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A REVISION OF THE SPECIES OF THE GENUS *POLYCESTA* OCCURRING IN THE UNITED STATES (COLEOPTERA, BUPRESTIDAE)¹

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INTRODUCTION

The buprestid beetles belonging to the genus *Polycesta* have long been of interest to coleopterists because of their scarcity, their interesting discontinuous distributional pattern, and their unique appearance. The classification of these insects, however, has not been well established, primarily because of the variation of structural characters many of them exhibit, but also because the distribution of each of the species has not been clearly understood.

With the hope of finding stable taxonomic characters that could be used as a basis for species classification, a study was made of the male genitalia of the members of this genus known to occur within the boundaries of the United States. Differences in the structure of this organ have been found that allow for a ready differentiation of the species. Nearly 400 specimens have been examined. From these, distributional and external morphological data have been gathered and analyzed. These data have also helped immeasurably to clarify the species problem present in this genus. The correlation of the genitalic differences with the more constant external morphological differences, together with the existing distributional and biological data, will, it is hoped, place the taxonomy of the United States species of *Polycesta* on a firmer basis than formerly.

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The present paper recognizes 11 species as occurring in the United States, four of which are described as new.

ACKNOWLEDGMENTS

The writer is especially indebted to Dr. E. G. Linsley, under whom this work was begun, and Dr. M. A. Cazier for their valuable suggestions and criticisms. Dr. Cazier has further assisted this study by lending the writer a large number of specimens from the collection of the American Museum of Natural History. To Mr. J. N. Knull and Dr. H. C. Manis appreciation is expressed for their aid and loan of material. For notes and suggestions or for the loan of material from their private collections or collections in their care thanks are gratefully given to Messrs. F. M. Beer, R. G. Dahl, K. S. Hagen, J. R. Helfer, P. D. Hurd, Jr., F. T. Scott, R. van den Basch, A. J. Walz, and B. E. White, and to Drs. M. T. James, I. La Rivers, E. S. Ross, R. L. Usinger, and E. C. Van Dyke. Thanks are also extended to Mr. W. S. Fisher for comparing specimens with material in the United States National Museum and to Dr. R. E. Blackwelder for notes concerning the emendation of names.

DISTRIBUTION

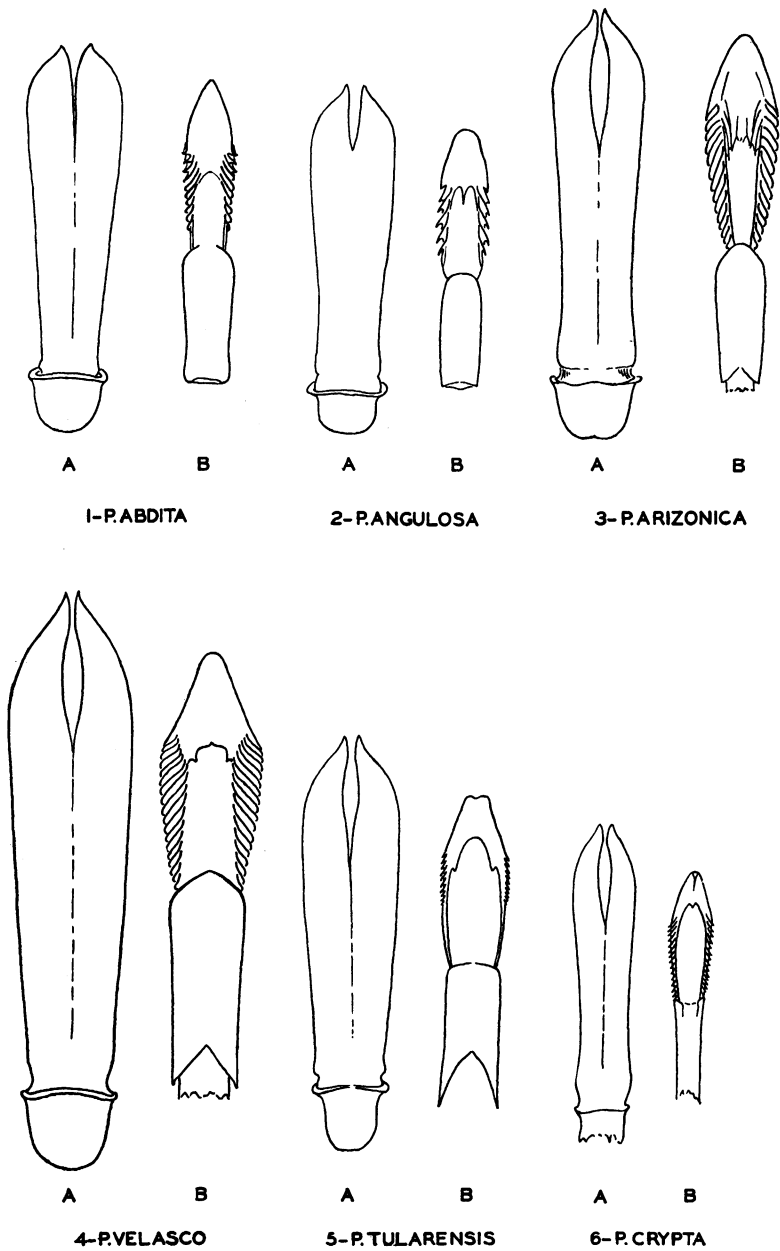
Approximately 45 species are now recognized as belonging to the genus *Polycesta*, the majority of which occur in the New World. Two species have been described from China, and eight are known from Africa. In the Western Hemisphere the largest number of species are recorded from the tropical and subtropical areas of the West Indies and Central and South America, with only a comparatively few ranging into the temperate regions. Eleven species are known from the United States, two of which also occur outside its boundaries. Of these, *P. angulosa* is known only from Cuba and Florida, while *P. velasco* ranges throughout the southwestern United States and Sonoran Mexico. With regard to the remaining nine species endemic to the United States, three do not occur in the state of California. *P. abdita* is known only from the Florida Keys, *P. elata* occurs in Texas and Arkansas, and *P. arizonica* presents a spotted distributional pattern in Arizona, New Mexico, and western Texas. Of the California species, only one, *P. californica*, also occurs outside the limits of this state. It ranges along the Pacific coast north into Oregon and possibly Washing-

ton. However, in the southern half of California it occurs in a sympatric manner with five species which are endemic to this region. Thus it is seen that six species of *Polycesta* are rather closely associated with one another within a fairly small area. This area, which is west of the true desert regions, extends north from San Diego County in two forks. One follows the coast range up to the vicinity of the Mt. Hamilton Range, and the other follows the inland mountain ranges up to the Sequoia National Park region. At present, the distribution of the six species within this area is not fully understood, and additional collections are needed in order to bring about a clarification of the problem and the factors responsible for it. However, from a study of available specimens it has been noted that *P. californica* and *P. crypta* seem to occur throughout the greatest part of this area, *P. hageni*, *P. cazieri*, and *P. cyanea* appear to be restricted to certain parts of it, while *P. tularensis* is known only from two widely separated localities, each in the northern part of each fork.

PHYLOGENY AND SPECIATION

On the basis of morphological characters, the United States species of *Polycesta* are readily separated into three well-defined groups, those of *abditata*, *arizonica*, and *elata*. The presence of pronotal depressions, structure of the elytral costae, shape of the hind margins of the abdominal sternites, and the structure of the male genitalia are the characters that have been used to form the basis upon which the groups have been separated. These characters have also been used as indicators of the degree of group relationships.

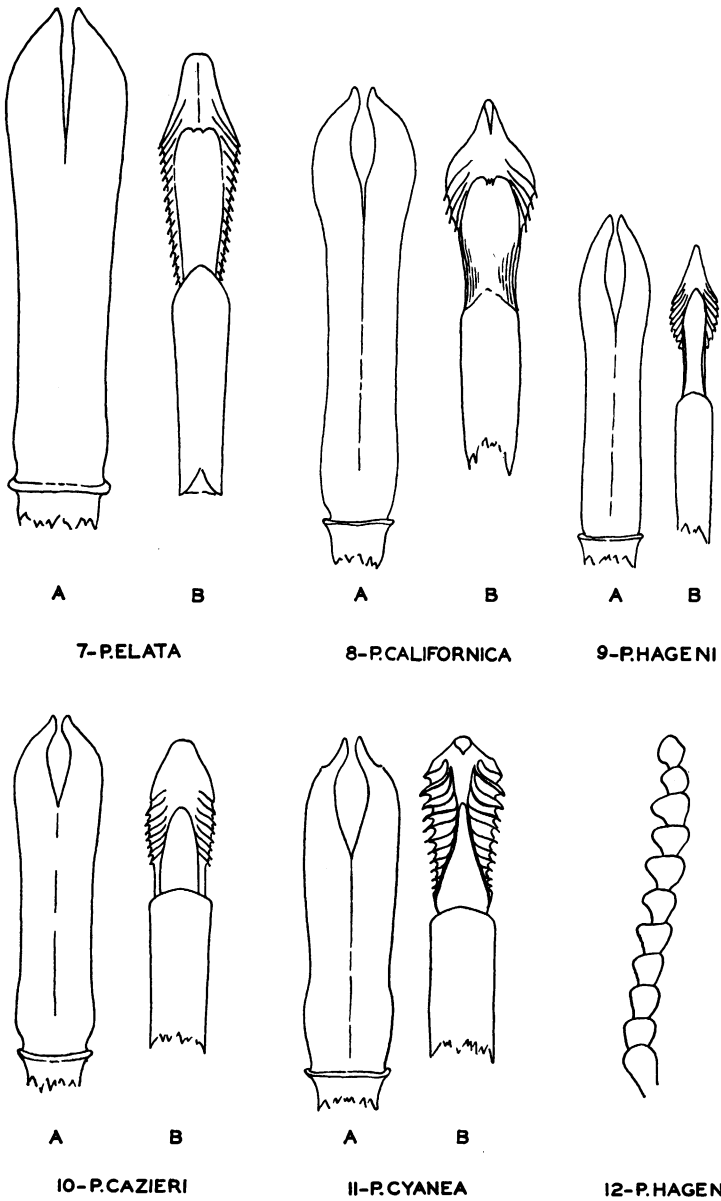
The *abditata* group, which includes *P. abditata* and *P. angulosa*, is quite distantly related to the others. Its affinities are with the West Indian forms which have not been available for study and thus it will not enter into this discussion. However, it must be pointed out that the *abditata* group does show a slight relationship to the *elata* group by possessing several characters in common with that group. The pronotum has a longitudinal median depression in each, but in the case of the former, the lateral depressions are just behind the front angles of the pronotum while in the latter they are just behind the middle. The shape of the hind margins of the abdominal sternites also shows some similarities, as do the male genitalia.



FIGS. 1-6. Dorsal views of the male genitalia of the species of *Polycesta*.
A. Lateral lobes. B. Median lobe.

An even weaker relationship appears to exist between the *arizonica* and *elata* groups. Apparently the *arizonica* group broke off from the others at a very early date; however, the structure of the male genitalia indicates common ancestry. Only two species are known from the *arizonica* group, *P. arizonica* and *P. velasco*, the latter being the more specialized. Apparently, *P. arizonica*, or more likely its basic stock, occupied a wide, continuous range in the southwestern United States prior to the advent of the arid desert areas during the Miocene. With increasing aridity it is possible that this species, with its host plants, was forced into the isolated spots it now occupies in the Southwest. However, in response to aridity *P. velasco* developed and was able to inhabit the great desert areas of this region.

