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The Beetle Family Carabidae of Costa Rica: Twenty-nine new species of *Agra* Fabricius 1801 (Coleoptera: Carabidae, Lebiini, Agrina)

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Abstract

Based on a study of 1,100 specimens of the genus *Agra* (Coleoptera: Carabidae: Lebiini: Agrina) from Costa Rica, twenty-nine new species were discovered and are here validated and described: *A. catie*, **n. sp.** (type locality: Limón, Tortuguero National Park, Estacíon Cuatro Esquinas, sea level, LN 280000,590500); *A. catbellae*, **n. sp.** (type locality: Cartago, Turrialba, 600m, 09º53'N 083º38'W); A. *dable*, **n. sp.** (type locality: Heredia, Estacíon Magsasay, Parque Nacional Braulio Carrillo, 200m, LN 264600,531100); *A. delgadoi*, **n. sp.** (type locality: Cartago, Turrialba, CATIE, 600m, 09º53'N 083º38'W); *A. fugax*, **n. sp.** (type locality: Heredia, Estacíon La Selva, 10º27'N 083º59'W; *A. giesberti*, **n. sp.** (type locality: Cartago, 15km NE Turrialba, 10º00'N 083º30'W); *A. granodeoro*, **n. sp.** (type locality: Cartago, Turrialba, Chirripo, Grano de Oro, 1120m, LN 200250,595900); *A. ichabod*, **n. sp.** (type locality: Alajuela, Atenas, 9º58'N 084º23'W); *A. jimwappes*, **n. sp.** (type locality: Guanacaste, La Pacifica, 10º28'N 085º07'W); *A. julie*, **n. sp.** (type locality: Cartago, Turrialba, 600m, 09º53'N 083º38'W); *A. katewinsletae*, **n. sp.** (type locality: Puntarenas, Monteverde, 1380m, 10º50'N 085º37'W); *A. liv*, **n. sp.** (type locality: Puntarenas, Manual Antonio National Park, Quepos, 80m, 09°23'N 84°09'W); *A. monteverde*, **n. sp.** (type locality: Puntarenas, Monteverde, 1380m, 10º50'N 085º37'W); *A. not*, **n. sp.** (type locality: Puntarenas, Carara Biological Reserve, Estacíon Bonita, 50m, LN 194500,469850); *A. notcatie*, **n. sp.** (type locality: Limón, Tortuguero National Park, Estacíon Cuatro Esquinas, sea level, LN 280000,590500, November (R. Delgado)(INBio: CRI000-298655); *A. pitilla*, **n. sp.** (type locality: Guanacaste, Guanacaste National Park, Estacíon Pitilla, 9 km S Santa Cecilia, 700m, LN 330200,380200); *A. phallica*, **n. sp.** (type locality: Cartago, Tucurrique, 09º51'N 083º43'W); *A. quesada*, **n. sp.** (type locality: Limón, Manzanillo, RNFS Gandoca y Manzanillo, 0-10 sea level, LS 398100,610600); *A. santarosa*, **n. sp.** (type locality: Guanacaste, Santa Rosa National Park, 280m, 10º50'N 085º37'W); *A. schwarzeneggeri*, **n. sp.** (type locality: Cartago, Turrialba, 650m, 09º53'N 083º38'W); *A. sirena*, **n. sp.** (type locality: Heredia, Estacíon La Selva, 10º27'N 083º59'W); *A. solanoi*, **n. sp.** (type locality:); *A. solisi*, **n. sp.** (type locality: Limón, Tortuguero National Park, Cerro Tortuguero, 119m, LN 285000,588000); *A. turrialba*, **n. sp.** (type locality: Cartago, Turrialba, 600m, 09º53'N 083º38'W);

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A. ubicki, **n. sp.** (type locality: Puntarenas, 3 km NE Golfito, 8º39'N 083º10'W); *A. winnie*, **n. sp.** (type locality: Guanacaste, Guanacaste National Park, Estacíon Santa Rosa, 800m, LN 313000,359800); *A. zumbado*, **n. sp.** (type locality: Guanacaste, Guanacaste National Park, Estacíon Patilla, 9 km S Santa Cecilia, 700m, LN 330200,380200); *A. zuniga*, **n. sp.** (type locality: Puntarenas, Manual Antonio National Park, Quepos, 80m, LS 370900,448800). Six additional species are recorded for the first time in Costa Rica: *Agra castaneipes* Bates, *A. campana* Erwin, *A. fortuna* Erwin, *A. guatemalena* Csiki, *A. incisa* Liebke, and *A. rufiventris* Bates. The presence of a Panamanian species, *A. championi* Bates, in Costa Rica, as noted by Max Liebke has been confirmed (*Agra danjanzeni* Erwin = *A. championi* Bates, **new synonymy**). Also included: Neotype designation for *Agra pia* Liebke 1940 and apparent rediscovery of this species in Costa Rica; *Agra aurifera* Liebke 1940 description translated from the German and reproduced here with comments.

Key words: Costa Rica, Coleoptera, Beetles, Carabidae, *Agra*, new species, synonyms, geographical distribution

Introduction

Pivotal to our knowledge of species that regulate most of the environmental processes on Earth is who they are, where they are, and what they are doing (Daniel Janzen, pers. comm.). This knowledge will come from inventories of all species at regional and local scales, everywhere. The National Biodiversity Inventory of Costa Rica (INBio, El Instituto Nacional de Biodiversidad as conceived by D. Janzen and R. Gamez in the late 1980's) set out in the early 1990's to make available on the World Wide Web a “page” for every species, their basic unit of biodiversity information (UBI, Unidades Básicas de Información) with all current information readily available. As species are discovered (or rediscovered) and documented, their images, descriptions and natural history become available to this growing **Encyclopedia of Life** in Costa Rica for all Costa Ricans and for the people of Earth, generally via the Internet. Previously described species can go onto a page as rapidly as taxonomists can get them there, with portals to parallel web sites. However, new (to science) insect species (the focus here) discovered and documented, first must be published according to the International Code of Zoological Nomenclature; “web validation” of a new species name currently is not an option. Hence, the main purpose of the present contribution is to validate 29 new species names for the carabid genus *Agra* and make descriptions and illustrations available to the web site at INBio where they will become potentially available to some 6 billion persons via home and office computers and the many CyberNet Cafes, the access points in “differently cultured countries.”

Forty-two additional species of Costa Rican *Agra* are “in press” at the INBio web site. The presented knowledge comes from a study of 1,100 specimens collected within Costa Rica and 11,142 specimens from other parts of the Neotropics and Neo-subtropics.

Once it is fairly certain that all the species of this genus are described for Costa Rica (see below regarding females specimens), I will produce a key to their identification that will appear at the INBio web site “Information Services” icon (e.g. see Erwin, Kavanaugh,

and Moore (2002) for a key to the tribes and genera of Carabidae of Costa Rica hosted by the INBio web site: http://www.inbio.ac.cr). In the meantime, I provide below a preliminary guide to the identification of all species groups known from Costa Rica, thus far.

A phylogenetic classification necessitates a far broader scope of study, as the Costa Rican fauna of this genus represents less than 8% of the currently known species across the Neo- and Neosubtropics. Costa Rican taxa will contribute to that endeavor eventually, but in this contribution they are thus listed alphabetically, as are the species groups and supgroups in which the species are arrayed. I use these monophyletic species groupings (cf. Erwin 1998; Erwin in prep; Erwin and Pogue 1988) because the subgeneric and species group components of *Agra* are reasonably well understood, even if not yet completely published.

Taxonomic history

Agra Fabricius 1801, in which currently there are 602 described species and subspecies (not counting the present descriptions), is moderately well represented in Costa Rica. At present, 71 species of *Agra* have been documented in the literature for Costa Rica, if the present contribution is included. Species represented only by female specimens add an additional six, apparently undescribed, species at this time. I have not described them here because they are in part the difficult cajennensis complex and males are needed for subgroup assignment. More detailed descriptions of the Costa Rican taxa named herein, as well as previously described ones, including color images, associated label data for all specimens studied, maps of their known distributions, and what is known of their natural history will soon be found at the following website: http://www.inbio.ac.cr, under the ATTA icon, “click” Insects, Coleoptera, and Carabidae, then click “Carabidos coloridos del follaje.”

In addition to the new species described herein, the following are new country records for Costa Rica: *Agra barrensis* Straneo, *A. castaneipes* Bates, *A. campana* Erwin, *A. dimidiata* Chevrolat, *A. fortuna* Erwin, *A. guatemalena* Csiki, *A. incisa* Liebke, *A. lavernae* Erwin, and *A. rufiventris* Bates. *A. championi* Bates described from Panamá, (type in BMNH) and cited by Liebke (1940) as also occurring in Costa Rica is the senior synonym of *A. danjanzeni* Erwin, **n. syn**., and belongs in the rufoaenea species-group (Erwin 1991). Liebke's specimens are missing from the collection housed in Warsaw, and likely were lost during World War II. Two other Liebke species, *A. aurifera* and *A. pia,* described from Costa Rica, probably lost their type specimens in World War II, as well. From the description and illustration provided by Liebke, I have not been able to discover any recently collected specimens of *A. aurifera*, and so at present it remains a *nomen dubium*. *A. pia* Liebke, on the other hand is identifiable (see below).

A complete list of all *Agra* species and their synonyms and distributions is on the following web site: http://entomology.si.edu, under Databases, Western Hemisphere Carabidae.

Natural History

Adults probably are predaceous on other arthropods; one specimen of an undescribed species from Panamá had fragments of termites in its gut contents. Adults also have been observed drinking exudates from young new shoots and young leaves on a variety of tree species, as well as feeding on pollen (Arndt, et al. 2001). Adult tarsi are adapted to running on the surfaces of leaves, and the beetles rest under the leaves, "concealed" with legs and antennae tucked close to the body, which is aligned with the midrib of the leaf (E.S. Ross, *pers comm*. with photos). Adults are nocturnal and commonly fly to lights at night. Most species in the genus are known from the forest canopy, yet some species also are often found in suspended dry leaves in the under story.

Known larvae are thought to occur under bark of standing trees, probably in burrows of other insects, and are thought to be predatory (Arndt, et al. 2001). Adults generally are found by fogging, black-lighting, or sweeping and beating vegetation.

Methods

General procedural methods for handling specimens are as described previously (Erwin 2000a). Species concepts are outlined in Erwin and Kavanaugh (1981). Descriptions are organized using the “nested” style of providing data (Erwin and Kavanaugh, (1981)). Table 1 in Erwin (2000a) provides a character state matrix for all characters thus far investigated across these and all previously revised *Agra* groups. Measurements for body parts are coded as follows and are presented in the species descriptions as measures of single specimens, if that is all I saw, or as ranges based on the smallest and largest of all specimens studied for each species. The general measurements presented in millimeters in the descriptions are: length (ABL = apparent body length, that length used by most previous authors as total length measured by holding up a ruler alongside the specimen (see Erwin and Kavanaugh, 1981); width (TW = total width across the widest portion of the elytra, actually measured as the left elytron (WE) and doubled to obtain value of specimen’s width). Specific measures are presented in the figure captions: head length (HL); pronotum length (PL); elytron width (WE); sternum VI width (SW); aedeagus length (AL); stylomere 2 length (S2L).

The species of *Agra* Fabricius known from Costa Rica

The **arrowi** species-group
Agra duplicata Liebke 1938:59, Costa Rica
Agra jimwappes Erwin **n. sp.**, Costa Rica
Agra winnie Erwin **n. sp.**, Costa Rica, El Salvador

The **barrensis** species-group
Agra barrensis Straneo 1955:26, Colombia, Costa Rica, Panamá

The **buqueti** species-group
Agra giesberti Erwin **n. sp.**, Costa Rica, Guatemala, Panamá

The **cajennensis** complex
macracantha subgroup
Agra catie Erwin **n. sp.**, Costa Rica
Agra fugax Erwin **n. sp.**, Costa Rica
Agra macracantha Bates 1883:246, Costa Rica, Panamá
Agra sirena Erwin **n. sp.**, Costa Rica, México
castaneipes subgroup
Agra castaneipes Bates 1883:246, Colombia, Costa Rica, Panamá
Agra not Erwin **n. sp.**, Costa Rica
Agra phallica Erwin **n. sp.**, Costa Rica
Agra turrialba Erwin **n. sp.**, Costa Rica
quesada subgroup
Agra quesada Erwin **n. sp.**, Costa Rica

The **chrysopteryx** species-group
Agra chrysopteryx Bates 1878:609, Costa Rica, Nicaragua, Panamá

The **coerulea** species-group
Agra elaina Bates 1883:250, Belize, Costa Rica, Guatemala, Panamá
Agra laeticolor Bates 1878:609, Costa Rica, Nicaragua

The **dimidiata** species-group
Agra dimidiata Chevrolat 1856:352, Costa Rica, México, Panamá
Agra eponine Erwin 2000a:16, Costa Rica
Agra hespenheide Erwin 2000a:16, Costa Rica
Agra inbio Erwin 2000a:17, Costa Rica
Agra janzeni Erwin **n. sp.**, Costa Rica
Agra paratax Erwin 2000a:16, Costa Rica

The **exarata** species-group
Agra sigillata Liebke 1940:99, Costa Rica, Panamá
Agra striatifemoris Liebke 1940:100, Costa Rica

The **fada** species-group
Agra aurifera Liebke 1940: Costa Rica
Agra katewinsletae Erwin **n. sp.**, Costa Rica
Agra lavernae Erwin 1978:265, Costa Rica, Panamá

The **fallax** species-group
Agra yola Erwin 2000b:282, Costa Rica

The **famula** species-group
Agra campana Erwin 1983:273, Costa Rica, Panamá
Agra crassicornis Liebke 1940:92, Costa Rica
Agra dable Erwin **n. sp.**, Costa Rica
Agra fortuna Erwin 1983:270, Costa Rica, Panamá
Agra liv Erwin **n. sp.**, Costa Rica, Panamá
Agra santarosa Erwin **n. sp.**, Costa Rica
Agra solisi Erwin **n. sp.**, Costa Rica

The **feisthameli** species-group
Agra nevermanni Liebke 1938:59, Belize, Costa Rica, Guatemala

The **fulvicauda** species-group
Agra fulvicauda Bates 1883:249, Costa Rica, Nicaragua

The **incisa** species-group
Agra incisa Liebke 1938:65, Colombia, Costa Rica

The **lycisa** species-group
Agra hilaris Liebke 1938:57, Costa Rica
Agra ubicki Erwin **n. sp.**, Costa Rica

The **oblongopunctata** species-group
Agra guatemalena Csiki 1932:1513, Costa Rica, Guatemala
Agra hysophila Straneo 1966:475, **New Status**, Costa Rica, Panamá

The **olivella** species-group
Agra olivella Bates 1883:250, Costa Rica, Guatemala

The **palmata** species-group
Agra atriperna Erwin 1984:42, Costa Rica, Panamá
Agra costaricensis Liebke 1940:89, Costa Rica

Agra flavipes Straneo 1982:396, Costa Rica
Agra granodeoro Erwin **n. sp.**, Costa Rica
Agra kayae Erwin 1984:39, Belize, Costa Rica, Guatemala, Honduras, México

The **perrinae** species-group
Agra schwarzeneggeri Erwin **n. sp.**, Costa Rica

The **peruana** complex
ligulata subgroup
Agra ligulata Liebke 1940:101, Costa Rica
Agra solanoi Erwin **n. sp.**, Costa Rica
notcatie subgroup
Agra notcatie Erwin **n. sp.**, Costa Rica

The **pia** species-group
Agra pia Liebke 1940: Costa Rica

The **pitilla** species-group
Agra pitilla Erwin **n. sp.**, Costa Rica

The **purpurea** species-group
Agra catbellae Erwin **n. sp.**, Costa Rica
Agra purpurea Bates 1883:251, Costa Rica, Panamá
Agra semifulva Bates 1883:249, Costa Rica, Panamá

The **rufiventris** species-group
Agra delgadoi Erwin **n. sp.**, Costa Rica, Panamá
Agra julie Erwin **n. sp.**, Costa Rica
Agra rufiventris Bates 1883:248, Costa Rica, Panamá

The **rufoaenea** species-group
Agra championi Bates 1883:253, Costa Rica, Panamá
Agra panamensis Bates 1878:609, Costa Rica, Panamá
Agra strangulata Chaudoir 1863:224, Brazil, Bolivia, Colombia, Costa Rica, Ecuador, French Guiana, Panamá, Perú, Surinam, Trinidad, Venezuela

The **soccata** species-group
Agra ichabod Erwin **n. sp.**, Costa Rica
Agra monteverde Erwin **n. sp.**, Costa Rica

The **virgata** species-group
Agra nola Erwin 1986:302, Costa Rica, Panamá
Agra vate Erwin 1986:302, Costa Rica, Guatemala, México, Panamá
Agra virgata Chevrolat 1856:352, Costa Rica, México, Panamá

The **zumbado** species-group
Agra zumbado Erwin **n. sp.**, Costa Rica

The **zuniga** species-group
Agra zuniga Erwin **n. sp.**, Costa Rica

Preliminary aid to the identification of species groups known from Costa Rica

Members of *Agra* species range in size from 6 mm to over 35 mm throughout their range from Texas to Argentina, however, in Costa Rica the smallest are about 8 mm and the largest are about 25 mm, thus descriptors below are described as from “small to large,” never “very large.”

