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American Lithobiid Centipeds

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NEW GENERA AND SPECIES OF AMERICAN LITHOBIID CENTIPEDES

By RALPH V. CHAMBERLIN

The lithobiomorphous chilopods herein described are represented in lots from various sources recently acquired by the author, in whose collection the material is at present retained at the University of Utah. With the exception of two species from Mexico, all are from the United States, the majority coming from California, with others from Arizona, Nevada, Oregon, and Washington.

Family WATOBIIDAE

Genus ELATTOBIUS, new

Agreeing with *Arkansobius* in general, but with the articles of antennae numerous instead of being fixed at 19.

Elattobius simplex, new species

Color dark brown, with the legs a lighter, somewhat reddish brown. Antennae of moderate length, composed of about 50 articles which are very short beyond the second one. Ocelli 1 + 3, 3.

Prosternal teeth 2 + 2, small, the line of apices nearly straight. Special seta ectad of outer tooth on each side hair-like.

Posterior angles of ninth, eleventh, and thirteenth tergites produced.

Coxal pores small, round, 3 (4), 4, 4, 4.

Tarsi of all legs long and distinctly biarticulate.

Claw of female gonopods strictly entire; basal spines 2 + 2

Length, 9.4 mm.

LOCALITY.—Taken on banana from Mexico at New Orleans, July 12, 193. One female.

Family LITHOBIIDAE

Tidabius emporus, new species

Body and legs yellow throughout.

Antennae short, composed of 25 articles which are very short beyond the second. Ocelli in a narrow longitudinal patch, in two series; 1 + 4, 3 (4), the first of the top series larger than the "single" ocellus.

Prosternal teeth small, pale 2 + 2, the line of apices concave.

Ventral spines of first legs 0, 0, 0, 0, 1. Ventral spines of penult legs 0, 1, 3, 3, 1; dorsal spines, 0, 0, 2, 1, 0; claws 2 (3). Ventral spines of anal legs, 0, 1, 3, 1, 0; dorsal, 0, 0, 2, 0, 0; claw single. None of the posterior coxae armed.

Claw of female gonopods tripartite, lobes acute, small; basal spines 2 + 2, relatively short and broad.

LOCALITY.—Taken at Honolulu in packing material about *Rhynchostylis retusa* from Japan, April 11, 1938. One female.

Among known species of *Tidabius* having the ventral spines of the anal legs 0, 1, 3, 1, 0, comparable in its small size only with *tivus* but at once separated from the latter in having the claw of the anal legs single instead of double.

Simobius lobophor, new species

A dark brown, in part blackish. Antennae also brown, rufous distally. Legs yellowish brown.

Ocelli typically 1 + 4, 3 (4), 2; the single ocellus not enlarged, well separated from the others.

Coxal pores, 3, 4, 4, 4.

Ventral spines of first legs 0, 0, 1, 3, 1. Ventral spines of penult legs 0, 1, 3, 3, 2; dorsal, 1, 0, 3, 0 (1), 0; the claw armed. Ventral spines of anal legs, 0, 1, 3, 3, 1; dorsal, 1, 0, 3, 1, 0; the claw unarmed. None of the posterior coxae laterally armed.

Length, 10.5 mm.

LOCALITY.—Washington: Naches River, 15 miles below summit (W. 121°7': N. 46°59').

One male taken July 5, 1938, by W. Ivie.

Nipponobius annectus, new species

Color above light reddish brown. Head and antennae somewhat orange yellow, the other legs yellow.

Antennae very short, composed of 20 articles of which all but the first few and the last one are very short and compactly joined. Ocelli 1 + 2, the single ocellus minute, the most anterior largest.

Prosternal teeth 2 + 2, pale, equal; line of apices a little recurved; median incision acutely V-shaped.

Coxal pores small, 1 (2), 2, 2, 3 (2).

Claw of female genital forceps short, entire; basal spines 2 + 2

Ventral spines of first legs, 0, 0, 0, 0, 1; of second, 0, 0, 0, 1, 1. Ventral spines of anal legs, 0, 1, 3, 1, 0; dorsal, 1, 0, 2, 0, 0; claw unarmed. Ventral spines of penult legs, 0, 1, 3, 1, 0; dorsal, 1, 0, 2, 1, 0; claw armed. Dorsal spines of thirteenth legs, 0, 0, 1, 1, 1. None of the posterior coxae laterally armed.

Anal legs inflated, the penult less so.

Length, 5 mm.

LOCALITY.—California: eleven miles east of Glenville; elevation, 5,000 ft.; March 19, 1941. S. and D. Mulaik. One female.

The other species known in this genus are from Japan and China. From these the present species differs in fewer ocelli, gonopods of female, and details of spining of legs.

***Oabius ajonus*, new species**

A pale yellow species with the head somewhat darker, weak orange.

It differs from *Oabius oreinus* in having the articles of the antennae 20 in number instead of the exceptional number 22. Ocelli few in number, from 4 to 6 in two series; e.g., 1 + 3, 2 and 1 + 2, 1; the single ocellus typically smaller than the first ocellus of upper series with which it is in contact. Prosternal teeth normal.

Ventral spines of first legs 0, 0, 0, 1, 1. Ventral spines of penult legs, 1 (0), 3, 3, 2; dorsal, 1, 0, 2, 1, 1. Ventral spines of anal legs, 1, 0, 3, 1, 0; dorsal, 1, 0, 2, 1, 0; claw single. None of the coxae laterally armed.

Gonopods of female with claw tripartite, the lateral lobes rather weak; basal spines 2 + 2.

Length, about 8 mm.

LOCALITY.—Arizona: 20 miles south of Ajo. Six specimens, males and females, taken by S. and D. Mulaik. January 4, 1941.

Differing from *O. oreinus*, another Arizona species, in antennae, eyes, smaller size, and in the characteristic ventral spining of the anal legs, 0, 1, 3, 1, 0, in which it also differs from the other species.

***Oabius pelotes*, new species**

Head with lateral margin smoothly continuous. Antennae short, in the type composed of 21 articles. Ocelli 4, in a single series, small.

Prosternal teeth 2 + 2, normal.

