

HOBBSEUS YALOBUSHENSIS, A NEW CRAWFISH FROM CENTRAL MISSISSIPPI (DECAPODA: CAMBARIDAE)

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Abstract.—A new crawfish, *Hobbseus yalobushensis*, is described from the headwaters of the Yalobusha River, ultimately a tributary of the Mississippi River. This is the first record of the genus from the Mississippi drainage. The new species is most closely related to *H. prominens* (Hobbs) and *H. petilus* Fitzpatrick. It is distinguished from them by the relative lengths of the terminal elements of the first pleopod of the first form male; females of *H. yalobushensis* are the only members of the genus to have a deep, long trough in the anterior part of the annulus ventralis.

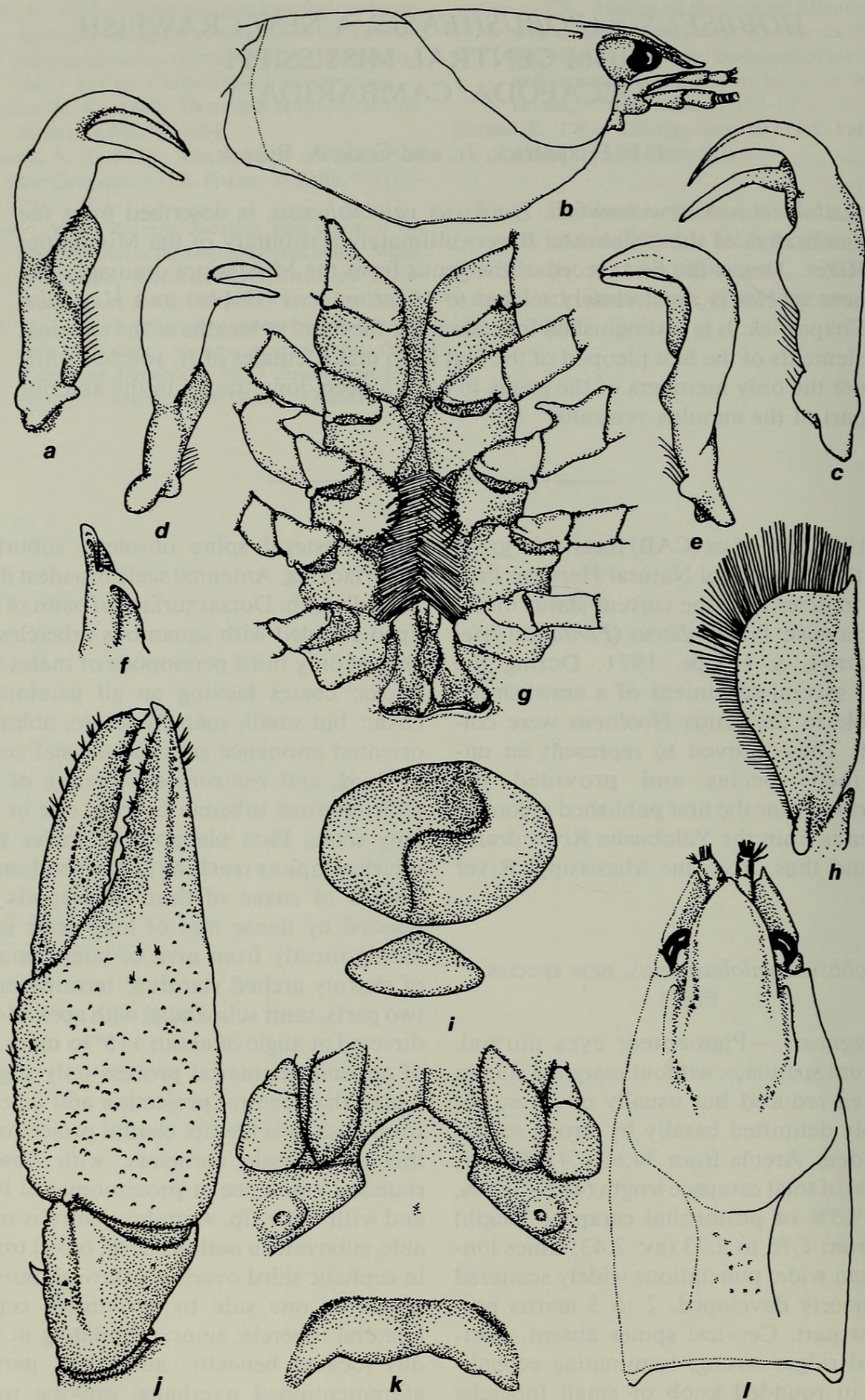
In 1987, one of us (CAB) received a grant from the Mississippi Natural Heritage Program to determine the current status of the rare crawfish *Procambarus (Pennides) lylei* Fitzpatrick & Hobbs, 1971. During the study, several specimens of a crawfish assignable to the genus *Hobbseus* were collected. These proved to represent an undescribed species and provided the opportunity for the first published record of the genus from the Yalobusha River drainage, and thus, from the Mississippi River basin.

