

NEW SPECIES OF CARPHOBORUS EICH. WITH KEY TO SPECIES NORTH OF MEXICO (COLEOPTERA-SCOLYTIDAE)

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While making an intensive study of the bark beetles of Western North America, I noticed that two of the species in the genus *Carphoborus* were new. Since the last key to the species of this genus has been compiled (Swaine, 1918) Dr. Swaine has described five new species which with my two would more than double the number in the genus. I therefore feel that a new key should be made.

I am indebted to the Museum of the California Academy of Sciences for the use of its collection of this genus, and to Dr. E. C. Van Dyke of the University of California for his helpful criticisms.

KEY TO THE SPECIES OF THE GENUS CARPHOBORUS EICHIOFF.

1. The declivital interspaces moderately or feebly, subequally elevated; the front concave at least in the male..... 2
The declivital interspaces alternately unequally prominent..... 5
2. Sutures of the antennal club at least slightly arcuate; declivital interspaces 1 and 3 very feebly serrate in at least one of the sexes..... 3
Sutures of the antennal club nearly straight; declivital interspaces 1 and 3 distinctly serrate 4
3. Sutures of the antennal club transversely arcuate; without an epistomal process extending anteriorly, on *Pinus ponderosa* and *P. lambertiana*. Calif. *simplex* Lec.
Sutures of the antennal club obliquely arcuate; an epistomal process extending anteriorly between the mandibles, on *Pseudotsuga taxifolia*. Calif. *vandykei* n. sp.
4. The elytral declivity moderately and subacutely serrate on alternate interspaces; the elytra reddish, the interspaces roughened, convex, indistinctly clothed with very small yellowish scales not concealing the surface; the front of the female with a blunt median tubercle surmounting the convexity, on *Pinus radiata*. Calif..... *radiata* Sw.
The elytral declivity acutely, rather feebly serrate; the elytra black, reddish on the declivity, the interspaces feebly granulate and feebly convex, densely clothed with greyish scales almost concealing the surface; female with front unarmed, on white spruce. Alta., Man., Eastern slopes of the Rockies across northern Alberta, Saskatchewan, into Manitoba..... *carri* Sw.
5. The elytra lightly punctate-striate, the striae punctures minute. Middle and Southern states *bicristatus* Chap.
The elytra strongly punctate-striate, the striae punctures coarse..... 6
6. Second declivital interspace normally wide. on pines. Calif.... *blaisdelli* Sw.
Second declivital interspace reduced..... 7
7. Second declivital interspace obsolete..... 8
Second declivital interspace narrow..... 10
8. Third and first declivital interspaces subequally elevated..... 9
Third declivital interspace more strongly elevated than the first; antennal club only slightly longer than wide. N. Y., Tenn., Washington, D. C..... *bifurcus* Eich.
9. Third and first declivital interspaces very faintly elevated, on *Pinus*

- sabiniana* and *Pinus jeffreyi*. Calif.....*swainei* n. sp.
 Third and first declivital interspaces moderately elevated, on white spruce.
 Alta.*sansoni* Sw.
10. Second declivital interspace very narrow.....II
 Second declivital interspace moderately narrow, on *Picea canadensis*. N. W.
 Territories*andersoni* Sw.
11. Third declivital interspace very strongly elevated, on red spruce. N. B....
*dunni* Sw.
 Third declivital interspace moderately elevated; antennal club twice as long
 as wide, on *Pinus ponderosa*. B. C., Ut.....*ponderosa* Sw.

