

THE
COLEOPTERISTS
BULLETIN

AN INTERNATIONAL JOURNAL DEVOTED TO THE STUDY OF BEETLES
URL—<http://www.auburn.edu/beetles/colebull.htm>

VOLUME 50, NO. 4

DECEMBER, 1996



Platynus indecentis Liebherr and Will

World List abbreviation: Coleopts Bull.

THE COLEOPTERISTS BULLETIN
(FOUNDED 1947 BY ROSS H. ARNETT, JR.)
(ISSN 0010-065X)

The Coleopterists Bulletin is A Fully Refereed Journal published quarterly beginning in March by the Coleopterists Society. The Society is an international organization devoted to the study of all aspects of systematics and biology of beetles of the world.

Membership: Open to anyone. Annual dues of \$30.00 include subscription to *The Coleopterists Bulletin*.

Library subscription: \$50.00.

Change of address: POSTMASTER: Send address changes to Coleopterists Bulletin % Ed Zuccaro, P.O. Box 767, Natchez, MS 39121, U.S.A.

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Known office of publication: The Coleopterists Society, % Ed Zuccaro, 23 D'Evereaux St., Natchez, MS 39120, U.S.A.

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Mailing date for this issue: December 30, 1996

NEW NORTH AMERICAN *PLATYNUS* BONELLI
(COLEOPTERA: CARABIDAE), A KEY TO SPECIES NORTH OF MEXICO,
AND NOTES ON SPECIES FROM THE SOUTHWESTERN UNITED STATES

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Abstract

Platynus indecentis, **new species**, is described from northeastern North America, and *Platynus cazieri*, **new species**, and *Platynus cohni*, **new species**, are described from Arizona. *Platynus indecentis* is a cryptic sibling of the widespread *P. decentis* (Say), and is known to date only from sphagnum bog habitats. *Platynus cazieri* appears closely related to *P. aphaedrus* Chaudoir of Veracruz, Oaxaca, and Chiapas, Mexico, whereas *P. cohni* is considered a member of the subgenus *Trapezodera* Casey. Other *Trapezodera* species range from the Transvolcanic Sierra of Mexico south to Chiapas. A key to the species of *Platynus* Bonelli north of Mexico, and distributional notes for species occurring in the southwestern United States are provided. *Platynus brunneomarginatus* (Mannerheim) exhibits color polymorphism characterized by an abrupt transition zone in the mountains surrounding the southern end of the Central Valley, California.

The genus *Platynus* Bonelli (Coleoptera: Carabidae) is an extremely diverse component of the Middle American biota, with an estimated 300 species known from Mexico alone (Liebherr, unpubl. data). The *Platynus* fauna of Canada and the United States is relatively depauperate, with 19 previously known species. Nonetheless, this fauna is historically diverse, with several lineages—*e.g.*, the subgenera *Batenus* Motschulsky and *Platynus*—exhibiting Laurasian distributions (Liebherr 1989), whereas others are centered in Mexico and Central America (Bates 1882, 1884, Darlington 1936, Whitehead 1973, Liebherr 1992). This paper adds to the known faunas of both Laurasian and Mexican lineages. From material collected in eight northeastern states and the province of Ontario, we newly describe a cryptic sibling species allied to the common transamerican *Platynus decentis* (Say), a member of the Holarctic subgenus *Platynus*. Discovery of this new species would seem unlikely, even improbable. That it was overlooked since Thomas Say described *P. decentis* in 1823 may be explained by its anatomical similarity to its immensely variable, geographically widespread, and quite common North American relative, and its close association with sphagnum bog habitats. Other recent descriptions of eastern North American platynines have also often involved bog or endemic wetland species; *e.g.* *Agonum darlingtoni* Lindroth (1955), *A. superioris* Lindroth (1966), and *A. canadense* and *A. palustre* (Goulet 1969).

We also describe two species from Arizona that are related to species occurring in Mexico. These represent northern extensions of the Middle American *Platynus* fauna, and are restricted to the mountains of southeastern Arizona.

Identification of *Platynus* from Canada and the northern and eastern reaches of the United States has previously relied upon Lindroth (1966), a work fo-

ocusing on the Canadian fauna. This paper provides a key to *Platynus* for America north of Mexico, allowing identification of all species currently assigned to the genus occurring in the United States and Canada. To aid future collecting of *Platynus* species in the comparatively inadequately known southwestern United States, distributional notes for species occurring in that area are also included.

Lindroth (1966) treated *Platynus* as congeneric with an enlarged genus *Agonum* Bonelli. Later workers (Whitehead 1973, Habu 1978, Liebherr 1986, Bousquet and Laroche 1993) have distinguished distinct lineages within Lindroth's *Agonum*. Most *Platynus* are distinguishable from *Agonum* by the presence of a dorsal constriction of the neck, and female spermatheca with short duct relative to apical spermathecal reservoir (Liebherr 1986, 1992). Small *Platynus* may lack the neck constriction, interpreted by Liebherr (1992) as an evolutionary reversal associated with small body size. Identification of North American specimens of *Platynus* and *Agonum* is best pursued by using the key to platynine genera in Liebherr (1986), noting that *Agonum languidum* Horn of that key is conspecific with *Platynus ovatulus* (Bates), followed by species identifications using Liebherr (1994) for *Agonum*, and the key below for *Platynus*.

Materials and Methods

Specimen preparation, dissection and staining techniques, and morphological terminology follow Liebherr (1992). Overall body length represents the sum of: 1) length from mandibular apex in closed position to cervical ridge, measured along midline of head, 2) length of pronotum along midline, and 3) length of left elytron from scutellar to elytral apex. Size range was determined by visually comparing all specimens, and measuring all candidates for largest and smallest body size.

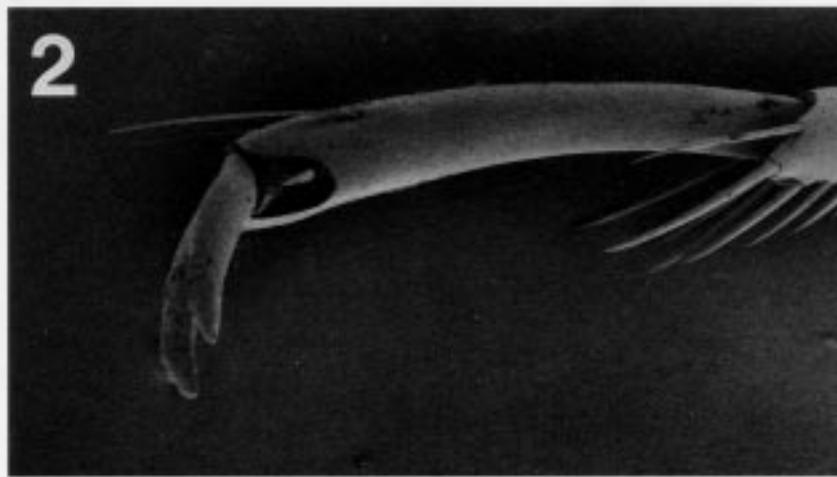
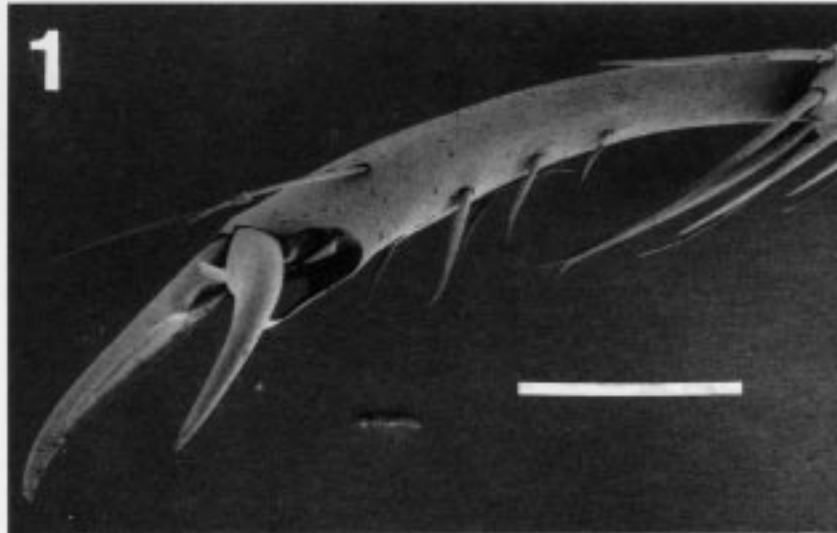
Specimens were borrowed from the following institutions through the cooperation of their curators; Lee H. Herman, American Museum of Natural History, New York (AMNH); Nigel E. Stork, The Natural History Museum, London (BMNH); David H. Kavanaugh, California Academy of Sciences, San Francisco (CAS); Robert L. Davidson, Carnegie Museum of Natural History, Pittsburgh, PA (CMNH); Yves Bousquet, Canadian National Collection, Ottawa (CNC); Cheryl B. Barr, California Insect Survey, University of California, Berkeley (CISC); Cornell University Insect Collection, Ithaca, NY (CUIC); Philip D. Perkins, Museum of Comparative Zoology, Harvard University, Cambridge, MA (MCZ); Danny Shpeley, University of Alberta, Strickland Museum of Entomology (UASM); David R. Maddison, University of Arizona, Tucson (UAZC); Lynn Kimsey, University of California, Davis (UCD); Ross T. Bell, University of Vermont, Burlington (UVMC). Specimens were also made available from the personal collections of Harry J. Lee, Fairview Park, Ohio (HJLC), and the junior author (KWWC).