Hobbseus yalobushensis, new species

Fig. 1

Diagnosis.—Pigmented; eyes normal. Rostrum spatulate, without marginal spines; acumen reduced but usually obvious, not sharply delimited basally by strong rostral shoulders. Areola from 34.6 to 41.9% (av. 42.0%) of total carapace length (43.5–51.0%, av. 49.5% of postorbital carapace length) and from 1.75 to 2.73 (av. 2.43) times longer than wide; punctations widely scattered and poorly developed, 2 to 5 across narrowest part. Cervical spines absent. Postorbital ridges strong, terminating cephalically in rounded knob or small tubercle.

Branchiostegal spine obsolete; suborbital angle lacking. Antennal scale broadest distal to midlength. Dorsal surface of palm of cheliped studded with squamous tubercles. Ischia of only third pereopods of males with hooks; bosses lacking on all pereopodal coxae, but small, sparsely setose, obliquely oriented eminence on caudomesial corner of third, and ventromesial margin of fifth with obvious tubercle bearing one or two long setae. First pleopods of males symmetrical, apices reaching just beyond caudal margin of coxae of third pereopods and hooded by dense mat of long setae originating mostly from area of lateral margin of sharply arched sternites; terminating in two parts, rami subparallel with apex of each directed at angle of about 115° to main axis of appendage; mesial process only slightly longer than central projection and tapering from base to acute tip; central projection of first form male corneous, with obscure rounded eminence at proximomesial base, and with acute tip. Annulus ventralis movable, subovate in outline; deep, broad trough in cephalic third overhung through most of length of one side by prominent cephalolateral tubercle; sinus, originating in fundus located beneath caudalmost part of aforementioned overhang, moving trans-



versely past midline and then turning sharply caudad following gently undulant path to or nearly to caudal margin. Hand of female sparsely hirsute with comparatively few punctations above and below.

Holotypic male, Form I. — Cephalothorax (Fig. 1*b*, *l*) subovate, slightly compressed laterally, deeper than wide at level of caudodorsal margin of cervical groove (8.0 and 7.5 mm, respectively). Abdomen longer than carapace (16.0 and 15.4 mm). Areola 2.43 times longer than wide with 3 or 4 irregular rows of poorly delineated punctations, 3 across narrowest part, constituting 36.4% of entire length of carapace (44.1% of postorbital length). Rostrum slightly depressed anteriorly, only weakly excavate dorsally, unthickened elevated margins flanked mesially by deep punctations only near base; acumen slightly upturned, poorly set off from rostrum and not reaching distal margin of penultimate podomere of antennule. Subrostral ridge weak and barely visible in dorsal aspect. Postorbital ridge strong, grooved dorsolaterally, terminating cephalically in rounded, unexpanded knob. Suborbital angle lacking. Branchiostegal spine obsolete. Cervical spine absent; very few deep punctations on carapace, deepest in vague row leading caudomesially from base of postorbital ridge; few low squamous granulations in extreme cephalolateral part.

Cephalic lobe of epistome (Fig. 1*k*) broadly subtriangular, distinctly convex with elevated margins, obtuse fovea in main body. Antennules of usual form with small spine near ventromesial margin of basal article. Antennae extending caudally to midlength of third abdominal tergum; antennal scale (Fig. 1*h*) 1.40 times longer than wide, widest distal to midlength, lateral part

thickened, terminating in strong acute spine and overreaching distal margin of ultimate podomere of antennal peduncle.

Cephalic section of telson with single immovable spine in each caudolateral corner and slightly movable spine just mesial to it.

