

A NEW CRAWFISH OF THE GENUS *ORCONECTES*
FROM CONCHAS LAKE, NEW MEXICO¹

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ABSTRACT

Orconectes deanae is described from Conchas Lake, South Canadian River drainage, in San Miguel County, New Mexico. It is most closely related to members of the Palmeri Group of the Virilis Section.

The species described herein has been known to the authors since 1960 but a lack of sufficient material to base our description (2 Form I males; 1 female) has prevented us from describing it until now. Recently a fine series of Form I males was collected at Conchas Lake, the type locality, resulting in this description.

Orconectes deanae is closely related to members of the Palmeri Group of the Virilis Section but can easily be distinguished from all other *Orconectes* by differences in the first pleopods of Form I males and the annulus ventralis of females.

The authors wish to express their appreciation to Dr. Horton H. Hobbs, Jr. for his helpful advice and review of this paper.

Orconectes deanae new species
(Figures 1-8)

Orconectes causeyi Jester, 1967, pp. 518, 521, 523 (in part).

¹A contribution of the Department of Wildlife and Fisheries Sciences, Texas Agricultural Experiment Station, Texas A & M University, and Journal Article No. 439 of the Agricultural Experiment Station, New Mexico State University.

Diagnosis.—Rostrum with distinct acumen and lateral spines; without carina. Areola obliterated, constituting 30.6% to 33.7% (average 32.1%) of entire carapace length. Chelae as in other species of Palmeri Group. First pleopod of Form I male terminating in two strongly bent rami, reaching coxopodite of second pereopods when abdomen flexed. Central projection of first pleopod bent at approximately 45° angle and representing 20.5% to 23.8% (average 23.0%) of entire pleopod length; mesial process bent at approximately 90° angle and 19.3% to 22.1% (average 21.2%) of entire pleopod length.

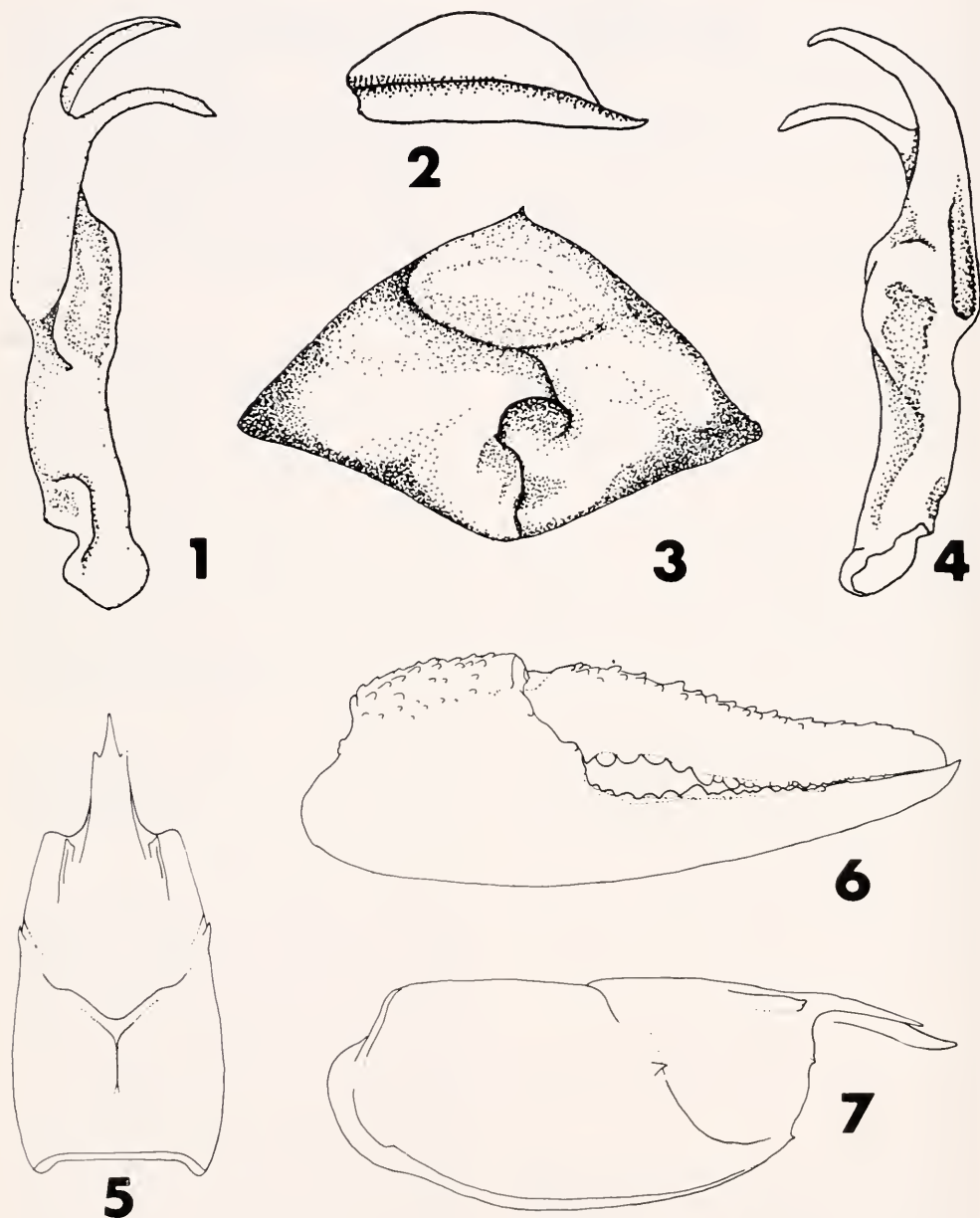
Holotypic male Form I.—Body pigmented; eyes normal. Body subcylindrical, only slightly depressed. Abdomen narrower than carapace (16.7 mm and 20.0 mm in widest parts, respectively).