Ventral spines of first legs, 0, 0, 1, 3, 1. Ventral spines of the penult legs, 0, 1, 3, 3, 1; dorsal, 1, 0, 3, 1, 1; accessory claw present. Ventral spines of the anal legs 0, 1, 3, 2, 0; dorsal, 1, 0, 3, 1, 0; claw single. Last three pairs of legs laterally armed, last two pairs dorsally. Dorsal spines of twelfth legs, 0, 0, 3, 2, 2.

Claws of female gonopods apically rather blunt, tripartite, the lateral lobes weak. Basal spines 2 + 2.

LOCALITY.—California: Hastings Reservation, Monterey County. One female taken January 29, 1940, and a male and female, June 12, 1940.

This species differs from *O. tiganus*, found in the Pacific Grove region, in having only the last two pairs of coxae dorsally armed, in having the dorsal spines of the twelfth legs 0, 0, 3, 2, 2, instead of 1, 0, 3, 1, 1 and the ventral spines of the penult legs 0, 1, 3, 3, 1 instead of 0, 1, 3, 3, 2.

Oabius kernensis, new species

Color above brown, with the head orange and legs yellow.

Ocelli in two series, a maximum of 8 in number; e. g., 1 + 4, 3, the anterior ocellus of each series very small or 1 + 4, 2 with anterior ocellus of upper row reduced. Antennae short.

Prosternal teeth normal, 2 + 2, pale, broad at base.

Coxal pores small, 2, 3, 3, 2.

Ventral spines of first legs 0, 0, 1, 2, 1. Ventral spines of penult legs, 0, 1, 3, 3, 2; dorsal, 1, 0, 3, 1, 1; claw armed. Ventral spines of anal legs, 0, 1, 3, 2, 1; dorsal, 1, 0, 3, 1, 0; claw single. Dorsal spines of 13th legs, 0, 1, 3, 2, 2. Last two pairs of coxae laterally armed.

Claw of female genital forceps rather short and proportionately broad, tripartite. Basal spines 2 + 2, gradually attenuated from base to the more abruptly conical apical portion.

Length of female holotype, 7 mm.

LOCALITY.—California: 7 miles north of Glenville, Kern Co. March 19, 1941.

Three specimens collected by S. and D. Mulaik.

Suggesting *O.astianus* in the spining of the legs, but a smaller species with the ocelli in two rows instead of in three.

Arebius crenius, new species

Body above yellowish, with head and sometimes caudal end more or less orange; antennae and legs yellow.

Head with marginal interruptions distinct. Antennae of moderate length, composed of 20 articles which are from moderate to long in length. Ocelli in a narrowly elliptic patch and in 2 series; e. g., 1 + 4, 5; the single ocellus small and contiguous with the patch; all black.

Prosternal teeth 2 + 2, very small; special seta fine but with obviously thickened base; median sinus V-shaped; margin ectad of dental line convex and very oblique.

Posterior angles of none of the dorsal plates at all produced.

Coxal pores small, pale and circular; 2, 3, 3, 2.

Last three pairs of coxae laterally armed. Ventral spines of first legs, 0, 0, 1, 3, 1; dorsal 0, 0, 1, 2, 1. Ventral spine of 12th and 13th legs, 0, 0, 3, 3, 2; dorsal 1, 0, 3, 2, 2. Ventral spines of penult legs, 0, 1, 3, 3, 1; dorsal, 1, 0, 3, 2, 1; claw single. Ventral spines of anal legs, 0, 1, 3, 2, 0; dorsal, 1, 0, 3, 1, 0; claw single.

The anal legs of the male long and slender, without special lobes.

Claw of female genital forceps tripartite, the lateral lobes small; basal spines 2 + 2, slender, equal.

The anal legs of the male long and slender, without special lobes.

Claw of female genital forceps tripartite, the lateral lobes small; basal spines 2 + 2, slender, equal.

Length, to about 11 mm.

LOCALITY.—California: Mountain Springs. January 8, 1941. S. and D. Mulaik.

Five specimens, males and females.

In the author's key (1916) this species runs to *A. dolius*, species known from Friant and Santa Barbara. It differs in having the ventral spines of the anal legs 0, 1, 3, 2, 0 instead of 0, 1, 3, 2, 1; the dorsal spines of the 12th and 13th legs 1, 0, 3, 2, 2 instead of 1, 0, 3, 1, 1; the claw of female gonopods tripartite instead of bipartite; etc.

Arebius epelus, new species

General color yellow, the head and most posterior segments more orange.

Head subcordate, longer than wide. Antennae short, articles 21. Ocelli two or three on each lateral margin, uniseriate, very small, the most caudal one smallest, usually pale and often nearly obsolete.

Prosternal teeth small and pale, the line of their apices straight; median incision acutely V-shaped; lateral margin straight, running obliquely caudoectad from outer tooth.

Coxal pores small and round; 2, 3, 3, 2.

Last two pairs of coxae dorsally armed, last pair laterally. Ventral spines of first legs, 0, 0, 1, 2, 1. Ventral spines of anal legs, 0, 1, 3, 1, 0; dorsal, 1, 3, 1, 0; claw single. Ventral spines of penult legs, 0, 1, 3, 2, 0; dorsal, 1, 0, 3, 1, 1; claw single. Third joint of anterior legs not armed dorsally. Anal and penult legs conspicuously sulcate along inner sides of joints.

Claw of female gonopods entire; basal spines 2 + 2, those on each side subequal, long and slender and acuminate from base to tip.

Anal and penult legs in both sexes narrowly and sharply channeled along mesal side of last joints, the two preceding more weakly channeled.

Length, 5-7 mm.

LOCALITY.—California: Carmel Valley, Hastings Reservation. Female holotype taken May 1, 1940; a female taken January 31, and a male and female on March 9, and another pair on March 17, 1940.

Differs from *A. obesus* in having only last pair of coxae laterally armed, in having the ventral spines of anal legs 0, 1, 3, 1, 0 instead of 0, 1, 3, 2, 1 and apparently in having the articles of the antennae normally 21 instead of 20.

Arebius tridens, new species

Head with the usual marginal interruptions. Antennae composed of 21 articles. Ocelli in an elongate patch, arranged typically in four curved series; e. g., 1 + 6, 5, 4.

