THE HARVESTMEN OF FAMILY TRIAENONYCHIDAE 
IN NORTH AMERICA (Opiliones)

By
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INTRODUCTION

Several recent collecting trips to the Pacific Northwest revealed a large number of unusual phalangids, mostly in the family Triaenonychidae Soerensen. The morphological characters of this family are expanded and clarified by the new series and will be of value in determining phalangid evolution. A significant correlation between undisturbed forest habitat and these phalangids exists.

The order Phalangida is divided into three suborders, the mite-like phalangids in Cyphothalmida, the typical "daddy-long-legs" in Palpatores, and the indolent, shorter-legged phalangids in Laniatores. Of the Laniatores, Triaenonychidae is one of the most widespread families. Found in temperate forests throughout the Southern Hemisphere, this family makes a northern appearance in the forests of western North America with no known representatives in the tropics. The Triaenonychid habitat in North America, except for cavernicolous species, is in coniferous forests which have rather cold, moist winters.

DISTRIBUTION AND TAXONOMY

Early work in this family was compiled and organized by C. Roewer in his book "Die Weberknechte der Erde" published in 1923. At this time Triaenonychids were known from South
subfamilies on the basis of the shape of the trifurcated claw in New Zealand and Australia. The American triaenonychids also indicate weakness in classifying subfamilies by sterna because many have shapes that are intermediate in the sternal classification system. On the other hand, the structure of the hind claw does reflect a natural division of the family, so I will adopt the subfamily characters of Forster.

Key to Subfamilies of TRIAENONYCHIDAE

1. Hind claws with two pairs of branches on median prong . PARANONYCHINAE Briggs, new subfamily

2. Hind claws with side branches much shorter than median prong . . . TRIAENONYCHINAE Pocock

Hind claws with side branches equal in length to, or longer than, the median prong . . . . . . . . . . . . . . . . . . SOERENSENELLINAE Forster

Subfamily TRIAENONYCHINAE Pocock

Claws of 3rd and 4th legs with two or less branches on median prong, branches shorter than median prong. Penes with relatively complex apical velum, dorsal plate not chitinized and usually reduced. Eggs not observed in care of adults.

Key to North American Genera of TRIAENONYCHINAE

1. Hind claws without ventral tooth, branches small or absent . . . . . . CYPTOBUNUS Banks

2. Eye tubercle conical, on anterior margin of scute . . . . . . . . . . . . . . . . . . . ZUMA Goodnight and Goodnight

Eye tubercle subconical, slightly recessed from anterior margin . . . . . . Sclerobunus Banks

GENUS CYPTOBUNUS BANKS


Scute with segmental areas delineated by shallow grooves. Eye tubercle recessed from anterior margin of scute. Sternum narrow, with opercular branches. Operculum large. Body without black pigment, integument colorless. Chelicerae with fixed finger extending beyond movable finger. Palpi strongly spinose, femur with at least six strong ventral spines, without sexual dimorphism. First tarsus with three segments, second with five or more segments, third and fourth with four segments. Femur and second trochanter of first legs with elongate ventral spines. Tarsal claw of hind legs with lateral spines much reduced or absent, ventral tooth absent. Distal tarsus of first leg with two segments, of second with three segments. Basal segment of second tarsi longer than remaining segments combined. Penis with two apical setae, apical dorsal spur, and reduced lateral processes on anterior margin. Ovipositor without setae on ventral lobe.

NOTE. Cyptobunus is not synonymous with Sclerobunus because, chiefly, significant differences exist in the second tarsi, hind tarsal claws, and palpal femora. These genera show a close relationship, however, in the structure of their genitalia.

TYPE SPECIES. Cyptobunus cavicolens Banks.

Key to the Adults of Cyptobunus

1. Hind claws with two reduced lateral branches............... Cyptobunus cavicolens Banks
   Hind claws with one reduced lateral branch
2. Cornea large, retina in place behind cornea
   Cytophobunus ungulatus ungulatus Briggs, new species
   Cytophobunus ungulatus madhousensis Briggs, new subspecies

Cyptobunus cavicolens Banks.
(Figures 1-9.)


MALE. Total body length, 1.94 mm. Scute length, 1.53 mm. Length of eye tubercle, 0.19 mm. Scute width, 1.79 mm. Length of second leg, 0.30 mm. Width of eye tubercle, 0.23 mm.

