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## FAUNA OF THE VALE AND CHOZA: 12

### A New Trematopsid Amphibian from the Vale Formation

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#### INTRODUCTION

The family Trematopsidae is represented in the early Permian of Texas by *Acheloma* in the Wichita group and *Trematops* in the Arroyo Formation of the Clear Fork group (see Olson, 1941). Until 1954 no members of this family had been discovered in post-Arroyo beds, although the persistence of the general habitat in which the earlier genera lived suggested that some members might well have survived the Arroyo-Vale transition. A recent discovery of a reasonably well-preserved skull and skeleton of a trematopsid in the lower part of the Vale Formation shows this, in fact, to have been the case, and adds this family to those previously recognized in the post-Arroyo Clear Fork deposits:

#### CLASS AMPHIBIA

##### Subclass *Apsidospondyli*

##### Superorder *Labyrinthodontia*

##### Order *Rhachitomi*

##### Family *Trematopsidae*

##### *Trematopsis* gen. nov.

*Diagnosis.*—General characters of skull and post-cranium similar to those of *Trematops* and *Acheloma*. Proportional differences as shown in Tables 1 and 2. In specimens of comparable size, *Trematopsis* differs from *Trematops* and *Acheloma* as follows: snout shorter, orbits much larger, distal width of humerus and proximal and distal widths of femur less in proportion to length. Femur longer in proportion to skull length.

**Trematopsis seltini**<sup>1</sup> sp. nov.

*Diagnosis.*—As for genus.

*Type.*—CNHM-UR 279. Part of skull and jaws, 19 intercentra, some with neural arches, scapulo-coracoids (part), pubo-ischiadic plate, left humerus and distal end of right humerus, radius, right femur and part of left femur, head of tibia, fragments of ribs, vertebrae, lower limb and foot bones.

*Horizon and locality.*—Lower part of Vale Formation, about 100 feet above base, Clear Fork group, Early Permian, Baylor County, Texas. In drainage area of Beaver Creek, Locality Bac.<sup>2</sup>

*Description and discussion.*—Figures 133 and 134 illustrate the principal features of the new genus. Somewhat less than half of the skull is preserved, and sutures between the elements of the dermal surface are not visible. Crushing has been slight. The skull measurements in Table 1 give a fairly accurate statement of the original dimensions. Adult skulls of *Trematops milleri* and *Acheloma cumminsii* provide the most suitable materials for generic comparisons, since they are roughly comparable to the skull of *Trematopsis seltini* in over-all size. The principal differences between the skulls of the new genus and of these species are found in the relatively short snout and the large orbits of the former. Orbital proportions in *Trematopsis* are approximately the same as those in the small species of *Trematops* and *Acheloma*, which, as is usual, have orbits proportionately much larger than those in the large species of their respective genera. If the orbit of *Trematopsis* gives a reasonable indication of the size of the eye, as seems probable, this structure was truly enormous. The narial region of *Trematopsis* is poorly preserved, so that it has been impossible to determine whether or not the elongated, partially double narial opening and medial narial opening, characteristic of *Trematops* and *Acheloma*, were present in *Trematopsis*. The length of the snout is such, however, that the lateral narial openings of *Trematopsis* were certainly proportionately shorter than those in the earlier genera.

<sup>1</sup> The specific name is given in recognition of Richard Seltin, who discovered the type specimen.

<sup>2</sup> Locality Bac is defined by aerial photographic index as follows: CUM 4B 65, road at 5.1–0.9, along breaks east to 6.3–1.0, north and northeast along breaks to 7.0–3.3, east-southeast around nose of breaks to 7.8–4.0, west to 6.1–4.8, and along breaks to 5.1–0.9. For index interpretation see Olson (1948). This area includes beds of Arroyo age along its eastern margin and lower Vale beds over the more western parts. The Arroyo-Vale contact runs from about 6.7–4.6 south to 6.6–2.2.