This aridity apparently brought about changes in the *elata* group as well. First of all, however, it must be noted that the *elata* group may be further divided into distinct subgroups, *elata*, *californica*, and *crypta*. The basic stock of these subgroups probably occupied the same general area as the basic stock of the *arizonica* group. When the arid conditions were manifested it was unable to adapt itself to these conditions and thus was forced westward and eastward away from the arid regions. East of the deserts, *P. elata* developed from this basic stock. This species shows closer affinities to the members of the *abditata* and *arizonica* groups than do the other species in the *elata* group. West of the deserts the *californica* and *crypta* subgroups have arisen. The *californica* subgroup contains *P. californica*, which has been able to occupy very large areas of California and Oregon, and the specialized and closely related *P. hageni*. This latter species has broken away from the *P. californica* stock in response to the more or less arid conditions present along the western margin of the Great Basin region in the vicinity of the southern Sierra Nevada Mountains. The *crypta* subgroup occurs only in a rather small area in southern California and yet is represented by four rather specialized species. *P. crypta* is the most primitive of these and occupies more of this area than the others. *P. tularensis* has become more or less stabilized morphologically and is known only from two limited areas. *P. cazieri* and *P. cyanea* are very closely related but are geographically distinct. Both are undergoing considerable evolutionary change at the present and appear to have developed along a separate line from that of *P. tularensis*.



FIGS. 7-11. Dorsal views of the male genitalia of the species of *Polycesta*.
 A. Lateral lobes. B. Median lobe.

FIG. 12. Antenna of *P. hageni*.

CLASSIFICATION

GENUS **POLYCESTA** SOLIER

Polycesta SOLIER, 1833, Ann. Ent. Soc. France, ser. 1, vol. 2, p. 281. MANNERHEIM, 1837, Bull. Soc. Nat. Moscou, vol. 7, p. 36. CASTELNAU AND GORY, 1837, Histoire naturelle . . . des insectes coléoptères, buprestides, vol. 2, p. 1. LACORDAIRE, 1857, Genera des coléoptères, vol. 4, p. 62. MARSEUL, 1865, L'Abeille, vol. 2, p. 258. LECONTE, 1859, Proc. Acad. Nat. Sci. Philadelphia, (1858), vol. 10, p. 68. LECONTE AND HORN, 1883, Smithsonian Misc. Coll., no. 507, p. 199. KERREMANS, 1893, Ann. Ent. Soc. Belgique, vol. 37, p. 113; 1902, in Wytzman, Genera insectorum, fasc. 12, no. 1, p. 25; 1904, Monographie des buprestides, vol. 1, p. 469. SCHAEFFER, 1906, Canadian Ent., vol. 38, p. 23. BURKE, 1917, Bull. U. S. Dept. Agr., prof. papers, no. 437, p. 6. FISHER, 1919, Proc. Ent. Soc. Washington, vol. 21, no. 4, p. 91. GOOD, 1925, Ann. Ent. Soc. Amer., vol. 18, p. 270. FISHER, 1925, Proc. U. S. Natl. Mus., vol. 65, p. 6. CHAMBERLIN, 1926, Catalogue of the Buprestidae of North America, p. 230; 1933, Jour. New York Ent. Soc., vol. 41, p. 37.

Lycaste GISTL, 1834, Die Insecten-Doubletten aus der Sammlung des Rudolph von Jenison-Walworth. MANNERHEIM, 1837, Bull. Soc. Nat. Moscou, vol. 7, p. 36.

Nemaphorus SOLIER, 1851, in Gay, Historia fisica y politica de Chile, Zoologia, vol. 4, p. 490.

Body more or less robust to elongate, feebly convex, attenuate posteriorly, blackish or dark bronze in color. Head vertical; front flat or slightly concave, with or without a median carina which may take the form of an inverted "Y"; clypeus variable in front, truncate or emarginate; antennal cavities rather small, round, completely closed, bordered posteriorly by a narrow carina; antennae rather slender, variable, first segment elongate, moderately clavate at apex, second segment short, third segment rather subcylindrical, longer than second, fourth segment moderately clavate, serrate from fifth segment, segments gradually becoming more serrate and shorter in length from fifth to eleventh segments, eleventh segment rounded at apex; eyes rather large and convex, elliptical, rather narrow, much closer to each other at vertex than at bottom. Pronotum transverse; sides broadly rounded to angulate; hind margin bisinuate, fitting closely to elytra; disk flattened or with median and lateral depressions. Scutellum visible, small, usually convex and oval in shape. Elytra usually coarsely punctured with a variable number of elevated longitudinal costae; sides more or less sinuate near base, usually serrate near apex. Prosternum broad, rather convex; front margin more or less truncate or feebly bisinuate; prosternal process rather broad and flat, sides parallel to behind front coxae,

apex broadly rounded. Sternal cavity formed entirely by mesosternum which is deeply emarginate in front, the lateral branches broad and diverging, expanded at apices. Posterior coxae rather narrow and feebly dilated internally; front margin more or less transverse, strongly sinuate; hind margin broadly arcuately emarginate, often feebly sinuate, notched near trochanter. Abdomen with sutures between sternites variable in shape. Legs moderately long; femora robust to moderately flattened, feebly bowed; tibiae elongate, cylindrical, feebly bowed, apices slightly dilated, bearing a pair of spines; tarsi compressed and feebly developed, first segment moderately elongate; second and third segments triangular and about equal in length, third with or without a membranous lobe beneath, fourth segment rather broad, strongly triangular, with a membranous lobe beneath, fifth segment elongate, obconical, tarsal claws simple.

GENOTYPES: Of *Polycesta*, *Buprestis porcata* Fabricius; of *Lycaste*, unknown; of *Nemaphorus*, *Nemaphorus costatus* Solier.

The genus *Polycesta* belongs to the tribe Acmaeoderini and is represented in the United States along with five other members of this tribe, *Chrysophana*, *Acmaeodera*, *Acmaeoderoides*, *Ptosima*, and *Paratyndaris*. From these it differs by having simple tarsal claws. In general it may be further differentiated by its larger size, blackish or bronze color, and by its costate and coarsely punctured elytra.

Apparently the members of this genus are in a state of evolutionary plasticity at the present, which accounts for the rather great variation within the species and for the difficulties which have been encountered in attempting their classification.

DISCUSSION OF CHARACTERS

HEAD: The front may be concave, flattened or slightly convex, with or without a median longitudinal carina. In *P. elata* this carina takes the form of an inverted "Y." With *P. californica* there may be a small, smooth callosity above the base of each antenna. The front margin of the clypeus is either truncate or emarginate, but too variable to be of much value as a taxonomic character. The occiput bears a small, smooth median area which contains a fine impressed line in several species. Nearly all the species have the antennal segments longer than broad, shining and shallowly reticulate; however, the antennal segments

of *P. hageni* (fig. 12) are opaque and more deeply reticulate, with segments four to seven distinctly broader than long.

PRONOTUM: The general shape is rather variable, but several species may be identified by the degree of expansion of the side margins and whether they are angulate or broadly rounded. Several excellent characters are to be found on the disk. The *arizonica* group has the disk flattened along the middle, but the extreme base may be slightly depressed. The *abdit*a group has a broad median depression extending from the base to the front margin, and in addition there is a feeble, round, lateral depression just behind the front angles. The *elata* group also has a broad median depression extending from base to apex, but the small, round lateral depressions are behind the middle near the expanded side margins. The punctuation of the disk may aid in separating species, depending primarily on the placement and abundance of the punctures.

SCUTELLUM: There are definite differences in the shape of this structure between widely separated species. However, the scutellum is in general too variable to be of much value in distinguishing closely related species.

ELYTRA: These are of great importance for they offer differences in shape, punctuation, number of costae, and, to a lesser extent, the nature of the apical spines. In a few species the lateral margins more or less gradually taper from the apical third to the apices, presenting a slender appearance. In others the lateral margins are much more abruptly descending to the apices, giving the insect a much more robust appearance. The elytra of *P. angulosa* are very coarsely and deeply punctured, while those of the majority of the remaining species are rather coarsely and more shallowly punctured. *P. velasco* has the elytra rather indistinctly punctured, the punctures being quite shallow. Nearly all of the species have three entire longitudinal costae on each elytron, *angulosa* normally has only one, while *velasco* has all of the interstitial spaces costate. The short scutellar costae, those that arise at the base of the elytra between the suture and the first main interstitial space and extend somewhat obliquely to near the basal third of the suture, are present in the *abdit*a and *arizonica* groups. However, they are usually only faintly indicated on *P. angulosa*, and are entirely absent in the *elata* group.

PROSTERNUM: Differences may be seen in the shape of the

front margin of the prosternum, but they are not present to the degree which warrants their use at the present time.

LEGS: The hind margin of the posterior coxae presents differences in the degree of emargination between the species. These differences are too gradual between closely related species to be used as a taxonomic character in this paper. Both the *abdit*a and *arizonica* groups have a broad membranous lobe beneath the third and fourth tarsal segments. However, in the *elata* group, this lobe is absent from the third tarsal segments and is present only beneath the fourth tarsal segments. *P. tularensis* has this lobe considerably reduced in size.

ABDOMEN: In two of the groups the males and females may be readily distinguished on the basis of the character of the first abdominal sternite. In the *abdit*a group the males have a dense patch of yellowish pubescence at the middle of this sternite; the females lack this dense patch. In the *elata* group the males have the first abdominal sternite swollen longitudinally along the middle, especially towards the base. This area on the females is quite distinctly flattened. The shape of the hind margins of the first, second, and last abdominal sternites may be of considerable importance in separating species. Moreover, the last abdominal sternite may be used to separate the males and females of all groups. In general, the apex of the last abdominal sternite is much more narrowed and more prolonged in the males.

GENITALIA: All the species may be readily separated on the basis of differences in the male genitalia (figs. 1-11). The more important differences are to be found on the median lobe, which necessitates its removal from the lateral lobes. The presence and character of lateral plate-like structures on the median lobe and its general shape are of primary importance in separating species, and the general shape of the lateral lobes may also be of value. The genitalia show variation within a single species, as would be expected. The extremes of this variation have been associated with the typical forms very easily in all cases.

KEY TO THE SPECIES

1. Pronotum with a broad median depression and an inconspicuous lateral depression behind front angles, sides angulate; male with a densely pubescent, yellowish spot at middle of first abdominal sternite. Florida.....2
- Pronotum without depressions or with a broad median depression and a small lateral depression behind middle, sides broadly rounded; male

- without a pubescent spot on first abdominal sternite. Pacific coast states and southwestern United States.....3
2. Black, elytra piceous or ferrugineous; each elytron with two or three entire longitudinal costae, rather densely punctured, punctures rather coarse and round, forming striae between costae, scutellar costa distinct...*abdita*
- Black with distinct aeneous tinge; each elytron with at most two entire longitudinal costae, densely punctured with very coarse deep punctures, scutellar costae usually faintly indicated.....*angulosa*
3. Pronotum without distinct depressions, at most the disk may be flattened; elytra with distinct scutellar costae; third and fourth tarsal segments with membranous lobes beneath.....4
- Pronotum with a broad median and narrow lateral depressions behind middle; elytra with the short scutellar costae obsolete; only fourth tarsal segments with membranous lobes beneath.....5
4. Elytra black with reddish green luster, alternate interstitial spaces costate, apices widened internally.....*arizonica*
- Elytra shining black, all interstitial spaces elevated, apices not widened internally.....*velasco*
5. Antennae slender, shining, segments four to seven longer than broad.....6
- Antennae short, rather dull, segments four to seven broader than long...*hageni*
6. Upper surface bronze, body more or less elongate; lateral margins of elytra gradually tapering to apices; front of head carinate.....7
- Upper surface black, body usually more or less robust; lateral margins of elytra more abruptly descending to apices; front of head with or without a median carina.....8
7. Larger (15 to 25 mm.); front of head with an inverted Y-shaped median carina; hind margins of second, third, and fourth abdominal sternites slightly prolonged at sides. Texas and Arkansas.....*elata*
- Smaller (9 to 18.5 mm.); front of head normally with a median longitudinal carina and a small, smooth callus above the base of each antenna; hind margins of second, third, and fourth abdominal sternites more or less truncate. Pacific coast states.....*californica*
8. Front of head with a median longitudinal carina; occiput with a small, smooth median area; apices of elytra usually with conspicuous spines; under surface blue black or bronze black.....9
- Front of head without a median longitudinal carina, at most a smooth callosity at vertex; occiput densely and roughly punctured; apices of elytra normally with short indistinct spines; under surface black.....10
9. Rather elongate, length of elytra more than four times longer than length of pronotum; apical elytral spines normally extending beyond sutural spines; fourth tarsal segment with a broad membranous lobe beneath; under surface bronze black.....*crypta*
- Rather robust, length of elytra less than four times longer than length of pronotum; elytra terminating in sutural spines; fourth tarsal segment with a narrow membranous lobe beneath; under surface blue black.....*tularensis*
10. Front of head usually concave; lateral margins of median lobe of male genitalia with five to eight rather inconspicuous lateral processes, pro-

- duced somewhat posteriorly and flattened against the median lobe, their rims not attaining the midline. Southern coast ranges, California. . . *cazieri*
- Front of head usually flattened; lateral margins of median lobe of male genitalia with seven to 11 prominent lateral processes, anterior-posteriorly flattened and extending out nearly at right angles, their rims extending nearly to midline of median lobe, those processes nearest the apex most conspicuous. Southern Sierra Nevada to the San Jacinto Mountains, California. *cyanea*

***Polycesta arizonica* Schaeffer**

Polycesta arizonica SCHAEFFER, 1906, Canadian Ent., vol. 38, p. 21. FALL, 1906, Ent. News, vol. 17, p. 166. CHAMBERLIN, 1926, Catalogue of the Buprestidae of North America, p. 230; 1933, Jour. New York Ent. Soc., vol. 41, p. 39.

