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A NEW EARWIG IN THE GENUS *VOSTOX* (DERMAPTERA: LABIIDAE) FROM THE SOUTHWESTERN UNITED STATES AND MEXICO¹

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During the summer of 1958 a single male earwig was taken from a light trap in southwestern New Mexico and sent to the U. S. National Museum for identification. Apparently a new species of *Vostox*, it was put aside with the hope that more specimens might be collected. In the fall of 1959, during a study of the Dermaptera in the University of Arizona collection, six adults and three nymphs of this same earwig were discovered among some undetermined specimens. A further search finally resulted in the completion of the series of six males, seven females, and three nymphs upon which the following description is based. This new earwig brings the total number of Dermaptera in the United States, both native and adventive, to 19 species and 1 subspecies.⁴ Probably not more than six or seven of them are representatives of our endemic fauna.

There are about seven previously described species of *Vostox*, of which only *brunneipennis* (Serville) occurs in the United States; the others are all Neotropical. *V. brunneipennis* ranges from Virginia, Indiana, and Illinois south to Florida and westward to eastern Texas, with a few records from Panama and the states of Vera Cruz and Sinaloa in Mexico. So far as the available material demonstrates, the new species ranges from southern New Mexico and Arizona into the Mexican states of Sinaloa and Baja California. Neither of the species

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⁴Several changes, which have occurred in the list of United States Dermaptera since the paper by Gurney (1950) appeared, may be noted. *Prolabia* has been found to be a synonym of *Marava*, and *M. wallacei* (Dohrn) a synonym of *M. arachidis* (Yersin), the latter current combination replacing *Prolabia arachidis* (see Hincks, 1954). *Pyragropsis buscki* (Caudell), a recent addition to the list, occurs in Florida (Gurney, 1959). *Prolabia pulchella* (Serville) has been transferred to *Laprobia*, a genus described as new by Hincks (1960).

of *Vostox* found in the United States is apparently very common over most of its range, though fairly numerous specimens of *brunneipennis* have been seen from Florida and other southeastern states, where it occurs beneath loose bark of trees. *Spongovostox apicedentatus* (Caudell) is similar superficially to the new species and is one of the commonest earwigs native to the southwestern United States and northwestern Mexico. The following keys serve to distinguish the latter and the two United States species of *Vostox*, in spite of their general similarity in habitus, size, and coloration.

Keys to Species of *Vostox* and *Spongovostox* Found in
Continental United States
(Males)

1. Forceps armed with a conspicuous subapical tooth
..... *Spongovostox apicedentatus* (Caudell)
Forceps armed with at least one conspicuous tooth at or considerably anterior to middle (if tooth is absent, forceps are definitely concave internally on basal third) 2
2. Forceps sparsely tuberculate beneath, not concave internally, typically bearing a prominent, rounded tooth considerably anterior to middle (if two prominent teeth occur, the smaller, secondary tooth is at the middle); pygidium as in Figs. 10 or 11; parameres with conspicuous preapical curvature, Fig. 9.
..... *Vostox brunneipennis* (Serville)
Forceps smooth beneath, generally conspicuously concave internally on basal third, larger specimens with tooth near middle; pygidium as in Figs. 2, 3 or 7; parameres less conspicuously curved, Fig. 8. *Vostox excavatus*, new species

(Females)

1. Forceps armed with a basal, quadrate tooth, projecting but little beyond dorso-internal margin; abdominal sterna moderately clothed with fine yellow-brown setae and bearing many long, brown setae on posterior margins (males and nymphs as well); suggestions of lateral folds on segments four, five, and sometimes six (sometimes subtle but, when prominent, each fold bearing a long, light brown seta); pygidium much like Fig. 5.
..... *Spongovostox apicedentatus* (Caudell)
Forceps armed with a large, basal, quadrate tooth, projecting well beyond dorso-internal margin (Fig. 1) 2
2. Dorsal surface of anal segment with a scattering of prominent tubercles over posterior third (Fig. 13); ventro-internal margin of forceps prominent and crenulate, dorso-internal margin

broadly rounded and beset with a few widely spaced tubercles, inner face thus scarcely concave for more than half its length; pygidium as in Fig. 12, but scarcely diagnostic.