The **arrowi** species-group

Members of this group are of medium size and range in color from brown to black in Costa Rica, but elsewhere they are highly colorful, even metallic.

Diagnostic combination of the arrowi species-group includes the following: Elytral interneurs of bi- or triserite rows of punctulae. Middle tibia of male with dense brush of setae on medial margin AND metasternum pubescent; sternum VI of female emarginate or with small median blunt tooth, stylomere 2 short and arcuate. Sterna III, IV, and V of male interuppted by median hyaline margin.

The **barrensis** species-group

Members of this group are of medium to large size and black in color.

Diagnostic combination of the barrensis species-group includes the following: Labrum flat. Elytral foveae in interneurs 2, 4, and 6 very large, adjacent intervals constricted at each fovea, interneurs divided into short "chains" of punctulae. Elytral apex tridentate. Male with metasternum pubescent, base of anterior and middle femora, and disc of abdominal sternum VI plumose.

The **buqueti** species-group

Members of this group are of medium to large size and range from rufous to black in color.

Diagnostic combination of the buqueti species-group includes the following: Male with densely pubescent metasternum, sparsely setigerous patches on abdominal sterna IV-

VI, slightly clavate middle tibia with dense vestiture around it, dense vestiture medio-apically on posterior tibia. Prothorax markedly narrowed anteriorly and evenly setigerous.

The **cajennensis** complex

Members of this complex are of moderately small to very large size and range from rufous to brown in color in Costa Rica. Elsewhere they are often aeneous or metallic.

Diagnostic combination: Antennomere 8 coequal in length with 7 in males, 1/2 the length in females; prosternal process bifid in males, planular in females; middles tibia more or less rounded in x-section; middle and hind tibiae in male slightly to markedly arcuate and flattened antero-mesially, rounded in female; arcuate-flattened portion of tibiae markedly setose (brushy) or totally devoid of vestiture; elytral interneurs not well organized, of large foveae or of medium-sized foveae interspersed with punctulae; female stylomere 2 moderately long, somewhat flattened dorso-ventrally.

The **macracantha** subgroup

Diagnostic combination of the macracantha subgroup includes the following: Elytral apex straight between lateral and sutural apices, shallowly to markedly oblique; apex not spinose laterally, nor suturally. Elytral interneurs each a series of large shiny (brassy in *A. fugax*) foveae. Prosternal process bifid. Metasternum densely pubescent. Middle and posterior tibia markedly excavate anterio-mesially, middle tibia not, or micromucrate. Abdominal sterna 2-5 with bilateral pubescent patches; male with sparse bilateral vestiture on abdominal sterna III and V, only IV with bilateral tufts. Posterior tibia slightly excavate and with moderately dense vestiture medio-apically. Aedeagus without apico-dorsal depression.

The **castaneipes** subgroup

Diagnostic combination of the castaneipes subgroup includes the following: Elytral apex shallowly arcuate between lateral and sutural apices, with dentate sutural apex; interneurs of large, coarse foveae. Middle and posterior tibia markedly excavate antero-mesially. Metasternum sparsely setigerous. Abdominal sternum IV with bilateral tufts of dense setae, II and III with patches, sternum V with varying amounts of setae. Aedeagus ventrally with a longitudinal depression near apex.

The **quesada** subgroup

Diagnostic combination of the quesada subgroup includes the following: Elytron with sutural apex prolonged and acutely pointed, lateral apices modestly dentate, margin between them slightly arcuate. Aedeagus with ostium of medium length, apex simple lobate, shaft of aedeagus with distinct swelling in basal half, markedly narrowed apically; parameres glabrous. Stylomere 2 elongate, bisetose apically.

The **chrysopteryx** species-group

Members of this group are of medium size and are metallic green in color with rufous forebody in Costa Rica.

Diagnostic combination of the chrysopteryx species-group includes the following: Head densely setigerous behind eyes. Prothorax of both sexes abruptly narrowed anteriorly and densely setigerous. Male with densely pubescent metasternum, posterior coxae and trochanters, and densely setigerous patches on abdominal sterna II-VI; middle tibia with dense vestiture medially, sparse vestiture medio-apically on posterior tibia. Aedeagus markedly narrowed apically and with a markedly scimitar-shaped apex.

The **coerulea** species-group

Members of this group are of small to medium size and are piceous to blue in color in Costa Rica.

Diagnostic combination of the coerulea species-group includes the following: Head of both sexes appearing swollen behind and below eyes. Prothorax long and very narrow, narrower than head. Elytra long and narrow, apex slightly lobed at middle. Male metasternum, posterior coxae and trochanters sparsely setigerous; base of all femora, posteriorly, with tuft of setae; abdominal sterna III, IV, V with patch of long scattered setae on disc. Appendages long and thin; posterior tibia of male slightly excavate, with long sparse setae on medial margin.

The **dimidiata** species-group

Members of this group are of medium size and are rufopiceous to black in color.

Diagnostic combination: Elytron with sutural and post-lateral dentiform projections spinose; interneurs of contiguous cribriform punctulae. Metathorax and abdominal sternum VI of male pubescent or densely setigerous. Middle femur of male densely setigerous along medial margin. Abdominal sternum III of male interrupted post-medially by extensive hyaline area. Aedeagus with apex broadly lobed apically. Sternum VI of female deeply incised, with a central tooth-like projection.

The **exarata** species-group

Members of this group are of medium size and are rufopiceous to black in color in Costa Rica. Elsewhere some are metallic.

Diagnostic combination of the exarata species-group, subgroup includes the following: Elytral interneurs finely punctulate, intervals 2, 4, 6 with setigerous punctures. Male with trochanter, metasternum and abdominal sterna II-VI pubescent, base of anterior and middle femora, and disc of abdominal sternum VI plumose. Abdominal sternum VI of male deeply u-shaped, lateral angles obtuse. Aedeagus with transversely lobate apex, ostium catopic.

The **fada** species-group

Members of this group are of small to medium size and are highly colorful in Costa Rica and throughout their range with rufous forebody, bicolored legs, and two-toned elytra, the base metallic.

Diagnostic combination of the fada species-group includes the following: Labrum flat, entire. Elytra with markedly and evenly punctulate interneurs; apex slightly lobed between lateral and sutural angles. Metasternum of male densely pubescent; abdominal sterna each with long scattered setae. Apex of abdominal sternum VI with obtuse hind angles. Male legs unmodified, similar to females. Aedeagus with apex a simple lobe, ostium elongate.

The **fallax** species-group

Members of this group are of medium size and are slightly metallic in Costa Rica, brown in Panamá.

Diagnostic combination of the fallax species-group includes the following: Robust scape, elongate antennomeres 4-11, and punctate head. Metathorax of male with small centralized patch of dense pubescence. Male legs without additional vestiture, similar to those of female. Posterior trochanter apically pointed. Elytral interneurs markedly deep, punctulae slightly cribriform. Aedeagus long, straight, narrow with moderate sized ostium, apex of phallus a perfectly diamond-shaped lobe, and parameres glabrous. Stylomere 2 elongate, with three terminal seta, two of which are spinose.

The **famula** species-group

Members of this group are of medium size and are black in Costa Rica, often with bicolored legs; one Costa Rican species has slightly metallic green elytra.

Diagnostic combination of the *famula* species-group includes the following: Labrum flat, anterior margin entire and truncate or slightly incised, incision shallowly v-shaped; lateral lobes of mentum short, narrowly rounded apically, median tooth short, narrowly rounded; middle and hind tibiae slightly compressed; posterior male basitarsus long, symmetric, not dilated; apex of elytron bispinose; female sternum VI apico-medially notched, notch shallow and wide; male median lobe with or without ostium bridged at middle, ostium elongated, apex broadly arrowhead-shaped.

The **feisthameli** species-group

Members of this group are of medium size and are brown in Costa Rica.

Diagnostic combination of the feisthameli species-group includes the following: Antennomere 8 of female equal in length to 7 as in males. Elytron with interneurs bi- or triserially punctulate or apparently uniseriate with punctures offset, alternating, not forming a straight row. Stylomere 2 without fixed spinose setae at apex, spatulate, shaft with short sparse setae.

The **fulvicauda** species-group

Members of this group are of small to medium size and are highly colorful in Costa Rica and throughout their range with rufous forebody, bicolored legs, and two-toned elytra, the base black (see the ?mimetic pitilla group below).

Diagnostic combination of the fulvicauda species-group includes the following: Labrum flat, entire. Pronotum and prosternum densely punctuate. Elytral apex medially slightly lobed; lateral tooth small, sutural angle obtusely rounded, not dentate; interneurs evenly and finely punctulate. Metasternum of male densely pubescent; abdominal sterna II-VI each with long dense pubescence. Apex of abdominal sternum VI in male obtuse angulate laterally, with deep u-shaped apical margin, female with rounded lateral angles and narrowly notched medially. Male middle tibia with small apicomedial brush. Aedeagus ostium short, slightly catopic, apex of phallus a simple diamond-shaped lobe, left paramere unisetose, right paramere multisetiferous. Stylomere 2 with 4 apical spinose setae.

The **incisa** species-group

Members of this group are of medium size and are brown in Costa Rica and brown to black elsewhere.

Diagnostic combination of the incisa species-group, subgroup includes the following: Labrum entire. Female antennomere 8 about 2/3 the length of 7. Elytral setigerous foveae in interneurs 2, 4, and 6 very large, adjacent intervals constricted at each fovea, interneurs divided into short "chains" of punctulae, intervals somewhat catenate. Elytral apex tridentate. Male with metasternum pubescent, base of anterior and middle femora, posterior trochanters, and disc of sternum VI plumose.

The **lycisa** species-group

Members of this group are of small to medium size and are brown in Costa Rica and brown to black elsewhere, some with aeneous to sub-metallic elytra.

Diagnostic combination of the lycisa species-group includes the following: Pronotum and head markedly setigerous. Head with short and medially depressed occiput. Sternum VI in both sexes dentate latero-posteriorly. Elytral apex slightly obliquely truncate, spinose or not. Stylomere 2 quadrispinose.

The **oblongopunctata** species-group

Members of this group are of medium to moderately large size and are brown or aeneous to sub-metallic elytra in Costa Rica and brown to black elsewhere.

Diagnostic combination of the oblongopunctata species-group includes the following: Labrum flat. Head behind eyes elongate, evenly rounded posteriorly, more tapered in male. Elytral interneurs each a series of large separated foveae; elytral apex obliquely truncated, laterally with a small tooth, suturally obtuse. Male metasternum sparsely setigerous, abdominal sterna III-V bilaterally setigerous.

The **olivella** species-group

Members of this group are of medium size and are black in Costa.

Diagnostic combination of the olivella species-group includes the following: Head dimpled on the vertex. Male without accessory setae on abdomen or legs, similar to females. Metasternum of male with a central patch of setae. Elytra nearly truncate with both sutural and lateral teeth acute and of equal size. Aedeagus with elongate ostium divided at middle by a chitinous bridge, apex a simple diamond-shaped lobe, parameres glabrous.

The **palmata** species-group

Members of this group are of medium to large size and are rufopiceous to black in color in Costa Rica. Elsewhere some are slightly metallic.

Diagnostic combination of the palmata species-group includes the following: Labrum flat; mentum with lateral lobes acute, not spiniform. Head elongate or not, broader across middle than occiput, eyes large; head posterior to eyes normally elongate, not ballooned (lateral aspect), eyes less than 1.5 times their own diameter from cervical constriction. Tibia moderately or slightly compressed, laterally barely expanded, apex never prolonged; all tibiae latero-apically oblique. Elytral apex bidentate, dentiform projections small.

The **perrinae** species-group

Members of this group are of medium size and are piceous to aeneous in color in Costa Rica. Elsewhere some are slightly metallic or black.

Diagnostic combination of the perrinae species-group includes the following: Male with an enormously enlarged middle femur that is pilose along the lower anterior margin. Apical margin of elytron usually tridentate or truncate (Costa Rica species only). Interneurs finely punctuate with evenly spaced larger foveae.

The **peruana** complex

Members of this complex are of medium size and are piceous in color in Costa Rica. Elsewhere some are slightly metallic or for the most part black.

Diagnostic combination of the peruana species-group includes the following: Males with two bilateral patches of long vestiture on at least abdominal sterna IV. Elytral apex spinose medially and laterally, with slight lobe between. Sternum VI apico-laterally acute, apical margin medially arcuate with small v-shaped emargination at center. Aedeagus left pleuropic, parameres multisetose.

The **ligulata** subgroup

Diagnostic combination of the ligulata subgroup includes the following: Elytral interneurs striatio-punctate with regular unisetose foveae in interneurs 2, 4, 6, and 8. Males with dense, short vestiture on metasternum, long dense vestiture on abdominal sterna III-V. Middle tibia of male moderately to markedly clavate apico-medially.

The **notcatie** subgroup

Diagnostic combination of the notcatie subgroup includes the following: Male with sparse and scattered setae on metasternum and sparse patches of setae on abdominal sterna II, III, and VI, only V and IV with small bilateral tufts. Middle tibia without dense apico-medial brush, posterior tibia with apical excavation and dense brush.

The **pia** species-group

At present, this group is know only from the Costa Rican species which is moderately small and with black forebody and metallic purple elytra.

Diagnostic combination of the pia species-group includes the following: Head with vertex dimpled dorsally. Elytra metallic purple with slightly prominent sutural and lateral dentiform projections. Male venter without accessory patches of setae. Aedeagus with ostium elongate.

The **pitilla** species-group

Members of this group are of medium size and are highly colorful in Costa Rica with rufous forebody, bicolored legs, and two-toned elytra, the base black (see the ?mimetic fulvicauda group above).

