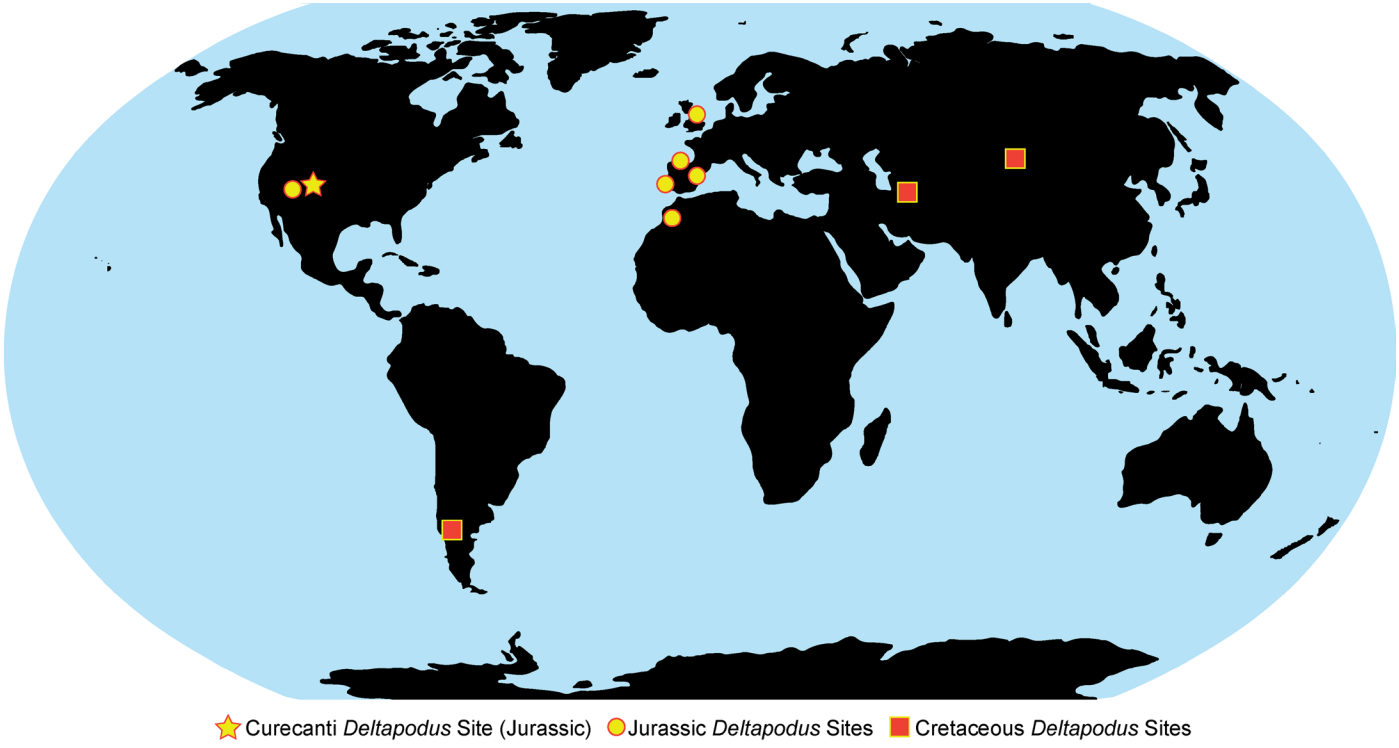


FIGURE 2. Global distribution of *Deltapodus* tracks. CURE site represented by a star (see Table 1 for reference details). The circle in Utah, to left of the star, represents several sites.