..... *Vostox brunneipennis* (Serville)
Dorsal surface of anal segment comparatively smooth; dorso- and ventro-internal margins of forceps prominent and closely set with small tubercles (almost crenulate), inner face thus distinctly concave as a longitudinal groove nearly to tip; pygidium as in Fig. 4. *Vostox excavatus*, new species

***Vostox excavatus*, new species**

Figures 1-8

Description. Male (holotype): Size medium, form usual for genus; body depressed with sides of abdomen (except for slightly narrower segments 1 and 10) subparallel and as wide as elytra; abdomen minutely punctulate above and below, less so on segments 1-3, increasingly so posteriorly, body practically smooth elsewhere; fine, short setae rather densely covering labrum, antennae and limbs, but sparse on remainder of body including forceps, elytra and wing scales; a few longer setae on posterior margin of head, anterior margin of pronotum, cephalic faces of femora, near bases of coxae, and on the posterior margins of all abdominal sterna except the last.

Head cordate in dorsal outline, with greatest width through the eyes equal to the median length; occipital margin broadly and obtusely emarginate; caudal angle of genae broadly rounded; eyes not especially prominent, slightly shorter in length than the postocular portions of genae; ecdysial cleavage lines very faintly impressed; antennae broken, one with 11, the other with 12 segments, the first segment equal to the sixth in length, considerably shorter than the fourth and fifth together.

Pronotum subquadrate, with greatest width at caudal third nearly equal to its median length, cephalic margin produced mesad to form a narrow cervical flange, laterocephalic angles obtuse and narrowly rounded, lateral margins straight and diverging slightly to the broadly rounded caudal margin, anterior two-thirds of disc convex with lateral margins flaring upward, thus forming shallow furrows which broaden and become confluent with the flattened posterior third of disc; median longitudinal sulcus moderately impressed on convex portion of disc, but becoming obsolete in posterior third.

Elytra with median length 2.1 times the greatest width of a single elytron; lateral margins nearly straight and subparallel, humeral angles broadly rounded, distal margin subtruncate. Exposed portions

of wings projecting posteriorly almost one-half the median elytral length with external margins converging gradually to the truncated distal extremities.

Abdomen broadened slightly in the middle, with basal segment notably narrower than anal segment; lateral folds moderately prominent on second and third terga; posterior margin of terga four, five, and six bordered with small tubercles, becoming obsolete laterad; anal segment transversely rectangulate with sides subparallel, posterior margin truncated, but with a small lobe laterad above dorso-internal margin of each forceps.

Forceps, as in figure 7, about three-fourths as long as the normally exposed portion of abdomen, relatively smooth, slender, and straight except for gentle incurving of the apical third, a prominent, slightly rounded tooth just anterior to middle on dorso-internal margin; inner faces rather strongly excavate anteriorly, this becoming obsolete proximad from tooth; ventro-internal margin bearing a few irregularly spaced tubercles anterior to tooth; pygidium, as in figure 7, with sides parallel at base, converging acutely to the narrowly rounded apex; subgenital plate slightly less exposed than the last tergum, its lateral margins oblique and broadly rounded into the somewhat concave distal margin; concealed genitalia as in figure 8.

Femora moderately inflated, anterior pair most strongly so, and subequal in length to anterior tibiae; tarsi long, slender, their ventral margins (particularly of metatarsi) bearing numerous, stiff setae; posterior metatarsus subequal to the combined length of the remaining two tarsal segments, the ventral surface with 2 rows of setae along the outer (lateral) margin, inner (mesal) margin with 2 longitudinal rows and numerous shorter marginal setae which are arranged in about 12 to 15 short, oblique, comblike rows to give a "stepped" or "staircase" effect. (The combs are best seen on clean specimens, in a mesal view, with magnification of 50 or more times, in a strong light.)