The marginal teeth of *Trematopsis* form single rows on the maxillary and dentary as in other members of the family. A pair of large palatal teeth is present near the anterior end of the palate and presumably other pairs were developed, located as they are in *Trematops*. Both marginal and palatal teeth consist of long, slightly

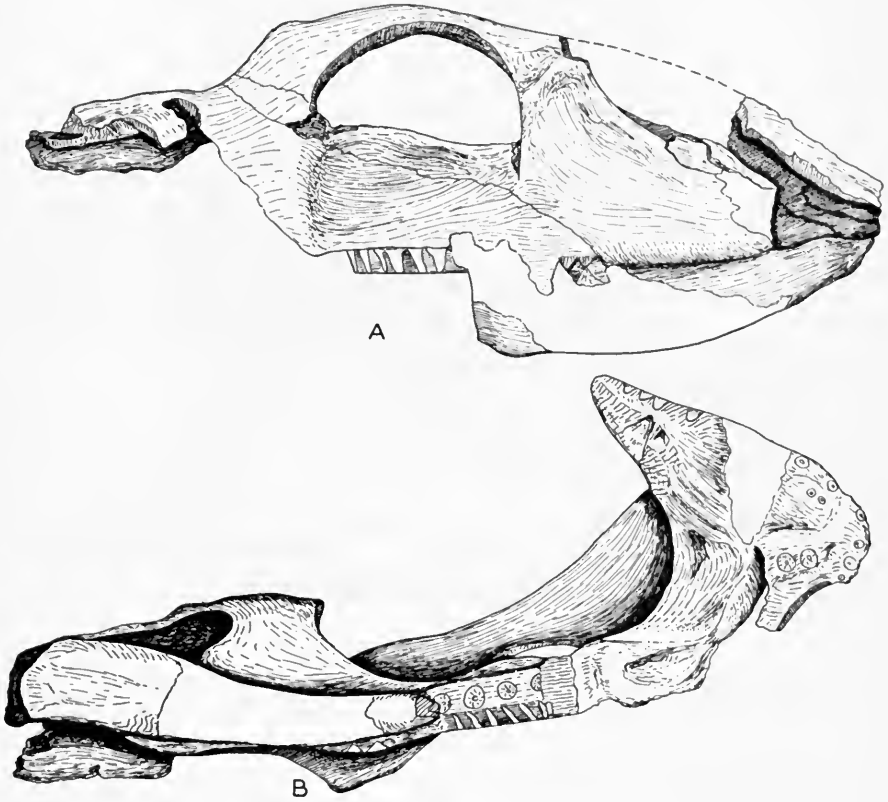


FIG. 133. Skull of *Trematopsis seltini* gen. and sp. nov. A, lateral view; B, ventral view. Both  $\times \frac{1}{2}$ .

recurved cones, characterized by a complex labyrinthine infolding of the enamel. Maxillary teeth are more closely spaced than their dentary counterparts, and, in the mid-region of the jaw, where relationships are clearly shown, there are approximately two upper teeth for each lower.

The postcranium requires little specific comment, since it closely resembles that in the other trematopsid genera. As in *Trematops*,

the limbs were lightly built and comparable to those of contemporary terrestrial reptiles. The hind limb of *Trematopsis*, however, appears, on the basis of evidence from the femur, to have advanced somewhat farther in this direction than in either *Trematops* or *Acheloma*.

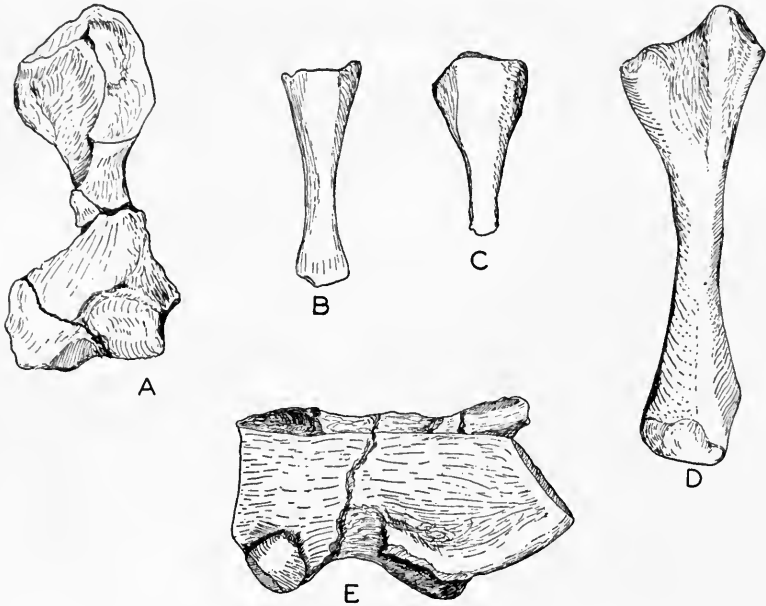


FIG. 134. Postcranial elements of *Trematopsis sellini* gen. and sp. nov. A, humerus, ventral view; B, radius, dorsal view; C, tibia (head), dorsal view; D, femur, dorsal view; E, pubo-ischiadic plate, ventral view. All  $\times \frac{1}{2}$ .