Development and testing of the key was based on specimens of all species held in the CUIC. During that activity, three specimens of the undescribed northeastern species were discovered amongst the 497 specimens determined as *P. decentis*. This surprising discovery prompted us to borrow and examine the 2728 specimens determined as *P. decentis* held in the CNC, CMNH and UVMC, leading to discovery of 31 more specimens of the undescribed species. The analysis of geographic variation in color of *Platynus bruneomarginatus* (Mannerheim) was based on examination of 1112 specimens (CISC, CUIC).

**Key to Adults of Species of the Genus *Platynus* Bonelli in America
North of Mexico**

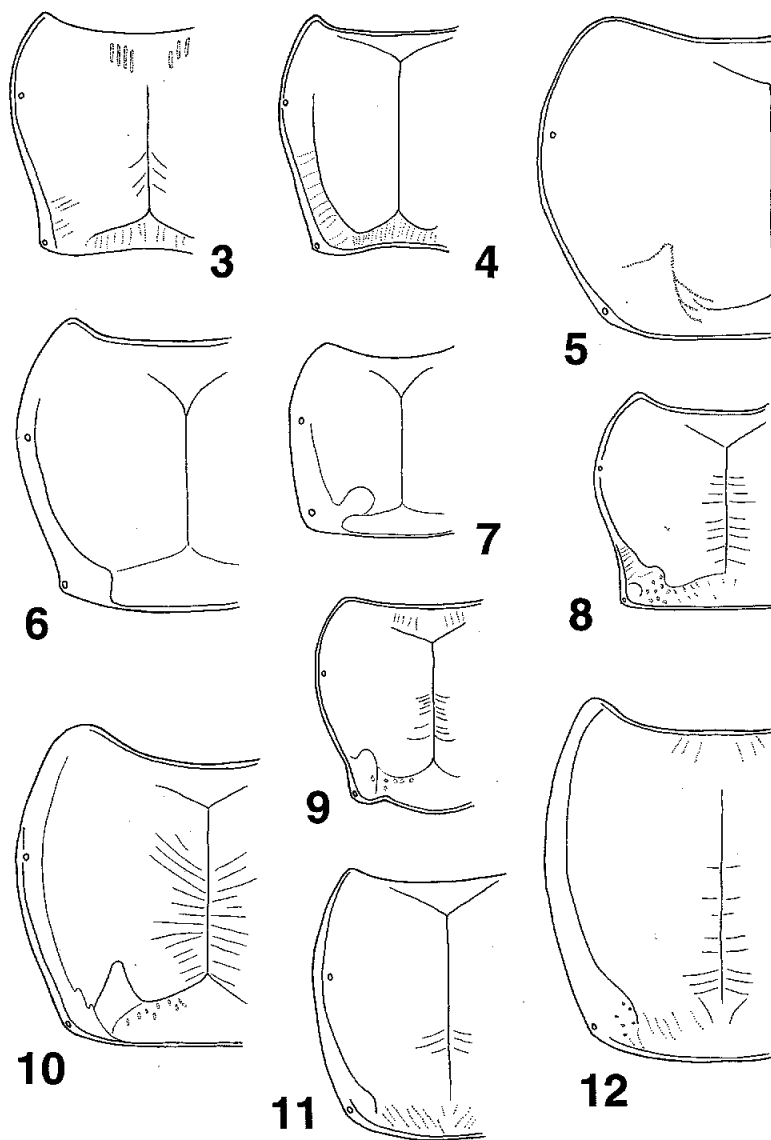
This key includes the 22 species comprising the genus *Platynus* in America north of Mexico. Because there are no stable characters useful in distinguishing *Platynus* from *Colpodes buchannani* Hope, an adventive species introduced into Portland, Oregon (Hatch 1953), and now occurring as far northeast as Kootenai Co, Idaho (Sheep Springs, 1-VI-1972, D. E. Foster, CUIC), is also included in the key. Lindroth (1966) treated 12 *Platynus* species, principally those found in eastern or northern North America, including California. Figures listed in the key as "fig." are found in that work; those listed as "Fig." are in this work. Previously described species, for which distributional notes are included herein, are indicated by an asterisk.

1. Metatarsomere V ventrally setose, 6–14 setae, each seta subequal to longer than depth of tarsomere (Fig. 1) 2
- 1'. Metatarsomere V apparently glabrous ventrally, setae sometimes visible, but only at high magnification (*e.g.*, 125×) (Fig. 2) 8
- 2(1). Metafemur glabrous apically, dorsoapical setae absent 3
- 2'. Metafemur with 3–20 setae on dorsoapical surface 6
- 3(2). Body small, overall length 4.0–9.0 mm; body coloration including legs ferruginous to rufopiceous 4
- 3'. Body large, overall length 9.3–12.5 mm; body coloration including legs dark piceous to black *P. ovipennis* (Mannerheim)
- 4(3). Humeri rounded to slightly angulate; overall length 4.0–7.2 mm; elytral disc concolorous with pronotum, or only slightly darker 5
- 4'. Humeri angulate; overall length 8.0–9.0 mm; elytral disc smoky piceous, contrasting with ferruginous pronotum (Fig. 3)
..... *P. agilis* LeConte*
- 5(4). Neck with evident constriction; pronotum with evident hind angles (Fig. 4); elytra narrowed basally *P. pecki* Barr*
- 5'. Neck without evident constriction; pronotum ovate, hind angles obsolete (Fig. 5); elytra parallel-sided, humeri well developed
..... *P. ovatulus* (Bates)*
[See Liebherr (1992:47) for comprehensive treatment of this species.]
- 6(2). Elytral discal setae restricted to 3rd interval, or to 3rd, 5th and 7th intervals, or to base of all intervals; legs piceous, concolorous with body 7
- 6'. Setae associated with third interval obscured by elytral discal setae, setose throughout length of all intervals; legs rufous, body brunneous to piceous *P. hypolithos* (Say)
- 7(6). Fifth tarsomeres with 4–6 long setae ventrally; metafemur with 3–5 dorsoapical setae; pronotum with well developed denticle at angulate hind angles (Fig. 6) *P. indecentis* Liebherr and Will
- 7'. Fifth tarsomeres with 12–14 long setae ventrally; metafemur with 9–15 dorsoapical setae; pronotum with basolateral margins rounded, hind angles obsolete (fig. 327c) *P. angustatus* Dejean
- 8(1). Metafemur without dorsoapical setae 9
- 8'. Metafemur with 2–11 dorsoapical setae (the 2–4 setae in *P. parmarginatus* are very short) 14
- 9(8). Elytral microsculpture transverse mesh to transverse lines; pronotum with sinuate lateral margins, base narrow or broad, basal seta located in marginal bead or close to margin (Figs. 8, 9) 10



Figs. 1-2. Scanning electron micrographs of fifth metatarsomere, lateral view. **1.** *Platyus indecentis*. **2.** *P. decentis*. Scale bar = 300 μ m for both figures.