No. 90] BRIGGS: NORTH AMERICAN TRIAENONYCHIDAE

Anterior margin of scute smooth, with weak indentations over chelicerae and weak projections flanking chelicerae. Scute smooth, no posterior tubercles, without pigmentation. Tergites without significant tubercles. Eye tubercle small, abruptly rounded. Eyes with dark, rounded retinas. Sternum narrow, broadens near operculum. Maxillary processes triangular lobes bearing prominent setae. Operculum large, semicircular, setose. Palpi with four pairs of spines on tarsus, six or seven ventral spines on femur, two spines on trochanter. Tarsal formula 3-5-4-4. Femur of first leg with two long ventral spines, second trochanter with one ventral spine. Tarsal claw of hind legs with single prong bearing two minute lateral scales on opposite sides of midpoint. Penis with lateral setae on rounded apical process, velum on dorsal and ventral surfaces a complex, folded tissue. Ventral transverse flange present.

FEMALE. Similar to male. Ovipositor with blunt lateral and dorsal lobes bearing a few prominent setae.

JUVENILES. Hind tarsi with typical six-branched claws of Triaenonychidae.

SPECIMENS EXAMINED. Montana, Jefferson County. Females, males, and juveniles, Big Spring Room and Cathedral Room of Morrison Cave (Lewis and Clark Caverns), 31 December 1940, Pietsch, Mills, Pepper et al., and 22 February 1941, W. L. Jellison. Deposited in the American Museum of Natural History and Montana State University. Known only from Lewis and Clark Caverns.

Cyptobunus ungulatus ungulatus Briggs, new species.
(Figures 10-18.)

MALE. Total body length, 2.59 mm. Scute length, 2.21 mm. Length of eye tubercle, 0.22 mm. Scute width, 2.18 mm. Length of second leg, 1.31 mm. Width of eye tubercle, 0.25 mm. Anterior margin of scute truncate with slight palpal indentation; only a slight central projection exists. Scute smooth, no posterior tubercles, without pigmentation. Tergites lack tubercles or pigmentation. Eye tubercle small, abruptly rounded. Eyes with large rounded retinas. Sternum very narrow, with indistinct broadening at operculum. Maxillary processes triangular lobes bearing setae. Operculum large, semicircular, setose. Chelicerae robust.

Palpi with four pairs of spines on tarsus, anterior pair of tarsal spines reduced, ten spines on tibia, seven ventral spines on femur, two spines on trochanter. Tarsal formula 3-5-4-4. Femur of first leg with two spines, second trochanter with one spine. Tarsal claws of hind legs with single prong bearing one minute scale near midpoint, ectal on fourth legs and mesal on third legs. Penis with lateral setae on small, circular apical process. Ventral transverse flange present.
FEMALE. Similar to male.


*Cytobunus ungulatus madhousensis* Briggs, new subspecies. (Figures 19-25.)

FEMALE. Similar to male.

TYPE SPECIES. *Zuma acuta* Goodnight and Goodnight.

Key to the Females of *Zuma*

Adults with yellow-brown integument underlain by black pigment, if black pigmentation diminished, integument colorless. Low elevation habitat. ...

... ... ...

... ... ...

Above 4,000 feet ... . *Zuma tioga* Briggs, new species.

**GENUS ZUMA GOODNIGHT AND GOODNIGHT**


Anterior margin of scute uniformly truncate, with little indication of cheliceral sockets. Scute slightly granular, without pigmentation. Tergites smooth, unpigmented. Eye tubercle small, abruptly rounded, eyes with interconnected retiniae.

Sternum narrow, broadens near operculum. Maxillary processes triangular lobes bearing setae. Operculum large, semicircular.

Palpi with four pairs of spines on tarsus, anterior pairs of tarsal spines reduced, ten spines on tibia, seven ventral spines on femur, two spines on trochanter.

Tarsal formula 3-5 or 6-4-4. Femur of first leg with 3 spines. Second trochanter with one spine. Tarsal claw of hind legs with single prong bearing one minute ectal scale on fourth legs and none on third legs.

Ovipositor with setae on lateral lobes, none on dorsal lobe.

MALE. Not known.

TYPE SPECIMEN. Holotype female, North Madhouse Cave, near Provo, Utah County, Utah, 27 May 1965, 7,500 feet, Stan Moulton. Deposited in the American Museum of Natural History.

*Zuma acuta* Goodnight and Goodnight.