Diagnostic combination of the pitilla species-group includes the following: Head short behind eyes, quadrate in both sexes. Elytral apex moderately projected acutely. Male metasternum and posterior coxae with fine short pubescence, abdominal sterna II-VI with same, but not so densely arranged. Abdominal sternum VI projected acutely at posterio-lateral corners. Male tibiae without supplemental vestiture. Male parameres unisetose.

The **purpurea** species-group

Members of this group are of medium size and are moderately metallic in Costa Rica with rufous forebody, and in one species with two-toned elytra, the base black (see the ?*mimetic fulvicauda* group above).

Diagnostic combination of the purpurata species-group includes the following: Elytral apex tridentate. Male with dense plumose vestiture on base of each femur, metasternum, mid and posterior coxae, trochanter, abdominal sterna II-VI; sternum VI of both sexes deeply incised, male broadly, female narrowly.

The **rufiventris** species-group

Members of this group are of small size and are moderately metallic in Costa Rica with rufous forebody, and with venter rufoaeneous.

Diagnostic combination: Labrum flat, entire. Elytra with markedly and evenly punctulate interneurs; apex slightly lobed between lateral and sutural angles. Metasternum of male densely pubescent; abdominal sterna each with long scattered setae. Apex of sternum VI angulate laterally, corner obtuse. Male legs unmodified, similar to females. Aedeagus with apex a simple lobe, ostium elongate.

The **rufoaenea** species-group

Members of this group are of large size and are brown or black or bicolored in Costa Rica with black forebody and rufous elytra.

Diagnostic combination of the rufoaenea species-group includes the following: Labrum disc slightly convex along midline. Head behind eye smooth. Antenna of female with antennomeres 3-7 long and narrow, antennomere 8 very short, 9-11 short. Prosternum process rounded. Mesotrochanter toothed posteriorly. Metatrochanter normal in male. Middle tibial apex not produced, tibia densely setigerous medially (male), sparsely setigerous (female). Posterior tibia mesially smooth, densely setigerous (male), sparsely setigerous (female), apex not produced. Posterior basitarsus narrow. Posterior femur normal. Aedeagus without ostium bridge, sides not convergent; apex narrowly arrow-shaped. Female stylomere elongate, bispinose, sparsely setigerous.

The **soccata** species-group

Members of this group are of moderately small size and are rufopiceous, aeneous in Costa Rica.

Diagnostic combination of the soccota species-group includes the following: Elytra with interneurs of large, poorly organized foveae; apex more or less truncate, with small lateral tooth, sutural tooth absent. Male abdominal sterna III and IV with small bilateral patches of long setae; posterior tibia excavated and densely setigerous apico-medially.

The **virgata** species-group

Members of this group are of medium size and are among the most highly colorful *Agra* known. All species have rufous forebody and patterned elytra, pale with longitudinal stripes.

Diagnostic combination of the virgata species-group, subgroup includes the following: Prothorax densely punctate and microsetigerous, setae short and sparse. Occiput of head smooth with some short setae. Elytron with stripped color pattern and with bi or triserially punctate interneurs. Stylomere 2 stout, apically swollen, unarmed apically, with some short scattered setae overall.

The **zumbado** species-group

Members of this group are of small size and in Costa Rica have ferruginous venter and appendages and bright brassy elytra.

Diagnostic combination: Labrum flat, entire. Elytra with markedly and evenly punctulate interneurs; apex moderately lobed between lateral and sutural angles. Metasternum and abdominal sterna II-V of male densely pubescent, sternum VI with long scattered setae. Apex of sternum VI angulate laterally, corner slightly obtuse. Male legs unmodified, similar to females. Aedeagus with apex a broad axe-shaped lobe, ostium elongate, parameres glabrous.

The **zuniga** species-group

Members of this group are of small size and in Costa Rica have ferruginous venter and metallic purple elytra.

Diagnostic combination of the zuniga species-group includes the following: with slightly prominent sutural and lateral dentiform projections. Male venter with extensive accessory patches of setae; ostium of medium length, left pleuropic; apex subscimitariform.

Accounts of taxa

The **arrowi** group

Diagnostic combination of the arrowi species-group include the following: Elytral interneurs of bi- or triserite rows of punctulae. Middle tibia of male with dense brush of setae on medial margin AND metasternum pubescent; sternum VI of female emarginate or with small median blunt tooth, stylomere 2 short and arcuate. Sterna III, IV, and V of male interuppted by median hyaline margin.

The composite range of this group extends from México to Paraguay and southern Brazil and across the Amazon Basin onto the Guyana Shield.

The arrowi group was previously defined (Erwin 1998). Three species are known from Costa Rica: the 2 new species below and *A. duplicata* Liebke.

Agra jimwappes Erwin, new species

(Figs. 1a, 1b, 1c)

Holotype. Female, COSTA RICA: Guanacaste, La Pacifica, 10º28'N 085º07'W, June (J.E. Wappes)(USNM: ADP85171).

Diagnosis. With character states of the arrowi group, and elytral apex clearly obliquely truncate with a small lateral tooth.

Description. Color and luster: Castaneous, head and knees piceous; head and prontoum very shiny, elytra somewhat matte in appearance. Form: Male unknown. Head (Fig. 1a) behind eyes somewhat rounded in female. Elytron (Fig. 1b) with apex moderately produced medially, lateral tooth small, sutural angle obtuse, not projected acutely; interneurs of biserite rows of punctulae. Sternum VI (Fig. 1c) of female shallowly v-shaped. Size: medium, 15.1mm in length, 3.8mm in width.

Other specimens examined. None, the Holotype is only specimen known at present.

Specific epithet. The specific epithet, *jimwappes*, is a noun in apposition based on the name of James E. Wappes, the collector of the Holotype, and many other excellent records of this genus.

Notes. Adults of this species are similar to adults of *Agra winnie*, however, the truncated elytral apex of *Agra jimwappes* is clearly unique.

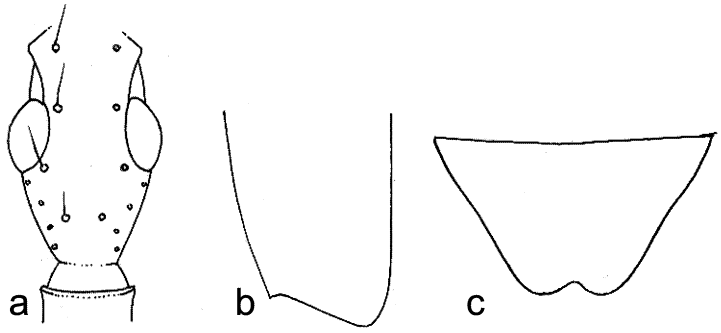

FIGURE 1. *A. jimwappesi*, female, dorsal aspect: a) head; b) apex of elytron; c) Sternum VI, female, ventral aspect. Measures (mm): HL = 2.6; WE = 1.9; SW = 3.6.

***Agra winnie* Erwin, new species**
(Figs. 2a, 2b, 2c, 2d)

Holotype. Male, COSTA RICA: Guanacaste, Guanacaste National Park, Estacíon Santa Rosa, 300m, LN 313000, 359800, (D.H. Janzen & W. Hallwachs)(INBio: CRI000-590299).

Diagnosis. Apex of elytron clearly prolonged (Fig. 2b) and legs piceous with black knees.

Description. Color and luster: Piceo-castaneous, head and knees piceous; head, prontoum, and elytra very shiny. Form: Head (Fig. 2a) behind eyes somewhat tapered in both sexes. Elytron (Fig. 2b) with apex moderately produced medially, lateral tooth small, sutural angle acute, not projected acutely; interneurs of biserite rows of punctulae. Middle tibia of male with dense brush of setae on medial margin AND metasternum pubescent, vestiture short; sternum VI (Fig. 2c) of male and female emarginate. Aedeagus (Fig. 2d) with ostium elongate; apex planariform. Stylomere 2 as in *Agra duplicata* (see INBio web site). Size: medium, 13.9 to 14.8mm in length, 3.8 to 4.0mm in width.

Other specimens examined. Costa Rica: 1 female paratype Specimens examined: Guanacaste, 1f, P.N. Santa Rosa, Estacíon Santa Rosa, 300m, 85°37'W 10°50'N, LN 313000,359800, June, (D.H. Janzen & W. Hallwachs)(INBIO: CRI000-590299), 1f, Estacíon Murcielago, Cuajiniquil, 8.0 km SE, 100m, 85°42'W 10°04'N, LN 320300,347200, July, (III curso Parataxonomos)(INBIO: CRI000-927870). In addition, 2 paratypes, 1 male, 1 female, from San Salvador, El Salvador.

Specific epithet. The specific epithet, *winnie*, is a noun in apposition based on the given name of Winnie Hallwachs, co-collector of the Holotype.

Notes. Members of this species are similar to the preceding, however, *Agra winnie* is the only species in Costa Rica whose adults have **all** of the following attributes: elytron with convex intervals, apex clearly prolonged, legs piceous with black knees, and head somewhat tapered behind eyes.

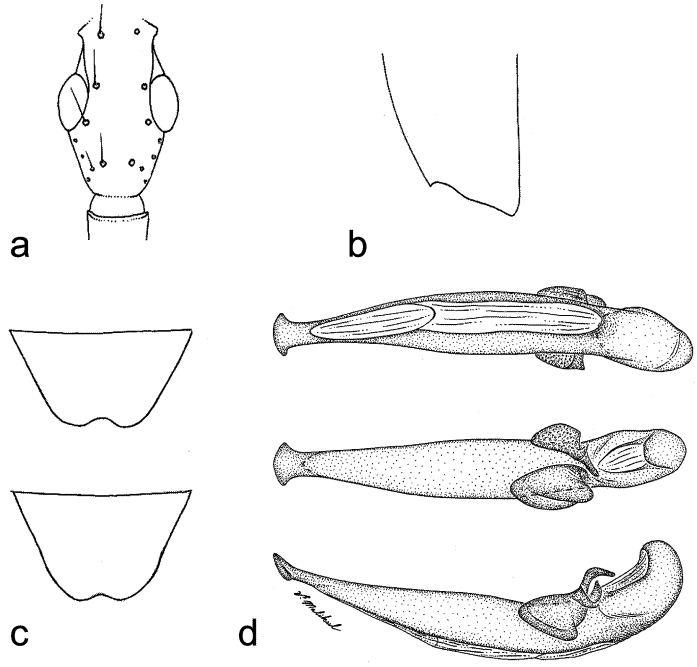

FIGURE 2. *A. winnie*, dorsal aspect, male: a) head; b) apex of elytron; c) Sternum VI, male (top), female (bottom), ventral aspect; d) aedeagus, dorsal (top), ventral (middle), left lateral (bottom) aspects. Measures (mm): HL = 2.8; WE = 1.9; male SW = 3.5, female SW = 3.6; AL = 2.1.

The **buqueti** species-group

Diagnostic combination of the buqueti species-group includes the following: Male with densely pubescent metasternum, sparsely setiferous patches on abdominal sterna IV-VI, slightly clavate middle tibia with dense vestiture around it, dense vestiture medio-apically on posterior tibia. Prothorax markedly narrowed anteriorly and evenly setiferous.

This group's distribution ranges from Guatemala to southern Brazil, and across the Amazon Basin onto the Guyana Shield into Surinam. However, only the one new species described below is known to occur in Central America.

***Agra giesberti* Erwin, new species**
(Figs. 3a, 3b, 3c, 3d, 3e, 3f)

Holotype. Female. COSTA RICA: Cartago, 15km NE Turrialba, 9º53'N 83°38'W, April (E. Giesbert) (CAS: ADP62298).

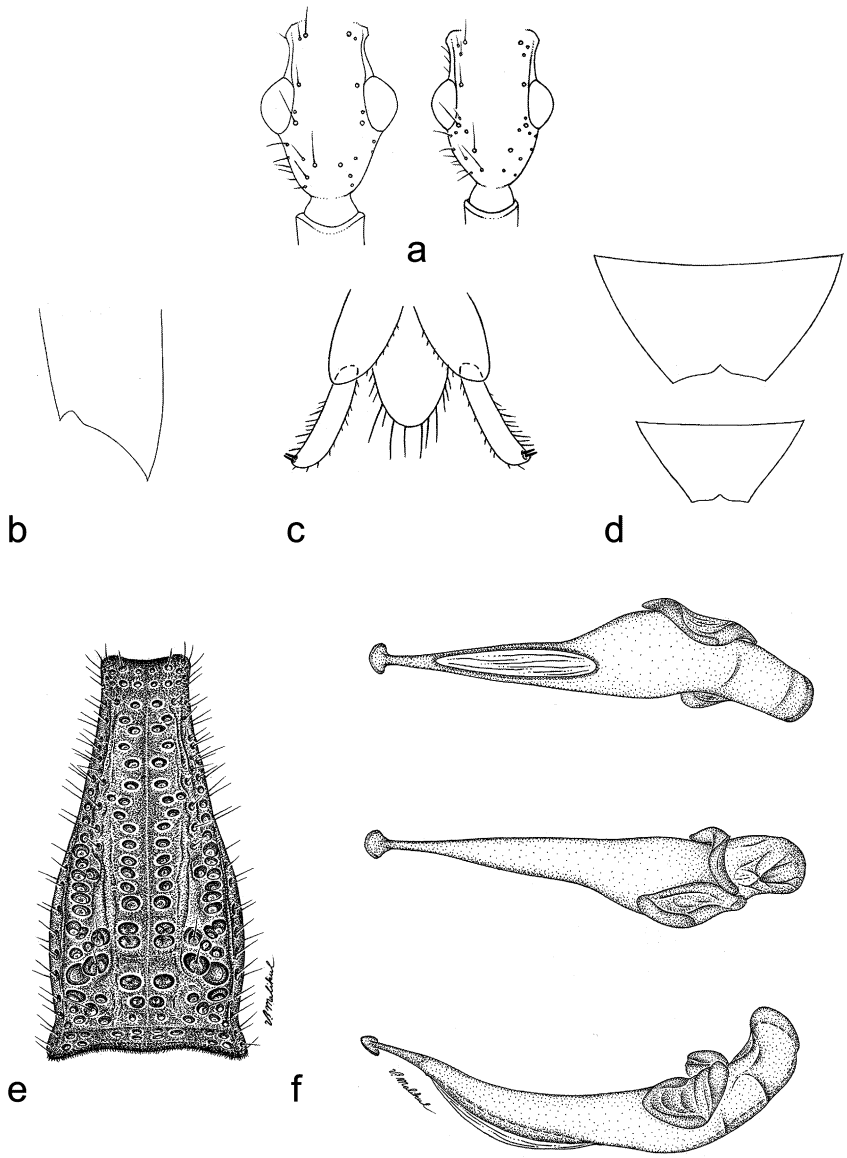

FIGURE 3. *A. giesberti*, dorsal aspect: head, a) male, female; b) apex of elytron; c) female, ventral aspect, stylomere 2; e) male; pronotum; d) Sternum VI, male (top), female (bottom), ventral aspect; f) aedeagus, dorsal (top), ventral (middle), left lateral (bottom) aspects. Measures (mm): HL = 3.0; PL = 4.3; WE = 2.9; male SW = 5.6, female SW = 4.0; AL = 3.3; S2L = 0.7.

Diagnosis. This is the only species of the buqueti species-group known from Costa Rica. Its alternating interneurs with large and small fovea provide an easy recognition attribute, as does the elongate, multisetiferous and anteriorly tubiform prothorax (Fig. 3e).

