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New species of *Stenothorax* Schmidt from the northwestern
United States (Coleoptera: Scarabaeidae: Aphodiinae)

Paul E. Skelley
Florida State Collection of Arthropods
Florida Department of Agriculture and Consumer Services
P. O. Box 147100
Gainesville, FL 32614-7100 USA

Ron H. McPeak
Department of Entomology
San Diego Natural History Museum
P. O. Box 121390
San Diego, CA 92112-1390

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Paul E. Skelley and Ron H. McPeak
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New species of *Stenothorax* Schmidt from the northwestern United States (Coleoptera: Scarabaeidae: Aphodiinae)

Paul E. Skelley

Florida State Collection of Arthropods
Florida Department of Agriculture and Consumer Services
P. O. Box 147100
Gainesville, FL 32614-7100 USA
Paul.Skelley@FreshFromFlorida.com

Ron H. McPeak

Department of Entomology
San Diego Natural History Museum
P. O. Box 121390
San Diego, CA 92112-1390
ronmcpeak@comcast.net

Abstract. New insights into the genus *Stenothorax* Schmidt (Coleoptera: Scarabaeidae: Aphodiinae: Aphodiini) allowed for an influx of new materials from many new localities, and the realization that the genus needs revision. In this work, newly discovered characters used to distinguish species are defined. *Stenothorax lanei* (Saylor) is redescribed. Diagnosis and new distributional data are presented for *S. lanei*, *S. mcpeaki* Gordon and Skelley, *S. washtucna* (Robinson) and *S. woodleyi* Gordon. Seven **new species** are described from the northwestern United States: *S. lahontanensis*, *S. niviviator*, *S. odontomonteus*, *S. schneppi*, *S. smilodon*, *S. winnemucca*, and *S. wintoni*. All new species are illustrated and compared with presumed closest relatives.

Key words. Pacific Northwest, brachypterous, winter active, dunes, rodent burrows, Pleistocene, glacial lake flood

Introduction

Stenothorax Schmidt (Coleoptera: Scarabaeidae: Aphodiinae) is one of the largest and most diverse genera of North American Aphodiini. Their morphological diversity presents many problems to create a simple definitive generic description (Gordon and Skelley 2007). Yet, most members are readily distinguishable by their general facies and in being flightless.

For a decade after helping draft the species key in Gordon and Skelley (2007), PES attempted to identify newly acquired materials of the genus. Frustration occurred as many specimens could not be forced into existing species concepts. As can be expected, the key in Gordon and Skelley (2007) proved inadequate for newly discovered taxa. More detailed morphological studies discovered new characters (e.g. secondary row of setae on protibia) and the realization that some characters are problematic in diagnosing species and relationships (e.g. worn clypeal teeth, variable punctuation patterns). These character understandings along with improved ecological and geographical considerations gave us new insight into members of the genus.

Detailed studies of series (instead of single specimens) lead to a better understanding of age-related wear compared to phenotypic variation of populations, and the realization that some published locality data are based on misidentifications. At that point, we decided a full review of the genus was needed to present improved species concepts, starting from a study of types. All available specimens, both new and old, need to have their identity and locality data confirmed.

The purpose of this work is to review some species groups occurring in the northwestern US, present new concepts of species characters, variation and distributions, and to describe or redescribe species as needed while building toward a full generic review. This work provides names and data for researchers that will allow us to return borrowed materials in a timely manner.

Materials and Methods

Coverage. This work focuses on species in Oregon, Washington, Idaho, and northern Nevada, east of the Cascade and Sierra Nevada mountain ranges. Some northwestern species [*S. cribratulus* (Schmidt), *S. dilaticollis* (Saylor), *S. gravis* (Fall), *S. martini* (VanDyke), *S. micellus* Gordon and Skelley, *S. nevadensis* (Horn), *S. oriens* Gordon and Skelley, *S. sparsus* (LeConte)] are members of species groups that occur primarily outside of the area of interest. They are the subjects of future work.

Past identifications questioned. All reported data and identifications in publication by previous workers, except for primary type specimens, are considered questionable until confirmed. Data presented here have been confirmed by identifications based on our new concepts of the species. Each confirmed specimen, whether reported here or for species not yet treated, has an individual white determination label which states “det. P. Skelley’17”. Future identifications made for this research project will reflect the year the determinations are made, with specimens individually labeled.

Because of past confusion in the identification with many of these species, *Stenothorax lanei* (Saylor) is redescribed and other species have updated diagnoses to provide adequate information to avoid future misidentifications.

Variation, apparent or true. Past misidentifications are often based on specimens that varied from the perceived norm in some way. Reasons for these variations are the result of numerous factors that need some explanation:

Age-related wear. When studying *Stenothorax*, caution must be taken to recognize older, worn specimens. Clypeal marginal teeth and surface rugosities, setal fringes, protibial teeth, spurs, etc., can be reduced by age-related wear. Extreme wear (Fig. 1–2) on older specimens, while uncommon, is obviously wear. But, many specimens show wear that can be easily overlooked and characters wrongly interpreted. Subtle wear can change the apparent shape of protibial and clypeal teeth, or break off setal fringes, so a diagnostic character state may no longer be visible for the individual specimen. These age-related variations are not accounted for in the descriptions but are noted in the variation paragraph if some have been observed.

Teratologic variations. Some specimens have been found with deformities (Fig. 3). In most cases these are not bilaterally symmetrical and are otherwise distinctly unique. They are not considered further.

Gender variation. Sexual dimorphisms are present in several forms on different legs, including protibial spur shape, lower mesotibial spur shape, curvature of the medial protibial margin, and development of the medio-ventral row of setae on the protibia (female Fig. 18, 22; male Fig. 19, 23). Details of the dimorphism form and position are often shared within species complexes. These are covered in a separate paragraph in the descriptions.

Phenotypic variation. Some characters are truly variable within a population. Such characters include puncture patterns, and variations in body part ratios like pronotal or protibial width vs. length. These variations become evident when series from local populations are available for study. Some of the more notable variations are discussed within the species accounts.

Occasionally, an individual is discovered that is notably phenotypically different from other members of the populations. Examples of some observed phenotypic oddities include major variation in pronotal shape, punctation, and development of marginal groove and beads. In some cases, individual variation in a character state appear similar to a different species. The question is, are these individual expressions or individuals of an unrecognized population?

Unique specimens from isolated, under sampled areas, pose the largest dilemma in answering species limits and phylogenetic questions. In our approach, these individuals cannot be considered a different species until more materials are found expressing the character state(s) within a population with a definable geographical range. Species descriptions are based on holotypes, but the full species concepts are based on characters expressed within populations, not by individuals.

Species concept. We follow the evolutionary species concept where a species is a lineage distinguishable from others by definable sets of character states (Wheeler and Platnick 2000). Thus, species are based on series, not individuals. For these flightless species, they are morphologically distinct and appear geographically isolated from other similar species (presumed relatives). Other forms of data are taken into consideration when available.

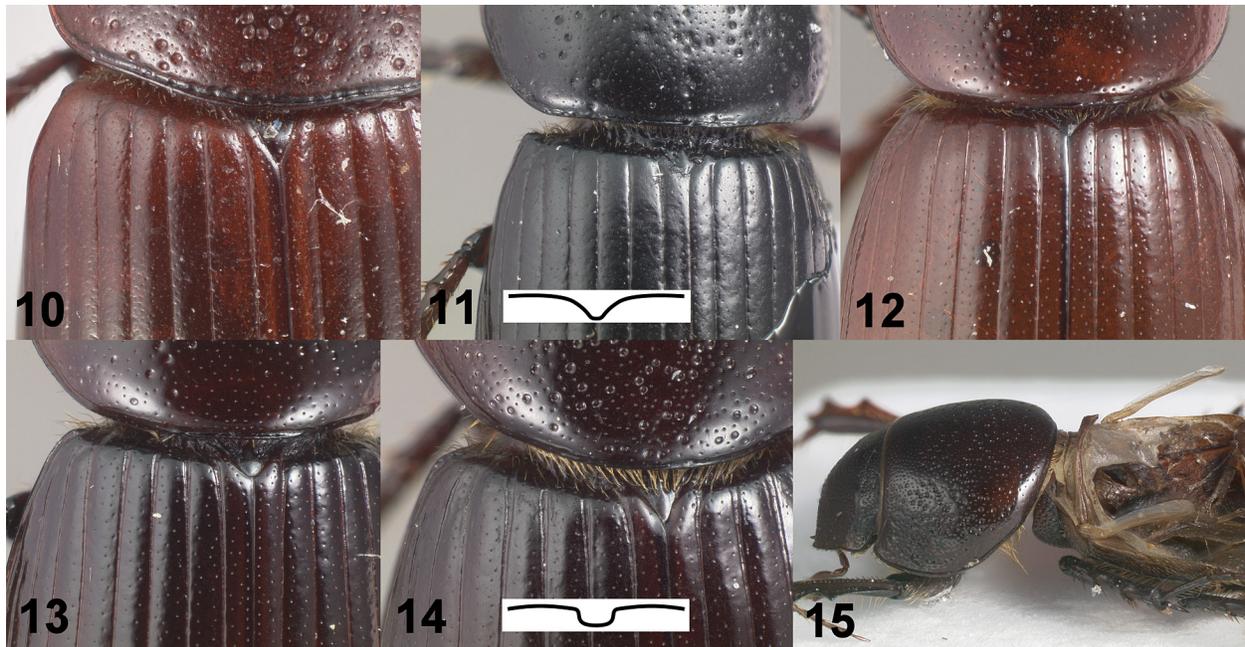


Figures 1–9. *Stenothorax* spp. characters. 1–2) Extreme age-related wear on *Stenothorax* spp.; note lack of clypeal teeth, smoothing and dulling of clypeal surface granulations, and reduction of protibiae. 1) *S. wintoni*. 2) *S. schneppi*. 3) Deformity on a *S. woodleyi*, note apparent tubercle is not centered on head. 4–9) *Stenothorax* species heads. 4) *S. nivivator*. 5) *S. odontomonteus*. 6) *S. nevadensis* (Nevada, Washoe Co., Washoe Lake). 7) *S. winnemucca*. 8) *S. lahontanensis*, narrow head. 9) *S. wintoni*, broad head.

Terminology. General terminology follows Gordon and Skelley (2007). Labral character terminology follows Dellacasa et al. (2010). However, some of our new character interpretations need explanation:

Clypeal teeth. Gordon and Skelley (2007) provide detailed definitions of different forms of clypeal teeth in the Aphodiini, from absent (Fig. 4) to spiniform. Most teeth character states relate to the acuteness of the apex. One pair of species discussed here differ primarily in the form of these teeth: *S. odontomonteus* Skelley and McPeak, n. sp., being broadly angulate, continuous with the clypeal margin (Fig. 5) vs. *S. nevadensis* which is distinctly angulate, separate from the clypeal margin (Fig. 6). In other species the teeth are truly spiniform (Fig. 7–9). Caution is necessary when trying to discern clypeal tooth characters as these teeth are easily worn down as specimens age.

Clypeus narrow vs. broad. This character is evident on some species, but in others it is hard to determine. Many species have a broad head, but the *nevadensis*, *comosus*, and *pyriformis* complexes, with a more cylindrical body have a narrower head. Narrowed vs. broad head is defined by comparing the distance between the most anterior part of the anterior clypeal margin (usually indicated by the



Figures 10–15. *Stenotothorax* spp. characters. **10–14)** *Stenotothorax* pronotal and elytral bases. **10)** *S. niviviator*, complete pronotal marginal bead, rounded strial margin. **11)** *S. odontomonteus*, reduced pronotal marginal bead, rounded strial margin (inset shows cross section of rounded margin). **12)** *S. lahontanensis*, pronotal marginal bead absent, sharply edged strial margin. **13)** *S. winnemucca*, pronotal marginal bead absent, sharply edged strial margin. **14)** *S. wintoni*, pronotal marginal bead absent, sharply edged strial margin, note striae also wider towards base (inset shows cross section of sharp edge). **15)** *S. wintoni*, fused elytra removed exposing strap-like hind wings.

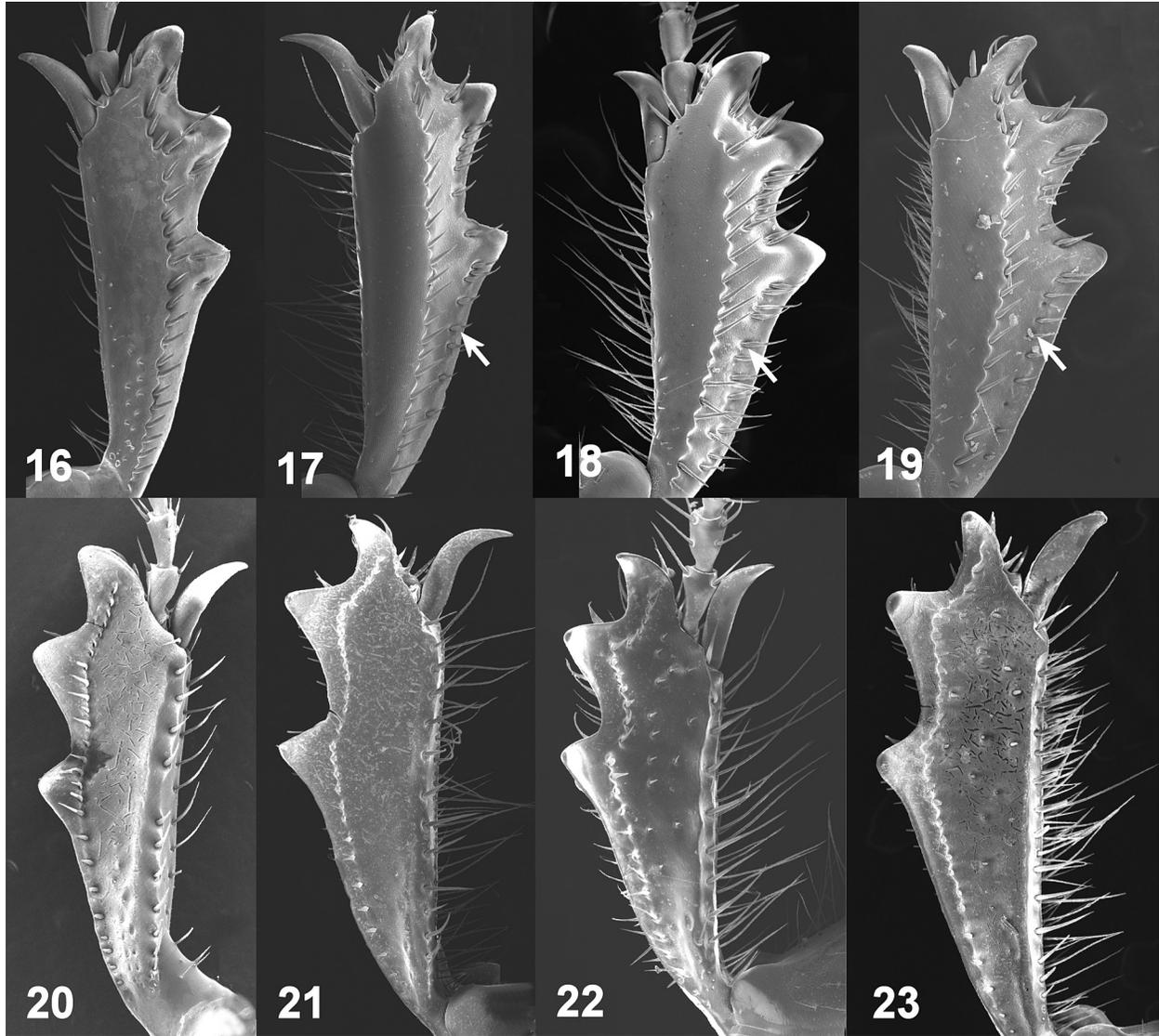
placement of the clypeal teeth, but there are exceptions) vs. the distance from that point to the frontoclypeal suture. A “narrow clypeus” (Fig. 7–8) has this distance between the anterior most points shorter than the distance to suture. A “broad clypeus” (Fig. 9) has this distance between the anterior most points more than the distance to suture.

Pronotal basal groove and bead. While overlooked by other workers, Saylor (1940) started his key with the character comparison “Base of thorax with a distinct and entire marginal line” (Fig. 10–11) vs. “Base of thorax without a marginal line, or if one is present at middle, it is entirely lacking near the hind angles” (Fig. 12–14). These character states appear to be of phylogenetic significance and are important in our species group concepts as discussed later in this work.

Elytra striae. Within the Aphodiini, there are numerous elytral characters used to distinguish taxa. In *Stenotothorax*, the size of the strial punctures and how they encroach upon the intervals has been used. When the punctures encroach upon the intervals, the interval edge becomes crenate. When this occurs, we state punctures crenate the sides of the intervals. We also see differences in the edge between the striae and the intervals, especially near the base and over the declivity, relating to the sharpness of this edge and widening of the stria. In many taxa the edge is a gradually rounded slope from the interval into the stria, which we refer to as striae with “sides rounded” (Fig. 10–11). In other species, the edge is abrupt and sharply defined, which we refer to as striae “sharply edged” (Fig. 12–14).

Wings. Most species of *Stenotothorax* are flightless with elytra fused. The hind wings are reduced and strap-like, that do not reach the middle of the elytral length (Fig. 15). All species discussed here are flightless, having vestigial hind wings and fused elytra.

Protibia dorsal setal rows. A general character of most beetles is to have a dorsal seta or cluster of setae on either side at the base of each protibial tooth (Fig. 16). Many species of *Stenotothorax* have this cluster expanded into a row of setae connecting these clusters and extending basally. Thus, they have two rows of dorsal setae proximal of the basal tooth (Fig. 17–19). This secondary row of setae does not occur on any other aphodiine genus in the New World, nor on any other aphodiine that we have studied



Figures 16–23. *Stenothorax* protibiae dorsal (top) and ventral (bottom) surfaces. Note abrasions on ventral surfaces. **16, 20)** *S. ovipennis*, lacking secondary dorsal row of setae. **17, 21)** *S. wintoni*, with secondary dorsal row of setae proximal of basal tooth. **18, 22)** *S. comosus*, with coarse setose punctures on ventral surface, female with sparse setae on medial margin. **19, 23)** *S. winnemucca*, with coarse setose punctures on ventral surface, male with denser setae on medial margin. Arrow points to secondary row of setae.

worldwide. This character appears to be an autapomorphy for many species in the genus. Here we use the phrase the “protibia with a secondary row of setae” to describe this character state.