MALE: Slender, medium sized, rather feebly shining, black with a reddish green luster.

Head with front convex, with a slight depression above clypeus, with or without a median carina, densely, irregularly, and rather finely punctured, rather densely clothed with short, suberect, silvery hairs; occiput with a smooth median area, more sparsely punctured than front, nearly glabrous; antennae slender, black, rather sparsely clothed with short, fine, pale hairs, segments longer than broad, finely, inconspicuously reticulate; clypeus very broadly and shallowly, triangularly emarginate in front, front angles narrowly rounded.

Pronotum transverse, approximately twice as broad as long, front narrower than base, widest at basal third; front margin feebly emarginate with a broad lobe at middle, a row of fine, silvery hairs extending from under front margin nearly to eyes on either side of middle; sides rather feebly, arcuately rounded; hind angles acute, hidden under front margin of elytra; basal margin broadly bisinuate; surface with disk flattened, slightly depressed at middle near base, densely, rather finely punctured, reticulate, except for a smooth, narrow median line extending from base to front margin which bears a finely impressed line basally, rather densely clothed with fine, short, silvery hairs along sides.

Scutellum nearly square, flattened or impressed, nearly smooth, glabrous.

Elytra as wide as pronotum, slightly more than four times longer than length of pronotum; humeri obsolete, humeral angles obtusely angulate; sides very feebly sinuate to behind middle, then gradually, somewhat arcuately tapering to apices; lateral margins coarsely and irregularly spinose slightly before and at apices;

sutural margins divergent before apices, expanded at apices; scutellar costae distinct; striae consisting of rows of moderate-sized, irregular punctures, separated from each other by nearly their own widths; second and fourth interstitial spaces costate, entire, sinuate, sparsely punctured with small, round punctures along sides of costae; sixth interstitial spaces sparsely and irregularly punctured with small, round punctures, feebly costate at middle, somewhat sinuate; surface sparsely clothed with very short, erect, silvery hairs along lateral margins.

Under surface with thoracic sternites finely, densely punctured along sides, median areas smooth except for a few small punctures, pubescence rather dense, mainly confined to the sides, consisting of rather short, semirecumbent, silvery hairs, front margin of prosternum strongly bisinuate; abdominal sternites finely, densely punctured along sides, sparsely punctured at middle, impunctate along hind margins, pubescence as on thoracic sternites, hind margin of first abdominal sternite truncate, more or less obsolete at middle, hind margin of second abdominal sternite broadly lobed at middle, semicircularly emarginate near sides, acutely prolonged at sides, hind margins of third and fourth abdominal sternites broadly and feebly rounded posteriorly, prolonged at the sides, last abdominal sternite very broadly triangular, hind margin arcuate, narrowly prolonged at apex, disk rather finely and densely punctured. Third and fourth tarsal segments with a broad membranous lobe beneath.

Length: 11.5 mm. to 16.3 mm.

FEMALE: Differs from the male by having the hind margins of the first four abdominal sternites feebly lobed at middle, slightly prolonged at the sides; last abdominal sternite triangularly prolonged, side margins straight, oblique, hind margin truncate, feebly notched at middle, disk with a narrowly raised median line near apex.

Length: 18 mm. to 23.3 mm.

TYPE LOCALITY: Palmerlee, Cochise County, Arizona.

RECORDED DISTRIBUTION: Arizona: Palmerlee, Cochise County; Catalina Mountains; Redington; Huachuca Mountains; Santa Rita Mountains.

MATERIAL EXAMINED: Arizona: Prescott, June 30 (D. J. and J. N. Knull); Santa Rita Mountains, July 26 (W. J. Chamberlin); Chochise County, July 20, 1908 (V. W. Owen); Chiricahua Mountains, August (D. K. Duncan); Huachuca Mountains,

July 10 to 16; Carr Canyon, Huachuca Mountains, June 6, 1930 (E. G. Linsley); Miller Canyon, Huachuca Mountains, July 7 and 10 (H. W. Wenzel). New Mexico: Silver City, August 1, 1933. Texas: Davis Mountains, July 6 (J. N. Knull); Chisos Mountains, July 16 (H. W. Wenzel); July 9, 1939, and July 17, 1946 (D. J. and J. N. Knull).

Hosts: Reared and collected from *Quercus hypoleuca* and *Quercus* spp.

This species appears to occupy a rather large area in the southwestern United States, but it is restricted within this area to more or less isolated spots where its host plants may be found. Thus it is to be found in the mountainous regions of the Southwest where oaks occur. In contrast, *P. velasco*, a closely related species, occurs at the lower elevations in the southwestern United States and northern Mexico in the typical desert area. Fall (1906) records *P. arizonica* from Fort Yuma, California (which was located across the Colorado River from the present town of Yuma, Arizona). However, it is believed that this record was based on incorrectly determined or mislabeled material, for this locality is in the typical desert area far removed from areas where the known hosts of *P. arizonica* occur.

The only species with which *P. arizonica* could be confused is *P. velasco*. It may be readily separated, however, by being smaller and narrower, by having the alternate interstitial spaces of the elytra costate, by having the sutural margins of the elytra widened at the apices and by exhibiting a very distinctive reddish green luster.

There is a female specimen from the Huachuca Mountains, Arizona, in the Van Dyke collection which differs slightly from typical examples of *P. arizonica*. The last abdominal sternite of this specimen has a very prominent, median, longitudinal carina near the apex, the side margins are slightly arcuate, and the apex is very narrowly rounded without any indication of a notch.

***Polycesta velasco* Castelnau and Gory**

Polycesta velasco CASTELNAU AND GORY, 1837, Histoire naturelle . . . des insectes coléoptères, buprestides, vol. 2, p. 5. LECONTE, 1859, Proc. Acad. Nat. Sci. Philadelphia, (1858), vol. 10, p. 68; 1859, Trans. Amer. Phil. Soc., vol. 11, p. 221. CROTCH, 1873, Proc. Acad. Nat. Sci. Philadelphia, vol. 35, p. 89. WATERHOUSE, 1882, Biologia Centrali-Americana, Coleoptera, vol. 3, no. 1, p. 18. HORN, 1894, Proc. California Acad. Sci., ser. 2, vol. 4, p. 328. WICKHAM, 1895, Canadian Ent., vol. 27, p. 294 (misidentification); 1898, Bull. Lab. Nat. Hist.

Univ. Iowa, vol. 4, no. 3, p. 305. FALL, 1901, Occas. Papers California Acad. Sci., vol. 8, p. 118. WATERHOUSE, 1904, Ann. Mag. Nat. Hist., ser. 7, vol. 14, p. 258. KERREMANS, 1904, Monographie des buprestides, vol. 1, p. 496. FALL, 1905, Ent. News, vol. 16, p. 73; 1906, Ent. News, vol. 17, p. 166. SCHAEFFER, 1906, Canadian Ent., vol. 38, p. 23. KERREMANS, 1906, Monographie des buprestides, vol. 2, p. 612. FALL, 1910, Trans. Amer. Ent. Soc., vol. 36, no. 2, p. 138. BURKE, 1917, Jour. Econ. Ent., vol. 10, p. 329; 1917, Bull. U. S. Dept. Agr., no. 437, pl. 4, fig. 4. ESSIG, 1926, Insects of western North America, p. 395. CHAMBERLIN, 1926, Catalogue of the Buprestidae of North America, p. 232. THERY, 1927, Ann. Ent. Soc. France, vol. 96, p. 249. CHAMBERLIN, 1933, Jour. New York Ent. Soc., vol. 41, p. 38. MOORE, 1937, Occas. Papers San Diego Nat. Hist. Soc., no. 2, p. 50. VAN DYKE, 1942, Proc. California Acad. Sci., ser. 4, vol. 24, no. 3, p. 98.

MALE: Rather slender, large sized, shining, black.

Head with front feebly depressed, rather moderately and irregularly punctured, punctures of moderate size, rather densely clothed with semirecumbent, silvery hairs; occiput with a smooth median area bearing a finely impressed line, more sparsely, finely, and uniformly punctured than front, nearly glabrous; antennae slender, black, moderately clothed with short, brownish hairs, segments longer than broad, finely, inconspicuously reticulate; clypeus very broadly and shallowly, arcuately emarginate in front, front angles broadly rounded.

Pronotum transverse, approximately twice as broad as long, front narrower than base; front margin feebly bisinuate, a row of fine silvery hairs extending from under front margin nearly to eyes on either side of middle; sides arcuate, somewhat expanded, widest at basal third; hind angles acute, concealed beneath front margin of elytra; basal margin broadly and strongly bisinuate; surface with disk flattened, slightly depressed at middle of base, rather sparsely punctured, punctures of moderate size, lateral areas more coarsely, densely punctured, reticulate, a narrow, smooth median area extending from base to middle, rather moderately clothed with fine, short, semirecumbent, silvery hairs near sides.

Scutellum nearly round, flattened, nearly smooth, glabrous.

Elytra slightly narrower than pronotum, four times longer than length of pronotum; humeri inconspicuous, humeral angles obtusely angulate; sides feebly sinuate to in front of apical third, then gradually rather arcuate to apices; lateral margins rather coarsely, irregularly spinose slightly before and at apices; sutural margins not expanded at apices; scutellar costae distinct; all

interstitial spaces costate, costae most conspicuous on those nearest suture, sides of costae bearing rows of fine punctures, striae consisting of moderate-sized, irregular, shallow punctures, most conspicuous near sides; surface sparsely clothed with very short, erect silvery hairs.

Under surface rather finely and moderately punctured, nearly impunctate on median areas, densely clothed with rather long, silvery, semirecumbent hairs along sides, sparsely pubescent on median areas; prosternum swollen in front of fore coxae, front margin bilobed; hind margin of first abdominal sternite broadly lobed at middle; hind margin of second abdominal sternite bisinuate, feebly prolonged at sides; hind margins of third and fourth abdominal sternites nearly truncate, feebly prolonged at sides; last abdominal sternite broadly triangular, narrowly prolonged at apex, side margins arcuately rounded, sides of prolongation nearly parallel, hind margin broadly rounded, basal two-thirds of prolongation with a strong median carina which is acute at apex. Third and fourth tarsal segments with a broad membranous lobe beneath.

