

NOTES ON AMERICAN *SITONA* (COLEOPTERA: CURCULIONIDAE), WITH THREE NEW SPECIES

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ABSTRACT.—Historical notes extracted from a taxonomic revision of American representatives of *Sitona* Germar are presented. Described as new to science are *Sitona alpinensis* (Utah to Northwest Territories), *bryanti* (Arizona), and *oregonensis* (Oregon to Washington).

Preface

The author (now 94 years of age) commenced a taxonomic revision of the weevil genus *Sitona* in 1954 and labored with it until January 1977 when advancing age prevented finalization of the manuscript. Because of the great effort he expended on this project, the family has requested that the introductory pages and the descriptions of new species be published as his final contribution to science in the journal he founded. Although some of the terminology is outdated, the introduction and descriptions are presented as he wrote them. The paratypes of *alpinensis* and *oregonensis* were distributed more than a decade ago; it is presumed that those not accounted for here are mostly in the U.S. National Museum and in the British Museum (Natural History). Treated in the unfinished manuscript are 23 species; 4 are introduced from Europe, and 19 are regarded as native to America. A review of the full text of the manuscript is in progress.—Editor.

INTRODUCTION

The genus *Sitona* is rather large, containing between 90 and 100 valid species from the Palearctic and Nearctic regions. Casey (1888) described 16 species from the western United States, 10 of which are considered as valid species in this study.

A total of 23 species are dealt with in this treatise; four are introduced species. Sixteen native species were previously described, and three new species are proposed.

The weevil species assigned to the genus *Sitona* by Casey have been for many decades in a nebulous taxonomic state. Thomas L. Casey, the son of Brig. Gen. Thomas Lincoln Casey, graduated from the United States Military Academy at West Point in 1879 and was admitted to the Corps of Engineers. He remained in the military service until his retirement in 1912, having reached the rank of

colonel. For three years, 1885–87, Casey's official military duties called him to the Pacific Coast. "During this time, many portions of California, Nevada, Arizona, and portions of Texas were explored by himself in person" (Casey 1888:229). While in California, Casey and several other entomologists in California collected about 3,500 specimens of Coleoptera which he transported to his quarters when he returned to Washington, D.C.

Casey's (1888) treatise, *Sitoninae*, was based largely upon specimens of *Sitona* he accumulated while stationed in California. He devoted much of his life to acquiring and studying the Coleoptera of America. He died in February 1925.

He bequeathed his notable entomological collection to the United States National Museum. "In order to assure the perpetuity of this valuable collection, Col. Casey's wife, Mrs. Laura Welsh Casey, established a memorial fund to provide for the care and knowledgeable curatorial work in the handling and installation of the collection" (Buchanan 1935).

The collection consisted of "12,245 named forms with a total of 116,738 specimens and more than 9,200 holotypes" (Buchanan 1935). L. L. Buchanan was appointed to serve as curator. "The curatorial work was started by Mr. Buchanan on 1 April 1926, and was continued half a day at a time, for a period of 5 years" (Buchanan 1935).

Buchanan was meticulous in transferring the Casey specimens. "The cardinal rule guiding the curatorial work was to preserve exactly Casey's concept of each species. Regardless of occasional conflict with accepted synonyms,

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Casey's arrangement of specimens was strictly followed; furthermore, steps were taken to virtually guarantee the permanent preservation of this arrangement, so that students, both now and in the future, will have equal assurance that before them stand Casey's actual original series of each species; and not a hodge-podge resulting from accidental misplacement of specimens or interpolation of later and irrelevant material" (Buchanan 1935:6).

I have greatly appreciated the care and accuracy exercised by Buchanan as he transferred the specimens into the museum collection. During the course of this study, I had the opportunity of visiting the museum on nine different occasions and studying the species of *Sitona* as Casey had arranged them. I always found Buchanan and his aide and successor, Dr. Rose Ella Warner, very cooperative and helpful.