(Figures 26-35.)

**MALE.** Total body length, 1.9 mm. Scute length, 1.14 mm. Length of eye tubercle, 0.31 mm. Scute width, 1.33 mm. Length of second leg, 4.27 mm. Width of eye tubercle, 0.27 mm.

Anterior margin of scute with rounded shoulders. Scute granulatate. Integument brownish yellow. Cephalothorax with intricate pattern of dark pigment. Areas continuously pigmented except for four pairs of light lateral spots and light band between areas four and five. Tergites each with a band of dark pigment and a pair of light lateral spots. Eyes conical, large, about one third width of scute at its position.

Maxillary processes of second coxae lightly setose, rounded lobes. Operculum barely extends to third coxae. Chelicerae with base of distal segment setose. First leg with spine bearing tubercle on first and second trochanters, two spine bearing tubercles on base of femur. All legs with dark pigmentation.

Penis with truncated apex and two lateral setae.

**FEMALE.** Similar to male.

**JUVENILES.** Hind claws with three pairs of lateral branches.

**NEW RECORDS.** CALIFORNIA: Monterey County: Near Pfeiffer Falls, Big Sur, 2 July 1967, T. Briggs, T. Lee, and B. Leong; 3.5 miles east of Highway 1 on Bixby Canyon Road, 9 July 1967, T. Briggs. San Mateo County: 0.7 miles east of legs with pair of branches, median prong with ventral tooth. Metatarsi with astragalus and calcaneus.

Penis with two apical setae, sclerotized ventral plate, distal section without dorsal or lateral processes. Ovipositor with setae on ventral lobe, with setae on lateral lobes.

**TYPE SPECIES.** *Zuma acuta* Goodnight and Goodnight.

NOTE. Populations of Zuma acuta found in Empire Cave, near Santa Cruz, Santa Cruz County show some loss of pigmentation. The type is from Redwood City, California.

Zuma tioga Briggs, new species. (Figures 36-41.)

FEMALE. Total body length, 1.68 mm. Scute length, 1.06 mm. Length of eye tubercle, 0.19 mm. Scute width, 1.21 mm. Length of second leg, 4.19 mm. Width of eye tubercle, 0.23 mm.


MALE. Unknown, may not exist.

JUVENILES. Hind claws with three pairs of lateral branches.

TYPE SPECIMEN. Holotype female, 3.8 miles northeast of Crane Flat Ranger Station, Yosemite National Park, Tuolumne County, California, 21 July 1968, G. Leung, M. Wong, and T. Briggs.

OTHER LOCALITIES. CALIFORNIA: Mariposa County: 5.8 miles west of Crane Flat Ranger Station, Yosemite National Park, 28 July 1967, (7000 feet), T. Briggs. Tuolumne County: 5.0 miles west of Crane Flat Ranger Station, Yosemite National Park, 28 July 1967, (5000 feet), T. Briggs and A. Lee; North Crane Creek Camp, Yosemite National Park, 21 July 1968, T. Briggs.

GENUS SCLEROBUNUS BANKS


Anterior margin of scute with zero to four pairs of tubercles on shoulders. Scute with integument orange, black pigmentation faint to nil. Tergites with pigmentation slightly darker than on scute, but lighter than other Sclerobunus. Eye tubercle a rounded mound. Sternum with median groove. Maxillary processes rounded and setose. Operculum extends close to third coxae. Palpi of male not swollen at femur. First leg with 2 or 3 spines on femur. Penis with sclerotization at base of apical setae, distolateral velum projections moderately acute.

FEMALE. Similar to male.


OTHER LOCALITIES. BRITISH COLUMBIA: 10.6 miles east of Hope near Manning Park, 23 August 1969, T. Briggs. 17.8 miles east of Hope near Manning Park, 23 August 1969, T. Briggs.


Lewis County: Chanapecosh, Mt. Rainier National Park, 8 August 1955, V. Roth.

Sclerobunus robustus robustus (Packard).

(Figures 54-60.)


MALE. Total body length, 3.09 mm. Scute length, 2.44 mm. Eye tubercle length, 0.34 mm. Scute width, 2.35 mm. Length of second leg, 7.18 mm. Eye tubercle width, 0.38 mm.

Sclerobunus robustus idahoensis Briggs, new subspecies.

(Figures 61-66.)