Prosternal teeth 2 + 2; special setae fine, hair-like.

Tarsi of all legs biarticulate. Ventral spines of penult legs 0, 0, 1, 3, 3, 2; dorsal, 1, 0, 3, 1, 1; claws 3 (or two claws and a spine). Ventral spines of anal legs, 0, 1, 3, 2, 0; dorsal, 1, 0, 3, 1, 0; claw single. Last four pairs of coxae dorsally armed, last two pairs laterally armed.

Coxal pores small, uniseriate; 4, 4, (5), 5, 4.

Claw of female gonopods distinctly tripartite, all lobes acute, with the laterals equal to each other but shorter than the median. Basal spines 2 + 2, long, narrowest at middle and widening toward each end.

Length, 15 mm.

LOCALITY.—California: Monterey Co., Hastings Reservation. Female holotype taken January 30, 1940.

This species seems most nearly related to *A. dolius*, known from Friant and Santa Barbara, but it is a larger form differing in the female in having the claw of the gonopods strongly tripartite instead of bipartite.

Arebius platypus, new species

Apparently close to *A. sequoius* and *A. dolius* of California, but a larger form in which the claw of the female genital forceps is plainly tripartite, thus differing from *dolius*, and with the lateral lobes larger relatively to the median one than in *sequoius*, than which it is also larger. The basal spines of the forceps are proportionately shorter and stouter than in *dolius* with an apical conical part set off and short.

Ventral spines of first legs, 0, 0, 1, 3, 2; of the second, 0, 0, 2, 3, 2. Ventral spines of the penult legs, 0, 1, 3, 3, 2; dorsal, 1, 0, 3, 1, 1. Claw armed. Ventral spines of the anal legs 0, 1, 3, 2, 0; dorsal, 1, 0, 4 (3), 1, 0; claw unarmed. The last two pairs of coxae laterally armed.

Both the anal and the penult legs in the female holotype are conspicuously flattened, particularly the last two articles.

Length, 11 mm.

LOCALITY.—Washington: Naches River, 15 miles below summit (W. 121° 7': N. 46° 59'). July 5, 1938. One female and one male, somewhat defective, taken by W. Ivie.

Arebius sequoius, new species

This form is separated from *A. dolius*, the type locality of which is Friant, as a subspecies on the basis of its smaller size (7 mm. length as against 9-11 mm.), and especially the presence of a distinct outer lobe to the claw of the female genital forceps, which is thus tripartite

instead of bipartite. The ventral spines of the penult legs are sometimes 0, 1, 3, 3, 1, instead of 0, 1, 3, 3, 2.

LOCALITY.—California: Sequoia National Park, "Cold Spring," 10 miles east of Hammond; elevation, 3,500 ft.; March 20, 1941. Three males and four females. Also 12 miles northeast of Hammond where many specimens were taken on March 21 and 22, 11 miles east of Glenville where specimens were taken March 20, and 6 miles west of Bishop, a male and female on March 16.

***Arebius agamus*, new species**

Antennae short, Ocelli, c. g., 1 + 4(3), 4, 2, the single ocellus notably large.

Ventral spines of the first legs, 0, 0, 1, 2, 1, of the second 2, 2, 1; third joint of following legs also with two ventral spines. Ventral spines of penult legs, 0, 1, 3, 3, 2; dorsal, 1, 0, 3, 1, 1. Ventral spines of anal legs, 0, 1, 3, 2, 1; dorsal, 1, 0, 3, 1, 0; claw armed. Last three pairs of coxae laterally armed.

Anal legs in male long and slender, not specially modified.

Gonopods of female essentially entire but with 1 or 2 minute lateral teeth representing the lateral lobes.

Coxal pores small; 3, 3, 3, 2.

Length, 10 mm.

LOCALITY.—California: Sequoia National Park, "Cold Spring," 10 miles east of Hammond. Elevation, 3,500 ft.; March 20, 1941. Three males. Also a male and female taken 12 miles northeast of Hammond on March 21 and 22, and several 5 miles northeast of Lemoncove, March 20.

Probably nearest to *A. elysianus*, known from Los Angeles Co., but a darker colored species differing in having the ventral spines of the anal legs 0, 1, 3, 2, 1 instead of 0, 1, 3, 3, 1; the dorsal spines of the thirteenth legs, 1, 0, 3, 1, 1 instead of 1, 0, 3, 2, 2; and the last three, instead of only the last 2, pairs of coxae laterally armed.

***Arebius cherosus*, new species**

Dorsum brown or in part slightly chestnut. The legs pale brown, the antennae more chestnut.

Ocelli, c. g., 1 + 4, 5, 3, the single ocellus of moderate size.

Prosternal teeth pale, rather small, the line of their apices recurved.

Coxal pores 1(2), 2, 2, 2.

Ventral spines of first pairs of legs, 0, 0, 1, 3, 1. Third joint of following pairs of anterior legs also armed with a single ventral spine. Ventral spines of penult legs 0, 1, 3, 3, 1; dorsal, 1, 0, 3, 1, 1; claw armed with two reduced spines. Ventral spines of anal legs, 0, 1, 3, 2,

0; dorsal, 1, 0, 3, 1, 0; claw single. Dorsal spines of 12th legs 0, 0, 3, 1, 1; of the 13th, 1, 0, 3, 1, 1. None of the posterior coxae laterally armed.

Anal legs characteristically channeled along both mesal and ectal surface.

Claw of female genital forceps distinctly tripartite; basal spines 2 + 2, with apices conical.

Length, 9 mm.

LOCALITY.—California: Sequoia National Park, "Cold Spring," 10 miles East of Hammond. Elevation, 3,500 ft.; March 20, 1941. One female.

This species agrees with *A. dolius* in having the claw of the anal legs unarmed, but differs in having the claw of female gonopods tripartite instead of bipartite, in lacking lateral spines on the posterior coxae, etc.

Pokabius simplex, new species

The type is chestnut colored above with the antennae brown and the legs yellow.

Antennae short, with articles decreasing in length from the second to the penult.