Protibia ventral surface. The ventral protibial face is concave and primarily smooth, with rows of setae that roughly follow the contours of the respective margins. The surface between these rows often has coarse punctures basally, otherwise it is completely smooth (Fig. 20–21). Two species (*S. comosus* Gordon and Skelley and *S. winnemucca* Skelley and McPeak, n. sp.) are exceptions in having several coarse punctures scattered across the surface (Fig. 22–23, 29). While highly variable in number and position, coarse punctures are always present on the protibial venter of these two species, while rarely a few are present in other species. Here we use the phrase the “ventral protibial surface is punctate” to describe this character.

Distribution. With a clearer understanding of the species' diagnostic character states, we find that most species occupy a definable geographical range. Their distribution may relate to prehistoric event(s), soil type, habitat type, or other potential factors that act as isolating mechanisms. For these flightless taxa, we consider regional geology and prehistory to help delimit a species.

Interestingly, we only find one or two flightless species at any given locality. In all cases, they are distinct morphologically, possibly expressing character displacement, and we hypothesize they occupy different niches. Thus, knowledge of a species distribution is of great value in future identifications, especially for worn or damaged specimens.

Descriptions. Unless noted, descriptions are based on male holotypes. Type series for the new species include all available specimens, unless otherwise noted. Verbatim label data are presented for holotypes only. Paratype data and data for previously described species may be abbreviated or annotated for consistency and accuracy of data presentation. When the locality presented on labels are the same for multiple collecting events, we use "same locality" to reflect this and keep the presentation clear.

Species key. No key is presented as there are other new species under consideration outside the present area of interest. All of these new species, and the new characters used to distinguish them, will greatly alter existing keys and make any key presented here premature. A key to all species is under construction and will be presented in the full generic review.

Types. Types or paratypes from the type locality of all previously described species and synonyms of *Stenothorax* have been studied. They were made available either through institutional loans or with photographs kindly provided by curators overseeing their care.

Materials studied. Specimens are deposited in the following collections:

BYU	Brigham Young University, Monte L. Bean Life Science Museum, Provo, UT, USA [S. Clark]
CASC	California Academy of Sciences, San Francisco, CA, USA [J. Schweikert]
CMNC	Canadian Museum of Nature, Ottawa, Canada [F. Genier, A. Smith]
CNCI	Canadian National Collection of Insects, Ottawa, Canada [P. Bouchard]
CSCA	California State Collection of Arthropods, Sacramento, CA, USA [A. Cline]
DCC	Dave Carlson collection, Fair Oaks, CA, USA
DCGC	G. Dellacasa and M. Dellacasa collection, Genoa, Italy
EMEC	Essig Museum of Entomology, University of California, Berkeley, CA, USA [R. Brett, P. Oboyski]
FSCA	Florida State Collection of Arthropods, Gainesville, FL, USA
GSPC	Gareth S. Powell collection, Brigham Young University, Provo, UT, USA
KESC	Kyle E. Schnepf collection, Gainesville FL, USA
LACM	Los Angeles County Museum, Los Angeles, CA, USA [W. Xie]
MJPC	M. J. Paulsen collection, Lincoln, NE, USA
NHML	Natural History Museum, London, UK [M. Barclay, B. Garner]
ODA	Oregon Department of Agriculture, Salem OR, USA [J. LeBonte]
OJSM	Ora J. Smith Museum of Natural History, Caldwell, ID, USA [B. Clark]
RCWC	Ross C. Winton collection, Jerome, ID, USA
RMPC	R. H. McPeak collection, Vancouver, WA, USA
SEMC	Snow Entomological Museum, University of Kansas, Lawrence, KS, USA [Z. Falin]
UCDC	R. M. Bohart Museum of Entomology, University of California, Davis, CA, USA [L. Kinsey, S. Hayden]
UNSM	University of Nebraska State Museum, Lincoln, NE, USA [M. Paulsen]
USNM	National Museum of Natural History, Smithsonian Institution, Washington, DC, USA [Floyd Shockley]
WBWC	William B. Warner collection, Chandler, AZ, USA
WFBM	W. F. Barr Museum, University of Idaho, Moscow, ID, USA [L. Leblanc]
WSU	Washington State University, Pullman, WA, USA [R. Zack]

Processes and equipment. Dissections were made from fresh materials or specimens relaxed with detergent water. Genitalia and epipharynx are glued on the paper point with the specimen or under it on the same pin. Photos of specimens were taken with a Syncroscopy Automontage system and scanning

electron photographs were taken with a JEOL JSM-5510LV at the FSCA. Measurements were taken with an ocular micrometer on a Leica MS5 dissecting microscope. Specimens were studied under the same microscope, and on various other dissecting microscopes available at the museum or private collector's home at the time of study.

Results

Discovery of new characters gave insights into potential relationships that will allow us to draft a pragmatic framework in the full generic review (in preparation). Here we use the term 'group' for potentially related species share defined morphological character states that are restricted to a major geographical region. While the term 'complex' is used for very similar species that may hold additional cryptic species in isolated habitats within a region. We use these informal terms because any formal genus-level naming is extremely premature and would only confuse future research. However, to adequately place the new species within the genus, we must define two of these groups: 1) The Columbia and Snake River group; 2) The Great Basin group.

Snake and Columbia River Species Group

East of the Cascade Range there is a group of *Stenotothorax* centered around the Snake and Columbia River drainages. The species included are *S. lanei* (Saylor), *S. mcpeakii* Gordon and Skelley, *S. niviviator* Skelley and McPeak, n. sp., *S. smilodon* Skelley and McPeak, n. sp., *S. washtucna* (Robinson), *S. wintoni* Skelley and McPeak, n. sp., and *S. woodleyi* Gordon. Their distribution and evolution may be a result of isolation with the substrates formed and reformed prehistorically by the Lake Bonneville and Pleistocene glacial lake outburst floods (e.g. Missoula Floods; Alt and Hundman 1995; Allen et al. 2009; Grayson 2011; Oviatt and Schroder 2016) and possible backwash flooding up tributaries. For now, we feel our survey efforts have been sufficient to understand the species of *Stenotothorax* occurring in eastern Washington, eastern Oregon, and southwestern Idaho.

Stenotothorax lanei (Saylor)

Figure 24

Aphodius lanei Saylor 1940: 103 ~ Hatch 1971: 448.

Aphodius (Stenotothorax) lanei Saylor ~ Dellacasa 1988: 397.

Stenotothorax lanei (Saylor) ~ Gordon and Skelley 2007: 204–206.

Aphodius caseyi Saylor 1940: 104 ~ Hatch 1971: 447; Gordon and Skelley 2007: 204–206 (syn.).

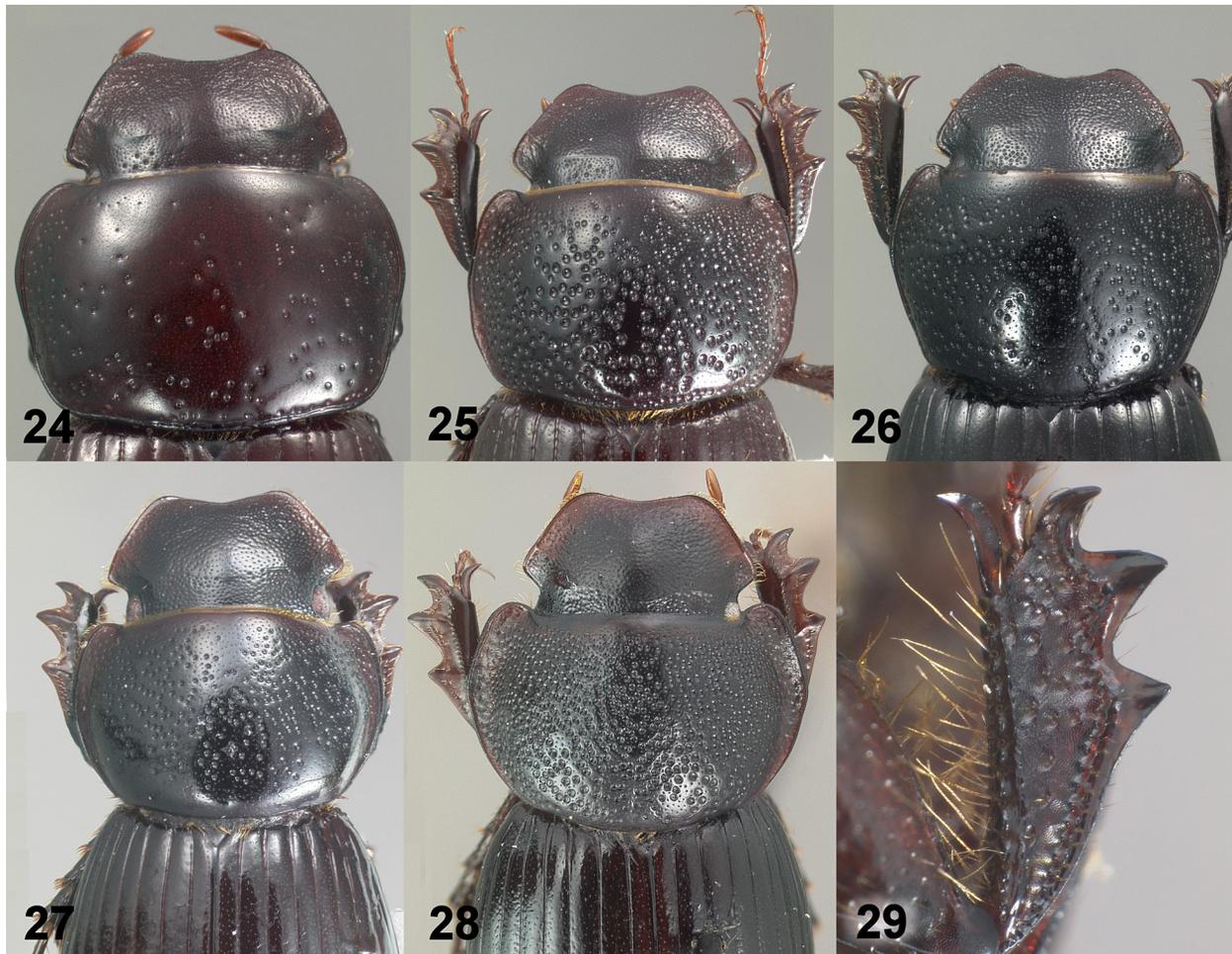
Aphodius (Stenotothorax) caseyi Saylor ~ Dellacasa 1988: 397.

Aphodius pullmani Saylor 1940: 104 ~ Hatch 1971: 477; Gordon and Skelley 2007: 204–206 (syn.).

Aphodius (Stenotothorax) pullmani Saylor ~ Dellacasa 1988: 397.

Diagnosis. *Stenotothorax lanei* is distinguished from other members of the genus by the following combination of characters: protibia with secondary setal row, pronotum broad but not laterally explanate, pronotal basal line and bead distinct across width, pronotal lateral marginal bead distinctly thickened anteriorly, elytral humerus rounded to weakly angulate not dentate, and dorsally with fine indistinct punctation on a glossy surface. *Stenotothorax lanei* appears to be restricted to Blue Mountain area of northeastern Oregon, southeastern Washington, crossing into western Idaho near Moscow.

Redescription. Length 8.6–11.2 mm, width 3.7–5.0 mm. Body elongate, color dark red-brown, glossy. **Head** with clypeus broad, distance anterior most point of clypeal margin greater than distance from apex to frontoclypeal suture. Clypeus anterior margin distinctly emarginated at middle, rounded on either side; setal fringe absent; surface rugosely wrinkled or weakly granulate anteriorly, becoming smooth along frontoclypeal suture; entire surface from clypeus to vertex with distinct evenly distributed fine punctures; vertex with few widely scattered coarse punctures each side of middle; frontal lobe projecting, weakly angulate. **Epipharynx** with apical margin sinuate, tylus projecting; chaetopodia few and stout; epitorma narrowed (fig. 381 in Gordon and Skelley 2007). **Pronotum** broad, transversely



Figures 24–29. *Stenotothorax* species, head and pronotum. 24) *S. lanei*. 25) *S. mcpeaki*. 26) *S. washtucna*. 27) *S. woodleyi*, typical pronotum. 28) *S. woodleyi*, from Rufus, OR. 29) *S. winnemucca*, ventral protibia, female paratype from type locality.

rectangular in dorsal view, widest at middle, glossy; with evenly distributed indistinct fine punctures; coarse punctures widely scattered, diameter = width of basal marginal groove, about 10 x larger than fine punctures, not denser laterally, occasionally absent along anterior medial surface; surface near anterior angles not explanate; lateral margins evenly arcuate anteriorly, becoming broadly rounded posteriorly, lacking setal fringe; posterior angle rounded, weakly evident; lateral marginal bead notably thickened on anterior half; basal groove broad and bead distinct, not reduced, present on either side of middle when viewed dorsally, continuous with lateral groove and bead. **Scutellum** triangular, coarsely punctate basally, lacking punctures apically. **Elytra** fused, elongate; each humerus rounded, humeral denticle lacking; sides evenly arcuate to weakly pointed apex; elytral punctation obscure, surface glossy; striae all similar in development, fine; sides smoothly rounded, striae not more distinct nor wider basally, slightly wider and deeper over posterior declivity; striae I–VI reaching base; strial punctures fine but distinct and weakly crenating sides; intervals weakly convex, all similarly developed; epipleural fold setose at extreme base only. **Appendages** with hind wing vestigial, strap-like. Profemur densely coarsely punctate on ventral surface. Protibia elongate, primary dorsal setal row situated along midline; with a secondary row of setae; lateral teeth with basal most tooth situated at mid-tibial length; protibial spur evenly curved inwardly; protibia lacking ventral projections at medial apex beneath spur and ventrally along basal median margin; lacking coarse punctations on ventral surface. Meso- and metafemur finely punctate on ventral surface, coarse punctures few, less distinct than profemur. Meso- and metatibia

gradually widening before abruptly dilated apex. Meso- and metatibial spurs narrowed, saber-like; lower mesotibial spur sexually dimorphic. Meso- and metatarsomere I length = length of corresponding upper spur. **Venter** with metasternum short; densely coarsely punctate laterally, sparsely finely punctate medially. Abdomen with basal sternite coarsely punctate, setose and rugose across surface; medial and apical sternites punctate as basal sternite laterally, glossy and impunctate medially. **Male genitalia** with parameres longer than basal piece, weakly curved lateral view, apex dorsoventrally flattened and rounded (fig. 392 in Gordon and Skelley 2007).

Sexual dimorphism. Male protibial spur bent more abruptly inward in apical 1/3; female more evenly curved from middle. Lower mesotibial spur of male stout, short, 1/3 length of upper spur, bent inward at apex; female lower mesotibial spur unmodified, 1/2 length of upper spur.

Variation. Some specimens of *S. lanei* show striking amounts of wear on various body parts. The potential for character reductions need to be realized when observing worn specimens. Examples of this wear includes near loss of protibial teeth, near loss of clypeal rugosity (type of *A. pullmani*), and even dulling of the surface. Variation in punctation and other characters led to Saylor placing his species in different sections of his key. The truncation of the apical protibial tooth (type of *A. caseyi*), is partially sexually dimorphic, but not entirely, and is the most readily worn structure. Thus, this is not a good character to use in species recognition. Most specimens studied have a similar number of coarse pronotal punctures, but some have notably less or more.

The holotype of *S. lanei* and one other from Whitman Co., Washington, are the only specimens studied that have greatly reduced basal pronotal line. Both are the only specimens known from each locality. However, available specimens from areas surrounding these localities all possess a distinct basal line of varying degrees of development. All other diagnostic characters are shared with other specimens.

Type material. Of *A. lanei*, Washington, Blue Mts., Godman Spr., 6000' (USNM, examined); of *A. caseyi*, Oregon (USNM, examined); of *A. pullmani*, Washington, Pullman (USNM, examined).

Materials studied. ($n = 63$) Collection data for materials confirmed to be *S. lanei* are: **IDAHO: Latah Co.:** Moscow, 2560 ft, 2-IV-1932, T.A. Brindley [1 WFBM]; same locality, 8-IV-1936, R.E. Miller [1 USNM]; same locality, 17-V-1955, F.T. Cook [1 WFBM]; same locality, 17-XII-1960, W.F. Barr [1 CMNC, 1 WFBM]; same locality, 17-XII-1960, Phyllis Strecker, R.E. Strecker [2 CNCI, 1 WFBM]; same locality, 10-V-1996, R. Sprague [1 WFBM].

OREGON: [1 USNM *A. caseyi* type]; **Baker Co.:** Lookout Mountain, 44°32.399'N, 117°16.845'W, 5218 ft, 30-IX-2014 to 22-II-2015, R.H. McPeak [1 FSCA]; **Umatilla Co.:** Battle Mountain Summit, Hwy.395, 45°16.225'N, 118°58.643'W, 4270 ft, 1-X-2014 to 21-II-2015, R.H. McPeak [1 FSCA]; same locality, 9-XI-2015, P. Skelley, K. Schnepf, R.H. McPeak, K. Arguez [1 DCGC, 4 FSCA, 1 KESC, 1 NHML]; Exit 228 on I-84, Deadman Pass Rest Area, 45°35'54"N, 118°30'17"W, 3600 ft, 21-XI-2014, P. Skelley, K. Schnepf [2 FSCA]; Fly Creek Valley, SE Umatilla Co., 15-XI-1961, Joe Schuh [1 FSCA]; Toll Gate Rd., Blue Mts, 7-VI-1938 [1 CASC]; W of Tollgate; MP 16/17 on Hwy 204, 45°47.466'N, 118°07.793'W, 4631 ft, 22-VIII-2014 to 1-III-2015, R.H. McPeak [1 FSCA]; **Union Co.:** Johnson Rock USFWS Lookout, 15 mi. W, 14 mi. S La Grande, 5700 ft, 11-VII-1977, A.K. Johnson [1 EMEC]; Off Spring Creek Rd. near Hwy 84, 45°22.207'N, 118°18.015'W, 3498 ft, 8-X-2013 to 21-VI-2014, R. H. McPeak [3 RMPC]; Wallowa-Whitman Nat. For. off Spring Creek Rd. [NW. LaGrande], 45°22.207'N, 118°18.015'W, 3498 ft, 30-IX-2014 to 13-XI-2014, R.H. McPeak [2 FSCA]; same locality, 30-IX-2014 to 21-II-2015, R.H. McPeak [1 FSCA]; **Wallowa Co.:** 22 km. W. Troy, Long Meadows, 1230 m, 15-VIII-1955, J.F. O'Brien [1 UCDC]; Enterprise area; along Ant Flat Rd., 45°31.071'N, 117°15.540'W, 4127 ft, 23-VIII-2014 to 13-IV-2015, R.H. McPeak [1 FSCA, 1 RMPC]; Enterprise, north of, on Hwy 3, 45°40.054'N, 117°16.527'W, 4825 ft, 23-VIII-2014 to 13-IV-2015, R.H. McPeak [1 FSCA, 2 RMPC].