No. 90] BRIGGS: NORTH AMERICAN TRIAENONYCHIDAE 11

Anterior margin of scute with two to four pairs of tubercles on shoulders. Scute with orange integument, black pigment faint. Dark patches at ends of anterior scutal groove and dark band on each scutal area. Four pairs of lateral light spots on posterior of scute. Tergites granular with central band of dark pigment. Eye tubercle a rounded cone slightly recessed from anterior margin. Median of eye tubercle with light longitudinal band. Eyes joined by dark retinal pigment.


First leg with ventral spine on first and second trochanters, two ventral spines on femur. Penis with dorsal and ventral plates obscured by complex velum. Distolateral projections from velum spine-like. Ventral transverse groove present.

FEMALE. Palpi with normal femur.


NOTE. Southern subspecies of Sclerobunus robustus are found at high altitudes in the fir forests of isolated desert mountains. The isolated populations are remarkably undifferentiated, even from northern subspecies.

Sclerobunus robustus robustus (Packard).

(Figures 54-60.)
pigment. Tergites with dark pigment. Eye tubercle a rounded mound.

Sternum with deep median groove. Maxillary processes rounded and setose, two dark tubercles are present on some specimens. Operculum extends to third coxae. Palpi with slightly swollen femur on males. Penis with distolateral velum projections moderately acute.

FEMALE. Palpal femur normal.

TYPE SPECIMENS. Holotype male and allotype female. 2.8 miles northwest of Clarkia on State Highway 3, Shoshone County, Idaho. 11 August 1967, T. Briggs, K. Hom, and A. Jung.


Sclerobunus robustus glorietus Briggs, new subspecies. (Figures 67-72.)

MALE. Total body length, 2.18 mm. Scute, 1.82 mm. Eye tubercle length, 0.34 mm. Scute width, 1.82 mm. Length of second leg, 4.50 mm. Eye tubercle width, 0.35 mm. Anterior margin of scute with two or three pairs of shoulder tubercles. Pigmentation darker than Sclerobunus robustus nonidentifiable but lighter than Sclerobunus robustus idahoensis. Eye tubercle a rounded cone. Sternum with median groove. Maxillary processes rounded and setose.

Palpi with swollen femur on males. First leg with black pigmentation. Penis with distolateral velum projections sharply acute.

FEMALE. Body pigmentation lighter than in males. Palpal femur normal.

TYPE SPECIMENS. Holotype male and allotype female. 4 miles southeast of Glorieta Baldy Lookout, Santa Fe County, New Mexico, 14 August 1968, T. Briggs, K. Hom, and D. Oyang.

PARANOCHINAE Briggs, new subfamily

Claws of third and fourth legs with two pairs of branches on median prong. Penis with relatively simple apical velum, dorsal plate chitinized. Eggs not observed in care of adults. Setose space between posterior of sternum and opercular opening. Prominent sutures at juncture of fused sternites.
Anterior margin of scute rounded. Scute granular, motiled with dark pigment, areas clearly delineated with furrows and tubercles, integument yellow-brown. Tergites granular, dark pigment posterior margin, posterior tubercles present. Eye tubercle conical, extends over anterior margin of scute, eyes in dark pigment zones at base. Maxillary processes from second coxae setose, reduced, widely separated by sternum. Operculum extends to third coxae, dorsal groove usually present.

Chelicerae with short fingers, chelicerae unpigmented. Palpi reduced, weak spines on tibia and tarsus, femur with but one ventral spine. Black pigment absent from palpi.

Tarsal claw of hind legs with proximal pair of lateral spines slightly shorter than distal pair. Black pigment may or may not be absent from distal end of each leg segment, tarsi usually lightly pigmented.

Penis without ventral process, dorsal process a narrow, subtubular spur longer than operculum. Two pairs of short lateral setae near apex.

FEMALE. Operculum truncate, does not extend to third coxae. Ovipositor with elongated, acute lobes. Setae present only on lateral lobes. Female broader than male.


NOTES. The record for Paranonychus brunneus from Atka Island, Alaska, consists of a single female which agrees with this species. Atka Island, however, may not have had trees in 1906 and, therefore, was an unlikely habitat for Paranonychus. Juveniles have the typical integument of immature specimens but are unusual in possessing black pigment beneath the integument that is normally found in adults. Large numbers of juveniles were encountered in many of the collecting localities.

Paranonychus concolor Briggs, new species.