Description. Color and luster: Piceous. Head rufinistic, appendages rufotestaceous, and femora infuscated in some adults. Surface very shiny. Head (Fig. 3a) behind eyes moderately short, markedly tapered in male, more rounded in female. Prothorax (Fig. 3e) at anterior third somewhat depressed. Elytron (Fig. 3b) with apex shallowly obliquely arcuate, sutural angle produced. Sternum VI (Fig. 3d) shallowly v-notched in both sexes. Aedeagus (Fig. 3f) markedly narrowed apically, ostium of medium length, apex subscimitariform. Stylomere 2 (Fig. 3c). Size: large, 17.8 to 21.5mm in length, 4.0 to 5.8mm in width.

Other specimens examined. Costa Rica: 2 paratypes, 1 male, 1 female, from the following Conservation Areas: Guanacaste, Tortuguero. Costa Rica, Cartago, 1f, Turrialba, 15.0 km NE, 83°38'W, 9°53'N, April, (E. Giesbert)(CAS: ADP62298); 1f, Limón, Cariari, nr, Hacienda La Suerte, May, (F.T. Hovore)(FTHC: ADP70512). I have seen additional specimens (paratypes) from Guatemala and Panamá.

Specific epithet. The specific epithet, *giesberti*, is the Latinized genitive form of the family name of the late Edward Giesbert, amateur Coleopterist extraordinaire, who took time from his beloved cerambycids to collect an *Agra* or two.

Notes. This species ranges from sea level (Panamá) to 2000m (Guatemala).

The **cajennensis** complex

Diagnostic combination: Antennomere 8 coequal in length with 7 in males, 1/2 the length in females; prosternal process bifid in males, planular in females; middles tibia more or less rounded in x-section; middle and hind tibiae in male slightly to markedly arcuate and flattened antero-mesially, rounded in female; arcuate-flattened portion of tibiae markedly setose (brushy) or totally devoid of vestiture; elytral interneurs not well organized, of large foveae or of medium-sized foveae interspersed with punctulae; female stylomere 2 moderately long, somewhat flattened dorso-ventrally.

This complex (Erwin 1998) is a very diverse and speciose assemblage whose range extends across that of the entire genus, from Texas to Argentina.

The following five subgroups are represented in Costa Rica. Additional information is provided by Erwin (1996, 1998).

The **cajennensis** complex **castaneipes** subgroup

Diagnostic combination of the cajennensis species-group, castaneipes subgroup includes the following: Male with sparse bilateral vestiture on abdominal sterna III and V, only IV

with bilateral tufts. Elytral apex not spinose laterally nor suturally. Posterior tibia slightly excavate and with moderately dense vestiture medio-apically.

The subgroup distribution ranges from Guatemala to southern Brazil, and across the Amazon Basin onto the Guyana Shield in Surinam. Of this subgroup, only the following three new species and *A. castaneipes* Bates itself are known from Costa Rica.

***Agra not* Erwin, new species**
(Figs. 4a, 4b, 4c, 4d)

Holotype. 1m, Limón, R.B. Hitoy Cerere, Estacíon Hitoy Cerere, Sendero Bobocara, 300m, LN 184250,1641800, May-June, (F. Umana)(INBIO: ADP103257).

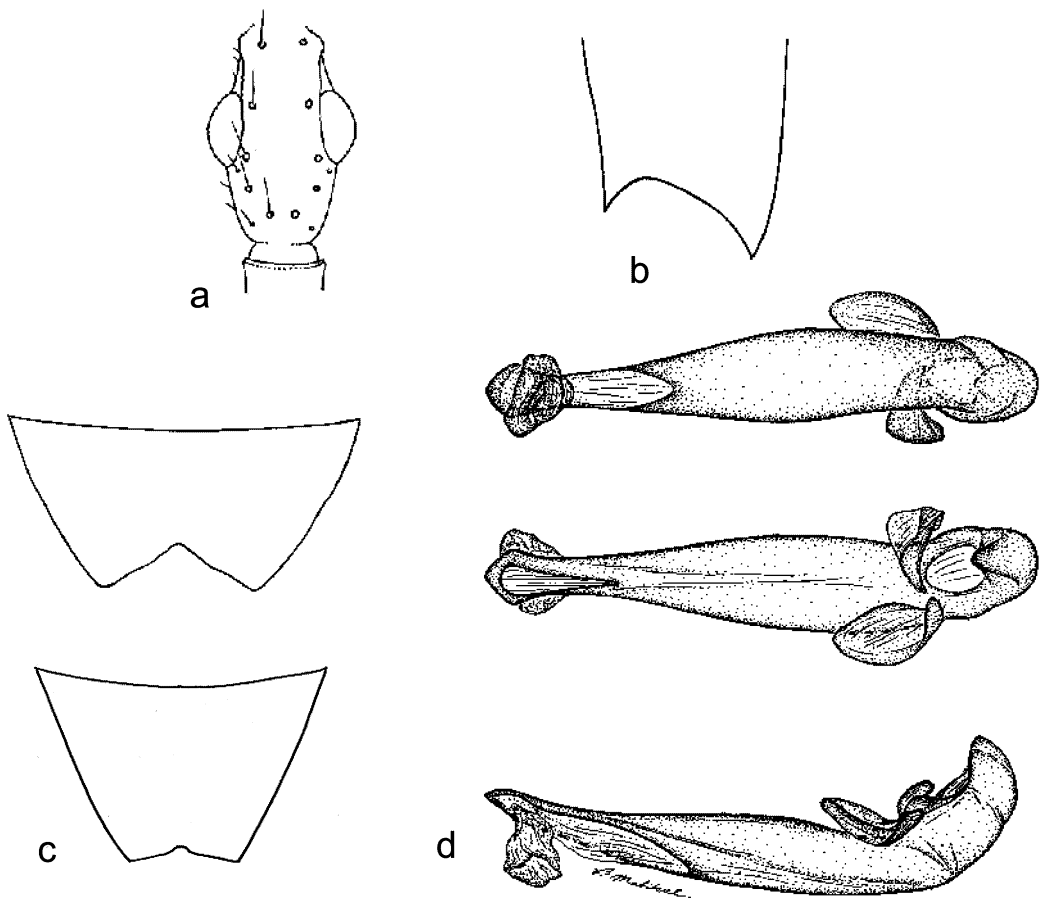

FIGURE 4. *A. not*, male, dorsal aspect: a) head; b) dorsal aspect, left elytron; c) Sternum VI, male (top), female (bottom), ventral aspect; d) aedeagus, dorsal (middle), ventral (left), left lateral (right) aspects. Measures (mm): HL = 2.3; WE = 1.9; male SW = 3.5, female SW = 3.6; AL = 3.0.

Diagnosis. This is the only species of the cajennensis species-group in Costa Rica with interneurs with large blue-tinted fovea and elytral apex (Fig. 7b) straight between sutural and lateral dentiform projections. Narrow with robust legs, quadrate head, and markedly convex pronotum.

Description. Color and luster: Piceous. Appendages bright ferruginous. Surface very shiny; elytral interneur foveae with blue-tinted metallic reflections. Medium-sized and narrow, females with slightly broader elytra. Head (Fig. 4a) behind eyes small and narrow, rounded in female, tapered in male, shorter than prothorax. Prothorax moderately short and medially swollen, gradually constricted with sides convergent to anterior collar. Elytra (Fig. 4b) narrow and moderately convex, apex slightly oblique, lateral tooth prominent, sutural angle acute. Abdominal sternum VI (Fig. 4c) deeply V-notched in male, shallowly U-notched in female. Aedeagus (Fig. 4d) with ostium moderately short, apex simple, cordiform. Size: medium, 12.9 to 14.6mm in length, 2.8 to 3.4mm in width.

Other specimens examined. Costa Rica: 5 paratypes, females, from the Pacifico Central Conservation Area: 1f, Cartago, 1.6 km N Turrialba, CATIE, 600m, LN 574947,208307, January, (V.M. Kirk)(UASM: ADP21815); 2f, Heredia, Estacíon La Selva, 10º27'N 83º59'W, April, (R.Vargas & D. Brenes)(INBio: CRI002-416950), November, (INBIO: CRI002-232193); 1f, Limón, R.B. Hitoy Cerere, Estacíon Hitoy Cerere, Send. Bobocara, 300M, LN 184250,1641800, May-June, (F. Umana)(INBIO: ADP103259); 1f, Puntarenas, 4.0 km N San Isidro de El General, 84°48'W, 10°18'N, July, (F.T. Hovore)(FTHC: ADP6429).

Specific epithet. The specific epithet, *not*, is an arbitrary combination of letters.

Notes. This species has been historically confused with *A. castaneipes* Bates because Bates' type series from the Volcán de Chiriqui contains two species. *A. castaneipes* adults are generally larger, and markedly darker in color without the blue-tinted interneural foveae.

Agra phallica Erwin, new species

(Figs. 5a, 5b, 5c, 5d)

Holotype. Male. COSTA RICA: Cartago, Tucurrique, 09º51'N 83º 43'W, (P. Schild & Burgdorf)(USNM: ADP10016).

Diagnosis. *Agra phallica* is the only species in Costa Rica whose adults have the following attributes: (See image) Femur concolorous; elytron with sutural apex prolonged, acutely pointed (see figure). Male middle and posterior tibiae excavate, markedly arcuate, and densely setose in apical half; elytral apex shallowly arcuate between lateral and sutural apices; metasternum not pubescent; abdominal sterna 2-5 with 2 bilateral patches.

Description. Color and luster: Piceous with bright rufous appendages, head rufinistic, femur concolorous; surface very shiny. Form: Head (Fig. 5a) behind eye moderately short,

tapered in male, rounded in female. Male middle and posterior tibiae excavate, markedly arcuate, and densely setose in apical half. Elytron (Fig. 5b) with apex shallowly arcuate between lateral and sutural apices, lateral tooth small, sutural tooth acute, broad and moderately prolonged. Metasternum not pubescent. Abdominal sterna IV and V with 2 bilateral patches of dense long setae. Abdominal sternum VI (Fig. 5c) deeply round-notched in male, V-notched in female. Aedeagus (Fig. 5d) with markedly short ostium, apex a simple lobe, phallus ventrally with a longitudinal depression. Size: medium, 15.0 to 17.0mm in length, 3.40 to 4.20mm in width.

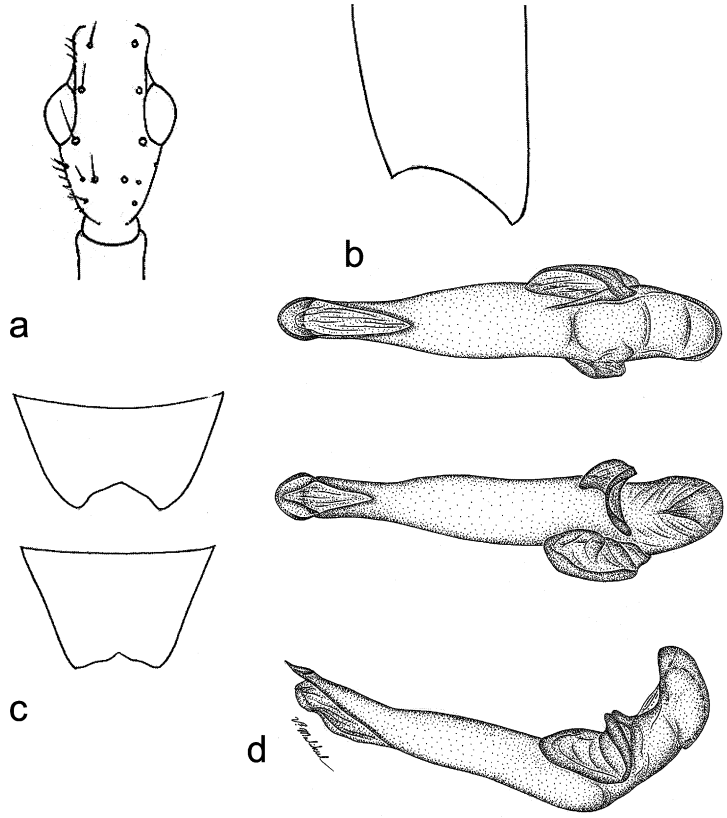

FIGURE 5. *A. phallica*, dorsal aspect, male: a) head; b) apex of elytron; c) Sternum VI, male (top), female (bottom), ventral aspect; d) aedeagus, dorsal (top), ventral (middle), left lateral (bottom) aspects. Measures (mm): HL = 2.9; WE = 1.7; male SW = 3.2, female SW = 4.0; AL = 3.0.

Other specimens examined. Costa Rica: 7 paratypes, 2 male, 7 females, from the following Conservation Area: Cordillera Volcánica Central. Costa Rica, Cartago, 1f, Monumento Nacional Guayabo, Turrialba, 1100m, LN 217200,570300, June, (G. Fonseca)(INBIO: CRI001-883189), 1f, Turrialba, 3.0 km SE, CATIE area, 1100m,

83°38'W, 9°53'N, February, (H.F. Howden & A. Howden)(USNM: ADP54792), 1f, June, (J.E. Wappes)(USNM: ADP58562), 1f, April, (E. Giesbert)(CAS: ADP62296), 1m, April, (E. Giesbert)(FSCA: ADP103111), 1f, (M. de Mathan)(MNHP: ADP4859), 1f, Tucurrique, 83°43'W, 9°51'N, (P. Schild & Burgdorf)(USNM: ADP10015), 1m, (WAR: ADP103113).

Specific epithet. The specific epithet, *phallica*, referring to the unique aedeagus, is a manuscript name from Liebke's collection in WAR. I am retaining this name, but I have chosen a different Holotype specimen than he labeled with his manuscript name, one that is in better condition.

Notes. This species is presently known from only higher altitudes, in Costa Rican wet forest.

Agra turrialba Erwin, new species

(Figs. 6a, 6b, 6c, 6d)

Holotype. Male, COSTA RICA: Cartago, Turrialba, 600m, 09º53'N 83º 38'W, June (J. E. Wappes)(USNM: ADP58598).

Diagnosis. This is the only species of the cajennensis species-group in Costa Rica in which males have abdominal sternum IV elongate and medially lobed so that it covers partially sternum V; males also with hind femur deeply excavate and anterio-medially glabrous.

Description. Color and luster: Piceous with bright rufous appendages, head rufinistic, femur slightly infuscated. Surface very shiny. Form: Medium-sized and narrow, females with slightly broader elytra. Head (Fig. 6a) behind eyes small and narrow, rounded in both sexes, shorter than prothorax. Prothorax moderately short and medially swollen, gradually constricted with sides convergent to anterior collar. Elytron (Fig. 6b) narrow and moderately convex; apex markedly oblique, lateral tooth prominent, sutural tooth elongate, markedly acute; interneurs each a series of linear foveae. Abdominal sternum VI (Fig. 6c) deeply round-notched in male, V-notched in female. Aedeagus (Fig. 6d) with markedly short ostium, apex simple lobe; phallus ventrally with a longitudinal depression. Size: medium, 14.6 to 17.0mm in length, 3.4 to 3.8mm in width.