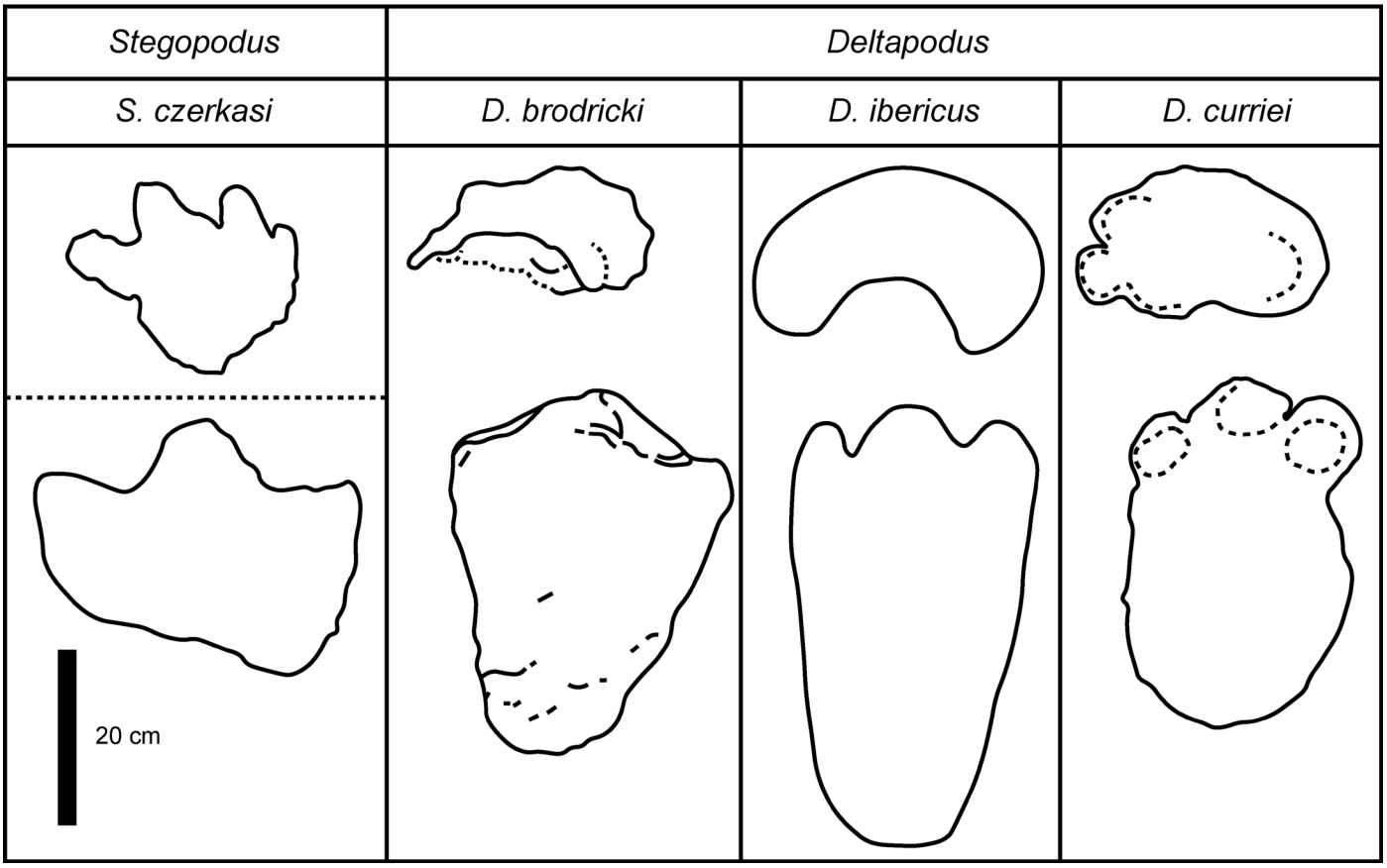


FIGURE 3. Thyreophoran ichnogenera attributed to stegosaurs (modified from Gierliński and Sabath, 2008; Lockley and Hunt, 1998; Whyte and Romano, 1994; Cobos et al., 2010; Xing et al., 2013). Scale bar is 20 cm.

triangular morphology (Fig. 5E). Some pes tracks are concave in the lateral margins (Figs. 5F, F top views). The pes specimens have lengths between 29.9–50.2 cm (41.6 cm average), widths between 20.5–33.1 cm (27.2 cm average), and length-to-width ratios from 1.31–2.24 (1.5 average). Pes preserved depth (not actual from original surface) are 8.4–25.6 cm (16.0 cm average), and manus preserved depths are between 10.5–23.3 cm (15.8 cm average).

Linear, near-vertical 1–3 mm-wide striations dominantly occur on the anterior margins of manus and pes prints (Fig. 6). In manus prints, the structures are much more localized to small areas a few centimeters in diameter (Figs. 6A and B). Striations are rare in the posterior of prints, and are only observed in one pes print (Figs. 5H and 6D). Striations were observed in two of the four manus prints, and approximately one-quarter of pes prints have striations. Striations are often vertical in nature, but some oblique examples show a lateral shift from the base to the top of the track (Fig. 6E and F).

DISCUSSION

The CURE manus specimens of the *Deltapodus* ichnospecies that display a pollex (digit I) are most similar to *D. brodricki* in that the pollex extends further medially (in reference to the track midline) and away from digit II than that of *D. curriei* (Fig. 3). *D. brodricki* from the type area often displays sharper pollex features, which may be a toponomic or taphonomic bias or a morphological variation. The manual tracks from CURE most closely resemble the *Deltapodus* examples from the Upper Jurassic Lourinhã Formation in Portugal, with the pollex-bearing examples mirroring the morphology of specimen ML1351 (Mateus et al., 2011; Guillaume et al., 2022). While similar morphologically, the Portuguese specimen is almost twice the size (28 x 45 cm) of the CURE specimens, but the CURE specimens do fall within the range of other known *Deltapodus* length-to-width ratios (Table 2; Fig. 7). Although these manus specimens are displaced, it is reasonable to presume that they are related to the associated pes specimens due to their close proximity, and also due to their overall similarity to the morphology of known associated manus examples from other locations. Furthermore, manual prints of *Deltapodus* are typically close to the same width as associated pedal prints (Fig. 3). The CURE specimens conform to this ratio in that the manus widths (15.1–29.1 cm) are close to the pes widths (20.5–33.1 cm). Alternatively, the preservation of the tracks makes it difficult to be absolutely certain that the manus trackmaker is stegosaurian because titanosauriform tracks of this age can share a similar kidney-shaped manus track morphology (Guillaume et al., 2022).