Coloration: Similar to *brunneipennis*; head, pronotum, median third of wing scales and abdomen dark chestnut brown, paler on antennae, elytra, anal segment and forceps; outer two-thirds of wing scales yellowish-white; limbs honey yellow; eyes black.

Measurements (in millimeters): Body length (exclusive of forceps and pygidium), 9; median length of head, 1.5; length of pronotum, 1.5; median length of elytron, 2.5; internal length of exposed wing scale, 1.1; length of forceps, 4.3.

Female (allotype): General form as in male, but somewhat more robust and differing as follows: head broader and longer; eyes larger

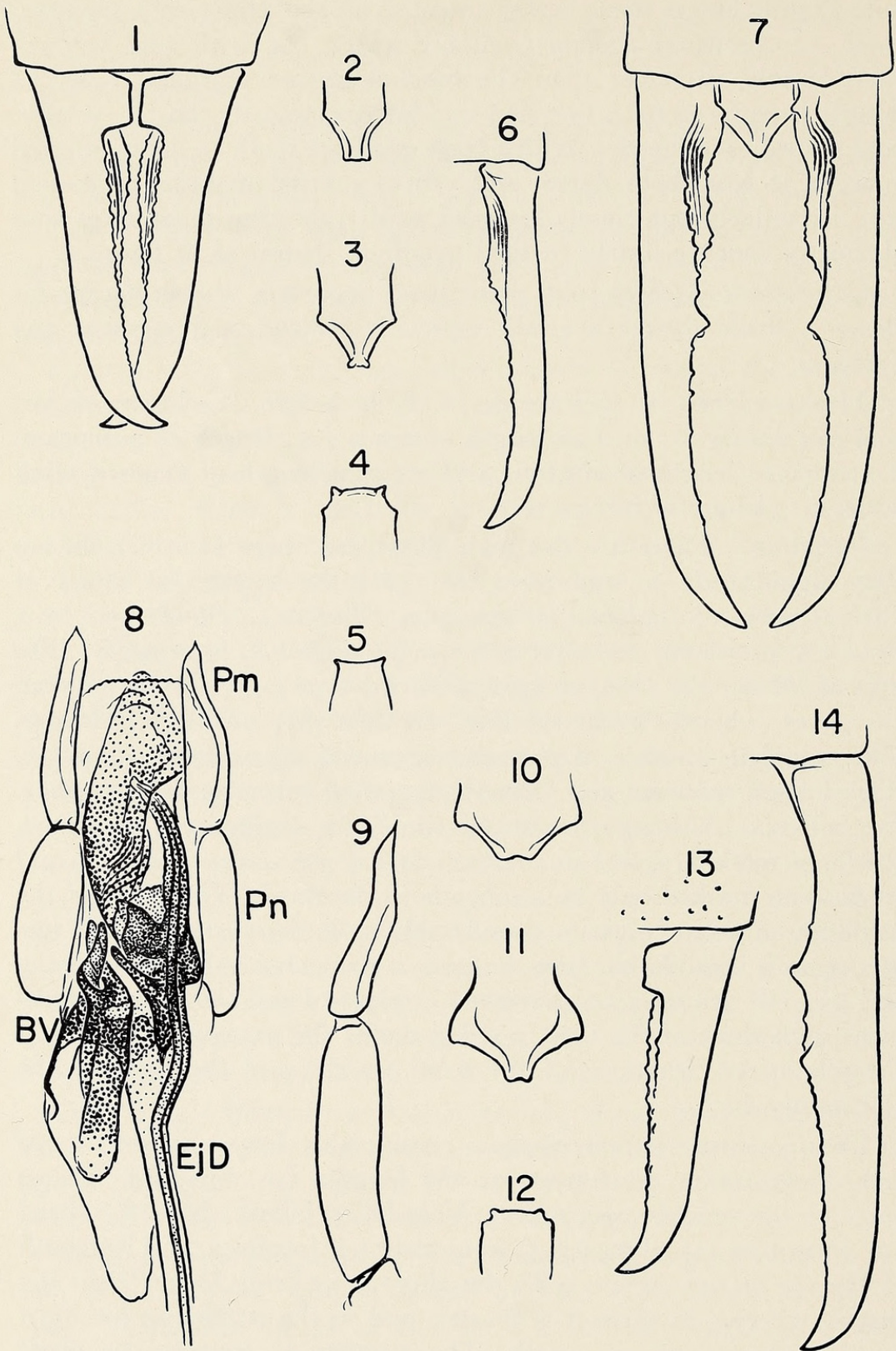
and slightly longer than cheeks; antennae broken, one with 9, the other with 12 segments; abdomen notably wider, but with anal segment considerably narrower than the basal segment; marginal tubercles absent from terga four, five, and six; forceps typically shorter, stouter, and shaped as in figure 1, with a large quadrate tooth on dorso-internal margin at base, both dorso- and ventro-internal margins prominent and irregularly but closely set with small tubercles, inner faces thus distinctly concave nearly to tips; pygidium shaped as in figure 4.