Ocelli typically, 1 + 4, 3; the first ocellus of bottom row largest of the seriate ocelli.

Coxal pores, 2, 2, 3, 3.

Ventral spines of first legs, 0, 0, 1, 3 (2), 1. Ventral spines of penult legs, 0, 1, 3, 3, 1; dorsal, 1, 0, 3, 1, 1; accessory claw obsolete. Ventral spines of anal legs, 0, 1, 3, 2, 0; dorsal, 1, 0, 3, 1, 0; claw unarmed. Last two pairs of coxae laterally armed.

Differing from other species in the anal legs of the male in which the fourth joint has the dorsal elevation at proximal end low and rounded, setose, with no definite dorsal furrow on the joint distad of it.

Claw of female gonopods tripartite; basal spines 2 + 2.

Length, 9 mm.

LOCALITY.—California: 6 miles west of Jackson. March 27, 1941. Male holotype and one female. D. and S. Mulaik.

Pokabius vaquero, new species

Differing from *P. utahensis* and *P. sokovus* in larger size (15 mm. length as against 7-10 mm.), in having the last two pairs of coxae laterally armed instead of only the last pair, and in the modification of the anal legs of male which likewise distinguishes it from other known species. In these the caudal end of the third joint is transversely elevated along mesodistal border, the upper end of this ridge bearing the most mesal of the dorsal spines; the fifth article at

mesoproximal corner produced into a somewhat triangular lobe, distad of which the joint is not longitudinally furrowed as it is in e. g., *sokovus* and *clavigerens*, the joint somewhat thickening distad as in *utahensis*.

Ocelli in three series; 1 + 5, 4, 3.

Ventral spines of first legs, 0, 0, 1, 2, 2. Ventral spines of penult legs, 0, 1, 3, 3, 2; dorsal, 1, 0, 3, 1, 1; claw armed. Ventral spines of anal legs, 0, 1, 3, 2, 0; dorsal, 1, 0, 3, 1, 0; claw unarmed.

The color a somewhat orange yellow.

Length, about 15 mm.

LOCALITY.—Nevada: 29 miles southwest of Calloway Ranch. One male taken on "volcanic" flow," March 15, 1941, by S. and D. Mulaik.

Pokabius liber, new species

Close to *P. oreines* but differing in having the last pair of coxae laterally armed and in the form of the process of the fourth joint of the anal legs in the male. This is similarly located but is broader, more lamellate, with distal end broadly rounded and somewhat reflexed; caudo-dorsal surface broadly concave but not forming a rather narrow channel as in *oreines*.

Length of male holotype, 11 mm.; of female allotype, 12.5 mm.

LOCALITY.—California: 2 miles north of Independence. A male and female taken March 17, 1941. S. and D. Mulaik.

Pokabius linsdalei, new species

General color of body and legs yellow.

Antennae consisting of the usual 20 articles. Ocelli in the holotype small, 5 in number, 4 in a series and one above these; other arrangements: 1 + 3, 1 + 2, 3.

Prosternal teeth small and pale, the line of their apices straight.

Ventral spines of penult legs 0, 1, 3 (2), 3, 0; dorsal, 1, 0, 2, 1, 0; claws two with a spine. Ventral spines of anal legs, 0, 1, 3, 1, 0; dorsal, 1, 0, 2, 0, 0; claw single. None of the posterior coxae laterally armed. Claw of genital forceps of female tripartite; basal spines 2 + 2.

Peculiar especially in the form of the lobe of the fourth joint of the anal legs of the male. This lobe projects proximad above the third joint nearly halfway to the proximal end of the latter, the third joint thickest at middle, not elevated at distal end. Last three joints of anal and penult legs channeled along mesal surface in both sexes.

Length, 7-9 mm.

LOCALITY.—California: Monterey Co., Hastings Reservation. One male taken February 1, 1940, and eight of both sexes on December 20, three on February 1, and two on February 20, 1941, by Dr. J. M. Linsdale, for whom the species is named.

A species falling with *disantus* in the author's key but conspicuously different in the form of the proximal lobe on the fourth joint of the anal legs of the male.

Pokabius oreines, new species

Readily distinguished from previously known species in the male by peculiarities in the modification of both anal and penult legs. The penult legs are swollen and characteristically flattened from side to side, the flattening particularly pronounced on the more distal articles, with the fifth and sixth articles conspicuously longitudinally furrowed, the adjacent articles less strongly so. In the more strongly swollen anal legs the especially crassate fourth article is produced above at proximal end into a large process which curves characteristically dorsocephalad and then mesad; this process attenuated from base distad to a narrow apex which is blunt or truncate, deeply furrowed along its dorsal surface, with the furrow continuing along dorsal surface of article to its distal end. The dorsally elevated distal end of the third article excavated or obliquely flattened for reception of basal part of the process from fourth. Articles beyond fourth flattened and channeled as in the penult legs. Last two pairs of legs in female also crassate and channeled.

Antennae of usual general form and length. Ocelli in two or three series, from 7 to 12 in number; e. g., 1 + 3, 3, and 1 + 5, 4, 3, with the first ocellus of middle series enlarged.

Coxal pores unusually few, the typical arrangement being 1, 2, 2, 1.

Differing from other known species in not having any of the posterior coxae laterally armed. Ventral spines of first legs, 0, 0, 1, 3, 2; of second and following pairs, 0, 0, 2, 3, 2. Ventral spines of penult legs, 0, 1, 3, 3, 1; dorsal, 0, 1, 2 (3 in female), 1, 1; claw armed. Ventral spines of anal legs, 0, 1, 3, 2, 0; dorsal, 1, 0, 3, 1, 0; the claw unarmed.

Claw of the female genital forceps short, weakly trilobed, the median lobe much largest and dorsal one nearly obliterated. Basal spines 2 + 2.

Length, up to 11 mm.

LOCALITY.—California: 12 miles northeast of Hammond. Elevation from 3,000 to 4,000 feet. March 21 and 22, 1941. Nine specimens taken by S. and D. Mulaik.

Nothembius amplus, new species

Body and appendages yellow.