WASHINGTON: Columbia Co.: Blue Mts., Godman Springs, 6000 ft, 7-VII-1929, M.C. Lane [1 USNM *A. lanei* type]; **Spokane Co.:** Spangle, area, Jct. Jennings Rd & Parker Rd., 47°26'03.70"N, 117°26'07.19"W, 2377 ft, 24-VIII-2014 to 27-III-2015, R.H. McPeak [1 FSCA]; **Walla Walla Co.:** 15-X-1946, F. Terukina [1 WSU]; College Place, 14-XI-[?], Curtis Perkins [1 WSU]; same locality, 14-X-1946, Barnell Bundy [1 FSCA]; same locality, 8-XI-1946, G.H. Nelson [1 USNM]; same locality, 30-IX-1947, N. Britton [1 USNM]; same locality, 22-X-1947, C.A. Riggins [1 USNM]; same locality, 1-XI-1947, LaJean Akins [1 FSCA]; same locality, 1-XI-1947, H. Bennett [1 USNM]; same locality, 6-XI-1947, Earle Lanthrop [1

WBWC]; same locality, 12-V-1948, W. Masterjohn [1 USNM]; Walla Walla, X-1946, J. Grozensky [1 USNM]; **Whitman Co.:** Pullman, 28-XI-1898, C.V. Piper [1 USNM *A. pullmani* type]; same locality, 15-IV-1930, N.M. Downie [1 FMNH]; same locality, 3-IV-1931, N.M. Downie [3 FMNH]; same locality, 3-IV-1961, N.M. Downie [2 CMNC]; same locality, 27-X-1962, R.W. Dawson [1 FSCA]; same locality, 20-XI-1962, R.W. Dawson [1 FSCA]; same locality, 10-XII-1962, R.W. Dawson [1 FSCA]; same locality, 16-XII-1970 [1 FSCA]; 12.8 mi. SW Pullman, Lyle Grove Biol. Area, 28-29-IV-1995, C.N. Looney [1 WFBM]; Rose Creek, 4 mi. N. Albion, 26-IV-1997, R. Rood [1 RMPC].

Observed habits. Specimens have been collected in barrier pitfall traps, walking on snow, under log, and feeding on deer dung and carrion.

Remarks. *Stenothorax lanei* is the largest member of the genus, and can occur along with *S. nivivator* n. sp., *S. washtucna* (Robinson), and *S. micellus* Gordon and Skelley; some of which have been misidentified in the past. However, *S. lanei* is distinguished by the thickened lateral pronotal bead, *S. nivivator* by the dull surface, *S. washtucna* by the reduced basal pronotal bead, and *S. micellus* by its smaller size and lack of the secondary protibial setal row.

Stenothorax mcpeaki Gordon and Skelley

Figure 25

Stenothorax mcpeaki Gordon and Skelley 2007: 207–208.

Diagnosis. *Stenothorax mcpeaki* is distinguished from other species in the region by the clypeus lacking teeth and setal fringe, the complete basal pronotal marginal line, and the explanate pronotum. *Stenothorax mcpeaki* appears to be restricted to sites near the Columbia River along the Oregon and Washington border, east of the Cascade Mountains. Gordon and Skelley (2007) did not have a male present for the original description. We take this opportunity to describe male characters from topotypic specimens.

Male. Male genitalia with parameres shorter than basal piece, abruptly curved and acutely pointed apically in lateral view (similar to *S. smilodon*, as in Fig. 41). Sexual dimorphism evident in male with short stout lower mesotibial spur, length about 1/3 length of upper spur, with inward apical hook. Male protibia narrower than female.

Type material. Oregon, Wasco Co., 6 mi. E. of The Dalles (USNM, examined).

Materials studied. ($n = 142$) Collection data for materials confirmed to be *S. mcpeaki* are: **OREGON:** **Gillam Co.:** John Day River & Rock Creek, 0.5 mi. S. of McDonald, 45°34.858'N, 120°24.378'W, 384 ft, 10-XI-2015, P.E. Skelley, K.E. Schnepf, R.H. McPeak, K. Arguez [2 FSCA, 6 KESC]; Rock Creek & John Day River, 45°34.858'N, 120°24.378'W, 384 ft, 10-XI-2015 to 1-IV-2016, R.H. McPeak [4 FSCA, 3 RMPC]; **Wasco Co.:** 5.2 mi. E. of The Dalles on I-84, 4-XII-2008 to 22-I-2009, R.H. McPeak, [1 RMPC]; same locality, 22-I to 25-IV-2009, R.H. McPeak [3 RMPC]; 6 mi. E. of The Dalles, 45°38.847'N, 121°02.454'W, 11-22-III-2005, R.H. McPeak [1 FSCA; 2 RMPC]; same locality, 14-30-XI-2007, R.H. McPeak [2 FSCA]; 6 mi. E. of The Dalles eastbound I-84, 45°38.846'N, 121°02.458'W, 7-X-17-XII-2007, R.H. McPeak [1 ODA, 5 RMPC, 2 WBWC]; same locality, 30-XI-2007 to 19-I-2008, R.H. McPeak [1 ODA, 20 RMPC]; same locality, 19-I-2008 to 12-IV-2008, R.H. McPeak [1 RMPC]; same locality, 23-X-19-XI-2011, R. McPeak [5 FSCA]; same locality, 20-XI-19-XII-2011, P. Skelley, R.H. McPeak [3 CMNC, 2 DCGC, 18 FSCA, 2 NHML, 1 RMPC, 2 WBWC, 2 WSU]; same locality, 19-XII-2011 to 30-I-2012, R.H. McPeak [10 RMPC]; 6.3 mi. N. Dufur on Hwy 197, 29-IX-2008, R.H. McPeak [1 RMPC]; mouth of Deschutes R. at Columbia R., 45°37.757'N, 120°54.822'W, 24-XI-2013 to 10-I-2014, R.H. McPeak [1 RMPC]; Rufus, 45°41.444'N, 120°44.409'W, 235 ft, 23-IX-2013 to 10-I-2014, R.H. McPeak [3 FSCA, 1 RMPC]; same locality, 10-I-2014 to 14-XI-2014, R.H. McPeak [1 RMPC]; The Dalles, nr. Discovery Center, 45°38.912'N, 121°12.699'W, 170 ft, 30-XI-2013 to 10-I-2014, R.H. McPeak [2 RMPC]; same locality, 10-I-21-II-2014, R.H. McPeak [1 FSCA]; Tygh Valley, 45°15.404'N, 121°10.529'W, 1196 ft, 8-XI-2013, R.H. McPeak [3 RMPC]; same locality, 5-IX-2013 to 10-I-2014, R.H. McPeak [10 FSCA, 13 RMPC]; same locality, 10-I-2014 to 21-XI-2014, R.H. McPeak [3 RMPC]; same locality, 11-XI-2014, K.E. Schnepf [1 KESC].

Washington: Klickitat Co.: Avery Park; 1.5 mi. E, 45°39.561'N, 121°00.522'W, 200 ft, 20-XI-2011

to 30-I-2012, R.H. McPeak [1 FSCA]; Dallesport; 100 m east of Hwy 197, 45°37.604'N, 121°08.825'W, 200 ft, 23-XI-2013 to 10-I-2014, R.H. McPeak [1 FSCA]; Dallesport; dunes to NW, 45°38.182'N, 121°11.376'W, 145 ft, 30-XI-2013 to 21-II-2014, R.H. McPeak [1 RMPC].

Observed habits. Specimens have been collected in barrier pitfall traps in grasslands with many pocket gopher and ground squirrel nests, in sandy areas with sage brush, in *Thomomys* Wied-Neuwied burrows, from backfilled *Thomomys* burrows, in ground squirrel burrows, under fresh slimy deer bone, coyote scat, and in sand under dune shrubs.

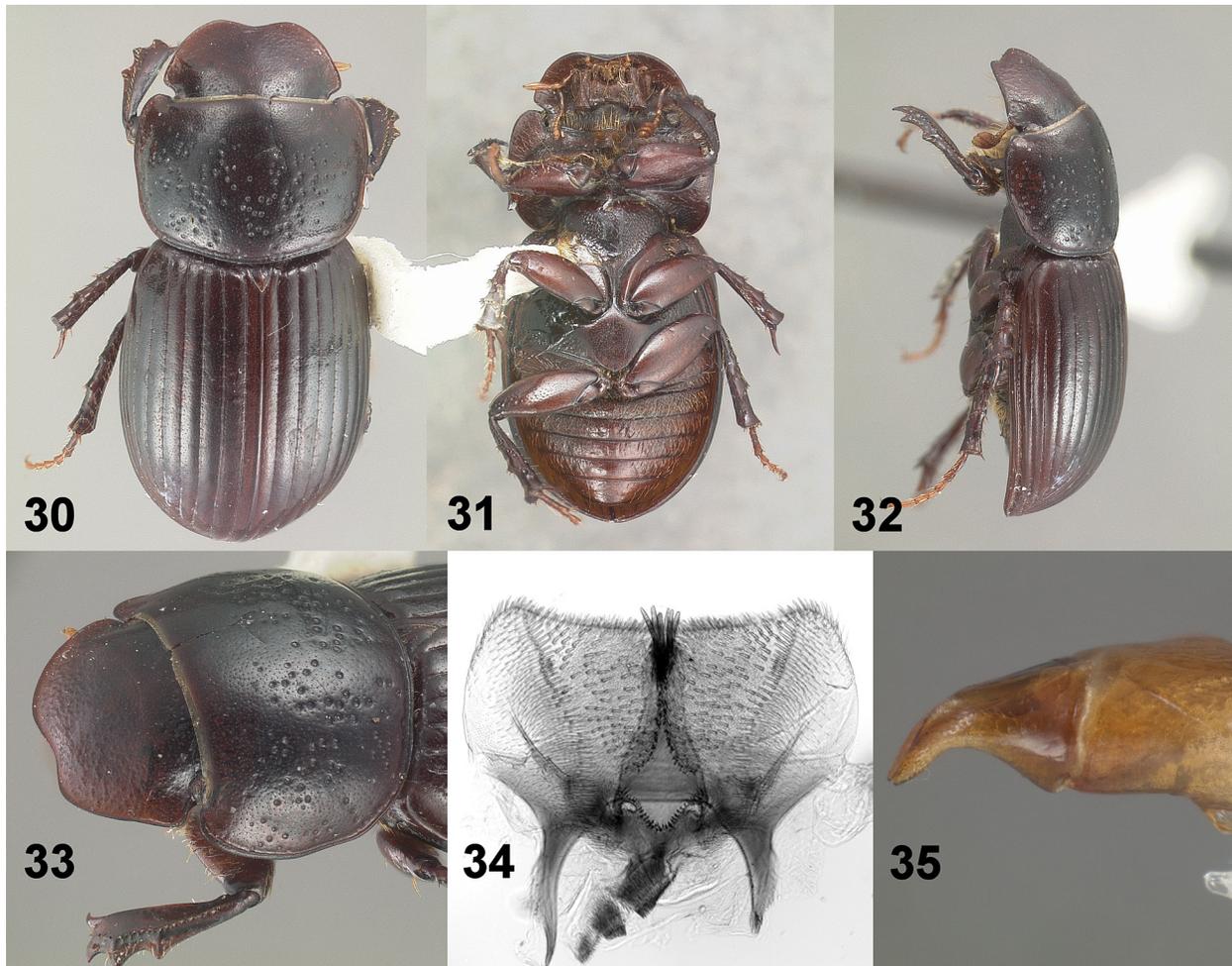
Remarks. *Stenothorax mcpeaki* is most similar to *S. smilodon*, see remarks under that species.

Stenothorax nivivator Skelley and McPeak, new species

Figures 4, 10, 30–35

Diagnosis. *Stenothorax nivivator* is distinguished from other members of the genus by the following combination of characters: protibia with secondary setal row, pronotum broad but not laterally explanate, pronotal basal line and bead distinct across width, pronotal lateral marginal bead weakly thickened anteriorly, elytral humerus rounded to weakly angulate not dentate, and dorsally with fine distinct punctation dense enough to make surface appear dull. *Stenothorax nivivator* appears to be restricted to mountainous areas of west central Idaho.

Description. Holotype male length 7.8 mm, width 3.4 mm. Body elongate, color dark red-brown, dull. **Head** with clypeus broad, distance between anterior most point of clypeal margin equal to distance from apex to frontoclypeal suture; clypeus with anterior margin distinctly emarginated at middle, rounded on either side, setal fringe absent; surface moderately rugose or weakly granulate anteriorly, becoming smooth along frontoclypeal suture; entire surface from clypeus to vertex with distinct evenly distributed fine punctures; vertex with few widely scattered coarse punctures each side of middle; frontal lobe projecting, weakly angulate. **Epipharynx** with apical margin; nearly straight, gently concave entire length, tylus not projecting; chaetopodia numerous and fine; epitorma narrowed (Fig. 34). **Pronotum** broad, transversely rectangular in dorsal view, widest at middle, dull; with distinct evenly distributed fine punctures; coarse punctures widely scattered, diameter = width of basal marginal groove, about 10 x larger than fine punctures, not denser laterally, lacking along anterior medial surface; anterior margins weakly explanate; lateral margins evenly arcuate anteriorly, becoming broadly rounded posteriorly, posterior angle indistinct, marginal bead weakly thickened anteriorly, lacking setal fringe; basal groove broad and bead distinct, not reduced, present on either side of middle when viewed dorsally, continuous with lateral groove and bead. **Scutellum** triangular, coarsely punctate basally, lacking punctures apically. **Elytra** fused, elongate; each humerus rounded, denticle weak and obtuse, sides evenly arcuate to parabolically rounded apex; striae all similar, distinct but fine, not more distinct or wider basally, slightly wider and deeper over declivity; striae I–VI reaching base, sides smoothly rounded; strial punctures fine and indistinct, strial sides not crenated; interval punctation distinct, fine, not arranged in rows, surface dull, weakly convex, all intervals similarly developed; epipleural fold setose at extreme base only. **Appendages** with hind wing vestigial, strap-like. Profemur densely coarsely punctate on ventral surface. Protibia elongate, primary dorsal setal row situated along midline of surface; with a secondary row of setae; protibial lateral teeth with basal most tooth situated just anterior of mid-tibial length; protibial spur evenly curved inwardly; protibia lacking ventral projections at medial apex beneath spur and ventrally along basal median margin. Meso- and metafemur finely punctate on ventral surface, few coarse punctures less distinct than profemur. Meso- and metatibia gradually widening before abruptly dilated apex. Meso- and metatibial spurs narrowed, saber-like; lower mesotibial spur narrow, blunt, apically inwardly hooded, 1/3–1/2 length of upper mesotibial spur. Meso- and metatarsomere I length = length of corresponding upper spur. **Venter** with metasternum short; densely coarsely punctate laterally, sparsely finely punctate medially. Abdomen with basal sternite coarsely punctate, setose and rugose across surface; medial sternites punctate as basal sternite laterally, glossy and impunctate medially; apical sternites entirely impunctate and glossy. **Male genitalia** with parameres shorter than basal piece; curved ventrally at apical third to acutely pointed apex in lateral view (Fig. 35).



Figures 30–35. *Stenothorax niviviator*, n. sp. **30)** Dorsal habitus. **31)** Ventral habitus. **32)** Lateral habitus. **33)** Oblique anterior view head to elytral base. **34)** Epipharynx. **35)** Male genitalia, lateral view.

Sexual dimorphism. Female lower mesotibial spur unmodified, 1/2 length of upper spur.

Variation. Length 6.4–8.85 mm, width 2.9–3.8 mm. As with all species, some specimens show a large amount of wear on the tibia and clypeal margin. Other notable variation is in the number of coarse pronotal punctures, one specimen having roughly half as many as the most punctate specimen. Laterally the pronotal margin can be evenly arcuate to weakly angulate medially. The pronotal marginal bead is weakly thickened anteriorly in most specimens. In some, the marginal bead does not appear thickened anteriorly.

Type material. Holotype male: “/ 7 mi. N. Deary, IDAHO, Latah Co., XII-29-1966 / D. A. Barstow Collector / L. S. Hawkins, Jr. Collector / *Stenothorax lanei* (Saylor) det. P. E. Skelley 2007 / **HOLOTYPE** *Stenothorax niviviator* Skelley&McPeak!”. Property WFBM, deposited in FSCA.

Allotype and paratypes ($n = 28$): **IDAHO: Benewah Co.:** Crystal Cr., 22-XII-1963, [2 WFBM]; [labeled as Lanah Co.] Flat Creek, 15-XI-1952, W.F. Barr [1 USNM]; **Clearwater Co.:** 5 mi. E. Bovill on Roger’s Cr. Rd., 22-I-2005, P. Barrett, F. & J. Merickel [1 RMPC, 3 WFBM]; Bovill, 21-I-2005, S.S. Gesdorf [1 WBWC]; Musselshell R. S., 6-XII-1965, E.J. Allen [1 WFBM]; **Idaho Co.:** Mud Creek Jct., 25-XI-1978, R.C. Biggam [1 RMPC, 3 WFBM]; **Lanah Co.:** 3 mi. E. Robinson L., 8-I-1967, W.F. Barr [1 WFBM]; 3.5 mi. E. Bovill, 11-XII-1978, R.C. Biggam [4 WFBM]; 5.5 mi. E. Bovill, 11-XII-1978, R.C. Biggam [4 WFBM, 1 RMPC]; same data as holotype [allotype female and 1 FSCA]; Robinson L., 22-III-1978, W.M.