In the 1888 study in which Casey described 16 new native species of *Sitona*, he did not recognize Say's species *Sitona indifferens* and *S. scissifrons* or the two distinctive species *S. californicus* Fahraeus and *S. vittatus* LeConte, nor did he consider to any extent the variability in size, color, and color pattern of the species he treated.

In 1831, Say (LeConte 1859) discussed 135 species of American weevils, 95 of which he described as new species, including *Sitona indifferens* and *S. scissifrons*, both inhabitants of Missouri. His description of *S. scissifrons* is brief, but it is more accurate and complete than that of *S. indifferens*.

Because the original type series of *S. scissifrons* was destroyed, and because it is now established that only one good native American species inhabits Missouri, in order to fix the identity of *S. scissifrons*, I have designated a specimen collected at Rock Port, Missouri, by R. E. Munson as the Neotype. This Neotype was deposited in the Entomological Collection at the U.S. National Museum, Washington, D.C.

The type specimens of LeConte's *Sitona sordidus* and *S. vittatus* were loaned to me. These have been studied in connection with a large series of specimens from California.

The validation of *Sitona californica* Fahraeus has been considered in some detail in the treatment of this species in the main text of this study.

History

The genus *Sitona* was proposed by Germar (1817) and was subsequently cited by Germar (date ?), Schoenherr (1826, 1834), and Say (1831). Schoenherr (1840) changed the spelling to *Sitones* from which time it had rather wide usage (LeConte and Horn 1876, Casey 1888). Germar's *Sitona* has priority over Schoenherr's *Sitones*.

Sitona is the sole genus of the tribe Sitonini, subfamily Thylacitinae (Kissenger 1964). It is distinguished from all other tribes by the punctuation and pubescence of the mandibles, which are sharp and without a tooth on their internal edge and curved into a hook at the apex. Some 90 to 100 species are widespread in the Nearctic and Palearctic regions. Some of the useful characters for distinguishing this genus have been listed by the following authors of *Sitona*:

"*Character generis*: Antennae breviusculae, subtenues; articulis primis funiculi longiusculis, obconicis, reliquis nodosis; clava oblongoalis; rostrum supra planum aut in medio linea impressum, aut sulcatum; oculi majusculi, in plerisque subrotundati, modice prominuli, in nonnullis oblongi, valde prominuli; thorax subteres, lateribus pone medium rotundatus; elytra elongata, apice rotundata; humeri obtuse angulati" (Schoenherr 1826:134).

"Antennae geniculate, rather short and slender; the scape elongation clavate, reaching to the middle of the eyes; funiculus with the first and second joints rather long, obconic; the remainder nodose; club elongate-ovate, acuminate. Rostrum short nearly horizontal; the apex emarginate, above flat, with an impressed longitudinal line or groove; eyes rather large, sometimes rounded, moderately prominent, or oblong and very prominent. Thorax rounded, with the sides a little dilated beyond the middle, as dilated in the middle; scutellum minute, rounded; elytra elongate, with the apex rounded, the shoulders obtusely angulated; legs moderate; femora incrassated in the middle; tibiae truncate at the apex, unarmed" (Stephens 1831:132).

"Mandibles lacking scar, punctured, and with pubescence" (Fowler 1891:216).

"Antennal grooves deep, short, curving abruptly downwards just behind the antennae, scape reaching middle of eyes, funicle

7-jointed, joints 1 and 2 thick, 3-7 shorter, club elongate, ringed eyes prominent, round to oblong; front coxae contiguous, hind ones widely separated; claws slender, divergent, appendiculate" (Blatchley and Leng 1916: 140).

"Scape shorter than breadth of head including eyes" (Joy 1932:176).

"*Sitona* normally lacks the mandibular scar in the adult and its larva has spiracles with paired annulate air tubes" (Crowson 1955: 165).

"Rostrum broad and short, and with impressed median line; head behind eyes not much broader than base of rostrum" (Kevan 1959:251, 259).

"Tarsal claw with auxiliary clawlike seta" (Kissenger 1964:23).

In this study the male genitalia have proven to be of value in separating the species; female genital structures are poorly developed and of little, if any, value in the classification of species in this genus.