Head with marginal interruptions distinct. Antennae of moderate length, composed of 22 or 23 articles, the larger number typical. Eyes black, composed of 7-9 ocelli in two series forming a linear patch; e. g., 1 + 4, 2 and 1 + 5, 3; the single ocellus contiguous, not enlarged.

Prosternal teeth 2 + 2, small, the line of their apices a little recurved; median sulcus V-shaped; anterior margin outside of teeth on each side oblique, much nearer the horizontal line.

None of the dorsal plates with posterior angles produced.

Coxal pores small, circular, typically 3, 3, 3, 3.

Ventral spines of first legs 0, 0, 2, 3, 1; dorsal, 0, 0, 3, 2, 1. Ventral spines of 13th legs 0, 1, 3, 3, 2; dorsal, 1, 0, 3, 2, 2. Ventral spines of penult legs, 0, 1, 3, 3, 2; dorsal, 1, 0, 3, 1, 1; claws 2, the accessory very small. Ventral spines of anal legs, 0, 1, 3, 2, 0; dorsal, 1, 0, 3, 1, 0; claw single. Last two pairs of coxae laterally armed.

The anal legs of the male bearing the usual special lobe on the ventral side of the fifth article at its distal end; this lobe distally truncate somewhat as in *N. insulac* but much smaller and lower.

Claws of female genital forceps strictly entire, long and acute; basal spines 2 + 2, acute, the inner of each pair smaller.

Length, 8-9 mm.

LOCALITY.—California: Mountain Springs. Two females and one male taken January 8, 1941, by S. and D. Mulaik.

Resembles *N. insulac* more closely than other known species, but differs in spining of legs, in the smaller size of the "single" ocellus, in the antennal articles with number apparently normal at 23 instead of 22, etc.

Genus **KIBERBIUS** Chamberlin

Bull. Mus. Comp. Zool. Harvard, 1916, vol. 57, no. 4, p. 153.

Further study of this and related genera when more material is available will probably render some reallocation necessary. *K. gosobius* and *K. dyscritus* seem especially aberrant and their position must be regarded as tentative. Unfortunately only the male of the second of these species is known. The species now referred to *Kiberbius* may be separated as follows:

Key to Species of *Kiberbius*

1. (10) Articles of antennae constant at 20..... 2
2. (3) Last two pairs of coxae laterally armed..... 3
3. None of coxae laterally armed..... 4
4. (5) Ventral spines of anal legs 0, 1, 3, 1, 0; length under 7 mm.
.....*K. nannus* Chamberlin
5. Ventral spines of anal legs 0, 1, 3, 2, 0; length 8 mm. or more.... 6
6. (7) Claw of female gonopods entire.....*K. robes*, n. sp.
7. Claw of female gonopods tripartite (an *remex*?)..... 8
8. (9) Head longer than wide.....*K. remex* (Chamberlin)
9. Head equal in length and breadth.....*K. ogmopus* (Chamberlin)
10. Articles of antennae 22 or more.....11
11. (12) Last three pairs of coxae laterally armed, ventral spines of
anal legs 0, 1, 3, 2, 0.....*K. dyscritus*, n. sp.
12. (13) None of the posterior coxae laterally armed; ventral spines
of anal legs 0, 1, 3, 2, 1.....*K. gosobius*, n. sp.
13. (12) Last 2 pairs of coxae laterally armed; ventral spines of
anal legs 0, 1, 3, 1, 0.....*K. cayoteus*, n. sp.

***Kiberbius cayoteus*, new species**

Pale yellow, the color brighter on head and at caudal end.

Head with marginal interruptions not evident. Antennae composed of the usual 20 articles. Eyes narrowly oblong or sublinear, the ocelli in 2 series; 1 + 4, 3 (2); the single ocellus not separated or enlarged.

Prosternal teeth 2 + 2, small, the line of their apices slightly recurved; the oblique margin ectad of dental series on each side running nearly at an angle of 45° with the longitudinal axis.

Ventral spines of first legs 0, 0, 1, 3, 1. Ventral spines of penult legs, 0, 1, 3, 3, 2; dorsal, 1, 0, 3, 1, 0 (1); claw single. Ventral spines of anal legs, 0, 1, 3, 1, 0; dorsal, 1, 0, 3, 1, 0; claw single. Last two pairs of coxae laterally armed, the spines minute.

In the male, the tarsal joints of anal legs conspicuously flattened and furrowed along mesal side as usual, the furrow also obvious on the more proximal joints but there not flattened.

Length, 8.5 mm.

LOCALITY.—California: Coyote Wells. One male taken January 8, 1941, by S. and D. Mulaik.

This species differs from other known species in having the last two pairs of coxae laterally armed, excepting *K. dyscritus*, the following species.

Kiberbius dyscritus, new species

Pale brown, with legs and antennae lighter.

Head with marginal interruptions small but distinct. Antennae short or moderate, with the number of articles in the type varying from 22 to 26 and differing on the two sides, in one specimen being 22 and 23, and in the other 22 and 26 on the two sides. Ocelli arranged in three series; e. g., 1 + 4, 4, 2; single ocellus largest, contiguous with the others.

Prosternal teeth 2 + 2, dark; margin ectad of teeth on each side nearly straight, running at an oblique angle of about same degree as in *cayoteus*; median sulcus with angle slightly less than rectangular.

Ventral spines of first legs, 0, 0, 2, 3, 1; dorsal, 0, 0, 2, 2, 2. Ventral spines of penult legs, 0, 1, 3, 3, 2; dorsal, 1, 0, 3, 1, 1; the accessory claw minute. Ventral spines of anal legs, 0, 1, 3, 2, 0; dorsal 1, 0, 3, 1, 0; claw unarmed. Last three pairs of coxae laterally armed.

In the male the distal articles of the anal leg are flattened as usual, but they are not distinctly grooved along mesal surface as in the other known species.

Length, about 11.5 mm.

LOCALITY.—Arizona: South Mountain View. Two males taken Dec. 28, 1940, by S. and D. Mulaik.

An aberrant form somewhat doubtfully placed in this genus.

Kiberbius robles, new species

A pale yellow form.

