

SPECIES OF THE GENUS BATRISODES
FROM THE PACIFIC SLOPE OF
WESTERN NORTH AMERICA

(Coleoptera: Pselaphidae)

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All of the species of *Batrisodes* known from the Pacific Slope of North America, although a heterogenous group, can be placed in the subgenus *Empinodes* (Park, 1953). The distinguishing features of this subgenus (after Park) are as follows: (1) face not excavate between antennal cavities, (2) vertexal foveae nude, (3) vertex not granulate-punctate, (4) antennal segment X not ventrally foveate, (5) elytron trifoveate, (6) mesofemora of male not spined, (7) mesotarsus of male simple, (8) metathoracic tibia bearing apically a bundle of long setae, (9) the aedeagus bearing right and left internal spines which appear to be attached to the internal sac and, hence, more or less capable of being exerted. In reference to (6) above, the mesofemur is actually spined to some extent in all of the species. Two species groups can be separated on the basis of this spine. In some species it is a large spine midway on the femur and in others it is a smaller spine more approximate to the trochanter. The more northern species belong to the latter group and the spine is represented by a tubercle.

Many of the species have been collected in association with ants. This association is apparently not obligate and frequently may be nothing more than chance co-existence. Most of the specimens have been recovered from rotting wood or from under stones. Although some species are winged, none of the specimens were taken at lights.

Specimens from the type locality or close to the type locality were selected and compared with the types of the species of Casey and Brendel. Preparations of the aedeagi were then made from these selected specimens and, although the types were not dissected, conspecificity of the specimens is highly probable except for *B. monticola*, *B. tulareanus* and *B. speculum*. Specimens of *B. monticola* were not available; specimens comparable to *B. tulareanus* were not from the type locality; and the *B. speculum* type is a female.

Measurements of head length were made from clypeus to neck,

of antennal segments as indicated by line "a" fig. 3, and of certain aedeagi as indicated in figs. 21, 22. All other measurements are given as maxima.

Special thanks are extended to Drs. J. F. Gates Clarke, O. L. Cartwright, J. A. G. Rehn and E. S. Ross whose cooperation made possible examination of type material. The majority of the specimens studied were from the collections of the California Academy of Sciences and the University of California, Davis. The holotypes of new species are deposited in the California Academy of Sciences.

KEY TO THE SPECIES OF THE GENUS BATRISODES

- 1 Terminal antennal segment with blunt tooth at inner proximal margin (fig. 2); mesofemur spined; last sternite usually excavatemales 2
 - Terminal antennal segment lacking tooth; mesofemur not spined; last sternite usually without, or with only a small excavationfemales¹
- 2 (1) Mesofemur with spine near middle (fig. 10); head with or without lateral carinae (fig. 1)..... 3
 - Mesofemur with spine within proximal one-third (fig. 9; head without lateral carinae 8
- 3 (2) Antennal segments II and III subequal in length (fig. 3)..... 7
 - Antennal segment III one-half to three-fourths length of segment II (figs. 4-5) 4
- 4 (3) Last sternite shallowly impressed; median lobe of aedeagus equal to or shorter than basal lobe..... 5
 - Last sternite with deep circular depression occupying most of segment; median lobe of aedeagus longer than basal lobe (fig. 11)*indistinctus* Grigarick & Schuster
- 5 (4) Lateral carinae absent; Sierra Nevada Mountains..... 6
 - Lateral carinae of head present; Coast Range*martini* Grigarick & Schuster
- 6 (5) Width of antennal segment II subequal to length of segment III, (fig. 5); median lobe of aedeagus relatively straight (fig. 13)*nebulosus* Grigarick & Schuster
 - Width of antennal segment II greater than length of segment III (fig. 4) median lobe of aedeagus rounded-transverse (fig. 14).....*obscurus* Grigarick & Schuster
- 7 (3) Pygidium with a tubercle as long as wide, appearing truncate in lateral view (fig. 23).....*denticauda* Casey
 - Pygidium with a tubercle obviously wider than long, appearing rounded in lateral view (fig. 25).....*cicatricosus* Brendel
- 8 (2) Apex of median lobe simple, at most slightly rotated (figs. 16-18) 9
 - Apex of median lobe with laterally directed process and large thin flange (figs. 19-22)10

¹Females can generally be identified by comparison with males in respect to characters other than secondary sexual characters.

- 9 (8) Aedeagus with left internal tooth very broad (fig. 16)
*albionicus* (Aubé)
 —Aedeagus with left internal tooth relatively slender (fig. 17)
*mendocino* Casey
- 10 (8) Median lobe of aedeagus oriented to left (fig. 19)
*opacus* Grigarick & Schuster
 —Median lobe of aedeagus oriented to right (figs. 20-22).....11
- 11 (10) Left anterolateral angle of base of aedeagus obsolete, partly
 fused with median lobe (fig. 20).....*tulareanus* Casey
 —Left anterolateral angle of base of median lobe well devel-
 oped (figs. 21-22)12
- 12 (11) Right internal tooth of aedeagus wider than left.....13
 —Left internal tooth of aedeagus wider than right (fig. 21)
*zephyrinus* Casey
- 13 (12) Left internal tooth longer than right.....*speculum* Casey
 —Left internal tooth shorter than right (fig. 22).....*lustrans* Casey

***Batrisodes indistinctus* Grigarick and Schuster, new species**

(Fig. 11)