- 9'. Elytral microsculpture isodiametric; pronotum rectangular, basal pronotal seta distinctly inside convex laterobasal margin (Fig. 7) ——— *P. cohnii* Liebherr and Will
- 10(9). Metatarsomeres 2-3 with moderate to weak, or without, dorsolateral sulci, median area broadly convex, not narrowly carinate ——— 11
10. Metatarsomeres 2-3 with deep, broad dorsolateral sulci, median carina distinct ——— 12
- 11(10). Pronotal hind angles sharp, almost right, basal seta set in marginal



Figs. 3–12. Left side of pronotum, dorsal view. **3.** *Platynus agilis*. **4.** *P. pecki*. **5.** *P. ovatulus*. **6.** *P. indecentis*. **7.** *P. cohni*. **8.** *P. lyratus*. **9.** *P. megalops*. **10.** *P. cazieri*. **11.** *P. rufiventris*. **12.** *P. falli*.

- bead at hind angle (Fig. 8); legs rufous, body piceous; metepisterna elongate, anterior margin shorter than mesal margin
P. lyratus (Chaudoir)*
- 11'. Pronotal hind angles rounded behind basal seta that is located slightly inside margin; legs and body concolorous; metepisterna quadrate, anterior and mesal margins subequal *P. trifoveolatus* Beutenmüller
- 12(10). Pronotal laterobasal depressions smooth, basal margin straight or slightly convex (fig. 321h); neck constriction broad, shallow (lateral view); forebody less metallic than elytra, legs concolorous with body 13
- 12'. Pronotal laterobasal depressions rugose to punctate, basal margin trisinate (Fig. 9); neck constriction deep, narrow; body metallic blue, tibiae and tarsi testaceous *P. megalops* (Bates)*
- 13(12). Pronotal hind angles rounded behind basal seta; elytral striae deep, intervals moderately convex; elytral microsculpture transverse mesh, metallic luster faint; tarsi gracile, only slightly broadened apically
P. tenuicollis (LeConte)
- 13'. Pronotal hind angles sharp, right; elytral striae fine, intervals flat; elytral microsculpture dense transverse lines, luster metallic purple to green; tarsi robust, broadened apically
Colpodes buchannani Hope
- 14(8). Apical abdominal sternum of males with 2–3 marginal setae each side, females with 4 setae each side 15
- 14'. Apical abdominal sternum of males with 1 seta each side, females with 2 setae each side 16
- 15(14). Tarsi robust, broad, metatarsomeres 1–3 with median area flattened apically; pronotal laterobasal depressions rugose (Fig. 10)
P. cazieri Liebherr and Will
15. Tarsi gracile, metatarsomeres 1–3 with median area convex throughout length; pronotal laterobasal depressions smooth (Fig. 11)
P. rufiventris (Van Dyke)*
- 16(14). Frons with 2 rufous spots on piceous ground color 17
- 16'. Frons unicolorous, rufous, piceous, or metallic blue 18
- 17(16). Pronotum with completely rounded margin at basal seta (fig. 321a); humeri angulate *P. mannerheimii* (Dejean)
- 17'. Pronotum with evident jag at basal seta (fig. 321e); humeri rounded
P. cincticollis (Say)
- 18(16). Mandibles of normal proportions, retinacular teeth covered by labrum in dorsal view, terebral blade broad to curved apex; metatarsi with evident outer and various inner dorsolateral sulci 19
- 18'. Mandibles elongate, sickle shaped, retinacular teeth evident apicad labrum; metatarsi lacking outer and inner dorsolateral sulci
P. prognathus Van Dyke
[See Liebherr (1989) for redescription and discussion of affinities.]
- 19(18). Pronotum with lateral and basal marginal setae; humeri rounded to slightly angulate; dorsal body color not metallic; elytral intervals weakly to moderately convex 20
- 19'. Pronotum lacking lateral marginal seta, basal seta present (Fig. 12); humeri distinctly angulate, almost right; dorsal body color metallic blue; elytral intervals flat *P. falli* (Darlington)*
- 20(19). Elytral microsculpture isodiametric to transverse mesh; antennomeres short, antennomere 9 2.5–3.0× long as broad 21

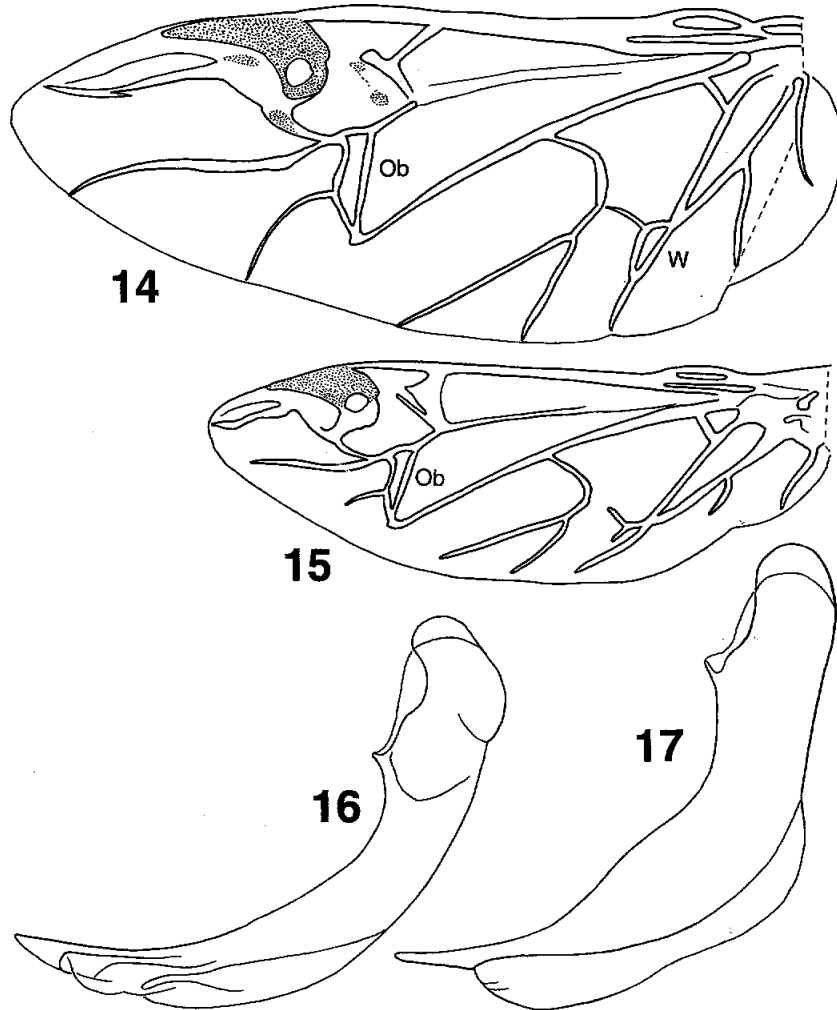
- 20'. Elytral microsculpture dense transverse lines, only partly joined in a transverse mesh; antennomeres elongate, antennomere 9 $>4.0\times$ long as broad *P. parmarginatus* Hamilton
- 21(20). Pronotal laterobasal depressions punctate (figs. 321b, c, f); elytral microsculpture isodiametric, sculpticells in transverse rows or not ... 22
- 21'. Pronotal laterobasal depressions smooth to slightly wrinkled (fig. 321d); elytral microsculpture transverse mesh *P. brunneomarginatus* (Mannerheim)*
- 22(21). Forebody shiny, microsculpture of frons and pronotal disc hard to trace; elytra narrowed basally, striae basally punctate, intervals convex, microsculpture isodiametric with transverse arrangement of sculpticells *P. decentis* (Say)
- 22'. Forebody with evident microsculpture, isodiametric on frons, transverse lines in loose mesh on pronotal disc; elytra parallel-sided, striae with faint punctulae basally, intervals only slightly convex, microsculpture granulate isodiametric in both sexes *P. opaculus* LeConte



Fig. 13. *Platynus indecentis*, female.

