



A New Fossil Salamander of the Genus Siren from the Eocene of Wyoming
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Santiago (UIMNH 8182-86). The latter record constitutes the first record for this species outside of the state of Jalisco.

*Rana montezumae.*—In addition to the specimens listed below, which I have examined, Smith and Taylor (1948: 99) give a number of localities for this species. Most of these have been plotted in Figure 3. Distrito Federal: México (AMNH 1289); vicinity of Guadalupe (AMNH 12216-27, 13366-78). Guanajuato: Guanajuato (USMN 9891, 12684, 26155); Santa Rosa (USMN 47206). Jalisco: Teocaltiche (UIMNH 32308). Mexico: Lagunilla de Ojuelos, 5 mi. W Toluca (AMNH 55265-66). Michoacán: Tupátaro (USMN 10239 [3 specimens], 10243 [3 specimens], 10251, 10253-55, 10258); Sahuayo (USMN 113735); 5 mi. NW Maravatio (UIMNH 32304-05). Puebla: Chignahuapan (USMN 21454-59). San Luis Potosí: Arriaga (LSUMZ 2520-38, 2554-55); Bledos (LSUMZ 2549-50, 4275-77, 4285); 21 km. W Illesca (LSUMZ 2317); Laguna de las Rusias (LSUMZ 5654); Presa Gonzales Santos, 10 mi. SW San Luis Potosi (LSUMZ 4303-06); Presa Prudentia (LSUMZ 5668); Presa San Jose, 4 mi. SW San Luis Potosi (LSUMZ 4307-10); Sierra San Miguel, 7500 ft. (LSUMZ 4973).

ACKNOWLEDGMENTS

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THE AMERICAN MUSEUM OF NATURAL HISTORY, NEW YORK.

# A New Fossil Salamander of the Genus *Siren* from the Eocene of Wyoming

COLEMAN J. GOIN AND WALTER AUFFENBERG

WE have recently located three specimens of a fossil salamander of the genus *Siren* in the collections of Yale University. This discovery makes two important contributions to our knowledge of the Sirenidae. Until the present time the earliest known sirenid was *Siren hesterna* from the Lower Miocene of Florida. The new find indicates that the family was present in the Eocene and extends the range to Wyoming, far outside the present known distribution of the family.

These three specimens seem to represent a species heretofore unknown and we propose for it the name

***Siren dunni*, *sp. nov.***

TYPE.—Yale Peabody Museum 3873, a dorsal vertebra, collected by O. C. Marsh, Aug. 13–14, 1873.

HORIZON AND LOCALITY.—Middle Eocene, Bridgerian, *Orohippus* Faunal Zone, Cottonwood White Layer; Henry's Fork, Bridger Basin, Sweetwater County, Wyoming.

DIAGNOSIS.—A small *Siren* with the neural arch standing high above the centrum and with the zygapophysial ridge nearly straight as seen from the side. From the Recent species it differs in having the zygapophysial ridges more concave as seen from above and in the nearly straight horizontal position of the zygapophysial ridges as seen from the side. From *S. hesterna* of the Miocene of Florida it differs in the reduced angle between the aliform processes and in having a better developed floor between the aliform processes. From *S. simpsoni* of the Pliocene of Florida it differs in that the dorsal wing of the transverse process originates near the posterior margin of the centrum and swings up gradually to meet the zygapophysial ridge at an angle of about 40° whereas in *simpsoni* the dorsal wing originates well forward of the posterior margin of the centrum and rises

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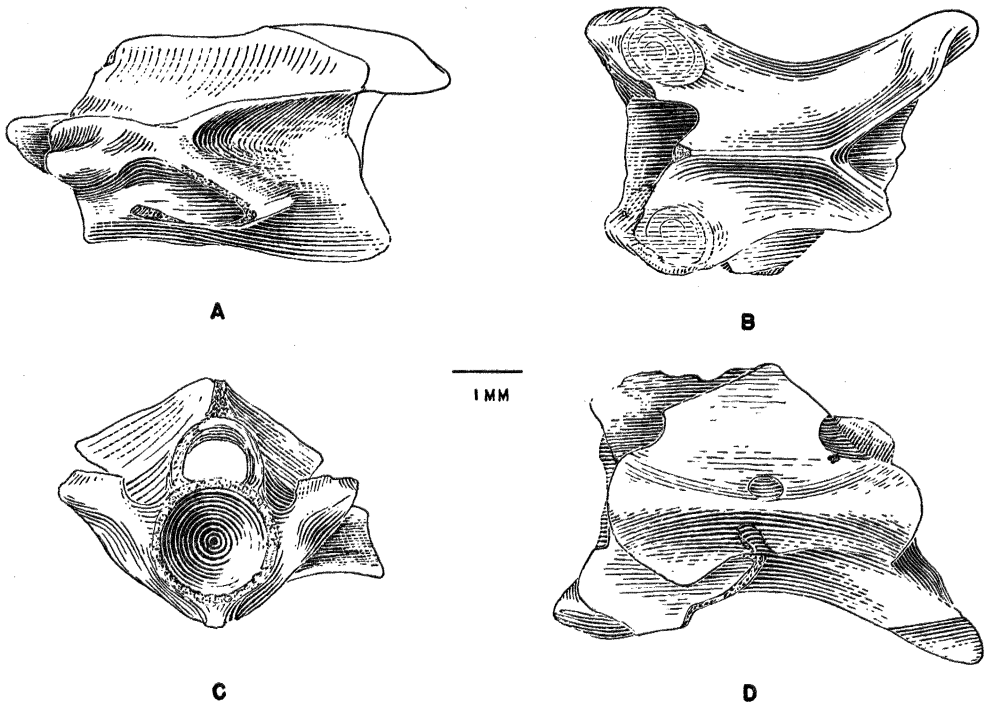


Fig. 1. Type specimen of *Siren dunni*, Yale Peabody Mus. No. 3873. A. Lateral view, left side. B. Dorsal view. C. Anterior view. D. Ventral view.

abruptly, meeting the zygapophysial ridge at an angle of about 60°.