Hanks [1 WFBM]; Strychnine Cr., 2 mi. N Laird Park, 12-XII-1954, K.D. Hallett [1 WFBM]; 5 mi. N. Moscow, 11-XII-1968, P. Schroeder [1 RMPC].

Observed habits. All specimens appear to have been hand collected, walking on snow in early winter.

Remarks. *Stenothorax nivivator* is a cryptic species that will key to *S. lanei* in Gordon and Skelley (2007). *Stenothorax lanei* differs most notably in having a distinctly anteriorly thickened lateral pronotal marginal bead, distinct strial punctures, fine dorsal punctation, dorsal surface glossy, and male genitalia having parameres more elongate and only weakly curved. Other body and genitalic characters indicate a closer relationship with *S. mcpeaki* and *S. smilodon*, which differ in having a more explanate pronotal surface near the anterior angle. More analysis is needed to sort out these relationships.

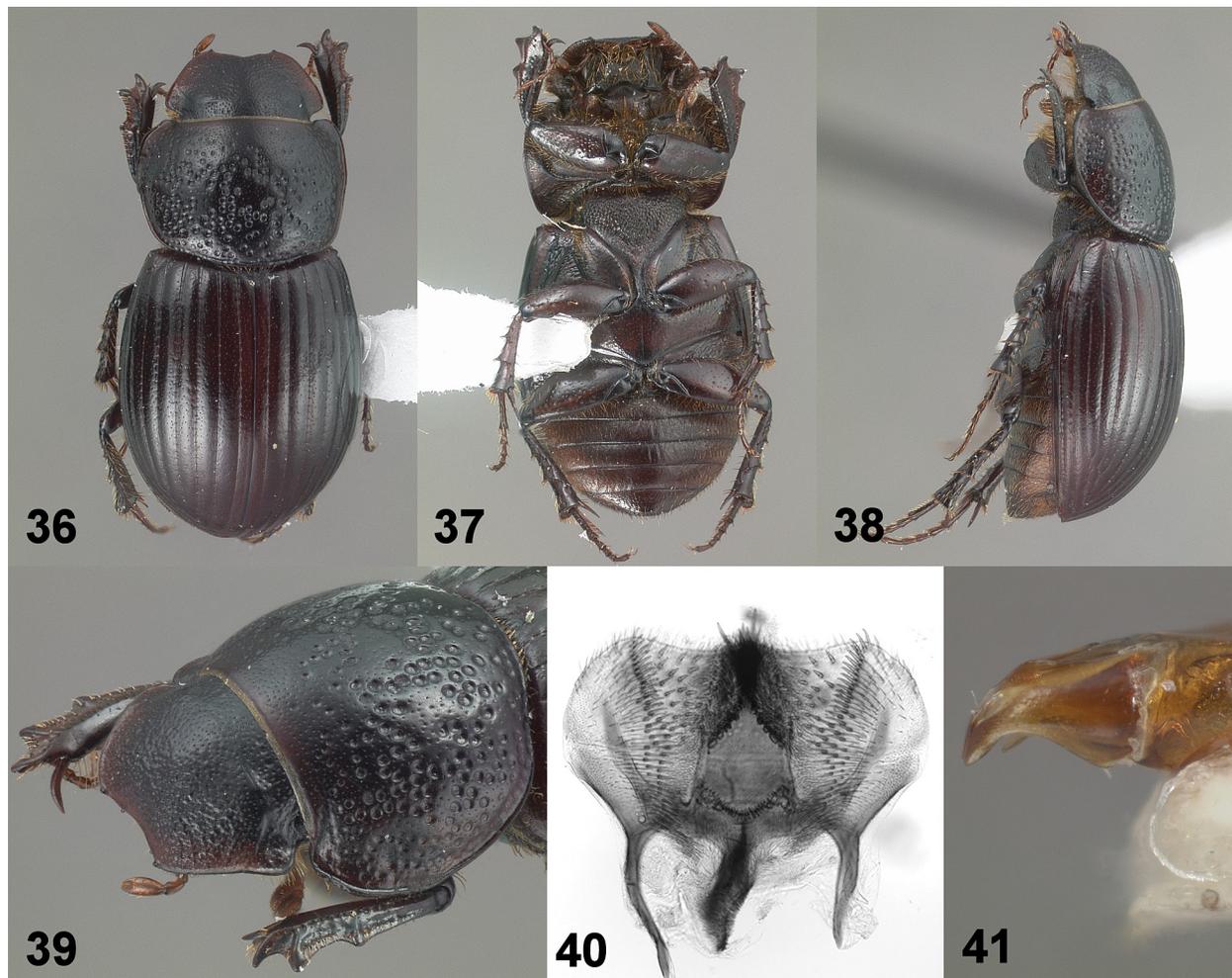
Etymology. Whether a behavior or coincidence, many *Stenothorax* species become active at the beginning of winter and are occasionally found walking on snow or in near freezing weather at night. Nearly all specimens of this species were collected “on snow”, thus, the species name “snow traveler” is appropriate. The epithet is a combination of the Latin “*nivis*” meaning of snow and “*viator*” meaning traveler or pilgrim.

Stenothorax smilodon Skelley and McPeak, new species

Figures 36–41

Diagnosis. *Stenothorax smilodon* is distinguished from other members of the genus by the following combination of characters: protibia with secondary setal row, broad head, clypeus with two nearly spiniform teeth, pronotum explanate at anterior angles, pronotal basal groove and bead distinct across width. *Stenothorax smilodon* appears to be restricted to the western Snake River Plain in eastern Oregon and southwestern Idaho.

Description. Holotype male length 6.9 mm, width 3.3 mm. Body elongate; color dark red-brown nearly black, glossy, weakly dull. **Head** with clypeus broad, distance between anterior most point of clypeal margin roughly equal to distance from angle (teeth) to frontoclypeal suture; clypeus anterior margin with a nearly spiniform tooth either side of median emargination, margin with setal fringe short to absent, indistinct in dorsal view; clypeal surface rugose and densely, finely punctate nearly up to frontoclypeal suture; surface from base of clypeus to vertex with strong, fine, dense punctures; frontal lobe projecting, angulate. **Epipharynx** with apical margin sinuate, tylus projecting; chaetopodia few and stout, numerous and fine; epitorma broad (Fig. 40). **Pronotum** transversely subrectangular, widest at middle, narrowing in basal half, explanate near anterior angles; punctation on disc of two sizes, fine punctures evenly distributed, coarse punctures roughly 10–12× larger than fine punctures; lateral margins lacking setal fringe, evenly arcuate anteriorly, more strongly so posteriorly, posterior angle indistinct; basal pronotal groove broad and bead distinct across width, slightly reduced either side of middle, continuous with lateral groove and bead. **Scutellum** triangular, coarsely punctate basally, impunctate apically. **Elytra** fused, elongate; each humerus rounded, humeral denticle distinct in dorsal view; striae distinct, fine, edges rounded; striae I–IV deeper and wider near base and on declivity; strial punctures fine, weakly crenating sides; intervals all similarly developed, weakly convex, moderately glossy; interval punctation fine, scattered, arranged in vague rows on more lateral intervals; epipleural fold setose at extreme base only. **Appendages** with hind wing vestigial, strap-like. Profemur densely coarsely punctate on ventral surface. Protibia elongate, primary dorsal setal row situated along midline of surface; with a secondary row of setae; protibia lacking ventral projections at medial apex beneath spur and along medial basal margin; protibial spur evenly curved inwardly. Meso- and metafemur finely punctate on ventral surface, few coarse punctures less distinct than profemur. Meso- and metatibia gradually widening before abruptly dilated apex. Meso- and metatibial spurs narrowed, saber-like; lower mesotibial spur sexually dimorphic, stout, 1/3–1/2 length of upper spur, bent inward at apex. Meso- and metatarsomere I length = length of upper spur. **Venter** with metasternum short; densely coarsely punctate laterally, sparsely finely punctate medially. Abdomen with basal sternite coarsely punctate, setose and rugose across surface; medial and apical sternites punctate as basal sternite laterally, glossy and impunctate medially. **Male genitalia** with parameres shorter than basal piece; sharply angled ventrally at apical third to bluntly pointed apex in lateral view (Fig. 41).



Figures 36–41. *Stenothorax smilodon*, n. sp. 36) Dorsal habitus. 37) Ventral habitus. 38) Lateral habitus. 39) Oblique anterior view head to elytral base. 40) Epipharynx. 41) Male genitalia, lateral view.

Sexual dimorphism. Female lower mesotibial spur unmodified, 1/2 length of upper spur. Male protibia narrower than in female.

Variation. Length 6.5–8.1 mm, width 3.0–4.1 mm. Worn specimens show varying degrees of reduction in clypeal teeth. A couple specimens lack these teeth and have notably worn protibial teeth.

Type material. Holotype male: "/ IDAHO: Payette Co., 2560 ft, 4 mi. S of New Plymouth, Exit 9 on I-84 jct. St-30, 11-12-NOV-2014, P. Skelley, K. Schnepf, G. Powell / N43°54'24" W116°48'59", mouths of rodent burrows excavated by badgers / [red paper] **HOLOTYPE** *Stenothorax smilodon* Skelley&McPeak /". Deposited in the FSCA.

Allotype and Paratypes ($n = 34$): **IDAHO: Payette Co.:** same data as holotype [allotype female and 1 FSCA, 1 USNM]; **Washington Co.:** Andrus WMA, 44.7623°N, 116.8479°W, 1538 m, 15-XI-2012, R. Winton [3 RMPC].

OREGON: Baker Co.: Exit 338 on I-84, jct. Lookout Mt. Rd., 44°28'27"N, 117°20'22"W, 2360 ft, 12-21-XI-2014, Skelley, Schnepf, Powell [4 FSCA]; Exit 338 on I-84, jct. Lookout Mt. Rd., 44°28'27.51"N, 117°20'19.75"W, 2360 ft, 12-XI-2014, K.E. Schnepf [1 KESC]; Exit 338 on I-84, jct. Lookout Mt. Rd., 44°28.448N, 117°20.327'W, 2332 ft, 30-IX-2014 to 22-II-2015, R.H. McPeak [2 FSCA, 1 RMPC]; same locality, 22-II-2015 to 13-IV-2015, R.H. McPeak [1 FSCA, 2 RMPC]; Hwy 84 & Lookout Mtn. Rd., 44°28.445'N, 117°20.361'W, 2359 ft, 9-X-2013 to 17-IV-2014, R.H. McPeak [2 FSCA, 3 RMPC]; Lookout

Mtn., near corral, 44°32.399'N, 117°16.845'W, 5218 ft, 30-IX-2014 to 22-II-2015, R.H. McPeak [1 FSCA]; **Malheur Co.:** Moors Hollow Road & Hwy. 84, 44°10.959'N, 117°08.121'W, 2531 ft, 14-X-2015 to 15-III-2016, R.H. McPeak [6 FSCA, 4 RMPC]; Lytle Blvd, 9.5 km S. Vale, T19S R45E S24, 2680 ft, 25-IX-1983 to 12-XI-1983, William H. Clark, Mary H. Clark [1 OJSM].

Observed habits. Some of the specimens were collected in burrows of a species of *Thomomys* Wied-Neuwied (Rodentia: Geomyidae), others were collected from rodent burrows excavated by badgers. These latter burrows also had *S. schneppi* Skelley and McPeak, n. sp., at their entrance. As with other large species of *Stenothorax*, available data indicates they may have an association with burrowing rodents. More field observations are needed to substantiate this hypothesis. They have been collected in barrier pitfall traps and walking on snow. Ross Winton (*in litt.*) states, “The ones I collected were out by the hundreds probably around 5pm but the cloud cover and snowfall were so dense it felt more like dusk. I found it easiest to collect on closed roads with no tracks in the middle of intact habitat (in this case sagebrush steppe). This allowed for better visibility of the beetles against the white background.”

Remarks. *Stenothorax smilodon* is most similar to *S. mcpeaki*, most notably differing in that *S. mcpeaki* lacks clypeal teeth and has an isolated distribution along the Columbia River of Oregon and Washington. If an explanate pronotum and clypeal teeth are considered to be easily derived characters, then these two species along with *S. nivivator* share many body and genitalic characteristics, indicating they may form a species complex.

Etymology. This is the largest species of *Stenothorax* with distinct clypeal teeth, which we had nicknamed “big and toothed”. It seems fitting to name it after another big and toothed animal, the saber-toothed cat, *Smilodon* Lund (Carnivora: Felidae), which also occurred in western North America. Although there are no morphological similarities between the two, we like the name, which is being applied as a noun in apposition.

Stenothorax washtucna (Robinson)

Figure 26

Aphodius washtucna Robinson 1938: 108 ~ Hatch 1971: 448.

Aphodius (Stenothorax) washtucna Robinson ~ M. Dellacasa 1988: 397.

Aphodius washtuca ~ Saylor 1940: 103 (misspelling).

Stenothorax washtucna (Robinson) ~ Gordon and Skelley 2007: 215.

Aphodius constrictus Robinson 1946: 54 ~ Hatch 1971: 448; Gordon and Skelley 2007: 217 (syn.)

Aphodius (Stenothorax) constrictus Robinson ~ M. Dellacasa 1988: 397.

Diagnosis. The toothless clypeal margin, reduced basal pronotal marginal groove, and lack of explanate pronotum readily distinguish *S. washtucna* from any other species in the region. *Stenothorax washtucna* appears to be widely distributed around the Scablands of Washington and nearby in Oregon and Idaho. We take this opportunity to present new and confirmed collection data.

Type material. Of *A. washtucna*, Washington, Ritzville (USNM, examined); of *A. constrictus*, Washington, Whitman Co., Pullman (USNM, examined).

Materials studied. ($n = 160$) Collection data for materials confirmed to be *S. washtucna* are: **IDAHO:** **Latah Co.:** Moscow, 2560 ft, 14-I-1941, E. Prather [1 USNM]; same locality, 17-XII-1960, Phyllis Strecker, R.E. Strecker [2 CMNC, 9 CNCI, 3 MJPC, 2 RMPC, 1 USNM, 6 WFBM]; same locality, 17-XII-1960, W.F. Barr [1 WFBM]; 2 mi. NE of Moscow, 24-III-1957, C.J. Peterson [1 WFBM]; 14 mi. S. Moscow, 10-XII-1989, R.J. Sawby [1 WFBM].

OREGON: **Gilliam Co.,** Condon, 4-II-1951, Avery & Lauderdale [1 USNM]; **Jefferson Co.:** 21-XII-1969, C. Maser [2 USNM]; E of Madras (milepost 8 on Hwy 26), 44°30.419'N, 121°04.048'W, 3043 ft, 8-XI-2013 to 12-II-2014, R.H. McPeak [3 FSCA, 3 RMPC]; same locality, 12-II-2014 to 16-VI-2014, R.H. McPeak [1 RMPC]; **Morrow Co.:** Ione; 3.5 mi E on Hwy 74, mile post 32/33, 45°29.013'N, 119°44.939'W, 1227 ft, 1-X-2014 to 1-III-2015, R.H. McPeak [3 FSCA, 3 RMPC]; **Umatilla Co.:** Adams, 24-X-1947, H.E. Morrison [1 USNM]; Milton-Freewater, 11-XI-1954, L. Wallace [1 USNM]; Hwy 395 between milepost 27/28 [S of Pilot Rock], 45°24.864'N, 118°59.461'W, 2824 ft, 1-X-2014 to 21-II-2015, R.H. McPeak [1 FSCA];

Wheeler Co.: N of Fossil, Cummings Hill, 45°02.729'N, 120°11.847'W, 3270 ft, 1-XI-2013 to 13-II-2014, R.H. McPeak [2 FSCA]; N of Fossil, Cummings Hill, 45°02.729'N, 120°11.847'W, 3270 ft, 13-II-2014 to 19-V-2014, R.H. McPeak [2 RMPC]; SW of Fossil (milepost 31 on Hwy 218), 44°54.131'N, 120°19.751'W, 2065 ft, 1-XI-2013 to 21-II-2014, R.H. McPeak [1 FSCA, 1 RMPC].