MALE. Total body length, 1.84 mm. Eye tubercle length, 0.33 mm. Scute length, 1.44 mm. Eye tubercle width, 0.31 mm. Scute width, 1.48 mm. Length of second leg, 1.94 mm. Anterior margin of scute rounded. Scute granular, faintly mottled with dark pigment, scutal areas darkest.
Dorsal process of penis a prominent spine widely separated from ventral process.

Metanonychus nigricans oregonus Briggs, new subspecies.

3. Ventral swelling or spur on base of male palpal tarsus.

Metanonychus idahoensis Briggs, new species.

No ventral swelling or spur on base of male palpal tarsus.

4. Dorsal plate of penis broader than ventral process and with pointed apex.

Metanonychus setulus setulus Briggs, new species.

Dorsal plate not significantly broader than ventral process, apex rounded or blunt.

5. Dorsal plate of penis curves strongly toward ventral process resulting in a median separation.

Metanonychus setulus mazamus Briggs, new subspecies.

Dorsal plate flush with ventral process.

6. Dorsal plate of penis cleft medially.

Metanonychus setulus navarrus Briggs, new subspecies.

Dorsal plate entire at apex.

7. Adults small; northern California.

Metanonychus setulus obrieni Briggs, new subspecies.

Adults normal size; Oregon Cascades.

Metanonychus nigricans nigricans Briggs, new species.

(Figures 81-86.)

No. 90] BRIGGS: NORTH AMERICAN TRIAENONYCHIDAE

Ventral transverse flange prominent. Apical pair of setae absent.

FEMALE. Similar to male in structure. Ovipositor with reduced dorsal and ventral lobes.

TYPE SPECIMENS. Holotype male and allotype female. 0.4 miles north of Del Norte Coast Redwood State Park, Del Norte County, California, 25 June 1966, V. F. Lee, A. Jung, and K. Hom.


Metanonychus nigricans oregonus Briggs, new subspecies.

(Figures 87-94.)

MALE. Total body length, 1.77 mm. Scute length, 1.32 mm. Length of eye tubercle, 0.28 mm. Scute width, 2.56 mm. Length of second leg, 4.49 mm. Width of eye tubercle, 0.30 mm.

Body mottled with dark pigment. Eye tubercle with light median stripe nearly continuous, black pigment joins retinae. Femur of first leg with two to three prominent spines on femur, one on trochanter.

Penis with dorsal process a recurved spine widely separated from ventral process.

FEMALE. Similar to male.

TYPE SPECIMENS. Holotype male and allotype female. 0.7 miles due west of Blodgett, Benton County, Oregon, 20 June 1966, T. Briggs, V. F. Lee, and K. Hom.


Metanonychus idahoensis Briggs, new species.

(Figures 95-104.)

MALE. Total body length, 1.39 mm. Scute length, 1.41 mm. Length of eye tubercle, 0.17 mm. Scute width, 1.13 mm. Length of second leg, 2.74 mm. Width of eye tubercle, 0.19 mm.

Anterior margin of scute rounded at shoulders. Scute granular, mottled with dark pigment, areas clearly delineated with furrows and tubercles. Tergites granular, with central band of dark pigment. Integument pale yellow-brown. Eye tubercle a rounded mound near anterior margin of cephalothorax. Light median stripe on tubercle not continuous. Maxillary processes from second coxae setose and blunt. Operculum tangent to third coxae, without groove for penis. Chelicerae with narrow constriction on basal segment. Palpi with strong spines on tibia and tarsi, femur with four to five strong ventral spines. Black pigment continuous on legs, tarsi with black pigment. Distal branches on hind claws elongate. Penis with very small, sclerotized dorsal spur near apex.
coxae, without groove for penis. Chelicerae with constriction on basal segment. Palpi with two or three prominent ventral spines on femur. Ectal spur on base of tarsus. Femur pigmentation increases distally on legs. Femur of first leg with one prominent ventral spine, second tarsochelicer with one, and trochanter with one or two. Hind claws with equal branches. Penis with ventral flange and pair of apical setae. Ventral and dorsal plates parallel, truncate at apex.

**FEMALE.** Similar to male but lacks ectal spur on base of palpal tarsus. Slightly larger in size.

**JUVENILES.** Hind claws with three pairs of lateral branches.

**TYPE SPECIMENS.** Holotype male and allotype female. 2.8 miles northwest of Clarkia on State Highway 3, Shoshone County, Idaho, 11 August 1967, T. Briggs, K. Hom, A. Jung, P. Lum, and J. Tom.