Male.—Reddish-brown. Head 430μ long x 363μ wide. Vertexal foveae 150μ apart; ambient sulcus shallow, ending at vertexal foveae; lateral margins not carinate; face simple. Eyes nearly round, of about 25 facets. Median carina of ventral surface interrupted by a small fovea. Antenna 1.1 mm. long; lengths/widths of segments in microns: I, 130/90; II, 120/76; III through VIII, approximately 68/55; IX, 75/75; X, 75/85; XI, 250/112. Pronotum approximately 445μ long x 415μ wide, medianly sulcate. Elytra 615μ long; discal setae somewhat sparse, about 81μ long; discal striae less than one-half elytra length. Alate or brachypterous. Mesofemur 510μ long with spine 300μ from base; mesotibia 420μ long, with large terminal spine, subterminal spine very small, obscured by setae. Metasternum broadly and deeply impressed, not extending between metacoxae. Abdomen 725μ long; tergite I 625μ wide, with parallel carinae 110μ long, separated by 220μ . Pygidium evenly convex. Last sternite with deep circular depression occupying entire length of segment, no median posterior extension on anterior margin. Aedeagus 568μ long x 218μ wide.

Female.—Resembles male except eyes smaller, of about 15 facets. Pygidium tapered posteriorly to a blunt apex. Last sternite without deep circular depression.

Holotype male, 14♂ and 13♀ paratypes, SEVEN MILES NORTH OF LAKEHEAD, SHASTA COUNTY, CALIFORNIA, IV-23-54, under stones, R. O. Schuster.

This species is related to *B. martini*, and *B. nebulosus* but differs in having a deep circular depression in the last sternite.

***Batrisodes martini* Grigarick and Schuster, new species**

(Figs. 6, 10, 12)

Male.—Reddish-brown. Head 408μ long x 390μ wide. Vertexal foveae 163μ apart; ambient sulcus shallow, extending to back of head; lateral carinae

weakly developed; face simple. Eyes nearly round, with approximately 30 facets. Antennae lengths/widths of segments in microns: I, 127/82; II, 91/64; III through VIII, 68/54; IX, approximately 68/73; X, approximately 68/77; XI, 204/114. Pronotum 454μ long x 410μ wide, lacking median sulcus. Elytra 530μ long; discal setae sparse, about 60μ long; discal striae nearly obsolete, nearly one-third elytra length. Brachypterous, wings 450μ long. Mesofemur 530μ long with spine 225μ from base; mesotibia 455μ long, terminal and subterminal spines obsolete. Metasternum broadly and deeply impressed, not extending between metacoxae. Abdomen 725μ long; tergite I 635μ wide, with parallel flattened carinae very short, separated by 160μ . Pygidium weakly convex. Last sternite lacking conspicuous depression, with uniformly wide, polished anterior margin. Aedeagus 422μ long x 200μ wide.

Holotype male, three male and two female paratypes, CYPRESS RIDGE (PRESUMABLY NEAR WOODACRE) MARIN COUNTY, CALIFORNIA, between April 11 and April 17, 1920, J. O. Martin. Additional specimens, not included in the type series, were collected as follows: Hills back of Oakland, 1 ♀, III-19-22, E. C. Van Dyke; Marin County, 1 ♂, II-28-20, J. O. Martin; San Francisco, 1 ♀, November, F. E. Blaisdell.

This species differs from *B. indistinctus* by the absence of a depression in the last sternite and from *B. nebulosus* and *B. indistinctus* by the presence of lateral carinae of the head.

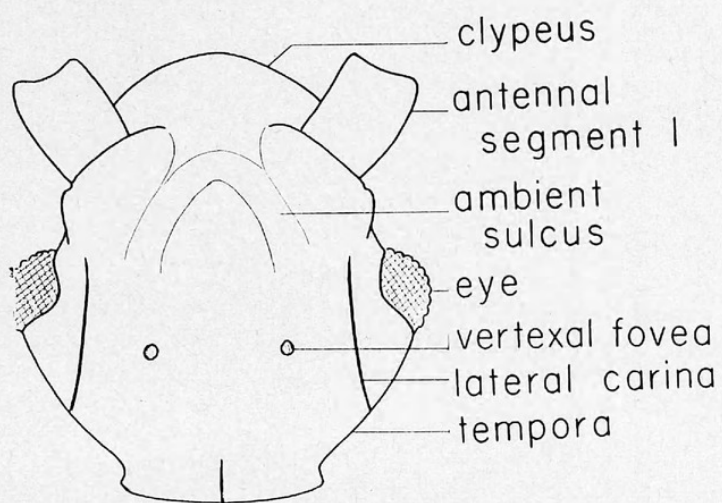
***Batrisodes nebulosus* Grigarick and Schuster, new species**

(Figs. 5, 13)

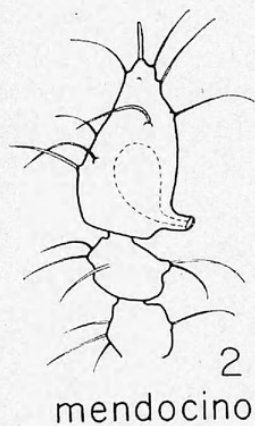
Male.—Reddish-brown. Head 413μ long x 363μ wide. Vertexal foveae 150μ apart, separated by a small longitudinal depression; ambient sulcus extends beyond vertexal foveae; lateral carinae lacking; face with one small puncture on each side of center. Eyes slightly reniform, of about 45 facets. Ventral surface of head with uninterrupted median carina. Antenna approximately 1.1 mm long; lengths/widths of segments in microns: I, 136/82; II, 118/59; III through VIII, about 59/50; IX, 75/75; X, 75/85; XI, 222/135. Pronotum 422μ long x 409μ wide, with very weak median sulcus. Elytra 531μ long; discal setae 77μ long; discal striae about one-half elytra length. Brachypterous. Mesofemur 490μ long with spine 272μ from base; mesotibia 409μ long with terminal spine long and thin;