The above characterizations of *Sitona* help to identify this genus. The following are some of the major characteristics which have helped to separate the species of *Sitona*: (1) Inner margin of eye not prominent; inner margin of eye prominent; (2) prothorax with distinct median vitta; prothorax without distinct median vitta; (3) elytra without erect setae; elytra with erect setae; (4) thorax finely punctured; thorax deeply punctured; (5) beak and front sulcate; beak and front not sulcate; (6) aedeagus with pointed median lobe; aedeagus with angular median lobe; (7) size of species specimen (a) small or (b) large; (8) elytra tessellate or not tessellate.

Specimens of a species will fall into one or the other of the above couplets but will also be distinctive in a number of other characteristics. These extrinsic and intrinsic characters within a species, which will affect the color, color pattern, size, and shape of individuals, color and density of body scales, and bodily structures will then need to be carefully studied and recorded. In this study much time has been spent checking type specimens of the Casey Collection with many specimens from type areas. This has necessitated the synonymizing of a number of Casey's species. As early as 1886, Casey disclosed that the only specimen with which he was concerned was the specimen he described. "It will be ob-

served that the descriptions refer in all cases to the single specimen assumed as the type"; and "I have preferred, therefore, in the existing state of knowledge, to describe one definite type and give such general remarks as may indicate the variation exhibited by the material at hand" (Casey 1886).

My study of the Casey Collection of *Sitona* specimens, the comments made by Buchanan, and the observation by R. E. Blackwelder (1950) that "on the average, nearly half of the species named in the collection were described by Casey and consist of a holotype and sometimes a few paratypes," have convinced me that if Casey, as he described the above-mentioned native species, had been provided with more specimens for his study and had noted the extent of variation upon which to base each of his new species, the treatise of the *Sitona* in 1888 would have been much improved.

An examination of Casey's *Sitona* specimens revealed that he had very few specimens of most of the species he described. His *Sitona* paper and the U.S. National Museum catalog accession record of the type specimens of *Sitona*, transferred from the Casey Collection by Buchanan in April 1927, show the following were represented: *extrusus* 3, type (2 paratypes missing) +1 ex. Colo.; *varians* 13, type; *margaritarus* 2, type (paratype missing); *procerus* 1, type; *occidentalis* 2, type (+1 paratype); *eximius* 4, type (+3 paratypes); *montanus* 2, type (+1 paratype); *nebulosus* 1, type; *alternans* 1, type; *osculans* 2, type (paratype missing); *prominens* 2, type (+4 ex.); *hispidiceps* 2, type (1 paratype +6 ex.); *augustulus* 1, type (+1 ex.); *explicitus* 1, type (+10 ex.); *apacheanus* 2, type (paratype missing); *sparsus* 1, type.

NEW TAXA

Sitona alpinensis, n. sp.

Fig. 1

Derm black, scales small, some round, elongate, dense, colored white, brown, black, some iridescent; setae short, black and white, obscurely interspersed among the scales. *Head* as long as rostrum, wider at base than rostrum; interocular space as wide as length of head, occiput punctate, concealed by scales and setae. Eyes large, slightly ovate, some scales, but no long setae over the dorsal inner

