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BIOLOGICAL SCIENCES

THREE NEW SPECIES OF NORTH AMERICAN *POLYPHYLLA* HARRIS

(COLEOPTERA: SCARABAEIDAE: MELOLONTHINAE)

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Polyphylla brownae from Alabama, *Polyphylla ratcliffei* from Utah, and *Polyphylla stellata* from California are described as new. They are correlated with existing keys, and each holotype is illustrated.

† † †

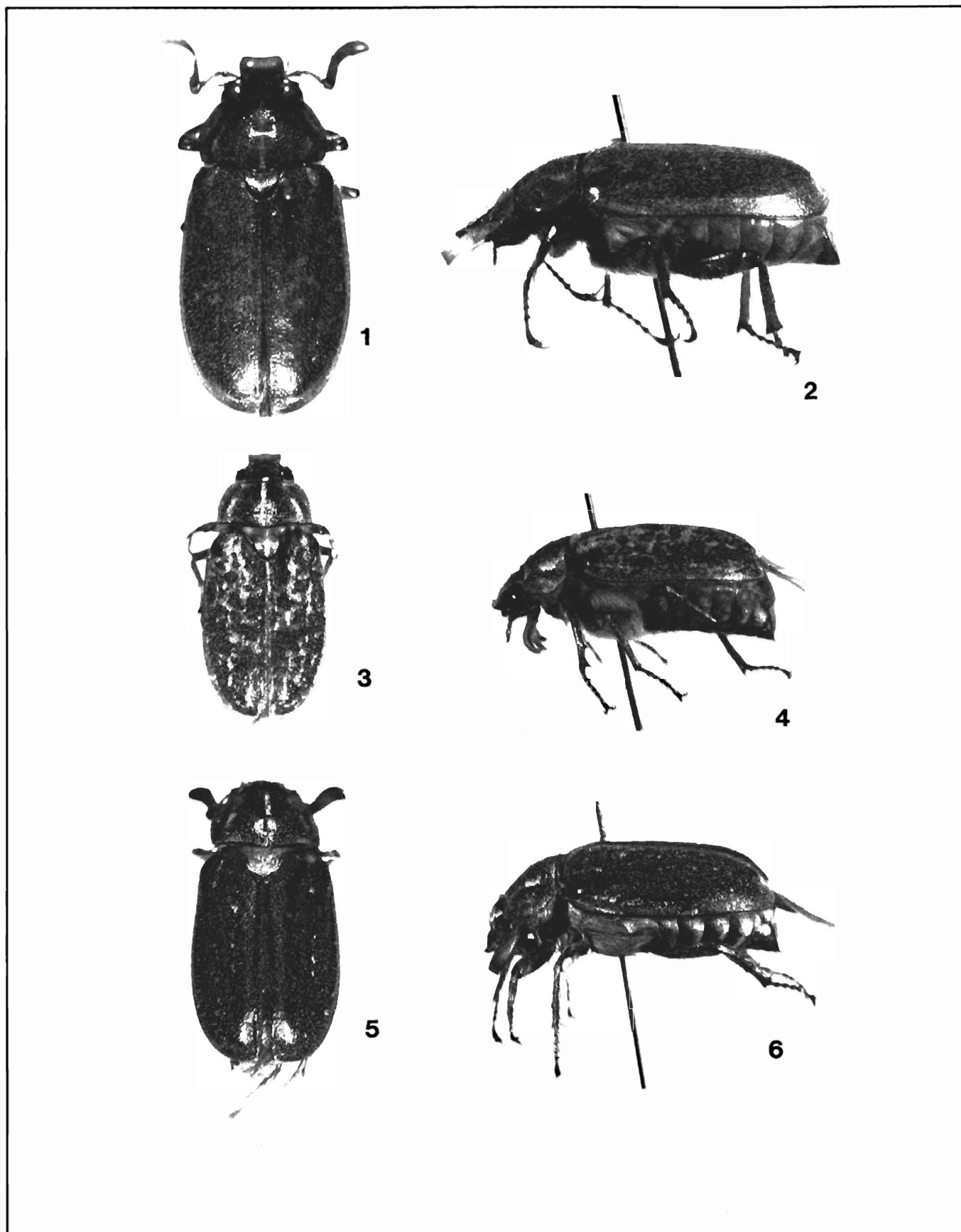
INTRODUCTION

In the New World, the genus *Polyphylla* Harris occurs from 53° North latitude (British Columbia) south to at least 15° North latitude (Honduras). It is recorded from all states of the mainland United States except Alaska, Connecticut, Michigan, Ohio, and West Virginia. In America north of Mexico there are 28 species now considered valid (Young, *in preparation*), including the three new species here described.

I am indebted to the following institutions whose loan of material has made these descriptions possible: Academy of Natural Sciences Philadelphia (ANSP), California Academy of Sciences (CASC), Museum of Comparative Zoology (MCZC), University of California-Davis (UCDC), University of Idaho (UIC), and the United States National Museum (USNM). Thanks also go to Brett C. Ratcliffe, Curator of Entomology, University of Nebraska State Museum, for his constructive review of this manuscript.

Polyphylla brownae new species (Figs. 1, 2)

HOLOTYPE MALE. Body long, narrow, overall length 29.3 mm, width 12.1 mm. Elytra light brown, head and pronotum deeper, richer brown. Clypeus moderately concave, lateral margins contracted for posterior one-fourth; surface entirely, deeply punctate, each puncture giving rise to a broad, yellowish, suberect hair, hairs becoming erect in postero-lateral corners. Head with large, dense, shallow punctures, covered with widely spaced, erect hairs throughout, hairs becoming short and more concentrated along epistomal suture; squamae lacking. Antennal club one and one-third longer than combined length of head and clypeus, distal one-third gradually curved outwards. Prothorax abruptly convex, just over one and one-half wider than long, disc mostly rugose, with variably sized, random punctures laterally, midline suddenly and deeply depressed just anterior to middle and bearing a swirl of fine, recumbent