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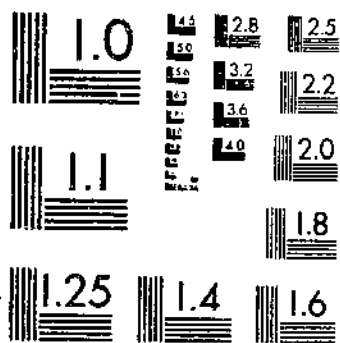
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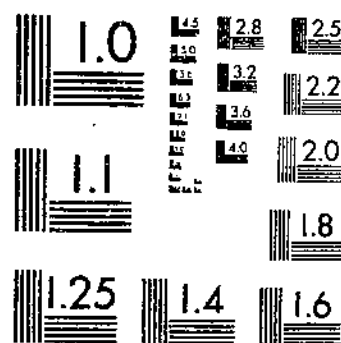
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THE GENUS PROTHECA OF THE AMERICAS (COLEOPTERA: ANOBIIDAE)

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TECHNICAL
BULLETIN
NUMBER 1605

PREPARED BY
SCIENCE AND
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16
A1.36:1605

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ABSTRACT

White, R. E. 1979. The genus *Protheca* of the Americas (Coleoptera: Anobiidae). U.S. Department of Agriculture, Technical Bulletin No. 1605, 24 pp.

In this bulletin, 25 *Protheca* species are described, 20 of which are new. They occur in the Caribbean Islands (15), South America (7), Central America (2), and North America (1). These species are placed in five groups, which are briefly described. Also included are a key to species, a discussion of taxonomic characters important in the key, a morphological description and taxonomic treatment of the genus with a diagnosis, and 21 illustrations showing male genitalia of 13 species.

KEYWORDS: Coleoptera: Anobiidae, *Protheca*, taxonomic revision, new species, Americas.

ACKNOWLEDGMENTS

My thanks are offered to Jean Menier and Mme. A. Bons, Museum National d'Histoire Naturelle (MNHP), Paris, for assistance during my examination of the Pic collection and for loan of specimens. My thanks also go to the following persons for loan of specimens: Ubirajara R. Martins, Museu de Zoologia da Universidade de São Paulo (ZMSP), Brazil; Edward C. Becker, Canadian National Collection (CNCI), Ottawa; Henry F. Howden, Carleton University (HAHC), Ottawa; and Clarence D. Johnson, Northern Arizona University (NAU), Flagstaff.

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THE GENUS *PROTHECA* OF THE AMERICAS (COLEOPTERA: ANOBIIDAE)

By RICHARD E. WHITE¹

The Dorcatominae, to which *Protheca* belongs, is the largest and taxonomically the most difficult of the Anobiidae subfamilies. This bulletin is one of a series in which selected genera of American Dorcatominae are treated.

Species of *Protheca* occur exclusively in the Americas; 15 are from various Caribbean Islands, 7

from South America, 2 from Central America, and 1 from North America.

Larvae of many species in this subfamily bore in fungi, including woody fungi, mushrooms, and puffballs. Some bore in wood, dead branches, twigs, or vines. The only record available on habits of a *Protheca* species is of *hispidata* from a tulip tree.

HISTORICAL REVIEW

The genus *Protheca* and two North American species, *hispidata* and *puberula*, were described by LeConte (1865), when he also established the basic framework of our higher classification of Anobiidae. Fall (1905) refined the LeConte classification and clarified the interrelationships of anobiid genera, including *Protheca*. Pic described the following species that actually belong in *Protheca*: *Leptobia guadalupensis* (1909) from Guadeloupe, *Catorama insulcata* (1927) from Brazil, and *Pseudodorcatoma hirsuta* (1937) from Costa Rica. Fisher (1936) described *Protheca flavitarsis* from Puerto Rico. Le-

pesme (1947) needlessly erected *Picatoma* for Pic's *Leptobia guadalupensis*. *Protheca puberula* LeConte was transferred to *Sculptotheca* Schilsky by Español (1973, pp. 62-63).

I recognize the need for the generic change made by Español, because *puberula* exhibits notable differences from species of *Protheca*. It has a nine-segmented antenna and the lateral lobes of the male genitalia lack palplike objects. However, I cannot confirm the assignment of *puberula* to *Sculptotheca*, for I have not seen the type-species of that genus.

METHODS

The sample of specimens of *Protheca* that I saw during this work was rather small. Twenty-four of the twenty-five species I recognize were represented by only about 60 specimens, excluding the North American species *hispidata* LeConte with 69 specimens. Eleven of the twenty new species are described from single specimens. Considerable work

remains before the species of this genus are completely known.

During my visit at the Museum National d'Histoire Naturelle in Paris early in 1977, I examined most types of Anobiidae species that were described by Maurice Pic. As a result, I am now able to assign with certainty those Pic species of Anobiidae whose types were available. In this bulletin, I assign to *Protheca* and redescribe three species that were named by Pic. Part of the Pic collection was unavailable, for it had been on loan for many years and had never been returned to the museum.

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MORPHOLOGY

General.—Body in dorsal view oval to subcylindrical, 1.4–2.0 times as long as wide. Surfaces often with 2 sizes of punctures (large, rimmed punctures and smaller, dotlike punctures), sometimes with small punctures only; surfaces sometimes finely granulate, infrequently with large granules. Pubescence, at least in part, weakly to strongly bristling, short and sparse to (most often) medium in length and density, sometimes dense and obscuring surface sculpture; in most species swirled or alternating in direction and thus forming light and dark areas; pubescence usually more or less yellowish, sometimes brown, infrequently bicolored. Ground color usually red brown to brown, sometimes nearly black.

Head.—Eyes large to small, separated by 1–3 times vertical diameter of an eye, bulging. Antenna 11-segmented; segment 1 large, arcuate, segments 2–8 small; last 3 segments much enlarged, together longer than all preceding united, segments 9 and 10 subtriangular, segment 11 more or less spindle shaped. Ventral surface distinctly excavated, receiving antennae during retraction. Last segment of both maxillary and labial palpi subtriangular, usually longer than wide, distal margin usually nearly straight, sometimes arcuate or notched.

Dorsal surface.—Pronotum in side view nearly evenly rounded or (more frequently) most strongly rounded before base, infrequently distinctly convex before base; at side often nearly evenly rounded, but usually flat to weakly concave, infrequently distinctly concave; lateral margin sharp, fine, usually not attaining anterior margin. Scutellum small to medium, apex rounded. Elytron with distinct striae, with traceable striae, or with no evidence of striae; striae, when present, formed of large, deep punctures, often most distinct at side of elytron, some species with 10 more or less distinct striae; humerus distinct; lateral margin strongly, inwardly arcuate at level of hindfemur.

Ventral surface.—Prosternum much reduced, narrow, strongly transverse; front coxae flattened, narrowly separated, largely concealed during retraction. Mesosternum nearly vertical, concave, concealed during retraction, at apex often produced into a hook, latter visible in retraction; middle coxae widely separated. Metasternum anteriorly at middle with a broad lobe, lateral parts of lobe delimited posteriorly by tarsal grooves, surface behind lobe

nearly always longitudinally grooved; metepisternum visible at side, very narrow. Abdomen with 5 segments, 5th segment longest, 2d, 3d, and 4th subequal in length, 1st segment short, depressed each side of middle, receiving hindlegs and generally concealed by them, always visible between legs; abdominal sutures usually bisinuate, sometimes arcuate or nearly straight, in most species distinct throughout, infrequently obscure to absent medially; front and middle tibiae with no evidence of striae on outer face.

Male genitalia.—Trilobed, symmetrical; lateral lobes distinctly cleft (weakly cleft in only *aberrans*); palplike process of a lateral lobe usually stout; median lobe usually short and rather broad, often with a membranous extension apically.

Length.—1.3–2.9 mm.

Discussion.—Characters that distinguish members of this genus from species of other genera are given in the diagnosis following the generic synonymy.

P. aberrans, *producta*, and *estriata* are the most aberrant members of this genus. The first is unique for the absence of a longitudinal groove on the metasternum and the second species has but a weak groove on the metasternum. *P. producta* and *estriata* are the only members of the genus in which the abdominal sutures are obsolete medially. The body in dorsal view of these three species is more nearly oval than the usual subcylindrical body of other species of this genus.

Since species of *Protheca* infrequently exhibit external sexual characters, determining the sex of a specimen nearly always requires removal of the abdomen, its dissection, and examination of the genitalia. However, attempts to remove the abdomen can cause irreparable damage to a specimen, because these species are very small and the body parts are tight fitting.

I tried to sex the holotypes of all new species but gave up the attempt to sex the types of *densa* and *sinuata* rather than take the chance of greatly damaging them. Since the nature of the pubescence (i.e., whether swirled and producing light and dark patches or not) is an important taxonomic character, I have avoided relaxing specimens in a liquid to aid in dissecting genitalia; such relaxation would mat the pubescence and lessen its taxonomic value.

The male genitalia of species of this genus are distinctive in having the lateral lobes cleft and the median lobe short and broad. The most aberrant genitalia are those of *aberrans*; the lateral lobes are

narrow and weakly cleft and the palplike process of a lateral lobe is rather long and narrow basally. The next most unusual genitalia are of *producta*; each lateral lobe is bifurcate and cleft.

TAXONOMIC CHARACTERS

Certain characters in the key to species and in the species descriptions require explanation so that they may be understood and used effectively.

A pivotal character in couplet 1 of the key is the nature of the pubescence on the dorsal surface. In most species, this pubescence is distinctly swirled or alternating in direction and (as a result) has light and dark areas. In other species, the pubescence is weakly changing direction or nearly uniform in direction and thus lacks light and dark areas. Fortunately most species clearly fall into one category or the other. Since this condition of the pubescence varies to nearly midway between the extremes in a couple of species, use of the first couplet may be difficult with them.

In most species of *Protheca*, the pubescence is light reflective at one angle to a light source but not at another angle. Thus the light and dark areas are produced in those species with swirled or alternating patches of pubescence. Those species with the pubescence nearly uniform in direction may also have reflective pubescence, but it does not show distinct light and dark areas.

The dual punctation on the body surfaces of many species of *Protheca* is a frequent character in members of Anobiidae. At its greatest development (in species of the *densa* group), the large, rimmed punctures are distinctly impressed and much larger than the smaller, dotlike punctures (see figs. 19-21). In other species, the large punctures may be much less distinctly impressed (even shallow) but still much larger than the small punctures and thus never confused with them. In yet other species, the larger punctures may be rather small and approach the size of the small punctures or even intergrade

with them. In these last species, I refer to the punctation as being obscurely dual. There is a nearly complete continuum of conditions between a surface with only simple, dotlike punctures to obscurely dual punctation to clearly dual punctation. Effective portrayal of all these conditions is rather difficult.

In most species, all the abdominal sutures are distinct throughout. In *producta* and *estriata*, the sutures are distinct at the sides but indistinct to absent medially (referred to as obsolete). Most species have the abdominal sutures bisinuate, that is, they are like a lazy W with the angles rounded. The sutures of some species are arcuate, and infrequently a suture (or more than one) may be nearly straight across.

When elytral striae are present, they are formed of punctures that are different from those of the dual punctation. The strial punctation is generally larger and always deeper than the large punctures of the dual punctation. In a few species, the strial punctures approach the size of the large punctures of the dual punctation and can be confused with them.

The terminal segment of both the maxillary and labial palpi is subtriangular. Because its form often varies from one species to another, a description of the shape of the margins and angles of a segment is useful and thus naming them is necessary. As a head is examined from the ventral view and the forward-directed palpi are studied, I name the margins and angles of a terminal palpal segment in turn as follows: The margin nearest the body midline is the mesal margin, then the mesal angle, distal margin, distal angle, and finally basal margin.

