

BANANA PESTS IN THE GENUS *COLASPIS*,
INCLUDING DESCRIPTION OF A NEW SPECIES
(COLEOPTERA: CHRYSOMELIDAE)

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ABSTRACT

Four species of *Colaspis* (Coleoptera: Chrysomelidae) considered to be established pests of banana fruit are redescribed and illustrated including a new species. They are: *gemellata* Lefèvre, *ostmarki* Blake, *submetallica* Jacoby, and *blakeae* n. sp. A fifth, *hypochlora* Lefèvre is redescribed and considered to be an occasional feeder on bananas.

From Mexico to Venezuela beetles in the genus *Colaspis* are occasional to persistent feeders on young banana fruit and unfurled leaves. A literature search for colaspis banana pests disclosed references only to *C. hypochlora* Lefèvre (Gowdey 1926, Salt 1928, Darlington 1929, Squire 1935, 1936, Cleare 1939, Anon. 1968) or *Colaspis* sp. (Anon. 1964). In addition, *C. fulvotestacea* Lefèvre was identified in 1959 from specimens collected from banana fruit in Puerto Limón, Costa Rica (F. Lara, personal correspondence). Since life history accounts, particularly of larval habits, varied so much between publications, there was a strong likelihood that several species other than "*hypochlora*" were involved.

My interest in colaspis beetles was triggered by an epidemic on banana fruit in Changuinola, near Almirante, Panamá, beginning in 1968 and eventually spreading over 2,000 ha. by 1973. In 1973 simultaneous outbreaks of colaspis beetles in banana plantations near Santa Marta and Turbo, Colombia, also caused severe losses of banana fruit.

Doris H. Blake, Smithsonian Institution, undertook the difficult task of sorting out the *Colaspis* species considered to be established pests of bananas. This involved inspecting specimens, including types, from French, British, and United States Collections. During the course of these investigations Doris Blake: 1) Described the Changuinola species, *C. ostmarki*, as new (Blake 1973). It was first identified as *C. sp.* near *fulvotestacea* Lef. and is the same as the Puerto Limón species earlier identified as *fulvotestacea*; 2) Determined the banana colaspis from Surinam and Guayana to be *C. gemellata* Lefèvre; and 3) Found specimens from Sevilla, Colombia, collected by G. Salt who had written the major biological paper on "*C. hypochlora*" (Salt 1928) and determined the species to be close to, but distinct from *gemellata* and *hypochlora*.

SPECIES INCLUDED

Four species of *Colaspis* may be considered persistent pests of banana fruit: *C. blakeae* n. sp., *C. gemellata* Lefèvre, *C. ostmarki* Blake, and *C. submetallica* Jacoby. Although *C. hypochlora* has been extensively reported as a banana pest, most, if not all, observations were of the above species. Actually, the smaller yellow-brown species of *Colaspis* from Mexico and

Central America are very similar and have been mostly identified as *C. hypochlora* (Blake 1970). *Colaspis hypochlora* is common on plants near banana plantations, but joins a number of other colaspis beetles in being only occasional or accidental feeders on bananas. Since *hypochlora* has been so extensively associated with bananas in the literature, it is included in the following descriptions for comparison.

Colaspis blakeae Ostmark, new species
(Fig. 2C)

Length 5.1 to 5.9 mm, average: 5.5, sexes equal in length; elongate oblong oval; yellow brown, less commonly reddish brown; edges of prothorax and elytra, often prosternum and mesosternum, lustrous green; abdomen usually brown; head brown, finely punctured, approximately 80% of females, 15% of males with dark area along frontal suture, the dark area frequently with metallic green spots; genae at base of antennae inflated, impunctate; interocular space half width of head; front and clypeus finely punctate, clypeus usually darker; mandibles large, black; antennae filiform; yellow brown usually with 7th, half of 10th, and entire 11th (last) segments dark; margins of pronotum green, rounded, not sinuate; finely, but not densely punctate; pronotal punctures not pigmented or gemmate; scutellum yellowish or reddish brown; elytra wider than prothorax and 3 times as long; first 2 interspaces wider than others with single rows of coarse punctures between, rest of interspaces irregularly varying in width, striae with punctures varying from geminate to single and sometimes alternate; elytral punctures sometimes faintly green, always highly pigmented; interspaces not highly elevated, somewhat flattened; epipleura green.