hairs; lateral one-third with dense, recumbent hairs, without squamae throughout. Elytra one and one-half longer than wide, slightly narrower posteriorly, entire surface with short, recumbent, randomly scattered hairs, hairs becoming slightly more concentrated marginally, squamae lacking. Pygidium likewise covered with recumbent hairs, hairs a little longer than those on elytra, squamae absent. Abdomen devoid



48 FIGURES 1-6. *Polyphylla* new species. Figures 1 and 2, Holotype, *P. brownae*. Figures 3 and 4, Holotype, *P. ratcliffei*. Figures 5 and 6, Holotype, *P. stellata*.

of scales, clothed only with fine hairs. Protibiae weakly tridentate.

MEASUREMENTS (Holotype male). Length antennal club 6.1 mm, combined length head and clypeus 4.5 mm; length pronotum 6 mm, width 9.4 mm; length elytra 18.9 mm, width 12.1 mm.

FEMALE. Unknown.

TYPES. Holotype male ANSP 8,395: Alabama: Calvert, VII-4-1923, no collector's name. Calvert is in extreme southern Washington County, bordering on Mobile County which borders on the Gulf of Mexico. One Paratype male CASC: Alabama, Calvert, VII-4-1921, no collector's name. One Paratype male MCZC: Alabama: Calvert, VII-4-1923, no collector's name. Also labelled "H.C. Fall Collection" and "Liebeck Coll."

REMARKS. This species is named in honor of my wife, Nova Brown Young. In the course of a monographic revision of the North American fauna of *Polyphylla* (Young, *in preparation*), the three specimens on which this description is based emerged from the thousands examined. Though they come from institutional collections on opposite coasts of the United States, it seems probable that H.C. Fall collected all three, and they have been subsequently separated.

Using Young's 1967 key to species complexes, *P. brownae* falls within the *hammondi* complex based on the narrow, elongate, parallel-sided aedeagus. Externally, it is immediately recognizable as a member of this group of species that occurs throughout the southwestern and central United States. It is distinguished from its congeners by the combination of its unusual Alabama occurrence and complete lack of squamae over its entire body above and below. Vestiture is composed entirely of hairs. The two paratypes are slightly smaller and darker than the holotype; other than these characters, they are very much like the name-bearing type.