EXPLANATION OF FIGURES

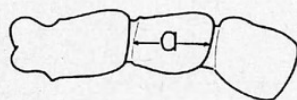
Fig. 1, head, dorsal view; fig. 2, antennal club of male; figs. 3-5, first three antennal segments, "a" indicates measured length; fig. 6, pronotum; fig. 7, apical and subapical mesotibial spines; fig. 8, depression of last sternite and small anterior margin; fig. 9, mesofemoral spine approximate to trochanter; fig. 10, mesofemoral spine remote from trochanter; figs. 11-22, Aedeagi; figs. 23-26, terminal segments of abdomen (figs. 23 and 25, lateral view; figs. 24 and 26 ventral view).



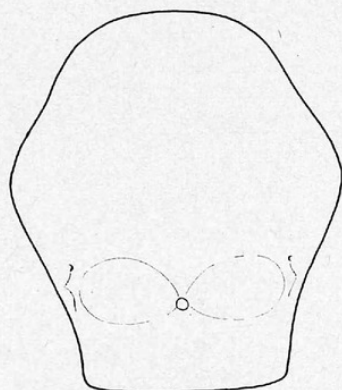
1 denticauda



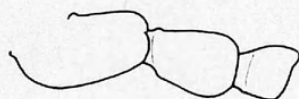
2 mendocino



3 denticauda



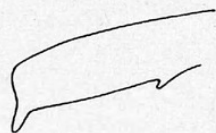
6 martini



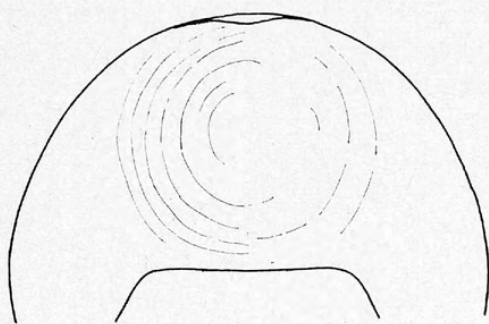
4 obscurus



5 nebulosus



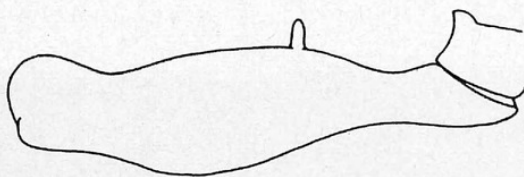
7 mendocino



8 zephrinus



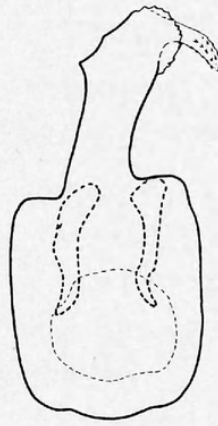
9 mendocino



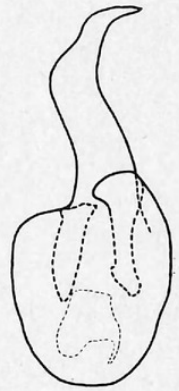
10 martini



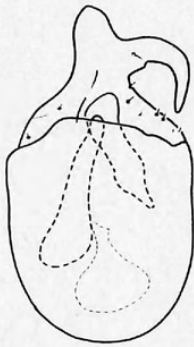
11 indistinctus



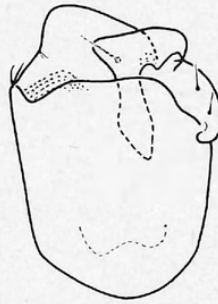
12 martini



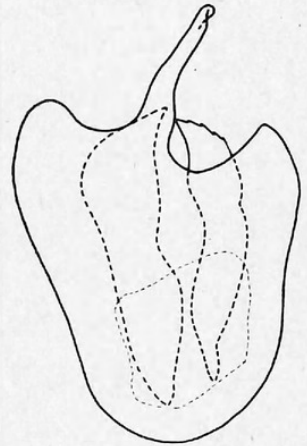
13 nebulosus



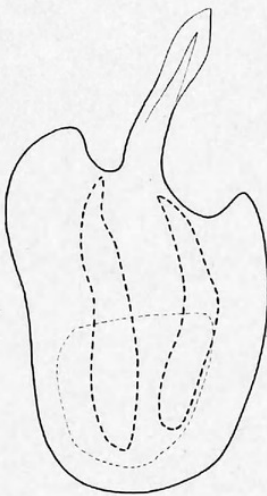
14 obscurus



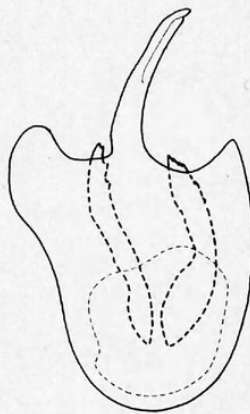
15 cicatricosus



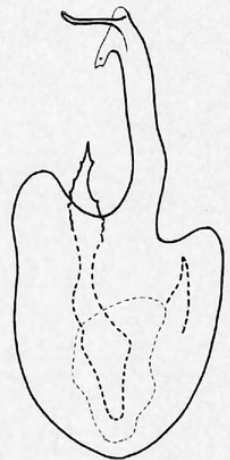
16 albionicus



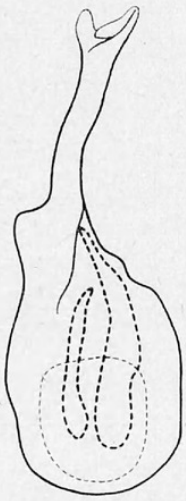
17 mendocino



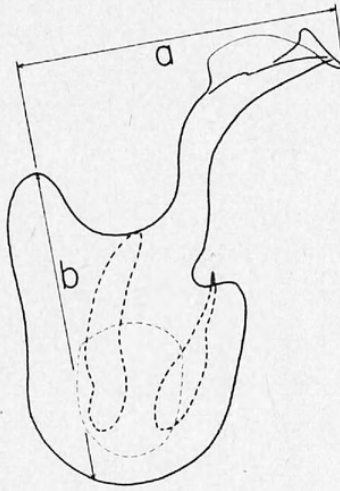
18 mendocino



19 opacus



20 tulareanus



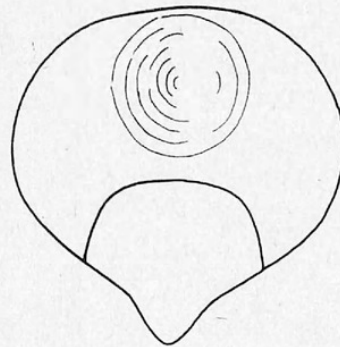
21 zephrinus



22 lustrans



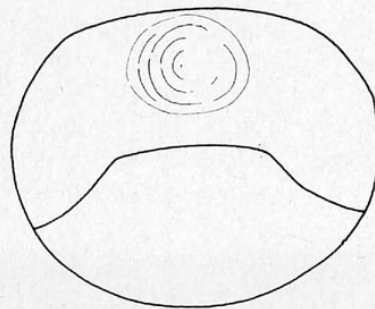
23 denticauda



24 denticauda



25 cicatricosus



26 cicatricosus

subterminal spine not visible. Metasternum broadly and shallowly impressed, the impression extending between metacoxae. Pygidium with conical tumosity, basal margin slightly raised and polished. Sternite V with slight median impression. Last sternite very shallowly impressed. Aedeagus 500μ long x 209μ wide.

Female.—Similar to male except eyes of about 20 facets. Pygidium evenly convex. Last sternite with shallow transverse basal impression.

Holotype male and two paratype females, FOUR MILES WEST OF NEWCASTLE, PLACER COUNTY, CALIFORNIA, I-3-59, from litter of *Quercus wislizenii*, F. C. Raney and R. O. Schuster.

B. nebulosus can be separated from *B. indistinctus* by the differences previously mentioned and by the shorter median lobe of the aedeagus.