Coloration: Differs from male in no important respect except for being a shade darker over-all, especially on the anal segment and forceps.

Measurements (in millimeters): Body length (exclusive of fore- and pygidium), 9; median length of head, 1.5; length of pronotum, 1.5; median length of elytron, 2.5; internal length of exposed wing scale, 1.1; length of forceps, 4.3.

Variation: There are five male paratypes, three of which do not vary significantly in size from the type; the length (in mm.) of various parts of the smallest specimen (Tucson) follow: body 7.2, head 1.5, pronotum 1.2, elytron 2.1, wing scale 1.1, forceps 2.8. The eyes of all but the smallest agree with the type in being shorter than the genae, whereas in the smallest specimen they are slightly longer. The complete number of antennal segments varies from 12 to 16. The Tucson specimen also lacks the marginal tubercles on terga four, five, and six. Although the forceps of all are distinctively excavated, the large tooth is absent in the two smaller specimens (Fig. 6), and its position marked only by a tubercle in the third. The shape of the pygidium apparently varies considerably as in *brunneipennis*; in two specimens it is unlike the type in that it is truncated at the tip (Figs. 2 and 3). All genitalia are preserved in glycerol and show close agreement with those of the type in the shape of the parameres, details of the sclerotized armature of the basal vesicle, and the bend of the ejaculatory duct.

The six female paratypes show considerably less variation in size and configuration of characters; the lengths (in mm.) of various parts of the smallest specimen ("Venodio") follow: body 8.6, head 1.6, pronotum 1.4, elytron 2.3, wing scale 1.2, forceps 2.2. The length of the eye of two agrees with the allotype in being longer than the cheeks, whereas in three it is shorter, and in the remaining specimen these measurements are equal. The number of antennal segments ranges from 13 to 16. Most of the paratypes vary but little in the shades of brown described above; however, the two females from



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Baja California are a dark, smoky brown over-all, nearly black on the head, and diminishing posteriorly to a dark chestnut brown on the forceps. The appendages and outer portions of the wing scales are a lighter smoky brown.

Nymphs: Three nymphs, presumably collected with one of the adult males, are included with the paratypes. These specimens are probably more than half-grown, for they range in length from 6.5 to 7 mm., and each bears moderately developed, fused wing pads. The antennae are 10- to 12-segmented. Each of the first six abdominal sterna bears two long setae, which are conspicuously arranged in contralateral rows, one-third of the width of the abdomen from each margin. (This pattern may exist in the adult stage but is not evident in any of our specimens.) The smooth forceps range from 1.8 to 2.2 mm. in length but show none of the specializations of either sex beyond the minute tubercles along the dorso- and ventro-internal margins. Figure 5 shows the configuration of the pygidium which suggests that all three may be females. Their coloration is similar to the holotype, except that the outer two-thirds of both pairs of wing pads are dark brown and the inner third is a lighter, yellow-brown.

Holotype: U.S.N.M. No. 65696

Type locality: Santa Catalina Mts. (2000-3000 ft.), Pima Co., Ariz.

