and *Paratypothorax* as well as the metoposaur *Buettneria perfecta*. This specimen represents the highest stratigraphic occurrence of *Leptosuchus adamanensis* in the park.

PSEUDOPALATINAE Long and Murry, 1995
***Pseudopalatus* Mehl, 1928**
***Pseudopalatus* sp.**

In 2002 a partial skull (PEFO 31207) consisting of the skull roof and portions of the braincase were collected from just above the Rainbow Forest Bed and below the Agate Bridge Bed near Mountain Lion Mesa (PFV 295). A wide postorbito-squamosal bar and supratemporal fenestra that are slit-like in dorsal view (Fig. 3H) allow assignment of this specimen to *Pseudopalatus* (Long and Murry, 1995). However, the squamosals are anteroposteriorly shortened, the squamosal tips are not knob-like, and the squamosal fossa extends to the tip of the squamosal, unlike any known pseudopalatine. Parker and Irmis (2004) tentatively referred this skull to *P. mccauleyi* based on the morphology of the squamosals and the exoccipitals, however until more complete material is found, this skull is best referred to *Pseudopalatus* sp. This specimen co-occurs with the aetosaur *Typothorax* at PFV 295 and is the lowest occurrence of a pseudopalatine phytosaur in the park, ~3 m above the Rainbow Forest Sandstone.

ARCHOSAURIA Cope, 1869
PSEUDOSUCHIA Gauthier, 1986
STAGONOLEPIDIDAE Lydekker, 1887

Next to phytosaur remains, aetosaurs are the most frequently recovered vertebrate fossils in the park. Long and Ballew (1985) prominently featured the aetosaurs of PEFO in their discussion of the taxonomic utility of aetosaur plate ornamentation. This included listings of material by locality. It should be noted, however that much of this material is extremely fragmentary and in many cases not identifiable below the level of Stagonolepididae indet. Contrary to Long and Ballew (1985), almost none of the material referred by these authors to *Desmatosuchus* belongs to that taxon. For example, UCMP 126901 and UCMP 126837 are unidentifiable fragments while UCMP 126838 is a paramedian plate of *Paratypothorax* sp. with the lateral and medial margins broken off.

***Desmatosuchus* Case, 1920**
***Desmatosuchus haplocerus* (Cope, 1892)**

Although almost none of the specimens from the PFNP referred to *Desmatosuchus haplocerus* by Long and Ballew (1985) and Long and Murry (1995) pertain to that taxon, *D. haplocerus* does occur at PEFO. Currently, known material is restricted to several fragmentary paramedian plates (PFV 202/PEFO 23338; PFV 212/PEFO 26668) (Figs. 4B-D) and a fragmentary lateral plate (PFV 198/PEFO 31177) (Fig. 4E), all from the Blue Mesa Member in the Blue Forest area. The paramedian plates are dorsoventrally thickened with the complex tongue-and-groove articulation characteristic of *Desmatosuchus* (Long and Ballew, 1985), while the lateral plate is similar to the more anterior cervical lateral plates of UMMP 7476 (holotype of *D. spurensis*; Case, 1922). A plate from locality PFV 294 (MNA V697) was illustrated by Long and Ballew (1985: figs. 7a-b) as a cervical lateral plate but actually represents an incomplete dorsal lateral plate (Parker, 2003). This specimen is from the Petrified Forest Member and co-occurs with the aetosaur *Typothorax coccinarum* and is referable a new species of *Desmatosuchus* (Parker, 2003; in press).

***"Desmatosuchus" chamaensis* Zeigler, Heckert and Lucas, 2002**

PEFO 31162 (Fig. 4F) is an anterior caudal paramedian plate of *"Desmatosuchus" chamaensis* from the Karen's Point locality (PFV 75). Parker (2003) demonstrated that *"D." chamaensis* shares almost no characters with *Desmatosuchus*, instead is more closely related