Platynus indecentis Liebherr and Will, new species

Diagnosis. Extremely similar to *Platynus decentis*, but with impunctate laterobasal pronotal depressions (Figs. 6, 13); tarsomere V with 6 long setae



Figs. 14–15. Left flight wing. 14. *Platynus indecentis*. 15. *P. decentis*.
 Figs. 16–17. Male aedeagal median lobe, left lateral view. 16. *P. indecentis*. 17. *P. decentis*. Ob = oblongum cell, W = wedge cell.

ventrally (Fig. 1); macropterous metathoracic wings with reflexed apex fully developed (Fig. 14); metepisternum smooth; lateral reaches of abdominal sternum II at most slightly wrinkled; male aedeagal median lobe apex triangular, aedeagal internal sac everting from median lobe on its left lateral side (Fig. 16).

Description. *Head.* Frons shiny, frontal furrows shallow, broad; neck impression broad, evident even in dorsal view; eyes convex, distance across eyes $1.65\times$ interocular distance; labrum broadly and shallowly emarginate apically; antennomeres elongate, an-

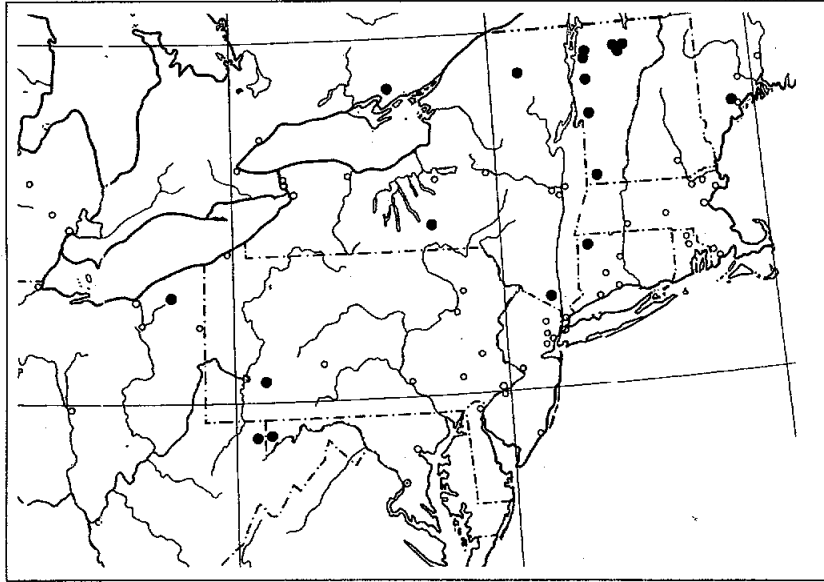


Fig. 18. Distributional records of *Platynus indecentis*.

tennomere 9 about $3.5\times$ as long as broad; mentum with triangular median tooth; submentum with single lateral seta each side. *Prothorax*. Pronotum with broadly reflexed lateral margins, basolateral margins slightly sinuate before denticulate, obtuse hind angles (Fig. 6); laterobasal depressions broad, smooth, with slightly raised tubercle; median base smooth, basal margin complete medially; median impression fine; anterior transverse impressions deep, delimiting a depressed anterior median triangle; apical marginal bead continuous medially; prosternal process unmarginated. *Elytra* slightly narrowed basally; subapical sinuation evident; elytral stria deep, impunctate throughout length; elytral intervals moderately convex; humeral angles evident, tightly rounded; 3 dorsal elytral setae in depressions extending halfway across third interval; 15–16 lateral elytral setae. *Pterothorax*. Metepisternum elongate, mesal margin $1.5\times$ anterior margin; metepisternum and metepimeron completely impunctate; macropterous metathoracic wings, with reflexed apex fully developed (Fig. 14). *Abdomen*. Lateral reaches of abdominal sternum II only slightly punctate, any punctures obscured by wrinkles no more distinct than observed on more posterior segments; males with 1 apical seta each side of apical sternum, females with 2 setae each side. *Legs* gracile, tarsi moderately elongate; profemur lacking anteroventral setae, with 2 posteroventral setae; mesofemur with 2 anteroventral setae; metacoxa with 2 setae, inner seta lacking; metafemur with 2 anteroventral setae, 3–5 dorsoapical setae; metatarsomeres 1–3 with broad outer dorsolateral sulcus, slightly shallower inner sulcus, median area broadly convex; fourth metatarsomere with very short, equal inner and outer apical lobes, apical setae moved slightly antepical and dorsal, subapical setae lacking; fifth metatarsomere obviously setose ventrally, with 5–6 setae longer than the depth of tarsomere viewed laterally (Fig. 1). *Color*. Legs and body unicolorous, rufopiceous; apical 4–5 antennomeres paler, brunneous; reflexed lateral margins of pronotum slightly translucent, therefore paler; metasternites, abdominal sterna, and elytral epipleura rufobrunneous. *Microsculpture*. Frons with reduced microsculpture, surface shiny; pronotal disc with faint but evident transverse microsculpture of lines partly joined into a loose mesh; elytra with transversely stretched isodiametric mesh, sculpticells joined in transverse rows $1.5\text{--}2.0\times$ as broad as long in males, females with

less transverse mesh, sculpticells still in transverse rows but nearly equal in breadth and length. *Male Genitalia*. Aedeagal median lobe with triangular apex (dorsal view), with internal sac everting from left lateral aspect of lobe (Fig. 16); inner face of median lobe (euventral face) evenly concave or straight at midpoint from basal bulb to apex (not recurved as in *P. decentis*, Fig. 17); median lobe testaceous, with brunneous dark areas, not darkly melanized. *Female Reproductive Tract*. Bursa copulatrix vasselike, ventral expansion near entrance of common oviduct and spermathecal duct (Fig. 19), incomplete medial band of short, fine microtrichia, strongest on left side; spermatheca apically recurved, basally wider than spermathecal duct, with about 30 irregular constrictions, duct-reservoir junction straight; spermathecal gland duct about 1.5× length of gland reservoir plus pedicel, duct entering spermathecal duct well below basal expansion of spermathecal reservoir; apical gonocoxite with narrow base, apex narrowly rounded, 2 lateral ensiform setae, 1 dorsal ensiform seta, and 2 apical nematiform setae inserted in round depression; basal gonocoxite with apical fringe of 9 setae, inner 6 irregularly staggered in 2 rows.

Type Series. *Holotype*. New York. Tompkins Co.: McLean Bog, 19-IX-1995, K.W. Will, under bark in sphagnum bog (♂, CUIC). *Allotype* ♀. Same data and deposition. *Paratypes*. U.S.A. **Connecticut**. Litchfield Co.: N Colebrook, 11-IX-1953, E. G. Matthews (1 ♂, 1 ♀, CUIC). **Maryland**. Garrett Co.: Cranesville Swamp Preserve, southeast corner, 780 m, 28-IX-1995, R. L. Davidson, sphagnum swamp under bark of dead tamarack and pine (2 ♂, 1 ♀, CMNH). **Maine**. Lincoln Co.: Walpole, 10-IX-1994, C. & S. Staines (1 ♀, CMNH). **New York**. Essex Co.: Whiteface Mtn summit, 6-VII-1995, K. W. Will (1 ♂, KWWC). Tompkins Co.: Ithaca, 24-VI-1947, C. Robinson (1 ♂, CUIC); Malloryville Bog, 23-IX-1995, K.W. Will, under pine bark in sphagnum bog (1 ♂, CUIC), J. K. Liebherr, under *Populus* bark (1 ♀, CUIC), J. K. Liebherr, under hardwood bark in swamp (1 ♀, CUIC); McLean Bog, 22-IX-1995, J. K. Liebherr, in dead wood in sphagnum bog (1 ♂, 1 ♀, CUIC); Ulster Co.: Rochester. Pacama Vly [=bog], 41° 15' 30" N, 74° 15' 30" W, 225 m, 11-20-VI-1994, M. S. Adams (1 ♂, CMNH), 21-30-VI-1994, M. S. Adams, pitfall trap in sphagnum bog (2 ♀, CMNH). **Ohio**. Geauga Co.: Fern Lake Bog, 21-VIII-1980, H. J. Lee (1 ♂, HJLC). **Pennsylvania**. Westmoreland/Somerset Co.: Linn Run St. Pk., 6 mi. SE Rector, 27-VI-1981, R. Davidson, sphagnum bog (1 ♂, 1 ♀, CMNH), R. & J. Bell, sphagnum bog (1 ♂, CMNH), 24-VII-1986, R. Davidson (1 ♀, CMNH). **West Virginia**. Preston Co.: 2 km SSE Cranesville, Cranesville Swamp Pres., 39-32N, 79-29W, 778 m, 26-29-IX-1995, R. Davidson, W. Zanol, M. Klingler, wetland sphagnum bog, hand collected, TNC 171 (30 ♂, 37 ♀, CMNH). **Vermont**. Addison Co.: Bristol, Beaver Meadow, 15-VI-1980, M. Langworthy (1 ♀, CMNH); Chittenden Co.: Bolton, Bolton Notch, 19-V-1963, R. & J. Bell (4 ♂, 3 ♀, UVMC); Burlington, 28-IX-1970, C. Page (1 ♀, CMNH); Huntington, Green Mt. Audubon Nature Center, 14-V-1974, R. Bell (1 ♂, UVMC); Lamoille Co.: Morristown, Molly's Bog, 21-VI-1962, Bell & Mills (4 ♂, 2 ♀, UVMC); Waterville, Judevine Brook, 11-VI-1963, (1 ♂, CMNH), 17-V-1963, R. & J. Bell, beaver pond (2 ♂, 1 ♀, UVMC). Rutland Co.: Rutland, Jct. Rtes. 7 & 103, 22-IX-1980, J. Leonard (1 ♂, UVMC). Windham Co.: Jacksonville, 2-VIII-1962, Mills, swamp (1 ♂, CMNH). **CANADA**. **Ontario**. Alfred, 27-IX-13-X-1980, S. Peck, sphagnum bog carrion trap (1 ♀, CNC) (Fig. 18).