This species is probably an eastern relict of the *P. hammondi* lineage as discussed by Young (1972). It is probable that *P. brownae* inhabits some type of sandy environmental refugium, or that additional collecting will show its distribution southwards to the coastal-dune complexes of the Gulf of Mexico.

Polyphylla ratcliffei new species

(Figs. 3, 4, 7)

HOLOTYPE MALE. Body narrow, small, overall length 21 mm, width 9.5 mm. Elytra light brown, pronotum darker brown, head black. Clypeus moderately reflexed apically, lateral margins continuously narrowing posteriorly, anterior one-third with narrow, elongate, yellowish, suberect to recumbent squamae, squamae continuing laterally and along epistomal suture, disc with a few scattered scales interspersed with suberect hairs. Head with large, dense, shallow punctures, scaled along lateral margins and on canthi, disc shining black, with long golden suberect hairs throughout. Antennal club barely longer than combined length of head and clypeus, distal two-thirds recurved. Prothorax broadly convex, widest just anterior

to midlength, one and two-thirds wider than long, with dense, large shallow punctures; vitta on depressed midline degenerating on posterior half; lateral vittae broad, strongest posteriorly; squamae concentrated along all margins except middle quarter of front, with long, golden, suberect hairs throughout. Elytra just under one and one-half longer than wide, parallel-sided, with sparse, short, fine erect hairs; narrow sutural vitta weakly formed of small, white squamae, squamae broadly and randomly scattered to clustered over surface, without defined vittae (but squamae somewhat more clustered in anterior third of normally vittate areas). Pygidium with small, white scales evenly distributed (except along midline) and with short, fine, recumbent hairs. Protibiae strongly tridentate.

MEASUREMENTS (Holotype male). Length antennal club 4 mm, combined length head and clypeus 3.5 mm; length pronotum 4.5 mm, width 7.5 mm; length elytra 14 mm, width 9.5 mm.

FEMALE. Unknown.

TYPES. Holotype male UIC: Utah: Grand County: 9 mi northwest of Moab, VI-18-1985, attracted by black light, T.D. Miller and F.W. Merickel, collectors. Four male Paratypes, same data. Deposited as follows: Author (1), UIC (1), UNSM (1), USNM (1).

REMARKS. This species is named in honor of Dr. B.C. Ratcliffe, Curator of Insects, University of Nebraska State Museum. It will key to the *diffRACTA* complex in Young (1967). Within this species group, it will key to *P. devestiva* Young, which is endemic to three counties in SW Idaho. There are no intervening morphologically similar demes. In external appearance, *P. ratcliffei* cannot be distinguished from *P. avittata* Hardy, described from the Hurricane Dunes, 6 mi south of Hurricane, Washington County, Utah. These two cryptic species may be immediately distinguished, however, by configuration of the aedeagus. I extracted the aedeagi of the holotype and two paratypes of *P. avittata* and those of the type series of *P. ratcliffei*. In caudal view, the parameres of *P. avittata* are clearly unequal, the left one bearing a translucent dorsal flange and the right one a smaller flange. This flange is not present in *P. ratcliffei* (Fig. 7).

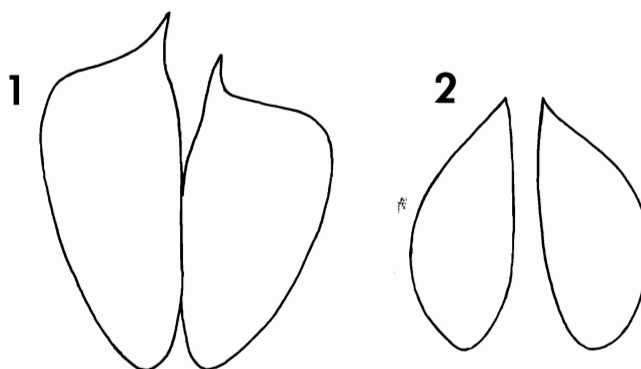


FIGURE 7. Caudal views of aedeagi. (1) *P. avittata*, parameres unequal. (2) *P. ratcliffei*, parameres equal.