Head with marginal breaks obsolete. Antennae composed of the usual 20 articles. Ocelli in a sub-linear patch but in two series of which the upper is short; e. g., 1 + 2, 4, the most anterior ocellus minute, the others increasing in size caudad. Prosternal teeth 2 + 2, pale.

Ventral spines of first legs, 0, 0, 1, 2, 1; dorsal, 0, 0, 2, 2, 1. Ventral spines of penult legs, 0, 1, 3, 3, 2; dorsal, 1, 0, 2, 1, 1; accessory claw present. Ventral spines of anal legs 0, 1, 3, 2, 0; dorsal, 1, 0, 2, 1, 0; claw unarmed. None of the posterior coxae laterally armed.

Anal legs compressed, with longitudinal furrow along mesal side conspicuous.

Claw of female genital forceps entire; basal spines 2 + 2.

Length, about 8.5 mm.

LOCALITY.—Arizona: 15 miles west of Robles. Two females taken January 2, 1941, by S. and D. Mulaik. Differs from *K. ogmopus* in having the claw of the female gonopods entire.

Kiberbius gosobius, new species

Dorsum from yellow to light chestnut, the color commonly brighter at ends.

Head with marginal interruptions weak or obsolete. Antennae of moderate length, composed in the fully adult individuals usually of 23 articles, less commonly of 22 or 21; in the pseudomaturus stage, especially in the males, the number is most frequently 20. Ocelli mostly in 3 longitudinal series; e. g., 1 + 4, 4, 3 and 1 + 3, 4, 2.

Prosternal teeth 2 + 2, the line of their apices straight or slightly recurved.

Ventral spines of first legs, 0, 0, 2, 3, 2; dorsal spines of first and second legs, 0, 0, 2, 2, 2. Ventral spines of penult legs, 0, 1, 3, 3, 2; dorsal, 1, 0, 3, 1, 1; claw single. Ventral spines of anal legs mostly 0, 1, 3, 2, 1; dorsal, 1, 0, 3, 1, 0; claw single. Dorsal spines of anal legs mostly 0, 1, 3, 2, 1; dorsal, 1, 0, 3, 1, 0; claw single. Dorsal spines of 12th and 13th legs usually 1, 0, 3, 1, 1, of the 11th, 0, 0, 3, 2, 2. None of the posterior coxae laterally armed. Anal legs with glands along inner face, this area sometimes sunken in form of the longitudinal furrows, articles but little flattened in female but more strongly so in male.

Claw of female gonopods large and strictly entire; the basal joint not excavated within as in *Gosibiids*; basal spines 2 + 2, the inner one of each pair obviously shorter than the outer, all acuminate from base.

Length, up to 17 mm. in the females, the males considerably smaller.

LOCALITY.—Arizona: Covered Wells. Many males and females taken January 3, 1941, by S. and D. Mulaik.

Nadabius phanus, new species

A species apparently nearest in general structure to the eastern *N. pullus* (Bollman), but a larger form differing, at least in the typical cases, in having the ventral spines of the anal legs 0, 1, 3, 3, 1 instead of 0, 1, 3, 3, 0, and especially in having the articles of the antennae 25 in number instead of 20. Ocelli somewhat more numerous; e. g., 1 + 4, 4, 3, 1 (2).

Process at distal end of tibia of anal legs of male unusually low, proportionately long, on mesodorsal face of joint.

Length, about 14 mm.

LOCALITY.—California: Hastings Reservation. One male taken March 25, 1941, by Dr. J. M. Linsdale.

Family ETHOPOLIDAE

Bothropolys (Calopolys) dasys, new subgenus and species

Differing from other known species of *Bothropolys* in having none of the dorsal plates produced and on this basis placed in a separate subgenus, *Calopolys*.

Dorsum brown with head and posterior one or more segments orange or light ferruginous. Antennae and legs yellow except the posterior pairs which are more orange.

Head strongly margined behind and laterally, the lateral margining smooth continuous, wholly without interruption forward to eyes. Antennae short, composed of 20 articles. Ocelli typically in three series; e. g., 1 + 4, 4, 3, the single ocellus contiguous with others. Prosternal teeth small, black 6 + 6, with the special seta cetal in position, no diastema being present; median incision very narrow, its sides nearly parallel.

Dorsal plates strongly and characteristically longitudinally rugose.

Ventral spines of first legs 0, 0, 1, 3, 2; dorsal, 0, 0, 3(2), 2, 1. Ventral spines of 13th legs, 0, 1, 3, 3, 2. Ventral spines of penult legs, 1½ 1, 3, 3, 1; dorsal, 1, 0, 3, 1, 1; claw single. Ventral spines of anal legs, 1, 1, 3, 2, 0(1); dorsal, 1, 0, 3, 1, 0; claw single. Last two pairs of coxae laterally armed.

Claw of female genital forceps tripartite; basal spines 2 + 2.

Length of types, 10-12.25 mm.

LOCALITY.—California: Hastings Reservation. A male and female taken February 18, 1941, and a male January 28, 1941, by Dr. Linsdale.

Ethopolys positivus, new species

Closely related to *E. pusio* (Stuxberg) but differing in having the claw of the female genital forceps strictly entire instead of tripartite and in having the ventral spines of the anal legs more often 1, 0, 3, 2, 0, instead of 1, 0, 3, 2, 1. Basal spines of genital forceps 2 + 2 or 2 + 3. Sometimes only the last pair of coxae laterally armed. When in full color dark brown, the head typically more chestnut. Ocelli, e. g., 1 + 4, 4, 2 or 1 + 4, 4, 3, being thus essentially as in *pusio*.

Length, up to 20 mm.

LOCALITY.—California: Sequoia National Park, "Cold Spring," 10 miles east of Hammond. March 20, 1941. Four specimens taken by S. and D. Mulaik. Also four specimens 12 miles northeast of Hammond on March 21 and 22, 1941.

Family GOSIBIIDAE

Guambius hesperus, new species

The dorsum in the preserved types is dark olivaceous brown with the head and antennae chestnut.

Ocelli in four longitudinal series in a compact group: 1 + 4, 3, 3, 2, decreasing in size ventrad, the single ocellus much largest. Antennae of moderate length, the articles in three of the types 23, in one 26, and in one 23 on one side and 28 on the other.