Length: 15 mm. to 21 mm.

FEMALE: Differs from the male by having the hind margin of first abdominal sternite broadly but feebly lobed at middle; hind margins of second, third, and fourth abdominal sternites nearly truncate, slightly prolonged at sides; last abdominal sternite triangular, more or less elongate, lateral margins feebly arcuate, hind margin very broadly rounded, a transverse sub-apical carina slightly indicated in front of hind margin.

Length: 19.5 mm. to 27.5 mm.

TYPE LOCALITY: Mexico.

RECORDED DISTRIBUTION: Mexico: Lower California. California: Indio; San Diego County; Devil's Canyon, San Diego County. Arizona: Sabino Canyon; Catalina Mountains; Florence; Yuma; Tucson; Ft. Huachuca. New Mexico. Texas: Carmel; Hermit County; Laredo; Encinal.

MATERIAL EXAMINED: California: Newberry, Mojave River, San Bernardino County, June 28 (T. Craig); Indio, Riverside County, July 7, 1941 (D. J. and J. N. Knull); Coachella, Riverside County, July 26, 1941 (F. M. Beer); Thermal, Riverside County, June 17, 1940 (K. S. Hagen); Painted Canyon, Riverside County, June 21, 1941 (W. F. Barr, K. S. Hagen); Lost Palms Canyon, Riverside County, June 28, 1946 (W. F. Barr and J. W.

MacSwain); 23 miles south of Vidal, June 12, 1940 (W. F. Barr); 8 miles north of Blythe, June 26, 1946 (W. F. Barr); Blythe, July 22, 1947 (W. F. Barr); Ripley, Riverside County, June 25, 1946 (W. F. Barr). Nevada: Las Vegas, August 1 (J. N. Knull). Arizona: Ehrenberg, July 22, 1939 (F. H. Parker); July 26, 1946 (E. C. Van Dyke); Stoval, Yuma County, June 28, 1936 (M. A. Cazier, E. S. Ross); Yuma; San Luis, Yuma County, June 19, 1940 (W. F. Barr); Wickenburg, June 29, 1939 (D. J. and J. N. Knull); Florence, July 17 and 18, 1903 (C. R. Biederman); 14 miles east of Oracle, July 25, 1924 (E. P. Van Duzee); Sabino Canyon, July 23, 1933; Tucson, July, 1924 (Wickham); July 12, 1929 (R. W. Black); "Ariz." Texas: Marathon, June 10, 1930 (E. G. Linsley); Encinal, June 29, 1930 (J. O. Martin); Zapata County, June 2, 1939 (D. J. and J. N. Knull); Dimmit County (Leutgens); "Tex" (Fuchs).

HOSTS: The recorded hosts are *Prosopis juliflora glandulosa*, *Acacia greggii*, and *Cercidium floridum*. In addition to these, the writer has beaten this species from *Larrea divaricata* and *Dalea spinosa*, in which it may also breed.

Polycesta velasco is one of the typical buprestids found in the true desert regions of the great Southwest. It tends to be less punctured and more pubescent than other members of this genus. Undoubtedly these modifications are adaptations which help the insect to withstand the high temperatures with which it is associated. These modifications also help to serve as a ready means by which this species may be identified. *P. velasco* may be distinguished from all others by its large size and by having all of the elytra interstitial spaces costate; moreover, the ventral surface, especially towards the sides, is quite heavily clothed with long silvery hairs.

Several writers have indicated that this species may be synonymous with *P. montezumae* Castelnau and Gory, a species that is recorded from Mexico, Colombia, and Ecuador, but until specimens of the latter can be examined, this writer feels that *P. velasco* should be retained as a distinct species.

***Polycesta abdita*, new species**

MALE: Rather slender, medium sized, feebly shining, black, elytra ferrugineous, costae dark, under surface more strongly shining with slight cupreous tinge, legs with purplish tinge.

Head with front slightly convex, without a median carina,

densely, rather coarsely and irregularly punctured, moderately clothed with rather long pale hairs; occiput finely, densely punctured, nearly glabrous; antennae slender, piceous, becoming ferrugineous towards apex, sparsely clothed with short, fine, brown hairs, segments longer than broad, finely reticulate; clypeus nearly truncate in front, front angles obtusely angulate.

Pronotum transverse, slightly less than twice as broad as long, front narrower than base, front margin bisinuate with median lobe rather well developed, a row of fine brownish hairs extending from under front margin nearly to eyes on either side of middle; sides obliquely expanded from front angles to basal third where they are obtusely rounded, then rather feebly narrowed to posterior angles which are obtusely angulate and more or less concealed beneath front margin of elytra; basal margin feebly bisinuate; surface with a broad median depression extending from base nearly to front margin, longitudinally carinate at middle and longitudinally impressed at base, an obsolete lateral depression in front of middle, punctures coarse, deep, and reticulate, rather sparse along margins of median depression, base nearly impunctate except for very fine reticulations, pubescence very sparsely placed, pale, short, and semirecumbent.

Scutellum rounded, broader behind, convex, impunctate, and glabrous.

Elytra as wide as pronotum, four times longer than length of pronotum; humeri obsolete, humeral angles broadly rounded; sides feebly sinuate to apical third, then arcuately converging to apices; lateral margins sparsely and irregularly spinose at apices; sutural margins slightly divergent before apices; scutellar costae distinct; striae consisting of rows of irregular punctures which are at about equal distance from one another; second and fourth interstitial spaces costate, entire, feebly sinuate; sixth interstitial spaces costate, obsolete at base and apex; surface glabrous.

Under surface rather densely, coarsely punctured, abdominal sternites less coarsely and deeply punctured, moderately clothed with short, silvery, suberect hairs; front margin of prosternum truncate; first abdominal sternite with a dense median patch of short yellowish hairs, less densely punctured at middle, an area behind hind coxa sparsely, rather coarsely scabrous, hind margin sinuate near side margins, broadly lobed at middle; hind margins of second, third, and fourth abdominal sternites more or less truncate; last abdominal sternite broadly triangular, side margins

feebly arcuate, apex broadly rounded. Third and fourth tarsal segments with a broad membranous lobe beneath.

Length: 16 mm.

FEMALE: Differs from the male by being slightly more robust, with a dense patch of hairs absent from the middle of the first abdominal sternite and with the last abdominal sternite more elongate and narrowly rounded at apex.

Length: 17 mm.

TYPE MATERIAL: Holotype, male (No. 59153, United States National Museum), from Chocoloskee, Florida. Allotype, female (the American Museum of Natural History), from Tortugas Island, Florida, July 1, 1925. One female paratype from Sunny Isles, Florida, June 13, 1935, in the collection of J. N. Knull, and one female paratype from Buck Key, Florida (G. Brainard), in the writer's collection. The writer has also seen a female specimen erroneously labeled "Ariz" which has not been designated as a paratype.

HOSTS: The only reference to a host is on the label of the allotype which was collected while flying around *Conocarpus* trees.

The paratypes are considerably larger than the allotype, each measuring approximately 22 mm. in length.

Polycesta abdita is very distinct from any of our species of *Polycesta*. The structure of the male genitalia, presence of a pubescent spot at the middle of the first abdominal sternite of the male, and the shape of the pronotum place it next to *P. angulosa*, which also occurs in Florida and with which it has been confused. However, it may be distinguished by having the elytra ferruginous to piceous in color with distinct scutellar costae and at least four entire, longitudinal costae; also the elytra are not so coarsely and deeply punctured, and the pronotal depressions are more pronounced. *P. angulosa* has the elytra black with a cupreous tinge, the scutellar costae are usually faintly indicated, there is usually only a pair of distinct, longitudinal costae, and the striae consist of very coarse and deep and closely placed punctures.

Since the identity of these two species may have been confused in the past, several of the recorded localities of *P. angulosa* probably apply to *P. abdita* and thus should not be regarded as certain until additional collections can be made and the correct distributional status of the two ascertained. Data gathered from specimens show that *abdita* appears to be restricted to the Florida Keys, whereas *angulosa* occurs on both the mainland of Florida and the keys.

***Polycesta angulosa* Jacquelin Duval**

Polycesta angulosa JACQUELIN DUVAL, 1857, in Ramon de la Sagra, Histoire physique, politique et naturelle de l'Île de Cuba, Animaux articulés (French edition), p. 62; 1857 (Spanish edition), vol. 7, p. 28. CHEVROLAT, 1867, Ann. Soc. Ent. France, ser. 4, vol. 7, p. 582 (separates, p. 158). GUNDLACH, 1891, Contribucion á la entomologia Cubana, vol. 3, no. 5, p. 166. KERREMANS, 1904, Monographie des buprestides, vol. 1, p. 514. SCHAEFFER, 1906, Canadian Ent., vol. 38, p. 23. FALL, 1910, Trans. Amer. Ent. Soc., vol. 36, no. 2, p. 138. KNULL, 1922, Canadian Ent., vol. 54, p. 79. CHAMPLAIN AND KNULL, 1922, Canadian Ent., vol. 54, p. 102. FISHER, 1925, Proc. U. S. Natl. Mus., vol. 65, p. 20. KNULL, 1925, Ohio State Univ. Studies, vol. 2, no. 2, p. 5. CHAMBERLIN, 1926, Catalogue of the Buprestidae of North America, p. 230; 1933, Jour. New York Ent. Soc., vol. 41, p. 37.

Polycesta obtusa LeCONTE, 1859, Proc. Acad. Nat. Sci. Philadelphia (1858), vol. 10, p. 68; 1859, Trans. Amer. Phil. Soc., vol. 11, p. 220. CROTCH, 1873, Proc. Acad. Nat. Sci. Philadelphia, vol. 25, p. 89. SCHAEFFER, 1906, Canadian Ent., vol. 38, p. 23. FALL, 1910, Trans. Amer. Ent. Soc., vol. 36, no. 2, p. 138. CHAMBERLIN, 1933, Jour. New York Ent. Soc., vol. 41, p. 38.

Polycesta excavata, KERREMANS, 1904, Monographie des buprestides, vol. 1, p. 513 (in part). FISHER, 1925, Proc. U. S. Natl. Mus., vol. 65, p. 22.

MALE: Moderately robust, medium sized, rather feebly shining, black with aeneous luster, more noticeable on under surface, elytra with cupreous tinge.

Head with front flat, without a median carina, densely, irregularly, rather coarsely punctured, moderately clothed with rather short, suberect, pale hairs; occiput without a smooth median area, more densely and finely punctured than front, nearly glabrous; antennae rather slender, black with purplish tinge, sparsely clothed with short, fine, pale hairs, segments longer than broad, finely, inconspicuously reticulate; clypeus very broadly and shallowly emarginate in front, front angles very broadly rounded.

Pronotum transverse, nearly twice as broad as long, front narrower than base; front margin feebly bisinuate, median lobe nearly obsolete, a row of brownish hairs extending from under front margin nearly to eyes on either side of middle; sides obliquely expanded from front angles to slightly behind middle where they are obtusely rounded, then rather feebly narrowed to near the posterior angles where they are nearly parallel; hind angles obtuse, hidden beneath the elytra; basal margin broadly bisinuate; surface with a broad, rather inconspicuous, median depression extending from base to in front of middle, and bearing a smooth median longitudinal line, a small, shallow inconspicuous lateral depression just in front of middle, punctures coarse, dense,

and deep, denser on anterior half where they are irregularly reticulate, sparsely clothed with a few short, inconspicuous hairs.

Scutellum subquadrate, slightly convex, nearly smooth, glabrous.