SPECIES GROUPS

The following descriptions for the species groups are directly comparable for most characters used. However, there are characters referred to for particular species groups that do not apply to the other groups. Unfortunately over half the species fall into

the last group. These 15 species exhibit general similarities, but I have not found satisfactory characters to further define them.

(1) *Producta* group - *aberrans*, *estriata*, *producta*. Dorsal outline nearly evenly arcuate; in dor-

sal view body oval; elytron nonstriate or with 1 weak stria posteriorly at side; large elytral punctures largest basally near suture; metasternum weakly, longitudinally grooved at middle or not grooved; abdominal sutures obliterated medially or not.

(2) Striatipennis group - *parva*, *striatipennis*. In lateral view dorsal outline arcuate but most strongly rounded at elytral declivity; in dorsal view body stout, subcylindrical; elytron at side with 3 distinct striae formed of very large, deep punctures; metasternum distinctly grooved medially.

(3) Densa group - *densa*, *infaceta*. In lateral view body elongated, dorsal outline most strongly rounded near base of pronotum and at elytral declivity; in dorsal view body stout, subcylindrical; elytron with traceable to distinct striae at side; dual punctation of body coarse, distinct; metasternum distinctly grooved at middle; pubescence nearly even in direction or weakly inclined.

(4) Undulata group - *conca*, *insulcata*, *undulata*. In lateral view dorsal outline nearly evenly arcuate; in dorsal view body elongate-oval; elytron lacking striae or with 1 weak stria apically at side; punctation of dorsal surface more or less obscurely dual; metasternum distinctly grooved medially; eyes moderate to small.

(5) Mexicana group - *asperata*, *aurata*, *bicolor*, *brunnea*, *carinata*, *cinerea*, *flavitaris*, *granulata*, *guadalupensis*, *hirsuta*, *hispida*, *mexicana*, *ocellata*, *sinuata*, *variegata*. Pronotum in lateral view nearly always most distinctly rounded, or even produced, before base, but evenly arcuate in *flavitaris*; elytra elongated, most distinctly rounded at declivity; in dorsal view body stout and subcylindrical; elytron nearly always at side with traceable to distinct striae formed of lineate punctures; metasternum distinctly, longitudinally grooved at middle; eyes medium to small.

KEY TO SPECIES

- | | | |
|---------|---|----------------------------|
| 1. | Pubescence of dorsum with distinctly swirled or alternating patches that often form vague to distinct light and dark areas as in figures 14 and 18 | 2 |
| | Pubescence of dorsum not distinctly swirled or alternating, uniform in direction or weakly changing direction and without light and dark areas as in figure 21 | 17 |
| 2 (1). | Abdominal sutures obliterated medially as in figure 20; Brazil | <i>estriata</i> , n. sp. |
| | Abdominal sutures distinct throughout although sometimes weaker medially; various localities | 3 |
| 3 (2). | Body very dark brown throughout; pubescence dark with reddish luster; punctation very dense, surfaces thus weakly shiny; Venezuela | <i>brunnea</i> , n. sp. |
| | Body light to medium brown or dark brown only in part; pubescence not as above; punctation usually less dense, surfaces more shiny; various localities | 4 |
| 4 (3). | Head punctation not dual or obscurely so; elytra often dark brown to nearly black | 5 |
| | Head punctation clearly dual, punctures not intergrading in size; elytra usually otherwise | 9 |
| 5 (4). | Length 2.9 mm; Brazil | <i>aurata</i> , n. sp. |
| | Length 1.4-2.0 mm; Costa Rica, Dominica, Jamaica | 6 |
| 6 (5). | Length 1.9-2.0 mm; punctation at side of pronotum and on elytra clearly dual; elytra much darker than pronotum; elytral pubescence bicolored, mostly yellowish but weakly orange before apex; Jamaica | <i>bicolor</i> , n. sp. |
| | Length 1.3-1.6 mm; punctation at side of pronotum and on elytra not clearly dual; elytra not or slightly darker than pronotum; elytral pubescence not bicolored; Costa Rica and Dominica | 7 |
| 7 (6). | Elytral apex coarsely, distinctly granulate | <i>granulata</i> , n. sp. |
| | Elytral apex minutely, not distinctly granulate | 8 |
| 8 (7). | Red brown throughout; pubescence denser, distinctly swirled; Puerto Rico | <i>flavitaris</i> Fisher |
| | Dark brown at least in part; pubescence less dense, gradually changing in direction; Dominica | <i>undulata</i> , n. sp. |
| 9 (4). | Apical half of elytron at side without striae or grooves | 10 |
| | Apical half of elytron at side with 1-3 obscure to distinct series of lineate punctures, or with shallow groove | 11 |
| 10 (9). | Abdominal sutures 2, 3, and 4 strongly bisinuate; length 2.7 mm; Jamaica | <i>carinata</i> , n. sp. |
| | Abdominal sutures 2 and 3 weakly bisinuate, suture 4 anteriorly arcuate; length 2.0 mm; Guadeloupe | <i>guadalupensis</i> (Pic) |

11 (9).	Pronotal disk punctate and finely to coarsely granulate	12
	Pronotal disk punctate, not granulate	13
12 (11).	Elytra black or nearly black, remainder of body brown; pronotal disk minutely granulate and punctate; Mexico	<i>mexicana</i> , n. sp.
	Entire body brown; pronotal disk granulate, not punctate; Jamaica ..	<i>asperata</i> , n. sp.
13 (11).	Large punctures of metasternum obscure and clearly smaller and sparser (or absent) posteriorly	<i>striatipennis</i> , n. sp.
	Large punctures of metasternum distinct and nearly equally dense throughout ..	14
14 (13).	Pubescence of dorsum bicolor, mostly yellow but with red hue at elytral declivity near suture; body less than 1.7 times as long as wide; Costa Rica	<i>hirsuta</i> (Pic)
	Pubescence of dorsum of 1 color, dull yellowish throughout, or yellow and vaguely orange along suture; body 1.8-1.9 times as long as wide; various localities	15
15 (14).	Very small, length 1.5-1.7 mm; Jamaica	<i>variegata</i> , n. sp.
	Larger, length 1.8-2.5 mm; Cuba, Dominica, Jamaica, U.S.	16
16 (15).	Elytral disk with traceable striae formed of large punctures; U.S. ..	<i>hispidula</i> LeConte
	Elytral disk without traceable striae; Cuba, Dominican Republic, Jamaica	<i>cinerea</i> , n. sp.
17 (1).	Abdominal sutures obliterated medially as in figure 20; Brazil	<i>producta</i> , n. sp.
	Abdominal sutures distinct medially; various localities	18
18 (17).	Each elytron with 10 distinct rows of lineate punctures; Virgin Islands	<i>parva</i> , n. sp.
	Elytron not as above or with obscure rows of punctures; various localities	19
19 (18).	Metasternum at middle not longitudinally grooved	<i>aberrans</i> , n. sp.
	Metasternum at middle longitudinally grooved	20
20 (19).	Punctuation of dorsal surface very obscure, not clearly dual	21
	Punctuation of dorsal surface distinct and clearly dual	22
21 (20).	Body stouter, about 1.5 times as long as wide; side of pronotum distinctly concave; Brazil	<i>concaua</i> , n. sp.
	Body more elongated, about 1.8 times as long as wide; side of pronotum not distinctly concave; Cuba	<i>sinuata</i> , n. sp.
22 (20).	Abdominal sutures 3 and 4 anteriorly arcuate; Brazil	<i>insulcata</i> (Pic)
	Abdominal sutures 3 and 4 bisinuate; Cuba and El Salvador	23
23 (22).	Smaller, 1.5-1.7 mm; El Salvador	<i>ocellata</i> , n. sp.
	Larger, 2.1-2.3 mm; Cuba	24
24 (23).	Eyes separated by 1.3-1.6 times vertical diameter	<i>infaceta</i> , n. sp.
	Eyes separated by 2.1 times vertical diameter	<i>densa</i> , n. sp.

Genus PROTHECA LeConte

Protheca LeConte, 1865, p. 241; Gemminger and Harold, 1869, p. 1785; Crotch, 1873, p. 81; LeConte and Horn, 1883, p. 225; Henshaw, 1885, p. 84; Hamilton, 1895, p. 336; Fall, 1905, p. 259; Blatchley, 1910, p. 883; Pic, 1912, p. 72; Leng, 1920, p. 243; Blackwelder, 1945, p. 406; White, 1962, p. 28; Español, 1967, p. 92; 1969, p. 58; 1973, p. 52. Type-species: *Protheca hispidula* LeConte, fixed by Lucas, 1920, p. 541, by subsequent designation.

Picatoma Lepesme, 1947, p. 224; Español, 1967, p. 92; 1973, p. 58; White, 1979, p. 217. Type-species: *Leptobia guadalupensis* Pic, 1909, p. 169, by monotypy.

Diagnosis.—Pubescence bristling; head beneath excavated, receiving antennae; antenna with last 3 segments greatly enlarged; metasternum anteriorly with broad lobe, sides of lobe delimited posteriorly by tarsal grooves; elytron at side notched for hindfemur; length 1.3-2.9 mm.

This combination of characters will separate members of *Protheca* from all other genera of American Anobiidae.

SPECIES DESCRIPTIONS

Protheca aberrans, new species (fig. 7)

General.—Body 1.4-1.5 times as long as wide, sides of elytra arcuate, elytra widest at basal third. Pubescence sparse, medium in length, bristling in

part, dull yellow; that on elytra with orange hue, not forming swirled patches, but weakly changing in direction, on each elytron inclined outward at base, medially on elytron in part parallel with body axis, in part weakly inclined inward, pubescence at elytral apex inclined outward. Body beneath pu-

bescence largely red brown, clytra and metasternum brown.

Head.—Front nearly evenly convex throughout; sculpture of fine, dual punctation, large and small punctures nearly to actually intergrading in size, large punctures at middle of front separated on an average by 1–2 times diameter of a puncture; narrow, moderately distinct groove over each eye. Eyes small, separated by 2.5–2.9 times vertical diameter of an eye. Antennal club orange, 9th and 10th segments of male produced laterally (as fig. 16), 9th and 10th segments of female normal (as fig. 15). Maxillary and labial palpi with last segment of each subtriangular; last segment of maxillary palpus with distal angle acute, distal margin not notched, nearly straight, basal margin nearly straight; last segment of labial palpus with distal angle forming nearly a right angle, distal margin not notched, nearly straight, basal margin nearly straight.

Dorsal surface.—Pronotum in lateral view evenly convex; sculpture on disk very fine, sparse, obscurely dual, large and small punctures intergrading in size; punctation at side dense and coarse, obscurely dual, large and small punctures intergrading in size; lateral margin attaining or nearly attaining anterior margin, latter sinuate. Elytral disk with moderately dense, dual punctation, large punctures variable in size, nearly intergrading in size with small punctures, punctation at side denser, more clearly intergrading; fairly distinct punctate stria set in shallow depression at side from level of hind-coxa to elytral apex, sometimes a 2d (or even a 3d) punctate stria weakly indicated above 1st stria.

Ventral surface.—Metasternum not grooved at middle, distinct, dual punctation anteriorly at side, large punctures shallow, separated on an average by a little less than diameter of a puncture, large punctures smaller posteriorly on metasternum. Abdominal sutures 2, 3, and 4 distinct throughout, 2d and 3d weakly bisinuate, 4th more distinctly bisinuate; punctation distinct, dual, much denser posteriorly; abdomen nearly evenly convex, some specimens with 5th segment weakly, longitudinally depressed medially, others with 5th segment nearly flat.

Length.—1.4–1.9 mm.