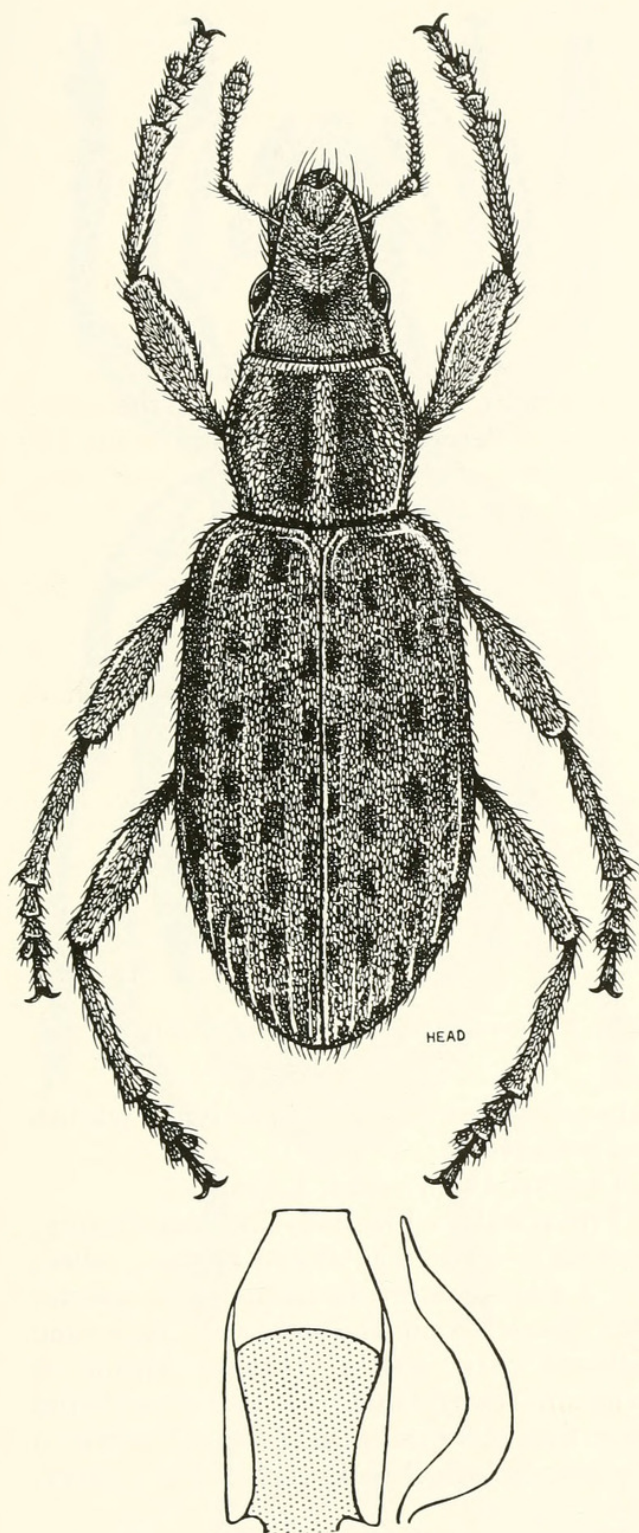


Fig. 1. *Sitona alpinensis*: dorsal aspect of adult, dorsal and lateral aspects of median lobe of male genitalia.

margin of eye. Rostrum concave, sulcus deep, extends from fovea between eyes to apical flattish area of rostrum. Antenna reddish brown; scape extending to middle of eye; first joint of funicle longer than second; second as long as segments 3–4 combined; club as long as segments 4–7 combined; scrobes deep, di-

rected downward, areas covered with scales between posterior margin of scrobe and anterior margin of eye. *Prothorax* convex, densely covered with scales and decumbent setae; widest before the middle, wider than long, constricted and slightly elevated at apex; base and apex truncate; punctures deep and numerous, lateral and medial vitta of white scales and setae; scutellum with white setae. *Elytra* twice as long as wide, sides parallel two-thirds of length, greatest convexity near declivity, costate, striae punctured, extending from base to apex of elytra; with humeral carina; scales small, vitta of white ones extending posteriorly, sutural area with brown scales, some blotches of black scales in declivitous area; apex rounded, moderately acuminate. Legs, posterior femora extending to posterior margin of fourth ventrite; clothed with white decumbent setae, club of femora moderate in size with a few small white scales; prosternal coxal cavities open. Ventrites 1–2 about equal in width, 3–4 shorter and equal in width, segment 5 as wide as 3–4 combined; all segments clothed throughout with white setae and scales. Pro-, meso-, and metasternites uniformly clad with white setae and few scales.

LENGTH: 5.2–7.1 mm; breadth: 2.3–2.9 mm.