Length-to-width relationships of pes prints from CURE are similar to both *D. brodricki* and *D. ibericus* (Fig. 8), but there is only one data point for *D. ibericus*, which lies at the top of the CURE specimens' range. The population of CURE specimens has average greater lengths and widths than those of *D. curriei* (Fig. 8). Most CURE pes specimens share the same morphological outline as *D. brodricki* (Fig. 3). Whyte and Romano (2001, fig. 3) illustrate that *D. brodricki* has a wide variety of morphotypes, with many of the same variations (sharp vs. rounded heel, ovate vs. triangular overall morphology, shortened vs. elongate axis) seen within the CURE specimens (Fig. 5). The concavity and opposing convex nature in the lateral margin of some CURE pes specimens (Fig. 5F, and G top views) is likely a morphological variation that was also noted in *D. brodricki* by Whyte and Romano (1994, fig. 8B). These concave and convex margins may be the result of animal foot morphology, or potentially are time-averaged taphonomic representations of the series of

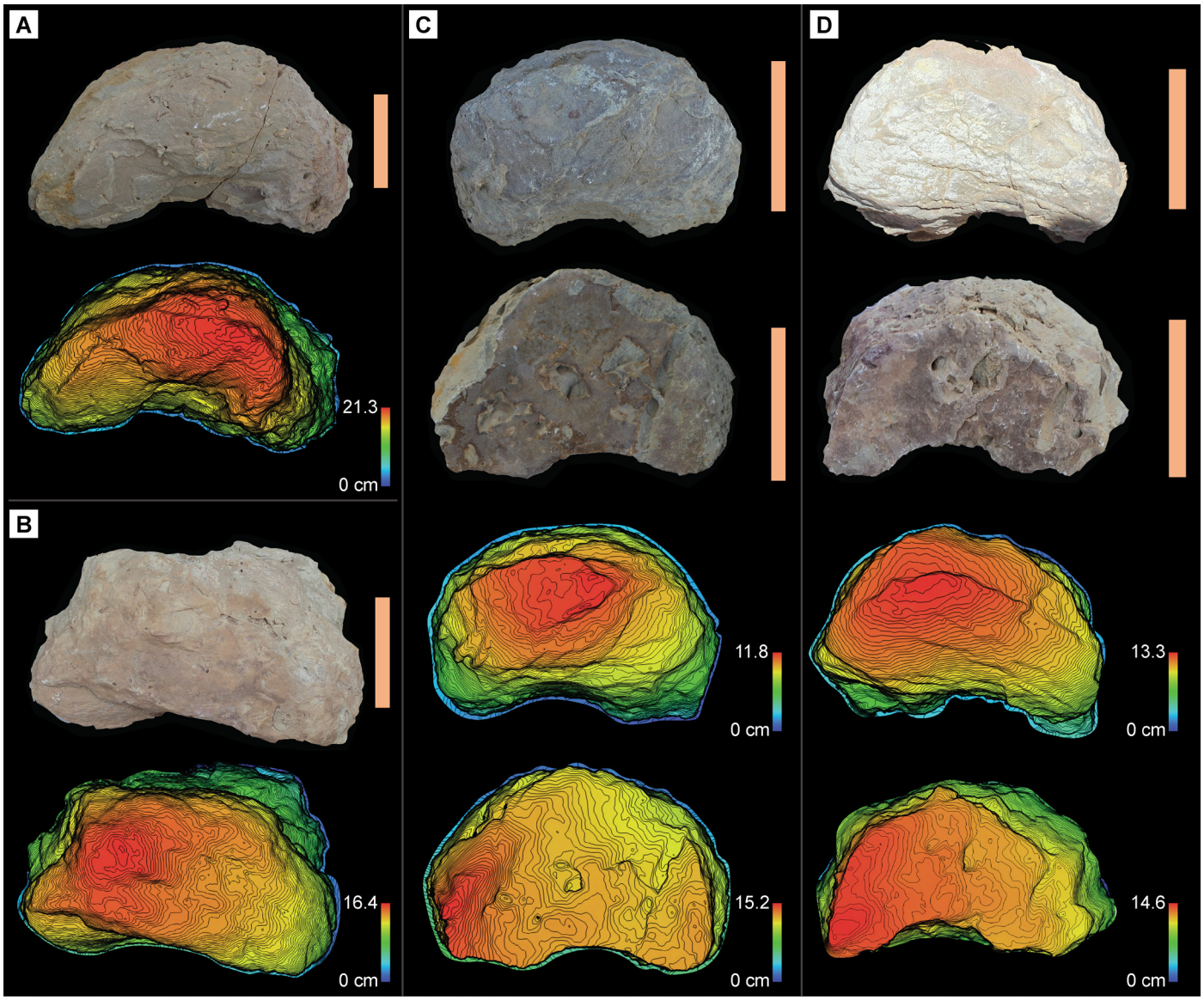


FIGURE 4. The overall morphology of CURE potential *Deltapodus* manus tracks. **A-D,** Basal view of specimens**; C and D,** Specimens with basal and top views; **B-D,** Potential pollex features are present. Color ramp and 1 mm contour intervals are represented from three-dimensional models of the specimens. Specimens I **(A)**, K **(B)**, 55 **(C)**, and 57 **(D)** are represented. Scale bars are 10 cm.