Etymology. Named for this species' close similarity to *P. decentis*, and the indecent period of years, 172 to be exact, between description of *P. decentis* and discovery of its cryptic sibling. Though JKL coined the name, KWW was the first to recognize it from CUIC specimens and the first to purposefully collect it from the field—those specimens picked as holotype and allotype—thereby establishing the species' authorship.

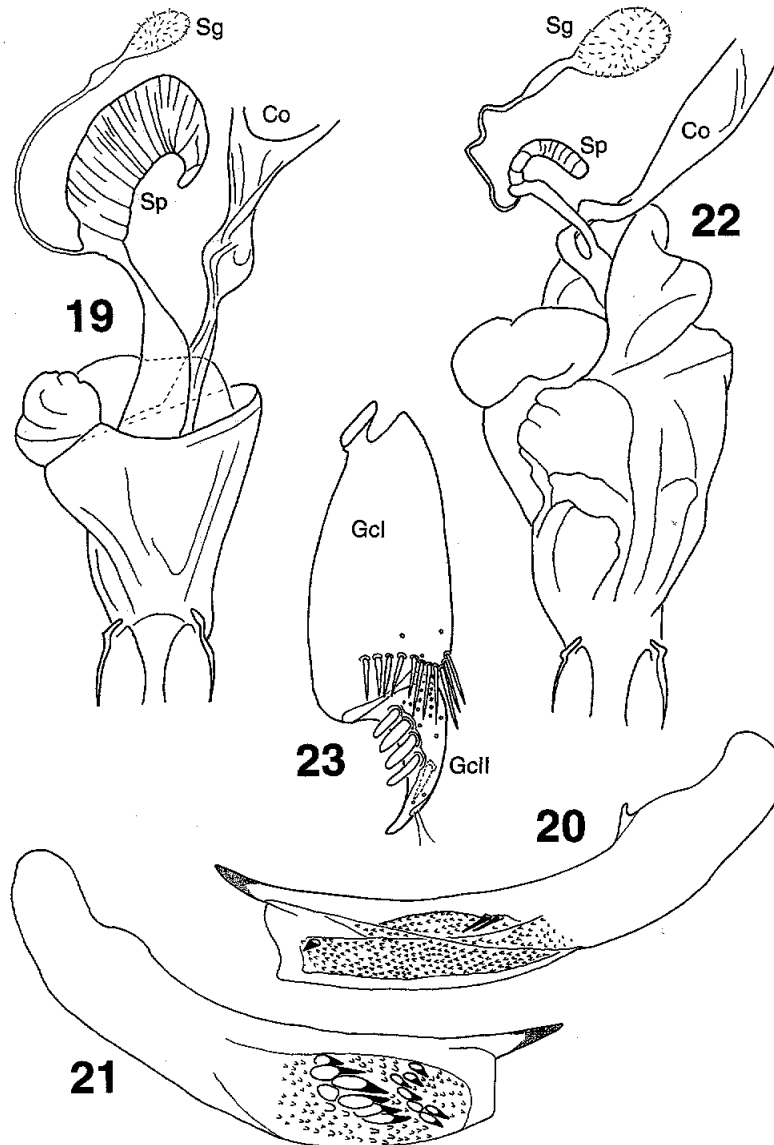


Fig. 19. *Platynus indecentis*, female reproductive tract, ventral view.

Figs. 20–23. *Platynus cazieri*. **20.** Male aedeagal median lobe, left lateral view. **21.** Male aedeagal median lobe, right lateral view. **22.** Female reproductive tract, ventral view. **23.** Right female gonocoxa, ventral view. Co = common oviduct, GcI = basal gonocoxite, GcII = apical gonocoxite, Sg = spermathecal gland, Sp = spermatheca.

Affinities. *Platynus indecentis* has been confused with *P. decentis*, suggesting a close relationship. However, the Palearctic triplet of *P. assimilis* (Paykull), *P. krynickii* (Sperk), and *P. longiventris* (Mannerheim), is also extremely similar, requiring cladistic analysis including all five taxa to determine sister group relationships. The cumulative range of these five species is completely Holarctic (Lindroth 1966, 1992).

Dynamics. The metathoracic wings of *P. indecentis* are fully macropterous (Fig. 14), in contrast to the brachypterous wings of *P. decentis* (Fig. 15). The specimen of *P. indecentis* from Whiteface Mountain, New York, was taken under a board in highly human-trafficked alpine habitat, not the likely breeding habitat for this species, suggesting that this individual had flown to the summit from lower elevations.

In this case, the bog specialist, *P. indecentis*, has retained the plesiomorphic flight wing condition, presumably due to selective advantage in colonizing isolated bogs. Conversely, the forest generalist, *P. decentis*, has evolved a brachypterous condition, suggesting that it disperses on foot among its preferred, more continuously distributed habitat.

Ecology. *Platynus indecentis* is associated with sphagnum bog habitats, a deduction first made by R. L. Davidson (pers. comm.). Based on Davidson's deduction, the authors collected specimens in dead punky wood of standing snags on the sphagnum mat at McLean Bog, Tompkins Co, New York. On 22-IX-1995, JKL confined his collecting activities to the edge of the sphagnum mat in McLean Bog, finding two specimens of *P. indecentis*; KWW searched adjacent hemlock-maple-beech forest on swales surrounding the bog, finding 11 specimens of *P. decentis*. Subsequently, we found *P. indecentis* under pine and cottonwood bark at Malloryville Bog, about 4 air km from McLean Bog. Based on our findings, Davidson and colleagues found individuals in similar, apparently overwintering sites in bog habitats in West Virginia and Maryland. Further work on the microhabitat preferences of these two species is warranted.

The Palearctic relative, *P. longiventris*, is also known to frequent dead *Populus* logs in periodically flooded forest (Lindroth 1992). Lindroth records *P. longiventris* climbing trees infested by leafroller caterpillars (Lepidoptera: Tortricidae), and occupying arboreal squirrel nests.

Platynus cazieri Liebherr and Will, new species

Diagnosis. A large depressed *Platynus*, overall body length 13.0–13.7 mm; elytra rufopiceous without metallic reflection, with granulate isodiametric microsculpture in both sexes; pronotum bisetose, with straight lateral margins before rounded-angulate hind angles, laterobasal depressions rugose to slightly punctate on mesal surface (Fig. 10); metafemur with 9–11 dorsoapical setae; abdominal sternum VII with 2–3 marginal setae each side in males, 4 each side in females.