TYPE LOCALITY: Holotype, Glacier Lake (Emerald Lake), Mount Timpanogos, Utah County, Utah, elevation 10,000 feet; July 1941 (Vasco M. Tanner); allotype, same data as holotype; 20 paratypes: 7, Glacier Lake (Emerald Lake), Mount Timpanogos, elevation 9,800 feet (L. F. Braithwaite, S. K. Taylor, and V. M. Tanner); 3, Hidden Lake, Mount Timpanogos, Utah County, Utah, elevation 9,700 feet, 27 July 1940 (C. L. Hayward); 3, Aspen Grove, BYU campus environs, Mount Timpanogos, Utah County, Utah, elevation about 6,500 feet (Lowell Miller, V. M. Tanner); 1, Bear Paw Mt., Montana, September 28 (Hubbard and Schwarz); 1, Helena, Montana (collection of C. W. Leng); 1, Gallatin Val., Montana, 10 July 1907 (Wickham Collection, 1933); 1, Gallatin County, Montana, elevation 9,400 feet, 10 July 1900 (E. Koch); 1, Good Hope, N.W.T., 20 June 1931, Lot 237 (Owen Bryant), found on dwarf pea, *Astragalus* sp.; 1, Yukon Crossing, Y.T., Can. 24, Vol. 11 (J. M. Jossup).

The holotype, allotype, and one paratype

are in the Life Science Museum, Brigham Young University. The remaining paratypes were distributed more than a decade ago, but no record was kept of where they were sent.

CHARACTERISTICS: *Sitona alpinensis* is related to *S. cylindricollis* Fabricius in body shape and color of scales, but *alpinensis* is a larger species, the rostrum concave, sulcus deep, extending from fovea between eyes to apical flattish area of rostrum. Eyes are large and prominent. Elytra with well-developed costae at least on odd-numbered interstriae. The genitalia of *alpinensis* are distinctive. The median lobe is broader, shorter, and with two orificial plates. *Sitona alpinensis* is a high-altitude form, having been collected only in the Hudsonian and subalpine zones.

Sitona bryanti, n. sp.

Fig. 2.

Form robust, derm black; scales and setae black, except white scales on medial vitta of prothorax and lateral vittae of elytra; white scales and setae on ventrites and legs. *Head* longer and wider than rostrum; sulcus prominent, deep, extending from fovea between the eyes to carina of the rostral disc; frontal of head between eyes flat; eyes prominent, elongated, two-thirds as long as the head; inner margin slightly elevated above margin of head; deep punctures on head and rostrum; long black and silvery setae on the rostrum and head; scrobes deep and discernible from above; antennae dark rufous; scape of antennae reaching middle of eye; first joint of funicle as long as joints two and three combined; club large, as long as segments 3-7 combined. *Prothorax* slightly wider than long; not constricted at apex; widest at middle, apex and base equal; thickly punctured and covered with black scales and setae, except for a prominent medial vitta of small elongate white scales. *Elytra* three-fourths as wide as long; sides straight and parallel in basal three-fourths, acutely rounded at apex; disc convex, basal area not elevated, surface without striae, middle of disc punctate, closely covered with small elongate black scales and black, decumbent setae; lateral vittae of white scales extending from humeri to umbones; declivitus and covered with white scales and setae from umbones to apex. Legs uniformly brownish in color, clothed with long, decumbent, silvery