Chela (Fig. 1*j*) somewhat depressed, slightly rotated mesially, subovate in cross section. Upper surface with comparatively prominent tubercles and only sparsely punctate, punctations deep only on fingers and in cluster of three proximal to base of immovable finger. Both fingers with median longitudinal ridge above and below, setiferous punctations more common on dorsal flank of opposable margins. Opposable margin of immovable finger with three prominent tubercles in basal half, single row of minute denticles along distal half. Opposable margin of dactyl with tubercle near midlength and second subequal tubercle near proximal one-tenth, both smaller than tubercles of immovable finger; single row of crowded minute denticles in distal half. Lateral margin of fixed finger with obtuse keel along most of its length and four tufts of setae in distal one-fourth; corresponding margin of palm only slightly undulant; inner margin of palm with single, nearly cristiform row of 13 tubercles, flanked above by three tiny squamous tubercles and, in distal third, below by four. Low but broad squamous tubercle near base of dactyl. Outer margin of dactyl entire with row of submarginal, conspicuously setose punctations in distal half.

Carpus of cheliped slightly longer than wide; dorsal surface with shallow nearly longitudinal furrow toward mesial margin and few scattered setiferous punctations, mostly in distal half; mesial margin with

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Fig. 1. *Hobbseus yalobushensis*, all figures of holotype except *d*, *e*, morphotypic male; *i*, allotypic female. *a*, Mesial view of first pleopod; *b*, Lateral view of carapace; *c*, Lateral view of first pleopod; *d*, Mesial view of first pleopod; *e*, Lateral view of first pleopod; *f*, Caudal view of tip of first pleopod; *g*, Ventral aspect of basal podomeres of pereopods; *h*, Antennal scale; *i*, Annulus ventralis; *j*, Dorsal aspect of distal podomeres of cheliped (carpus rotated about 20° laterally to visualize stout mesial spine); *k*, Epistome; *l*, Dorsal view of carapace.

nine irregularly placed squamous to low spiniform tubercles; lower submesial margin with strong, acute spine slightly distal to midlength; lower laterodistal corner with acute spine, lower mesiodistal corner lacking ornamentation. Merus with row of eight subacute spines along ventromesial margin and another of five along ventrolateral margin, with row of four spiniform tubercles on dorsal margin, row terminating in two more small but stout subacute, adjacent spines. Ischium with three small spines along distal two-thirds of mesial margin.

Hooks on ischia of third pereiopods only (Fig. 1g); hooks strong, simple, slightly arched, and overhanging basioischial articulation but opposing structure on basis lacking. Coxae of all pereiopods lacking bosses, but third with slightly globose expansion of caudomesial corner bearing irregular arrangement of from seven to nine long, coarse setae; fifth with typical ventromesial setose eminence and penile orifice.

Sternum of third through fifth pereiopods deeply excavate and with dense tufts of setae arising from lateral margins, setae (with minor contributions from proximal parts of coxae) obscuring distal half of pleopods when latter held parallel to body.

First pleopods (Fig. 1a, c, f) as described in "Diagnosis"; central projection corneous.

Allotypic female.—Except in secondary sexual characteristics, differing from holotype in following respects: abdomen subequal in length to carapace; mesial margin of palm with row of 12 tubercles; opposable margin of fixed finger with proximalmost tubercle reduced to scarcely more than prominent undulation; mesial margin of carpus with 2 small tubercles and 1 small spine proximal to stout spine, no ornamentation distally; merus with only 3 small spines in ventrolateral row, row ending distally in strong acute spine at corner; ventromesial row of 3 large, 1 small, followed by 3 large, 1 small, and distally, 4 large spines, dorsal surface with 2 spines on distalmost margin.

Annulus ventralis (Fig. 1i) movable, subovate in outline, highest (ventrally) just caudal to midlength; deep broad trough arising on cephalomedian margin and progressing obliquely to left of midpoint of annulus, high crescent-shaped eminence (or cephalolateral tubercle) overhanging lateral and caudal extremes of trough; sinus arising in deep fossa located in caudolateral corner of trough, progressing transversely to right of median line, there turning sharply caudad, following gently undulant path to just short of caudal margin. Postannular sclerite prominent, about half width of annulus, and not obscured by caudal margin of latter.

Morphotypic male, Form II.—Differing from holotype in following respects: areola with 4 punctations across narrowest part; proportions of chela more like allotype and inner margin of palm with row of 12 tubercles; mesial surface of carpus with 3 small spines proximal to stout spine, entire dorsally; ventromesial margin of merus with row of 3 large, 1 small, and 3 large spines, lateral row represented by single quite prominent acute spine at base of distal fourth; dorsal surface of same podomere with 3 triangularly arranged stout spines near distal margin.

Both terminal elements of first pleopod (Fig. 1d, e) noncorneous, less slender, subequal in length, and apices subacute. Hooks on ischia of third pereiopods conspicuous but markedly less developed, rounded at apex. Left first pleopod with incomplete, obscure suture delimiting basal tenth.