WASHINGTON: Adams Co.: 1.2 mi. N. of Hwy 26 on Foulkes Rd., 46°48.545'N, 118°39.048'W, 1426 ft, 8-XI-2015 to 31-III-2016, R.H. McPeak [1 DCGC, 9 FSCA, 1 NHML, 11 RMPC, 1 WBWC]; Ritzville, 30-III-1921, M. Robinson Collection [1 USNM *A. washtucna* type]; same locality, 30-III-1921, M.C. Lane, [4 USNM]; same locality, 14-III-1971, G.D. Alpert [4 FSCA]; WSU-Lind Dryland Research Station, 8-XI-2007, Rod Rood [1 FSCA, 1 RMPC]; **Asotin Co.:** Asotin, Sportsman access, 46°19'14"N, 117°13'44"W, 8-III-2014, E. D'Auria [1 RMPC]; Clarkston [1 FSCA]; **Benton Co.:** ALE Site, IBP Plot (ungrazed), Hanford (AEC) Res., 10 mi. NW. Richland, 29-XI-1972, L. Rogers [2 USNM]; same locality, 27-XII-1973, N.E. Woodley [1 USNM]; ALE Site, Snively Basin, upper old field, Hanford (AEC) Res., 10 mi. NW. Richland, 29-III-1974, L. Rogers [1 USNM]; same locality, 18-III-1975, L. Rogers [1 USNM]; Rattlesnake Springs, Hanford AEC Res., 1-III-1968, W. W. Cone [1 USNM]; Rattlesnake, Prosser, 20-III-1934, I.W. Bales [1 FMNH, 1 WSU]; **Chelan Co.:** 3 mi. W. Wenatchee, No.2 Canyon, 16-XII-1973, R.F. Lagler, M.C. Hunter [1 USNM]; **Klickitat Co.:** Roosevelt; 0.2 mi. W of Roosevelt on Hwy 14, 45°44'25.80"N, 120°13'56.89"W, 300 ft, 9-IX-2014 to 21-II-2015, R.H. McPeak [5 FSCA, 5 RMPC]; **Walla Walla Co.:** College Place, X-1946, B. Walter [1 WSU]; Walla Walla, 18-II-1931, E.W. Jones [1 WFBM]; same locality, 26-II-1931, E.W. Jones [1 WFBM]; same locality, 27-II-1931, E.W. Jones [1 WFBM]; same locality, 4-VI-1932, E.W. Jones [1 WFBM]; same locality, 30-III-1937 [1 USNM]; same locality, 12-IV-1937, R.W. Jones [1 USNM]; **Whitman Co.:** Hwy 26 MP 104, 11-XI-2002, R. Rood [1 RMPC]; Pullman [1 USNM, 1 WSU]; same locality, W.M. Mann [1 USNM]; same locality, XII, L.W. Saylor Colln. [1 CASC]; same locality, XII-1897 [4 WSU]; same locality, XII-1897, C.V. Piper [2 USNM]; same locality, XI-1898 [1 USNM]; same locality, 21-XI-1898, R.W. Doane [1 WSU]; same locality, 12-I-1899, R.W. Doane [3 WSU]; same locality, 7-IV-1899, R.W. Doane [1 WSU]; same locality, 5-I-1908, W.M. Mann [1 USNM]; same locality, 12-I-1909 [1 FMNH]; same locality, 19-XI-1910, M. Robinson Collection [1 USNM *A. constrictus* type]; same locality, 22-IV-1917 [1 WSU]; same locality, 2-V-1917 [2 FMNH, 1 WSU]; same locality, 9-III-1926 [1 WSU]; same locality, 22-XII-1929, Paul Eiole [1 WSU]; same locality, 12-III-1930 [1 WSU]; same locality, 12-I-1939, R.W. Doane [1 FMNH]; same locality, 16-IV-1951, N.M. Downie [1 CNCI]; same locality, 25-IX-1967, R.D. Akre [3 FSCA]; same locality, 27-XII-1982, W. J. Turner [1 RMPC]; same locality, 14-III-1983, A.D. Mudge [2 WBWC]; same locality, 14-III-1985, A. D. Mudge [7 RMPC]; Pullman, WSU Golf Course, 2400 ft, 4-I-1989, W. J. Turner [2 RMPC]; 6 mi. SW. Pullman, 2-XII-1967 [2 WSU].

Observed habits. Specimens have been collected from sagebrush litter and grasslands with pocket gophers, in sage brush vole nest (*Lagurus curtatus* (Cope), Gordon and Skelley 2007), in thatch ant nests (*Formica* spp.), in stored grain/wheat, walking on snow, in deer carrion, from soil, from burrow trap, and in barrier pitfall traps.

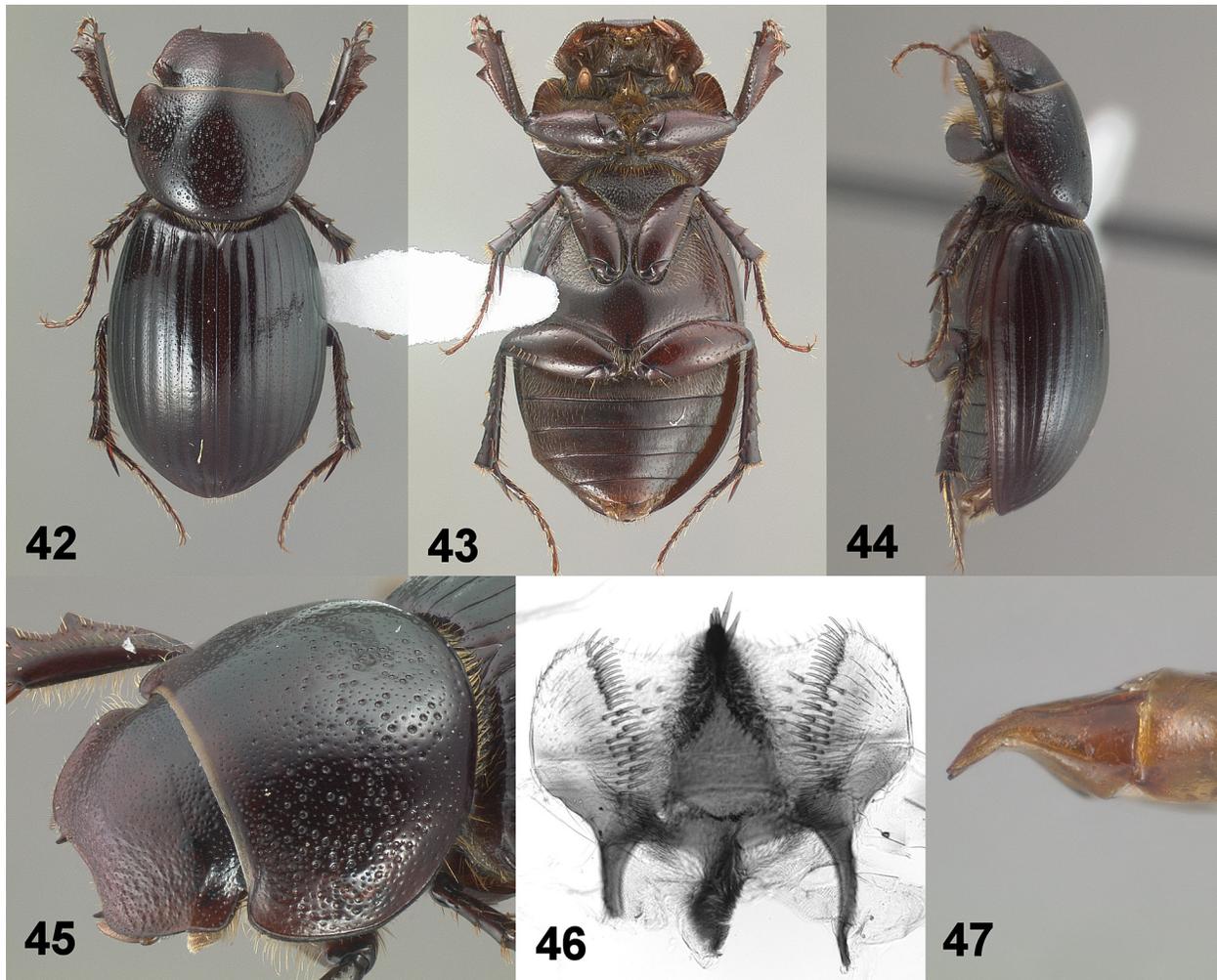
Remarks. *Stenothorax washtucna* appears most similar to *S. wintoni*. See remarks under that species. Characters presented by Robinson for *A. constrictus* either fall well within normal variation ranges or are normal age-related wear on the type.

Stenothorax wintoni Skelley and McPeak, new species

Figures 1, 9, 14–15, 17, 21, 42–47

Diagnosis. *Stenothorax wintoni* is distinguished from other members of the genus by the following combination of characters: protibia with secondary setal row, head with clypeus broad, clypeus with setal fringe and spiniform teeth, pronotal basal groove and bead reduced, and pronotal surface near anterior angle weakly explanate. *Stenothorax wintoni* appears to be restricted to the Snake River Valley.

Description. Holotype male length 7.4 mm, width 3.4 mm. Body elongate, somewhat hour-glass shaped; color dark red-brown to nearly black, glossy. **Head** with clypeus broad, distance between anterior most point of clypeal margin roughly equal to the distance from angle to frontoclypeal suture; clypeal anterior margin with spiniform tooth each side of middle, tooth situated medially of most anterior part of clypeal margin, margin weakly crenulate near teeth and with short setal fringe, distinct in dorsal view; clypeal



Figures 42–47. *Stenotothorax wintoni*, n. sp. 42) Dorsal habitus. 43) Ventral habitus. 44) Lateral habitus. 45) Oblique anterior view head to elytral base. 46) Epipharynx. 47) Male genitalia, lateral view.

surface rugose, granulate, and finely, distinctly punctate up to frontoclypeal suture; frons and vertex with fine, distinct, dense punctures; frontal lobe projecting, angulate. **Epipharynx** with apical margin sinuate, tylus projecting; chaetopodia few and stout; epitorma broad (Fig. 46). **Pronotum** with sides and base hemispherically rounded, transverse, widest anteriorly, distinctly constricted in basal half, surface near anterior angles weakly explanate; disc punctation two sizes, fine punctures evenly distributed, dense, coarse punctures roughly 5× larger than fine punctures evenly widely scattered; lateral margins lacking setal fringe, evenly arcuate from anterior angles to middle of base, posterior angles obliterated; basal margin evenly rounded, with marginal groove and bead at middle fine, reduced to lacking on either side. **Scutellum** triangular, coarsely punctate basally, impunctate apically. **Elytra** fused, oval; each humerus reduced rounded, humeral denticle not evident; striae distinct, sharply edged, wider at base and over declivity; striae I–VI reaching base; strial punctures fine, not crenating strial sides; intervals weakly convex, flattened, punctation distinct, fine, arranged in vague rows, all intervals similarly punctate, glossy; epipleural fold setose at base only. **Appendages** with hind wing vestigial, strap-like. Profemur densely coarsely punctate on ventral surface. Protibia elongate, primary dorsal setal row situated along midline of surface; with a secondary row of setae; lacking ventral projections at medial apex beneath spur and along medial basal margin; protibia lacking coarse punctures on ventral surface; protibial spur evenly curved inwardly. Meso- and metafemur finely punctate on ventral surface, few coarse punctures

less distinct than on profemur. Meso- and metatibia gradually widening before abruptly dilated apex. Meso- and metatibial spurs narrowed, saber-like; lower mesotibial spur weakly sexually dimorphic, curved in at apex, 1/3–1/2 length of upper spur. Meso- and metatarsomere I length = length of upper spur. **Venter** with metasternum short; laterally punctures not evident, seta present, surface alutaceous, sparsely finely punctate medially. Abdomen with basal sternite setose and rugose across surface; medial and apical sternite surfaces as basal sternite laterally, alutaceously glossy and glabrous medially. **Male genitalia** with parameres shorter than basal piece; angled ventrally at apical third to acutely pointed apex in lateral view (Fig. 47).

Sexual dimorphism. Female lower mesotibial spur 1/2 length of upper spur, not modified. Sexes difficult to distinguish without dissection.

Variation. Length 6.3–7.5 mm, width 2.8–3.4 mm. All available specimens show little of the wear visible on other species. We suspect this is simply sampling bias. Some variation or wear was noted on the clypeal setal fringe. The development of the basal marginal groove and bead showed some variation in the amount of reduction on either side of the middle.

Type material. Holotype: “IDAHO: Owyhee Co., Bruneau Dunes SP, 42.90575, -115.68792, 23-NOV-15-DEC-2014, gopher burrow trap, P. Skelley, K. Schnepf, A. Gillogly, R. Winton / [red paper] **HOLOTYPE** *Stenothorax wintoni* Skelley&McPeak /”. Deposited in the FSCA.

Allotype and paratypes ($n = 98$): **IDAHO: Bonneville Co.:** Idaho Falls, N.R.T.S., 17-IV-1967 [1 BYU]; **Elmore Co.:** Bliss Dam Dunes, 42.91728°N, 115.08693°W, 4-II-17-III-2015, R. Winton, B. Lyon [3 FSCA]; **Owyhee Co.:** same data as holotype [4 CMNC, 2 CNCI, 2 DCGC, allotype female and 50 FSCA, 2 NHML, 2 OJSM, 2 RCWC, 4 RMPC, 2 USNM, 2 WBWC]; same locality, 42.90452°N, 115.68546°W, 23-XI-15-XII-2014, P. Skelley, K. Schnepf, A. Gillogly, R. Winton [2 FSCA]; same locality, 15-XII-2014 to 4-II-2015, R. Winton, B. Lyon [1 FSCA]; same locality, 42.90163°N, 115.68079°W, 15-XII-2014 to 4-II-2015, R. Winton, B. Lyon [2 FSCA, 2 RCWC]; same locality, 42.89940°N, 115.67979°W, 15-XII-2014 to 4-II-2015, R. Winton, B. Lyon [1 FSCA]; same locality, 42.90124°N, 115.68006°W, 23-XI-15-XII-2014, P. Skelley, K. Schnepf, A. Gillogly, R. Winton [4 FSCA]; same locality, 23-XI-2014, K.E. Schnepf [2 KESC]; same locality, 42°45'21"N, 115°41'17"W, 2510 ft, 23-XI-2014, P. Skelley, K. Schnepf, A. Gillogly, R. Winton, [7 FSCA, 1 KESC].

Observed habits. Most available specimens were collected in *Thomomys* burrows, while the first specimens were collected nocturnally, dispersing on the dunes near these burrows in near freezing temperatures. Another couple were collected in barrier pitfall traps.

Remarks. *Stenothorax wintoni* is most similar to *S. washtucna* and *S. woodleyi*, differing from both of these by their lack of clypeal teeth.

Etymology. This species is named for Ross Winton, Idaho Department of Fish and Game, who assisted with our initial collection of this species on the Bruneau Dunes and is continuing survey work for other *Stenothorax* in Idaho.

Stenothorax woodleyi Gordon

Figures 3, 27–28

Stenothorax woodleyi Gordon 2006: 47–48 ~ Gordon and Skelley 2007: 217, 221.

Diagnosis. The toothless clypeal margin, reduced basal pronotal marginal groove, and strongly explanate pronotum readily distinguish *S. woodleyi* from any other species in the region. *Stenothorax woodleyi* appears to be widespread in the central Scablands of Washington, and narrowly along the Columbia River in Oregon. We take this opportunity to present new and confirmed collection data.

Type material. Washington, ALE Site, Snively Basin, Hanford (AEC) Res., 10 mi. NW Richland (USNM, not examined; many paratypes and topotypical specimens examined).

Materials studied. ($n = 163$) Collection data for materials confirmed to be *S. woodleyi* are: **OREGON: Gilliam Co.:** Arlington; E on Hwy 84 between milepost 142/143, 45°45'50.42"N, 120°07'40.18"W, 435

ft, 10-IX-2014 to 6-I-2015, R.H. McPeak [1 FSCA, 1 RMPC]; same locality, 6-I-2015 to 1-III-2015, R.H. McPeak [1 RMPC]; S. of Arlington on Hwy 19 at milepost 6, 45°38'56.09"N, 120°10'04.67"W, 665 ft, 10-IX-2014 to 6-I-2015, R.H. McPeak [2 FSCA]; E. side of John Day River across from LePage Park, 45°43.555'N, 120°38.636'W, 12-XII-2012 to 18-III-2013, R.H. McPeak [2 FSCA, 2 RMPC]; **Morrow Co.:** Ione, 3.5 mi E on Hwy 74, mile post 32/33, 45°29.013'N, 119°44.939'W, 1227 ft, 1-X-2014 to 1-III-2015, R.H. McPeak [3 FSCA, 3 RMPC]; **Umatilla Co.:** 5 mi. E. Hermiston, 4-XI-1978, K.J. Goeden [1 ODA]; on Hwy 82, 7.3 mi. N of jct. with Hwy-84, 26-XI-2011 to 28-I-2012, R.H. McPeak [1 FSCA, 1 RMPC]; Umatilla; 11.1 mi. E on Hwy 730, 45°56.705'N, 119°04.164'W, 400 ft, 26-XI-2011 to 28-I-2012, R.H. McPeak [1 DCGC, 5 FSCA, 1 NHML, 5 RMPC]; same locality, 26-II-2012 to 15-IV-2012, R.H. McPeak [1 FSCA]; **Wasco Co.:** Rufus, 45°41.444'N, 120°44.409'W, 235 ft, 23-IX-2013 to 10-I-2014, R.H. McPeak [2 FSCA, 3 RMPC]; same locality, 10-I-2014 to 14-XI-2014, R.H. McPeak [1 RMPC];