***Carpheoborus vandykei* n. sp.**

Length: $1\frac{1}{2}$ to $2\frac{1}{2}$ mm. Head with the front deeply concave, closely, transversely rugose, moderately, deeply, densely punctured and sparsely clothed with scale-like hairs; a single bifid carina-like tubercle medially between the eyes with the points bent anteriorly, simulating a V-shaped carina; median area of the epistoma extends anteriorly between the mandibles, as wide at the base as at the truncate tip, varying in length from moderately long to quite long, the surface is opaque with minute transverse rugosities, at the base there are two deep moderately large punctures, basal margin of the front moderately clothed with long hairs; the concavity is as wide as long, very sparsely punctate with small deep punctures, remainder is minutely, finely, shallowly granulate and very sparsely clothed with small scale-like hairs; sutures of the antennal club are obliquely arcuate, the tip of the club is strongly obliquely arcuate. Pronotum slightly constricted anteriorly, sides arcuate with a shallow transverse impression extending to the disc, densely deeply punctured on the posterior two-thirds and moderately densely punctured on the anterior third, punctures small, moderately clothed with short, scale-like hairs, wider than long 4.0:3.5. Elytra striae deeply impressed with large, deep, closely placed punctures; interspaces slightly wider than the striae, become wider on the declivity except the second which gradually disappears, transversely rugose, finely punctured, and clothed with short scale-like hairs; declivity with a very few, almost obsolete, granule-like separations on the first interspace, third with not many more but slightly larger, fifth and seventh meeting at the declivity, each having a very few serrations, the ninth with several widely spaced serrations and meeting the third near the base of the declivity, the first, third and ninth interspaces are slightly convex, the second and eighth almost obsolete, none of the tubercles of the declivity longer than the scale-like hairs. The venter of the abdomen is very sparsely clothed with stiff bristle-like hairs.

The female has the front with the concavity larger, extending between the eyes, without the tubercle between the eyes; the concavity is sparsely fringed with long hairs, surface glabrous, moderately punctate with deep moderate punctures, except at a small median portion which is smooth and very slightly elevated and very minutely, finely, shallowly granulate. The serrations of the declivity are more distinct and more numerous than in the male.

This species is separated from *C. simplex* Lec. by its obliquely arcuate antennal sutures, oblique truncate tip of the club and by the epistomal process. It is easily distinguished from *C. radiata* Sw. by the antennal club being less than twice as long as wide, the sutures of the club being oblique and strongly

arcuate, the serrations of the elytral declivity less pronounced, and the front of the female unarmed. *C. carri* Sw. differs from this species by being more densely clothed with scale-like hairs and smaller in size.

Holotype and allotype are retained in the author's collection, one pair of paratypes will be placed in the collection of Dr. Van Dyke, deposited in the California Academy of Sciences, San Francisco, one pair will be sent to Dr. Swaine for the Canadian National Collection, one pair in the collection of Mr. Wohletz and the remainder in my own collection.

Long series of this species were collected by Dr. E. C. Van Dyke, Mr. E. F. Wohletz, and myself from beneath the bark of small dead branches of Douglas fir, *Pseudotsugae taxifolia* Lamb, on Mt. St. Helena, Calif., March 29, 1931.

***Carphoborus swainei* n. sp.**

Length : 2-3 mm. Head with the front deeply concave, closely transversely rugose and densely, closely, deeply punctate, very sparsely clothed with short scale-like hairs, anterior margin clothed with moderately long bristle-like hairs; median area of the epistoma extends anteriorly between the mandibles, slightly broader at the base than at the truncate tip, the surface is very finely rugose and opaque; the median tubercle between the eyes appears like two large granules latitudinally side by side on an elevation; the convexity is wider than long, shining, very sparsely punctate with moderately deep, moderate sized punctures, the remainder is minutely, finely, shallowly granulate, and sparsely clothed with small, scale-like hairs; the sutures of the antennal club are somewhat oblique, first suture straight, second slightly arcuate, the apex of the club is scarcely obliquely rounded. Pronotum with the sides slightly arcuate, very slightly sinuate anteriorly, very closely, deeply, moderately punctured on the posterior two-thirds and very faintly, sparsely punctured, densely finely granulate on the anterior third, moderately clothed with short scale-like hairs, wider than long, 3.75:2.5. Basal margin of the elytra with the serrations widely spaced; striae deeply impressed with moderately large punctures closely placed; interspaces uniformly wider than the striae, transversely rugose, clothed with short scale-like hairs; declivity with the first, third, fifth, seventh and ninth interspaces very faintly serrate with granular-like serrations, first moderately elevated, third and ninth distinctly elevated, second obsolete, eighth nearly so, the fifth and seventh and the third and ninth meeting on the declivity. Venter of the abdomen sparsely clothed with stiff moderately long, bristle-like hairs and very sparsely interspaced with short scale-like hairs on all but the first segment.