foot movement. Mateus et al. (2011) suggested that their PBS1 *Deltapodus* track specimen exhibited anterolateral sliding based on skin slide impressions and track wall deformation. Although it is difficult to distinguish substrate-related slip from normal motion of the animal, Milàn and Chiappe (2009) and Herrero-Gascón and Pérez-Lorente (2017) suggested rotation in the foot from *Deltapodus* track examples. Potential rotation of outline morphology is observable in at least one CURE specimen (Fig. 5E) that shows displacement of a triangular heel impression and widening towards the posterior margin. It should be noted that this specimen (Fig. 5E) has subtle features at the anterior end that are tentatively interpreted as toes, and the poorly-preserved outline morphology of the track is similar to that of sauropod tracks (e.g., Lockley and Hunt, 1995). However, the *D. brodricki* specimen described by Milàn and Chiappe (2009: fig. 2B) from the Brushy Basin Member of the Morrison Formation in Utah looks almost identical to the specimen in Fig. 5E in the overall sharp triangular shape and rotation of the pes. Other indications of foot rotation are evidenced in the lateral displacement of oblique striations coupled with morphology (Fig. 5F, G, Fig. 6E, F), as medial digit III, one lateral digit, and potentially the heel, are displaced from each other vertically. This may indicate a normal component of rotation in the foot and limb of the trackmaker during locomotion, and may explain in part the wide morphological variations preserved in *Deltapodus* (e.g., rotation of the heel broadening track appearance; Milàn and Chiappe, 2009). This potential foot rotation is an aspect of *Deltapodus* that needs further investigation and requires more specimens to substantiate.

The vertical striations in CURE pes tracks have been noted in other *Deltapodus* examples (Mateus and Milán, 2010; Mateus et al., 2011; Herrero-Gascón and Pérez-Lorente, 2017; Guillaume et al., 2022). These frictional sedimentary features (Fig. 6) are interpreted as the irregularity of tubercles sliding against a clay-rich surface (Currie et al., 1991). Currie et al. (1991) defined tubercles as a dinosaurian non-scale skin feature in a comparison to extant elephant and rhinoceros skin, and they suggested that these skin features can be preserved as positive