**Metanonychus setulus setulus** Briggs, new species. (Figures 105-108.)

**MALE.** Total body length, 1.41 mm. Scute length, 1.08 mm. Length of eye tubercle, 0.22 mm. Scute width, 1.63 mm. Length of second leg, 3.16 mm. Width of eye tubercle, 0.25 mm.

Anterior margin of scute rounded at shoulders. Scute granular, areas clearly delineated by unpigmented furrows, integument yellow-brown. Tergites granular, with central band of dark pigment. Eye tubercle a rounded mound at anterior margin of scute. Light median stripe nearly continuous. Sternum narrow, with broadening at juncture of second and third coxae and at juncture of third and fourth coxae. Maxillary processes from second coxae setose and acute. Operculum extends over base of third coxae, without groove for penis. Chelicerae with constriction on basal segment. Palpi with strong spines on tibia and tarsi, femur with one strong ventral spine. Femur of first leg with three ventral spines, trochanter with one. Black pigment nearly continuous on legs. Hind claws with equal branches. Penis with dorsal plate curved toward ventral plate resulting in medial separation; about equal in length to ventral plate and truncate at apex.

**TYPE SPECIMENS.** Holotype male and allotype female. 1.9 miles east of junction of Interstate 5 and Speaker Road, Wolf Creek, Josephine County, Oregon, 6 August 1967, T. Briggs.
Metanonychus setulus obrieni Briggs, new subspecies.
(Figures 125-128.)

MALE. Total body length, 1.13 mm. Scute length, 0.86 mm. Length of eye tubercle, 0.20 mm. Scute width, 0.88 mm. Length of second leg, 2.37 mm. Width of eye tubercle, 0.17 mm.

Tergites darkly pigmented.

Penis with ventral dorsal plates parallel, truncate at apex, and about equal in length.

TYPE SPECIMENS. Holotype male and allotype female. Fort Dick, Del Norte County, California, 2 July 1966, C. W. O'Brien.

Metanonychus setulus cascadus Briggs, new subspecies.

MALE. Total body length, 1.44 mm. Scute length, 0.97 mm. Length of eye tubercle, 0.19 mm. Scute width, 0.97 mm. Length of second leg, 2.77 mm. Width of eye tubercle, 0.19 mm.

Penis with ventral and dorsal plates parallel, truncate at apex. Penis similar to that of Metanonychus idahoensis.

FEMALE. Larger than male, operculum shorter than that of male.

TYPE SPECIMENS. Holotype male and allotype female. 9.0 miles north of Marion Forks, Marion County, Oregon, 27 August 1969, (1,000 ft.) T. Briggs.


FOREST RELATIONSHIPS

All travunoids are basically forest animals and are a surprisingly good indicator of the health of a forest. I have found innumerable times that heavily lumbered forests are devoid of these arachnids, while adjacent primary stands of trees support an abundance of specimens. They are uneventfully by a sparse removal of trees, but any forest once cut so only stumps or less remain of the original trees is not repopulated with triaenonychids and other travunoids even if a tree farm stand has replaced the forest for many years. Any forest lumbered to a succession stage of brushy undergrowth or non-climax trees does not contain these arachnids. One might conclude, therefore, that triaenonychids have great difficulty in adapting to changes in their environment.

Good examples of this relationship between triaenonychids and forest health were observed in comparing lumbered and un lumbered portions of San Mateo County Memorial Park, California; Butano Ridge of San Mateo County, California; Honeyman State Park of Lane County, Oregon; south of Gold Beach, Curry County, Oregon; and numerous locations in the Olympic Forest of Washington.

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LITERATURE CITED


FIGURES 36-42. Zuma tioga Briggs, new species.


MAP 1. Distributions of *Sclerobunus robustus* and *Cytobunus*. 
MAP 2. Distribution of *Sclerobunus nondimorphicus*.

MAP 3. Distributions of *Metanonychus idahoensis* and *M. setulus*.
MAP 4. Distributions of *Metanonychus* and *Zuma*.

MAP 5. Distributions of *Paranonychus concolor* and *P. brunneus*. 

LEGEND
- *M. nigricans* nigricans
- *M. nigricans* argentea
- *O. acuta*
- *I. trigla*
- *concolor*
- *brunneus*