**Supplemental Information**

The earliest equatorial record of frogs from the Late Triassic of Arizona

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**Running Head:** Triassic Frog from Arizona

**Detailed Specimen, Locality, and Age Information**

*DMNH 2018-05 (‘Green site’ specimens)*

DMNH (Perot Museum of Nature and Science) 2018-05-0002: nearly complete right ilium – 6.47 mm long, 1.88 mm acetabulum width, 0.7 mm width of blade halfway from the acetabulum to the anterior tip. All measurements taken with digital calipers.

‘Green site’ (DMNH 2018-05): The DMNH specimen was collected from visually green (though 5YR 6/1 in Munsell system) conglomeratic lenses containing fish scales, coprolites, and coal that are mainly 20 cm thick (though in places up to 100 cm) within a fine-grained fluvial sandstone with low-angle cross laminations. The locality occurs within the Jim Camp Wash beds (Revueltian estimated holochronozone; ≤217.7 – 213.870 ± 0.078 Ma; (1, 2)) of the Sonsela Member, Chinle Formation southeast of Petrified Forest National Park in Apache County, Arizona.

*PEFO 396 (Coprolite layer specimens)*

PEFO (Petrified Forest National Park) 41743: partially complete left ilium – 2.01 mm long, 0.77 mm acetabulum width, 0.32 mm width of blade ~halfway from the acetabulum to the anterior tip.

Billings Gap Tank E (PFV 396): PEFO 41743 was collected from a 5-12 cm thick lacustrine siltstone lens containing abundant coprolites and vertebrate remains, located near Billings Gap in Petrified Forest National Park, Arizona. The vertebrate assemblage found at the 'coprolite layer' has been described elsewhere (3, 4). PFV 396 is in the upper part of the Blue Mesa Member of the Chinle Formation, and its age is estimated to be between 223.036 ± 0.059 and 220.123 ± 0.068 Ma (Adamanian estimated holochronozone; (2, 5)). The age of a laterally equivalent layer at PFV 122 is estimated at 221.946 Ma (6).

*MNA Placerias Quarry specimens*

MNA (Museum of Northern Arizona) V12365, fragmentary left ilium – 3.49 mm long, 2.01 mm acetabulum width; MNA V12366, fragmentary left ilium – 2.34 mm long, 1.49 mm acetabulum width; MNA V12369, posterior process of maxilla (side unknown) – 2.20 mm anterior-posterior length.

*Placerias* Quarry (MNA 207-2): MNA specimens were collected from a buff colored mudstone containing abundant vertebrate bone and carbonate nodules (7). A diverse assemblage of macrovertebrates and microvertebrates have been described from this locality including abundant remains of the large dicynodont synapsid *Placerias* (8, 9). MNA 207-2 is in strata located near St. Johns Arizona that are roughly equivalent to the Lots Wife Beds of the Sonsela Member of the Chinle Formation at Petrified Forest National Park based on U-Pb ages from detrital zircons in both places. The fossiliferous horizon is estimated to be 219.39 ± 0.16 Ma (Adamanian estimated holochronozone; (2, 10)).

**Collection and preparation methods**

The microfossil specimens described here were collected using two main methodologies. Those from DMNH 2018-05 and PFV 089 were collected by in-field splitting of quarried sandstone blocks and examination of bedding surfaces for microfossils using hand loupes. Any specimens found were then consolidated with either Paraloid B-72 (Rohm and Haas) or Butvar B-76, and additional preparation was completed under magnification with pinvises in the Fossil Preparation Laboratory at Virginia Tech. Stabilization of the matrix surrounding the specimens was assisted by use of Carbowax (Dow Chemical). The specimen from PFV 396 was collected by screen washing methods described previously (4). Five to ten-pound blocks of fossiliferous matrix were individually broken down in water and screened through a stack of five 8-inch diameter screens with decreasing aperture sizes of 6.33 mm, 4 mm, 2 mm, 1 mm, and 180 μm. The concentrated clasts from each block were then sorted under a dissecting microscope. Specimens collected from MNA 207-2 were collected by bulk screen washing methods described previously (9).

**Computed tomographic methods**

We generated digital three-dimensional models of DMNH 2018-05-0002 using x-ray computed microtomography (μCT-scanning) at the University of Florida’s Nanoscale Research Facility. For this characterization, we used a Phoenix v|tome|x M 240 (GE Measurement & Control, Boston, USA) scanner with a 180 kv x-ray tube and a diamond-tungsten target; settings for each of the scans is provided in Supplemental Table 1. Raw 2D x-ray data were processed using the datos|x software v. 2.3 with post-processing, analyses (including segmentation), and visualization conducted using VG StudioMax v. 3.1 (Volume Graphics, Heidelberg, Germany). Both image stacks (TIFF) and surface mesh files of the ilia are available via MorphoSource (see Supplementary Table 1 for DOIs).

**Scanning electron microscope images**

We imaged MNAV12369 using a Hitachi tm3000 tabletop scanning electron microscope. Specifically, this allowed us to capture the detail of the pedicellate teeth and maxillary structure (SFig. 1).

**Justification for Identification of MNA V12369 to Anura**

We refer the maxillary fragment MNA V12369 to Anura based on the presence of pedicellate tooth bases (SFig. 1; (11)), similar to those figured by (12). The tooth bases are attached to a prominent sub-dental shelf. The labial surface of this element is smooth and unornamented.

**Caption for Supplementary Figure 1**

Comparisons among the Late Triassic anuran specimens from the Chinle Formation. Top row: photograph (a) and CT images of lateral, posterior, medial, and anterior views (b-e) of the ilium DMNH-2018-05-0002. Middle row: lateral and medial views of the ilia PEFO 41743, MNA V12366, and MNA V12365. Bottom row: SEM images (l, n) and photograph (m) of MNA V12369. (l) lingual, (m) labial, and (n) occlusal views of MNA V12369. All scale bars equal 1.0 mm.

**Supplementary References**

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