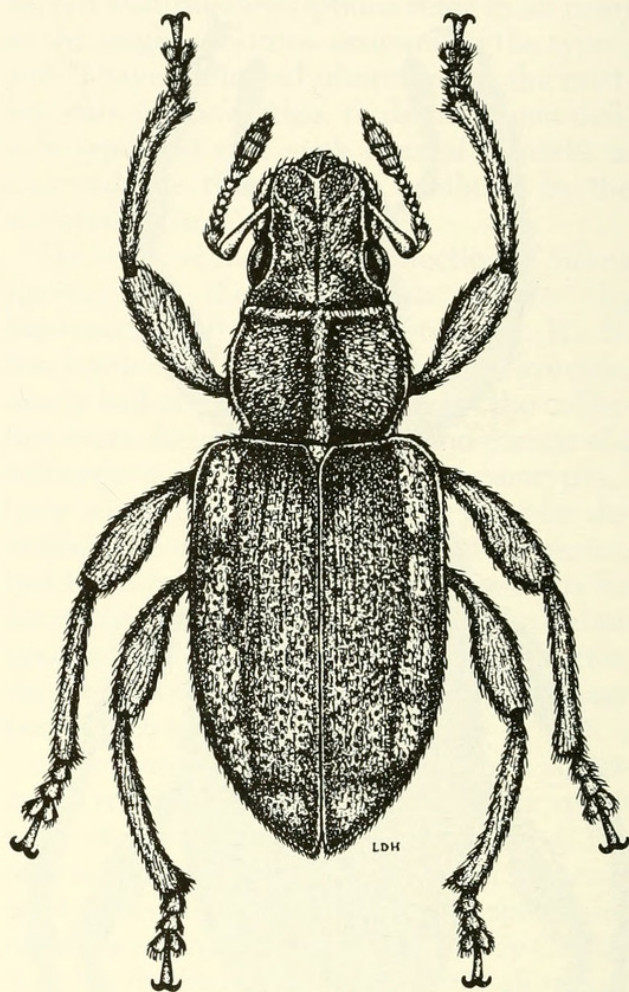


Fig. 2. *Sitona bryanti*: dorsal aspect of adult.

setae; ventrites with thick, low-lying, whitish scales and setae.

LENGTH: 4 mm; width: 1.5 mm.

TYPE LOCALITY: Flagstaff, Coconino County, Arizona. 3-VIII-1936. Owen Bryant, collector. I take pleasure in naming this species after Owen Bryant who was a very discerning collector. He was a frequent visitor at Brigham Young University and contributed more than 800 specimens of Curculionidae to the entomological collection of the University.

The unique holotype is in the Life Science Museum, Brigham Young University.

Sitona bryanti is a distinctive species. It is small in size, robust in form, with broad, short head and rostrum, medial vitta on prothorax and with lateral vittae on elytra.

Sitona oregonensis, n. sp.

Fig. 3.

Derm black, robust, elongate, scales ovate, dense, white, brown, and black in color; black