Type locality.—The holotype and allotype were collected from Topashaw Creek, 3.8 airmi. (6.1 km) SW of Mantee (jct. of St. Rtes. 15 and 46), T21N, R11E, at the boundary of Secs. 2 and 11, Webster County, Mississippi. Here the creek flows through agricultural land, but it is shaded by deciduous trees on both banks. The banks have been severely eroded by inflow from two metal culverts draining the fields and located approximately 15 m upstream of the collection site. The creek was from 1 to 2 m wide, and up to 0.7 m deep, with slow

flow. The animals were collected by dip net from the streambed of bare mid-phase Porters Creek clay. No plant material other than leaf litter was apparent in the shaded area where the specimens were taken. Other crawfish present were large numbers of an undescribed *Orconectes* species and *Cambarus* (*Depressicambarus*) *striatus* Hay, 1902. The morphotype was taken from Dry Creek, a Topashaw Creek tributary, 0.5 roadmi. (0.8 km) W of Hohenlinden, T15S, R1E, NE/4 SW/4 Sec. 36, also in Webster County.

Disposition of the types.—The holotype, allotype, and morphotype are in the collections of the National Museum of Natural History, Smithsonian Institution (USNM 219513, 219514, and 219515, respectively); the same museum also has three lots of paratypes (1 ♂ I, 5 ♂ II, 2 ♀). Other paratypes are in the collections of the Mississippi Museum of Natural Science, Jackson (MMNS; 4 ♂ I, 5 ♂ II, 5 ♀, 3 ♂ imm., 2 ♀ imm., 12 unsexed imm.); of the Royal Ontario Museum, Toronto (ROM; 1 ♂ I, 1 ♂ II, 1 ♀, 7 ♂ imm., 1 ♀ imm.); and of the Milwaukee Public Museum (MPM; 1 ♂ II, 1 ♀).

Range and specimens examined.—*Hobbseus yalobushensis* has been collected on nine occasions from six localities, all in the headwaters of the Yalobusha River, tributary to the Yazoo River, tributary to the Mississippi River: Calhoun County. (1) Small unmapped tributary of Bear Creek, 7.5 airmi. (12.2 km) SE of Calhoun City (jct. St. Rtes. 8 and 9), T22N, R10E, center Sec. 12, (MMNS; 1 ♀, 1 ♂ imm., 2 ♀ imm.), 13 Feb 1987, C. Busack, M. Belk, and N. Hunt, colls.; Chickasaw County. (2) Topashaw Creek at St. Rte. 340, 4.5 roadmi. (7.3 km) W of St. Rte. 15, T15S, R2E, boundary of Secs. 20 and 21, (ROMIZ 13881; 1 ♂ I, 1 ♂ II, 7 ♂ imm., 1 ♀ imm.), 14 Mar 1988, M. Belk, coll.; (3) Topashaw Creek at St. Rte. 340, 4.5 roadmi. (7.3 km) W of St. Rte. 15, T15S, R2E, boundary of Secs. 20 and 21, (MMNS; 2 ♂ I, 1 ♂ II, 1 ♀, 1 ♂ imm., 1 ♀ imm., 12 unsexed imm.), 26 Mar 1988, C. B. and M. B., colls.; (4) Topashaw Creek at

county road, 2.5 roadmi. (4.0 km) W of St. Rte. 341, T15S, R1E, Sec. 23 NW/4, (MMNS; 1 ♂ I, 2 ♂ II, 1 ♀, 1 ♂ imm.), 26 Mar 1988, C. B. and M. B., colls. (5) roadside ditch, 3.4 roadmi. (5.5 km) NW of St. Rte. 9 on St. Rte. 404, (tributary to Sabougla Creek), (USNM 218641; 1 ♂ I), 17 Apr 1967, C. Craig, coll.; (6) 3.4 roadmi. (5.5 km) N of St. Rte. 9 at Bellefontaine on St. Rte. 404, (USNM 207124; 1 ♂ II, 1 ♀), 14 May 1969, T. D. Thornhill, coll.; (7) 3.4 roadmi. (5.5 km) NW of St. Rte. 9 at Bellefontaine on St. Rte. 404, (USNM 207112; 4 ♂ II, 1 ♀), 14 May 1969, C. C., coll.; (8) Dry Creek, 0.5 roadmi. (0.8 km) W of Hohenlinden, R1E, T15S, NE/4 SW/4 Sec. 36, (USNM 219515; 1 ♂ II) (ROMIZ 13882; 1 ♀) (MMNS; 2 ♂ II, 2 ♀) (MPM IZ 1988-30; 1 ♂ II, 1 ♀), 24 Apr 1987, M. B. and K. Baldwin, colls.; (9) type locality, (USNM 219513, 219514; 1 ♂ I, 1 ♀) (MMNS; 1 ♂ I), 5 Jun 1987, C. B. and N. Baldwin, colls. In addition, two immature females collected by C. B., M. B., and C. Hill on 30 Jan 1987 from Sabougla Creek, 1 roadmi. (1.6 km) NW of Bellefontaine, T21N, R9E, SW/4 SE/4 Sec. 24, Webster County, are probably assignable to this species; this collection is at MMNS.