***Batrisodes obscurus* Grigarick and Schuster, new species**

(Figs. 4, 14)

Male.—Reddish-brown. Head 410μ long x 370μ wide. Vertexal foveae separation 160μ ; lateral carinae absent. Median carina of ventral surface of head uninterrupted. Antenna 0.98 mm long; lengths/widths of segments in microns: I, 140/77; II, 100/72; III through VIII, 64/55; IX, 75/75; X, 75/90; XI, 190/105. Pronotum 407μ long x 407μ wide, medianly sulcate. Elytra 538μ long; discal setae 60 to 75μ long. Brachypterous, wings less than 470μ . Mesofemur 505μ long with spine 387μ from base; mesotibia 453μ long with blunt terminal spine, subterminal spine 195μ from apex. Abdomen approximately 775μ long; tergite I 590μ wide with parallel carinae separated by 145μ . Last sternite without deep impression. Aedeagus 436μ long x 239μ wide.

Female.—Unknown.

Holotype male, FOUR MILES WEST OF NEWCASTLE, PLACER COUNTY, CALIFORNIA, IV-15-58, from litter of *Adenostema* and *Quercus*, R. O. Schuster and L. M. Smith.

Batrisodes obscurus tends toward *B. denticauda* and *B. cicatricosus* in genitalic structures but it differs from them by having antennal segment II longer than III, as in *B. nebulosus*.

BATRISODES DENTICAUDA Casey, 1893

(Figs. 1, 3, 23, 24)

Male.—Reddish-brown. Head 485μ long x 455μ wide. Vertexal foveae 163μ apart; ambient sulcus deep, extending past vertexal foveae beside lateral carinae; face simple. Eyes reniform, of about 45 facets. Median carina of ventral surface of head entire. Antenna approximately 1.0 mm long; lengths/widths of segments in microns: I, 186/100; II, 82/64; III through VII, 77/64; VIII, 68/64; IX, 73/82; X, 73/104; XI, 215/120. Pronotum 477μ long x 490μ wide, median sulcus very deep and long. Elytra 680μ long; discal setae sparse, about 95μ long; discal striae slightly over one-third elytra length. Wings approximately 2.36 mm long. Mesofemur 650μ

long with spine 331μ from base; mesotibia 499μ long, with large terminal and subterminal spines. Metasternum with median sulcus not extending between metacoxae. Abdomen 795μ long; tergite I 790μ wide, with parallel carinae about 60μ long, separated by 159μ . Pygidium with prominent tubercle as long as wide, truncate in lateral view. Last sternite with a deep circular depression nearly as long as segment, about two-fifths width of segment, anterior margin medianly narrowed. Aedeagus 395μ long x 295μ wide.