TYPE: male, U.S.N.M. Type No. 72775 and 40 paratypes (20 males, 20 females).

TYPE LOCALITY: Santa Marta, COLOMBIA, 8-XII-73, W. E. Bolton, feeding on banana fruit.

Other localities: PANAMA: Bocas del Toro, H. S. Barber and E. A. Schwarz; Pueblo Nuevo, 8 km from Panamá City, Papaya Plantation, VIII-1918, H. Morrison. Gamboa, C. Z., VII-1918, E. F. Dietz and J. Zetek; Puerto Armuelles, VII-1966, H. E. Ostmark. COLOMBIA: Sevilla, Normandia Farm, 30-VI-26, J. R. Johnston; loc. cit., 1-IX-27, G. Salt; Río Frío (Santa Marta), J. R. Johnston.

Colaspis blakeae is closely related to *hypochlora* and *gemellata*. The elytra of all 3 species appear striped to the naked eye. The aedeagi are dissimilar, and there are subtle but distinct differences in the elytral interspaces and striae. Generally, the pronotal and striae punctures of *gemellata* are metallic green. The elytral punctures of *blakeae* are pigmented, only occasionally showing a greenish glint; the pronotal punctures of *blakeae* are neither pigmented nor gemmate. The interspaces of *gemellata* are approximately the same width throughout, the punctures between in geminate rows; the interspaces of *blakeae* are generally irregular in width and punctures are in both single and geminate rows with some alternation in the same stria. The margins of the pronotum of *hypochlora* are sinuous, while those of *gemellata* and *blakeae* are rounded.

This species is named in honor of Doris H. Blake, in recognition of her years of work on the genus *Colaspis*.

BIOLOGICAL NOTES

Colaspis blakeae is the infamous "morrocuya" beetle that has caused severe losses of banana fruit in the Santa Marta-Sevilla region of northern Colombia for over 70 years. Apparently, *blakeae* becomes abundant only between August and November near the end of the rainy season. During the December to March dry season adult beetles are scarce, and damage to fruit is minimal or nonexistent.

Adult feeding on bananas is confined to fruit less than 40 days old and the underside of the sheath of the guard leaf (capote) over the fruit bunch. Unlike other *Colaspis* species, *blakeae* does not feed on new unfurled leaves (candelas), and populations cannot be estimated by leaf damage. Random collections indicate a 1:1 sex ratio.

Larvae apparently feed on roots of the grass, "paja panela", *Paspalum conjugatum* (Salt 1928).

Colaspis gemellata Lefèvre
(Fig. 2A)

Colaspis gemellata Lefèvre (1885)

Maecolaspis musae Bechyne (1950)

Length 4.5 to 5.5 mm, elongate oblong oval; dark brown, pronotum usually darker than elytra; edges of prothorax and elytra, prosternum, mesosternum and abdomen lustrous green; head brown with coarse gemmate punctures on front; genae at base of antennae elevated, impunctate; interocular space more than half width of head; front coarsely, clypeus finely punctured, usually darker; mandibles large, black; antennae filiform, yellow brown, usually with 7th, half of 10th and entire 11th (last) segments dark; margins of pronotum green, rounded, not sinuate, surface moderately coarsely, but not densely punctate, pronotal punctures gemmate; scutellum dark brown with greenish sheen. Elytra wider than prothorax and 3.5 times as long, interspaces of almost equal width throughout length, striae punctures gemmate and usually in regular geminate rows; first 2 interspaces not noticeably wider than others; interspaces not highly elevated; epipleura green.

The differences between *gemellata* and the closely related *blakeae* and *hypochlora* have been discussed under *blakeae*.

Adults of *gemellata* feed on banana fruit, bracts, and candelas and are considered a major pest of bananas. Adults also feed on okra, *Hibiscus esculentus*. Larval hosts and habits are unknown.

COLLECTION LOCALITIES: Surinam (Dutch Guiana), Guyana (Brit. Guiana), Colombia, Peru, Bolivia.