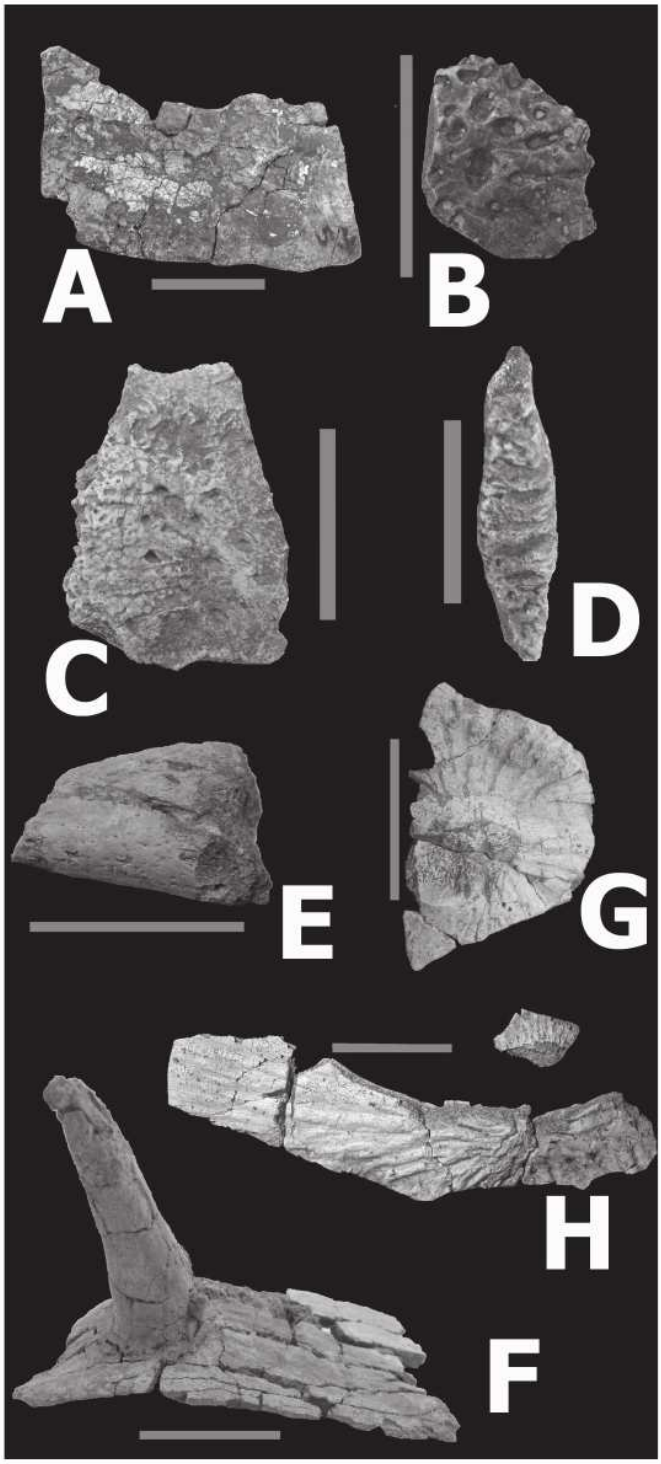

FIGURE 4. New aetosaur material from the park. **A**, *Stagonolepis wellesi* right cervical paramedian plate (PEFO 31217) in dorsal view; **B**, *Desmatosuchus haplocerus* paramedian plate fragment (PEFO 23338) in dorsal view; **C-D**, *Desmatosuchus haplocerus* paramedian plate fragment (PEFO 26668) in **C**, dorsal and **D**, medial views; **E**, *Desmatosuchus haplocerus* cervical lateral plate fragment (PEFO 31177) in lateral view; **F**, *"Desmatosuchus" chamaensis* anterior caudal paramedian plate (PEFO 31162) in anterior view; **G**, *"Desmatosuchus" chamaensis* lateral plate fragment (PEFO 34040) in lateral view; **H**, *"Desmatosuchus" chamaensis* partial paramedian plate (UCMP 129829) in dorsal view. Scale bars = 5 cm.

to *Paratypothorax*, and represents a distinct genus. PEFO 31162 co-occurs with the aetosaur *Typothorax coccinarum* above the Flattops Two Bed of the Petrified Forest Member and represents the first occurrence of this taxon outside of New Mexico. One fragmentary lateral plate (PEFO 34040) (Fig. 4G) and UCMP 129829 (Fig. 4H), a partial paramedian plate, are also referable to this taxon and were also collected from PFV 75.

Stagonolepis Agassiz, 1844

Stagonolepis wellesi (Long and Ballew, 1985)

Stagonolepis wellesi was described by Long and Ballew (1985) from the articulated posterior half of a partial skeleton (UMMP 13950) collected by E. C. Case from the Tecovas Formation of Texas (Case, 1932). Charles Camp collected *Stagonolepis* armor from the *Placerias* quarry in the early 1930s and a partial carapace (UCMP 27225) from the Blue Hills near St. Johns, Arizona in 1926. Unfortunately none of this material was described until the work of Long and Murry (1995), and except for a dentary fragment and several cervical vertebrae from UCMP 27225, the specimens do not appear to represent portions of the carapace not preserved in the holotype. In 1982 Michael Parrish discovered a partial carapace (UCMP 126844) from the Agate Bridge NW locality (PFV 162), which was illustrated by Long and Ballew (1985: pl. 5), however this specimen consists only of fragmentary paramedian and lateral plates from the dorsal region.

In 2002, another partial carapace referable to *Stagonolepis wellesi* (PEFO 31217) was collected from a sandy mudstone facies of the Rainbow Forest Bed at the Battleship NW locality (PFV 169). Preparation of this specimen is currently underway and preliminary work shows that this specimen also consists mainly of the posterior portion of a carapace, including the pelvis, anterior caudal vertebrae and associated armor. However, one plate collected during the excavation appears to be from the anterior dorsal or posterior cervical portion of the carapace, suggesting that elements anterior of the pelvis may be present in the unprepared material. The rectangular shape (wider than long), small size, low dorsal eminence, and faint ornamentation of this plate (Fig. 4A) are common for aetosaur cervical plates including those of *Stagonolepis robertsoni* and *Aetosaurus ferratus* (Walker, 1961). The dorsal eminence is strongly offset medially as in *Paratypothorax* (Long and Ballew, 1985). The plate is flat and not arched as in the dorsal paramedians of *Stagonolepis robertsoni* (Walker, 1961) and has an overall crescentic shape in dorsal view further supporting placement in the cervical series. Another interesting character of PEFO 31217 is that the neural spines of the anterior caudals are extremely high, being at least twice the height of the centrum. Although this portion of the column is present in the holotype of *Stagonolepis wellesi*, the neural spines of the caudal vertebrae are crushed, so they cannot be easily compared with the present specimen. Case (1932: plate III) reconstructed them as being 1.5 times the height of the centra. Although not well represented by the known material, the anterior caudal vertebrae of *Stagonolepis robertsoni* also appear to have tall neural spines (Walker, 1961: Fig. 10b). High neural spines in the anterior caudals are a feature also seen in phytosaurs (e.g., Case, 1927: plate I).