Rostrum reaching distal podomere of peduncle of antennule; margins subparallel, slightly thickened, terminating cephalically in tubercles; excavate dorsally; carina absent; acumen 32.7% length of entire rostrum. Postorbital ridges strong, each with prominent groove, terminating cephalically in prominent spine. Areola obliterated. Cephalic section of carapace 1.96 times as long as thoracic section. Suborbital angle absent. Branchiostegal spine acute. One prominent cervical spine on each side of carapace (additional small spine on left side, dorsal to prominent spine) just caudal to cervical groove. Carapace with setiferous punctations

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Figures 1-7. *Orconectes deanae* n. sp.: 1, mesial view of first pleopod of paratype Form I male; 2, antennal scale; 3, annulus ventralis of paratype female; 4, lateral view of first pleopod of paratype Form I male; 5, dorsal view of cephalothorax of holotype; 6, right chela of holotype; 7, lateral view of cephalothorax of holotype.

dorsally and caudolaterally, becoming setiferous squamous tubercles cephalolaterally. Carapace wider than high in region of caudo-dorsal margin of cervical groove (20.0, 16.4 mm, respectively).

Length of abdomen subequal to that of carapace (40.0, 41.6 mm, respectively). Cephalic section of telson with two prominent spines on each caudolateral corner.

Epistome subcircular in outline; with ele-

TABLE 1. Measurements of portion of type-series (in millimeters).

	Holotype ¹	Allotype ²	Form 1 males								
Carapace											
Height	16.4	13.9	16.2	15.2	13.8	14.8	13.5	15.1	10.3	10.5	12.6
Width	20.0	15.8	19.4	18.7	16.7	17.8	16.5	17.0	12.9	13.0	15.8
Length	41.6		41.5	38.6	35.0	37.4	35.0	36.4	27.8	27.8	32.5
Cephalic length	27.6		28.3	26.8	23.8	25.1	24.0	24.5	18.7	19.0	22.2
Areola length	14.0	10.8	13.1	11.8	11.2	12.3	11.0	11.9	9.1	8.8	10.3
Rostrum											
Length	10.4		11.9	11.1	9.8	10.0	10.3	10.0	8.3	8.0	9.3
Width	5.4	4.1	4.7	5.0	4.2	4.8	4.5	4.4	3.7	3.6	3.9
Acumen length	3.4		4.3	4.2	3.5	3.5	3.5	3.3	3.1	3.0	3.3
Chela, right											
Height	15.7	7.8	12.5	12.5	11.3	12.4	9.7	10.6	7.5	7.6	8.9
Palm-											
inner margin	11.6	5.1	7.5	8.5	8.5	9.1	6.7	7.5	5.6	5.6	5.9
outer margin	44.1	23.4	36.9	36.8	31.0	34.7	29.5	32.1	20.3	21.5	26.7
width	9.7	4.8	6.9	7.3	6.8	7.8	5.9	6.5	4.5	4.7	5.3
Dactyl length	29.3	16.5	25.9	25.2	20.9	23.3	20.6	22.5	13.6	14.6	19.0
Gonopod											
Length	11.6		11.1	10.4	10.0	10.5	10.1	10.2	8.4	8.3	10.0
Central projec-											
tion length	2.4		2.6	2.4	2.3	2.4	2.2	2.4	2.0	1.7	2.3
Mesial process											
length	2.3		2.4	2.3	2.1	2.3	2.1	2.2	1.8	1.6	2.2
Antennal scale											
Length	9.2	8.4	9.1	8.7	8.5	8.6	8.3	8.7	7.0	7.0	8.5
Width	3.4	3.2	3.7	3.3	3.2	3.2	3.2	3.2	2.6	2.6	3.0
Abdomen											
Length includ-											
ing telson	40.0	33.9	40.3	36.3	36.0	36.4	34.2	37.1	27.7	27.3	32.7