Types.—The male holotype (USNM No. 75692) bears the label data – Brazil, Nova Teutonia, lat. 27–11 S, lon. 52–23 W, IX–3–1948, F. Plaumann, G. H. Dieke Coll'n. 1965. A paratype (in USNM)

has the data – Garzón, Colombia, Huila, 26. x.39, Murillo, No. 49; another paratype (in ZMSP) has – Tapuruquara, Rio Negro, AM, 20–25, XI, 1962, J. Bechyné col.; another paratype (in ZMSP) has the label data – Belem, (Utinga) PA, 2.II.1962, J. Bechyné col. An additional 10 paratypes (in USNM) have the following – Brasilien, Nova Teutonia, 27°11'B 52°23' L, Fritz Plaumann, 300 bis 500 m.² These 10 paratypes have dates from May to December 1945.

Discussion.—The specific name (meaning abnormal) refers to the form of the metasternum. This is the only species of the genus known to me in which the metasternum is not grooved in the middle.

In most characters this species is similar to *producta*. In addition to the metasternal character, these two species differ in that the abdominal sutures of *producta* are obliterated medially but not in *aberrans*.

Protheca asperata, new species (fig. 12)

General.—Body about 1.8 times as long as wide, elytral sides subparallel in basal two-thirds. Pubescence of dorsum dull yellow, short, medium in density, weakly bristling, with some sheen in bright light, with numerous moderately to weakly swirled patches forming light and dark areas. Body beneath pubescence brown, margins usually darker, dorsal surface vaguely clouded with dark brown.

Head.—Front nearly evenly convex throughout, slightly produced above antennal bases; vague, irregular, shallow groove over eyes; sculpture of coarse, dual punctation, surfaces also finely granulate, large punctures at middle of front separated on an average by about diameter of a puncture. Eyes medium in size, separated by 2.3 times vertical diameter of an eye. Antennal club normal (as fig. 15), brown. Maxillary and labial palpi with last segment of each similar, subtriangular, each last segment with distal angle acute and distal margin not notched, basal margin of maxillary palpus sinuate, basal margin of labial palpus nearly straight.

Dorsal surface.—Pronotum in lateral view moderately produced before base; pronotal disk finely punctate-granulate, sculpture at side of dual punctation, large punctures separated on an average by

² Throughout this bulletin, information pertaining to types is given essentially as it appears on the insect labels.

about diameter of 1 puncture; lateral margin distinct, not attaining anterior margin. Elytra with fine, dense, dual punctation, large punctures on disk separated on an average by less than diameter of a puncture; a stria composed of large, deep punctures at extreme side, stria extending from level of hindcoxa to elytral apex, a shorter, weaker 2d stria and a short, very weak 3d stria above 1st stria.

Ventral surface.—Metasternum with dual punctation, large punctures at side separated on an average by about 1.5 times diameter of a puncture, large punctures evenly distributed, small punctures obscure; with shallow, longitudinal groove at middle. Abdominal sutures 2, 3, and 4 distinct throughout, suture 2 weakly bisinuate, 3d more clearly so, 4th most distinctly bisinuate; punctation clearly dual; 5th segment at middle weakly, longitudinally flattened.

Length.—2.4 mm.

Type.—The male holotype and only specimen (in CNCI) bears the data — Jamaica, 4000', Hardwar Gap, VII.3.1966, Howden & Becker.

Discussion.—The specific name (meaning rough) refers to the finely granulate pronotal disk.

The male genitalia of this species (fig. 12) are unique for the reduced, three-pointed median lobe.

This species is most similar to *mexicana*. *P. mexicana* occurs in Mexico and has the elytra black to near black, the rest of the body brown, and the pronotal disk punctate and minutely granulate. *P. asperata* is from Jamaica, is brown throughout, and has the pronotal disk nonpunctate and more coarsely granulate.

Protheca aurata, new species

General.—Body about 1.7 times as long as wide (proportions approximate, specimen damaged), elytra subparallel in about basal two-thirds. Pubescence golden, with sheen in bright light, medium in length and density, bristling; large swirled patches forming light and dark areas on dorsum. Body and legs beneath pubescence brown with red brown evident, abdomen at sides broadly red brown.

Head.—Front nearly evenly convex, somewhat produced above antennal insertions, vague, shallow depression near center; distinct groove over eye, weakly extending to over antennal base; sculpture of coarse, dense, dual punctation, larger punctures irregular in size and density. Eyes small, separated by 2.8 times vertical diameter of an eye. Antennal

club normal (as fig. 15), orange brown. Maxillary and labial palpi with terminal segment of each subtriangular, similar, labial palpus with last segment wider than last segment of maxillary palpus and with distal angle less strongly acute, distal margin of each not notched, but weakly, outwardly arcuate, basal margin of each sinuate.

Dorsal surface.—Pronotum in side view most strongly rounded before base; sculpture of coarse, dual punctation, large punctures at side separated on an average by less than diameter of a puncture; lateral margin distinct, attaining anterior margin, latter moderately sinuate. Elytral sculpture of coarse, dual punctation, large punctures on disk separated on an average by a little more than diameter of a puncture; a more or less distinct stria formed of large, deep punctures at side, stria extending from level of metasternum to near elytral apex, a 2d shorter less distinct stria above this, a 3d short, indistinct stria present.

Ventral surface.—Metasternum at side with coarse, dual punctation throughout, large punctures shallow, separated on an average by less than diameter of a puncture. Abdominal sutures 2, 3, and 4 distinct throughout, 2d and 3d bisinuate, 4th strongly bisinuate; abdomen nearly evenly convex, 5th segment weakly convex from base to apex; sculpture of dual punctation, less coarse than on remainder of body.

Length.—2.9 mm.

Type.—The female holotype (in ZMSP) and only specimen bears two handwritten labels that I find extremely difficult to decipher; they are on the pin between printed labels. My interpretation of the labels follows — Coleção J. Lane; Ter. Amana, Seraniviv, Bicellical, X 59; Icarapé sucuriçu; Dept. Zool. São Paulo.

Discussion.—The specific name (meaning golden) refers to the color of the pubescence.

This species is most similar to *bicolor*, which occurs in Jamaica and is 1.9–2.0 mm long; *aurata* is from Brazil and is 2.9 mm long.

Protheca bicolor, new species

(fig. 6)

General.—Body a little over 1.8 times as long as wide, elytral sides subparallel in basal two-thirds. Pubescence medium in length and density, moderately bristling, slightly obscuring surface sculp-

ture, yellow to pale white, with sheen in bright light; large, dull-orange patch on elytra behind middle; pubescence of dorsal surface with numerous swirled patches forming light and dark areas. Head, pronotum, legs, and ventral surface orange brown, pronotum, metasternum, and abdomen clouded with dark brown, elytra dark brown but with margins orange to red brown.

Head.—Front nearly evenly rounded throughout, with short, longitudinal depression at center; head adjacent to eyes weakly grooved, extending to over antennal base; surface obscurely punctate-granulate. Eyes medium in size, separated by about 2.3 times vertical diameter of an eye. Antennal club brown, normal in form (see fig. 15). Last segment of maxillary and labial palpi each subtriangular, distal margin of each outwardly arcuate, not notched; basal margin of last segment of maxillary palpus sinuate, that of last segment of labial palpus outwardly arcuate.

Dorsal surface.—Pronotum in lateral view produced before base; sculpture on disk of obscurely dual punctation, punctation at side distinctly dual, large punctures at side separated on an average by about diameter of a puncture; lateral margin distinct, nearly attaining anterior margin, latter distinctly sinuate. Elytral sculpture of distinctly dual punctation, large punctures on disk separated on an average by about 1.5 times diameter of a puncture; laterally with obscure striae and a weak groove before apex.

Ventral surface.—Metasternum at side with obscurely dual punctation, less distinct posteriorly; deep, longitudinal groove at middle. Abdominal sutures 2, 3, and 4 distinct throughout, progressively more distinctly bisinuate; punctation obscurely dual, surface near apex weakly granulate; abdomen near apex regularly convex as usual to slightly flattened.

Length.—2.0 mm.

Types.—This species is described from two nearly identical specimens. The male holotype (in HAHC) bears - Jamaica, 4000', Hardwar Gap, VII-29-1966, A. T. Howden. The paratype (in CNCI) has the same data except for - VII-10-1966, Howden & Becker.

Discussion.—The specific name (meaning with two colors) refers to the elytral pubescence; it ranges from yellow to pale white with a dull-orange patch behind the elytral declivity.

To distinguish this species from its relative *aurata*, see under the latter.

***Protheca brunnea*, new species**
(fig. 3)

General.—Body nearly 1.7 times as long as wide, elytral sides subparallel in basal two-thirds. Pubescence dark, blending into background, with weak dull-yellow to nearly reddish sheen in light, bristling, medium in length and density, slightly obscuring surface sculpture; pubescence on dorsal surface with large swirled patches forming vague light and dark areas. Body and legs beneath pubescence dark brown, but most body surfaces (and especially elytra) clouded with black.

Head.—Front weakly, longitudinally depressed at center; coarsely, very densely punctate, punctures large to small and intergrading in size; distinct groove over each eye, not extending over antennal base. Eyes small, separated by a little over 3 times vertical diameter of an eye. Antenna with club normal (as fig. 15), orange red. Maxillary and labial palpi with last segment of each subtriangular, each with distal margin nearly straight, not notched, distal angles acute.

Dorsal surface.—Pronotum in lateral view with dorsal outline most strongly rounded before base; discal sculpture of coarse, dual punctation, large punctures separated on an average by a little more than diameter of 1 puncture, smaller punctures dense, punctation similar at side, but large punctures larger, denser than on disk, separated on an average by about two-thirds diameter of 1 puncture; lateral margin distinct, not attaining anterior margin, latter weakly sinuate. Elytral punctation dual, coarse, large punctures on disk separated on an average by about 1.5 times diameter of a puncture, with very large, deep punctures at side forming a stria from level of hindcoxa to elytral apex, a 2d less distinct stria, and a 3d short, indistinct stria above this.

Ventral surface.—Metasternum at side with dual punctation, large punctures separated on an average by about diameter of a puncture, small punctures obscure; broad, deep, longitudinal groove at middle. Abdominal sutures 2, 3, and 4 distinct throughout, bisinuate, suture 2 weakly so, sutures 3 and 4 more distinctly so; punctation distinctly dual, rather coarse; abdomen nearly evenly convex.

Length.—2.3 mm.

Type.—The male holotype and only specimen (in HAHC) bears the data - 1100 m., Rancho Grande,

Aragua, Venezuela, Feb. 18-19, 1971, H. & A. Howden.

Discussion.—The specific name (meaning brown) refers to the body color.

This species is similar to *aurata* and differs in that it is very dark brown throughout, the pubescence is dark with a reddish luster, and the surface punctation is very dense. *P. aurata* is brown throughout, the pubescence is golden, and the surface punctation is less dense.

***Protheca carinata*, new species**
(figs. 5, 17, 18)

General.—Body a little over 1.9 times as long as wide, elytral sides subparallel in basal two-thirds. Pubescence short, medium in density, yellow, with distinct sheen in bright light, bristling in part, weakly obscuring surface sculpture; pronotal disk with an elongated patch of darker, vaguely reddish pubescence; pubescence of elytra with numerous small swirled patches that form light and dark areas. Body beneath pubescence, and legs, brown to dark brown.

Head.—Front nearly evenly convex throughout; sculpture of dual punctation, coarse, large and small punctures nearly intergrading in size, large punctures irregular in density; moderately distinct groove adjacent to eye, weakly extending to over antennal base. Eyes medium in size, separated by 2.0 times vertical diameter of an eye. Antennal club normal in form (as fig. 15), brown. Maxillary palpus with last segment elongate triangular, distal angle acute, distal margin nearly straight, not notched, basal margin incurved; labial palpus with last segment subtriangular, distal margin not notched, basal margin sinuate.