The four paratypes show considerable variation in external characters. Overall length varies from 18.75-21 mm, width from 8.5-9.5 mm. The elytra vary from clustered scales forming heavily broken, degenerate vittae to nearly unicolorous brown. Pronotal hairs vary from mostly absent to long and heavy. Dentition of the protibiae ranges from weakly to strongly tridentate.

Polyphylla stellata new species
(Figs. 5, 6)

HOLOTYPE MALE. Body narrow, parallel-sided, overall length 24 mm, width 10.4 mm. Elytra deep brown along all margins, becoming lighter centrally; head and pronotum deep brown marginally, black centrally. Clypeus with only anterior margin reflexed, punctures large, with areas between punctures rugose; white squamae concentrated on lateral and anterior margins, scattered widely on disc. Frons with similar punctation and rugosity, a suberect, yellow hair rising from each puncture, broad white squamae concentrated along eye margin, less concentrated along epistomal suture. Antennal club equal in length to combined length of head and clypeus, barely recurved at distal tip. Pronotum gradually convex, one and three-fifths wider than long, with deep, broad punctures, especially on disc; broad white squamae forming narrow vitta on slightly depressed midline, lateral vittae formed only on posterior half, more elongate, yellowish squamae broadly scattered over rest of surface; elongate, recumbent hairs only on central third of width, hairs scattered between squamae. Elytra one and one-half longer than wide, vittae (or any suggestion of vittae) lacking over entire surface; fine, minute, white squamae scattered randomly over surface, becoming concentrated in a few small spots, erect hairs absent. Pygidium with scattered, minute, white squamae, squamae more concentrated each side of midline. Protibiae weakly tridentate.

MEASUREMENTS (Holotype male). Length antennal club and combined length head and clypeus 3.85 mm; length pronotum 5 mm, width 8 mm; length elytra 15.1 mm, width 10.4 mm.

FEMALE. Unknown.

TYPES. Holotype male UCDC: California: Sacramento County, Carmichael, VII-11-1959, T.H. Gantenbein. Two Paratype males UCDC: same locality as Holotype, VII-21-1956,

R.E. Darby, collector (1) and California: Contra Costa County, Antioch, VII-3-1953, G.E. Marsh and R.O. Schuster, collectors (1). Two Paratype males USNM: identical data as for Holotype. One Paratype male, author's collection: California: Contra Costa County, Antioch, VII-30-1953, R.O. Schuster, collector.

REMARKS. This species very readily keys to the *diffRACTA* complex in Young (1967), or it may be placed within that species cluster at a glance by the presence of pronotal hairs. Within the *diffRACTA* complex, the absence of elytral hairs and the absence of pygidial hairs (varying to presence of short suberect hairs) places it at couplet 8 which separates *P. sobrina* and *P. modulata*. It is separated from both these species by the complete absence of any elytral vittae and its brown to black basal color. *P. sobrina* is one of the more distinct species in the North American fauna, characterized by its unique yellow to reddish brown color. *P. modulata*, basally colored more like *P. stellata*, typically shows well formed, hard-edged elytral vittae, and it cannot be confused with the avittate *P. stellata*.

The paratypes range in overall length from 22.1-23.3 mm, in width from 10.1-11.0 mm. Elytral length ranges from 14.3-15.7 mm. Overall they show very little variation in external morphology. In two paratypes the pronotal disc is devoid of squamae, having only a light covering of recumbent hairs. In another, the elytral squamae are missing centrally, giving the animal a simple deep brown appearance. Protibiae vary from barely to deeply tridentate. Once seen, this distinct species should be easy to recognize. The spotted or speckled aspect of the elytra (hence the name), with each spot being a single isolated white scale, is quite unique.

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