Description. *Head.* Frons smooth, shiny, frontal grooves shallow; neck impression shallow though evident; eyes convex, distance across eyes 1.67× interocular distance; labrum broadly and shallowly emarginate; antennae robust, antennomeres 8–10 about 2.3× as long as broad; mentum with acutely pointed median tooth; submentum with two lateral setae each side. *Prothorax.* Pronotum transverse, lateral margins straight to slightly convex before rounded-angulate hind angles (Fig. 10), laterobasal depressions punctate, median base irregularly punctate and wrinkled, lateral margins broad, slightly reflexed; prosternal process unmarginated ventrally, posterior dorsal triangle set off from lateral surfaces by slightly developed carina. *Elytra* broad, only slightly convex; lateral margins

evenly convex, subapical sinuation nearly obsolete; striae fine but complete, minute punctulae present throughout length, stronger in basal $\frac{1}{2}$ of length; elytral intervals nearly flat; humeri distinctly obtuse-angulate; scutellar seta single or doubled each side (2 specimens each); 3 dorsal punctures inserted in shallow depressions; 18–19 lateral setae. *Pterothorax*. Metepisternum elongate, macropterous. *Abdomen*. Males with 2–3 apical setae each side on apical abdominal segment, females with 4 setae each side. *Legs* robust, tarsi short and broadened apically; profemur lacking anteroventral setae, with 1 posteroventral seta; mesofemur with 2 anteroventral setae; metacoxa with 2 setae, inner seta lacking; metafemur with 2 anteroventral setae, 9–11 dorsoapical setae; tarsi stout, deep and narrow inner and outer dorsal sulci separated by broadly convex median area; 4th metatarsomere with short subequal lobes; 5th metatarsomere apparently glabrous ventrally, 4 very short setae may be visible. *Color*. Unicolorous, rufopiceous to brunneous, palpi and pronotal lateral margins paler. *Microsculpture*. Head and pronotal disc with reduced microsculpture, surface shiny; sculpticells on head isodiametric where visible, on pronotal disc distinctly transverse; elytra with granulate isodiametric microsculpture in both sexes. *Male Genitalia*. Aedeagal median lobe with elongate, acutely pointed apex (Figs. 20, 21); internal sac with large spinelike macrotrichia in basoventral and medioventral patches (Fig. 21), visible through the median lobe wall in unevverted specimens, balance of sac covered with small scalelike microtrichia. *Female Reproductive Tract*. Bursa copulatrix vaselike, with broad ventral lobe and 2 apical lobes near entrance of common oviduct (Fig. 22); spermatheca elongate, ovoid, with 14 major constrictions, base at right angle to duct, duct and spermathecal reservoir of equal diameter; spermathecal gland duct shorter than length of gland reservoir and pedicel, duct entering at base of spermathecal reservoir; apical gonocoxite strongly arcuate, laterally excavated, apex rounded (Fig. 23), 4–5 broad lateral ensiform setae, 1 dorsal ensiform seta, and 2 apical nematiform setae in elongate depression, ventral face with numerous sensilla; basal gonocoxite with apical fringe of 13–16 setae.

Type Series. *Holotype*. **Arizona**. Pima Co.: Baboquivari Mts, El Mirador Ranch, 4 mi NW Sasabe, 3-IX-1950 // T. Cohn, P. Boone, M. Cazier (δ , AMNH). *Paratypes*. Same data as holotype (1 δ , AMNH). **Arizona**. Santa Cruz Co.: 10 mi E Nogales, 28-VII-1956, C. & M. Cazier (1 δ , AMNH); Mexico // 1539 // Bowring, 63–47* (1 δ , BMNH) (Fig. 24).

Etymology. This species is dedicated to the memory of one of its collectors, Mont Cazier, and his longterm systematic efforts in Cicindelidae and Scarabaeidae, especially those of the southwestern United States and Mexico.

Affinities. *Platynus cazieri* is related to *P. aphaedrus* Chaudoir, a relationship first noted by Whitehead (1973). Both species exhibit the basal and medial bands of macrotrichia on the aedeagal internal sac—though the bands are heavier in *P. cazieri*—and the plurisetose apical abdominal sternum. *P. aphaedrus* differs by exhibiting more angulate pronotal hind angles, darker body color with a metallic green luster on the elytra, impunctate elytral striae, and an aedeagus longer relative to body length than in *P. cazieri*. The range of *P. aphaedrus* includes localities in Chiapas, Oaxaca and Veracruz.

Platynus cohni Liebherr and Will, new species

Diagnosis. Moderate-sized, similar to *Calathus*, overall length 7.9–9.1 mm; pronotum rectangular, with broad, nonreflexed, diaphanous lateral margins, basal seta located distinctly inside margin (Fig. 7); elytra widest behind middle, subapical sinuation slight, intervals almost flat, isodiametric sculpticells in transverse rows; metafemur without dorsoapical setae; abdominal sternum VII with 1 seta each side in males, 2 each side in females.

Description. *Head*. Frons smooth, frontal grooves shallow, wrinkled, indistinct; neck constriction shallow, broad; eyes slightly convex, distance across eyes 1.45 \times interocular

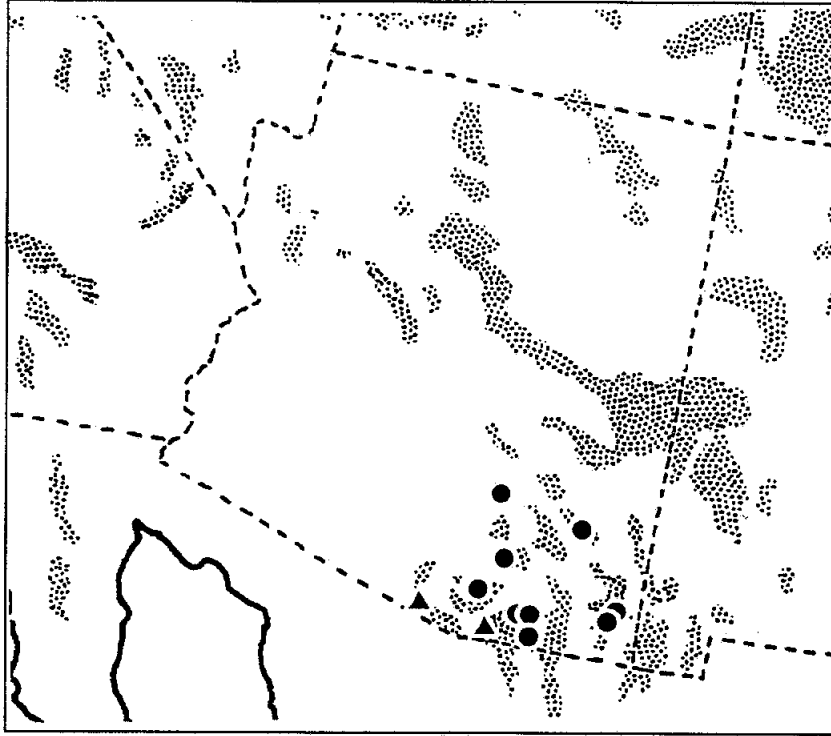
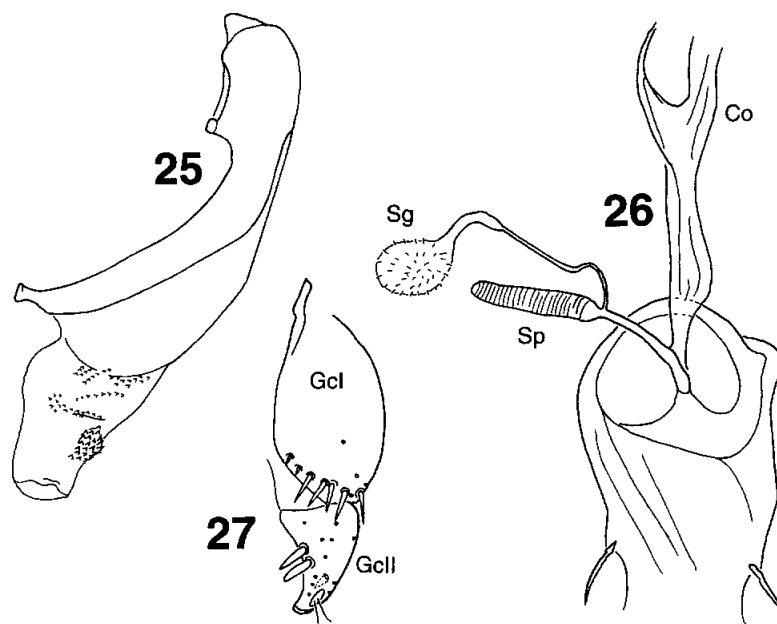