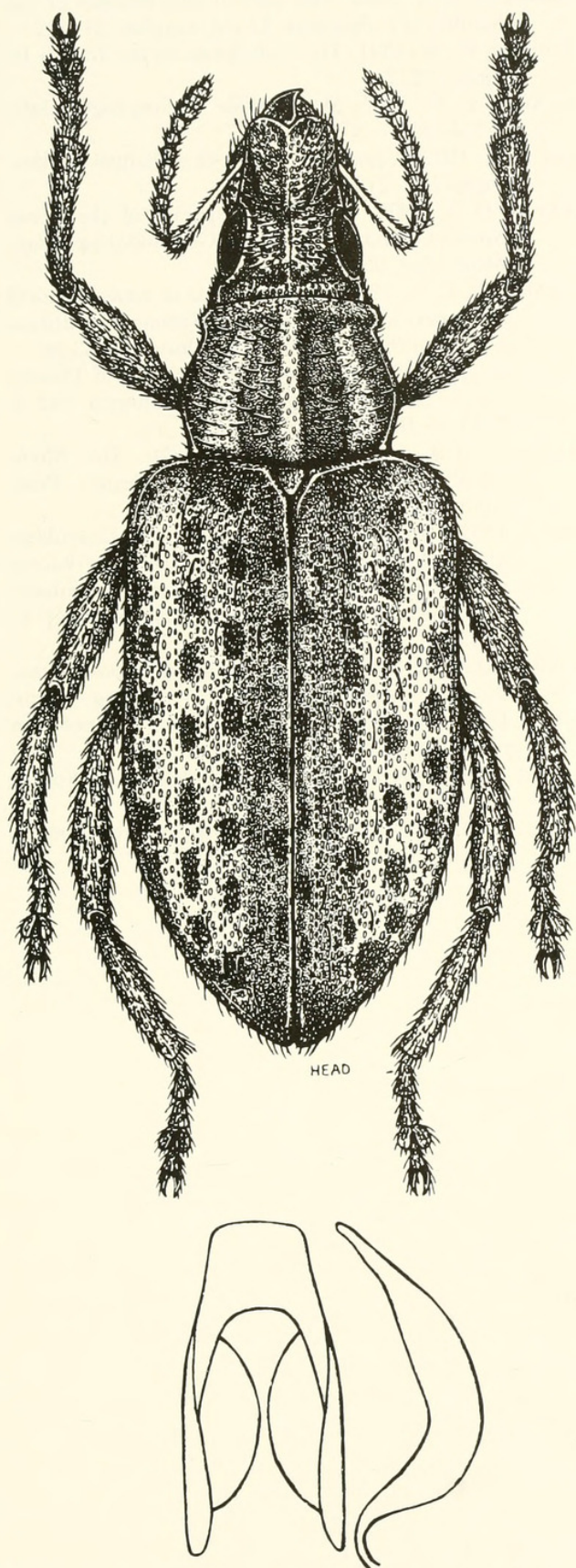


Fig. 3. *Sitona oregonensis*: dorsal aspect of adult, dorsal and lateral aspects of median lobe of male genitalia.

scales in patches along intervals of elytra; scales on ventral segments dense, white,

elongate, and intermixed with low-lying setae. *Head* wider than long; head and beak squamose and punctate; few short brown setae bordering the eyes; long white setae on rostrum, intermixed with iridescent scales; space between eyes level, divided by deep sulcus, which extends to central fovea of rostrum; eyes prominent, noticeable, convex, inner margins slightly elevated above margin of head; antennae dark rufous; first joint of funicle as long as joints two and three combined; scrobes deep and discernible from above. *Prothorax* at middle considerably wider than long; elevated in middle, sloping to apex and base; strongly constricted at one-fifth the length from apex on the sides; base feebly constricted, disc convex, sides arcuate surface punctures obscured by covering of elongate scales; trivittate, marginal stripes well developed, median one narrow; base and apex unequal. Scutellum well developed, covered by white scales. *Elytra* three times as long as the prothorax and about twice as long as wide; sides straight and parallel in basal three-fourths, acutely rounded at apex; disc convex; basal sutural area slightly elevated; intervals tessellate with black scales and setae, medial area with dark bands, lateral portions with bands of white scales; umbra with black scales; punctation obscured by dense covering of scales and setae; sparse white setae along lateral and posterior area. Legs densely covered with light, decumbent setae, scales sparse; venter clad with dense white scales and low-lying setae.

LENGTH: 5.6–6.1 mm; breadth: 2.6–2.9 mm.

The median lobe of the aedeagus is short, narrowed toward the rounded apex.

HOLOTYPE: Tigard, Washington County, Oregon, 11-V-1944 (Anderson), on leaves of lupine. **AlloTYPE:** Tigard, Washington County, Oregon, 11-V-1944 (Anderson). **Paratypes:** 5, Tigard, Washington County, Oregon, 11-V-1944 (Anderson); 5, Cornelius Pass, Washington County, Oregon, 9-IV-1936 (K. Gray and J. Schuh); 2, Portland, Multnomah County, Oregon, 8-V-1941 (J. Schuh) on Russell lupine; 1, Longview, Cowlitz County, Washington, 16-IX-1944 (Anderson); 1, Forest Grove, Washington County, Oregon, 8-V-1938 (mech trap); 1, Sleilacomm, Pierce County, Washington, 24-V-1945 (Forsell) on lupine leaves.

The holotype, allotype, and five paratypes are in the Life Science Museum, Brigham Young University. The remaining paratypes were distributed more than a decade ago, but no record was kept of where they were sent.

The robust size of the females, vittate prothorax, tessellate elytra, elongate, broad, parallel sides, and angular apices of the median lobe of the aedeagus are distinctive characteristics of *oregonensis* which distinguish it from related species *californicus*, *prominens*, and *lupina*.

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