WASHINGTON: Adams Co.: Kahlotus Sand Dunes, 46°46.865'N, 118°31.316'W, 1418 ft, 8-XI-2015 to 31-III-2016, R.H. McPeak [1 FSCA, 1 RMPC]; **Benton Co.:** Crow Butte area, 2.6 mi. W. Sonova Rd. on Hwy 14, 45°50'57.43"N, 119°51'59.60"W, 208 ft, 9-IX-2014 to 21-II-2015 R.H. McPeak, [1 FSCA]; Hanford (AEC) Res., ALE Site, Snively Basin, upper old field, 10 mi. NW Richland, 26-X-1973, L. Rogers [5 USNM]; same locality, 20-X-1975, L. Rogers [1 USNM]; Hanford Site, ALE Rd up to Rattlesnake Mtn., 46°22.757'N, 119°31.073'W, 24-X-20-XII-1998, C. Looney [4 WSU]; same locality, 46°22.757'N, 119°31.073'W, 20-XI-17-XII-1998, R.S. Zack [4 FSCA, 3 RMPC, 10 WBWC, 5 WSU]; same locality, 46°22.757'N, 119°31.073'W, 29-I-6-II-1999, C. Looney & R. Zack [2 WBWC]; same locality, 46°22.757'N, 119°31.073'W, 6-12-II-1999, C. Looney & R. Zack [1 WBWC]; same locality, 46°22.757'N, 119°31.073'W, 12-19-II-1999, C. Looney & R. Zack [2 FSCA]; same locality, 46°22.757'N, 119°31.073'W, 19-26-II-1999, C. Looney & R. Zack [2 WBWC, 2 UNSM]; same locality, 46°22.757'N, 119°31.073'W, 24-X-2-XI-1999, C. Looney [3 WBWC]; same locality, 46°22.757'N, 119°31.073'W, 2-9-XI-1999, R. Zack & C. Looney [1 WBWC]; same locality, 46°22.757'N, 119°31.073'W, 3-9-XII-1999, C. Looney & R. Zack [6 WSU]; McNary Dam area sandy habitat [on north side], 45°56.738'N, 119°17.869'W, 400 ft, 3-XII-2008 to 20-I-2009, R.H. McPeak [1 FSCA, 4 RMPC]; same locality, 45°56.738'N, 119°17.869'W, 400 ft, 20-I-2009 to 28-II-2009, R.H. McPeak [4 FSCA, 6 RMPC]; 6 mi. NW. of Richland on Rt. 240, 46°21'45"N, 119°23'06"W, 490 ft, 14-XI-2014, P. Skelley, K. Schnepf, G. Powell [1 FSCA]; Richland, 24-XII-1981, Woodley collection, on snow [1 USNM]; **Franklin Co.:** Juniper Dunes Wilderness; near N entrance, 46°25'27.12"N, 118°49'42.64"W, 870 ft, 8-X to 14-XI-2007, R.H. McPeak [1 FSCA, 1 RMPC]; Juniper Dunes Wilderness; near N entrance, 46°25'27.12"N, 118°49'42.64"W, 870 ft, 5-IV to 10-V-2007, R.H. McPeak [1 FSCA]; Wahluke Wildlife Area, 0.7 mi. N of view point, 46°38.406'N, 119°23.362'W, 812 ft, 6-X-2014 to 26-III-2015, R.H. McPeak [2 FSCA, 2 RMPC]; Wahluke Wildlife Area, 3.8 mi. S of Hwy 24, 46°41.031'N, 119°25.224'W, 812 ft, 6-X-2014 to 26-III-2015, R.H. McPeak [3 RMPC]; **Grant Co.:** 2.8 mi. E of Dodson Rd on Frenchman Hills Rd., 46°57.700'N, 119°29.850'W, 1086 ft, 5-X-2014 to 26-III-2015, R.H. McPeak [1 FSCA, 1 RMPC]; Frenchman Hills; on top of, below powerlines in I SW, 46°58.148'N, 119°41.110'W, 1700 ft, 5-X-2014 to 26-III-2015 R.H. McPeak, [3 FSCA, 2 RMPC]; Mattawa Area, 0.9 mi. N. jct. Hwy 2243 in L SW [Vernita Bridge], 46°39.274'N, 119°44.730'W, 770 ft, 6-X-2014 to 25-III-2015, R.H. McPeak [1 FSCA]; Moses Lake, 47°04.663'N, 119°20.095'W, 1060, 7-X-2014 to 6-VI-2015, R.H. McPeak [2 RMPC]; nr. Beverly; 3.6 mi. E of Hwy 243 on Lower Crab Creek Rd., 46°49.963'N, 119°51.598'W, 526 ft, 8-X-2014 to 25-III-2015, R.H. McPeak [1 DCGC, 5 FSCA, 7 RMPC]; Saddle Mtn. Top, 46°48.190'N, 119°45.092'W, 2222 ft, 7-X-2014 to 26-III-2015, R.H. McPeak [4 FSCA, 5 RMPC]; Soap Lake; milepost 73 on Hwy 17 S of Soap Lake, 47°20.895'N, 119°28.573'W, 1167 ft, 7-X-2014 to 26-III-2015, R.H. McPeak [3 FSCA, 3 RMPC]; Wahluke Wildlife Area, 3.8 mi. S of Hwy 24, 46°41.031'N, 119°25.224'W, 660 ft, 7-X-2014 to 26-III-2015, R.H. McPeak [3 FSCA]; **Kittitas Co.:** Wanapum Dam, 1.7 mi. S. on Huntzinger Rd [W side of Columbia River], 46°50.808'N, 119°57.828'W, 690 ft, 8-X-2014 to 25-III-2015, R.H. McPeak [1 FSCA, 1 RMPC]; Dunes at mouth Rock Creek on Columbia River, 45°42.182'N, 120°28.017'W, 300 ft, 29-IX-2012 to 18-III-2013, R.H. McPeak [1 FSCA, 1 RMPC].

Observed habits. Most specimens were collected in barrier pitfall traps in sandy sage brush and grassland habitats. One was collected scraping sand out of a depression in the sand, possibly an old rodent burrow entrance (pers. obs. PES).

Remarks. *Stenothorax woodleyi* appears most similar to *S. washtucna* and *S. wintoni*, differing from both by the strongly explanate pronotum.

Except for a single specimen from Wanapum Dam in Washington that almost lacks coarse pronotal punctures, an interesting character shift occurs in populations following the Columbia River along the Washington-Oregon border. Topotypical specimens and those in the Scablands have glossy elytra, well-separated coarse pronotal punctures, and the pronotal explanation broad but most prominent on the anterior half along the lateral margin (Fig. 27). Populations along the Columbia River, downstream from the Scablands, have the elytral punctures slightly coarser giving the elytra a dull appearance, pronotal punctures larger and denser, and the pronotal explanation broader and longer (Fig. 28). Materials from intervening populations show a clinal change in these character states. Thus, these two extremes are presently considered the same species.

Great Basin Species Group and Complexes

The first clue leading us to question species concepts in *Stenothorax* was the number of clypeal teeth alternating from population to population in the western Great Basin. There are also morphological differences within current populations of the species that appear to be sand dune inhabitants versus those that live in more mesic habitats or less sandy substrates. As additional series were studied, other characters indicating genetic isolation were found.

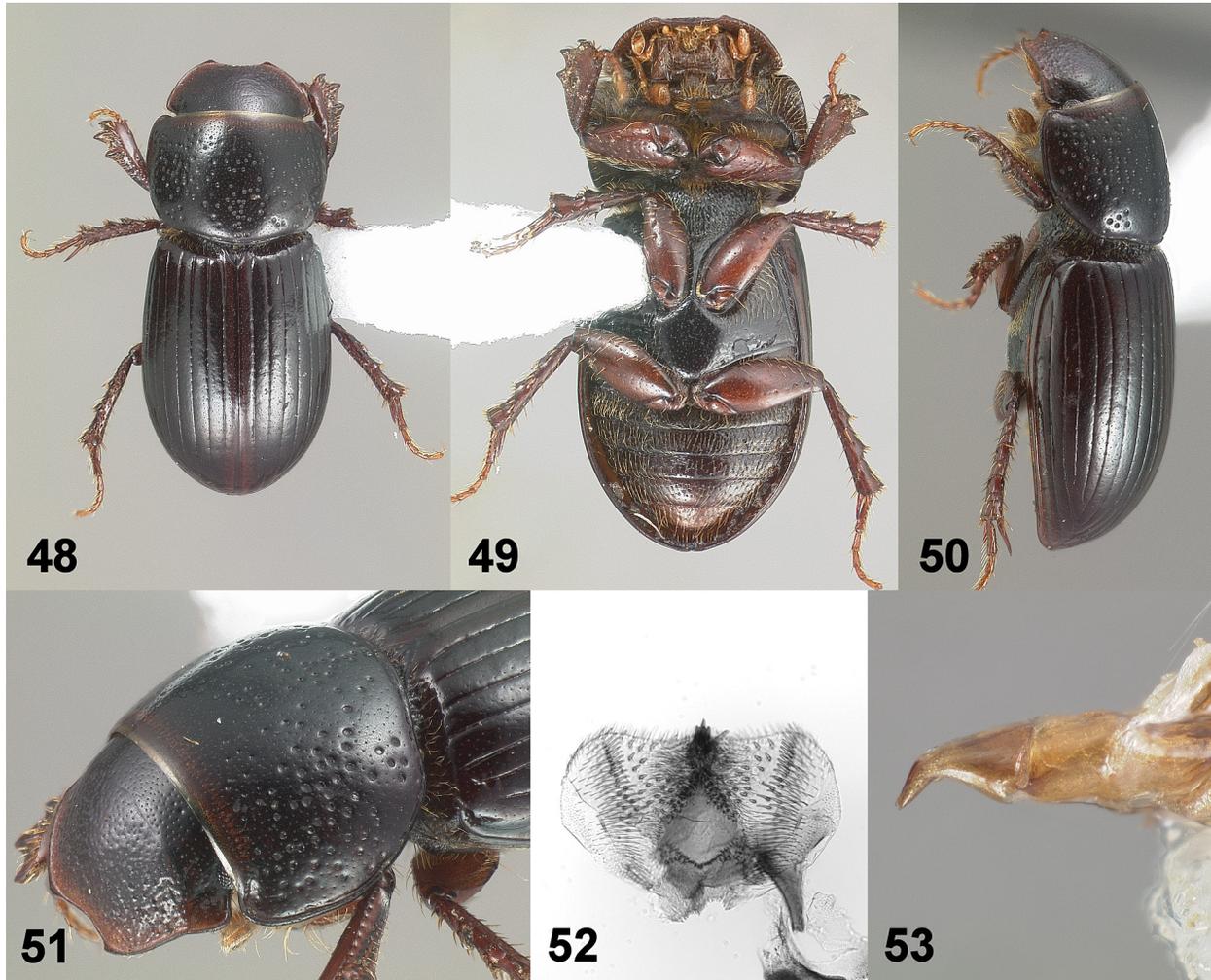
With the exception of the species complexes discussed above, most members of *Stenothorax* on the eastern slope of the Cascade and Sierra Nevada mountain ranges, and that occupy the Great Basin, appear to be closely related. They are easily distinguished from all others by their narrowed heads, clypeus with marginal teeth and reduced basal pronotal marginal groove and bead. These can be further arranged by other characters.

The nevadensis complex [*S. martini* (Van Dyke), *S. nevadensis* (Horn), *S. odontomonteus* n. sp., and *S. oviformis* (Robinson)] is characterized by the more rectangular pronotum (convergent toward base, posterior angles evident) with a weakly reduced basal marginal groove and bead, generally elongate elytra, clypeus having only two distinct triangular teeth and no setal fringe, clypeal surface lacking setae, and elytral striae not wider and the stria edge rounded at base. These species appear to occupy habitats outside of the prehistoric lake beds on the eastern slope of the Sierra Nevada and Cascade mountain ranges and throughout the more mountainous parts of the Great Basin region. Species of the nevadensis complex are generally widely distributed, and their species limits are being studied.

The comosus complex [*S. comosus* Gordon and Skelley, *S. winnemucca* n. sp.] is characterized by the more posteriorly hemispherical pronotum (constricted toward base, lacking posterior angles) with a greatly reduced basal marginal groove and bead, more oval elytra, clypeus having two spiniform teeth and setal fringe, clypeal surface lacking setae, and elytral striae wider and sharply edged at base. These species also share the unique character of having coarse punctures on the ventral surface of the protibia (Fig. 22–23, 29). They appear to be isolated to the sand dunes and sandy soils that could have been associated with the prehistoric Lake Lahontan in north-central Nevada and southeastern Oregon.

The pyriformis complex [*S. lahontanensis* n. sp., *S. parapyriformis* Gordon and Skelley, *S. pyriformis* (Brown), *S. schneppi* n. sp.] is characterized by the more posteriorly hemispherical pronotum (strongly constricted toward base, lacking posterior angles) with a greatly reduced basal marginal groove and bead, oval elytra, clypeus having four primary teeth (fresh specimens can have up to four additional secondary teeth) and setal fringe, clypeal surface near anterior margin with setae (often abraded), and elytral striae wider and sharply edged at base. The species in this complex appear to occupy sandy substrates and sand dunes scattered around the Great Basin from southern Nevada, extreme northwestern Arizona and western Utah up to the Snake River Valley in Idaho.

Our current use of these complexes is purely artificial. All of these species possibly represent a single lineage within the genus whose members evolved characters for a more psammophilous life history. The complicated history of Pleistocene lakes of the Great Basin, like Lake Lahontan and Lake Bonneville (Grayson 2011; Oviatt and Schroder 2016; Reheis 2016), and the isolation of associated dunes and sandy deposits are believed to be the origin of speciation of these complexes. Many regions throughout eastern California, Nevada and Utah need surveying before we can hope for a better understanding of *Stenothorax* in these areas.



Figures 48–53. *Stenothorax odontomonteus*, n. sp. 48) Dorsal habitus. 49) Ventral habitus. 50) Lateral habitus. 51) Oblique anterior view head to elytral base. 52) Epipharynx. 53) Male genitalia, lateral view.

***Stenothorax odontomonteus* Skelley and McPeak, new species**

Figures 5, 11, 48–53

Diagnosis. *Stenothorax odontomonteus* is distinguished from other members of the genus by the following combination of characters: protibia with secondary setal row, clypeus narrowed, small body size (most <6 mm length), clypeal margin bluntly angulate each side of emargination (not dentate) and lacking setal fringe, and pronotal basal groove and bead reduced. *Stenothorax odontomonteus* appears to be restricted to the Cascade Mountain range east of Mt. Hood, Oregon. Other members of the nevadensis complex have distinctly, sharply dentate clypeal teeth.

Description. Holotype male length 5.3 mm, width 2.2 mm. Body shape elongate; color black, glossy. **Head** with clypeus narrow, distance between anterior most point of clypeal margin less than distance from teeth to frontoclypeal suture; clypeal anterior margin upturned and roundly angulate each side of emargination, setal fringe absent; clypeal surface granulate and finely punctate anteriorly; rest of head surface smooth and finely punctate; extreme base of vertex with few moderate punctures and weakly rugose (not visible with head retracted); frontal lobe projecting, angulate. **Epipharynx** with apical margin sinuate, tylus projecting; chaetopodia few and stout; epitorma broad (Fig. 52). **Pronotum** transverse, widest anterior of middle, constricted in basal half, surface near anterior angles not explanate; disc

punctuation of two sizes, fine punctures as on head evenly distributed, coarse punctures roughly 5× larger than fine punctures evenly widely irregularly scattered; lateral margins lacking setal fringe, evenly arcuate from middle anteriorly and posteriorly to base, posterior angles weakly visible; basal margin weakly convex at middle otherwise nearly flat, with marginal groove and bead at middle fine, reduced to lacking on either side. **Scutellum** triangular, coarsely punctate basally, impunctate apically. **Elytra** fused, elongate; each humerus weak, humeral denticle present; striae distinct, striae sides weakly or not crenated, sides rounded; striae I–V reaching base, not wider toward base or over declivity; striae punctures fine; all interval punctuation indistinct, fine, arranged in two vague rows, intervals weakly convex; epipleural fold setose only at extreme base. **Appendages** with hind wing vestigial, strap-like. Profemur densely coarsely punctate on ventral surface. Protibia elongate; primary dorsal setal row situated along midline of surface; with a secondary row of setae; ventral surface lacking groups of coarse punctures; protibial spur evenly curved inwardly; lacking ventral projections at medial apex beneath spur and along medial basal margin. Meso- and metafemur finely punctate on ventral surface, few coarse punctures less distinct than profemur. Meso- and metatibia gradually widening before abruptly dilated apex. Meso- and metatibial spurs narrowed, saber-like; lower mesotibial spur sexually dimorphic, 1/3–1/2 length of upper spur. Meso- and metatarsomere I length = length of upper spur. **Venter** with metasternum short; laterally punctures not evident only seta present, surface alutaceous, sparsely finely punctate medially. Abdomen with basal sternite setose and rugose across surface; medial and apical sternite surfaces as basal sternite laterally, glossy and setose medially. **Male genitalia** with parameres shorter than basal piece; sharply angled ventrally at apical third to acutely pointed apex in lateral view (Fig. 53).

Sexual dimorphism. Female mesotibial lower spur unmodified. Male protibia have the inner apical margin slightly convex, with the marginal row of setae much denser and shorter apically than basally.

Variation. Length 4.48–6.3 mm, width 1.9–2.6 mm. Color of some specimens is dark red-brown, suspected to be younger or more teneral. Clypeal granulations may occupy the anterior half or cover nearly the entire clypeus up to the frontoclypeal suture. Lateral pronotal margin varies in the sharpness of the medial arcuate curve; a few are evenly curved from anterior angle to posterior angle, the majority are more strongly curved at middle, and one specimen has the middle curve nearly angulate. This last example gives the pronotal margin a distinct anterior and posterior region. Worn specimens have standard reduction of clypeal and protibial teeth.

Type material. Holotype: “/ OREGON: Wasco Co., Mt. Hood Nat. For. 4388 ft, ~18 mi. W of Dufur on NF-44; deer dung, frozen ground; 11-NOV-2015, 45°24.032', -121°28.769' / P. Skelley, K. Schnepf, R. McPeak, K. Arguez / [red paper] **HOLOTYPE** *Stenotothorax odontomonteus* Skelley&McPeak /”. Deposited in FSCA.

Allotype and paratypes ($n = 163$): **OREGON: Hood River Co.:** Parkdale, McCarthy Tree Farm, 45.52827°N, 121.57989°W, 22-X-2012, K. Larsen [1 RMPC]; **Wasco Co.:** same data as holotype [allotype female and 12 FSCA]; Mt. Hood N. F., W. of Pine Grove, 8 mi. E. Hwy-26 on Rt-216, milepost 8, 45°06.216'N, 121°27.802'W, 3356 ft, 11-XI-2015, P. Skelley, K. Schnepf, R.H. McPeak, K. Arguez [2 FSCA]; same locality, 11-XI-2015, K.E. Schnepf [2 KESC]; 2.1 mi. W Camp Baldwin on Hwy 44, 45°24.143'N, 121°27.587'W, 4111 ft, 5-IX-2013 to 14-V-2014, R.H. McPeak [3 FSCA, 7 RMPC]; W. of Dufur on NF-44, 45°24.032'N, 121°28.769'W, 4388 ft, 12-XI-2015, R.H. McPeak [5 RMPC]; ~10 mi. W. of Dufur on NF-44, 45°24.822'N, 121°19.529'W, 2706 ft, 11-XI-2015, P. Skelley, K. Schnepf, R.H. McPeak, K. Arguez [6 FSCA, 10 KESC]; same locality, 22-XI-2015 to 24-II-2016, R.H. McPeak [1 RMPC]; 8 mi. E of Hwy 26 on Hwy 216, 45°06.216'N, 121°27.802'W, 3356 ft, 11-XI-2015 to 1-IV-2016, R.H. McPeak [3 FSCA, 2 RMPC]; 8 mi. E of Hwy 26 on Hwy 216, 45°06'14.82"N, 121°27'43.73"W, 3180 ft, 6-VII-2006 to 12-III-2007, R.H. McPeak [2 RMPC, 1 WBWC]; same locality, 17-XI-2008 to 31-V-2009, R.H. McPeak [2 DCGC, 3 FSCA, 1-NMHL, 19 RMPC, 2 USNM]; same locality, 4-XI-2009 to 10-IV-2010, R.H. McPeak, [7 FSCA, 14 MJPC, 39 RMPC, 3 UNSM, 5 WSU, 10 WBWC].

Observed habits. Specimens collected in late fall and winter in barrier pitfall traps, in deer dung, and on freshly chewed deer bones. Some were found on deer dung under melting snow. These observations may indicate dispersing young adult feeding habits more than potential oviposition sites. Much fieldwork is needed to discover larvae and true habits for this and most other species of *Stenotothorax*.