Fig. 24. Distributional records of *Platynus cazieri* (▲), and *P. cohni* (●).

distance; labral margin straight except for shallow and narrow indentation medially; antennae moderately short, segments VIII-X about 2.5× long as broad; mentum with triangular median tooth with rounded apex; submentum with 2 lateral setae each side. *Prothorax*. Pronotum rectangular, lateral margins straight before rounded-angulate hind angles (Fig. 7); posterior pronotal seta well inside unreflexed margins, anterior pronotal seta in middle of diaphanous marginal gutter, distinctly inside slightly reflexed margin; basal and apical marginal beads obscure medially, traceable laterally; laterobasal depressions shallow, slightly wrinkled, impunctate; prosternal intercoxal process unmarginated apically, posterior face with dorsal triangle set off by carinate margins. *Elytra*. Disc flattened, sides and apex depressed; elytral width greatest at apical $\frac{2}{5}$, subapical sinuation reduced, margin only slightly concave approaching apex; striae fine but complete, slightly wavering, intervals slightly convex; humeri obtuse-angulate; scutellar seta single; 3 dorsal elytral setae in shallow depressions; 17-18 lateral elytral setae. *Pterothorax*. Metepisternum elongate, macropterous. *Abdomen*. Males with 1 apical seta each side on abdominal sternum VII, females with 2 setae each side. *Legs* gracile, tarsomeres 1-2 parallel-sided, tarsomeres 3-4 slightly expanded apically; profemur without anteroventral setae, with 2 posteroventral setae; mesofemur with 2 anteroventral setae; metacoxa with two setae, inner seta lacking; metafemur with 2 anteroventral setae, without dorsoapical setae; metatarsomeres 1-3 with obsolete inner and fine outer dorsal sulci, tarsomeres medially convex; metatarsomere 4 with short outer lobe, inner lobe lacking; metatarsomere V apparently glabrous ventrally, 2-4 very short setae may be visible. *Color*. Dorsal ground color rufous to rufopiceous, mouthparts, antennae, legs, pronotal margins, and elytral base, lateral margins and epipleura paler, testaceous to rufous; elytra



Figs. 25–27. *Platynus cohni*. 25. Male aedeagal median lobe, left lateral view, internal sac everted. 26. Female reproductive tract, ventral view. 27. Right female gonocoxa, ventral view. Co = common oviduct, Gcl = basal gonocoxite, GclI = apical gonocoxite, Sg = spermathecal gland, Sp = spermatheca.

with or without slight blue-green metallic luster. *Microsculpture.* Frons with shiny isodiametric mesh; pronotal disc with transverse mesh, laterobasal depressions isodiametric; elytral intervals with isodiametric mesh, some sculpticells in transverse rows. *Male Genitalia.* Aedeagal median lobe with bulbous base, apically narrower (Fig. 25); apex with knoblike expansion; internal sac with sparse microtrichia, and a single pineapple-shaped patch of scales dorsally near apex. *Female Reproductive Tract.* Bursa copulatrix broad, when extended about 1.5× as long as broad (Fig. 26); spermatheca with about 30 weak constrictions, rounded apically, reservoir-duct junction straight, length of reservoir and duct subequal; spermathecal gland duct shorter than length of gland reservoir plus pedicel, duct entering at base of spermathecal reservoir; apical gonocoxite broad, bluntly rounded (Fig. 27), 2 lateral ensiform setae, 1 dorsal ensiform seta, and 2 apical nematiform setae in round depression; basal gonocoxite with sparse apical fringe of 5–7 setae.

Type Series. *Holotype.* Arizona. Pima Co.: Santa Rita Mts, Madera Cyn, 4400', 13-VI-1965, R. W. Poole (♂, CUIC). *Paratypes.* Arizona. Cochise Co.: Chiricahua Mts, Greenhouse Cyn, 6500–7500', 7-VIII-1960, G. E. Ball family and R. B. Madge (1♂, UASM); nr Rucker Lake, 6000', 23–24-VIII-1981, J. K. Liebherr (1♂, CUIC); Rustler Park, under bark, 17-VI-1973, D. S. Chandler (1♀, UAZC); Huachuca Mtns, Carr Cyn, ca. 7000', 17-VII-1959 (6♀, UASM); 12–13-VIII-1960, G. E. Ball family and R. B. Madge (7♂, 5♀, UASM); Coronado Nat. Mem., 27-VII-1988, B.V. Brown, oak forest, blacklight (1♀, UASM); Ramsey Cyn, ca. 7000', 30–31-VIII-1960, G. E. Ball family and R. B. Madge (5♀, UASM). Gila Co.: Pinal Mts, Middle Pioneer Camp, 5000–6100', 16-VIII-1950 // T. Cohn, P. Boone, M. Cazier (1♀,

AMNH). Graham Co.: Pinaleno Mts, Wet Cyn 9 km SW Artesia, Arcadia Camp, 2030 m, 5-7-VIII-1991, M. Daman, R. Davidson, M. Klingler, W. Zanol, J. Rawlins (1 ♀, CMNH). Pima Co.: Santa Catalina Mts, General Hitchcock Camp, 1830 m, 26-28-VII-1982, J. & W. O'Hara, UV light (1 ♀, UASM) (Fig. 24).

Etymology. This species is named to honor one of the original collectors, Theodore J. Cohn, and his contributions to the systematics and biogeography of southwestern Orthoptera (Cohn 1965).

Affinities. Based on the rectangular pronotum with rounded-angulate hind angles, the posteriorly expanded elytra, and the aedeagus with apical knoblike expansion, *P. cohni* is related to three other species assignable to Casey's (1920) subgenus *Trapezodera*; *P. aeneicauda* (Bates), *P. conicicollis* (Chaudoir), and *P. inops* (Chaudoir). Whitehead (1973) lists Guerrero, Mexico, and Morelos as the range of *P. aeneicauda*; Oaxaca as the range of *P. conicicollis*, and Oaxaca and Chiapas as the range of *P. inops*.

Notes on *Platynus* Species Occurring in the Southwestern United States

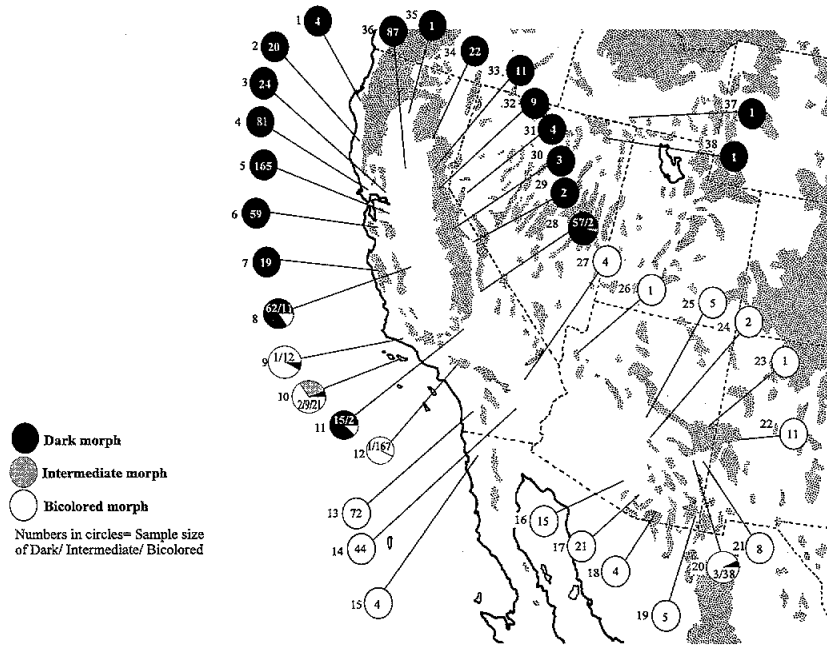
Species are placed in informal species groups below, rather than formal subgenera, as monophyly of all groups has not been demonstrated, and the authors do not wish to grant formal nomenclatural status to potentially paraphyletic groups. The *degallieri* species group represents an exception as Liebherr (1992) diagnosed it as monophyletic; the available subgeneric name for this taxon is *Glyptolenopsis* Perrault (1991).