Prosternal teeth 2 + 2, the special seta hair-like, ectad of each outer tooth.

Ventral spines of the first legs 0, 0, 1, 3, 3, the third joint of immediately succeeding legs with 2 ventral spines. Ventral spines of penult legs 0, 1, 3, 3, 1; dorsal, 1, 0, 3, 2, 2 (female) or 1, 0, 3, 1 (male); claws 2. Ventral spines of anal legs, 0, 1, 3, 2, 1; dorsal, 1, 0, 3, 2, 0; claws 2. Last two coxae armed laterally and dorsally, others unarmed.

Coxal pores round, small, and few. The fifth article of the penult legs of the male at distal end above with the typical lobe. This low and broad, and less conspicuous than usual; sixth article abruptly narrower than the fifth.

Claw of female gonopods long and entire; basal spines 2 + 2; basal article excavated within as usual.

Length, 16 mm.

LOCALITY.—California: Carmel Valley, Hastings Reservation. Three females and one male taken February 1, and one on January 11, 1940, and transmitted by J. M. Linsdale.

This species is especially interesting in being the first member of the genus to be reported from the Pacific coast region, the previously known species occurring in Mississippi, Arkansas, Texas, and Colorado. It is very distinct and may be placed with reference to the other species by means of the following key:

Key to Species of *Guambius*

1. (10) Posterior angles of none of the dorsal plates produced or those of only 9th and 11th more or less produced..... 2
2. (3) Dorsal spines of anal legs 1, 0, 3, 2, 0; of the penult, 1, 0, 3, 2, 2 or 1, 0, 3, 2, 1.....*G. hesperus*, n. sp.
3. (2) Dorsal spines of anal legs 0, 0, 3, 1, 0; of the penult, 0, 0, 3, 1, 1..... 4
4. (5) Ventral spines of penult legs 0, 1, 3, 3, 2....*G. euthus* (Chamberlin)
5. (4) Ventral spines of penult legs 0, 1, 3, 3, 1 or 0, 1, 3, 2, 1..... 6
6. (7) Ventral spines of first legs 0, 0, 0, 0, 1.....*G. pinguis* (Bollman)

7. (6) Ventral spines of first legs 0, 0, 1, 1, 1 or 0, 0, 1, 2, 1..... 8
8. (9) Trochanter of thirteenth legs armed; ventral spines of anal legs 0, 1, 3, 2, 1 or 0, 1, 3, 3, 1....*G. mississippiensis* (Chamberlin)
9. Trochanter of thirteenth legs unarmed; ventral spines of anal legs 0, 1, 3, 2, 0.....*G. curtior* (Chamberlin)
10. (1) Posterior angles of the 9th, 11th, and 13th dorsal plates produced11
11. (12) Articles of antennae 30-35; ventral spines of thirteenth legs normally 0, 0, 3, 3, 2; claws of anal legs 2.....
.....*G. coloradanus* (Chamberlin)
12. (11) Articles of antennae mostly 24-26; ventral spines of thirteenth legs normally 0, 1, 2, 3, 2; claws of anal legs 3.....
.....*G. oedipes* (Bollman)

Gosibius (Timiobius) sequens, new species

In having the posterior angles of the sixth, as well as those of the ninth, eleventh and thirteenth, dorsal plate produced, this species falls in the subgenus *Timiobius* with *G. intermedius*, a species known from the Santa Barbara region. From the latter species it differs in having the ventral spines of the penult legs 0, 1, 3, 3, 2 instead of 0, 1, 3, 3, 3, and those of the thirteenth legs 0, 0, 3, 3, 3, instead of 0, 1, 3, 3, 3. Unfortunately, the anal legs are missing from the type.

Articles of antennae, 30. Ocelli in type, 1 + 4, 4, 3, 2.

Coxal pores, 5, 5, 5, 5.

Gonopods of female with claw entire; basal spines 2 + 2.

Length, 25 mm.

LOCALITY.—California: Hastings Reservation. One female taken April 8, 1941, by Dr. J. M. Linsdale.

Gosibius benespinosus, new species

Agreeing with *G. arizonensis* and *G. montercus* in having none of the dorsal plates produced (subgenus *Abatobius*). It agrees with the latter but differs from the former in having the anal legs armed normally with 2 claws, although the accessory one is often obsolete. It also differs from *montercus* and agrees with *arizonensis* in having the fifth joint of the first thirteen pairs of legs, or all of these but the first one or two pairs, with 3 ventral spines. Dorsal spines of the anal legs 1, 0, 3, 2, 0, instead of 1, 0, 3, 1, 0, and the ventral 0, 1, 3, 3, 1, instead of 0, 1, 3, 2, 1. It is also apparently a somewhat smaller form, with the length 15 to 18 mm. instead of 18 to 22 mm. The color is yellowish brown, with posterior border of plates sometimes darker; head

light chestnut to orange; legs yellow. Articles of antennae 24-27. Ocelli in 4 series; e. g., 1 + 5, 5(4), 5(4), 3.

LOCALITY.—California: 6 and 11 miles west of Bishop, and at Benton Station. Several specimens at each place taken by S. and D. Mulaik on March 16, 1941.

Gosibius atopops, new species

Dorsum a dark olive brown, with head lacking the olive tinge. Antennae chestnut colored, and legs yellowish.

Antennae short, composed of 21 articles. Ocelli reduced essentially to two large ones, one above the other, with 2 or 3 very small, rudimentary ocelli detectable in front of these.

Prosternal teeth 3 + 3 or 3 + 4, the fourth in type being a much smaller one between middle one and outer one on right side. Special seta distally bristle-like, stouter at base than ordinary setae.

Posterior angles of none of dorsal plates produced.

Coxal pores 2, 2(3), 3, 3.

Ventral spines of first legs 0, 0, 2, 3, 1; of second, 0, 0, 2, 3, 2. Ventral spines of the penult legs 0, 1, 3, 3, 1; dorsal, 1, 0, 3, 2, 2; claws 2, one minute. Ventral spines of the anal legs, 0, 1, 3, 3, 1; dorsal, 1, 0, 3, 2, 1; claw with minute accessory claw. Last pair of coxae laterally armed.