Female.—Resembles male with respect to eyes, pygidium and wings. Last sternite with a small circular basal depression.

Distribution: California. Madera County: Sugar Pine, (21 specimens on "European style" points nearly impossible to determine sex), Dr. A. Fenyes. Mariposa County: Wawona, ♂, 4 ♀, VII-17-46, H. P. Chandler; Miami, 2 ♂, 1 ♀, May, A. Fenyes Collection. Shasta County: no further locality 1 ♀, Van Dyke Collection; Castle Crag, 2 ♂, VII-28-1898, A. Fenyes. Siskiyou County: no further locality, 2 specimens, August, Koebele Collection; McCloud, 2 ♀, VI-4-27, A. Fenyes. Oregon. No locality, 1 ♂, July, Blaisdell Collection.

This species is readily distinguished from all others by the shape of its pygidium. The aedeagus is similar to that of *B. cicatricosus*.

BATRISODES CICATRICOSUS Brendel

(Figs. 15, 25, 26)

Batrisesodes cicatricosus Brendel, 1890.

Batrisesodes pygidialis Casey, 1893, *new synonymy*.

Male.—Reddish-brown. Head 445μ long x 420μ wide. Vertexal foveae 150μ apart; ambient sulcus very shallow, ending at vertexal foveae. Lateral carinae extend posteriorly from antennal tubercles; face simple. Eyes reniform, of about 55 facets. Median carina on venter of head uninterrupted. Antenna about 1.1 mm long; lengths/widths of segments in microns: I, 168/87; II, 92/67; III through VIII, approximately 77/67; IX, 75/75; X, 75/90; XI, 205/120. Pronotum 443μ long x 443μ wide, medianly sulcate. Elytra 636μ long; discal setae 75μ long; discal striae weak, about one-third elytra length. Wings about 2.3 mm long. Mesofemur 575μ long with spine 285μ from base; mesotibia 480μ long with large acute terminal spine, subterminal spine 200μ from apex. Metasternum broadly and medianly sulcate, terminating before reaching metacoxae. Abdomen 870μ long x 640μ wide; tergite I with parallel carinae 75μ long, separated by 125μ . Pygidium broadly tumid with a transverse, polished, impunctate sulcus along basal margin. Last sternite with deep, nearly circular depression occupying anteromedian one-third of segment; anterior edge uniformly margined. Aedeagus 383μ long x 280μ wide.

Female.—Resembles the male with respect to eyes, pygidium with basal sulcus and transverse tumosity. Last sternite with a small circular basal depression.

Distribution: California. Alpine County: 3 ♀, VII-14-1907, F. E. Blaisdell.

Calaveras County: Big Trees, 3 ♂, 2 ♀, August, F. E. Blaisdell. Eldorado County: Riverton, 1 ♂, II-22-58, R. O. Schuster; Strawberry Valley, 3 ♂, 1 ♀, VIII-9-1912, E. C. Van Dyke. Placer County: 1 ♂, C. Fuchs; 1 ♂, 5 ♀, E. C. Van Dyke; Forest Hill, April, 1898, E. C. Van Dyke. Plumas County: Bucks Lake, 1 ♂, V-17-59, under douglas fir bark, R. F. Wilkey; Mohawk, 1 ♂, VI-5-25, A. Fenyés Collection. Shasta County: Shingletown, 1 ♂, VI-27-47, H. P. Chandler. Tuolumne County: Leland Meadows, 1 ♂, VIII-21-1960, M. E. Irwin; Pinecrest, 1 ♀, IX-23-1950, ex. sugar pine, R. O. Schuster; South Grove, Calaveras Big Trees State Park, 1 ♀, VI-4-1957, N. A. Walker.

The Brendel type of *B. cicatricosus* is a male. It is in the Academy of Natural Sciences of Philadelphia and bears, besides the name, the following information: Placer Co., California, September, Brend. Horn Coll. H9417. There is no significant external difference between the types of *B. cicatricosus* Brendel and *B. pygidialis* Casey, nor is there any reason to suspect any difference to be present between the aedeagi.

BATRISODES ALBIONICUS (Aubé), 1833

(Fig. 16)

Male.—Reddish-brown. Head 515μ long x 440μ wide. Vertexal foveae separated by 180μ ; lateral carinae lacking; face simple. Eyes reniform, of about 65 facets. Median carina of venter of head entire. Antennal lengths/widths of segments in microns: I, 173/109; II, 91/75; III, 95/73; IV through VIII subequal with VIII slightly shorter; IX, 91/100; X, 91/123; XI, 263/150. Pronotum 544μ long, median sulcus shallow and confined to basal half. Elytra 770μ long; discal setae 68μ long. Wings 2.7 mm long. Mesofemur 675μ long with small spine 137μ from base; mesotibia 590μ , subapical spine two-thirds as large as distal spine. Metasternum medianly impressed. Abdomen 960μ long x 900μ wide. Tergite I with short parallel carinae, separated by 185μ . Pygidium evenly convex, slightly wider than long. Last sternite with large median depression, not margined anteriorly. Aedeagus 627μ long x 350μ wide.

Female.—Resembles the male except eyes smaller, of 35 facets. Pygidium longitudinally tumid, in lateral view convex. Last sternite without depression.