Other specimens examined. Costa Rica: 19 paratypes, 8 male, 7 females, from the following Conservation Areas: Cordillera Volcánica Central, Guanacaste, Huetar Norte, Tortuguero. Costa Rica, Cartago, 1f, A.C. Amistad, Monumento Nacional Guayabo, Turrialba, 1100m, LN 217200,570300 #3202, September, (G. Fonseca) (INBIO: CRI002-039094), 1f, June, (G. Ekis)(USNM: ADP47280), 1f, February, (H.F. Howden & A. Howden)(UASM: ADP54795), 1f, Turrialba, 3.0 km SE, CATIE, 83°38'W 9°53'N, December, (F.T. Hovore)(FTHC: ADP6381), 1m, August, (D.W. Alsop)(CUNY: ADP58621), 1m, June, (J.E. Wappes)(USNM: ADP58598), 1m, June, (E. Giesbert)

(FSCA: ADP103115), 1m, Tuis, 732m, 83°48'W 9°50'N, (C.H. Lankester)(USNM: ADP10014), 1f, Tucurrique, 83°43'W 9°51'N, (P. Schild & Burgdorf)(USNM: ADP10013); Guanacaste, 1m, P.N. Guanacaste, Estacíon Pitilla, Santa Cecilia, 9.0 km S, 700m, 85°25'40'W 10°59'26"N, LN 330200,380200, November, (C. Moraga & P. Rios)(INBIO: CRI000-112744), 1m, vcn. Dos Rios, January, (E. Giesbert)(LACM: ADP58594); Heredia, 1m, Estacíon La Selva, Puerto Viejo, 3.0 km S, 50-150m, 83°59'W 10°27'N, April, (INBIO-OET: CRI002-268518), M/10/388, Bosque primario, 1m, November, (INBIO-OET: CRI002-232086), FVK/32/09, *Virola koschnyi*, 1f, January, (INBIO-OET: CRI002-724110), at light, L/00/666, 1f, Puerto Viejo, 3.0 km S, Finca La Selva, 84°01'W 10°26'N, June, (H.A. Hespenheide)(HAH: ADP76792), 1m, April, (H.A. Hespenheide)(HAH: ADP5095); Limón, 1f, R.B. Hitoy Cerere, Estacíon Hitoy Cerere, Send. Espavel, 200M, LN 400750,570200, June, (W. Arana)(INBIO: INB0003167631).

Specific epithet. The specific epithet, *turrialba*, is used as a noun in apposition based on the town Turrialba in Cartago Province, in reference to the type locality.

Notes. This species is widespread in Costa Rica from sea level to 1100 meters altitude, in both dry and wet forest.

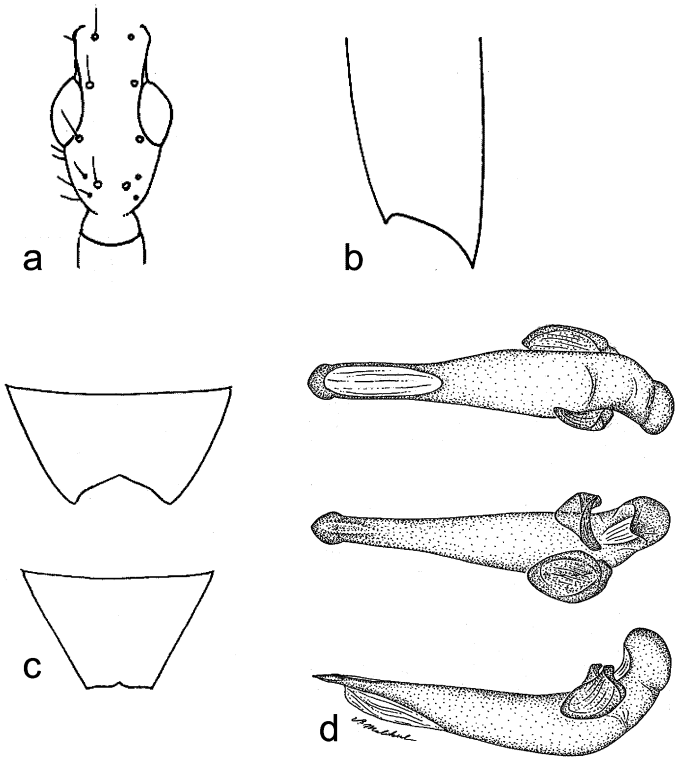

FIGURE 6. *A. turrialba*, dorsal aspect, male: a) head; b) apex of elytron; c) Sternum VI, male (top), female (bottom), ventral aspect; d) aedeagus, dorsal (top), ventral (middle), left lateral (bottom) aspects. Measures (mm): HL = 2.7; WE = 1.7; male SW = 3.2, female SW = 3.2; AL = 3.0.

The **cajennensis** complex, **macracantha** subgroup

Diagnostic combination of the macracantha subgroup includes the following: Elytral apex straight between lateral and sutural apices, shallowly to markedly oblique; apex not spinose laterally, nor suturally. Elytral interneurs each a series of large shiny (brassy in *A. fugax*) foveae. Prosternal process bifid. Metasternum densely pubescent. Middle and posterior tibia markedly excavate anterio-mesially, middle tibia not, or micromucrate. Abdominal sterna 2-5 with bilateral pubescent patches; male with sparse bilateral vestiture on abdominal sterna III and V, only IV with bilateral tufts. Posterior tibia slightly excavate and with moderately dense vestiture medio-apically. Aedeagus without apico-dorsal depression.

The known range of this subgroup is Guatemala to southern Brazil, and across the Amazon Basin onto the Guyana Shield into Surinam.

Four species of the macracantha subgroup are known from Costa Rica: the three species below and *Agra macracantha* Bates.

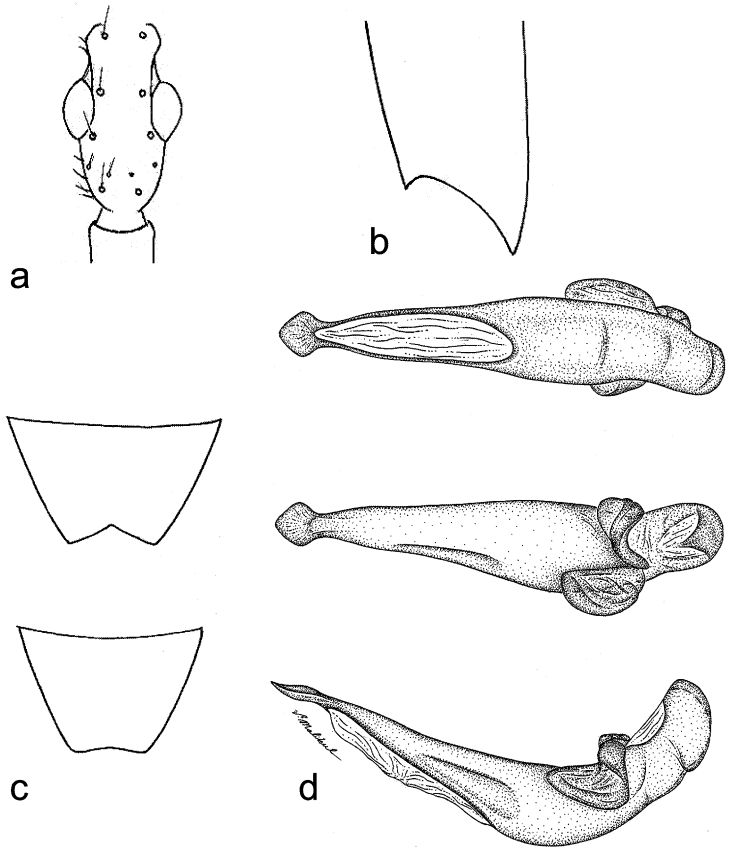

FIGURE 7. *A. catie*, dorsal aspect, male: a) head; b) apex of elytron; c) Sternum VI, male (top), female (bottom), ventral aspect; d) aedeagus, dorsal (top), ventral (middle), left lateral (bottom) aspects. Measures (mm): HL = 3.0; WE = 1.8; male SW = 3.4, female SW = 4.2.

***Agra catie* Erwin, new species**
(Figs. 7a, 7b, 7c, 7d)

Holotype. Male, **COSTA RICA:** Limón, Tortuguero National Park, Estacíon Cuatro Esquinas, sea level, 10°34'N 83°32'W, September (R. Delgado)(INBio: CRI000-840274).

Diagnosis. Femur concolorous. Prothorax narrow, not wider than head across eyes. Elytron with sutural apex markedly prolonged, acutely pointed. Male middle and posterior tibiae excavate and densely setose in apical half; elytral apex shallowly arcuate between lateral and apical apices; metasternum pubescent; abdominal sterna 2-5 with 2 bilateral patches.

Description. Color and luster: Prothorax and elytra dark piceous; head and appendages dark rufous. Surface very shiny. Form: Head (Fig. 7a) behind eye moderately elongate, markedly tapered in male, less so in female. Male middle and posterior tibiae excavate and densely setose in apical half. Elytron (Fig. 7b) with apex shallowly arcuate between lateral and apical apices. Metasternum pubescent. Abdominal sterna 2-5 with 2 bilateral patches. Abdominal sternum VI (Fig. 7c) deeply V-notched in male, emarginate in female. Aedeagus (Fig. 7d) with ostium of medium length, apex simple cordiform, left lateral face of phallus with distinct impression; parameres glabrous. Size: medium, 15 to 19.6mm in length, 3.6 to 4.4mm in width.

Other specimens examined. Costa Rica: 18 Paratypes: 5 males, 13 females from the following Conservation Areas: Cordillera Volcánica Central, Guanacaste, Osa, Pacifico Central, Tortuguero. Costa Rica, Cartago, 1f, Turrialba, 3.0 km SE, CATIE, 83° 38' W, 09° 53' N, June (E. Giesbert)(HAH: ADP4424), 1f, IICA/CATIE, April (E. Giesbert)(FSCA: ADP4421); 1m, Guanacaste, P.N. Guanacaste, Estacíon Pitilla, Santa Cecilia, 9.0 km S, 700m, 85° 25' 40' W, 10° 59' 26 N, LN 330200,380200, March (GNP Biodiversity Survey)(INBIO: CRI000-034152), 1f, 85° 25' 40' W, 10° 59' 26 N, December (C. Moraga & P. Rios)(INBIO: CRI000-166086); 1f, Heredia, Puerto Viejo, 3.0 km S, Finca La Selva, 84° 01' W, 10° 26' N, April (H.A. Hespenheide)(HAH: ADP5096), 2f, March (H.A. Hespenheide)(HAH: ADP62307, ADP80772); 1m, Limón, Finca de E. Rojas, Sector Cerro Cocori, 150m, May (E. Rojas)(INBIO: CRI000-468171), 1f, September (E. Rojas)(INBIO: CRI000-951292), 1f, Rio Reventazon, Ebene, Hamburg Farm, 10, 83° 28' W, 10° 15' N, March (F. Nevermann)(WAR: ADP3873, 1m, A.C. Tortuguero, Sardinas, Barra del Colorado, 15m, 83° 33' W, 10° 40' N, LN 291900,565900 #4639, April - May (F.V. Araya)(INBIO: CRI002-169837), 1f, 50m, LN 291900,565900 #2916, May (F.V. Araya)(INBIO: CRI001-917493), 1m, 15m, January - February (F.V. Araya)(INBIO: CRI002-163901), 1m, P.N. Tortuguero, Tortuguero, Cerro Tortuguero, 0-100m, 83° 32' W, 10° 34' N, LN 285000,588000, November (J. Solano (INBIO: CRI000-141193), 1f, A.C. Tortuguero, R.N.F.S. Barra del Colorado, Rio Sardinas, 10m, July (F.V. Araya)(INBIO: CRI000-690645), 1f, 0m, July (R.U. Chavarría)(INBIO: CRI000-244568); 1f, Puntarenas, Peninsula de Osa, Rancho Quemado, 200m, LS 292500, 511000, November (M. Seg-

ura)(INBIO: CRI000-962800), 1f, Res. Biol. Carara, Estacíon Quebrada Bonita, 50m, LN 194500,469850, August (R. Zuñiga)(INBIO: CRI000-181297).

Specific epithet. The specific epithet, *catie,* is used as a noun in apposition. It is the acronym of the forestry school at Turrialba, Centro Agronómico Tropical de Investigación y Enseñanza.

Notes. This species ranges from sea level to 1100m altitude.

Agra fugax Erwin, new species

(Figs. 8a, 8b, 8c, 8d)

Holotype. Male. COSTA RICA: Puntarenas, Carara Biological Reserve, Estacíon Quebrada Bonita, 50m, 09°46'35"N 84°36'11"W, June (R. Zuñiga)(INBio: CRI000-349227).

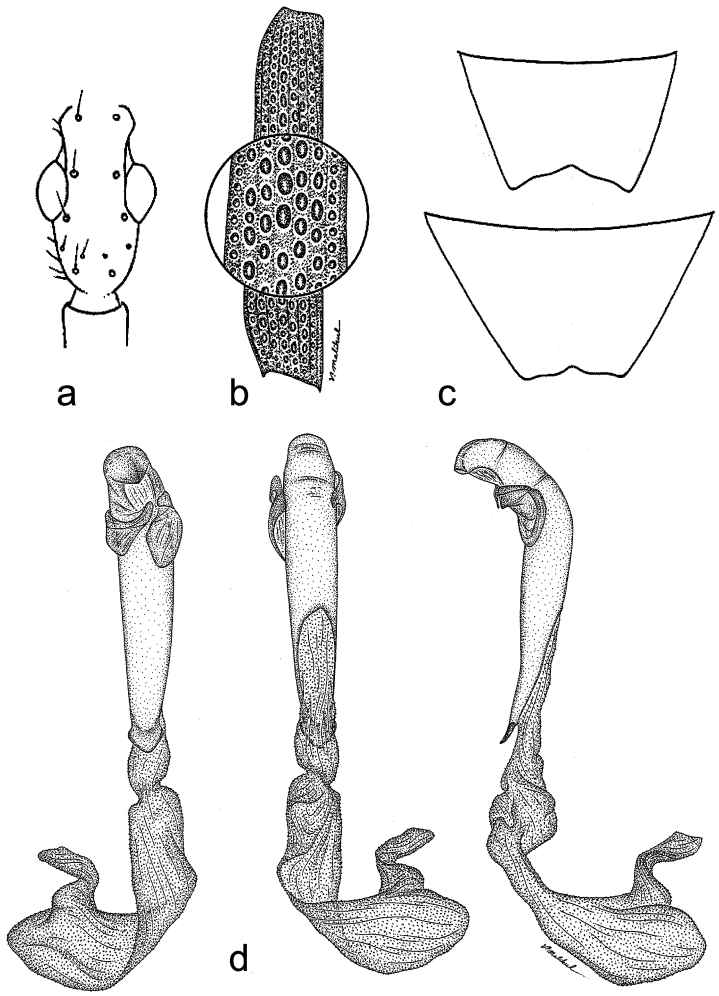

FIGURE 8. *A. fugax,* female, dorsal aspect: a) head; b) apex of elytron; c) Sternum VI, female, ventral aspect; d) aedeagus, dorsal (middle), ventral (left), left lateral (right) aspects.. Measures (mm): HL = 2.4; PL = 3.0; WE = 1.6; male SW = 3.0, female SW = 3.6; AL = 2.4.

Diagnosis. Femur concolorous; elytron with sutural and lateral apices modestly dentate, margin between them slightly arcuate. Head markedly convex and nearly quadrate basally. Elytral interneurs each a series of large shiny (brassy) foveae.

Description. Color and luster: Piceous with testaceous appendages, femur concolorous; elytral interneurs each a series of large shiny (brassy) foveae. Form: Head (Fig. 8a) behind eyes markedly convex and nearly quadrate posteriorly. Elytron (Fig. 8b) with apex moderately oblique, lateral and sutural dentiform projections moderately large, acute; interneurs each a series of large shiny (brassy) foveae. Abdominal sternum VI (Fig. 8c) shallowly U-notched in female. Aedeagus (Fig. 8d) with ostium moderately short, apex simple, cordiform. Size: medium, 13.6 to 13.8 mm in length, 3.2 to 3.8 mm in width.

Other specimens examined. Costa Rica: 1 paratype, female, from the Cordillera Volcánica Central Conservation Area: 1f, Cartago, Turrialba, 83°38'W 9°53'N, (WAR: ADP4214).