Elytra slightly wider than pronotum, four times longer than pronotum; humeri feebly evident, humeral angles obtusely angulate; sides very feebly sinuate to behind middle, then arcuately converging to apices; lateral margins coarsely and irregularly spinose slightly before and at apices; sutural margins slightly divergent before apices; scutellar costae feebly indicated; striae consisting of rows of very coarse and deep punctures, variable in size and shape, very closely placed to one another; interstrial spaces narrow, not raised except the second which are slightly costate and feebly sinuate and the fourth which are costate at the base of the elytra; surface glabrous.

Under surface rather densely punctured with moderate-sized punctures, more densely and coarsely punctured on thoracic segments, rather densely clothed with short, semirecumbent, pale hairs; front margin of prosternum feebly bilobed; first abdominal sternite with a dense median patch of short yellowish hairs, less densely punctured at middle, an area behind hind coxa sparsely, rather coarsely scabrous, hind margin sinuate near sides, broadly, arcuately lobed at middle; hind margins of second, third, and fourth abdominal sternites nearly truncate, feebly prolonged at sides; last abdominal sternite broadly triangular, sides arcuately rounded, rather broadly rounded at apex. Third and fourth tarsal segments with a broad membranous lobe beneath.

Length: 11.3 mm. to 15 mm.

FEMALE: Differs from the male by not having a dense patch of hairs at the middle of the first abdominal sternite and by having the last abdominal sternite more elongate, with the apex more narrowly rounded.

Length: 18 mm. to 23 mm.

TYPE LOCALITIES: Of *angulosa*, Cuba; of *obtusa*, "Philadelphia"; of *excavata*, Argentina.

RECORDED DISTRIBUTION: Cuba. Florida: Miami; Metacomba Key; Elliott Key; Key Largo; Buck Key. Alabama.

MATERIAL EXAMINED: Florida: Miami, April 12 and 25, 1921 (J. N. Knull); July 24, 1934 (F. N. Young); Metacomba Key; Long Key, May 15, 1939 (D. J. and J. N. Knull).

HOSTS: This species is recorded as breeding in *Coccolobis laurifolia*.

As pointed out by Chamberlin (1933) the type locality "Philadelphia" of the synonym *P. obtusa* was undoubtedly based on erroneously labeled material or due to the emergence of specimens from wood that had been brought from the south. The Alabama records are still questionable.

Polycesta angulosa may be immediately distinguished from any of the United States species of this genus by usually possessing only two entire, longitudinal costae on the elytra, by the presence of very deep and coarse, irregular elytral punctures which are somewhat reticulate, and by its distinct brassy luster.

***Polycesta elata* LeConte**

Polycesta elata LECONTE, 1859, Proc. Acad. Nat. Sci. Philadelphia (1858), vol. 10, p. 68; 1859, Trans. Amer. Phil. Soc., vol. 11, p. 220. CROTCH, 1873, Proc. Acad. Nat. Sci. Philadelphia, vol. 25, p. 89. KERREMANS, 1904, Monographie des buprestides, vol. 1, p. 508. FALL, 1905, Ent. News, vol. 16, p. 73; 1906, Ent. News, vol. 17, p. 166. KERREMANS, 1906, Monographie des buprestides, vol. 2, p. 612. SCHAEFFER, 1906, Canadian Ent., vol. 38, p. 23. BURKE, 1917, Jour. Econ. Ent., vol. 10, p. 329. ESSIG, 1926, Insects of western North America, p. 395. CHAMBERLIN, 1926, Catalogue of the Buprestidae of North America, p. 231; 1933, Jour. New York Ent. Soc., vol. 41, p. 40.

Polycesta cavata LECONTE, 1859, Proc. Acad. Nat. Sci. Philadelphia (1858), vol. 10, p. 68; 1859, Trans. Amer. Phil. Soc., vol. 11, p. 220. CROTCH, 1873, Proc. Acad. Nat. Sci. Philadelphia, vol. 25, p. 89.

MALE: Rather slender, large sized, shining, bronze black.

Head with front rather coarsely and irregularly punctured, rather sparsely clothed with short, suberect, pale hairs, concave, with an inverted Y-shaped carina which may be somewhat obliterated, extending nearly to the antennal bases; occiput more finely and sparsely punctured, glabrous, bearing a finely impressed, median line; antennae rather slender, shining, sparsely clothed with short, fine, brownish hairs, segments longer than broad; clypeus shallowly emarginate in front, front angles very broadly rounded.

Pronotum transverse, nearly twice as broad as long, front narrower than base, widest at basal third; front margin slightly bisinuate, a row of pale brownish hairs extending from under front margin nearly to eyes on either side of middle; lateral margins obliquely, rather feebly expanded to basal third where they are broadly rounded and then rather sinuately narrowing to hind

angles which are nearly parallel and rather inconspicuous, tips rounded, concealed beneath front margin of elytra; basal margin rather feebly bisinuate; surface with a broad, median depression extending from base to front margin, on either side of median depression is a small, narrow depression extending from base to slightly beyond middle, median depression with a narrow, smooth carina at bottom, extending from near base to in front of middle, surface irregularly, densely, and rather coarsely punctured, areas between depressions and in front of lateral depressions smooth except for a few fine hairs along lateral margins.

Scutellum elongate oval, convex, nearly smooth, shining and glabrous.

Elytra wider than pronotum, four times longer than length of pronotum; humeri nearly obsolete, humeral angles obtusely angulate; sides slightly expanded behind base, nearly parallel to apical third, then gradually, somewhat arcuately tapering to apices; margins before and at apices irregularly and sparsely spinose, apices feebly divergent; scutellar costae obsolete; second, fourth, sixth, and eighth interstrial spaces costate, second and fourth costae entire, nearly straight, cristate and smooth, sixth costae obsolete basally and apically, feebly arcuate, cristate with a few lateral punctures, eighth costae obsolete at base, sinuate; remaining interstrial spaces not costate, bearing irregular rows of rather small, round punctures; striae consisting of large, irregular punctures, somewhat reticulate; surface nearly glabrous.

Under surface with thoracic sternites rather finely, densely punctured along sides, sparsely punctured at middle, rather sparsely clothed with short, pale, semirecumbent hairs; prosternum feebly bisinuate in front; disk of first abdominal sternite swollen, hind margin broadly lobed at middle, slightly prolonged at sides; hind margin of second abdominal sternite slightly arcuate posteriorly, slightly prolonged at sides; hind margins of third and fourth abdominal sternites truncate, prolonged at sides; last abdominal sternite triangular, side margins broadly arcuate, distinctly prolonged at apex, hind margin nearly truncate, hind angles obtusely rounded. Fourth tarsal segment with a broad membranous lobe beneath.

Length: 15.2 mm. to 18 mm.

FEMALE: Differs from the male by having the disk of the first abdominal sternite flattened and the last abdominal sternite triangular and feebly prolonged at apex with the side margins very slightly sinuate and the hind margin broadly rounded.

Length: 20.5 mm. to 26.8 mm.

TYPE LOCALITIES: Of *elata*, Texas; of *cavata*, Alabama.

RECORDED DISTRIBUTION: Texas: Burnett County; Colorado County; Fedor, Lee County; Alpine; Cypress Mills; El Paso; Bethage.

MATERIAL EXAMINED: Texas: Llano County, June 11, 1941 (J. E. Gillaspay); Alpine, June; Austin, June 20, 1930 (E. G. Linsley); Burnett County; Cypress Mills, January 13, 1888; "Tex." Arkansas: Camp Robinson, June, 1943 (E. Hagen).

HOSTS: Chamberlin lists the following trees as the recorded hosts of *P. elata*: *Quercus obtusifolia*, *Q. arizonica*, *Q. emoryi*, *Q. hypoleuca*, *Plantanus wrightii*, *Celtis reticulata*, and *Prosopis juliflora*.

The "Arizona" and "California" records for this species are incorrect, as must be several of the recorded hosts. The type locality "Alabama" for the synonym *P. cavata* was probably based on a mislabeled specimen and thus may also be incorrect.

Polycesta elata is one of the largest and better known species of *Polycesta* occurring in the United States, yet it is represented by rather small series in most collections. The general form and bronze color immediately associate it with *P. californica*, to which it is closely related. However, the size, distribution, and structure of the male genitalia of these species are quite distinct. *Elata*, known only from Texas and Arkansas, is the larger, ranging from approximately 15 mm. to 27 mm. in length. *Californica*, which occurs in the Pacific coast states, exhibits a size variation of from 10.5 mm. to 20 mm. The genitalic differences may be best seen on examination of figure 8. *P. elata* may be further distinguished by the presence of an inverted Y-shaped median carina on the front of the head and by having the hind margins of the abdominal sternites slightly prolonged at the sides.

***Polycesta californica* LeConte**

Polycesta californica LECONTE, 1857, Reports of explorations and surveys to ascertain . . . route for a railroad from Mississippi River to Pacific Ocean, 47th parallel, Insects, Coleoptera, vol. 12, p. 45; 1859, Proc. Acad. Nat. Sci. Philadelphia (1858), vol. 10, p. 68; 1859, Trans. Amer. Phil. Soc., vol. 11, p. 220. CROTCH, 1873, Proc. Acad. Nat. Sci. Philadelphia, vol. 25, p. 89. FALL, 1901, Occas. Papers California Acad. Sci., vol. 8, p. 118. KERREMANS, 1904, Monographie des buprestides, vol. 1, p. 508. FALL, 1905, Ent. News, vol. 16, p. 73; 1906, Ent. News, vol. 17, p. 166. SCHAEFFER, 1906, Canadian Ent., vol. 38, p. 22. KERREMANS, 1906, Monographie des buprestides, vol. 2, p. 612. BURKE,

1917, Jour. Econ. Ent., vol. 10, p. 329. CHAMBERLIN, 1917, Ent. News, vol. 28, p. 166. GOOD, 1925, Ann. Amer. Ent. Soc., vol. 18, pl. 10. ESSIG, 1926, Insects of western North America, p. 395. CHAMBERLIN, 1926, Catalogue of the Buprestidae of North America, p. 320; 1933, Jour. New York Ent. Soc., vol. 41, p. 42. MOORE, 1937, Occas. Papers San Diego Soc. Nat. Hist., no. 2, p. 50. BEER, 1940, Pan-Pacific Ent., vol. 16, no. 1, p. 13. BEER AND HATCH, 1941, Univ. Washington Publ. Biol., vol. 10, no. 3, p. 101. WHITE, 1942, Bull. Brooklyn Ent. Soc., vol. 37, no. 1, p. 34.

Polycesta cribrana MOTSCHULSKY, 1859, Bull. Soc. Imp. Nat. Moscou, vol. 32, no. 2, p. 182. WATERHOUSE, 1889, Biologia Centrali-Americana, Coleoptera, vol. 3, no. 1, p. 177. KERREMANS, 1904, Monographie des buprestides, vol. 1, p. 485.

Polycesta californica bernardensis OBNENBERGER, 1924, Arch. Naturgesch., sect. A., vol. 90, no. 3, p. 35. CHAMBERLIN, 1933, Jour. New York Ent. Soc., vol. 41, p. 42.

MALE: Slender, medium sized, feebly shining, dark bronze, elytra inconspicuously mottled with dark splotches, under surface bronze and distinctly shining.

Head rather coarsely and densely punctured on front, punctures varying in size and shape, rather finely, densely punctured behind eyes and on occiput; front flattened with a smooth, median carina extending from vertex nearly to clypeus and a smaller, smooth, irregular callosity above the base of each antenna, moderately clothed with fine, short, suberect, silvery hairs; occiput with a narrow, impunctate, median area bearing a finely impressed line at middle, more sparsely pubescent than front; antennae shining, rather slender, sparsely clothed with short, fine, brownish hairs, segments longer than broad; clypeus with front margin broadly and very shallowly, triangularly emarginate, front angles obtusely rounded.