¹ Distal projection of antennal scale broken.
² Acumen broken off even with lateral rostral spines.

vated margins; lacking cephalomedian protuberance.

Antennules with prominent spine on basal segment. Antennae normal, reaching to proximal half of telson. Antennal scale moderately broad terminating cephalically in strong acute spine; lamellar portion widest at mid-length.

Chelae with setiferous punctations above and below; outer margin not costate. Inner margin of palm with two rows of cristiform tubercles, upper row of eight, lower of nine; finger with slight gape, opposable margin of immovable finger with proximal row of six tubercles gradually increasing in size distally, followed by alternating small and large tubercles to distal $\frac{2}{3}$; one tooth on inner surface at distal $\frac{2}{3}$ followed by smaller tooth

on same surface $\frac{1}{2}$ distance between it and corneous tip; crowded minute denticles on distal $\frac{1}{3}$, corneous tip overlying corneous tip of movable finger. Dactyl with two rows of tubercles along mesial margin; opposable margin with row of five subequal tubercles along proximal $\frac{1}{3}$, followed by alternating small and large tubercles to level of last tubercle on opposable surface of immovable finger; minute denticles on distal $\frac{1}{3}$.

Carpus longer than broad, with oblique furrow on upper surface; few scattered setiferous punctations above and below. Mesial surface with two tubercles on proxo-mesial margin; strong acute spine slightly distal to mid-length. Lower distolateral margin with strong acute spine; lower disto-mesial margin lacking ornamentation.

Upper distal surface of merus with two acute spines and two small tubercles proximally; lower distal surface with two rows of equidistant spines terminating with strong spine distally. Hooks on ischiopodites of third pereopods only; hooks strong, simple, extending to proximal margin of ischiopodite.

First pleopods symmetrical, extending cephalad to caudal margin of second pereopods when abdomen flexed; bifid distally. Central projection corneous and bent at approximately 45° angle to main shaft. Mesial process noncorneous and bent at approximately 90° angle to main shaft.

Allotypic female.—The acumen and tips of the antennae of the allotype are broken off. It differs from the holotype in the following ways: there is one prominent cephalic spine on each side of the carapace with two smaller spines on the left side (one above and one below the major spine) and one smaller spine on the right side (below the major spine); there is a third, smaller spine medially on the cephalic section of the telson; the tubercles on the inner surface of the palm of the chelae are not in distinct rows.

The annulus ventralis is sub-elliptical, being wider (3.7 mm) than long (2.4 mm). The cephalic third is depressed around a cephalomedial elevation. The sinus originates on the sinistral side, at the caudal region of the cephalically depressed area and extends caudally in an "s" pattern to just past the median line where it makes a shallow bend to the mid-caudal margin.

Morphotypic male.—Unknown.

Variations.—Few significant variations were observed in the specimens examined by the authors. Although the holotype and allotype have accessory cervical spines, none of the other adults possess them. Two spines on each caudolateral corner of the cephalic section of the telson also seems to be the rule rather than that variation exhibited by the allotype. The arrangement and number of tubercles on the chelipeds vary slightly but only in the allotype are the tubercles on the inner margin of the chela not arranged in two discernable rows.

Type-locality.—Conchas Lake, located at the junction of the Conchas and South Canadian Rivers in San Miguel County, on State

Road 104 approximately 32 miles NW of Tucumcari, New Mexico.