Specific epithet. The specific epithet, *fugax*, meaning swift, is a manuscript name from Max Liebke's collection in WAR that I am retaining, however, I have chosen a different Holotype specimen than he labeled with his manuscript name, a male that is in better condition.

***Agra sirena* Erwin, new species**
(Figs. 9a, 9b, 9c, 9d)

Holotype. Male. **COSTA RICA:** Heredia, Estacíon La Selva, 10º27'N 83º59'W, August, (R. Vargas & D. Brenes)(INBio: CRI002-416609), at black light, L/09/442.

Diagnosis. Femur not infuscated in basal two-thirds; elytron with sutural apex prolonged, broad. Male middle and posterior tibiae excavate and densely setose in apical half; elytral apex shallowly arcuate between lateral and apical apices, sutural apex acute, not prolonged; metasternum pubescent; abdominal sterna 2-5 with 2 bilateral patches.

Description. Color and luster: Piceous. Appendages rufous. Surface shiny. Form: Head (Fig. 9a) behind eyes moderately elongate, tapered and rounded behind in female, tapered in male. Male middle and posterior tibiae excavate and densely setose in apical half. Elytron (Fig. 9b) with apex shallowly arcuate between lateral and sutural apices, sutural angle not elongate. Metasternum and posterior trochanter pubescent. Abdominal sterna 2-5 each with 2 bilateral patches. Abdominal sternum VI (Fig. 9c) moderately V-notched in male and in female. Aedeagus (Fig. 9d) with ostium moderately long, apex simple diamond shape. Size: moderately large, 17.1 to 20.2mm in length, 4.8 to 5.0mm in width.

Other specimens examined. Costa Rica: 2 paratypes, females, from the following Conservation Area: Osa, Cordillera Central. I have seen 1 male from Veracruz, México, and labeled it as a paratype. Costa Rica, Cartago, 1f, Turrialba, 83°38'W, 9°53'N, January,

(C. Barfield)(HRBURKE: ADP54403); Heredia; Puntarenas, 1f, P.N. Corcovado, Estacíon Sirena, 1 -100m, LS 270500,508300 #2853, April, (G. Fonseca)(INBIO: CRI001-798662).

Specific epithet. The specific epithet, *sirena*, is used as a noun in apposition based on the Estacíon Sirena in Corcovado National Park in reference to one of the places in which members of this species are found.

Notes. The large size and non-infuscated femora make this species readily recognizable in Costa Rica.

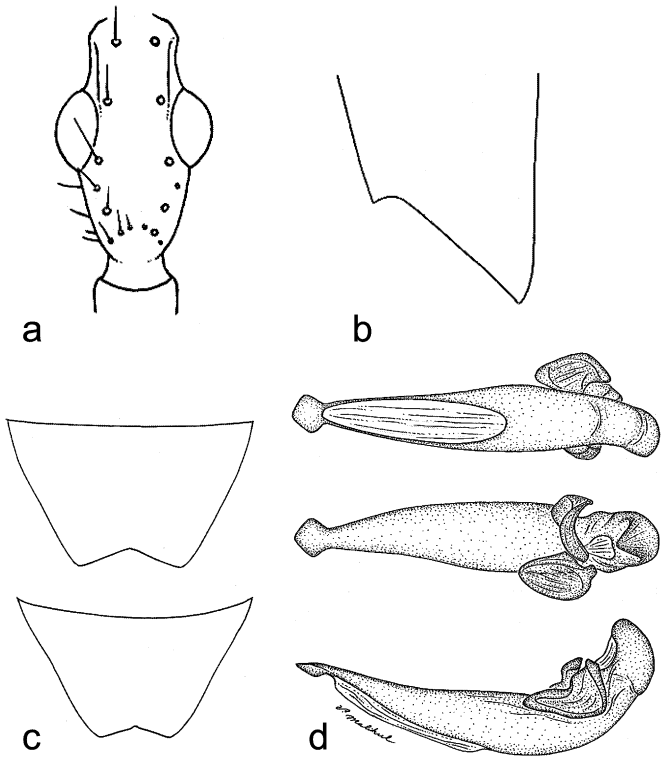

FIGURE 9. *A. sirena*, male, dorsal aspect: a) head; b) dorsal aspect, left elytron; c) Sternum VI, male (top), female (bottom), ventral aspect; d) aedeagus, dorsal (top), ventral (middle), left lateral (bottom) aspects. Measures (mm): HL = 3.9; WE = 2.4; male SW = 4.6, female SW = 4.6; AL = 5.0.

The **cajennensis** complex, **quesada** subgroup

Diagnostic combination of the quesada subgroup includes the following: Elytron with sutural apex prolonged and acutely pointed, lateral apices modestly dentate, margin between them slightly arcuate. Aedeagus with ostium of medium length, apex simple lobate, shaft of aedeagus with distinct swelling in basal half, markedly narrowed apically; parameres glabrous. Stylomere 2 elongate, bisetose apically.

This subgroup, represented by the species below, is known only from Costa Rica at present.

***Agra quesada* Erwin, new species**
(Figs. 10a, 10b, 10c, 10d, 10e)

Holotype. Male, **COSTA RICA:** Guanacaste, P.N. Guanacaste, Estacíon Pitilla, 9.0 km S Santa Cecilia, 700m, 85°25'40”W 10°59'26"N, LN 330200,380200, December, (C. Moraga)(INBIO: CRI000-959644)

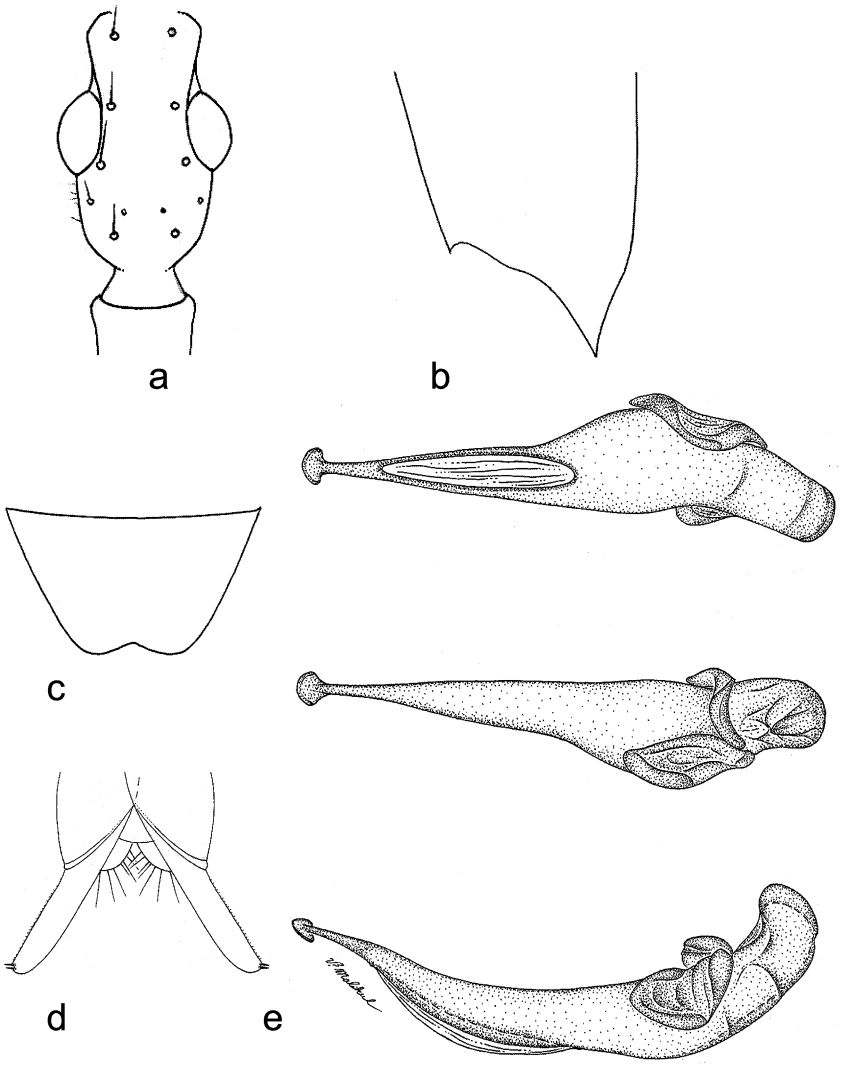

FIGURE 10. *A. quesada*, female, dorsal aspect; a) head; b) apex of elytron; c) Sternum VI, female, ventral aspect; d) stylomere 2; e) aedeagus, dorsal (top), ventral (middle), left lateral (bottom) aspects. Measures (mm): HL = 3.8; WE = 2.4; SW = 4.6; S2L = 0.9; AL = 5.0.

Diagnosis. Femur infuscated in basal two-thirds; elytron with sutural apex prolonged, acutely pointed (Fig. 10b).

Description. Color and luster: Piceous with rufous appendages, femur infuscated in basal two-thirds. Surface shiny. Form: Head (Fig. 10a) moderately elongate behind eyes, rounded behind in female. Elytron with apex (Fig. 10b) markedly oblique, lateral tooth small, sutural apex prolonged, acutely pointed; interneurs of large deep foveae in regular rows. Abdominal sternum VI (Fig. 10c) shallowly U-notched in female, shallowly v-notched in male. Stylomere 2 (Fig. 10d). Aedeagus (Fig. 10e) with ostium of medium length, apex simple lobate, shaft of aedeagus with distinct swelling in basal half, markedly narrowed apically; parameres glabrous. Size: very large, 22.3 to 23.5mm in length, 4.8 to 5.8mm in width.

Other specimens examined. Costa Rica: 4 paratypes, females, from the following Conservation Area: Guanacaste, La Amistad Caribe, Arenal Tilarán. Costa Rica, Alajuela, 1f, P.N. Volcán Tenorio, Upala, Bijagua, Albergue Heliconias, 700m, LN 422600,299100, May, (G. Rodriguez)(INBIO: INB0003074640); Guanacaste, 1f, P.N. Guanacaste, Estacíon Pitilla, Santa Cecilia, 9.0 km S, 700m, 85°25'40'W 10°59'26''N, LN 330200,380200, November, (GNP Biodiversity Survey)(INBIO: CRI001-024201), 1f, May - June, (P. Rios)(INBIO: CRI001-355554); Limón, 1f, Manzanillo, RNFS Gandoca y Manzanillo, 0-10m, 9º35'52"N 82º36'21"W, November, (F.A. Quesada)(INBio: CRI000-784200).

Specific epithet. The specific epithet, *quesada*, is used as a noun in apposition based on the family name of the collector of the Holotype specimen, parataxonomist, Freddy A. Quesada of San Ramón, Alajuela, Costa Rica.

Notes. Adults of this species are among the largest *Agra* in Costa Rica.

The **dimidiata** species-group

Diagnostic combination: Elytron with sutural and post-lateral dentiform projections spinose; interneurs of contiguous cribriform punctulae. Metathorax and abdominal sternum VI of male pubescent or densely setiferous. Middle femur of male densely setiferous along medial margin. Abdominal sternum III of male interrupted post-medially by extensive hyaline area. Aedeagus with apex broadly lobed apically. Sternum VI of female deeply incised, with a central tooth-like projection.

The distribution of this group ranges from México to Ecuador, east to Venezuela. Seven species are known from Costa Rica; the new species below and *Agra dimidiata* Chevrolat, *A. bci* Erwin, *A. eponine* Erwin, *A. hespenheide* Erwin, *A. inbio* Erwin, and *A. paratax* Erwin (for more details see Erwin 2000a).

***Agra janzeni* Erwin, new species**
(Figs. 11a, 11b, 11c)

Holotype. Female. COSTA RICA: Heredia, Estacíon La Selva, 10º27'N 083º59'W, October, (ALAS Project)(INBio-OET: CRI002-233128).

Diagnosis. All black body with large, coarse, cribriform elytral punctulae; antennae, tibiae and tarsi pale, femora infuscated. Elytron with apex spiniform at both sutural and lateral corners.

Description. Color and luster: Piceous with rufous appendages, femora infuscated; surface very shiny. Form: Male unknown. Head (Fig. 11a) moderately long behind eyes, quadrate with slight taper to neck. Pronotum robust, not much tapered to anterior collar. Elytron (Fig. 11b) short and broad, interneurs of large coarse cribriform punctulae, apex slightly oblique, lateral and sutural dentiform projections spiniform. Sternum VI (Fig. 11c) emarginate with small tooth at middle. Size: medium, 15.5mm in length, 5.2mm in width.

Other specimens examined. The female Holotype is the only specimen I saw.

Specific epithet. The specific epithet, *janzeni*, is the Latinized genitive form of the family name of Daniel H. Janzen, collector of many interesting *Agra* specimens from Costa Rica.

Notes. See Erwin (2000a), for further information on this species-group. The Holotype is from the Tortuguero Conservation Area.

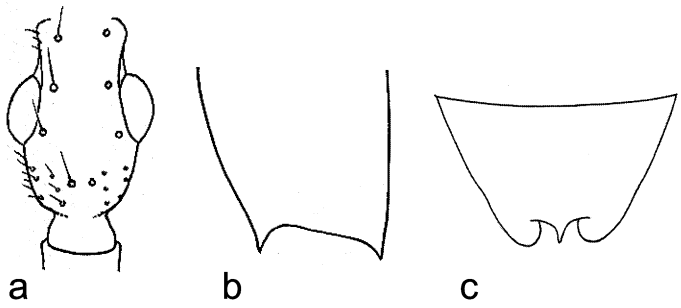

FIGURE 11. *A. janzeni*, female, dorsal aspect: a) head; b) apex of elytron; c) Sternum VI, female, ventral aspect. Measures (mm): HL = 3.0; WE = 2.0; SW = 3.8.

The **fada** species-group

Diagnostic combination of the fada species-group includes the following: Labrum flat, entire. Elytra with markedly and evenly punctulate interneurs; apex slightly lobed between lateral and sutural angles. Metasternum of male densely pubescent; abdominal sterna each with long scattered setae. Apex of abdominal sternum VI with obtuse hind angles. Male legs unmodified, similar to females. Aedeagus with apex a simple lobe, ostium elongate.

The composite range of this group extends from México to Bolivia and Bahia, Brazil.

Besides the two new ones below, one previously described species of the fada species-group occurs in Costa Rica: *A. lavernae* Erwin.

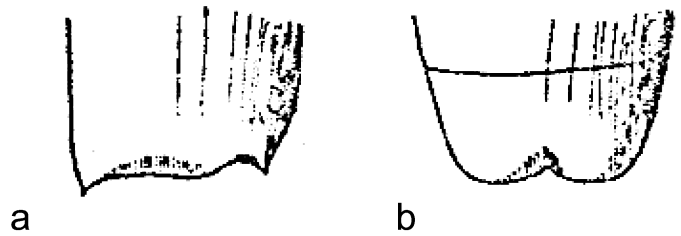

FIGURE 12. *A. aurifera* Liebke, female, dorsal aspect a) elytral apex; b) Sternum VI, ventral aspect, scanned from Liebke's (1940) original drawings. Measures not given by Liebke.

***Agra aurifera* Liebke**
(Figs. 12a, 12b)

Types (two females) not in WAR; they were likely lost in the allied bombing of Berlin in World War II. Because of the absence of type material and the lack of specimens matching Liebke's description, I am reproducing the latter which was kindly translated from the original (Liebke 1940: page 236) description in "Old German" to English, by Joachim Adis, Max Planck Institute, Germany. With the intensive collecting at Turrialba over the past several decades, it is curious that no new specimens matching this description have been discovered.