The forelimb shows little or no indication of a comparable change. The intercentra of the vertebrae are crescentic elements, which did not ossify to enclose the notochord as they did in *Trematops milleri*. The degree of ossification, however, is in part an age characteristic and of no great significance in taxonomy. Other preserved elements of the postcranium show no marked differences from homologous elements in *Trematops* and *Acheloma*. The tail, distal elements of the limbs, and portions of the girdles are missing or badly damaged in *Trematopsis* so that reliable comparisons are impossible.

*Trematopsis* may well have been derived directly from *Trematops*, most probably from *Trematops milleri*, with the principal changes occurring in the snout and orbital regions of the skull. It appears to have occupied much the same general ecological position in the



early Vale as that inferred for *Trematops* in the Arroyo. It was a terrestrial carnivore that presumably fed on small terrestrial and aquatic vertebrates and, perhaps, on large invertebrates. It may be that the gradual shift away from the Arroyo type fauna, which took place during the Vale, altered the ecology sufficiently that *Trematopsis* failed to survive the early Vale. As yet it has not been encountered in the rather extensive collections from the middle and upper Vale strata. It would not, however, be an unexpected constituent of the faunas throughout the Vale, and future collecting may well reveal its continued existence beyond the level now known.

TABLE 1: MEASUREMENTS

In millimeters

SKULL

	1	2	3	4	5
<i>Trematopsis sellini</i> gen. and sp. nov., CNHM-UR 279.....	230	65	70	54	80
<i>Trematops milleri</i> , CNHM-UC 640.....	220	60	60	42	100
<i>Trematops milleri</i> , CNHM-UC 1760.....	192	46	58	26	87
<i>Trematops willistoni</i> , CNHM-UC 1584.....	76	20	16	18	31
<i>Acheloma cumminsi</i> , CNHM-UC 481.....	183	..	43	27	83
<i>Acheloma whitei</i> , CNHM-UC 482.....	71	17	18	18	24

1. Length of skull from level of posterior end of otic notch to level of tip of snout.
2. Maximum height of skull at longitudinal mid-plane of orbit.
3. Maximum length of otic notch measured along tabular extension.
4. Maximum length of orbit.
5. Snout length from plane through anterior margins of orbits to tip of snout.

LIMB BONES

	Humerus			Femur		
	L	PW	DW	L	PW	DW
<i>Trematopsis sellini</i> gen. and sp. nov., CNHM-UR 279.....	82	44	42	104	23	33
<i>Trematops milleri</i> , CNHM-UC 640.....	..	..	..	84	25	30
<i>Trematops milleri</i> , CNHM-UR 280.....	73	48	45	..	..	..
<i>Trematops milleri</i> , CNHM-UR 281.....	76	36	44	..	..	..
<i>Trematops willistoni</i> , CNHM-UC 1584...	39	14	22	84	28	31
<i>Trematops milleri</i> , CNHM-UR 282.....	..	..	..	84	28	32
<i>Trematops milleri</i> , CNHM-UR 283.....	..	..	..	85	27	32

L, maximum length; PW, maximum proximal width; DW, maximum distal width.

TABLE 2: RATIOS

## SKULL

	2:1 <sup>1</sup>	3:1	4:1	5:1
<i>Trematopsis seltini</i> gen. and sp. nov., CNHM-UR 279..	0.28	0.30	0.24	0.35
<i>Trematops milleri</i> , CNHM-UC 640.....	0.27	0.27	0.15	0.45
<i>Trematops milleri</i> , CNHM-UC 1760.....	0.24	0.30	0.14	0.45
<i>Trematops willistoni</i> , CNHM-UC 1584.....	0.27	0.21	0.24	0.41
<i>Acheloma cumminsi</i> , CNHM-UC 481.....	....	0.24	0.15	0.45
<i>Acheloma whitei</i> , CNHM-UC 482.....	0.24	0.24	0.25	0.43

## LIMB BONES

	Humerus		Femur		
	PW:1 <sup>1</sup>	DW:1	PW:1	DW:1	L:1
<i>Trematopsis seltini</i> gen. and sp. nov., CNHM-UR 279.....	0.51	0.51	0.22	0.32	0.45
<i>Trematops milleri</i> , CNHM-UC 640....	....	....	0.30	0.36	0.39
<i>Trematops milleri</i> , CNHM-UR 280....	0.52	0.61	....	....	....
<i>Trematops milleri</i> , CNHM-UR 281....	0.47	0.58	....	....	....
<i>Trematops willistoni</i> , CNHM-UC 1584. ....	....	....	0.30	0.36	0.39
<i>Trematops milleri</i> , CNHM-UR 282....	....	....	0.32	0.39	....
<i>Trematops milleri</i> , CNHM-UR 283....	....	....	0.30	0.36	0.39

<sup>1</sup> Number and letter designation of measures as in Table 1.