Stagonolepis sp.

In 2004, another aetosaur carapace was collected from near old Highway 180 (PFV 304) in the southern portion of the park that is also referable to *Stagonolepis*. This specimen consists principally of armor plates, vertebrae and ribs and is currently undergoing preparation. This specimen is significant since it was collected several meters above the Rainbow Forest Bed of the Sonsela Member and represents the highest known stratigraphic occurrence of *Stagonolepis*. Most of this specimen is currently unprepared, although characteristics of several prepared paramedian plates suggest that it may be distinct from *Stagonolepis wellesi*.

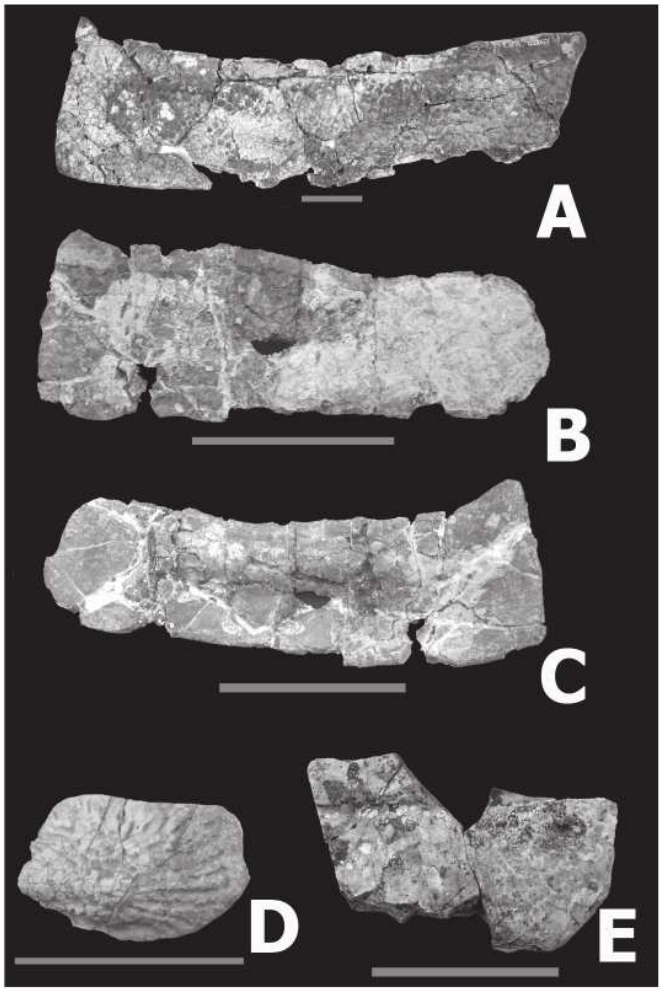

FIGURE 5. New *Typothorax* material from the park. **A**, *Typothorax coccinarum* paramedian plate (PEFO 23388) in dorsal view; **B-C**, *Typothorax coccinarum* paramedian plate (PEFO 33979) from a juvenile individual in **B**, dorsal and **C**, ventral views; **D**, *Typothorax* sp. lateral plate (PEFO 33980) from a juvenile individual in dorsal view; **E**, *Typothorax coccinarum* paramedian plate fragment (PEFO 26694) in dorsal view. Scale bars = 5 cm.

Typothorax Cope, 1875

Typothorax coccinarum Cope, 1875

Typothorax coccinarum is the most commonly recovered aetosaur from Norian aged strata in the southwestern United States. Significant finds made in recent years include a paramedian plate from PFV 70 (PEFO 23388; Fig. 5A) with a width of 432 mm, which represents the largest *Typothorax* plate found to date. The Giving Site (PFV 231) yields a wealth of *Typothorax coccinarum* material including a partial sacrum with associated armor, and two juvenile specimens. The juvenile specimens (Figs. 5B-D) demonstrate that the ornamentation of *Typothorax* plates did not change through ontogeny.

Another important specimen is a partial paramedian plate of *Typothorax coccinarum* (PEFO 26694) from the "Camp Butte Sandstone" (=Rainbow Forest Bed) in the Phytosaur Basin locality (PFV 121) below Blue Mesa. While represented by only a fragment (Fig. 5E), this plate can be referred to *Typothorax* based on the presence of a raised anterior bar, combined with prominent ventral strut