Dorsal surface.—Pronotum with moderately developed crest before base; sculpture of coarse, distinctly dual punctation, large punctures at side separated on an average by about diameter of a puncture; lateral margin distinct, not attaining anterior margin, latter distinctly sinuate. Elytral punctation distinctly dual, large punctures on disk separated on an average by 1-2 times diameter of a puncture; no striae at side, but with vague, longitudinal depression before apex.

Ventral surface.—Metasternum with dual punctation at side, large punctures largest, densest anteriorly, smaller, sparser posteriorly, very small to

nearly absent along middle of metasternum; broad, deep, longitudinal groove at middle. Abdominal sutures 2, 3, and 4 distinct throughout, 2d bisinuate, 3d and 4th strongly bisinuate; punctation dual; abdomen weakly flattened along middle from 3d through 5th segments.

Length.—2.7 mm.

Type.—The male holotype and only specimen (in HAHC) bears—Jamaica, 4000', Hardwar Gap, VII-30-1966, A. T. Howden.

Discussion.—The specific name refers to the blunt pronotal carina.

P. carinata is similar to *guadalupensis*. However, *carinata* has abdominal sutures 2, 3, and 4 distinctly bisinuate and the length is 2.7 mm, whereas *guadalupensis* has abdominal sutures 2 and 3 weakly bisinuate, suture 4 anteriorly arcuate, and the length is 2.0 mm.

***Protheca cinerea*, new species**
(fig. 19)

General.—Body 1.8 to nearly 1.9 times as long as wide, elytral sides subparallel in basal two-thirds. Pubescence light gray to dull yellow, with slight sheen in bright light, medium in length and density, bristling, forming weak to moderately distinct, swirled patches on dorsal surface and with weak light and dark areas. Body beneath pubescence red brown to brown, dorsal surface and usually metasternum darker than head and abdomen.

Head.—Front nearly even convex, but slightly produced over antennal bases; with distinctly dual punctation (fig. 19), large punctures variable in size and density; moderately distinct groove over eye, groove continued to over antennal base. Eyes large to medium, separated by 1.6-2.4 times vertical diameter of an eye. Antennal club normal (as fig. 15), orange. Maxillary and labial palpi each with terminal segment subtriangular; last segment of maxillary palpus with basal margin sinuate, distal margin not notched, distal angle acute, mesal angle broadly rounded; last segment of labial palpus with basal margin nearly straight, not sinuate, distal angle nearly a right angle, distal margin not notched, mesal angle broadly rounded.

Dorsal surface.—Pronotum in lateral view more rounded before base; punctation distinctly dual, large punctures at side distinct, dense, separated on an average by about half diameter of a puncture;

lateral margin distinct, attaining to nearly attaining anterior margin, latter weakly to moderately sinuate. Elytral punctation distinctly dual, coarse, large punctures on disk separated on an average by about diameter of a puncture; with a stria of large, deep punctures laterally at level of abdomen, a weak 2d stria indicated above 1st stria, a feeble 3d stria sometimes present, 1 or more additional striae sometimes indicated near base.

Ventral surface.—Metasternal punctation dual, large punctures strong, occurring throughout, anteriorly at side separated by a little less than to much less than diameter of a puncture, small punctures weak; broad, longitudinal groove at middle. Abdominal sutures 2, 3, and 4 distinct throughout, weaker at middle, all bisinuate; punctation dual; abdomen convex, but 5th segment more or less flattened front to back at middle.

Length.—1.9–2.2 mm.

Types.—The female holotype (USNM No. 75693) bears the data – Cayamas, 15–3, Cuba, E. A. Schwarz Collector, 264. A paratype (also in USNM) has – Jamaica, Porus, Feb. 22–II–37, Sta 414, Chapin and Blackwelder. A paratype (in USNM) has – At Blanton mine N. of San Christobal [sic], R. Dom., July 26, 1917 (373), Harold Morrison. A paratype (female in HAHC) has – Jamaica, Try., Barbecue Bottom, VIII, 10, 1966, A. T. Howden. The final paratype (female in CNCI) has the data – Jamaica, Try., Duncans, VII, 23, 1966, Howden & Becker.

Discussion.—The specific name (meaning gray) refers to the color of the pubescence.

There is a single damaged specimen (one elytron missing) in the USNM from El Salvador that I have labeled as near *cinerea*. The specimen exhibits no notable differences from *cinerea*, but it is difficult to accept that one species could have so wide a distribution as to include the Caribbean Islands and El Salvador, so I have not included this specimen in the type-series of *cinerea*. There is yet another specimen in the USNM from Dominica that I also have labeled as near *cinerea*. It is darker than the type specimens above, and the large punctures on the head, pronotum, and elytra are smaller and less dense than the comparable punctures in *cinerea*. More specimens will be needed to decide whether or not this specimen represents a species that is distinct from *cinerea*.

The North American species *hispidula* is most similar to this species. In addition to the different dis-

tributions, *hispidula* has large elytral punctures that form traceable discal striae, whereas *cinerea* does not have traceable discal striae.

Protheca concava, new species

General.—Body just over 1.5 times as long as wide, elytra subparallel in basal two-thirds. Pubescence sparse, short, weakly bristling, dull yellow, with slight sheen in bright light, not forming swirled patches on dorsal surface. Body beneath pubescence red brown, margins often dark.

Head.—Front nearly evenly convex, weakly produced above antennal insertions; punctation distinct, dual, large punctures variable in size, separated on an average at middle of front by about diameter of a puncture; weak groove over eye. Eyes small, separated by 2.7 times vertical diameter of an eye. Antennal club normal (as fig. 15), orange. Maxillary and labial palpi with last segment of each subtriangular; last segment of maxillary palpus with distal angle acute, distal margin nearly straight, not notched, basal margin sinuate; last segment of labial palpus with distal angle nearly a right angle, distal margin nearly straight, not notched, basal margin nearly straight.

Dorsal surface.—Pronotum in lateral view evenly convex; punctation on disk fine, very obscurely dual, punctures intergrading in size, surface at side nearly scabrous, obscurely punctate; surface at side distinctly concave; lateral margin attaining anterior margin, latter weakly sinuate. Elytral disk with obscurely dual punctation on finely uneven surface, small punctures distinct, larger punctures weak, surface irregular at side, punctation obscure; apical half at side with a single stria formed of deep punctures, stria shallowly depressed.

Ventral surface.—Metasternum at side very finely scabrous, punctation obscure; broad, deep, longitudinal groove at middle. Abdominal sutures 2, 3, and 4 distinct throughout, all weakly bisinuate; punctation at base dual, large punctures shallow, punctation at apex obscured by fine granulation; abdomen convex as usual, 5th segment shallowly depressed at base, 4th segment weakly flattened medially.

Length.—1.6 mm.

Type.—The female holotype and only specimen (USNM No. 75694) bears the data – P-Bormann, S. Catarina, F. Plaumann, XII–57. This is a locality in southern Brazil.

Discussion.—The specific name refers to the distinctly concave side of the pronotum.

P. concava is very similar to *sinuata*. However, the body of *concava* is about 1.5 times as long as wide, the side of the pronotum is distinctly concave, and it occurs in Brazil, whereas the body of *sinuata* is about 1.8 times as long as wide, the side of the pronotum is not distinctly concave, and it occurs in Cuba.

To distinguish this species from another similar species, see under *insulcata*.

Protheca densa, new species

General.—Body about 1.8 times as long as wide, elytral sides subparallel in basal two-thirds. Pubescence medium in density and length, bristling normally and imparting a shaggy appearance, dull yellow, with slight sheen in bright light, not forming swirled patches. Body beneath pubescence red brown to brown, ventral surface red brown, dorsal surface red brown to brown.

Head.—Front nearly evenly rounded throughout, very slightly produced above antennal insertions; punctation distinctly dual, moderately coarse, large punctures at middle separated on an average by a little less than diameter of a puncture; distinct groove over eye, groove weakly continued to over antennal base. Eyes moderate in size, separated by 2.1 times vertical diameter of an eye. Antennal club normal in form (as fig. 15), orange. Maxillary and labial palpi with last segment of each subtriangular; last segment of maxillary palpus with distal angle acute, basal margin sinuate, distal margin nearly straight, not notched; last segment of labial palpus with distal angle nearly a right angle, basal margin weakly sinuate, distal margin nearly straight, not notched.

Dorsal surface.—Pronotum in lateral view nearly evenly convex; punctation on disk distinctly dual, coarse, large punctures separated on an average by less than diameter of a puncture, large punctures at side very dense, separated on an average by about third diameter of a puncture, small punctures obscure; lateral margin attaining anterior margin, latter moderately sinuate. Elytron with coarse, distinctly dual punctation, large punctures on disk separated on an average by slightly less than to much less than diameter of a puncture, in addition to dual punctation with large, deep punctures arranged in rows, with 1–3 more or less distinct striae

at side formed of large, deep punctures, lowest longest, 2d and 3d (when present) progressively shorter, less distinct than first, weak to obsolete indications of punctate striae continued onto disk.

Ventral surface.—Metasternum with dual punctation, large punctures very large, distinct, dense, small punctures obscure, large punctures anteriorly at side separated on an average by about half diameter of a puncture, as dense posteriorly; broad but not deep, longitudinal groove at middle. Abdominal sutures 2, 3, and 4 distinct throughout, all bisinuate; punctation distinct, clearly dual; 5th segment flat to weakly concave front to back.

Length.—2.1 mm.

Type.—The holotype (USNM No. 75659) bears the data - Cayamas, 15-3, Cuba, E. A. Schwarz. Collector, 265. I was not able to sex the holotype.

Discussion.—The specific name refers to the very dense, large punctures at the side of the pronotum.

To distinguish this species from its relative *infaceta*, see under the latter.

Protheca estriata, new species

(fig. 9)

General.—Body about 1.5 times as long as wide, elytra widest before middle, in lateral view dorsal outline nearly evenly convex. Pubescence of dorsum weakly golden yellow, with sheen in bright light, medium in length and density, bristling, obscuring surface sculpture, forming swirled patches that produce light and dark areas. Body beneath pubescence dark brown throughout.

Head.—Front weakly depressed at center below vertex, transversely, bluntly produced between antennal insertions; punctation distinctly dual, larger punctures separated on an average by about diameter of a puncture; surface moderately shining; head over eyes with distinct, deep groove, groove extending over antennal insertion. Eyes separated by a little less than 2 times vertical diameter of an eye. Antennal club normal (as fig. 15), red orange. Maxillary and labial palpi with last segment of each subtriangular; distal margin of last segment of maxillary palpus with 1 large and 1 small notch, distal margin of last segment of labial palpus with a weak notch.

Dorsal surface.—Pronotum with distinctly dual punctation throughout, large punctures at side separated on an average by less than diameter of a puncture; lateral margin distinct posteriorly, weaker

anteriorly, not attaining anterior margin. Elytra with distinctly dual punctation, large punctures on disk separated on an average by a little more than diameter of a puncture, irregular in size, most dense at apex, with no striae, a weak, longitudinal depression at side at level of base of abdomen.

Ventral surface.—Metasternum with distinctly dual punctation, anteriorly at side large punctures separated on an average by less than diameter of a puncture, sparser posteriorly; shallow, longitudinal groove at middle. Abdominal sutures 2, 3, and 4 distinct at sides, nearly completely obliterated at middle; punctation distinctly dual; 5th segment at middle broadly, shallowly, longitudinally depressed.

Length.—2.4 mm.

Type.—The male holotype (in ZMSP) (the only specimen I have seen) bears the data - Pouso Alegre, M. Gerais - Brasil, IX.962, F. S. Pereira col., Dept. Zool. Sao Paulo.

Discussion.—The specific name (meaning without striae) refers to the absence of elytral striae.

P. estriata and *producta* are the only members of the genus in which the abdominal sutures are obliterated medially. The pubescence of the dorsum in *estriata* is swirled and has light and dark patches; that of *producta* is not swirled and does not show light and dark patches.