The holotype male was collected by Andrew A. Nichol on August 15, 1924. In reply to a recent inquiry as to the exact locality, Dr. Nichol has recalled that it was in the lower parts of either Sabino Canyon (south slope of the range) or Cañada del Oro (north and west slopes), probably the former. The allotype (U.S.N.M.) was taken under lights on the bridge over the Salt River (dry), Tempe, Maricopa Co., Ariz., on July 18, 1947, by Floyd G. Werner.

Paratypes: U. S. National Museum (1 ♂, 1 ♀, 2 nymphs); Department of Entomology, College of Agriculture, University of Arizona,

EXPLANATION OF PLATE 6.

Figs. 1-8, *Vostox excavatus*, new species. 1. Forceps of female allotype, dorsal view. 2. Male pygidium (Tucson), dorsal view. 3. Male pygidium (Virden), dorsal view. 4. Pygidium of female allotype, ventral view. 5. Nymphal pygidium, ventral view. 6. Male forceps (Tucson), dorsal view. 7. Forceps and pygidium of male holotype, dorsal view. 8. Concealed genitalia of male holotype: Pm, paramere; Pn, penis; BV, basal vesicle; EjD, ejaculatory duct. Figs. 9-14, *Vostox brunneipennis* (Serv.). 9. Left penis and paramere (Gainesville, Fla.), dorsal view. 10. Male pygidium (Dallas, Tex.), dorsal view. 11. Male pygidium (Gainesville), dorsal view. 12. Female pygidium (Paris, Tex.), ventral view. 13. Female forceps (Mobile, Ala.), dorsal view. 14. Male forceps (Gainesville), dorsal view. Figs. 1-7, 10-14, x15; Figs. 8 and 9, x34. (Drawings by senior author).

Tucson (1♂, 2♀, 1 nymph); Arizona State University, Tempe (1♂); Museum of Comparative Zoology, Cambridge, Mass. (1♂, 1♀); California Academy of Sciences, San Francisco, Calif. (1♂); Academy of Natural Sciences of Philadelphia (1♀); British Museum (N. H.), London, England (1♀).

The paratypes are from the following localities:

NEW MEXICO: Virden, Hidalgo Co., one male, Aug. 27, 1958. light trap, G. L. Nielsen.

ARIZONA: Tempe, one male, Nov. 22, 1955, Jones; Tucson, Pima Co., one male and three nymphs, Dec. 4, 1924, C. T. Vorhies; one female, Nov. 7, 1939, Wayne Enloe; two females, Dec. 29, 1939, Tom Embleton; Sabino Canyon, Sta. Catalina Mts., Pima Co., one male, July 25, 1955, at light, G. D. Butler and F. G. Werner; 2 mi. sw. Patagonia (4050 ft., Sonoita Creek bottom, willow-cottonwood), Sta. Cruz Co., one male, Aug. 21, 1949, F. H. Parker.

MEXICO: SINALOA, "Venodio", one female, 1918, Kusché; BAJA CALIFORNIA, 25 mi. w. La Paz (ca. 500-foot plateau, relatively rich shrubby vegetation), one female, light trap, Aug. 30, 1959, K. W. Radford and F. G. Werner; 10 mi. sw. San José del Cabo (100 yd. from ocean in sandy wash, sparse shrubs), one female, light trap, Sept. 1, 1959, K. W. Radford and F. G. Werner. Aside from the few notes appended to the above localities, there is no information of any sort available on this apparently rare earwig.

Morgan Hebard (1923, and other papers) described many Orthoptera collected by J. A. Kusché in Sinaloa, at "Venvidio", which probably is our "Venodio." Workers have been unable to locate either locality since, and Irving J. Cantrall, of the University of Michigan, has written us of having prepared a manuscript dealing with the Kusché locality. Thanks to Dr. Cantrall's cooperation, we are able to report that Venadillo apparently is the correct name. This small town is 5 miles northeast of Mazatlán on Mexican Highway 15, which goes to Culiacan.

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