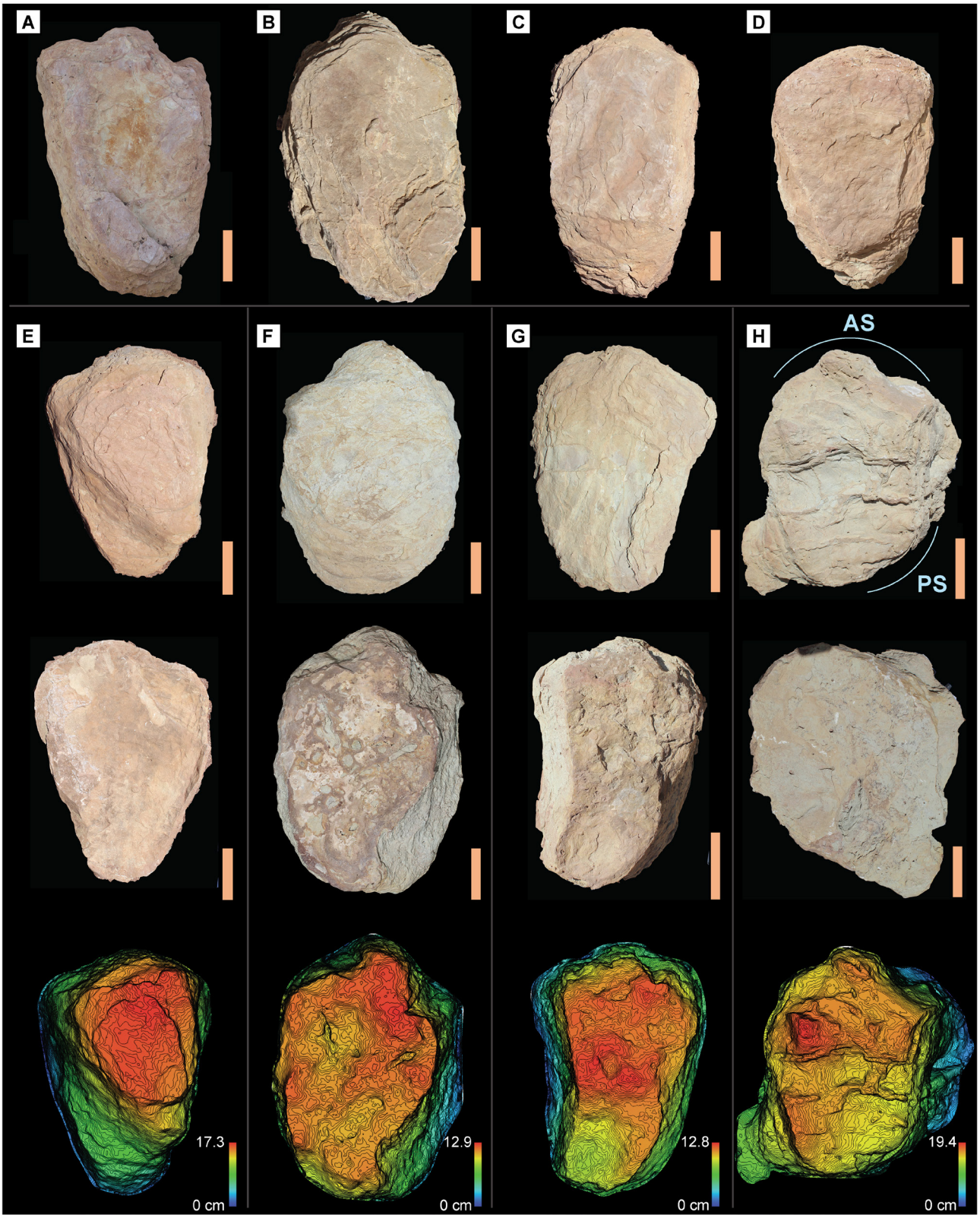


FIGURE 5. Selected examples of CURE *Deltapodus* pes track specimen numbers 35 **(A)**, 47 **(B)**, I **(C)**, 76 **(D)**, 6 **(E)**, L **(F)**, A34 **(G)**, and 61 **(H)** showing variations in morphology. **A-D.** Basal views ; **E-H,** Top and bottom views are associated with 1 mm contoured intervals and color scaled models. Overall morphologies are highly variable with some specimens **(A, B)** having well defined blunt toes, while others are elongate ovals **(C)**, or even triangular in appearance **(E)**. The posterior track morphology can be sharp or rounded in nature. Lateral displacement of the foot is evident in **E**. Some specimens **(F** and **G)** display concave/convex margins which may be due to foot morphology or associated rotation of the foot. Vertical striations are locally present on some specimens, with one specimen **(H)** having interpreted tubercle slide structures on both the anterior side (AS) and the posterior side (PS) of the margins as seen in side view in Figure 6. Scale bars are 10 cm.