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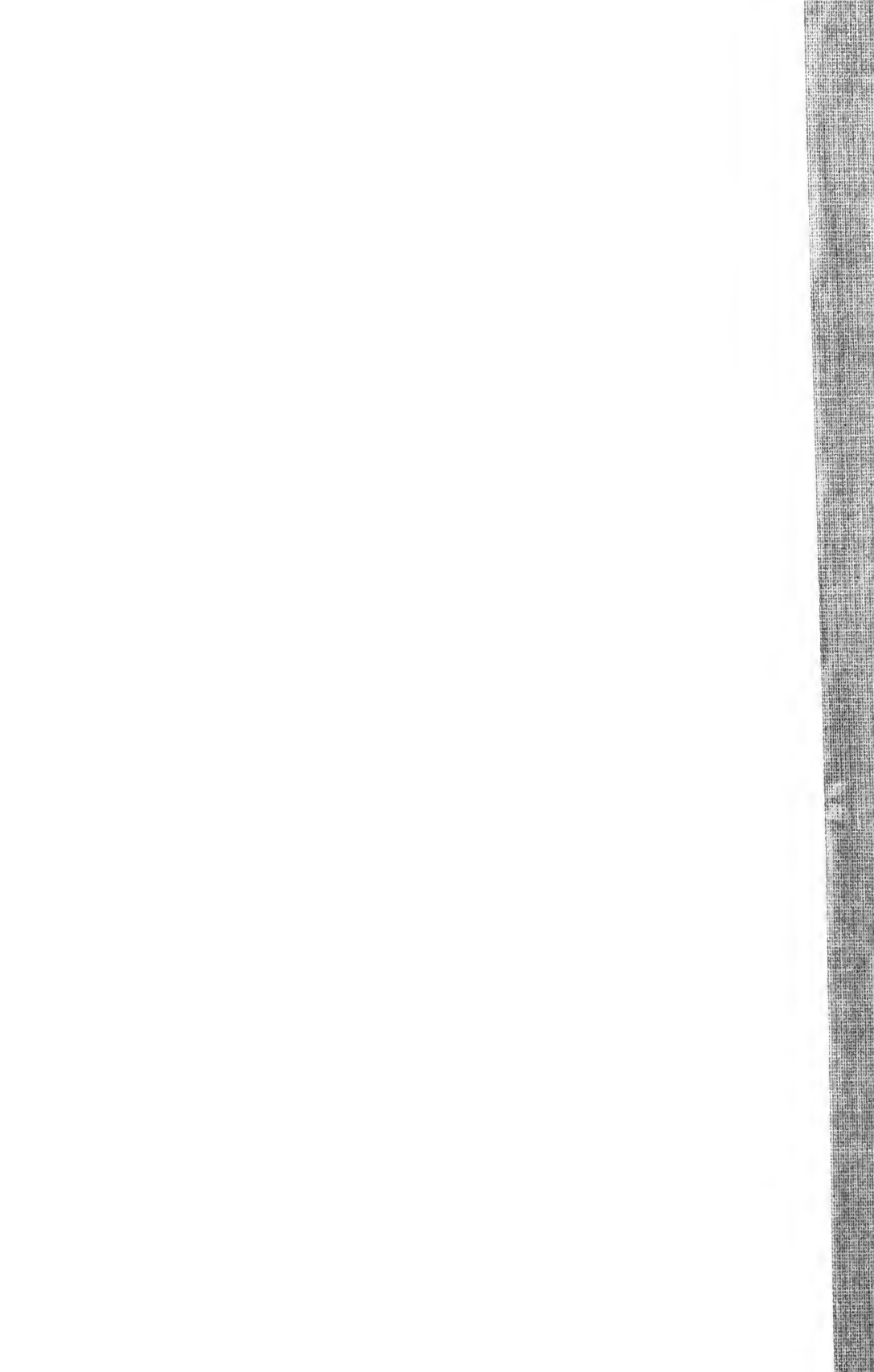
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