Remarks. Members of the *nevadensis* complex are readily distinguished from other complexes by the dentate clypeus lacking a setal fringe, protibia with a secondary row of setae, pronotum with a reduced basal groove and bead, and moderate to small body size. *Stenothorax odontomonteus* is probably the most easily recognized and geographically isolated member of the complex. Other members of the *nevadensis* complex have wider distributions and are more similar in morphology. These species need more character analysis before any conclusions can be drawn on their status.

Etymology. “*Odontomonteus*” is an intentional anagram of “Mount Hood Steno” with the letter “h” removed. Coincidentally, this anagram matches the combination of the classical roots “*odonto*” (Greek) and “*monte*” (Latin) with a Latinized suffix “-us”, which appropriately defines the species as the toothed one on the mountain.

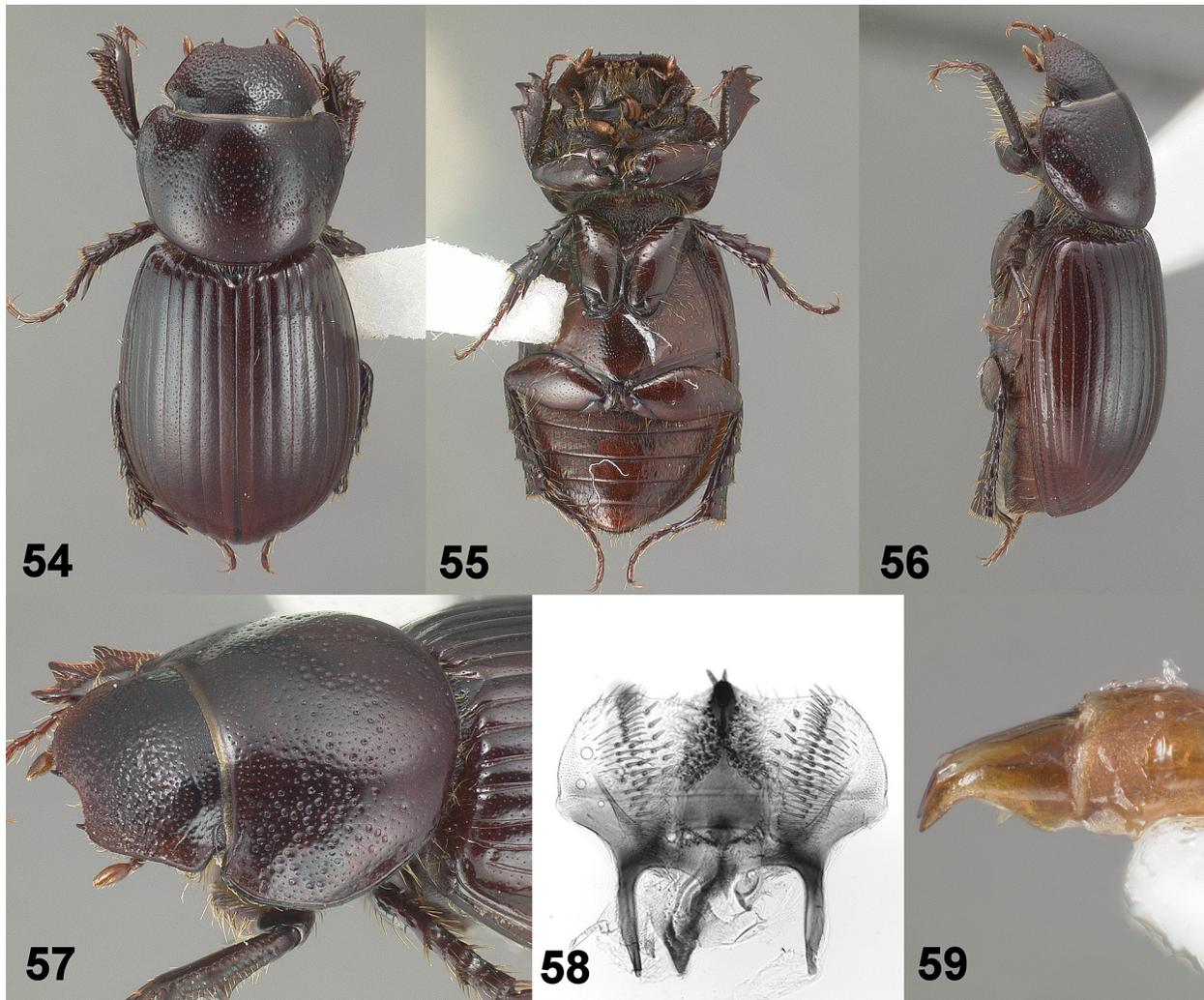
***Stenothorax winnemucca* Skelley and McPeak, new species**

Figures 7, 13, 19, 23, 29, 54–59

Diagnosis. *Stenothorax winnemucca* is distinguished from other members of the genus by the following combination of characters: protibia with dorsal secondary setal row and ventral surface with coarse punctures, pronotal basal groove and bead reduced, clypeus with 2 teeth and setal fringe, elytral striae wider and sharply edged at base, elytra epipleuron with short sparse lateral fringe of setae, and legs not robust. *Stenothorax winnemucca* appears to be restricted to the northern Great Basin, from the southern end of Lake Winnemucca, Nevada, to the Alvord Desert in southeastern Oregon.

Description. Holotype male length 6.4 mm, width 2.8 mm. Body somewhat hourglass shaped, widest at apical third of elytra; color nearly dark red-brown, glossy. **Head** with clypeus narrow, distance between anterior most point of clypeal margin less than distance from teeth to frontoclypeal suture; clypeus anterior margin spiniformly dentate, with 2 primary teeth, and lateral crenulations toward the frontal lobes, with short setal fringe; clypeal surface rugosely granulate on apical half, reducing in intensity towards the frontoclypeal suture, where it is weakly granulate, extreme anterior clypeal surface with few short indistinct setae; punctation of head distinct, fine, dense, evenly distributed from clypeus to vertex; frontal lobe projecting, angulate. **Epipharynx** with apical margin sinuate, tylus projecting; chaetopodia few and stout; epitorma broad (Fig. 58). **Pronotum** posteriorly hemispherical in shape, widest anteriorly, constricted in basal half; surface near anterior angles not explanate; disc punctation two sizes, fine punctures evenly distributed, coarse 4–5× larger than fine punctures evenly widely scattered, separated by 3 or more diameters; lateral margins with short setal fringe along anterior half, evenly arcuate from anterior angles to middle of base, posterior angles obliterated; basal margin evenly rounded, with fine marginal groove and bead only at middle, groove and bead absent on either side. **Scutellum** triangular, coarsely punctate basally, impunctate apically. **Elytra** fused, oval; each humerus reduced, humeral denticle minute; striae distinct, strial sides not crenated; striae I–VI sharply edged and wider at base; strial punctures fine; interval punctation fine, arranged in two vague rows, surface weakly convex; epipleural fold with short setae along ventral surface in addition to those at base. **Appendages** with hind wing vestigial, strap-like. Profemur with few indistinct coarse punctures on ventral surface. Protibia elongate, dorsal surface with primary setal row situated along midline; with a secondary row of setae ventral surface with groups of coarse punctures, lacking ventral projections at medial apex beneath spur and along medial basal margin; protibial spur evenly curved inwardly. Meso- and metafemur finely punctate on ventral surface, few coarse punctures less distinct than profemur; femora of similar shape, elongate. Meso- and metatibia gradually widening before abruptly dilated apex. Meso- and metatibial spurs narrowed, saber-like; lower mesotibial spur respectively 1/2–3/4 length of upper spur, bent inward at apex. Meso- and metatarsomere I length = length of upper spur. **Venter** with metasternum short; laterally punctures not evident only seta present, surface alutaceous, densely finely punctate medially. Abdomen with basal sternite setose and rugose across surface; medial and apical sternite surfaces as basal sternite laterally, smooth and setose medially. **Male genitalia** with parameres shorter than basal piece; sharply angled ventrally at apical third to acutely pointed apex in lateral view (Fig. 59).

Sexual dimorphism. Female mesotibial lower spur unmodified. Males with a denser row of setae along the anterior part of the inner protibial margin.



Figures 54–59. *Stenotothorax winnemucca*, n. sp. 54) Dorsal habitus. 55) Ventral habitus. 56) Lateral habitus. 57) Oblique anterior view head to elytral base. 58) Epipharynx. 59) Male genitalia, lateral view.

Variation. Length 5.4–6.9 mm, width 2.5–3.1 mm. Older specimens show typical signs of wear on protibial and clypeal teeth. Pronotal punctation varies in number and density of coarse punctures. Some specimens the coarse punctures make surface appear rough. The number of coarse punctures on the ventral surface of the protibia varies from a few (approximately 6) to many that make entire surface rough. Color varies from red-brown (teneral) to nearly black. Setal fringes can be matted or worn, thus not visible.

Type material. Holotype: “/ NEVADA: Humboldt Co., Winnemucca Dunes, 4310 ft., ~7 mi. W. US-95, 0.6 mi. S. off Sand Pass Road, N41°07.543' W117°49.649' / 10-NOV-2011; P. Skelley, M.J. Paulsen, R. McPeak, walking on dunes at night / [red paper] HOLOTYPE *Stenotothorax winnemucca* Skelley&McPeak /”. Deposited in the FSCA.

Allotype and paratypes ($n = 768$): **IDAHO: Owyhee Co.:** Given Hot Springs, 43°24.928'N, 116°42.388'W, 2252 ft, 30-IX-2015 to 15-III-2016, R.H. McPeak [2 FSCA, 1 RMPC]; Road to Silver City from Hwy 78, 43°05.443'N, 116°36.178'W, 4044 ft, 30-IX-2015 to 16-III-2016, R.H. McPeak [17 FSCA, 15 RMPC];

NEVADA: Humboldt Co.: Silver St. Vall., BFW Farms Dunes, 27-II-1974, D. Giuliani [2 CASC]; Winnemucca Dunes, 41.100°, -117.767°, 1425 m, 10-XI-2011, M.J. Paulsen [49 MJPC, 27 UNSM]; same data as holotype [allotype and 120 FSCA, 4 CNCI, 12 CMNC, 4 WFBM]; same locality, 9-10-XI-2011,

R.H. McPeak [10 WSU]; same locality, 41°08.436'N, 117°50.124'W, 4298 ft, 10-XI-2011 to 19-I-2012, P. Skelley, M.J. Paulsen, R.H. McPeak, [4 DCGC, 46 FSCA, 4 NHML, 4 USNM, 10 WBWC]; Winnemucca Dunes, 41°07.543'N, 117°49.649'W, 4313 ft, 9-10-XI-2011, R.H. McPeak [27 RMPC]; Winnemucca Dunes, 41°08.025'N, 117°50.073'W, 4313 ft, 9-XI-2011 to 29-I-2012, R.H. McPeak [229 RMPC]; Winnemucca Dunes, E. end, 2.6 mi. W. US-95, 1.7 mi. S. of Sand Pass Rd., 41°06.258'N, 117°45.747'W, 10-XI-2011, P. Skelley, M.J. Paulsen, R.H. McPeak [1 FSCA]; Winnemucca, 10 mi. N., 5 mi. W., sand dunes, 26-II-1974, D. Giuliani [1 CASC]; same locality, 27-II-1975, D. Giuliani [1 CASC]; Winnemucca, 10 mi. N., sand dunes, 8-I-1982, William H. Clark, Paul E. Bloom [27 OJSM]; Winnemucca, 10 mi. N., 7 mi. W., sand dunes, 27-II-1975, D. Giuliani [13 CSCA, 1 FSCA]; Winnemucca, 20 mi. N., 10 mi. W., 26-II-1974, D. Giuliani [8 CASC]; **Pershing Co.:** Rye Patch Dune, [3 OJSM]; Rye Patch St. Pk., Pitt-Taylor St. Rec. Area (Humboldt Dunes), 40°36.178'N, 118°18.807'W, 4158 ft, 11-XI-2011, P. Skelley, R.H. McPeak [23 FSCA, 7 RMPC]; **Washoe Co.:** Nixon, 5.5 mi. N. on Rt. 147, 39°52'51"N, 119°23'40"W, 18-XI-2008, P. Skelley and R.H. McPeak [17 FSCA]; 6 mi. N, 3 mi. W. Nixon, 14-II-1973, D. Giuliani [4 CSCA].

OREGON: Harney Co.: Fields, 42°15'48.8"N, 118°40'33.1"W, 4100 ft, 7-XI-2011, P. Skelley, M.J. Paulsen, R.H. McPeak [28 FSCA, 1 RMPC]; Fields Station, 42.263°, -118.676°, 1300 m, 7-XI-2011, M.J. Paulsen [14 MJPC, 8 UNSM]; Fields, 11.5 mi. N., 42°26'02.5", 118°37'16.1"W, 7-XI-2011 to 14-IV-2012, P. Skelley, R.H. McPeak [2 FSCA]; Fields, 12.2 mi. N., 42°26.097'N, 118°37.199'W, 4150 ft, 8-XI-2011 to 29-I-2012, P. Skelley, M.J. Paulsen, R.H. McPeak [17 FSCA]; Malheur, 28-IV-1974, L. Russell [1 USNM]; Malheur W[ildlife]. Ref[uge]., Sod House Sch., 20-VI-1974, Gordon & Carlson [1 USNM]; **Lake Co.:** Hwy 140 between mileposts 21 & 22, 42°11.995'N, 120°00.621'W, 5162 ft, 14-X-2013 to 15-IV-2014, R.H. McPeak [1 FSCA].

Gordon and Skelley (2007) report data for *S. nevadensis* from Nevada: Humboldt Co., BFW Fars Dunes. Specimens from this locality were not available for confirmation. However, they are expected to be *S. winnemucca*.

Observed habits. Most specimens of *S. winnemucca* were collected in different dunes or sandy soils across the range. Some were collected from *Thomomys* burrows in these soils, burrows of *Spermophilus beldingi*, sifted from the sands, walking on the dune surface on near freezing nights, and in rich sandy organic soils at the edge of a field. The holotype came from a large series (140 specimens) collected walking on dunes at night. Others collected in the same area and at the same time were from 5 barrier pitfall traps (235 specimens) and 30 *Thomomys* burrows (68 specimens). Based on these numbers and other observations, *S. winnemucca* are only opportunistically using rodent burrows. They are primarily associated with other organic deposits in sandy soils.

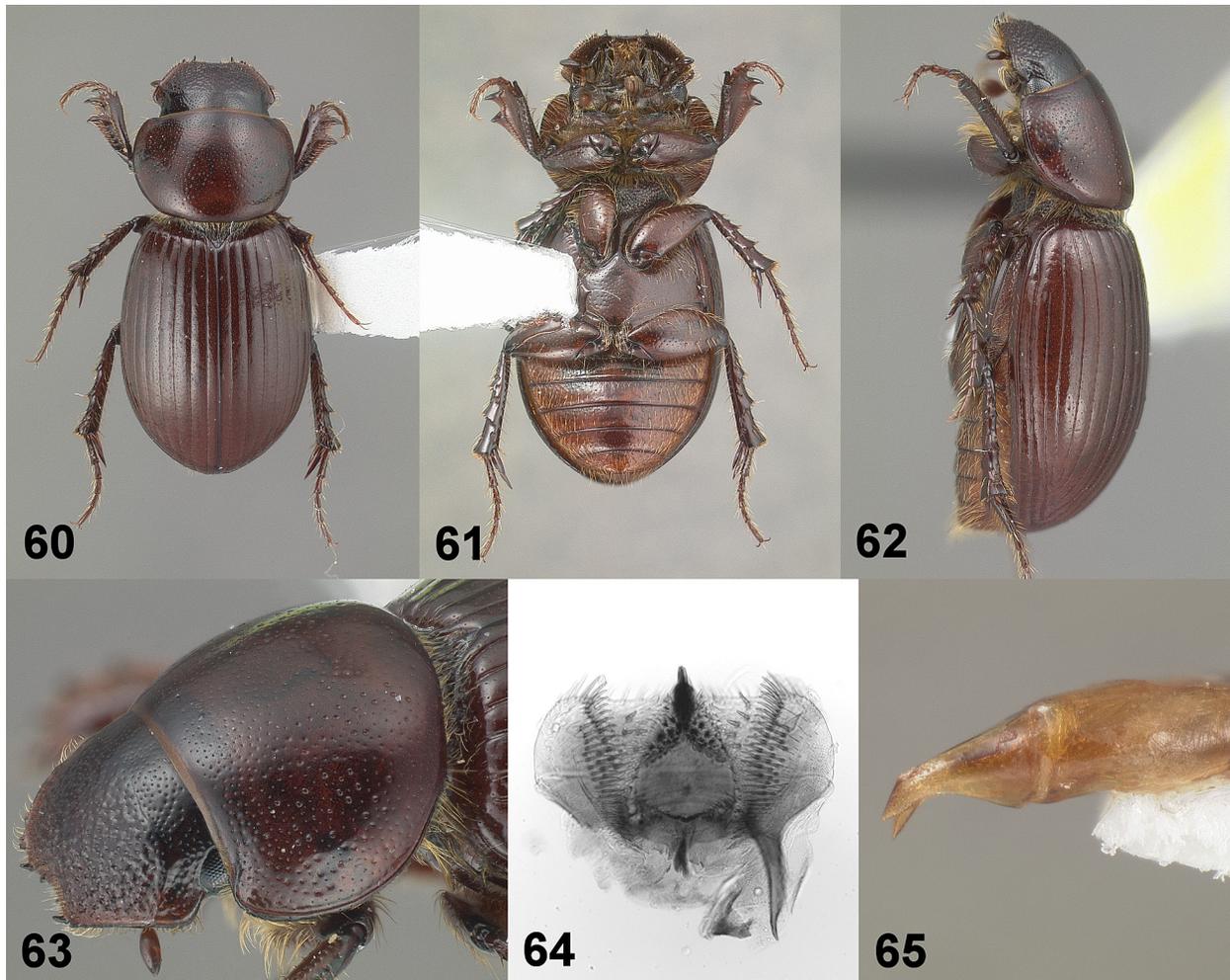
Remarks. Although considered to belong to different species complexes, *S. winnemucca* is most similar superficially to *S. nevadensis*, with which it has historically been attributed. Gordon and Skelley's (2007) habitus photograph of *S. nevadensis* is actually *S. winnemucca*. The species differ in that *S. nevadensis* has the pronotum less constricted basally, basal margin nearly straight, lacks the visible clypeal fringe of setae, has more elongate elytra, and lacks wider elytral striae at the base. In addition, *S. winnemucca* and *S. comosus* differ from species in the pyriformis and nevadensis complexes by having coarse punctures on the ventral surface of the protibia, and from those in the pyriformis complex by having two distinct clypeal teeth and visible sexual dimorphisms. *Stenothorax comosus* also differs from all other species of these complexes in having more robust legs and in being found only on two small isolated dunes east of Fallon, Nevada.