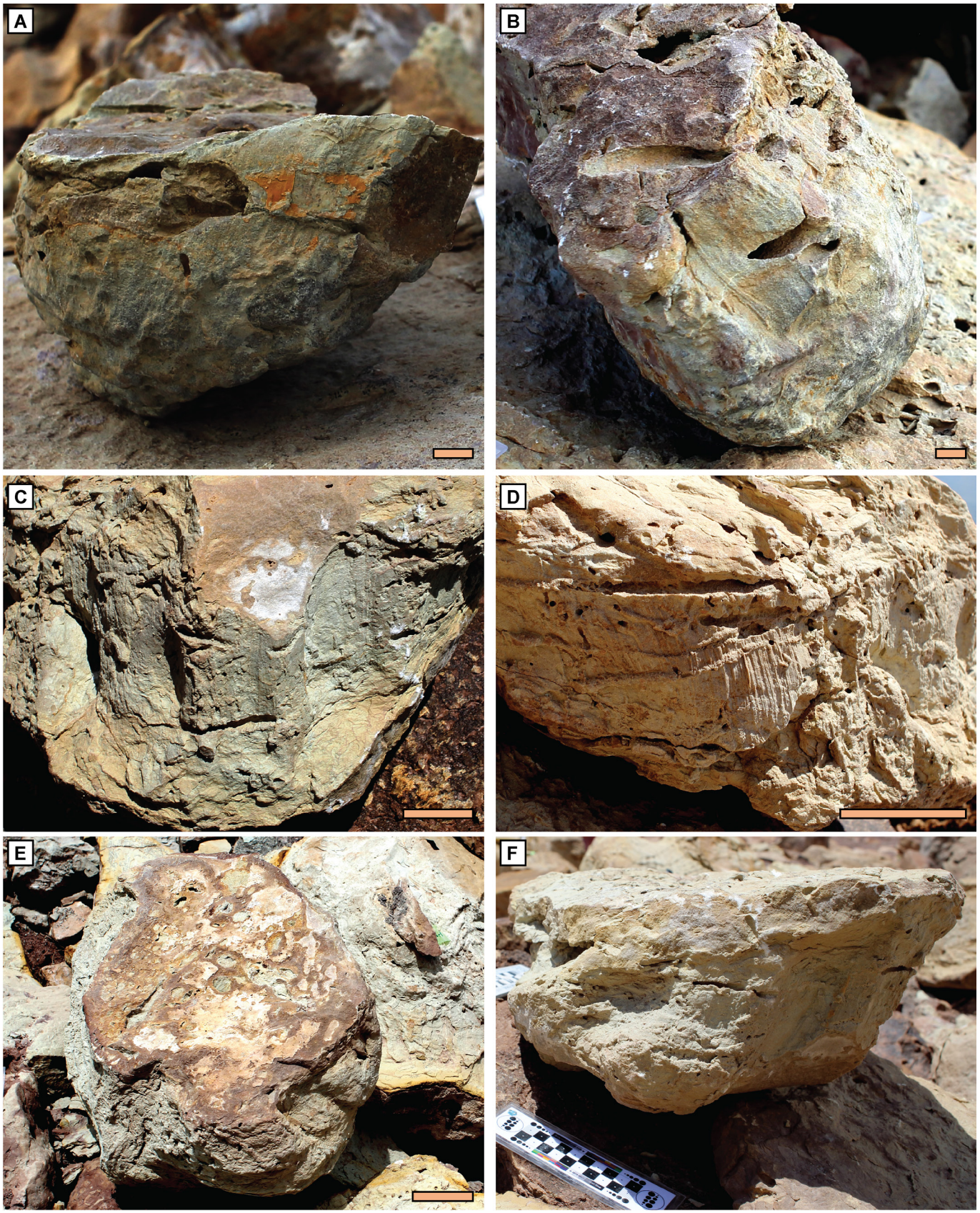


FIGURE 6. Vertical striations interpreted as skin (tubercle) slide marks seen on CURE *Deltapodus*. A majority of these structures are preserved on the anterior side of manus tracks **(A, B)** and of pes tracks **(C, E,** and **F)**. One track has posterior preservation **(D)**. Rotation of the foot is seen in some tracks **(E, F)** with the linear striations indicating the central digit III, one lateral digit, and potentially the heel shifting more tangentially. Specimens 55 **(A)**, 57 **(B)**, 61 **(C, D, F)**, and L **(E)** are represented with scale bars in **A** and **B** of 1 cm; the other scale bars are 5 cm.

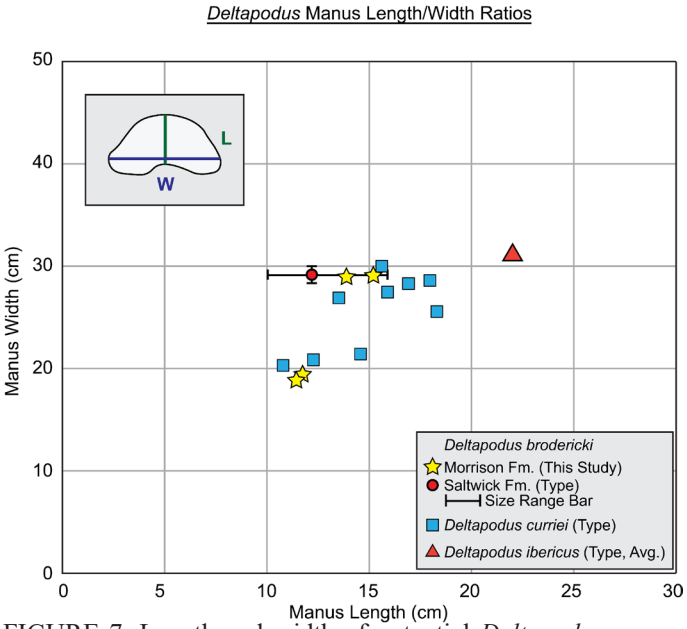


FIGURE 7. Length and width of potential *Deltapodus* manus from the study area (stars) compared with examples from the *Deltapodus* ichnospecies type localities (Whyte and Romano, 1993, 1994, 2001; Xing et al., 2013; Cobos et al., 2010).

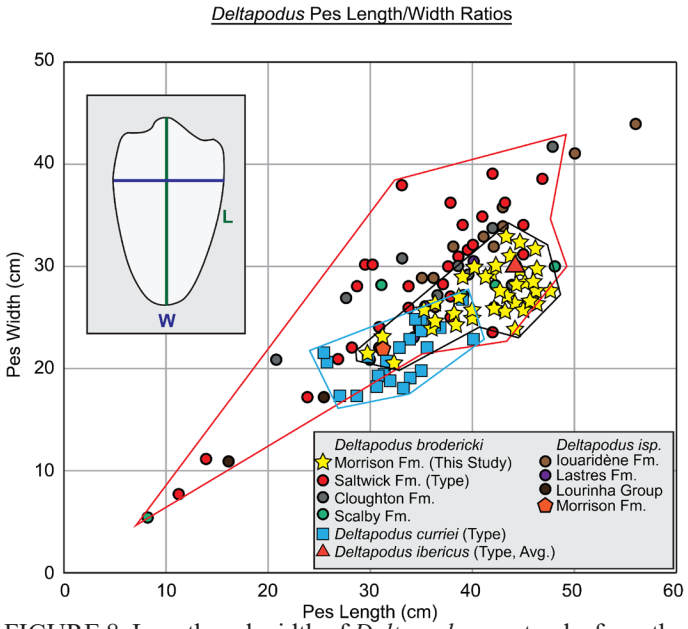


FIGURE 8. Length and width of *Deltapodus* pes tracks from the study area (stars and black polygon boundary) compared with examples from the literature (Whyte and Romano, 1993, 1994, 2001; Whyte et al., 2007; Mateus et al., 2011; Xing et al., 2013; Cobos et al., 2010; dePolo et al., 2020). Type area specimens are indicated by red polygon (*D. brodricki*), blue polygon (*D. curriei*), and a triangle symbol (*D. ibericus*, averaged value).