Colaspis ostmarki Blake (1973)
(Fig. 1 A-E)

Colaspis ostmarki was described in detail by Blake (1973). Adults feed on young banana fruit, bracts, and candelas; larvae on banana rootlets. The only serious damage is to the fruit; the leaf-feeding habit is useful to entomologists in locating and estimating populations of this beetle, since feeding holes on the unfurled leaves leave distinctive patterns on the right hand blade of the leaf looking upward. The adult beetles are present in banana plantations all year, possibly because the affected areas in Changuinola, Panamá and Puerto Limón, Costa Rica have no well-defined dry and rainy seasons.

Females of *ostmarki* average larger than males. Lengths of a series of 52 females ranged from 5.7 to 7.3 mm (ave. 6.4); 32 males from 5.1 to 6.5 mm (ave. 5.7). A random collection of beetles from fruit disclosed a sex ratio of 2 females to 1 male.

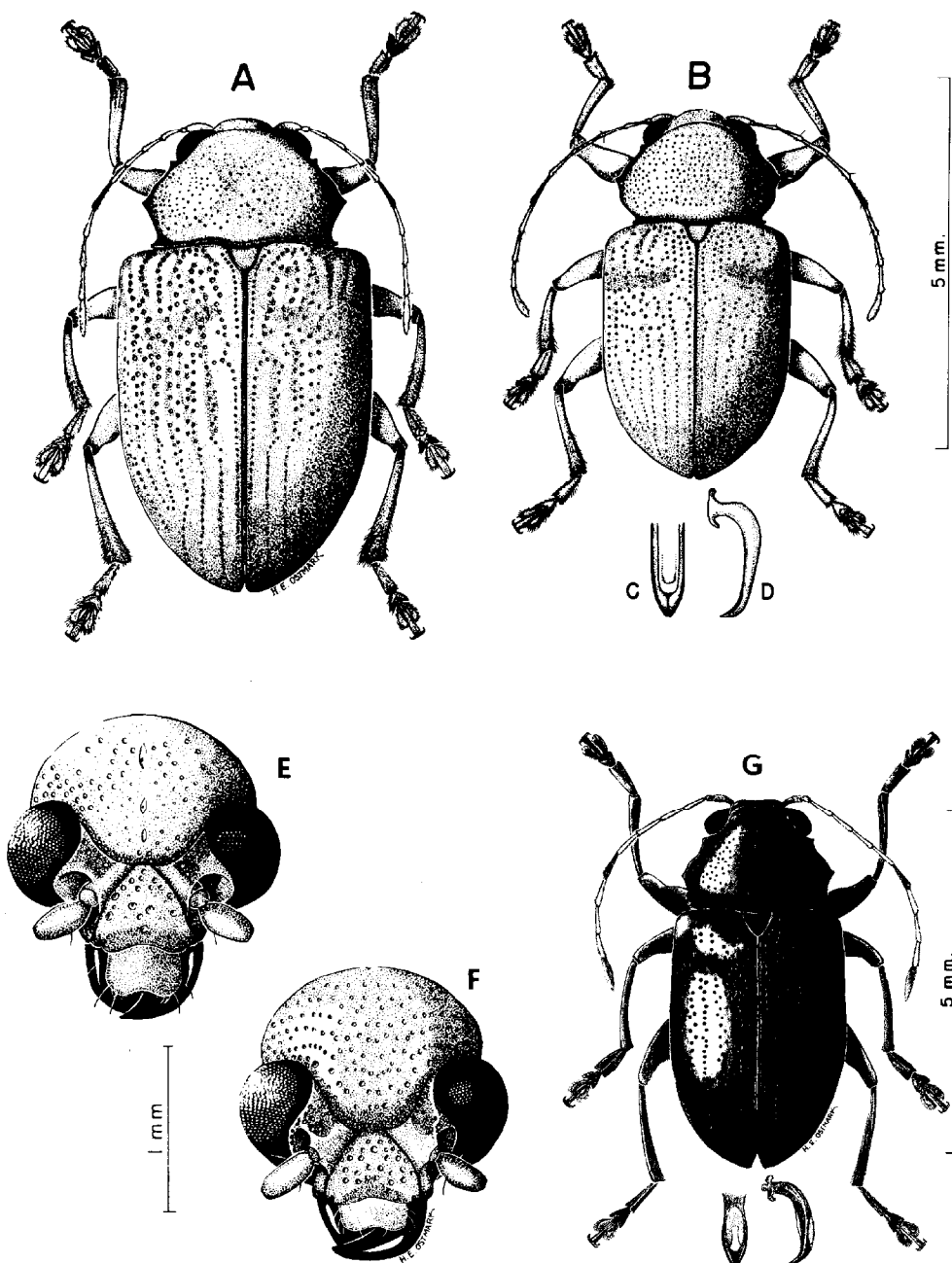


Fig. 1: Banana colaspis pests in *fulvotestacea* group. A. *Colaspis ostmarki*, female; B. *ostmarki*, male; C. Top view aedeagus; D. Side view aedeagus; E. Head *ostmarki*; F. Head *submetallica*; G. *submetallica*, male.

Colaspis submetallica Jacoby (1881)
(Fig. 1 F-G)

Length 5.0 to 7.3 mm, females larger; elongate oblong oval; light brown to almost black, dorsum with shining greenish sheen in most specimens; sterna and abdomen light to dark brown; head brown, sunken rows of punctures extending from top of eyes to apex of frons; some specimens show at least a trace of metallic green on the sunken rows or epicranial suture; frons and clypeus coarsely punctured, clypeus usually darker; genae at base of mandibles inflated, impunctate; interocular space less than half width of head; mandibles black; antennae filiform, yellow-brown, 7th segment dark, sometimes 11th (last) segment slightly darker; margin of pronotum shining metallic green; sinuate; surface