Protheca flavitarsis Fisher

(fig. 1)

Protheca flavitarsis Fisher, 1936, p. 241; Blackwelder, 1945, p. 106.

General.—Body a little less than 1.7 times as long as wide, sides of elytra subparallel in basal two-thirds. Pubescence of dorsum light in color, pale yellow, with sheen in bright light, medium in density, short, somewhat obscuring surface, weakly bristling, forming swirled patches that produce light and dark areas. Body beneath pubescence red brown, margin dark, dorsal surface darker than ventral surface.

Head.—Front nearly evenly convex, slightly produced over antennal base; punctation fine, with obscure indication of large punctures; fine groove over eye, extended over antennal base. Eyes moderate in size, separated by 1.9–2.0 times vertical diameter of an eye. Antennal club normal in form (as

fig. 15), orange. Maxillary and labial palpi with last segment of each subtriangular; maxillary palpus with basal margin of last segment weakly sinuate, distal angle acute, distal margin nearly straight, not notched; basal margin of labial palpus nearly straight, distal angle nearly a right angle, distal margin nearly straight, not notched.

Dorsal surface.—Pronotum in lateral view nearly evenly rounded; punctation of disk very fine, distinct, with very obscure indication of large punctures, very finely punctate-granulate at side; lateral margin attaining or nearly attaining anterior margin, latter moderately sinuate. Elytral disk with dense, dual punctation, large punctures small, not strong, irregular in density; weak stria formed of punctures and in a slight depression at side at level of abdomen, a 2d and 3d stria weakly indicated, feeble indications of punctate striae continuing onto disk.

Ventral surface.—Metasternum anteriorly at side with obscurely dual punctation, large punctures shallow, obsolete to absent over rest of metasternum; broad, moderately deep, longitudinal groove at middle. Abdominal sutures, 2, 3, and 4 distinct throughout, weakly bisinuate; punctation obscurely dual, large punctures small and shallow; 5th segment shallowly convex front to back.

Length.—1.3 mm.

Types.—The male holotype bears the data - On Coffee, Ponce, P.R., San Juan, 3191, Type No. 57597, U.S.N.M. A single paratype has the label data - Cacao, Vosque Finca, Ponce, P.R., Coll. 10 Mar. 33, R. G. Oakley; paratype, 57597, U.S.N.M.

Discussion.—Fisher's type series of *flavitarsis* was composite. Two of his paratypes are here assigned to *striatipennis*.

P. flavitarsis is most similar to *undulata*. The two differ in that the ground color of *flavitarsis* is red brown throughout and the pubescence on the dorsal surface is dense and distinctly swirled; *undulata* is dark brown, at least in part, and the pubescence on the dorsal surface is medium in density and is not swirled, but it is weakly changing in direction.

Protheca granulata, new species

General.—Body 1.7 times as long as wide, elytral sides subparallel in basal two-thirds. Pubescence of dorsum shining golden yellow in light, me-

dium in length and density, weakly bristling, not or slightly obscuring surface sculpture; each elytron with 5 or 6 distinctly swirled patches that form light and dark areas. Body beneath pubescence brown to reddish brown.

Head.—Front nearly evenly convex throughout, vertex very strongly convex; punctation fine and dense, some punctures a little larger than others; surface moderately shining; head not grooved over eyes. Eyes medium in size, separated by about 2.4 times vertical diameter of an eye. Antennal club normal (as fig. 15), dark brown. Maxillary and labial palpi each with last segment subtriangular, each about 1.5 times as long as wide, distal angle of each acute, distal margin of each not notched, outwardly arcuate.

Dorsal surface.—Pronotum in lateral view most strongly rounded behind middle; disk finely punctate and finely granulate, at side finely, densely punctate, punctation obscurely dual: lateral margin sharp, complete or nearly so. Elytral disk with fine, dense, obscurely dual punctation, with no evidence of striae; at side large punctures forming feeble indication of rows, at posterior half with very weak, longitudinal depression; at apex surface granulate; surface throughout weakly shining.

Ventral surface.—Metasternum with distinctly dual punctation, anteriorly at side large punctures separated on an average by about diameter of a puncture, large punctures smaller, sparser, shallow and indistinct posteriorly; at middle with broad, moderately deep, longitudinal groove. Abdominal sutures 2, 3, and 4 distinct throughout, last 2 more or less clearly bisinuate; punctation fine, dense, punctures variable in size but not clearly dual; apex finely, obscurely granulate; abdominal surface nearly evenly convex.

Length.—1.5–1.6 mm.

Types.—The female holotype (USNM No. 75696) bears the data – Dominica, Clarke Hall, II-20-28-1965, JFGC & TM Clarke, HE Evans; the single paratype (in USNM) has – Dominica, W.I., Hillsborough, Est. 15-III-65, W. W. Wirth, Bredin-Archbold Smithsonian Bio. Surv. Dominica.

Discussion.—The specific name refers to the granulate elytral apex.

This species is similar to *flavivarsis* and differs from it in that the elytral apex is minutely, not distinctly granulate; the elytral apex of *flavivarsis* is distinctly granulate.

Protheca guadalupensis (Pic), new combination

Leptobia guadalupensis Pic, 1909, p. 169; 1912, p. 61; Blackwelder, 1945, p. 404.

Picaloma guadalupensis (Pic), Lepesme, 1947, p. 224.

General.—Body about 1.8 times as long as wide, elytral sides subparallel in nearly basal two-thirds. Pubescence of dorsum medium in length and density, weakly bristling, somewhat obscuring surface sculpture, golden yellow, with sheen in light, swirled and forming distinct light and dark patches. Ground color brown throughout with tendency toward red brown, especially on head and abdomen, metasternum and elytra in part darker than remainder of body.

Head.—Front moderately, nearly evenly rounded throughout, weakly depressed and narrowly grooved above each eye, groove not extended over antennal base; sculpture of fine, dense punctation and indistinct larger punctures. Eyes medium in size, separated by 2.3 times vertical diameter of an eye. Antennal club normal in form (as fig. 15), brown. Last segment of maxillary palpus subtriangular, a little longer than wide, distal angle acute, mesal angle rounded; last segment of labial palpus subtriangular, slightly longer than wide, mesal angle broadly rounded; distal margin of both palpi outwardly arcuate, not notched.

Dorsal surface.—Pronotum in lateral view most strongly rounded behind middle; sculpture on disk of minute granulation and fine, dense punctation, sculpture at side of fine, dense, dual punctation, punctation obscured by indistinct granulation, large punctures separated on an average by about diameter of a puncture; lateral margin fine and sharp, not attaining anterior margin, latter arcuate. Elytral disk with fine, dense, dual punctation, punctation at side obscured by tendency to granulation, more distinctly so at elytral apex; lacking striae; in posterior half at side with a shallow depression.

Ventral surface.—Metasternum with fine, dense, dual punctation, nearly evenly distributed; moderately deep, longitudinal groove at middle. Abdominal sutures 2, 3, and 4 distinct throughout, sutures 2 and 3 weakly bisinuate, suture 4 anteriorly arcuate; punctation fine, dense, distinctly dual; sides of segments feebly granulate; 5th segment nearly evenly convex.

Length.—2.0 mm.

Type.—Pic described this species in a paper on the Coleoptera of Guadeloupe; he gave no detailed label data on the species. I have not seen the type.

Discussion.—During my visit at the Museum National d'Histoire Naturelle in Paris, the type of this species was not available to me, for some of the Pic collection had been on loan for many years and was never returned. The description here is from a specimen determined by P. Lepesme as *Picatoma guadalupensis* Pic. This specimen (in MNHP) bears the label data — Guadeloupe, Leo Dufau 1910. Very possibly this specimen is from the original type-series from which Pic described the species, because after Pic's description of *Leptobia guadalupensis* is found "(coll. Dufau et Pic)."

***Protheca hirsuta* (Pic), new combination**
(fig. 8)

Pseudodorcatoma hirsuta Pic, 1937, p. 195; Blackwelder, 1945, p. 404.

General.—Body 1.6–1.7 times as long as wide, elytral sides subparallel in about basal two-thirds. Pubescence of dorsum bristling, medium in length and density, somewhat obscuring surface, with weak, yellowish sheen in light, pubescence reddish along suture before apex, with swirled patches that form distinct light and dark areas. Body brown throughout.

Head.—Front distinctly, nearly evenly convex throughout, head adjacent to eye with fine groove, extending over antennal base; surface with dense, distinctly dual punctation. Eyes medium in size, separated by just over 2 times vertical diameter of an eye. Antennal club normal in form (as fig. 15). Last segment of maxillary palpus subtriangular, a little longer than wide, distal margin arcuate, distal angle acute; last segment of labial palpus subtriangular, about as wide as long, distal margin arcuate, distal angle nearly a right angle.

Dorsal surface.—Pronotum in lateral view most strongly rounded behind middle; disk with distinctly dual punctation, punctation similar at side but large punctures larger, denser, and separated on an average by clearly less than diameter of a puncture; surface weakly shiny; lateral margin fine and sharp, attaining or nearly attaining anterior margin. Elytra with dense, distinctly dual punctation, surface weakly shiny, large punctures at side irregularly larger, denser; in addition to dual punctation

with very large, deep punctures, at posterior half above margin these punctures alined into a fairly distinct stria, above this forming an obscure stria.

Ventral surface.—Metasternum with large, distinct punctures throughout, these largest, densest anteriorly at side, small punctures obscure; shallow, longitudinal groove at middle. Abdominal sutures 2, 3, and 4 distinct throughout, more or less clearly bisinuate; surface with distinctly dual punctation; surface nearly evenly convex but 5th segment nearly flat front to back.

Length.—1.8–1.9 mm.

Type.—The Nevermann collection (from which Pic described this species) is now in the USNM, and I hereby designate as lectotype a specimen with the following label data — Costa Rica, F. Nevermann, 23, II, 26; Hamburgfarm, Reventazon, Esene Limon; an Gebüsch; TYPE; Cotype No. 54555 U.S.N.M.; *Pseudodorcatoma hirsuta* n. sp.; *Pseudodorcatoma*, *Ps. hirsuta* Pic.

Discussion.—I have seen one additional example of this species (in USNM); it bears the following — Costa Rica, Turrialba 22–28, II, 65, SS & WD Duckworth.

P. hirsuta is most similar to *variegata*. They differ in that the pubescence of *hirsuta* is mostly yellow but with red at the middle before the elytral declivity; also, it occurs in Costa Rica. The pubescence of *variegata* is yellow but weakly orange before the elytral declivity, and it occurs in Jamaica.

***Protheca hispida* LeConte**
(fig. 11)

Protheca hispida LeConte, 1865, p. 241; Gemminger and Harold, 1869, p. 1785; Crotch, 1873, p. 81; Henshaw, 1885, p. 84; Hamilton, 1895, p. 336; Fall, 1905, p. 259; Blatchley, 1910, p. 882; Pic, 1912, p. 72; Leng, 1920, p. 243; Böving, 1954, p. 132; White, 1962, p. 28; Español, 1973, pp. 52, 53.

General.—Body nearly 1.9 times as long as wide, sides of elytra subparallel in basal two-thirds. Pubescence dull yellow, with weak sheen in bright light, medium in length and density, somewhat obscuring surface, bristling; each elytron with patch of swirled pubescence before middle, pubescence behind middle inclined, clean specimens thus with noticeable light and dark areas. Body red brown to brown. Surfaces with feeble luster.

Head.—Front nearly evenly convex; weak, narrow groove over eye, continuing over antennal base;

sculpture of dense, shallow punctures of various sizes, surface subgranulate. Eyes medium in size, separated by 2.3–2.5 times vertical diameter of an eye. Antennal club orange, normal in form (as fig. 15). Last segment of maxillary palpus subtriangular, a little longer than wide, distal angle acute, distal margin weakly, outwardly arcuate, not notched; last segment of labial palpus subtriangular, about as long as wide, otherwise similar in form to maxillary palpus.