DESCRIPTION OF TYPE.—Measurements in mm. (each measurement is also given in thousandths of the length of the centrum, in parentheses following the measurement): length of centrum along midventral line, 4.6. Width of vertebra at narrowest point of zygapophysial ridges, 2.8 (.609). Height of vertebra from lower margin of centrum to a line drawn between facets of postzygapophyses, 2.2 (.478). Distance from tips of prezygapophyses to tips of postzygapophyses, 6.6 (1.435). Angle between aliform processes, about 65°. Width of anterior glenoid cavity, 1.6 (.348); height of anterior glenoid cavity, 1.3 (.283). Width of neural canal, 1.0 (.217); height of neural canal, 0.9 (.196). Angle of posterior edge of transverse process with axis of centrum indeterminate.

Centrum longer than high; anterior glenoid cavity oval, wider than high, but somewhat eroded; posterior glenoid cavity definitely ovate and higher than wide. Centrum provided with an elevated, ridge-like, medium ventral keel, on either side of which is found a relatively large, subcentral foramen. Margin of ventral keel as seen from side nearly straight.

Total length of neural arch greater than length of centrum and its width at the narrowest portion of the zygapophysial ridges slightly greater than width of centrum. Neural canal stirrup-shaped both anteriorly and posteriorly; no median ridge on the floor of the neural canal.

Articulating surfaces of prezygapophyses broken on the left and eroded on the right, ovate in shape, longer than wide, directed more anteriorly than laterally. Articulating surfaces of postzygapophyses broken on the left, on the right ovate. Zygapophysial ridges well developed, markedly concave as seen from above. As seen from the side the zygapophysial ridge is nearly straight but it is slightly depressed where the dorsal portion of the transverse process meets the zygapophysial ridge.

Aliform processes well developed, vertical in position, somewhat rectangular as seen from the side but the left one broken and the right one somewhat eroded. As seen from above they form an anteriorly pointing V. Floor between aliform processes eroded so that its full extent is not discernible but it extends at least ⅔ of the distance to the posterior margins of the processes.

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Neural spine well developed but its dorsal margin eroded.

Transverse processes well developed and composed of two plate-like portions, of which the ventral is larger than the dorsal. The ventral portion is a wing-like structure extending from close to the anterior margin of the side of the centrum for about 4/5 of the length of the centrum. Its tip is broken so that its transverse extent is not determinable. The dorsal portion is a flat plate extending from the zygapophysial ridge, somewhat behind the posterior margin of the prezygapophysis, ventrally and posteriorly to the posterior margin of the ventral portion to which it is fused. What is left of the posterior margin of the transverse process forms a concave curve. Laterally a foramen is present in the angle between the dorsal and ventral portions of the transverse process and another lies somewhat ventral and posterior to the angle between the dorsal portion of the transverse process and the zygapophysial ridge.

VARIATION.—In addition to the type, two other vertebrae (Yale Peabody Museum 3874 and 3875) are referred to this species. The first is from Dry Creek, Bridger Basin, Sweetwater County, Wyoming, collected by Lamothe and Chew, and the other is from the same locality as the type, collected by O. C. Marsh, Sept. 15, 1871. Although somewhat broken, they do tell us a little about variation. In both of these specimens the angle between the aliform processes is about the same as in the type but in one the processes stand higher, perhaps because they are less eroded. In both of them the floor between the aliform processes is more extensive than in the type but even here the posterior margin of the floor is eroded so that its maximum development cannot be determined. In one specimen the zygapophysial ridges as seen from the side are slightly sinuous rather than nearly straight as in the type. The other is like the type. The lower plate of the transverse process is relatively longer than in the type and extends for nearly the entire length of the centrum. In other characters than can be determined these specimens are essentially the same as the type. The centra are 3.7 and 4.6 mm in length and the greatest diameters of the posterior glenoid cavities are 1.4 and 1.6 mm.

We wish to thank Dr. Joseph T. Gregory for the privilege of borrowing and reporting on these specimens.

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# The Effects of Temperature on Salientian Breeding Calls

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DURING the summer of 1952 and the spring of 1953 a study was made of the effects of temperature on the breeding calls of some Oklahoma salientians. An attempt was made to determine the relationship of air and water temperature to the number of calls produced in a given time interval (frequency of call) and to the lengths of the individual calls. All of the data were taken in the field in order to obtain results which would reflect the unhampered expression of the animals at the breeding sites.

Four species were studied: *Pseudacris nigrita triseriata* Wied, *Pseudacris clarki* Baird, *Pseudacris streckeri* Wright and Wright, and *Bufo terrestris charlesmithi* Bragg. All of the work was done in Oklahoma, the majority of it in Cleveland County.

## METHODS

The data on frequency were taken in the following manner. The calls produced by an individual over a ten second period were counted. Eight such counts were made for each individual calling at a particular temperature. Timing was done with a stopwatch. The mean number of calls produced per ten seconds was calculated for the set of eight. This mean is plotted against temperature in the figures that follow. Hereafter a "set" will refer to a group of eight counts in all cases.

Length of call was determined by starting the stopwatch when a single call began and stopping it at the end of this single call. Eight call lengths were timed for an individual over a very short period of time. Again the mean was calculated

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