> From Liebke (1940:236).
> "Black, pronotum with light greenish brasslike luster, elytra purple, with light green brasslike luster. Antennae, legs and ventral side black as well. Head quite short, back of head with almost rectangular edges. Vertex pit as small depressed line. Pronotum moderately long, broad, narrowing gradually towards tip. Disk with several rows of medium-coarse dots, on both sides of the very finely depressed middle (center) line, near lateral margin as well; the punctuation occupies almost the total width, leaving on each side of the disk only a very small smooth and arch like elevated longitudinal stripe. Elytra elongate, behind middle part enlarged, at tip obliquely truncate. Suture and external angle spine like acute extended; middle (center) angle only weakly pronounced but clearly visible. Dot stripes very fine, slightly depressed, formed by very densely arranged fine dots (punctures). Intervals flat, third and fifth each with 3-5 very fine setal points. Trochanter of hind legs normally long, rounded at tip. - Male unknown.

Female: third antennal segment as long as fourth segment, eighth segment not distinctly (1/6) shortened. Posterior margin of anal ring deeply notched, notch at base rounded. Length 13-14 mm. Two females from Turrialba, Costa Rica, in the Museum of Berlin and in my collection."

***Agra katewinsletae* Erwin, new species**
(Figs. 13a, 13b, 13c, 13d, 13e)

Holotype. Male, COSTA RICA: Puntarenas, Monteverde, 1380m, 10º 50'N 85º37'W, April, (E. Giesbert)(CAS: ADP62293).

Diagnosis. Metasternum and apical margin of elytra infuscated; elytra metallic green (basal) and ferruginous (apical). Elytral apex slightly lobed at middle. Male legs unmodified, similar to females. Abdominal sternum VI medially notched, lateral angle obtuse. Aedeagus with a central patch of membrane on the ventral surface.

Description. Color and luster: Elytra with metallic green basal area. Surface very shiny. Sternum and apical margin of elytra infuscated. Form: Head (Fig. 13a) short behind eyes, quadrate, that of male slightly more tapered posteriorly, that of female more rounded. Prothorax short and robust, widest across basal margin, swollen medially; pronotum densely and coarsely punctulate overall, some punctures with short setae. Elytral apex (Fig. 13b) slightly lobed at middle. Male legs unmodified, similar to females. Apex of abdominal sternum VI with obtuse hind angles. Abdominal sternum VI (Fig. 153) with moderate U-notch in both sexes. Aedeagus (Fig. 13e) with ostium elongate, a central patch of membrane on the ventral surface, apex of phallus a simple lobe, parameres glabrous. Stylomere 2 (Fig. 13c). Size: small, 8.5 to 13.0mm in length, 2.64 to 3.72mm in width.

Other specimens examined. Costa Rica: 25 paratypes, 11 males, 14 females, from the following Conservation Areas: Arenal Tilarán, Guanacaste, La Amistad Pacifico. Costa Rica, Guanacaste, 3m, 2f, P.N. Guanacaste, Estacíon Cacao, Volcán Cacao, SW slope, 1000-1400m, 85°25'40'W 10°59'26"N, LN 323300,375700, June, (II Curso Parataxonomia)(INBIO: CRI000-226163, CRI000-236120, CRI000-236128, CRI000-236139, CRI000-236140, CRI000-250375), 1f, March, (INBIO: CRI000-693979), 1m, April, (F.V. Araya)(INBIO: CRI000-344002), 1m, June, (C. Chavez)(INBIO: CRI000-642704), 1f, May, (F.V. Araya)(INBIO: CRI000-414096), 1f, November - December, (R. Blanco & C. Chavez)(INBIO: CRI000-145397), 1m, 1f, Estacíon Cacao, Volcán Cacao, SW slope, Derrumbe, 1000-1400m, 85°25'40'W 10°59'26"N, LN 323700,376700, May, (III Curso Parataxonomia)(INBIO: CRI000-409754, CRI000-409763), 1m, Estacíon Pitilla, Santa Cecilia, 9.0 km S, 700m, 85°25'40'W 10°59'26"N, LN 330200,380200, June, (P. Rios)(INBIO: CRI001-355323), 1f, October, (C. Moraga)(INBIO: CRI001-998022); Guanacaste, 1m, P.N. Rincón de la Vieja, Estacíon Las Pailas, 800m, LN 330200,380200, February, (K.E. Taylor)(INBIO: CRI000-994379); Puntarenas, 1f, A.C. Arenal, R.B.

Monteverde, Monteverde, San Luis, 1000-1350m, 84°50'W 10°14'N, LN 449250,250850, January, (Z. Fuentes)(INBIO: CRI001-857723), 1f, January, (Z. Fuentes)(INBIO: CRI001-857723), 1f, Hotel El Bosque , April, (J. Cope)(J.C.C.: ADP93509), 1f, April, (J.C. Soloman)(USNM: ADP27694), 1f, nr, Pensión Georgina, 84°48'W 10°18'N, July, (D.C. Rentz & K.R. Brodey)(GRUENW: ADP54540), 1m, May, (F.T. Hovore)(FTHC: ADP70502), 1f, May, (F.T. Hovore)(FTHC: ADP70506), 1m, P.N. Amistad, Estacíon Las Mellizas, Finca Cafrosa, 1300m, May, (M. Ramirez & G. Mora)(INBIO: CRI000-264684), 1m, San Vito de Java, Las Cruces, 82°57'W 8°46'N, March, (UMM: ADP89722).

Specific epithet. The specific epithet, *katewinsletae*, is the Latinized genitive form of the combined name of the actress Kate Winslet, starlet of the movie Titanic. Her character did not go down with the ship, but we will not be able to say the same for this elegant canopy species, if all the rain forest is converted to pastures.

Notes. This species is apparently similar to *Agra aurifera* Liebke, but differs in that the venter of the latter is ferruginous and the pronotum continuously narrows from base to apex.

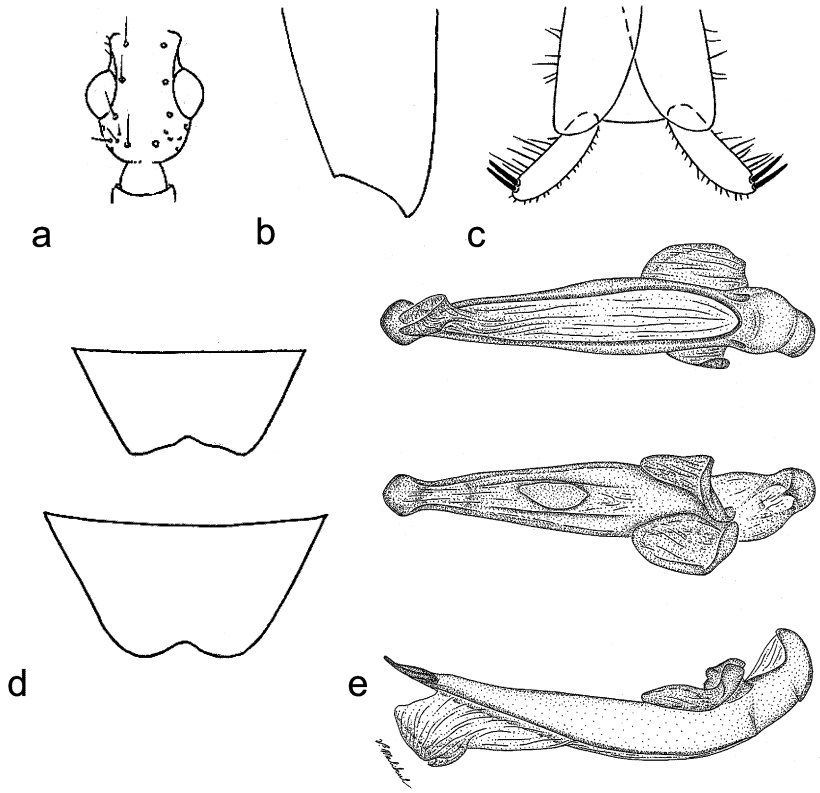

FIGURE 13. *A. katewinsletae*, dorsal aspect: head, a) male; b) apex of elytron; c) female, ventral aspect, stylomere 2; d) Sternum VI, male (top), female (bottom), ventral aspect; e) aedeagus, dorsal (top), ventral (middle), left lateral (bottom) aspects. Measures (mm): HL = 2.1; WE = 1.6; male SW = 2.4, female SW = 3.4; AL = 2.5; S2L = 0.2.

Diagnostic combination of the *famula* species-group includes the following: Labrum flat, anterior margin entire and truncate or slightly incised, incision shallowly v-shaped; lateral lobes of mentum short, narrowly rounded apically, median tooth short, narrowly rounded; middle and hind tibiae slightly compressed; posterior male basitarsus long, symmetric, not dilated; apex of elytron bispinose; female sternum VI apico-medially notched, notch shallow and wide; male median lobe with or without ostium bridged at middle, ostium elongated, apex broadly arrowhead-shaped.

This species-group was revised (Erwin 1983) based on a total of 7 species represented by 9 specimens. Since then, 53 additional specimens have been collected representing an additional 9 new species, 4 of which are found only in Costa Rica. The following new species and two additional species, *A. campana* Erwin and *A. fortuna* Erwin, are recorded here for the first time in Costa Rica. With the previously recorded *A. crassicornis* Liebke, this makes seven species of this group known from Costa Rica.

The distribution of this species-group ranges from México to Bolivia, east to Trinidad and the eastern Amazon Basin.

Agra dable Erwin, new species

(Figs. 14a, 14b, 14c, 14d)

Holotype. Male, COSTA RICA: Heredia, Estacíon Magsasay, Parque Nacional Braulio Carrillo, 200m, 10°24'04”N 84°02'57”W, March, (M. Zumbado)(INBio: CRI000-351513).

Diagnosis. Labrum entire. All black. Elytron with regular interneurs, 2, 4, and 6 with series of moderately impressed setigerous punctures, adjacent intervals catenate; interneurs with regularly spaced and moderately cribriform punctulae; apex with more or less similar-sized lateral and sutural acute dentiform projections.

Description. Color and luster: Black. Tips of mandibles, sides of antennomeres 4-11, and in some specimens, sides of abdominal sterna rufopiceous. Surface very shiny. Form: Labrum entire. Head (Fig. 14a) behind eye elongate, taper-rounded in both sexes. Prothorax subtubular, short, robust, sutures effaced, dorsal surface convex and densely punctate and transversely rugose, punctures very small. Elytron with apex (Fig. 14b) moderately oblique, with more or less similar lateral and sutural acute dentiform projections, margin between dentiform projections moderately lobed; interneurs with regularly spaced and moderately cribriform punctulae and 2, 4, and 6 with series of moderately impressed setigerous punctures. Metasternum with scattered setae; abdominal sterna III-VI of male with patches of discal setae. Sternum VI (Fig. 14c) moderately v-notched in both sexes. Aedeagus (Fig. 14d) with ostium elongate, apex a double scimitar, the distal with rounded sides, parameres glabrous. Size: medium, 14.5 to 18.0mm in length, 4.28 to 4.70mm in width.

Other specimens examined. Costa Rica: 5 paratypes, 3 males, 2 females from the following Conservation Areas: Cordillera Volcánica Central, Guanacaste, Tortuguero. Costa Rica, Guanacaste, 1m, P.N. Guanacaste, Estacíon Pitilla, Santa Cecilia, 9.0 km S, 700m, 85°25'40'W 10°59'26"N, LN 330200,380200, June, (C. Moraga)(INBIO: CRI000-819152), 1f, May, (GNP Biodiversity Survey)(INBIO: CRI001024226), 1m, P.N. Rincón de la Vieja, Estacíon Las Pailas, 800m, July, (K.E. Taylor)(INBIO: CRI001133380), 1f, October, (M.A. Zumbado)(INBIO: CRI000515130), 1m, Limón, P.N. Tortuguero, Estacíon Cuatro Esquinas, 0m, 83°32'W 10°34'N, LN 280000,590500, June, (E. Quesada)(INBIO: CRI000363904).

Specific epithet. The specific epithet, *dable*, is part of the Spanish word, agradable, meaning "pleasing."

Notes. Adults of this species are remarkably similar to those of *Agra solisi* (below) except for leg color and obliqueness of the elytral apex. An illustration of famula-group stylomere 2 is on the *Agra fortuna* web page.

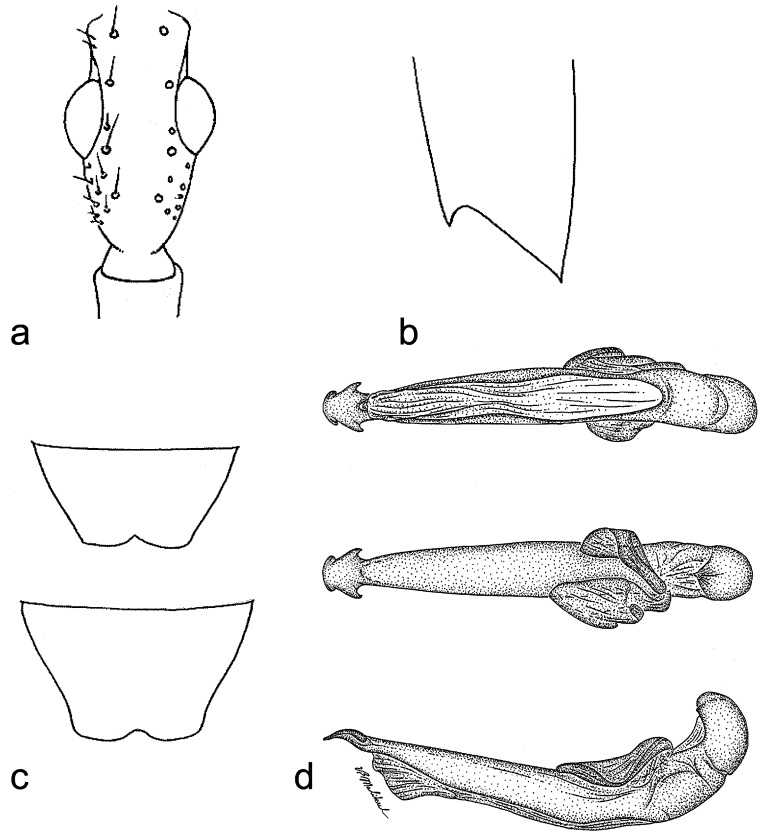

FIGURE 14. *A. dable*, male, dorsal aspect: a) head; b) apex of elytron; c) Sternum VI, male (top), female (bottom), ventral aspect; d) aedeagus, dorsal (top), ventral (middle), left lateral (bottom) aspects. Measures (mm): HL = 2.8; WE = 2.1; male SW = 3.9, female SW = 4.5; AL = 3.9.

***Agra liv* Erwin, new species**
(Figs. 15a, 15b, 15c, 15d)

Holotype. Female, **COSTA RICA:** Puntarenas, Manual Antonio National Park, Quepos, 80m, 09°23'N 84°09'W, January, (Bogenberger)(ZSBS: ADP6893).

Diagnosis. This is the only species of the *famula* species-group in Costa Rica that is entirely black with pale tibiae and tarsi and with normal elytral intervals.