finely but not densely punctate; scutellum brown; elytra wider than prothorax and 3 times as long, a transverse depression below basal umbones; sides of elytra green near base; costae developed in female especially near sides at base, much less so in male; elytra stria punctures in single rows at base becoming confused below basal umbones, continuing as mainly geminate rows becoming single near apex.

Colaspis submetallica is one of the *fulvotestacea* group characterized by a distinct depression behind the elytral shoulders and depressed rows of punctures extending from the eyes to the frontal tubercles on the face (Fig. 1E & F). Most specimens appear brown to black with a greenish sheen. Some lack the greenish sheen, closely resembling *ostmarki* and *fulvotestacea*, but the head of *submetallica* is more densely punctate and elytral punctures are coarser. Also *submetallica* lacks the sulci found on the front of the head of most *ostmarki*. The greenish sheen on the depressed rows of punctures above the frons and on the epicranial suture is apparently sex associated; over 90% of the females and only 20% of the males show the greenish color.

As in *ostmarki* the females average larger; the lengths of 13 males ranged between 5.0 and 5.8 mm (ave. 5.4); 29 females between 5.0 and 7.3 mm (ave. 5.8). The sex ratio is approximately 2 females to 1 male.

Most host records of *submetallica* list cacao, *Theobroma cacao*, but this beetle has also been a pest of bananas in the Turbo, Colombia and Machala, Ecuador area for years, especially in the vicinity of cacao plantations.

COLLECTION LOCALITIES: *Guatemala*: Cayuge, Alta Verapaz, Izabel. *Costa Rica*: Puntarenas, San Carlos. *Panamá*: Trinidad River, Paraíso, Waldeck, Porto Bello, Cabema, Gatun, Tabernella, Barro Colorado Is., Corozal, Caño Saddle, Gatun Lake, Bohio. *Colombia*: Turbo. *Belize*: River Sarstoon. *Ecuador*: Machala.