The dam was finished in 1939. The surface area is approximately 10,000 acres and the average depth 38.6 ft. Surface temperatures vary from approximately 36° to 82° F annually. The bottom is composed mostly of gravel, sand, and sandstone bedrock with silt being abundant only at the deltas which have formed at the mouths of the Conchas and South Canadian Rivers. *Orconectes deanae* has been collected on all bottom types except silt. The fish fauna in Conchas Lake is composed of 21 "warm-water" species, many of which are known to feed on *O. deanae*.

The types were collected from under rocks and along a rocky ledge on the southern shoreline of the lake. Most were taken as they darted from under rocks in the shallow areas (around 6 inches in depth) toward the deeper water.

Three individuals (2 Form 1 males and 1 adult female) were obtained from the lake on January 15, 1960. They were entangled in a gill net set on the bottom at a depth of 70 feet.

A series of juvenile individuals were collected in July of 1969 from the shoreline west of the rocky area. Here the water is shallow much farther off shore, and, at the time the collection was made, there was a large area of inundated vegetation. No adults were seen.

Disposition of types.—The holotype (No. 133759), allotype (No. 133760) and five paratypic Form 1 males (No. 133761) are deposited in the National Museum of Natural History (Smithsonian Institution). Four paratypic Form 1 males, three juvenile males and two juvenile females have been retained in the private collection of the senior author. These individuals were collected with the type-series on September 14, 1971. The juveniles collected in July of 1969 could not be found at the time of this writing.

Remarks.—The three specimens (2 Form 1 males, one female) mentioned by Jester (1967, p. 518) as having been collected from Conchas Lake on January 15, 1960 are housed in the Smithsonian Institution (No. 118186) as paratypes of *Orconectes causeyi* Jester, 1967. They were listed erroneously as the first observation of *Orconectes causeyi* and were designated as part of the paratypic-

series (p. 521). They are here included in the type-series of *Orconectes deanae*.

When Jester first collected crawfishes from Lake Conchas, he sent the three specimens mentioned above to Dr. Horton H. Hobbs, Jr., for examination, and, believing them to be conspecific with other specimens we had taken from the Lake, donated them to Dr. Hobbs. Unfortunately, not until after Jester's description of *O. causeyi* had been published was it discovered that two species were represented in the type-series, the three specimens first collected differing from all of the others. The difference of opinion between Hobbs and Reimer concerning the relationships of *O. causeyi* as recorded by Jester (p. 523) is understandable. The specimens examined by them belonged to different species.

Associates.—Only one other crawfish has been taken from the lake, *Orconectes causeyi* Jester. *Orconectes causeyi* was collected from the same shoreline area that yielded *Orconectes deanae* and often from under the same rock.

Relationships.—*Orconectes deanae* belongs to the Palmeri Group of the Virilis Section as evidenced by the obliterated areola, configuration of the chela, shape of the antennal scale, and construction of the gonopod and annulus ventralis. Its closest affinities seem to be with *Orconectes palmeri longimanus* (Faxon, 1898) which also occurs in

the Canadian River of Oklahoma. It can easily be distinguished from this species by differences in the curvature of the terminal elements of the gonopods. In *O. p. longimanus* they are only gently curved, never to the degree found in *O. deanae*.

Orconectes causeyi is a member of the Virilis Group of the Virilis Section but is not closely related to the new species, although it apparently is native to the upper Arkansas drainage (Dean, 1969, p. 5), including the South Canadian River.

Etymology.—This new species is named in honor of Mrs. Elsie Dean, the junior author's former secretary with the New Mexico Dept. Game and Fish, whose capacity for high quality work is exceeded only by her concern for the success and happiness of her co-workers. This species is named for Elsie as a small token of great esteem.

LITERATURE CITED

- DEAN, J. L. 1969. Biology of the crayfish *Orconectes causeyi* and its use for control of aquatic weeds in trout lakes. Technical Paper 24, Bureau of Sport Fisheries and Wildlife, U. S. Department of Interior. 15 pp.
- FAXON, W. 1898. Observations on the Astacidae in the United States National Museum and in the Museum of Comparative Zoology with descriptions of new species. Proc. U. S. Nat. Mus., 20:643-698.
- JESTER, D. B. 1967. A new crawfish of the Genus *Orconectes* from New Mexico (Decapoda, Astacidae). Amer. Midl. Nat., 77(2): 518-524.

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