Platynus decentis species group (Lindroth 1966)

Platynus brunneomarginatus (Mannerheim). This species is distributed from British Columbia south to northern Baja California, and east to southern Utah and western New Mexico (Lindroth 1966; Fig. 28). A color polymorphism is evident across this range, with individuals from the northwestern portions of the range exhibiting uniformly piceous body coloration, and individuals from southern California, northern Mexico, southern Arizona, and New Mexico bicolored. In the bicolored morph, the head, pronotum, ventral body surface and legs are ferruginous, contrasting markedly with the brunneous to piceous elytra. An abrupt transition zone occurs in the mountains surrounding the southern end of the Central Valley, California (Fig. 28), with most population samples available in collections fixed for one of the two color morphs. Several population samples are mixed. Two of these—Santa Cruz Island (sample 10) and Inyo + Tulare Counties (sample 28)—include individuals of a third, intermediate color form, in which the entire upper body surface is dark ferruginous, neither bicolored as in southern specimens nor piceous as in northern specimens. This intermediate color morph is associated with full sclerotization of the cuticle, suggesting that it is not a symptom of recent eclosion.

Color dimorphism has been recorded in the platynine carabid *Agonum decorum* (Say) (Liebherr 1983), and in that species a single diallelic gene determines whether individuals possess a bright red prothorax and testaceous legs, or a metallic green prothorax and piceous legs. The existence of an intermediate form in mixed samples of *P. brunneomarginatus* suggests that the genetic basis for the color pattern is not simply diallelic in this species.

The transition zone of *P. brunneomarginatus* coincides with an area of population disjunction in the well studied ring species, *Ensatina eschscholtzii*



- | # | State:County | # | State:County | # | State:County |
|----|---|----|-------------------------|----|-------------------------|
| 1 | CA: Humboldt | 12 | CA: Los Angeles, Orange | 25 | AZ: Coconino |
| 2 | CA: Mendocino | 13 | CA: San Diego | 26 | AZ: Mohave |
| 3 | CA: Solano | 14 | CA: Riverside | 27 | CA: San Bernadino |
| 4 | CA: Lake, Sonoma, Napa, Marin | 15 | MEX: Baja Cal. Norte | 28 | CA: Inyo, Tulare |
| 5 | CA: Alameda, Contra Costa, San Joaquin, Stanislaus, N&W Sta.Clara | 16 | AZ: Pima | 29 | CA: Mono |
| 6 | CA: S&E Sta. Clara, San Mateo, Sta. Cruz | 17 | AZ: Pinal | 30 | CA: Mariposa, Tuolumne |
| 7 | CA: San Benito, Monterey | 18 | AZ: Sta.Cruz | 31 | NV: Washoe |
| 8 | CA: Fresno, Madera | 19 | AZ: Cochise | 32 | CA: El Dorado |
| 9 | CA: Sta. Barbara, Ventura | 20 | AZ: Gila | 33 | CA: Placer, Nevada |
| 10 | CA: Sta. Barbara, Sta. Cruz Is. | 21 | AZ: Graham,Greenlee | 34 | CA: Plumas,Sierra |
| 11 | CA: Kern | 22 | NM: Catron | 35 | CA: Shasta, Tehama |
| | | 23 | AZ: Apache | 36 | CA: Butte, Yuba, Sutter |
| | | 24 | AZ: Maricopa | 37 | ID: Twin Falls |
| | | | | 38 | NV: Elko |

Fig. 28. Population samples illustrating distribution of *Platynus brunneomarginatus* color morphs. Circles for each sample indicate fraction of each morph, with number to left of circles keyed to samples listed below.

(Amphibia: Plethodontidae) (Jackman and Wake 1994). The blotched forms of the *Ensatina* complex exhibit a broad disjunction to the south and east of Ventura and Kern Counties (coincident with samples 9 and 11), with the nearest known blotched *Ensatina* populations in the mountains of Riverside and San Diego Counties (coincident with samples 13 and 14). Whereas both *Ensatina* and *P. brunneomarginatus* populations occupy mesic canyon habitats, populations of the latter are much more continuous across this transect, suggesting that study of *Platynus* population structure could shed light on the history of habitat fragmentation in the blotched subspecies of the *Ensatina* complex.

Platynus pecki species group

Platynus agilis LeConte. This species is distributed in southern California. The Santa Ynez Mountains comprise the northern edge of the range, with specimens collected at Lake Cachuma, Santa Barbara Co, and Wheeler Springs, Ventura Co (CAS). The southern distributional limit, based on examined specimens, is San Diego Co; Palomar Mtn (AMNH), Julian (UCD), and San Ysidro (MCZ).

Platynus pecki Barr. The type locality for this species is Lincoln Co, Monjeau Lookout, in the Sierra Blanca Mountains (Barr 1982). We have examined additional specimens from Lincoln Co, Capitan Mountains (CMNH), as well as Otero Co, Sacramento Mountains, Sacramento Peak, Water Cyn (CMNH).

Platynus degallieri species group (Liebherr 1992)

Platynus ovatulus (Bates). This species is the lone representative of the species group to occur north of Mexico (Liebherr 1992). *Platynus ovatulus* occurs in the Sierra Madre Occidental of Sonora and Chihuahua, and in Arizona exhibits a distributional range essentially identical to that of *P. cohni* (Fig. 24).

Incertae sedis

Platynus falli (Darlington). Darlington (1936) described this species from the Baboquivari Mountains, Pima Co, Arizona. We have examined specimens from Cochise Co, Cochise Stronghold (UASM); Pima Co, Rincon Mts, 4600'–4800' (UASM); and Santa Cruz Co, 5 mi. SW Patagonia, 3700' (AMNH). Whitehead (1973) states that it is closely related to, and possibly conspecific with *P. segregatus* (Bates), that taxon known from the states of Michoacan, Colima, Morelos, Guerrero, and Oaxaca.

Platynus lyratus (Chaudoir). This is an extremely common riparian species, found throughout eastern Arizona and in western New Mexico. Northern records include Utah: Piute Co, Piute Reservoir (UASM), and several sites in Coconino Co, Arizona. It appears to be widespread in Mexico, distributed throughout the length of Baja California (CISC, CUIC), and south to the state of Oaxaca (Whitehead 1973).

Platynus megalops (Bates). In Arizona, this species is recorded from Cochise, Graham, Pima, and Santa Cruz Counties. It is widespread throughout Mexico from Oaxaca north (Whitehead 1973). It has been repeatedly collected in flight at lights (UCD), and hand collected in riparian forest (UASM).

Platynus rufiventris (Van Dyke). Described from "Mount Washington near Nogales" by Van Dyke (1926), this species is known from specimens collected in Cochise, Pima, and Santa Cruz Counties, Arizona. Cochise Co records include Miller Cyn and Ramsey Cyn in the Huachuclas (UASM, UAZC). It has been collected at Upper Bear Cyn, Santa Catalina Mountains, Pima Co (UAZC). In Santa Cruz Co, it has been found repeatedly in Madera Cyn (UASM, UAZC, UCD). The possibility that its range includes northern Mexico must await study of this and other related Mexican taxa (Whitehead 1973).

Acknowledgments

We thank Thierry Deuve, Museum National d'Histoire Naturelle, Paris, and Michael Pogue and Warren E. Steiner, Jr., National Museum of Natural His-

tory, Washington, D.C., for examining types of Dejean and Casey names synonymized under *Platynus decentis*.

The fact that we recognized *P. indecentis* as a potentially valid species during the end of August 1995, and had discovered its habitat preference less than one month later is attributable to the wisdom of Robert L. Davidson, and we thank him for his ready sharing of information, and for confirmation of this species' bog association through his collecting efforts this past fall.

Not least, we thank Frances Fawcett for the quarter-view habitus of *P. indecentis*.

This research was supported by Hatch project NY(C)139406.

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(Received 13 December 1995; accepted 28 March 1996)

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