Colaspis hypochlora Lefèvre (1878)
(Fig. 2B)

Length 5.0 to 6.0 mm, ave. 5.4, sexes equal in length; elongate oblong oval; yellow brown to reddish brown; edges of pronotum brown occasionally with greenish sheen; edges of elytra greenish near base only; sterna and abdomen dark brown; exocoxal area of prosternum dark brown, frequently with metallic green lustre; episternum light brown; head brown, finely punctured; genae at base of mandibles slightly inflated or flat, impunctate; interocular space slightly more than half width of head; front and clypeus punctate, clypeus usually concolorous with front; mandibles large, black; antennae filiform, yellow brown, usually with 7th, 10th, and 11th (last) segments dark;

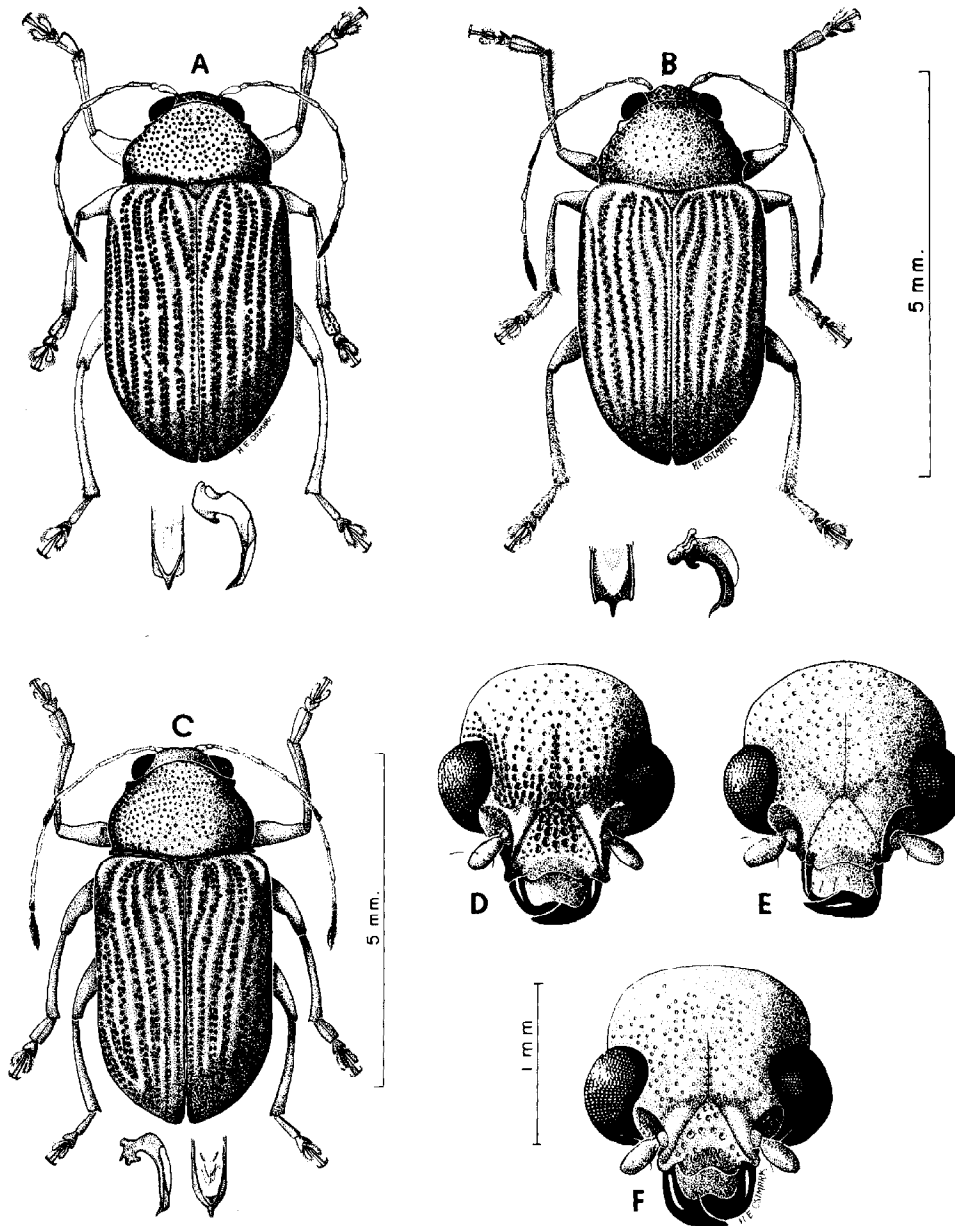


Fig. 2: Banana colaspis pests. A. *Colaspis gemellata*, male; B. *hypochlora*, male; C. *blakeae*, male, n. sp.; D. Head of *gemellata*; E. Head of *hypochlora*; F. Head of *blakeae*.

margins of pronotum sinuate; surface finely, but not densely punctate, pronotal punctures not pigmented or gemmate; scutellum brown; elytra wider than prothorax and 3 times as long; first 2 interspaces wider than 3rd, approximately equal to others; striae punctures highly pigmented not gemmate; costae not highly elevated, flattened, epipleura green.