Pronotum transverse, approximately twice as broad as long, front narrower than base, widest behind middle; front margin nearly truncate, feebly lobed at middle, a row of fine brownish hairs extending from under front margin nearly to eyes on either side of middle; lateral margins obliquely expanded to behind middle where they are broadly rounded and then obliquely narrowing to hind angles which nearly form inconspicuous right angles; basal margin bisinuate; surface with a broad median depression extending from base nearly to front margin, on either side of median depression is a small, narrow depression slightly behind middle, median depression with a narrow, non-punctured area bearing a finely impressed line on basal half and a feeble carina on anterior half; surface rather uniformly, densely,

coarsely, and deeply punctured, reticulate, except for areas between depressions which are very sparsely punctured, nearly glabrous.

Scutellum oval, convex, nearly smooth and glabrous, shining.

Elytra slightly wider than pronotum, usually a little more than four times longer than length of pronotum; humeri inconspicuous, humeral angles obtusely angulate; sides slightly expanded behind base, very feebly sinuate nearly to apical third, then gradually, somewhat arcuately tapering to apices; margins before and at apices irregularly spinose, apices slightly divergent; scutellar costae obsolete; second, fourth, sixth, and eighth interstitial spaces costate, second and fourth costae entire, nearly straight, cristate and smooth, sixth costae obsolete basally and apically, feebly arcuate, cristate with a few lateral punctures, eighth costae nearly entire, feebly bisinuate, punctured basally, smooth apically; remaining interstitial spaces not costate, bearing irregular rows of moderate-sized, elongate punctures; striae consisting of deep, coarse punctures; surface glabrous except for a few very fine, short, silvery hairs along lateral margins and at apex.

Under surface densely, rather finely, shallowly punctured except for median smooth areas, moderately clothed with short, suberect, brownish hairs; front margin of prosternum shallowly emarginate; disk of first abdominal sternite swollen, hind margin broadly lobed at middle; hind margin of second abdominal sternite feebly arcuate posteriorly, not prolonged at the sides; hind margins of third and fourth abdominal sternites very feebly arcuate anteriorly, not prolonged at the sides; last abdominal sternite broadly triangular, lateral margins arcuate, apex somewhat prolonged, bearing a faintly indicated median ridge, hind margin rather narrowly rounded, shallowly notched at middle. Fourth tarsal segment with a broad membranous lobe beneath.

Length: 10.5 mm. to 16.8 mm.

FEMALE: Differs from the male by having the first abdominal sternite flattened at the middle; the triangular last abdominal sternite is more elongate with the side margins very feebly arcuate and the hind margin nearly semicircularly rounded with or without a feeble notch at the middle; there is also a trace of a subapical carina on the disk.

Length: 12.5 mm. to 20.2 mm.

TYPE LOCALITIES: Of *californica*, Sacramento, California; of *cribrana*, "in the north of Mexico"; of *bernardensis*, San Bernardino, California.

RECORDED DISTRIBUTION: Washington: Seattle. Oregon: Gold Hill; Ashland. California: Yreka; Trinity County; Sacramento; Placerville; Yosemite; Los Gatos; North Fork; Sequoia National Park; Sunset Valley, Santa Barbara County; Mt. Wilson; Los Angeles; Pasadena; San Diego; Laguna. Lower California.

MATERIAL EXAMINED: Washington: Yakima Park, Mt. Rainier, July 8, 1938 (A. W. McLain). Oregon: Crabtree, July 30, 1940 (F. M. Beer); Merlin, March 17 and June 17, 1941 (F. M. Beer); Grants Pass, September 24, 1940 (F. M. Beer); Rogue River, March 19, 1939 (F. M. Beer); Murphy, December 30, 1940 (F. M. Beer); Ashland, May 15 and 18, 1938 (F. M. Beer). California: Carrville, Trinity County, June 16 and 25, 1913, and June 26, 1931; Shingletown, Shasta County, June 3, 1941 (P. D. Hurd, Jr.); Oroville, May 30, 1928 (H. H. Keifer); Yuba City, Sutter County, June 22, 1933; Auburn, June, 1933 (C. R. Clar); Rocklin, July 1, 1927; Davis, May 20, 1936 (B. E. White); Marsh Creek Springs, Contra Costa County, May 9, 1937 (E. C. Van Dyke); Russelman Park, east slope of Mt. Diablo, Contra Costa County, May 21, 1931 (E. C. Van Dyke); Livermore, August, 1903; Livermore Canyon, Alameda County, October 22, 1927; Manteca, San Joaquin County, October 7, 1938 (K. S. Hagen); Sonora, Tuolumne County, July 5, 1936; Jamestown, Tuolumne County, June 11, 1931; Smith's Creek, Santa Clara County, 2000 feet, July 4, 1909; Mariposa County, June 6, 1914 (F. W. Nunenmacher); Yosemite National Park, June 15, 18, and 30, 1921; Oakhurst, Madera County, May 26, 1942 (A. J. Walz); Santa Cruz Mountains; Tassajara, Monterey County, May 27, 1920 (L. S. Slevin); Auberry, Italian Creek, Fresno County, May 22, 1932; Tulare County; Sequoia National Park, May 19 to June 20, 1929; Kaweah, Tulare County, July 4 (F. T. Scott, R. S. Wagner); Wolverton, Sequoia National Park, June 2, 1929; Paradise Valley, Sequoia National Park, June 18, 1929; Potwisha, Sequoia National Park, May 18 to June 13, 1929; July 1, 1941 (E. C. Van Dyke); Springville, Tulare County, July 1, 1933 (F. T. Scott); California Hot Springs, Tulare County, June 3 to 5, 1939; Fairview, Tulare County, July 3, 1939 (D. L. Dow); Caliente Creek, Kern County (F. Grinnell); Woody, Kern County, June 4, 1938; Greenhorn Mountains, Kern County, May 26, 1946 (B. E. White); Kernville, Kern County, June 16, 1947 (V. S. and F. M. Beer); Havilah, Kern County, May 16,

1930; Sunset Valley, Santa Barbara County, July 4, 1939 (W. F. Barr, E. C. Van Dyke); Los Angeles County; Mt. Wilson, Los Angeles County, June 28, 1918; San Bernardino County; Lake Arrowhead, June 29, 1940; Mill Creek, San Bernardino County, December 29, 1940 (J. R. Fisher); Lytle Creek, San Bernardino County, June 8, 1928 (E. C. Van Dyke); Forest Home, San Bernardino County, June 15, 1928 (E. C. Van Dyke); Highland, San Bernardino County; Idyllwild, San Jacinto Mountains, July 28, 1928 (E. C. Van Dyke); June 20, 1940 (K. S. Hagen); June 13 to 22, 1941 (E. C. Van Dyke); Pine Cove, San Jacinto Mountains, June 3, 1939 (B. Brookman); Herkey Creek, San Jacinto Mountains, May 27, 1941 (D. J. and J. N. Knull); June 21, 1941 (E. C. Van Dyke); Santa Rosa Mountain, Riverside County, May 27 and June 5, 1946 (D. J. and J. N. Knull).

RECORDED HOSTS: *Quercus kelloggii*, *Q. chrysolepis*, *Q. douglasii*, *Q. garryana*, *Q. californica*, *Q. wislizeni*, *Arbutus menziesii*, *Populus fremontei*, *Alnus rhombifolia*, *Cercocarpus parvifolius*, *Pyrus malus*, *Acer macrophyllum*, *Heteromeles arbutiviscida*, *Acacia greggii*, and *Salix* sp. In addition, labels on several specimens indicate that *P. californica* has been beaten or swept from *Ceanothus cuneatus*, *Cercocarpus betuloides*, and *Eriodictyon* sp. These plants may also prove to be hosts of this buprestid.

Chamberlin (1933) placed Obenberger's subspecies *bernardensis* as a synonym of *P. californica*, and the present author is in agreement with this. *P. californica* is a very variable species and judging from Obenberger's description no valid characters are offered that justify a subspecific status for *bernardensis*. Since this synonymy is apparently based solely on the description and since this description may not be available to all, it is included below.

"*Polycesta californica* ssp. *bernardensis* m. n. ssp. Hab. Californien: San Bernardino. Long 12 mm. Lat. 4 mm. Kleiner, länglicher als die typische Form. Die Flügeldeckenrippen sind niedriger, Flügeldecken sind kürzer zugespitzt, Halsschild ist weniger breit, seitlich etwa in der Mitte am breitesten, regelmässig verrundet, in der Mitte und seitlich kaum eingedrückt. Kopf ohne die drie, für typische Form charakteristischen Reliefschen."

As pointed out by Chamberlin, Essig's record of *P. californica* occurring in Alaska must be erroneous. The writer believes that this error was due to the fact that *P. cavata* was placed as a

synonym of *P. californica* in the 1920 Leng "Catalogue of the Coleoptera" and that the distribution of *cavata* was listed as "Ala," meaning Alabama. Apparently Essig, knowing *californica* to be a west coast species, interpreted this abbreviation of Alabama to mean Alaska and thus recorded *californica* as occurring in this northern territory.

Although there are now two records of the occurrence of this species in the state of Washington, they must be regarded with considerable doubt. Beer and Hatch have pointed out that the "Seattle" record is undoubtedly due to mislabeling of specimens, and the present "Yakima Park" record appears also to be based on the same mistake. Yakima Park is located at an elevation of at least 6000 feet in Rainier National Park, and none of the known host plants of *P. californica* would be found there. Thus it is assumed that this species does not occur at this locality. However, it may occur at lower elevations in southern Washington, west of the Cascade Mountains. Additional collections are certainly needed in order to verify its occurrence in this state.

The Texas records for *P. californica* are definitely incorrect. These records were probably taken from misidentified specimens of *P. elata*. *P. californica* is also recorded as occurring in Lower California. Its range may extend into this region, but it is rather doubtful. At present the southernmost known locality for *californica* is some 65 miles from the Mexican border. The San Diego and Laguna records refer to *P. cazieri*.

Polycesta californica is the most numerous and variable of the United States *Polycesta*. Coupled with this abundance and variability are the large number of plant species in which it breeds and the rather wide range it occupies. It is most abundant in California, occurring only on the west side of the Sierra Nevada Mountains, especially in the foothill regions of this and the Coast Ranges where its host plants are most abundant. In Oregon it is found only on the west side of the Cascade Mountains.

On the basis of the external structure and color as well as the characters of the genitalia, *P. californica* is placed between *P. elata* and *P. hageni*, being more closely related to the latter. From *elata* it may be distinguished by the radical differences in the male genitalia, the more densely punctured pronotum, by having a longitudinal carina on the front of the head with or without a smooth callosity above the base of each antenna, and by having

the hind margins of the abdominal sternites not noticeably prolonged at the sides. From *hageni* it is most easily distinguished by having the antennal segments longer than broad. There are differences also in the structure of the male genitalia.

***Polycesta hageni*, new species**

MALE: Rather slender, rather small sized, very feebly shining, blackish bronze, under surface more shining and bronze.

Head densely, rather irregularly punctured, reticulate, sparsely clothed with short, fine hairs; front flattened with a short median carina near vertex; occiput and vertex with an impressed, fine, median line; antennae rather dull, short, sparsely clothed with short, stiff, brownish hairs, finely densely punctured, reticulate, segments four to seven broader than long; clypeus very broadly and shallowly emarginate in front, front angles broadly rounded.

Pronotum transverse, less than twice as broad as long, front narrower than base, widest behind middle; front margin nearly truncate, broadly but feebly lobed at middle, a row of fine, tanish hairs extending from under front margin to eyes on either side of middle; lateral margins obliquely expanded to behind middle, where they are broadly rounded, and then obliquely and rather sinuately narrowing to inconspicuous hind angles which are acute and hidden beneath the front margin of elytra; basal margin bisinuate; surface with a rather broad median depression extending from base to front margin, deeply impressed at base, on either side of median depression is a small lateral depression slightly behind middle; surface rather densely and coarsely punctured, reticulate except for areas between depressions which are nearly smooth except for a few deep, round punctures, pubescence consisting of a very few fine, short, silvery hairs along lateral margins.