Dorsal surface.—Pronotum in lateral view most distinctly rounded before base; punctation on disk fine, dense, clearly dual, punctation at side similar to that on disk, larger punctures separated on an average by about diameter of a puncture; lateral margin sharp, fine, almost attaining anterior margin, latter arcuate. Elytral disk with dense, obscure punctation, variable in size, surface subgranulate, smaller punctures at sides less distinct; in addition to dual punctation with large deep punctures in more or less traceable rows, punctures of striae often larger at elytral sides.

Ventral surface.—Metasternum with dense, more or less clearly dual punctation throughout, larger punctures variable in size; deep, broad, longitudinal groove at middle. Abdominal sutures 2, 3, and 4 distinct throughout, sutures 2 and 3 more or less bisinuate, suture 4 anteriorly arcuate to weakly bisinuate; surface with fine, dense, more or less clearly dual punctation; 5th segment nearly flat front to back.

Length.—1.5–2.5 mm.

Type.—LeConte's type is No. 3645 in the Museum of Comparative Zoology at Harvard University. The only data it bears besides the museum type number is "Ga."

Discussion.—Fall (1905, p. 260) gave the distribution as from New York to Florida and to Texas. White (1962, p. 29) noted the occurrence of this species in Ohio. As additions to this range, I have seen specimens from Tennessee, Kentucky, and Arkansas. I have examined a total of 69 specimens of this species. One specimen that I have seen is recorded from a tulip tree.

For notes on the species to which *hispidia* is most closely related, see under *cinerea*.

***Protheca infaceta*, new species**
(fig. 21)

General.—Body about 1.8 times as long as wide,

elytral sides subparallel in about basal two-thirds. Pubescence medium in length and density, distinctly bristling, somewhat obscuring surface sculpture, pale yellow, with weak sheen in light; nearly regular in direction, not swirled, weakly inclined in part, not forming light and dark areas. Body red brown nearly throughout but with dark brown on dorsal surface and metasternum.

Head.—Front moderately, nearly evenly rounded, somewhat depressed next to eyes; narrow groove above each eye, weakly continued to over antennal base; sculpture of coarse, dual punctation, larger punctures separated on an average by less than diameter of a puncture. Eyes large, separated on an average by 1.3–1.6 times diameter of an eye. Antennal club normal in form (as fig. 15), orange. Last segment of maxillary palpus subtriangular, a little longer than wide, distal angle acute, distal margin nearly straight, not notched; last segment of labial palpus subtriangular, slightly longer than wide, mesal angle strongly rounded, distal margin nearly straight, not notched.

Dorsal surface.—Pronotum in lateral view slightly more strongly rounded before base; sculpture on disk of dense, distinctly dual punctation, at side punctation denser, dual, large punctures predominating, separated on an average by about third diameter of a puncture; lateral margin fine, sharp, not or just weakly attaining anterior margin, latter more or less sinuate. Elytral disk with dense, coarse, dual punctation; at side with (in addition to dual punctation) very large, deep punctures that clearly form rows, these punctures continued onto disk, but there forming obscure rows.

Ventral surface.—Metasternum with dense, coarse, dual punctation, nearly evenly distributed; moderately deep, wide, longitudinal groove at middle. Abdominal sutures 2, 3, and 4 distinct throughout, clearly bisinuate; punctation dense, dual; sides of segments not granulate; 5th segment shallowly concave front to back.

Length.—2.2–2.3 mm.

Types.—The female holotype (USNM No. 75697) bears the label data – Cayamas 20–5 Cuba, E.A. Schwarz Collector. The single paratype (also in USNM) differs in these data only in having the collection date of 31–5.

Discussion.—The specific name (meaning coarse) refers to the very strong punctation of the dorsal surface.

I have labeled a single specimen from Guanaha-

cabibes, Cuba, as near *infaceta*. It differs in having the very large elytral punctures sparser and less distinctly forming striae. I need a more lengthy series of specimens to show whether the differences are simply species variation or whether two distinct species are involved.

This species is similar to *densa*. However, *infaceta* has the eyes separated by 1.3–1.6 times the vertical diameter of an eye; *densa* has the eyes separated by 2.1 times the vertical diameter of an eye.

Protheca insulcata (Pic), new combination

Catorama insulcata Pic, 1927, p. 9; Blackwelder, 1945, p. 405.

General.—Body nearly 1.7 times as long as wide, elytral sides weakly arcuate, body widest at about middle of elytra. Pubescence medium in length and density, bristling, somewhat obscuring surface sculpture, pale yellow, with slight sheen in bright light, not swirled, more or less uniform in direction but with tendency toward being inclined outward. Elytra brown and pronotum, head, ventral surface, and legs red brown.

Head.—Front strongly, nearly evenly rounded throughout; weak, narrow groove above each eye, groove not extended over antennal base; surface with obscure, indistinctly dual punctation. Eyes medium in size, separated by 2.3 times vertical diameter of an eye. Antennal club normal in form (as fig. 15), orange brown. Last segment of maxillary palpus subtriangular, a little longer than wide, distal angle acute, distal margin straight, not notched; last segment of labial palpus subtriangular, about as long as wide, distal angle acute, distal margin sinuate.

Dorsal surface.—Pronotum in lateral view evenly arcuate; sculpture on disk of somewhat obscure, indistinctly dual punctation, punctation at side clearly dual, large punctures distinct but variable in size, separated on an average by less than diameter of a puncture, small punctures obscure; lateral margin fine and sharp, not attaining anterior margin, latter arcuate. Elytral disk with dual punctation, large punctures weakly impressed, punctation at side and apex somewhat obscured by weak tendency toward granulation, with no evidence of striae; weak, longitudinal depression posteriorly at side.

Ventral surface.—Metasternum with dual punctation, with large punctures denser than elsewhere

anteriorly at side; deep, longitudinal groove at middle. Abdominal sutures 2, 3, and 4 distinct throughout, suture 2 weakly bisinuate, sutures 3 and 4 anteriorly bisinuate; punctation clearly dual, sides and apex of abdomen with a tendency toward granulation; 5th segment weakly concave before apex.

Length.—1.8 mm.

Type.—The holotype (in MNHP) bears the label data – Blumenau; Type; TYPE, *insulcata* n. sp. Blumenau is a Brazilian locality in Paraná near Curitiba.

Discussion.—This species is similar to *concaua*. However, on the dorsal surface *insulcata* has the punctation very obscurely dual, whereas *concaua* has the punctation clearly dual.

Protheca mexicana, new species

General.—Body nearly 1.8 times as long as wide, elytral sides subparallel in basal two-thirds. Pubescence on dorsum light in color, faintly yellowish, with slight sheen, that on elytra with reddish tinge, medium in length and density, not obscuring surface sculpture, bristling; pubescence forming small to large, not numerous, swirled patches that produce light and dark areas. Color (beneath pubescence) of head, legs, ventral surface, and pronotum red brown clouded with dark brown, elytra dull black.

Head.—Front nearly evenly convex, but somewhat produced above antennal insertions; distinct groove over eye, weakly continued over base of antenna; sculpture of dual, coarse punctation, large punctures varying in size, smallest at middle of front. Eyes medium in size, separated by 2.4 times vertical diameter of an eye. Antennal club dark brown, normal in form (as fig. 15). Maxillary and labial palpi similar, last segment of each subtriangular, distal angle of each acute, basal margin sinuate, distal margin weakly, outwardly arcuate, not notched; labial palpus little wider than maxillary palpus.

Dorsal surface.—Pronotum in lateral view somewhat produced before base; sculpture of coarse, dual punctation, appearing finely granulate, large punctures at side separated on an average by less than diameter of a puncture; lateral margin distinct, nearly attaining anterior margin, latter clearly sinuate. Elytral sculpture of coarse, dual punctation, large punctures somewhat variable in size, separated on disk on an average by 1–2 times di-

iameter of a puncture; at extreme side with a more or less clearly indicated stria formed of large, deep punctures, extending from near base to apex, a 2d shorter, less distinct stria present above 1st, a shorter, 3d indistinct stria above 2d.

Ventral surface.—Metasternum with coarse, dual punctation, anteriorly at side with large punctures separated on an average by about diameter of a puncture, large punctures smaller posteriorly; broad, deep, longitudinal groove at middle. Abdominal sutures 2, 3, and 4 distinct throughout, margins slightly raised at sides, sutures 2 and 3 bisinuate, 4th strongly so; abdomen nearly evenly convex throughout; sculpture of coarse, dual punctation.

Length.—1.9 mm.

Type.—The female holotype and only specimen (in NAU) bears the data - 3000, 75 mi. SW Tuxtla, Gutierrez, Chis., Mex., VII-5-68, C. D. Johnson collector.

Discussion.—For diagnostic notes on this species, see under *asperata*.

Protheca ocellata, new species

General.—Body nearly 1.7 times as long as wide, elytral sides subparallel in basal two-thirds. Pubescence of dorsum light, pale yellow, medium in density, short, weakly bristling, with slight sheen in bright light, not forming swirled patches. Body beneath pubescence brown.

Head.—Front nearly evenly convex, weakly produced above antennal insertions; moderately distinct groove over eye, weakly continued to over antennal base; punctation dense and coarse, variable in size, not dual to obscurely dual. Eyes small, separated by 2.5 times vertical diameter of an eye. Antennal club normal in form (as fig. 15), orange. Maxillary and labial palpi with last segment of each subtriangular, distal angle of maxillary palpus acute, distal angle of labial palpus nearly a right angle, basal margin of both palpi weakly sinuate, distal margin of both nearly straight, not notched.

Dorsal surface.—Pronotal outline in profile but slightly produced before base; punctation of disk dual, larger punctures separated on an average by more than diameter of a puncture, at side punctation dual, very dense and coarse, large punctures separated on an average by less than diameter of a puncture. Elytral disk with coarse, dense, dual punctation and with deep punctures of obscure striae, on disk large punctures of dual punctation

separated on an average by more than diameter of a puncture; laterally at apical half to two-thirds with a more or less distinct stria of deep punctures, obscure to very obscure striae above 1st stria, continuing onto disk.

Ventral surface.—Metasternum at side with coarse, dense, dual punctation, anteriorly large punctures separated on an average by less than diameter of a puncture, posteriorly large punctures a little smaller; broad, deep, longitudinal groove at middle. Abdominal sutures 2, 3, and 4 distinct throughout, sutures 2 and 3 clearly bisinuate, 4 less distinctly so; punctation dual, somewhat coarse and dense; abdomen nearly evenly convex.

Length.—1.5–1.6 mm.

Types.—The female holotype and a single paratype bear the data - El Salvador, Vol. Conchagua, May 27–29 '58, LJ Bottimer, Depto. de La Union. Both specimens are in CNCI.

Discussion.—The specific name refers to the small eyes.

This species runs in the key close to *insulcata*. However, *ocellata* has abdominal sutures 3 and 4 bisinuate and is from El Salvador; *insulcata* has abdominal sutures 3 and 4 anteriorly arcuate and is from Brazil.

Protheca parva, new species (fig. 13)

General.—Body 1.7 times as long as wide, elytral sides subparallel in basal two-thirds. Pubescence of dorsum dull light yellow, with slight sheen in bright light, medium in density and length, somewhat obscuring surface, slightly shaggy in appearance, slightly bristling, not forming swirled patches. Body beneath pubescence red brown.

Head.—Punctation of front indistinct, fine, obscurely dual; front nearly evenly convex, shallow depression at middle; moderately distinct groove over each eye, continued to over antennal base. Eyes large, separated by 1.3 times vertical diameter of an eye. Antennal club normal in form (as fig. 15), orange. Maxillary and labial palpi with last segment of each subtriangular, similar in form, each longer than wide, distal angle of each acute, basal margin of each feebly sinuate, distal margin of each not notched, nearly straight.