casts or negative impressions in dinosaur tracks. An example of frictional features made by tubercles, which is comparable to those seen in the CURE tracks, is from Xing et al. (2013), who reported slide marks 2.9 cm long with spacing between 32–100 mm, much larger than the spacing reported here. Herrero-Gascón and Pérez-Lorente (2017), and Guillaume et al. (2022), described more comparable examples of stegosaurian-sized skin polygons 1 mm and 3 mm wide and circular scales 2 to 3 mm wide, respectively. Mateus and Milán (2010) reported that their *Deltapodus* tracks have skin striations, and later work by Mateus et al. (2011) described tracks that have tubercles that are larger (6 mm) than the CURE specimens. However, this measurement referred to individual tubercles; their photos show slide marks the same size (Mateus et al., 2011, fig. 3C, 4B) as the CURE specimens. Guillaume et al. (2022) has noted that these vertical striations may occur along any part of the track margin, but in their *Deltapodus* specimens these striations are more consistently along the front of the foot. This is similar to striations observed in the CURE specimens, although the vertical structures may potentially have been made by irregularities in keratin from the animal's unguals.

CONCLUSIONS

The Curecanti National Recreation Area tracks described here are interpreted as examples of *Deltapodus brodricki*, produced by stegosaurian dinosaurs. The pes tracks appear to be in the median range of track sizes when compared to other tracks of *D. brodricki*. Vertical striations predominantly present on anterior portions of the manus and pes indicate friction between the animal's body and the substrate. The direction of these tubercle slides along the margins of some pes tracks imply a lateral component in emplacement or withdrawal, which may be due to rotation of the foot. The potential manus specimens are similar to that of *D. brodricki* examples in their crescentic shape and lack of digit marks, although pollex features, which have been observed in *D. brodricki,* are also potentially present. The CURE potential manus tracks feature two of the smallest known *Deltapodus* manus prints, but the relative size compared to the pes dataset suggests plausible association. The CURE tracks are important to understanding more about the *Deltapodus* ichnogenus and variations in the *D. brodricki* ichnospecies, by providing additional examples that increase the amount of data to help establish regular kinetic motion and toponomic/taphonomic factors in preservation. Additionally, these uncommon prints provide more opportunities for understanding one of the Jurassic's most popular dinosaurs.

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APPENDIX

TABLE 1. Global *Deltapodus* locations, formations, preservation, and depositional environments sorted by age (ascending).

Geographic Location	Formation	Age	Preservation	Depositional Environment	Tubercle Size	Reference
Kopet-Dagh Region, Northeastern Iran	Tigran	Aptian	Mold (Undertrack?)	Carbonate Shoreline	No tubercles	Abassi et al., 2018
Xinjiang Province, China	Huangyangquan	Hauterivian-Albian	Cast/mold	Fluvial	No tubercles	Xing et al., 2021
District of the Junggar Basin, China	Huangyangquan	Berriasian-Barremian	Cast	Fluvial-Lacustrine	Slide marks 2.9 cm, space between lines 32-100 mm	Xing et al., 2013
Blanding, Utah	Morrison	Upper Jurassic	Cast	Fluvial	No tubercles	Milán and Chiappe, 2009
Asturias, Spain	Tereñes	Upper Jurassic	Cast	Deltaic Coastal Plain	Skin impressions and marginal striations present.	Lockley et al., 2008
Galve Basin, Teruel, Spain	Villar del Arzobispo, Camarillas, Artoles	Tithonian-Early Berriasian/Late Barremian	Cast	Fluvial-Lacustrine	One polygon side 1 mm, another 3 mm. The largest feature is 7 mm.	Gascón and Pérez-Lorente, 2017
Teruel, Spain	Villar del Arzobispo	Tithonian-Berriasian	Cast	Tidal Flat	No tubercles	Cobos et al., 2010
Lourinhã, Portugal	Lourinhã	Kimmeridgian-Tithonian	Cast	Fluvial	Circular scales 2-3 mm wide, ovoid scales 5-7 mm wide, circular scales 3-4 mm wide, hexagonal or rectangular scales 5-7 mm wide	Mateus et al., 2011; Guillaume et al., 2022
Lusitanian Basin, Portugal	Lourinhã	Kimmeridgian-Tithonian	Cast	Carbonate Shoreline	Skin striations present	Mateus & Milán, 2010
Asturias, Spain	Lastres	Kimmeridgian	Cast	Coastal Plain	No tubercles	Piñuela et al., 2014
Patagonia, Argentina	Lajas	Bathonian-Early Callovian	Cast	Coastal Plain	No tubercles	Pazos et al., 2019
Iouaridéne ichnosite, Morocco	Iouaridéne	Bajocian/Bathonian or Oxfordian-Kimmeridgian	Mold	Carbonate Shoreline	No tubercles	Belvedere & Mietto, 2010
Isle of Skye, Scotland	Lealt Shale	Bajocian-Bathonian	Cast	Coastal Plain	No tubercles	dePolo et al., 2020
Cleveland Basin, Yorkshire, UK	Scalby	Aalenian-Bathonian	Cast	Fluvial	No tubercles	Whyte et al., 2007
Cleveland Basin, Yorkshire, UK	Cloughton	Aalenian-Bathonian	Cast	Fluvial	No tubercles	Whyte et al., 2007
Cleveland Basin, Yorkshire, UK	Saltwick	Aalenian-Bathonian	Cast	Fluvial	No tubercles	Whyte and Romano, 1994, 2001; Whyte et al., 2007