The differences between *hypochlora*, *gemellata*, and *blakeae* have been discussed under *blakeae*. The sinuous pronotal margins, the flattened genal

area near the mandibles, and the dark brown exocoxal area of *hypochlora* are the best distinguishing features. The elytra of *hypochlora* appear more distinctly striped under low magnification because of the highly pigmented elytral punctures.

The ubiquitous *hypochlora* has been misidentified as the pest of many plants, including bananas. I feel that all biological accounts involving this species must be considered suspect, pending further work. Adults of *hypochlora* have definitely been collected in Honduras from at least 7 plant species including bananas: *Desmodium affine*, *Ipomoea* sp., *Urera elata*, *Arachis hypogaea* (peanut), *Cissus sicyoides*, *Hamelia patens*, *Musa* sp.

Colaspis hypochlora is frequently found feeding on banana candelas in newly planted plantations in Panamá and may be considered at least an occasional feeder on banana fruit.

COLLECTION LOCALITIES: Misidentifications have been so common that collection records are largely valueless; this (or similar) species have been reported from Mexico to Venezuela.

Other *Colaspis* spp. reported as collected from "bananas" are: *confusa* Bowditch (Trinidad); *freyi* Bechyne (Costa Rica); *lebasi* Lef. (a metallic green species, common on banana leaves only, whose larvae feed on roots of the grass, *Paspalum conjugatum*) (Costa Rica, Panamá). Of the more than 230 species of *Colaspis* in Central and South America, there are undoubtedly many others that are also occasional or accidental feeders on bananas.

METHODS

Adults were collected from beetle-damaged banana fruit less than 40 days old by carefully fitting a large plastic bag over the hanging fruit, then vigorously shaking the enclosed bunch. Banana colaspis beetles habitually drop from their hiding places on bracts and young fingers when disturbed. This technique, developed by C. S. Stephens, United Brands Company, is very effective in collecting these otherwise elusive beetles.

Beetles were sexed by examining the terminal abdominal segment. Females have a rounded abdomen with a notch in the terminal segment; the male abdomen is narrower with no notch (Salt 1928). Also the first tarsal segment of pro- and mesothoracic legs of males is wider than that of females.

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FIRE ANTS USED IN SKELETAL PREPARATIONS—

(Note). Dermestid beetles are often used as skeletal cleaning agents though often they prove difficult to keep and are sometimes slow workers. We have used the imported fire ant *Solenopsis invicta* Buren (Formicidae, Myrmicinae) to clean skeletons and skulls of mammals and birds and have found them to be fast, effective, and with no maintenance problems, though most effective in the warmer months.

Fresh specimens, skinned and eviscerated, are placed in wooden boxes, 29×25×15 cm with wire mesh tops and bottoms. The boxes are mounted on 30 cm legs and are placed over an ant mound with one or two of the legs penetrating the mound. The ants swarm up the legs, find the specimens in the box and proceed to strip the tissue from the bones. The wire mesh prevents the removal of small bones and the legs prevent the ants from building the mound over the materials to be cleaned. After cleaning, the specimens are allowed to dry for 3 or 4 days before being sealed up. Seven to 8 skulls or 1 skeleton of a *Sigmodon*-sized animal can be thoroughly cleaned in 1 day by a single mound. Old, dried skulls can be cleaned after smearing the dried tissue with honey.

While the ant we used has a range limited to the Southeastern United States, perhaps other ant species in different localities could be used as well. We thank P. E. Jinright for the initial suggestion of the method and A. Bhatkar for determining the ant species. Robert L. Crawford, and James B. Atkinson, Tall Timbers Research Station, Rt. 1, Box 160, Tallahassee, Fla. 32303.