Variations.—Most of the limits of variation seen in this limited number of specimens is reflected in the description of the primary types, above. The second Form I male from the type locality has the apex of the rostrum broadly rounded and is without an acumen; perhaps it was broken early in life; also the mesial margin of the right palm has a row of 15 tubercles. In one of the Form II males (12.5 mm carapace length) collected with the morphotype, the terminal elements of the first pleopod are adpressed throughout their length, and the central projection is markedly the longer element; the pleopod also has a distinct juvenile suture proximally. The rostra of two immature specimens (1 ♂, 1 ♀) have sharply converging margins so that the acumen is acute and clearly delineated.

Size.—The largest animal collected is a

Table 1. — Measurements (in mm) of types of *Hobbseus yalobushensis*.

	Holotype	Allotype	Morpho- type
Carapace			
Total length	15.4	16.5	14.1
Postorbital length	12.7	13.2	11.5
Width	7.5	8.0	7.0
Height	8.0	8.6	7.4
Areola			
Length	5.6	5.8	5.1
Width	2.3	2.2	2.1
Antennal scale			
Length	3.5	3.6	3.4
Width	2.5	2.5	2.5
Rostrum			
Length	6.2	6.6	5.5
Width	4.2	4.1	3.9
Chela			
Length, mesial margin palm	4.6	5.0*	4.0
Width, palm	4.6	4.5*	4.0
Length, lateral margin propodus	9.6	8.8*	7.4
Length, dactyl	5.5	5.4*	4.8
Abdomen			
Length	16.0	16.5	15.4
Width	6.5	7.7	6.4

* Left chela; right regenerated.

female 21.8 mm in cephalothorax length. The largest first form male is 18.0 mm, and the smallest 14.8 mm. No ovigerous females or females carrying young were collected. For measurements of the primary types see Table 1.

Color notes. — The color patterns are extremely variable, ranging from medium brown with frequent irregular black splotches dorsally, and becoming nearly concolorous black laterally, to uniform medium tan, except for two poorly defined dorso-laterally placed dark lines extending from the mid-cephalic area to the cephalic margin of the telson. The abdomen is pale brown dorsally, except for the aforementioned lines which degenerate to a series of irregular splotches at the tergal margins. A dark red-

dish brown line marks the boundary between pleura and terga. The dorsal surface of the chela is basically orange brown, deepening to very dark brown on the fingers. The fingers are nearly white at the tips. The carpus, except for a light oblique groove, and the merus of the cheliped are dark brown dorsally. The pereiopods are dark brown dorsally and distally, fading to pink ventrally and proximally. The undersides of the abdomen and cephalothorax are white; those of the proximal pereiopodal segments are white but deepen to pink at the ischia or meropodites. A varying intensity of pink coloration imparts a striped appearance to the pereiopods, especially in juveniles.

Associates. — *H. yalobushensis* has been collected in association with *Cambarus* (*Depressicambarus*) *striatus*, *Procambarus* (*Ortmannicus*) *hayi* (Faxon, 1884), *Procambarus* (*Pennides*) *vioscai* Penn, 1946, and an undescribed species of *Orconectes*.

Relationships. — The nearest relatives of *Hobbseus yalobushensis* are *H. prominens* (Hobbs, 1966) and *H. petilus* Fitzpatrick, 1977. It can be distinguished from the former by its less spatulate rostrum and that in *H. prominens* the terminal elements are slightly divergent. In both of the previously described species the mesial process is markedly longer than the central projection; the mesial process is, at best, only slightly longer in *H. yalobushensis*. *Hobbseus yalobushensis* is unique in the genus in having such a well-developed, broad, long trough in the annulus ventralis and in having comparatively heavy, non-uniform tuberculate ornamentation on the dorsal surface of the palm of the chela.

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