TABLE 2. Data collected from CURE *Deltapodus* manus tracks.

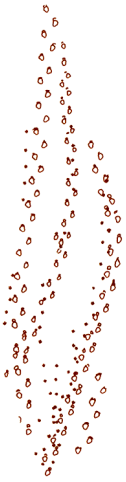
CURE Track #	Length (cm)	Width (cm)	Length to Width Ratio	Depth (cm)
I	13.9	29	0.48	16.4
K	15.1	29.1	0.52	23.3
55	11.4	18.8	0.61	10.5
57	11.7	19.4	0.60	12.9

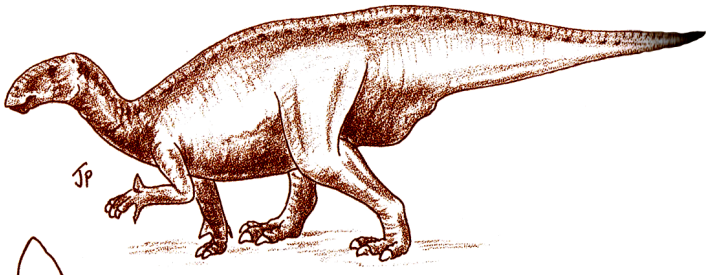
TABLE 3. Data collected from CURE *Deltapodus* pes tracks

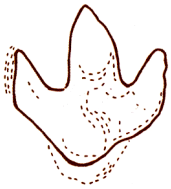
CURE Track #	Length (cm)	Width (cm)	Length to Width Ratio	Depth (cm)
32	29.9	21.4	1.40	14.2
111	31.3	23.2	1.35	9.9
G	32.4	20.5	1.58	13.7
A34	35.3	25.7	1.37	22.4
6	36	24.1	1.49	8.4
20	36.4	24.6	1.48	14.3
113	36.4	26.5	1.37	12.0
68	38.4	25.3	1.52	14.7
3	38.6	24.5	1.58	24.5
100	38.8	27.1	1.43	17.5
79	39.1	29.1	1.34	13.2
7	40	25.9	1.54	8.6
B	40	25.2	1.59	25.4
29	40.3	30.1	1.34	25.6
36	41.3	29.2	1.41	29.2
A30	41.9	29.4	1.43	21.8
110	42.3	30.1	1.41	15.6
116	42.3	26	1.63	10.0
5	42.9	27.7	1.55	11.2
19	43.2	25.7	1.68	13.1
15	43.4	27.3	1.59	14.2
99	43.4	33.1	1.31	16.2
94	43.8	31	1.41	16.9
A29	44.2	26.6	1.66	14.2
85	44.3	28.2	1.57	15.4
105	44.9	32.4	1.39	13.6
11	45	25.8	1.74	13.9
67	45.2	28.4	1.59	12.1
A35	45.7	26.7	1.71	22.4
4	46.1	28.5	1.62	21.4
47	46.1	28.3	1.63	17.2
35	46.3	28	1.65	11.7
78	46.4	29.8	1.56	16.9
A33	46.4	31.8	1.46	18.6
1	47.7	27.8	1.72	12.2
102	50.2	22.4	2.24	13.7



A carnivore attacking a brontosaur



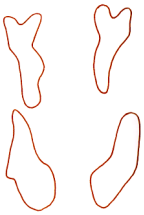




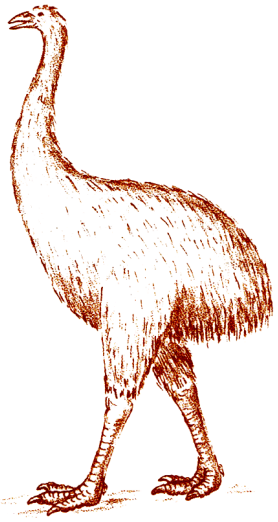
Track name: ***Iguanodontipus*** (hind foot)
Animal: *Iguanodon*
Track size: 30 cm long

Frog and tracks
Track size: 3 cm long









Moa and track
Track size 15-25 cm long