Scutellum oval, raised, and convex, very finely and densely punctured, reticulate, glabrous.

Elytra slightly wider than pronotum, slightly less than four times longer than length of pronotum; humeri inconspicuous, humeral angles obtusely rounded; sides obliquely and feebly expanded behind base, feebly sinuate to in front of apical third, then arcuately converging to apices; margins sparsely and irregularly spinose slightly before and at apices, sutural margins feebly divergent at apices; scutellar costae obsolete; second, fourth, sixth, and eighth interstrial spaces costate, second and fourth

costae entire, nearly straight, cristate and smooth, sixth costae obsolete except just in front of middle, eighth costae nearly entire, sinuate, punctured; remaining interstrial spaces bearing rows of moderate-sized, round punctures; striae consisting of rows of very deep, coarse, elongate punctures; surface glabrous.

Under surface very densely, rather finely, shallowly punctured, median areas sparsely punctured, rather moderately clothed with short, semirecumbent, pale hairs; front margin of prosternum very feebly emarginate, nearly truncate; disk of first abdominal sternite swollen, hind margin broadly, rather shallowly lobed; hind margin of second abdominal sternite feebly arcuate posteriorly, not prolonged at the sides; hind margins of third and fourth abdominal sternites truncate, not prolonged at the sides; last abdominal sternite broadly triangular, lateral margins feebly sinuate, apex very slightly prolonged, hind margin rather narrowly rounded, shallowly notched at middle. Fourth tarsal segment with a broad membranous lobe beneath.

Length: 11 mm.

FEMALE: Differs from the male by being more robust, larger in size, by having the disk of the first abdominal sternite feebly swollen, the hind margin of the second abdominal sternite truncate, and by having the last abdominal sternite triangular with the lateral margins slightly arcuate and the hind margin rather narrowly rounded.

Length: 12.9 mm.

TYPE MATERIAL: Holotype, male, and allotype, female, from Kernville, Kern County, California, June 7, 1940. Holotype collected by the writer and remaining in his collection. Allotype collected by K. S. Hagen and deposited in the California Academy of Sciences (Ent., No. 5930). Three male and two female paratypes from Kernville, California, June 7, 1940 (Barr, Hagen); one female paratype from Lone Pine, Inyo County, California, May 29, 1937 (E. C. Van Dyke); and two male and two female paratypes from Independence, Inyo County, California, June 14, 1937 (N. W. Frazier, J. H. Mitchell). Paratypes in the collections of the American Museum of Natural History, K. S. Hagen, E. C. Van Dyke, B. E. White, University of California, and the writer.

For his help during the course of this study, the writer takes pleasure in naming this species in honor of his friend Kenneth S. Hagen.

HOSTS: All the specimens collected at the type locality were swept from *Chrysothamnus* sp. (rabbit-brush), which is the probable host of this species.

Polycesta hageni is most likely to be confused with the variable *P. californica* with which it is most closely related. However, the antennal structure of these species offers a ready means of separation. The antennae of *hageni* are short, with the segments deeply reticulate, dull, and clothed with short coarse hairs; segments four to seven are broader than long. The antennae of *californica* are rather long and slender, with the segments shallowly reticulate, shining, and clothed with longer and finer hairs; segments four to seven are distinctly longer than broad. *P. hageni* may be further distinguished by being more densely punctured throughout, by having the spines near the elytral apices much less pronounced and by being smaller in size. The males range from 10.8 mm. to 12.8 mm. and the females from 10.7 mm. to 12.9 mm. in length.

***Polycesta crypta*, new species**

MALE: Rather slender, medium sized, feebly shining, black, front of head and under surface with a distinct bronze luster.

Head rather coarsely and densely, irregularly punctured on front, rather finely, densely punctured behind eyes and on occiput; front flattened with an irregular, smooth, median carina extending from vertex to area between antennal bases, moderately clothed with erect, fine, silvery hairs; occiput with a fine, impressed median line; antennae shining, moderately slender, rather sparsely clothed with short, fine, brownish hairs, segments longer than broad; clypeus rather broadly, triangularly emarginate at middle, front angles rounded.

Pronotum transverse, more than twice as broad as long, front distinctly narrower than base, widest slightly behind middle; front margin bisinuate, a row of fine, silvery hairs extending from under front margin nearly to eyes on either side of middle; lateral margins obliquely expanded to middle where they are very broadly rounded and then obliquely and rather sinuately narrowed to hind angles; hind angles not prominent, somewhat concealed beneath base of elytra; basal margin bisinuate; surface with a broad median depression extending from base to in front of middle, on either side of median depression is a narrow lateral depression extending from base to middle, median depression with a narrow, non-punctured area extending from base to middle

and bearing a faintly indicated impressed line, surface rather uniformly, densely, coarsely, and deeply punctured, reticulate except for areas between median and lateral depressions which are more sparsely punctured, sparsely clothed with fine, silvery, semi-recumbent hairs.

Scutellum rather oval, convex, nearly smooth, shining, and glabrous.

Elytra slightly wider than pronotum, slightly more than four times longer than length of pronotum; humeri inconspicuous, humeral angles obtusely rounded; side slightly expanded behind base, sinuate to apical third, and then broadly, arcuately convergent to apices; margins irregularly spinose before and at apices, apices divergent; scutellar costae obsolete; second, fourth, sixth, and eighth interstitial spaces costate, second costa of each elytron entire, nearly straight, cristate, and smooth; fourth costa feebly sinuate, entire, cristate, and smooth except at base where it is somewhat flattened and punctured; sixth costa obsolete except at middle where it is slightly elevated and punctate; eighth costa rather conspicuously elevated and punctate, obsolete at basal fourth; remaining interstitial spaces not costate, bearing irregular rows of rather coarse round punctures; striae consisting of very deep and coarse punctures which are variable in size and shape and which form a rough reticulation between the costae; surface glabrous except for a few very fine, short, silvery hairs along lateral margins and at apex.

Under surface densely, rather coarsely, shallowly punctured except for median smooth areas, moderately clothed with short, fine, silvery hairs; front margin of prosternum nearly truncate; disk of first abdominal sternite feebly swollen, hind margin broadly lobed at middle; hind margins of second, third, and fourth abdominal sternites truncate; last abdominal sternite broadly triangular, lateral margins arcuate, apex shallowly and broadly notched, disk with a faintly indicated median ridge. Fourth tarsal segment with a broad membranous lobe beneath.

Length: 12.6 mm.

FEMALE: Differs from the male by being more robust, larger, by having the disk of the first abdominal sternite flattened, and by having the last abdominal sternite triangular and slightly prolonged with the lateral margins somewhat arcuate, the hind angles broadly rounded and the hind margin feebly bisinuate.

Length: 18.9 mm.

TYPE MATERIAL: Holotype, male (No. 5931, California Academy of Sciences, Entomology), and allotype, female (No. 5932, California Academy of Sciences, Entomology), and two female and three male paratypes from Idyllwild, San Jacinto Mountains, Riverside County, California, June 13 to 22, 1941, collected by E. C. Van Dyke. The holotype was collected on June 13 and the allotype on June 22. Additional paratypes as follows: one male from Sequoia National Park, California, altitude 5000 to 7000 feet, June 21, 1929 (A. T. McClay); one female from Sunset Valley, Santa Barbara County, California, July 2, 1939 (E. C. Van Dyke); one female from Kernville, Kern County, California, June 16, 1947 (V. S. and F. M. Beer); one female from Pinon Flat, San Jacinto Mountains, Riverside County, California, June 21, 1941 (E. C. Van Dyke); and one male from Santa Rosa Mountain, Riverside County, California, 7000 feet, June 15, 1946 (D. J. and J. N. Knull). Paratypes in the collection of F. M. Beer, J. N. Knull, E. C. Van Dyke, and the writer.

HOSTS: No information is available concerning the host plants of this species.

The general form of *P. crypta* will immediately separate it from the other western species of *Polycesta*. The pronotum is distinctly more than twice as broad as long, and the elytra are slightly more than four times longer than the length of the pronotum. Thus the insect presents a rather unique appearance with its shortened and expanded pronotum and elongate elytra. In addition, the male genitalia exhibit characteristics that are quite distinct from those of the other species.

***Polycesta tularensis* Chamberlin**

Polycesta cyaneous CHAMBERLIN, 1933, Jour. New York Ent. Soc., vol. 41, p. 41 (in part).

Polycesta tularensis CHAMBERLIN, 1938, Jour. New York Ent. Soc., vol. 46, p. 445.

MALE: Rather robust, large sized, feebly shining; head, under surface, and legs distinctly blue black; pronotum and elytra more or less black.

Head coarsely and densely, rather irregularly punctured on front, rather finely, densely punctured behind eyes and on occiput; front concave with a smooth carina extending from vertex to area between the antennal bases, sparsely clothed with short, fine, pale hairs; occiput with a smooth median area containing

a fine, impressed, median line; antennae shining, slender, sparsely clothed with short, fine, brownish hairs, segments longer than broad; clypeus nearly truncate in front, very shallowly and broadly arcuately emarginate.

Pronotum transverse, about twice as broad as long, front distinctly narrower than base, widest behind middle; front margin feebly emarginate with a very broad, inconspicuous lobe at middle, a row of yellowish hairs extending from under front margin nearly to eyes on either side of middle; lateral margins obliquely expanded to just behind middle where they are broadly rounded and then narrowing obliquely and somewhat sinuately to the nearly parallel hind angles which are acute and project slightly beneath the elytra; basal margin bisinuate; surface with a broad median depression extending from base nearly to front margin, bearing a smooth, impressed line at basal third, a small inconspicuous depression on either side slightly behind middle, the area between median and lateral depression nearly smooth except for a few scattered, round punctures, remainder of surface very densely and coarsely, irregularly punctured, pubescence consisting of a few scattered, fine, short, white hairs.

Scutellum pear shaped, longer than broad, flattened, finely sculptured, glabrous.

Elytra nearly as wide as pronotum, slightly less than four times the length of pronotum; humeri nearly obsolete, humeral angles obtusely rounded; sides expanded to basal eighth, very feebly sinuate to apical third, then obliquely converging to apices which terminate in acute sutural spines, apical margins coarsely and irregularly spinose; scutellar costae obsolete; second, fourth, sixth, and eighth interstitial spaces costate, second and fourth costae entire, nearly straight, cristate, and smooth, sixth and eighth costae feebly developed, obsolete at bases and apices, moderately punctured with rather coarse, round punctures; remaining interstitial spaces not costate, bearing irregular rows of rather coarse, round punctures; striae consisting of very deep and very coarse punctures, variable in size and shape, forming a rough, irregular network between the costae; surface glabrous.

Under surface densely, rather coarsely punctured except for median smooth areas, moderately clothed with short, fine, yellowish hairs; front margin of prosternum broadly lobed with lobe very feebly emarginate in front; disk of first abdominal sternite more or less flattened, hind margin broadly lobed at middle; hind

margins of second, third, and fourth abdominal sternites more or less truncate; last abdominal sternite broadly triangular, apex narrowly rounded, disk with a faintly indicated, smooth, median ridge. Fourth tarsal segment with a rather small, narrow membranous lobe beneath.

Length: 15 mm. to 20 mm.

FEMALE: Differs from the male by having the disk of the first abdominal sternite flattened at the middle and by having the last abdominal sternite slightly prolonged with the sides obliquely narrowing to an obtusely rounded apex.

Length: 16.1 mm. to 22 mm.

TYPE LOCALITIES: Of *tularensis*, Springville, Tulare County, California; of *cyaneous*, Sequoia National Park, California.

RECORDED DISTRIBUTION: California: Springville, Tulare County.