Distribution: California. Del Norte County: 15 miles northeast Crescent City, 2 ♂, 1 ♀, III-13-58, redwood duff, J. Schuh. Oregon. Benton County: 8 miles north Corvallis, 1 ♀, XII-28-50, V. D. Roth; Scotts Hill, 1 mile southwest Corvallis, 1 ♀, X-31-50, ground litter, J. D. Lattin; Clackamas County: Metzler Park, 5 miles southwest Springwater, 1 ♂, VI-3-59, douglas fir litter, G. W. Krantz; Colton, 1 ♀, May 1953, E. S. Ross. Coos County: Near Bridge, 1 ♂, 3 ♀, VII-27-55, V. D. Roth; Near Bridge Camp, 5 ♂, 3 ♀, VII-28-54, V. D. Roth; Cape Arago, State Park, South Charleston, 1 ♀, V-24-57, cut grass along road, H. S. Dybas; Charleston, 2 ♂, 1 ♀, IX-10-47, I. M. Newell, 1 ♀, X-1-59, V. D. Roth; Marshfield (Coos Bay),

1♂, VI-12-14, E. C. Van Dyke; Curry County: 5 miles north Brookings, 2♀, X-1-59, V. D. Roth; 12 miles north Goldbeach, 1♂, 1♀, X-1-59, V. D. Roth; Humbug Mt., 1♂, 5♀, V-11-55, J. Capizzi; Myrtle Grove, Leob State Park, 7 miles east Brookings, 2♂, IV-22-57, H. S. Dybas; 4 miles north Pistol River, 2♀, V-23-57, litter, H. S. Dybas; Douglas County: Loon Lake, 7♂, 7♀, VII-1-59, alder and fern litter, L. M. Smith; Jackson County: Prospect, 1♂, IV-20-58, J. D. Vertrees; Lane County: 5 miles north Florence, 1♂, VI-7-57, litter in broadleaf evergreen forest, H. S. Dybas; Spencer Butte, Eugene, 1♂, V-19-57, oak leaf litter, H. S. Dybas; Lincoln County: 3 miles southwest Harlan 250', 1♀, IV-8-59, douglas fir litter, J. D. Lattin; Marion County: 4 miles north Gates, 1♀, I-23-55, V. D. Roth; 7 miles east Stayton, 1♀, IX-28-41, alder-maple litter, J. C. Chamberlin; Suttle Lake, Santiam Pass, 1♂, VI-25-54, V. D. Roth; Yamhill County: McMinnville, 2♀, V-11-57, maple, alder, fir litter, H. S. Dybas; 2.5 miles north Newburg, Chehalem Mts., 1♂, IV-5-59, J. D. Lattin. Washington. Pierce County: Tacoma, 1♀, IV-1-23, J. O. Martin; Sherman, 1♀, Fenyes collection. Canada. British Columbia. Steelhead, 1♂, 1♀, V-28-33, H. B. Leech; Vancouver, 1♂, IV-5-33, H. B. Leech.

B. albionicus is closely related to *B. mendocino* but differs by not having a medianly extended margin of the anterior border of the last sternite and by possessing a smaller mesofemural spine. The pygidium of the female of *B. albionicus* is more truncate in profile than that of *B. mendocino*. One population sample from northern California contained probable intergrades between the two species.

The type of locality of *B. albionicus* is given as "America Septentrionali". This species commonly occurs in British Columbia, Washington and Oregon, and has been collected in California only in the extreme north of Del Norte County.

BATRISODES MENDOCINO Casey, 1886

(Figs. 2, 7, 9, 17)

Male.—Reddish-brown. Head 468μ long x 440μ wide. Vertexal foveae 168μ apart; ambient sulcus deep, ending at fovea, lateral margins not carinate; face simple. Eyes reniform, with about 37 facets. Venter with median carina uninterrupted. Antenna 1.05 mm long; lengths/widths of segments in microns: I, 159/82; II and III subequal, 90/77; IV through VIII slightly shorter; IX, 86/105; X, 91/127; XI, 259/141. Pronotum 530μ long x 545μ wide, with deep median sulcus. Elytra 700μ long; discal setae sparse, approximately 85μ long; discal striae shallow, slightly over one-third elytra length. Brachypterous, wings about 1.0 mm. Mesofemur 672μ long with large (45μ long by 23μ wide) cuniform, spine 168μ from base; mesotibia 568μ long, with a large blunt terminal spine, subterminal spine acute, moderate in length. Metasternum broadly and deeply impressed, not extending between metacoxae. Abdomen 820μ long; tergite I 800μ

wide, with parallel carinae 45μ long separated by 152μ . Pygidium nearly as long as wide, evenly convex. Last sternite with deep circular depression occupying entire segment length, anterior margin widest medianly. Aedeagus 508μ long x 280μ wide.

Female.—Resembles male except smaller eyes of approximately 26 facets. Pygidium of female tapers posteriorly to pointed tuberosity with dorsum in lateral aspect concave. Last sternite without deep depression.