Etymology. This species is named after Winnemucca, an important Native American (Paiute) leader who had several regional places named after him; Lake Winnemucca, Winnemucca Dunes, the town Winnemucca, the Winnemucca Indian Colony, etc. It is fitting a beetle found in this area be named after him also (noun in apposition).

Stenothorax lahontanensis Skelley and McPeak, new species

Figures 8, 12, 60–65

Diagnosis. *Stenothorax lahontanensis* is distinguished from other members of the genus by the following combination of characters: protibia with secondary setal row, clypeus with four or more teeth



Figures 60–65. *Stenotothorax lahontanensis*, n. sp. 60) Dorsal habitus. 61) Ventral habitus. 62) Lateral habitus. 63) Oblique anterior view head to elytral base. 64) Epipharynx. 65) Male genitalia, lateral view.

and setal fringe, pronotal basal groove and bead reduced, coarse pronotal punctures smaller (only 2–3 times larger than fine punctures) and widely scattered, elytral striae wider and sharply edged at base, and elytra with short lateral fringe of setae. *Stenotothorax lahontanensis* appears to be restricted to an area of small dunes southeast of Pyramid Lake from Wadsworth to Fallon in Nevada.

Description. Holotype male length 5.8 mm, width 2.8 mm. Body somewhat hour-glass shaped, widest at apical third of elytra; color dark red-brown, glossy. **Head** with clypeus narrow, distance between anterior most point of clypeal margin less than distance from teeth to frontoclypeal suture; clypeus with anterior margin spiniformly dentate, with 2 primary teeth, 2 smaller teeth medially on the median emargination, one distinct smaller tooth lateral of the primary teeth followed by strong tooth-like crenulations toward the frontal lobes; clypeus fringed with short setae; anterior clypeal surface with few short indistinct setae; clypeal surface rugosely granulate on apical half, sculpture reducing in intensity towards the frontoclypeal suture, where it is weakly granulate; frontal punctation distinct, fine, evenly distributed from clypeus to vertex; frontal lobe projecting, angulate. **Epipharynx** with apical margin weakly sinuate, tylus projecting; chaetopodia few and stout; epitorma broad (Fig. 64). **Pronotum** posteriorly hemispherical in shaped, widest anteriorly, constricted in basal half; surface near anterior angles not explanate; disc punctation of two sizes: fine punctures evenly distributed; coarse punctures evenly widely scattered, separated by 4 or more diameters, 2–3× larger than fine

punctures; lateral margins with short setal fringe along anterior half, evenly arcuate from anterior angles to middle of base, marginal groove and bead weak on basal half, posterior angles obliterated; basal margin evenly rounded, with fine marginal groove and bead only at middle, absent on either side. **Scutellum** triangular, coarsely punctate basally, impunctate apically. **Elytra** fused, oval; each humerus reduced, humeral denticle absent; striae distinct, strial sides not crenated, striae I–VI attaining base, sharply edged and distinctly wider at base; interval punctation fine, arranged in two vague rows, surface weakly convex; epipleural fold with short; strial punctures fine; sparse, setae along ventral surface in addition to base. **Appendages** with hind wing vestigial, strap-like. Profemur with few indistinct coarse punctures on ventral surface. Protibia elongate, primary dorsal setal row situated along midline of surface; with a secondary row of setae; ventral surface lacking groups of coarse punctures; protibial spur evenly curved inwardly; lacking ventral projections at medial apex beneath spur and along medial basal margin. Meso- and metafemur finely punctate on ventral surface, few coarse punctures less distinct than profemur; of similar shape, elongate. Meso- and metatibia gradually widening before abruptly dilated apex. Meso- and metatibial spurs narrowed, saber-like; lower mesotibial spur respectively 1/2–3/4 length of upper spur. Meso- and metatarsomere I length = length of upper spur. **Venter** with metasternum short; laterally punctures not evident only seta present, surface alutaceous, densely finely punctate medially. Abdomen with basal sternite setose and rugose across surface; medial and apical sternite surfaces as basal sternite laterally, smooth and glabrous medially. **Male genitalia** with parameres shorter than basal piece; sharply angled ventrally at apical third to bluntly pointed apex in lateral view (Fig. 65).

Sexual dimorphism. Female lower mesotibial spur similar to male. Male protibia have the inner apical margin slightly convex, with the marginal row of setae slightly denser and shorter apically than basally. Setae may be worn or matted.

Variation. Length 5.8–6.3 mm, width 2.7–2.9 mm. Older specimens show typical signs of wear on protibial and clypeal teeth. Setae on the anterior clypeal surface are present, but often worn away on older specimens. Secondary clypeal teeth vary in number and size, in part due to wear.

Type material. Holotype: “/ NEVADA: Churchill Co., jct. Hwys 50 & Alt. 50, W. of Fallon, elev. 4030', XI-20-2008, P.E. Skelley, F. Skillman, W.B. Warner / 39°30'43"N, 118°56'36"W, sand/organic matter under plant on “dunes” / [red paper] HOLOTYPE *Stenotothorax lahontanensis* Skelley&McPeak /”. Deposited in the FSCA.

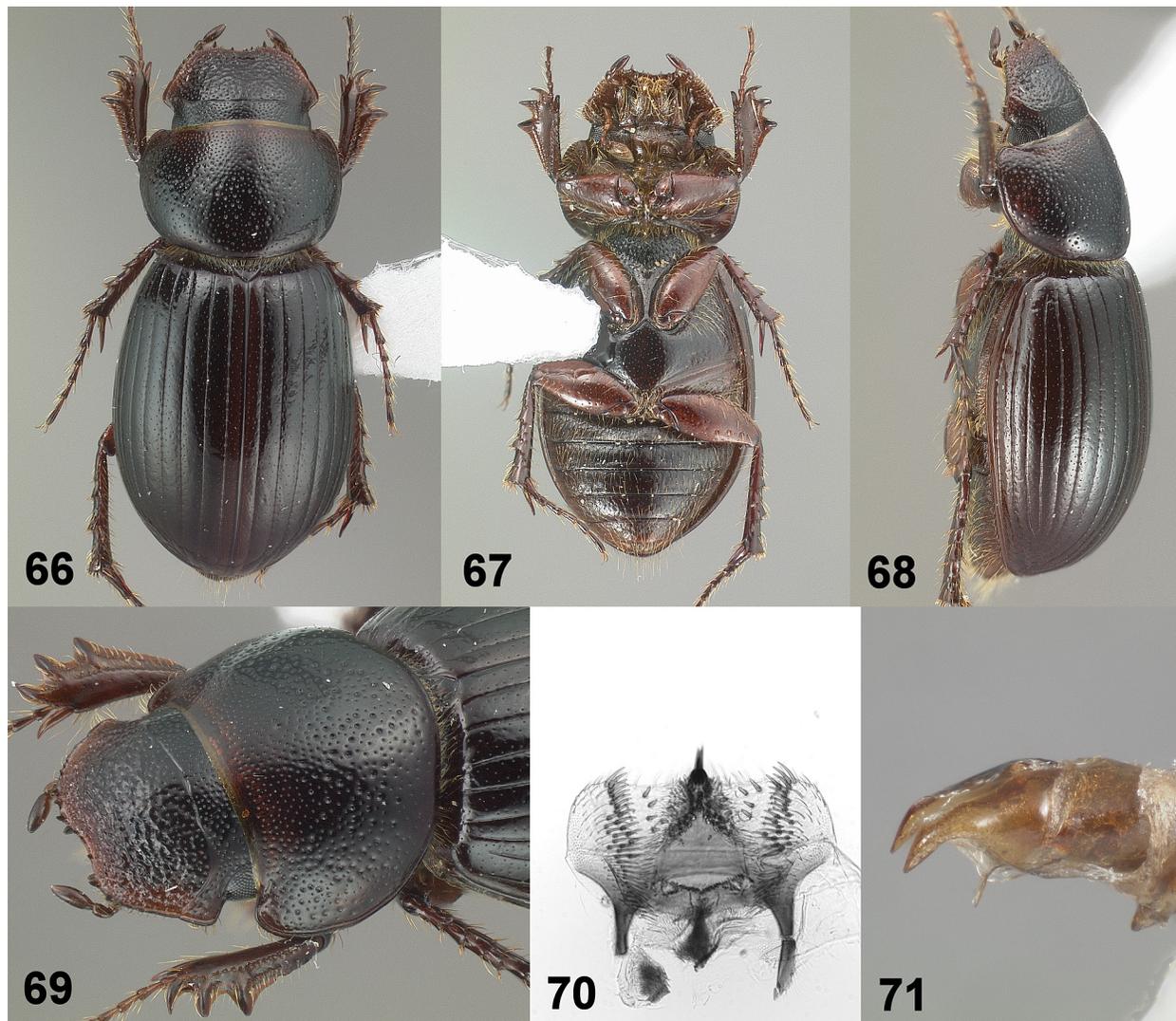
Allotype and paratypes ($n = 210$): **NEVADA: Churchill Co.:** same data as holotype [43 FSCA, 68 WBWC, 2 WFBM]; 3.2 mi. WSW. jct. Hwys 50 & alt. 50, W of Fallon, 39°28'48"N, 118°58'54"W, 4070 ft, 20-XI-2008, Skelley, Skillman, Warner [allotype and 10 FSCA, 14 WBWC]; same locality, 15-20-XI-2008, Skelley, Skillman, Warner [3 RMPC]; **Washoe Co.:** dunes 3 km SW of Wadsworth, 39°36'59"N, 119°18'19"W, 17-XI-2008, W.E. Steiner, et al. [4 CMNC, 2 CNCI, 4 DCGC, 45 FSCA, 4 NHML, 4 USNM]; nr. Wadsworth off I-80, 17-XI-2008, A.D. Smith [5 MJPC].

Gordon and Skelley (2007) report data for *S. parapyriformis* (Gordon and Skelley) from Nevada: Churchill Co., Stillwater NWR, Pintail Bay, 23 Feb., 15 Mar., 1998, R.W. Rust and M. Rahn. Specimens from this locality were not available for confirmation. However, they are expected to be *S. lahontanensis*.

Observed habits. The majority of the type series were sifted from under plants in small dunes in November.

Remarks. *Stenotothorax lahontanensis* is most similar to *S. parapyriformis* which has larger coarse pronotal punctures, elytral striae VI not attaining base, and is found at the eastern side of the Great Basin in southwestern Utah. Both species are similar to the intervening populations of *S. pyriformis*, which has distinct long fringe of elytral epipleural setae, and coarse pronotal punctures more numerous and densely distributed.

Etymology. Specific epithet is from the Pleistocene Lake Lahontan, which dried to become a series of smaller lakes, around which we hypothesize the *pyriformis* complex speciated. *Stenotothorax lahontanensis* is from one of the dry beds near the present-day Lahontan Reservoir.



Figures 66–71. *Stenotothorax schneppi*, n. sp. 66) Dorsal habitus. 67) Ventral habitus. 68) Lateral habitus. 69) Oblique anterior view head to elytral base. 70) Epipharynx. 71) Male genitalia, lateral view.

***Stenotothorax schneppi* Skelley and McPeak, new species**

Figures 2, 66–71

Diagnosis. *Stenotothorax schneppi* is distinguished from other members of the genus by the following combination of characters: protibia with secondary setal row, clypeus with 4 or more teeth and setal fringe, pronotal basal line and bead reduced, elytral striae wider and sharply edged at base, and elytra lacking lateral fringe of setae, small body size (<6 mm length). *Stenotothorax schneppi* appears to be restricted to the western part of the Snake River Plain in eastern Oregon and southwestern Idaho.

Description. Holotype male length 5.4 mm, width 2.4 mm. Body somewhat hour-glass shaped, widest at apical third of elytra; color nearly black, surface glossy. **Head** with clypeus narrow, distance between anterior most point of clypeal margin less than distance from teeth to frontoclypeal suture; clypeus anterior margin spiniformly dentate, with 2 primary teeth, 2 smaller teeth medially along the median emargination, one distinct smaller tooth lateral of the primary teeth followed by strong tooth-like

crenulations toward the frontal lobes; clypeal margin with setal fringe present, but short in dorsal view; clypeal surface rugosely granulate on apical half, reducing in intensity towards the frontoclypeal suture, where it is weakly granulate; extreme anterior clypeal surface with few short indistinct setae; punctation of head distinct, fine, dense, evenly distributed from clypeus to vertex; frontal lobe projecting, angulate. **Epipharynx** with apical margin weakly sinuate, tylus projecting; chaetopodia few and stout; epitorma broad (Fig. 70). **Pronotum** posteriorly hemispherical in shape, widest anteriorly, constricted in basal half; surface near anterior angles not explanate; disc punctation two sizes, fine punctures evenly distributed, coarse 3× larger than fine punctures evenly widely scattered, separated by 4 or more diameters; lateral margin with short setal fringe along anterior half, evenly arcuate from anterior angles to middle of base, marginal groove and bead weak on basal half, posterior angles obliterated; basal margin evenly rounded, with fine marginal groove and bead only at middle, groove and bead absent on either side. **Scutellum** triangular, coarsely punctate basally, impunctate apically. **Elytra** fused, oval; each humerus reduced, humeral denticle absent; striae distinct, strial sides not crenated; striae I–V attaining base, VI nearly attaining base, I–VI sharply edged and weakly wider at base; strial punctures fine; interval punctation fine, arranged in two vague rows, surface weakly convex; epipleural fold lacking setae along lateral margin, a few setae present at base only. **Appendages** with hind wing vestigial, strap-like. Profemur with few indistinct coarse punctures on ventral surface. Protibia elongate, primary dorsal setal row situated along midline of surface; with a secondary row of setae; ventral surface lacking groups of coarse punctures; protibia lacking ventral projections at medial apex beneath spur and along medial basal margin; spur evenly curved inwardly. Meso- and metafemur finely punctate on ventral surface, few coarse punctures less distinct than profemur; of similar shape, elongate. Meso- and metatibia gradually widening before abruptly dilated apex. Meso- and metatibial spurs narrowed, saber-like; lower mesotibial spur 1/2–3/4 length of upper spur. Meso- and metatarsomere I length = length of upper spur. **Venter** with metasternum short; laterally punctures not evident only seta present, surface alutaceous, densely finely punctate medially. Abdomen with basal sternite setose and rugose across surface; medial and apical sternite surfaces as basal sternite laterally, smooth and setose medially. **Male genitalia** with parameres shorter than basal piece; sharply angled ventrally at apical third to acutely pointed apex in lateral view (Fig. 71).

Sexual dimorphism. No sexual dimorphism was noted.

Variation. Length 4.7–5.8 mm, width 2.1–2.6 mm. Older specimens show typical signs of wear on protibial and clypeal teeth. Setae on the anterior clypeal surface are present, but short and indistinct, even on pristine specimens. Any older specimens lack these setae. Color varies from red-brown (teneral) to nearly black. Secondary clypeal teeth vary in number and size.

Type material. Holotype: “/ IDAHO: Payette Co., 2560 ft, 4 mi. S of New Plymouth, Exit 9 on I-84 jct. St-30, 11-12-NOV-2014, P. Skelley, K. Schnepf, G. Powell / N43°54'24" W116°48'59", mouths of rodent burrows excavated by badgers / [red paper] **HOLOTYPE** *Stenotothorax schneppi* Skelley&McPeak /” Deposited in the FSCA.

Allotype and paratypes ($n = 212$): **IDAHO: Payette Co.:** same data as holotype [allotype and 47 FSCA, 28 GSPC]; 4 mi. S of New Plymouth, 43°54.390'N, 116°48.959'W, 3700 ft, 13-XI-2014, Skelley & Schnepf [6 RMPC]; ~11 miles SE Ontario, 43°54'24.78"N, 116°49'01.42"W, 11-12-XI-2014, Kyle E. Schnepf, [same as type locality: 4 CMNC, 2 CNCL, 4 DCGC, 71 KESC, 4 NHML, 2 SEMC, 4 USNM, 4-OSJM, 4 RCWC, 4 WBWC, 4 WFBM].

OREGON: Malheur Co.: 11.5 km. SE Vale, T19S R45E S25, 785 m, 25-IX-1983 to 12-XI-1983, William H. Clark, Mary H. Clark [1 OJSM]; Moores Hollow Road & Hwy. 84, 44°10.959'N, 117°08.121'W, 2531 ft, 14-X-2015 to 15-III-2016, R.H. McPeak [6 FSCA, 6 RMPC]; 6 mi. S. Vale, T19S, R45E, NE1/4, AW1/4, Sec.20, 2700 ft, 19-III-1975, C. Maser [4 CSCA, 9 DCC, 1 LACM].

Observed habits. The majority of the type series was collected in sandy depressions with organic detritus at the mouths of ground squirrel burrows and badger diggings. As with other members of the pyriformis complex the strength of their association with small mammals vs. that of organic matter accumulations in isolated sandy substrates needs to be studied further. Other specimens have been collected in barrier pitfall traps.

Remarks. *Stenothorax schneppi* is the smallest species of the pyriformis complex, readily distinguished from the others by the reduced setal fringe of the elytral and clypeal surfaces, and isolated distribution. It is also the only species of the pyriformis complex that is known outside of the Great Basin. One hypothesis to its isolated distribution is its ancestor was washed to the lower Snake River Plain by the Lake Bonneville flood. Of course, more work and evidence are needed to substantiate any origin hypotheses for the species covered in this manuscript. First, more survey work is needed throughout the region to locate populations to study.

Etymology. This species is named for Kyle Schnepf, friend and colleague, who first collected them on a joint expedition where we collected three of the new species described here.

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