The female has the front with the concavity extending between the eyes, densely fringed with long hairs, the surface shining and definitely, very minutely, finely, shallowly, reticulate, with only a very few moderate punctures near the edges; without the median tubercle between the eyes as in the male, but with a minute latitudinal carina-like tubercle at the base of the epistomal process; declivital asperities slightly larger than in the male.

This species is separated from *C. blaisdelli* Sw. by its antennal club being longer than wide, the basal suture of the club almost straight, elytral striae only moderately rugose, and the second declivital interspace obsolete. It is readily distinguished from *C. ponderosa* Sw. in that it is a more slender species, its antennal club being less than twice as long as wide, the sutures of the club oblique,

elytral striae only slightly convex, third and first declivital interspaces subequally elevated. It is distinct from *C. bifurcus* Eich., *C. andersoni* Sw., and *C. sansoni* Sw. by the third declivital interspace being decidedly less elevated.

The holotype and allotype will be retained in the author's collection with a number of designated paratypes collected on Mt. Diablo, Calif., February 22, 1931. A long series of this species was collected by the writer from under the bark of small dead branches of Digger pine, *Pinus sabiniana* Doug. Several specimens were taken in the Arroyo Valle, Alameda Co., Calif., by Mr. Wohletz and myself, and a series was also collected by Dr. K. A. Salman on *Pinus jeffreyi* Vasey at Laguna Recreational Area, Cleveland National Forest, Calif., on March 8, 1931. A pair of paratypes will be sent to Dr. Swaine for the Canadian National Collection, one pair will be placed in the collection of Dr. Van Dyke, deposited in the California Academy of Sciences.

NOTES ON PSEUDOLUCANUS PLACIDUS (SAY). (LUCANIDAE,
COLEOPTERA).

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The literature concerning the large Stag-beetle *Pseudolucanus placidus* (Say) contains many conflicting and misleading data. Since the species occurs in exceptional abundance in a very restricted sandy area surrounding the author's home, it became a fairly easy task to check up on these statements. The present paper contains the information gathered during the past several years.

In 1932, the emergence of beetles on an observation plot of some two square yards began on June 3 with a few specimens, rose to the maximum intensity on the 5th and slowed off again in a die-away curve to the 18th of the same month. During this time approximately two hundred specimens were taken from the area, all between 8:45 and 10:00 p. m. (Eastern Daylight Saving Time), i.e., between dusk and dark. No specimens were found above ground before the earlier time, and all apparent emergence was over by the later hour. Several specimens were caught as they flew to the plot; none were allowed to escape from it. The numerical data quoted below are taken from the specimens coming from the experimental area except where otherwise indicated.

In other years, the emergence and flight occurred on very similar dates, although specimens taken as early as May 25th and as late as June 30th are at hand. The beetles come through the sod, boring away from their pupal chambers a cylindrical tunnel of non-uniform course, in diameter an easy fit for their bodies. The explanate tibial apices are used to pack the earth away behind as fast as it is dug from in front. The last portion of this exit-way is burrowed open to the surface during the afternoon preceding emergence, a slight amount of sand pushed away from the mouth of the hole, and during the early evening the occupant may be induced to bite at a match or the finger tip, and to hold on long enough to be drawn forth. It seems that all are facing out, and clinging to the sides of the hole, between one and a fraction, and two inches below the surface of the ground.

P. placidus, as indicated above, has a rather surly disposition despite its name, but the insect is excessively stupid, and its temper consequently of little import. Evidence of its lack of intelligence is the rarity with which a specimen,