Distribution: California. Del Norte County: 15 miles northeast Crescent City, 2♂, 1♀, III-13-58, redwood duff, J. Schuh; 35 miles south Crescent City, 2♀, VI-22-60, redwood, S. Radinovsky; 2 miles north Ft. Dick, 1♀, XI-21-53, V. D. Roth; 18.9 miles north Gasquet, 5♂, 22♀, VII-11-59, L. M. Smith; 18 miles South Klamath, 4♂, 9♀, VIII-13-53 and IX-19-53, redwood, E. E. Gilbert, G. A. Marsh, R. O. Schuster; Smith River Cutoff, 1♀, X-13-54, V. D. Roth. Humboldt County: 9 miles east Alton, 2♂, IX-20-55, redwood, N. A. Walker; Arcata, 1♀, July 1901, E. C. Van Dyke, 3♀, VI-11-19, F. E. Blaisdell; Big Lagoon 3♂, 1♀, VIII-13-53, G. A. Marsh, R. O. Schuster; East of Carlotta, 6♀, X-1-59, V. D. Roth; Dyersville, 6♂, 11♀, IX-19-53, redwood, E. E. Gilbert, R. O. Schuster; 1.5 miles south Dyersville, VIII-13-53, redwood, G. A. Marsh, R. O. Schuster; Freshwater, 6♂, 1♀, VIII-13-53, G. A. Marsh, R. O. Schuster, 2♂, 2♀, X-9-53, E. E. Gilbert, R. O. Schuster; Greenpoint, 2♀, VI-10-and 11-16, F. E. Blaisdell; 19 miles east Greenpoint, 5♂, 28♀, VII-11-54, E. E. Gilbert, R. O. Schuster; Prairie Creek Redwoods State Park, 2♀, IX-8-58, redwood litter, L. M. Smith; 5 miles south Scotia, 1♂, 1♀, X-1-59, V. D. Roth. Mendocino County: Faulkner Park, Anderson Valley, 1♂, 2♀, X-14-54, J. R. Helfer; Ft. Bragg, 1♀, VI-27-59, L. M. Smith; Franklin Lane State Park, 4♀, X-10-53, J. W. MacSwain; Hartsook Grove, 1♂, IX-19-53, E. E. Gilbert, R. O. Schuster; Little River, 9♂, 17♀, 1955 to 1957, J. R. Helfer; Mendocino, 1♂, I-4-58, J. R. Helfer, 1♀, V-26-55, J. R. Helfer, 1♀, X-19-57, J. R. Helfer; Paul M. Dimmick Memorial Grove State Park, 1♂, I-3-54, J. R. Helfer, 4♀, IV-10-55, J. R. Helfer; 3 miles north Potter Valley, 1♀, VII-24-59, L. M. Smith, R. O. Schuster; Ryan Creek, 2♀, III-7-54, P. D. Hurd; Napa County: Mt. St. Helena, 2♀, II-7-55, J. R. Helfer. Sonoma County: Duncan Mills, 1♀, II-23-55, J. R. Helfer; 5 miles east Guerneville, 1♂, 4♀, VIII-18-59, V. D. Roth; Monte Rio, 1♂, 1♀, VIII-13-53, G. A. Marsh, R. O. Schuster, 1♀, II-22-54, M. F. Schuster; 1 mile south Trenton, 5♂, 4♀, VIII-7-57, R. O. Schuster. Siskiyou County: 1♀, August, Koebele collection, Tehama County: Post Pile Camp, 5800', 3♂, 1♀, VIII-30-60, down log, A. A. Grigarick, R. O. Schuster.

This species is closely related to *B. albionicus*, but the male differs in the last sternite, the mesofemural spine and the left internal tooth of the aedeagus. The pygidium of the female of *B. mendocino* is more tapered than that of *B. albionicus*.

***Batrisodes opacus* Grigarick and Schuster, new species**

(Fig. 19)

Male.—Reddish-brown. Head 460μ long x 410μ wide, vertexal foveae

150 μ apart; ambient sulcus moderately deep, continuing less conspicuously to back of head; lateral margins not carinate; face simple. Eyes reniform, of about 37 facets. Median carina of ventral surface of head uninterrupted. Antennae 1.1 mm long; lengths/widths of segments in microns: I, 150/95; II, 91/68; III through VII, 77/60; VIII, 68/60; IX, 82/91; X, 86/114; XI, 227/127. Pronotum about 490 μ long, median sulcus shallow. Elytra 645 μ long; discal setae sparse, about 77 μ long; discal striae less than one-third elytra length. Winged. Mesofemur 622 μ long with spine 163 μ from base; mesotibia 530 μ long, with a thin spine perpendicular to tibia, sub-terminal spine small, acute. Metasternum deeply impressed, not extending between metacoxae. Abdomen approximately 900 μ long by 750 μ wide, with parallel carinae on tergite I extending 50 μ , separated by 127 μ . Pygidium evenly convex. Last sternite with deep circular depression occupying entire length of segment and three-fifths width, with slight median swelling of anterior margin. Aedeagus 590 μ long by 285 μ wide.

Female.—Resembles male except eyes smaller and rounder, of about 20 facets. Pygidium convergent to a broadly rounded apex. Last sternite without deep circular depression.

Holotype male, April 26, 1959, and 3 δ paratypes April 18, 1954, June 1, 1957, and April 26, 1959, were collected 6 MILES SOUTHEAST HALF MOON BAY, SAN MATEO COUNTY, CALIF., by R. O. Schuster. Other specimens considered conspecific but not included in the type series are as follows: Marin County: Inverness, XI-1-53, 1 φ , E. E. Gilbert, V. D. Roth, R. O. Schuster; Muir Woods, 1 δ , IV-23-11, E. C. Van Dyke; 4.5 miles south Woodacre, 1 φ , XI-1-53, G. A. Marsh, R. O. Schuster. Santa Clara County: Mt. Madonna, 2 φ , I-2-54, D. Burdick. Santa Cruz County: Big Basin, 1 δ , XII-23-53, V. D. Roth; Santa Cruz, 1 φ , Van Dyke collection; Santa Cruz Mts., 42 δ , 12 φ , Koebele collection. San Mateo County: Kings Mtn., 1 δ , XI-1-58, litter of redwood and laurel, R. O. Schuster.