In the male the penult legs with fifth article bearing a rounded dorsal eminence a little proximad of distal end. In the anal legs the fourth joint is shorter than the third and much shorter than the fifth; fifth joint thickened, concave above from end to end and with a shallow median longitudinal furrow.

Length, 10 mm.

LOCALITY.—California: 7 miles north of Glenville, Kern County, March 19, 1941. S. and D. Mulaik. One male.

Subgenus **AMPLOBIUS**, new

Characterized by having the posterior angles of the sixth, seventh, ninth, and eleventh and thirteenth dorsal plates strongly produced in the males. In the females of the genotype, the posterior angle of the seventh, and especially of the sixth, plate more weakly produced, in this respect apparently variable.

GENOTYPE.—*Gosibius fusatus*, new species.

Gosibius (Amplobius) fusatus, new species

Brown, with a median longitudinal dark line. Head more chestnut, also with median dark mark. Antennae chestnut proximally, paler distad. Legs yellowish, except posterior pairs which are darker.

Antennae of moderate length, composed of from 25 to 38 articles in the types, but 25 is by far the most frequent number. Eyes narrowly oblong, with ocelli in 3 series; e. g., 1 + 4, 4, 3, the single ocellus distinctly largest.

The free anterior and antero-lateral margin of prosternum forming an even curve; teeth 2 + 2 or 2 + 3, with special seta of usual form and position.

Coxal pores, 5, 4, 4, 4.

Ventral spines of first legs 0, 0, 2, 3, 2; dorsal, 0, 0, 3, 2, 2. Ventral spines of penult legs 0, 1, 3, 3, 2; dorsal, 1, 0, 3, 2, 2; claw armed. Ventral spines of anal legs 0, 1, 3, 3, 1; dorsal, 1, 0, 3, 2, 0; accessory claw minute. Last 3 pairs of coxae laterally armed.

The male of this species is remarkable in having the body, and especially the dorsal plates in the male much broadened in the middle region and from there conspicuously narrowed both forward and backward; widest plates serrate along lateral margin in male. The female specimens, not laterally serrate.

Penult legs in male with fifth article elevated at distal end into a conspicuous, distally rounded lobe between which and the proximal end the dorsal surface is concave. Fifth article of anal legs a little bowed ventrad but not thickened or produced into lobes.

Gonopods of female typical.

Length of male holotype, about 25 mm.; greatest width, 5 mm. Some specimens up to 30 mm. in length.

LOCALITY.—California: 11 miles east of Glenville; elevation, 5,000 feet; March 19, 1941; many specimens of both sexes. Two miles west of Kernville, March 18, many specimens, mostly partly grown. Sequoia National Park; elevation, 3-4,000 feet; 12 miles northeast of Hammond; four females. Ten miles east of Hammond at "Cold Spring," several specimens on March 20. Isabella, March 18, many specimens, mostly immature.

Gosibius saccharogeus, new species

A species of *Gosibius* in the restricted sense, the posterior angles of the ninth, eleventh, and thirteenth dorsal plates being produced.

Ocelli in 4 series; thus, 1 + 3, 3, 3, 1. The single ocellus very large, and the adjacent first caudal eye of the top row also enlarged. The antennae are notably long but are composed of only 25 or 26 articles as against more than 29 in *monicus*.

Prosternal teeth 2 + 2. Special setae in usual position.

Coxal pores 5, 5, 5, 5, decreasing in size proximad.

Ventral spines of penult legs 0, 1, 3, 3, 2, dorsal, 0, 0, 3, 2, 1. Distinct in having none of the posterior coxae armed either laterally or dorsally. Ventral spines of first legs 0, 0, 1, 2, 1; of second, 0, 0, 2, 3, 1.

Claw of the female gonopods long and strictly entire. Basal spines 2 + 2. Basal article of gonopods excavated within at base as usual.

In the male the fourth joint of the anal legs are conspicuously swollen and are longitudinally furrowed above as usual.

Length, up to 20-21 mm.

LOCALITY.—Texas: Sugarland. Five specimens, of which all but one are males, were collected February 26, 1938.

The species falls in a group with the California species *G. monicus* and *G. claremontus* in having the anal legs armed with two claws. It agrees with *monicus*, a considerably smaller form, in having the ventral spines of the anal legs 0, 1, 3, 3, 1 in the female though normally 0, 1, 3, 2, 1 in the male; dorsal spines 0, 1, 1, 3, 2, 1 as against 1, 0, 3, 2, 2 in *monicus*.

Genus POPOBIUS, new

Close to *Labrobius* under which it may later prove desirable to range it as a subgenus. It differs in having the special sense organ of prosternal margin not setiform or hair-like, but in form of a short spine or slender tooth, more slender, however, than the ordinary teeth. Articles of antennae numerous, indefinite. Unlike known species of *Labrobius*, the seventh, as well as the ninth, eleventh, and thirteenth, dorsal plate has the posterior angles conspicuously produced. None of posterior coxae armed either above or laterally.

Genotype.—*Popobius orronus*, sp. nov.

Popobius orronus, new species

Of a generally brown color.

Head with marginal interruptions slight. Antennae short, in the type consisting of 36 articles. Ocelli relatively few, arranged thus in type: 1 + 1, 4, 4 (3), the posterior "single" ocellus and the lone ocellus above the series much larger than the others.

Prosternal teeth 2 + 2; the ectal spine ectad of outer tooth on anterior margin of about same length as the teeth but decidedly more slender, though much stouter than the setae, spiniform.

Coxal pores small, round; 5, 4, 4, 4.

Ventral spines of the penult legs 0, 1, 3, 3, 2; dorsal, 0, 0, 3, 2, 2; claws 2. Ventral spines of anal legs, 0, 1, 3, 3, 1; dorsal, 0, 0, 3, 2, 0; claws 2.

Claw of female strictly entire; basal spines stout, 2 + 2; basal joint of gonopods well chitinized on mesal side but the excavation weak and not sharply limited.

Length, about 16 mm.

LOCALITY.—Mexico: Mt. Popocatepetl. One adult and one immature female collected by Geo. O. Lcc, August 11, 1938.