Dorsal surface.—Pronotal outline in lateral view evenly convex; sculpture of fine, dual, slightly obscure punctation, large punctures at side separated

on an average by less than diameter of a puncture; lateral margin not attaining anterior margin, latter moderately sinuate. Elytral sculpture of fine, slightly obscure, dual punctation, larger punctures on disk separated on an average by diameter to twice diameter of a puncture; 3 distinct striae at side, formed of very large, deep punctures, lower 2 strongest, punctures of striae largest at level of hindcoxa, at latter point adjacent striae separated by less than diameter of a puncture, punctures of striae continuing onto elytral disk, disk with 7 striae, striae weak near suture and apex.

Ventral surface.—Metasternum with obscurely dual, weak punctation; deep, broad, longitudinal groove at middle. Abdominal sutures 2, 3, and 4 weaker at middle but traceable throughout, sutures feebly bisinuate; punctation weak, obscurely dual; abdomen nearly evenly convex, slightly flattened medially near apex.

Length.—1.3 mm.

Type.—The male holotype and only specimen (USNM No. 75698) bears the data — St. Thomas, U.S.V.I. traps, St. T. & St. John 1930, XI-21-57, Lot 58-1930.

Discussion.—The specific name (meaning small) applies well because this is the smallest species of *Protheca* known to me.

In the key to species, *parva* keys out close to *producta*. However, *parva* has the abdominal sutures distinct medially and the length is 1.3 mm; *producta* has the abdominal sutures obliterated medially and the length is 2.0-2.1 mm. In addition, the former occurs in the Virgin Islands and the latter in Brazil.

***Protheca producta*, new species**
(figs. 4, 15, 16, 20)

General.—Body about 1.6 times as long as wide, elytral sides arcuate. Pubescence of dorsum sparse, medium in length, bristling in part, not obscuring surface, with slight sheen in bright light, dull yellow, that on elytra dull orange in part; hairs on dorsum somewhat irregular in direction but not forming swirled patches. Body beneath pubescence dark brown, abdomen more red brown.

Head.—Front nearly evenly convex, weakly produced between antennal bases; with fine, dual punctation, large punctures at middle separated on an average by more than diameter of a puncture;

deep groove over eye, not to weakly continued to over antennal base. Eyes large, separated by vertical diameter of an eye to over 1.6 times vertical diameter of an eye. Antennal club brown, that of female normal in form (see fig. 15), that of male with segments produced laterally (see fig. 16). Maxillary and labial palpi with last segment of each subtriangular, similar in form, distal angle of each acute, basal margin weakly sinuate; distal margin of maxillary palpus with 2 notches, distal margin of labial palpus with 1 notch.

Dorsal surface.—Pronotum in lateral view nearly evenly convex; sculpture of distinct, dual punctation, large punctures at side separated on an average by less than diameter of a puncture; lateral margin distinct basally, weakened beyond middle, not attaining anterior margin, latter sinuate. Elytra with distinct, dual punctation, large punctures largest on disk behind scutellum; with no evidence of striae; shallow, broad, elongated depression at side from level of 1st abdominal segment through level of 3d or 4th.

Ventral surface.—Metasternum with distinct, dual punctation throughout, large punctures anteriorly at side separated on an average by about diameter of a puncture, posteriorly on metasternum large punctures distinctly smaller; very shallowly, longitudinally depressed at middle. Abdominal sutures 2, 3, and 4 obliterated medially, distinct only at extreme sides, punctation distinct, dual; 5th segment transversely carinate at apex, vaguely flattened medially.

Length.—2.0-2.1 mm.

Types.—The female holotype (USNM 75699) has the label data — Chapeco, 27°07' 52"36, 600m, F. Plaumann, July 1960. Two paratypes (in ZMSP) bear the data — Petropolis, RJ, Brazil, 5-7.III.1962, J. Bechyné col. Both Petrópolis and Chapecó are in southeastern Brazil.

Discussion.—The specific name refers to the produced antennal segments of the male of this species.

A male paratype from Petrópolis has the 9th and 10th antennal segments much produced laterally. The female holotype and the other specimen (I have not examined the genitalia of this specimen) have the antennae normal. On this basis I assume the produced antennae to be a male character.

To distinguish this species from its relative *aberrans*, see under the latter and also under *estriata* and *parva*.

Protheca sinuata, new species

General.—Body 1.8 times as long as wide, sides of elytra subparallel in basal two-thirds. Pubescence of dorsum light in color, pale yellow, with feeble sheen in light, medium in density and length, slightly obscuring surface, bristling, not swirled or inclined but slightly irregular in direction causing a shaggy appearance. Body beneath pubescence red brown, elytra slightly darker than pronotum. Surfaces moderately shiny.

Head.—Front nearly evenly convex; deep, narrow groove over eye, weakly continued to over antennal base; surface punctate-granulate, punctation indistinctly dual, obscured by weak granulation. Eyes medium in size, separated by a little over 2.0 times vertical diameter of an eye. Antennal club normal in form (as fig. 15), orange. Last segment of maxillary palpus subtriangular, a little longer than wide, distal angle acute, distal margin nearly straight, not notched; (labial palpus not seen).

Dorsal surface.—Pronotum in lateral view nearly evenly rounded; punctation on disk fine, dense, dual, slightly obscured by weak tendency to granulation, large punctures at side much larger, predominating, separated by less than diameter of a puncture; lateral margin nearly attaining anterior margin, latter arcuate. Elytral disk with dense, dual punctation that is obscured by tendency to granulation, in addition to dual punctation with larger, deep punctures very obscurely arranged in rows, these punctures larger, more distinctly arranged in rows at sides of elytra.

Ventral surface.—Metasternum with dense, dual punctation that is nearly evenly distributed, obscured by tendency to granulation; deep, wide, longitudinal groove at middle. Abdominal sutures 2, 3, and 4 distinct throughout, distinctly bisinuate; 5th segment weakly convex front to back; punctation dual, obscured by tendency to granulation, larger punctures shallow, variable in size.

Length.—1.4 mm.

Type.—The holotype and single specimen (USNM No. 75700) has the label data — S. de las Vegas, Hab. XII.1947, F. de Zayas col. I interpret the locality as Santiago de las Vegas in Cuba. I was not able to sex the type.

Discussion.—The specific name refers to the distinctly sinuate 2d, 3d, and 4th abdominal segments.

To distinguish this species from *concaua*, see under the latter.

Protheca striatipennis, new species
(fig. 14)

General.—Body slightly less than 1.7 times as long as wide, elytral sides subparallel in basal two-thirds. Pubescence of dorsum medium in density, bristling, somewhat obscuring surface sculpture, shaggy in appearance, dull yellow, with sheen in bright light, swirled nearly throughout, forming vaguely darker areas or not. Body beneath pubescence orange brown to red brown.

Head.—Front nearly evenly rounded throughout; weak groove over eye, groove extending over antennal base; punctation obscurely dual, large punctures more or less weak, separated at center of front on an average by more than diameter of a puncture. Eyes large, separated by 1.6–2.0 times vertical diameter of an eye. Antennal club normal (as fig. 15), orange. Maxillary and labial palpi with last segment of each subtriangular, similar in form, distal angle of each acute, that of maxillary palpus more distinctly so, distal margin of each not notched, nearly straight, basal margin of last segment of maxillary palpus distinctly sinuate, that of labial palpus weakly sinuate.

Dorsal surface.—Pronotum in side view nearly evenly convex; surface with distinctly dual punctation, at side punctation dense, somewhat coarse, large punctures separated on an average by less than diameter of a puncture; lateral margin distinct, nearly attaining anterior margin, latter distinctly sinuate. Elytral punctation distinctly dual, large punctures of dual punctation on disk separated on an average by 1–2 times diameter of a puncture; large, deep punctures at extreme side forming distinct stria from base to apex, those at level of hindcoxa separated on an average by diameter of a puncture or less, 2d and 3d striae present, punctures of all 3 striae largest at about level of metasternum, smallest near elytral apex, with 5–7 more or less traceable striae on disk, punctures of these much smaller than those of first 3 striae.

Ventral surface.—Metasternum anteriorly at side with large punctures and obscure smaller punctures, large punctures separated on an average by about diameter of a puncture, absent posteriorly, small punctures weak to absent posteriorly; broad, longitudinal groove at middle. Abdominal sutures 2, 3, and 4 distinct throughout and moderately bisinuate; punctation dual; abdomen nearly evenly convex.

Length.—1.6–1.8 mm.

Types.—The female holotype (USNM No. 75701) bears the data – Andira inermis, Ponce PR, DDeLeon, V.2, '40; Hopk US, 33101.G.3. One paratype (female) bears – Moca, Vives Finca, Ponce, P.R. Coll. 4 May 33, R.G. Oakley; San Juan #4131. Another paratype, also a female, has – Orange, Vives Finca, Ponce, P.R., Coll. 4 May 33, R.G. Oakley; San Juan, #4129. Both paratypes (in USNM) are also paratypes of *P. flavitarsis* Fisher; the latter species was described from a composite series.

Discussion.—The specific name (meaning striate wing) refers to the distinctly striate side of the elytron. The punctures that form the striae are largest there and are distinctly aligned.

In the key this species runs to near *asperata*. The two differ in that the pronotal disk of *striatipennis* is punctate and not granulate, whereas that of *asperata* is punctate and granulate.

Protheca undulata, new species

(fig. 10)

General.—Body 1.8 times as long as wide, elytral sides subparallel in basal half; in lateral view dorsal outline broadly, nearly evenly arcuate. Pubescence of dorsum dull yellow with evident luster in light, more or less bristling, medium in density, not obscuring surface; on dorsum weakly swirled and forming more or less distinct light and dark areas. Body beneath pubescence brown to reddish brown.

Head.—Front nearly evenly convex, vertex distinctly convex; sculpture of fine, moderately dense punctation of 1 size; surface moderately shiny; head over eyes not grooved. Eyes medium in size, separated by about 2.0 times vertical diameter of an eye. Antennal club normal (as fig. 15), pale brown. Last segment of maxillary palpus subtriangular, clearly longer than wide, mesal margin arcuate, distal margin outwardly arcuate, not notched, distal angle acute; last segment of labial palpus subtriangular, a little longer than wide, mesal margin arcuate, distal margin outwardly arcuate, not notched, distal angle acute.

Dorsal surface.—Pronotal disk with fine, moderately dense, very obscurely dual punctation, surface shiny; punctation at side denser, more distinctly dual, surface subgranulate; lateral margin fading before anterior margin. Elytra finely, not

densely punctate, punctation obscure and obscurely dual, disk with no evidence of stria, surface shiny; surface at side more densely punctate, also subgranulate, with no evidence of striae.

Ventral surface.—Metasternum with fine, dense, obscurely dual punctation, nearly evenly distributed; broad, moderately deep groove at middle. Abdominal sutures 2, 3, and 4 distinct throughout, weakly sinuate; surface with fine, dense, obscurely dual punctation; abdomen nearly evenly convex, but 5th segment nearly flat front to back.

Length.—1.4 mm.

Types.—The male holotype (USNM No. 75702) bears the data – Dominica, W.I., d'Leau Gommier, 15 Feb. 1965, W.W. Wirth, Bredin-Archbold Smithsonian Bio. Surv. Dominica. A paratype (in USNM) has – Dominica, D'Leau Gommier, II-15-1965, 1400', HE Evans.

Discussion.—The specific name (meaning wavy) refers to the elytral pubescence. The hairs change direction in such a way as to form an undulate pattern.

To distinguish this species from *flavitarsis*, see under the latter.

Protheca variegata, new species

(fig. 2)

General.—Body about 1.8 times as long as wide, elytral sides subparallel in basal two-thirds. Pubescence of dorsum short, medium in density and length, bristling normally, pale yellow, but apically along suture weakly orange, with distinct sheen in bright light, forming swirled patches that produce light and dark areas. Dorsum with body beneath pubescence brown, ventral surface red brown.