This species is related to *B. lustrans*. The orientation of the median lobe of the aedeagus is to the left in this species and to the right in *B. lustrans*.

BATRISODES ZEPHRINUS Casey, 1886

(Fig. 21)

Male.—Reddish-brown. Head 500 μ x 442 μ wide. Ambient sulcus ending in vertexal fovea; without lateral carinae; face simple. Eyes of about 40 facets. Median carina of ventral surface of head entire. Antennal segments lengths/widths in microns: I, 122/77; II, 91/73; III, 91/73; IV through VIII subequal with VIII slightly shorter; IX, 88/91; X, 80/123, XI, 245/127. Pronotum 550 μ long x 535 μ wide, medianly sulcate. Elytra 700 μ long; discal stria shallow, less than one-half elytral length; discal setae sparse,

75 μ long. Brachypterous, 500 μ long. Mesofemur 635 μ long, with very small spine 170 μ from base; mesotibia 550 μ long with acute subapical spine at least one-half as large as distal spine. Tergite I with abdominal carinae separated by 177 μ . Pygidium four-fifths as long as wide, evenly convex. Depression of last sternite deep, one-half segment width; anterior border of depression with very small median margin. Aedeagus 635 μ long x 305 μ wide.

Female.—Resembles male except eyes smaller, of about 25 facets. Pygidium with a large pointed tubercle. Last sternite lacking depression.

Distribution: California. Lassen County: Duck Lake, 2 σ , V-8-21, J. O. Martin; Facht, 4 σ , 6 φ , various dates in May, 1921 and 1922, J. O. Martin.

The male genitalia of *B. zephrinus* is similar to that of *B. lustrans* and *B. speculum* but differs by having the left internal tooth wider than the right and by a larger flare on the median lobe.

BATRISODES SPECULUM Casey, 1886

A single male specimen from Alameda County, the type locality, was studied. The specimen had been slide-mounted and was therefore difficult to compare with the type female. If the male is a representative of *B. speculum*, then the species differs from *B. lustrans* only in the character employed to separate them in the key.

BATRISODES LUSTRANS Casey, 1908

(Fig. 22)

Male.—Reddish-brown. Head 500 μ long x 445 μ wide. Vertexal foveae separated by 173 μ ; ambient sulcus deep anteriorly, ending in vertexal foveae; lateral carinae lacking; face simple. Eyes reniform of about 45 facets. Antennal segments lengths/widths in microns: I, 173/91; II, 95/77; III, 91/77; IV through VIII subequal with VIII slightly shorter; IX, 91/104; X, 91/127; XI, 260/145. Pronotum 545 μ long x 531 μ wide, median sulcus quite shallow. Elytra 760 μ long; discal stria very shallow, less than one-third elytra length; discal setae sparse, 90 μ long. Wings 1.9 mm. Mesofemur 680 μ long, with large spine 170 μ from base; mesotibia 570 μ long with cuniform subterminal spine over one-half length of distal spine. Tergite I with abdominal carinae separated by 160 μ . Pygidium evenly convex, wider than long. Last sternite with wide, deep depression two-thirds width of segment; anterior margin of depression short but wide. Aedeagus 568 μ long x 272 μ wide.

Female.—Eyes smaller, of 25 facets. Pygidium bearing a pointed tubercle. Last sternite lacking depression.

Distribution.—California: Alpine County: Blue Lakes, August, 1 σ , F. E. Blaisdell. Calaveras County: 5.6 miles east Dorrington, 1 φ , VI-16-59, R. O. Schuster, L. M. Smith; Mokel. Hill, 3 σ , 2 φ , VII-6-1896, F. E. Blaisdell. Eldorado County: Riverton, 1 σ , V-8-54, B. J. Adelson, R. O. Schuster. Placer County: Tahoe City, 3 σ , 3 φ , VI-5-27, A. Fenyes. Tuolumne County: Strawberry, 1 σ , 1 φ , VI-19-57, J. W. MacSwain.

The aedeagus of *B. lustrans* differs from that of *B. zephrinus* in a shorter straighter median lobe and in a different configuration of the left anterolateral angles of the base (lines a and b, figs. 21, 22). The sizes of the internal teeth are reversed between these species. Specimens of *Batrisodes lustrans* are darker, or nearly black at lower elevations. A suspicion exists that *B. lustrans* may be a synonym of *B. monticola*. Until the types can be dissected, however, there is insufficient evidence to warrant such synonymy.

BATRISODES MONTICOLA Casey, 1886

The type locality of *B. monticola* is not known with accuracy. The aedeagus of the type is also unknown. The type of *B. monticola* differs from that of *B. lustrans* by darker color, slightly shorter and broader elytra, and in the abdominal carinae being more closely spaced.

While specimens of *B. lustrans*, from Tahoe City, are of a brown color, specimens of the same species from lower elevations in Eldorado and Amador Counties are much darker. Although we suspect that *B. lustrans* is a synonym of *B. monticola*, formalizing the synonymy seems to be unwise until such time as the type specimens are dissected.

BATRISODES APHENOGASTRI Fall, 1912

We have not seen material of this species. It is considered in the Pselaphid section of *Hatch's Beetles of the Pacific Northwest* by Park and Wagner.

BATRISODES OCCIDUS Casey, 1886

We have seen only the type male. It is characterized by a broad but shallow depression in the last sternite and by obsolete humeral angles of the elytra.

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