MATERIAL EXAMINED: California: San Antonio Valley Ranger Station, Mount Hamilton Range, Santa Clara County, June 20 and August 11, 1948 (R. van den Basch); Springville, Tulare County, August, 1933 (F. T. Scott); Kaweah, July, 1931 (F. T. Scott); Sequoia National Park, June, 1930 (F. T. Scott); Potwisha, July 1, 1941 (E. C. Van Dyke); Hammond, Sequoia National Park, June 18, 1947 (V. S. and F. M. Beer).

HOSTS: This species has been collected from the wood of *Quercus* sp.

Polycesta tularensis is readily recognized by its characteristic bluish black color and by the presence of a rather small, narrow, membranous lobe beneath the fourth tarsal segment. The front of the head is normally concave, with a median longitudinal carina extending the length of the depression. Each elytron terminates in a sutural spine which is also a significant characteristic of this species.

Since Buprestidae are rarely attracted to lights, it is of interest to note that the San Antonio Valley specimens were collected at a light trap.

***Polycesta cazieri*, new species**

MALE: Robust, medium sized, feebly shining, black, front of head and lateral margins of pronotum with a faint bronze tinge.

Head rather coarsely and densely, rather irregularly punctured in front, rather finely, densely punctured behind eyes and on occiput; front flattened, median carina absent except for a small,

smooth callosity on vertex, moderately clothed with erect, fine, silvery hairs; occiput with a small, smooth median area containing a fine, impressed, median line; antennae shining, moderately slender, rather sparsely clothed with short, fine, brownish hairs, segments longer than broad; clypeus broadly, very shallowly, triangularly emarginate in front.

Pronotum transverse, approximately twice as broad as long, front distinctly narrower than base, widest at basal third; front margin feebly emarginate with a very broad lobe at middle, a row of fine, silvery hairs extending from under front margin nearly to eyes on either side of middle; lateral margins arcuately rounded to basal third where they are broadly rounded and then obliquely extending to the inconspicuous hind angles which are concealed beneath the front margin of elytra; basal margin bisinuate; surface with a broad median depression extending from base nearly to middle, on either side of median depression is a small lateral depression slightly behind middle, area between median and lateral depression nearly smooth posteriorly except for a few scattered round punctures, more densely punctured towards front, remainder of surface very densely and coarsely, irregularly punctured, reticulate, pubescence consisting of a few scattered, fine, short, silvery hairs.

Scutellum bell shaped, longer than broad, convex, finely sculptured, glabrous.

Elytra at apical third nearly as wide as pronotum; humeri nearly obsolete, humeral angles slightly obtuse; sides feebly expanded at base, very slightly sinuate to apical third, then arcuately converging to apices, margins near apices finely, irregularly spinose; scutellar costae obsolete; second, fourth, sixth, and eighth interstitial spaces costate; second costae entire, nearly straight, cristate, and smooth; fourth costae feebly sinuate, entire, cristate, and smooth except at bases where they are broken by rather coarse round punctures; sixth and eighth costae feebly developed, obsolete at bases and apices, moderately punctate with rather coarse, round punctures; remaining interstitial spaces bearing irregular rows of rather coarse, round punctures; striae consisting of rows of very deep and very coarse punctures which are variable in size and shape, forming a rough, irregular network between the costae; surface with a few very fine, short, silvery hairs along lateral margins and at apex.

Under surface densely, rather coarsely punctured except for

median areas of thorax which are sparsely punctured, moderately clothed with short, fine, silvery hairs; front margin of prosternum very broadly lobed with lobe broadly and shallowly emarginate in front; first abdominal sternite feebly swollen along middle, hind margin broadly lobed at middle; hind margins of second, third, and fourth abdominal sternites more or less truncate; last abdominal sternite broadly triangular, lateral margins feebly arcuate, hind margin truncate, feebly notched, disk with a faintly indicated median ridge. Fourth tarsal segment with a broad membranous lobe beneath.

Length: 14.8 mm.

FEMALE: First abdominal sternite flattened at middle; last abdominal sternite with apex broadly rounded and shallowly, arcuately emarginate at apex.

Length: 18.9 mm.

TYPE MATERIAL: Holotype, male (No. 5933, California Academy of Sciences, Entomology), and allotype, female, from Sunset Valley, Santa Barbara County, California. The holotype was collected on July 3, 1939, by E. C. Van Dyke and the allotype on July 4, 1939, by the writer. Allotype in the writer's collection. Paratypes from the following localities: One male and two females from Ojai, California, April 15, 1936 (W. E. Simonds); one male from Ojai, California, July 15, 1936 (Helen A. Brandt); one male from Etiwanda, California, May 30, 1927 (W. E. Simonds); one female from Upper Arroyo Seco, Los Angeles County, June 25, 1940; one male from Pasadena, California, June, 1922; one male from San Diego County, California, July 4, 1913 (E. P. Van Duzee); one female from Warner's Ranch, San Diego County, California, August 28, 1884 (F. E. Blaisdell); and one male from San Diego, California (F. E. Blaisdell). Paratypes in the collections of the California Academy of Sciences, the American Museum of Natural History, J. N. Knull, and the writer.

This species is named after Mont A. Cazier as a slight token of appreciation for his generous assistance and as an acknowledgment of the contributions he has made in his studies on North American Buprestidae.

HOSTS: The female specimen from Upper Arroyo Seco, Los Angeles County, California, was collected from *Chaenactis artemisiaefolia*, a rather small composite native to southern California. It is assumed, however, that *P. cazieri* breeds in the wood of *Quercus* as do its allied species.

There are no external characters that may be used with certainty in distinguishing this species from *P. cyanea*. In general the males of *cazieri* have the middle of the first abdominal sternite swollen, while this area on the males of *cyanea* tends to be somewhat flattened. These species may be quickly separated, however, after an examination of the dissected male genitalia. With *cazieri*, the median lobe of the organ is not broadened and the lateral, plate-like structures are not prominent but obliquely flattened against the sides of the median lobe. With *cyanea* the median lobe is very broad with very conspicuous lateral plate-like structures extending out at nearly right angles. No morphological characters have been found by which the females may be separated.

At the present, there are definite differences in the distribution of these two species. *Cazier* appears to be restricted to the southern Coast Range in California, occurring from the San Diego to the Santa Barbara areas, while *cyanea* has been collected in the inland mountain ranges from the San Jacinto area north to the Sequoia National Park region in the southern Sierra Nevada Mountains.

A few minor variations have been noted in the paratypic series. Some specimens may have the front of the head feebly concave; with others the smooth callosity on the vertex may be entirely lacking. In general the apex of the median lobe of the male genitalia appears to be less elongate, with the hind margin more narrowly rounded, in specimens from the San Diego region. A female specimen collected on *Ceanothus cuneatus* at the type locality by B. E. White is assigned to this species with some doubt, for it is quite atypical in structure and appearance. The general form is narrower, the lateral margins of the pronotum are not broadly expanded, there are prominent spines near the elytral apices, and the last abdominal sternite is rather narrowly rounded at the apex. Moreover, the specimen exhibits a distinct bronze luster with the areas between the pronotal depressions and the elytral costae black.

***Polycesta cyanea* Chamberlin**

Polycesta cyaneous CHAMBERLIN, 1933, Jour. New York Ent. Soc., vol. 41, p. 41; 1938, Jour. New York Ent. Soc., vol. 46, p. 446.

MALE: Robust, rather small, very feebly shining, black. Head coarsely and densely, rather irregularly punctured on

front, rather finely, densely punctured behind eyes and on occiput; front very slightly concave, median carina absent except for a faintly indicated, small, smooth callosity on vertex, sparsely clothed with erect, fine, silvery hairs; occiput with a fine, impressed median line; antennae shining, moderately slender, sparsely clothed with short, fine, brownish hairs, segments longer than broad; clypeus truncate or broadly, very shallowly arcuately emarginate.

Pronotum nearly twice as broad as long, front somewhat narrower than base, widest slightly behind middle; front margin nearly truncate, a row of fine, tawny hairs extending from under front margin nearly to eyes on either side of middle; lateral margins broadly, arcuately rounded; hind angles inconspicuous, hidden beneath front margin of elytra; basal margin bisinuate; surface with a broad median depression extending from base to front margin, this depression bears a fine, impressed line from base nearly to middle, on either side of median depression is a small lateral depression slightly behind middle, area between median and lateral depression nearly smooth except for a few rather coarse, round punctures, a similar area, but very small, between lateral depression and hind angle, remainder of surface very densely and coarsely, irregularly punctured, somewhat reticulate, pubescence consisting of a few very fine, short, scattered, silvery hairs.

Scutellum bell shaped to oval, convex, finely sculptured, and shining.

Elytra as wide as pronotum; less than four times longer than length of pronotum; humeri nearly obsolete, humeral angles obtusely rounded; sides expanded behind base, sinuate to a point slightly behind apical third and then arcuately converging to apices, margins near apices finely, irregularly spinose; scutellar costae obsolete; second, fourth, sixth, and eighth interstitial spaces costate; second costa of each elytron entire, slightly sinuate, cristate, and smooth; fourth costa obsolete except at the middle where it is represented by slightly raised, irregular rows of rather coarse round punctures; remaining interstitial spaces bearing irregular rows of rather coarse round punctures; striae consisting of very deep and very coarse punctures which are variable in size and shape and which form a rough reticulation between the costae; surface glabrous except for a few very fine, short, silvery hairs along lateral margins near apex.

Under surface densely, rather coarsely punctured except for median areas, moderately clothed with short, fine, silvery hairs; front margin of prosternum very broadly lobed with the lobe broadly and shallowly emarginate in front; first abdominal sternite swollen medially, but swollen area with a flattened disk, hind margin broadly lobed at middle; hind margins of second, third, and fourth abdominal sternites more or less truncate; last abdominal sternite broadly triangular, lateral margins sinuate, apex feebly prolonged, hind margin very slightly notched, disk with a faintly indicated, median ridge. Fourth tarsal segment with a broad membranous lobe beneath.

Length: 10.5 mm. to 14 mm.

FEMALE: Differs from the male by having the first abdominal sternite flattened at middle and the last abdominal sternite with lateral margins feebly arcuate and apex rather broadly rounded.

Length: 14 mm. to 18.9 mm.

TYPE LOCALITY: Sequoia National Park, California.

RECORDED DISTRIBUTION: California: Sequoia National Park.

MATERIAL EXAMINED: California: Northfork, July 4, Sequoia National Park, July, 1931 (F. T. Scott); June, 1932; Potwisha, Sequoia National Park, July 1, 1941 (E. C. Van Dyke); Hammond, Sequoia National Park, June 18, 1947 (V. S. and F. M. Beer); Kaweah, June 28, 1931; July 4, 1931 (R. S. Wagner); Springville, Tulare County, August, 1933 (F. T. Scott); Tulare County, May, 1930 (F. T. Scott); Kernville, Kern County, June 16, 1947 (V. S. and F. M. Beer); Herkey Creek, San Jacinto Mountains, Riverside County, June 20, 1940 (W. F. Barr); Santa Rosa Mountain, Riverside County, June 5, 1946 (D. J. and J. N. Knull).

HOSTS: The recorded host of this species is *Quercus*. The specimen collected at Herkey Creek, San Jacinto Mountains, was beaten from *Ceanothus cuneatus*.

As mentioned previously, *P. cyanea* is most closely allied to *P. cazieri*, and it may be separated with certainty only after an examination of the male genitalia.

The specimen from Herkey Creek, San Jacinto Mountains, a female, differs somewhat from the other specimens of *P. cyanea*. The front of the head bears a distinct median carina, and the pronotum is twice as broad as long, being more broadly expanded than that of typical examples.

When this species was described by Chamberlin, he actually

had two species represented in his type series. The males were *P. cyanea* and the females were what he later described as *P. tularensis*. His original name, *P. cyaneous*, was undoubtedly based on the blue black color of the female specimens in his series. This name, of course, must stand since the holotype is a male specimen; however, it is here used in an emended form.

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