Head.—Front nearly evenly convex, weakly produced above antennal bases; sculpture of obscurely dual punctation, large punctures shallow, those near middle separated on an average by about diameter of a puncture; moderately distinct groove over eye, continued to over antennal base. Antennal club normal in form (as fig. 15), orange. Eyes separated by 1.9–2.0 times vertical diameter of an eye. Maxillary and labial palpi each with last segment subtriangular; basal margin of maxillary palpus sinuate, distal angle acute, distal margin weakly arcuate, not notched; basal margin of labial palpus weakly sinuate, distal angle nearly a right angle, distal margin weakly, outwardly arcuate, not notched.

Dorsal surface.—Pronotum in lateral view most distinctly rounded before base; punctation on disk obscurely dual, large punctures weak, sculpture of distinctly dual punctation at side, large punctures separated on an average by about half diameter of a puncture; lateral margin attaining anterior margin, latter more or less moderately sinuate. Elytral punctation distinctly dual, on disk large punctures separated on an average by 1–2 times diameter of a puncture, in addition to dual punctation with deep punctures forming obscure striae; more or less distinct stria in weak depression at side at level of abdomen, with weak to feeble indications of striae continuing onto disk.

Ventral surface.—Metasternum with dual punctation, large punctures present throughout, though sparser posteriorly at sides, large punctures anteriorly at side separated on an average by about diameter of a puncture; broad but not deep, longitudinal groove at middle. Abdominal sutures 2, 3, and 4 weaker at middle though distinct, suture 2 weakly bisinuate, 3d moderately bisinuate, 4th more dis-

tinctly so; punctation dual; 5th segment at middle more or less flattened.

Length.—1.5–1.7 mm.

Types.—The female holotype (in CNCI) and the single paratype (in USNM) bear the data – Jamaica, St. James, 3 mi. W. Flamingo, VIII–19–1966, Howden & Becker Collectors.

Discussion.—The specific name (meaning of different colors) refers to the pubescence. It is mostly yellow but with orange along the elytra suture. Its light and dark patches are due to the reflective, swirled hairs.

This species is very similar to *flavivarsis*. However, in *variegata* the sculpture at the side of the pronotum consists of distinctly dual punctation and the large punctures on the metasternum are distinct and evenly distributed. In *flavivarsis* the sculpture at the side of the pronotum consists of indistinct granulation and punctation and the large punctures of the metasternum are most distinct anteriorly and obscure to absent on the rest of the metasternum. For more notes, see under *hirsuta*.

UNCERTAIN PLACEMENT

No specimen known to belong to the following species has been seen. Since some of the Pic collection was not available for my examination when I was in Paris, I could not examine the type of *Leptobia guadalupensis subnitida*. The brief description provided for it is of little help in attempting to assign the name.

Leptobia guadalupensis subnitida Pic

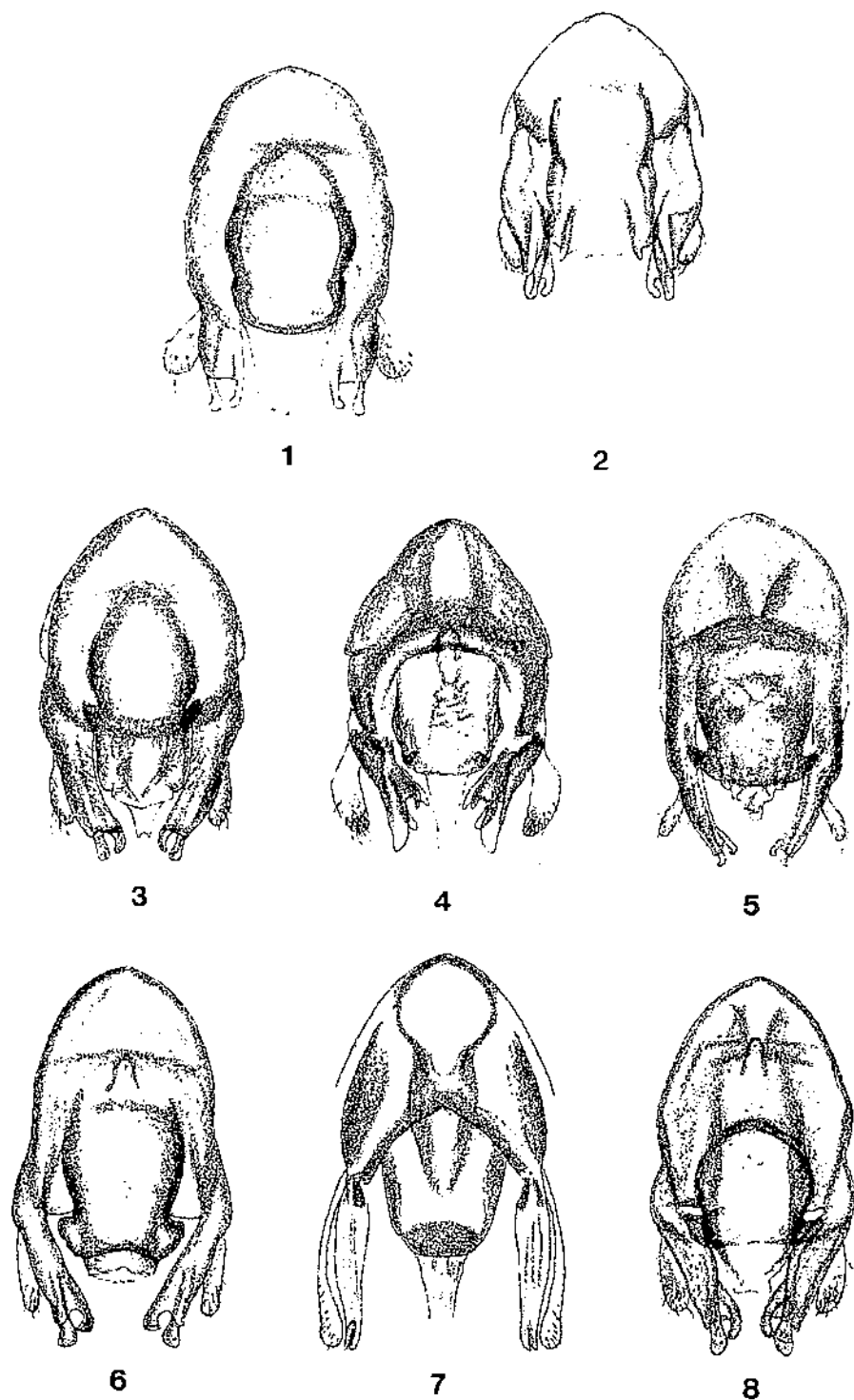
Leptobia guadalupensis subnitida Pic, 1909, p. 169.

“Parfois la forme est moins trapue, l'aspect plus granuleux avec le prothorax moins brillant (var. *subnitida*, nov.).”

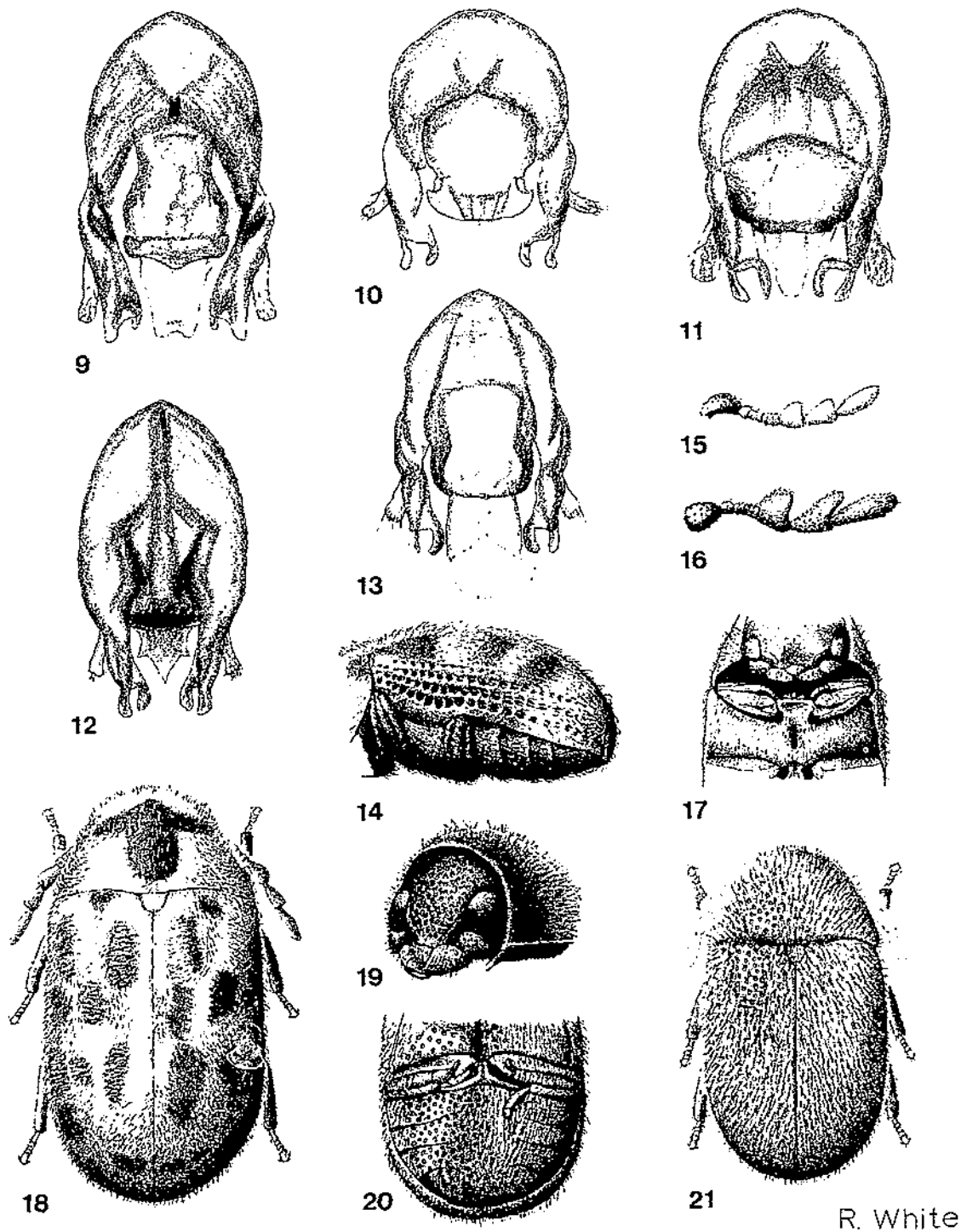
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FIGURES 1-8.—Male genitalia of *Protheca*: 1, *flavitaris* Fisher, holotype; 2, *variegata*, n. sp.; 3, *brunnea*, n. sp., holotype; 4, *producta*, n. sp.; 5, *carinata*, n. sp., holotype; 6, *bicolor*, n. sp., holotype; 7, *aberrans*, n. sp.; 8, *hirsuta* (Pic), holotype.



FIGURES 9-13.—Male genitalia of *Prothecha*: 9, *estriata*, n. sp., holotype; 10, *undulata*, n. sp.; 11, *hispida* LeConte; 12, *asperata*, n. sp., holotype; 13, *parva*, n. sp., holotype. FIGURES 14-21.—*Prothecha* species: 14, *striatipennis*, n. sp., side view; 15, *producta*, n. sp., female antenna; 16, *producta*, n. sp., male antenna; 17, *carinata*, n. sp., ventral view; 18, *carinata*, n. sp., dorsal view; 19, *cinerea*, n. sp., head; 20, *producta*, n. sp., abdomen; 21, *infaceta*, n. sp., dorsal view.

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