Description. Color and luster: Black. Tips of mandibles, sides of antennomeres 5-11, and in some specimens sides of abdominal sterna rufopiceous. Surface shiny. Form: Labrum entire. Head (Fig. 15a) behind eyes elongate, rounded in both sexes. Prothorax subtubular, short, robust, sutures effaced, widest at middle, dorsal surface moderately convex and sparsely punctate, punctures markedly small. Elytron (Fig. 15b) with apex with more or less similar acute dentiform projections, interneurs with small regularly spaced and slightly cribriform punctulae, adjacent intervals not catenate. Sternum VI (Fig. 15c) moderately deeply v-notched in male, shallowly v-notched in female. Aedeagus (Fig. 15d) ostium elongate, apex a double scimitar, parameres glabrous. Size: medium, 14.0 to 15.5mm in length, 3.4 to 4.6mm in width.

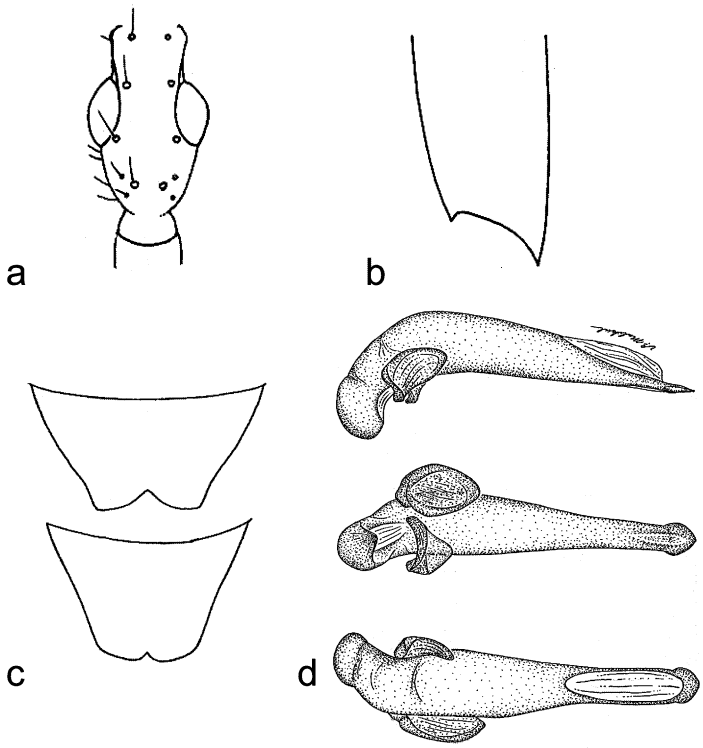

FIGURE 15. *A. liv*, male, dorsal aspect: a) head; b) apex of elytron; c) Sternum VI, male (top), female (bottom), ventral aspect; d) aedeagus, dorsal (top), ventral (middle), left lateral (bottom) aspects. Measures (mm): HL = 2.7; WE = 2.0; male SW = 3.6, female SW = 3.8; AL = 4.0.

Other specimens examined. Holotype above, and a male and female from Panamá are labeled as Paratypes.

Specific epithet. The specific epithet, *liv,* is a noun in apposition based on the first name of the actress Liv Tyler, starlet of the movie, Armageddon. The existence of this species of elegant beetle is dependent upon the rainforest not undergoing an Armageddon which is too much to hope for.

Notes. The single Costa Rican record above is from the Pacifico Central Conservation Area. Famula-group stylomere 2 can be found at the *Agra fortuna* web page.

***Agra santarosa* Erwin, new species**
(Figs. 16a, 16b, 16c, 16d)

Holotype. Male, **COSTA RICA:** Guanacaste, Santa Rosa National Park, 280m, 10º50'N 85º37'W, May [1980], (D.H. Janzen & W. Hallwachs)(USNM: ADP55010).

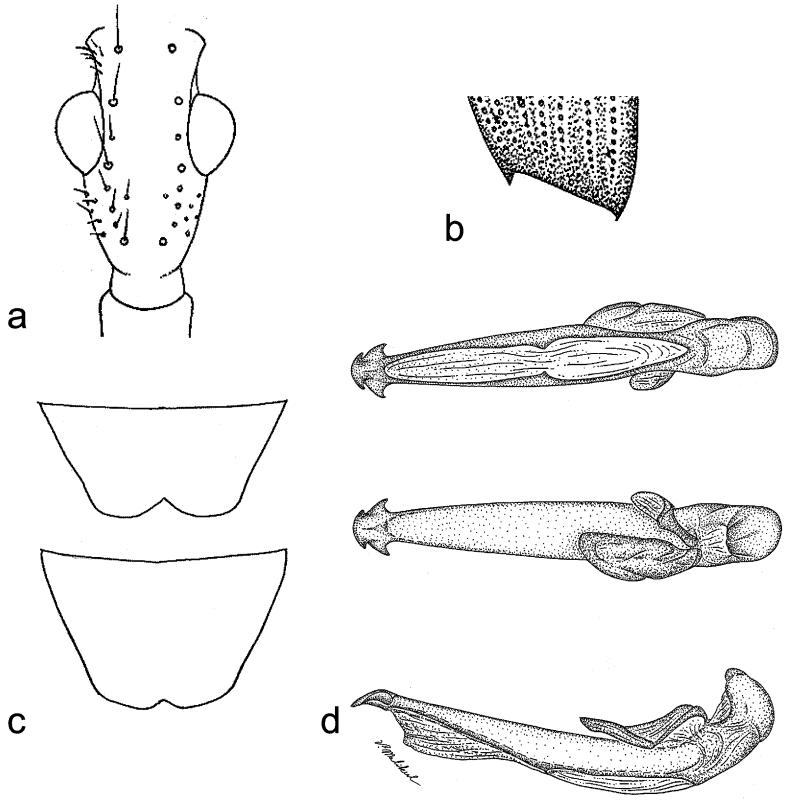

FIGURE 16. *A. santarosa*, male, dorsal aspect: a) head; b) apex of elytron; c) Sternum VI, male (top), female (bottom), ventral aspect; d) aedeagus, dorsal (top), ventral (middle), left lateral (bottom) aspects. Measures (mm): HL = 3.4; WE = 2.4; male SW = 4.6, female SW = 4.8; AL = 3.0.

Diagnosis. Black. Femora rufous, tibiae rufopiceous, knees and tarsi piceous. Elytral interneurs with regularly spaced and slightly cribriform punctulae; apex with more or less similar-sized lateral and sutural dentiform projections. Eyes very large, hemispherical, head short behind eyes.

Description. Color and luster: Black. Antennomeres 4-11 bicolored, red and black, tibiae rufous. surface Shiny. Form: Labrum entire. Head (Fig. 16a) behind eye moderately short, tapered in both sexes, more so in male. Prothorax "inflated" at basal third. Prothorax subtubular, short, robust, sutures effaced, dorsal surface flattened and densely punctate. Elytral apex (Fig. 16b) with more or less similar acute dentiform projections; interneurs with regularly spaced and slightly cribriform punctulae. Sternum VI (Fig. 16c) deeply v-notched in male, shallowly v-notched in female. Aedeagus (Fig. 16d) with ostium elongate, apex a double scimitar, parameres glabrous. Size: moderately large, 17.5 to 20.0mm in length, 4.86 to 5.16mm in width.

Other specimens examined. Costa Rica: 2 paratypes, both females, from the following Guanacaste Conservation Area. Costa Rica, Guanacaste, 1f, June, (D.H. Janzen & W. Hallwachs)(INBIO: ADP55016), 1f, Estacíon Maritza, Volcán de Orosi, East slope, 600m, LN 326900,373000, June, (GNP Biodiversity Survey)(INBIO: CRI000-134050).

Specific epithet. The specific epithet, *santarosa*, is a noun in apposition based on the type locality, Santa Rosa National Park.

Notes. An illustration of famula-group stylomere 2 is on the *Agra fortuna* web page.

***Agra solisi* Erwin, new species**
(Figs. 17a, 17b, 17c, 17d)

Holotype. Male, **COSTA RICA:** Limón, Tortuguero National Park, Cerro Tortuguero, 119m, 10°34'N 83°32'W, May, (R. Delgado)(INBio: CRI000-693068).

Diagnosis. Femora rufous and tibiae black. Labrum entire. Elytra with regular interneurs, 2, 4, and 6 with series of moderately impressed setigerous punctures; interneurs with regularly spaced and moderately cribriform punctulae; apex with more or less similar lateral and sutural acute dentiform projections.

Description. Color and luster: Black. femora rufous. Surface very shiny. Form: Labrum entire. Head (Fig. 17a) behind eye elongate, taper-rounded in both sexes. Prothorax subtubular, short, robust, sutures effaced, dorsal surface flattened and densely punctate. Elytron with apex (Fig. 17b) slightly oblique, with more or less similar-sized lateral and sutural acute dentiform projections, margin between dentiform projections moderately lobed; interneurs with regularly spaced and moderately cribriform punctulae and 2, 4, and 6 with series of moderately impressed setigerous punctures. Metasternum with scattered setae; abdominal sterna III-VI of male with patches of discal setae; Sternum VI (Fig. 17c) deeply v-notched in male, slightly emarginate in female. Aedeagus (Fig. 17d) with ostium

elongate, apex a double scimitar, the distal with rounded sides, parameres glabrous. Size: medium, 16.0 to 17.0mm in length, 4.42 to 4.70mm in width.

Other specimens examined. Costa Rica: 3 paratypes, 1 male, 2 females, from the Tortuguero Conservation Area. Costa Rica, Limón, 1f, Tortuguero, P.N. Tortuguero, Cerro Tortuguero, 100m, 83°32'W, 10°34'N, LN 285000, 588000, April, (R. Aguilar & J. Solano)(INBIO: CRI000-088728), 1f, 119m, 83°32'W, 10°34'N, LN 285000, 588000 #1698, May, (R. Delgado)(INBIO: CRI001-693063), 1m, Estacíon Cuatro Esquinas, 0m, 83°32'W, 10°34'N, LN 280000, 590500, July, (E. Quesada)(INBIO: CRI000-670951).

Specific epithet. The specific epithet, *solisi*, is the Latinized genitive form of the family name of Angel Solis, Curator of Beetles at the Instituto Nacíonal de Biodiversidad and collector of many interesting *Agra* specimens from Costa Rica.

Notes. Adults of this species are remarkably similar to those of *Agra dable* except the leg color and obliqueness of the elytral apex. An illustration of famula-group stylomere 2 is on the *Agra fortuna* web page.

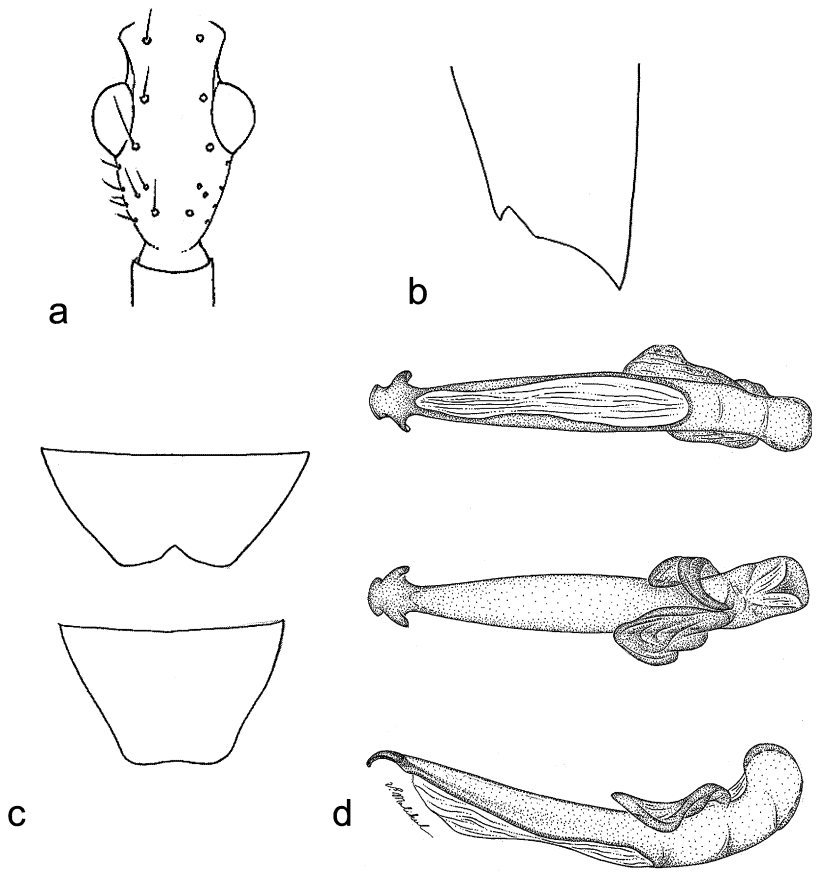

FIGURE 17. *A. solisi*, male, dorsal aspect: a) head; b) apex of elytron; c) Sternum VI, male (top), female (bottom), ventral aspect; d) aedeagus, left lateral (top), ventral (middle), dorsal (bottom) aspects. Measures (mm): HL = 3.2; WE = 2.2; male SW = 4.2, female SW = 4.3; AL = 3.3.

Diagnostic combination of the *lycisa* species-group includes the following: Pronotum and head markedly setiferous. Head with short and medially depressed occiput. Sternum VI in both sexes dentate latero-posteriorly. Elytral apex slightly obliquely truncate, spinose or not. Stylomere 2 quadrispinose.

The *lycisa* species-group was minimally defined by Straneo (1965), however, his included species did form a sound grouping. These share the characteristic quadrispinose stylomere 2 in females. An illustration of lycisa-group stylomere 2 is on the *Agra hilaris* web page.

This speciose group ranges from Costa Rica south to southern Brazil, Bolivia, and as far as east as Trinidad, and is often abundant locally. The other Costa Rican species is *A. hilaris* Liebke.

***Agra ubicki* Erwin, new species**
(Figs. 18a, 18b, 18c, 18d)

Holotype. Male, **COSTA RICA:** Puntarenas, 3 km NE Golfito, 8º 39'N 83º10'W, 100m, May, (D. Ubick)(CAS: ADP4553).

Diagnosis. Color piceous. Head markedly impressed on the occiput, almost foveate. Prothorax without the numerous long setae found in adults of *A. hilaris* Liebke. Elytral intervals not catenate.

Description. Color and luster: Color piceous. Surface shiny. Form: Head (Fig. 18a) behind eyes moderately long, markedly rounded, occiput markedly impressed on the occiput, almost foveate. Prothorax widest at basal third, pronotum somewhat flattened with moderately dense coarse punctures. Elytron with apex (Fig. 18b) almost truncate, lateral tooth small, sutural angle rounded, not projected acutely. Sternum VI (Fig. 18c) moderately emarginate and v-notched in both sexes. Aedeagus (Fig. 18d) with short ostium, apex of phallus a very broad triangular lobe, parameres glabrous. Size: small, 8.0 to 9.5mm in length, 2.48 to 3.24mm in width.

Other specimens examined. Costa Rica: 4 paratypes, 1 female, 3 males, from the Osa Conservation Area. Costa Rica, Puntarenas, 1m, P.N. Corcovado, Madrigal, 3.0 km W, 83°36'W 8°29'N, May, (D. Ubick)(CAS: ADP4554), 1m, Peninsula de Osa, 83°36'W, 8°29'N, August, (D.R. Whitehead)(USNM: ADP59571), 1m, Golfito, 3.0 km NE, 100m, 83°10'W, 8°39'N, May, (D. Ubick)(CAS: ADP4545), shaking foliage, tropical wet forest, 1f, May, (D. Ubick)(CAS: ADP4552).

Specific epithet. The specific epithet, *ubicki*, is the Latinized genitive form of the family name of the collector of the Holotype, Darryl Ubick of the Department of Entomology, California Academy of Sciences.

Notes. Adults of this species group are commonly found in suspended dry leaves in the understory of Neotropical forests.

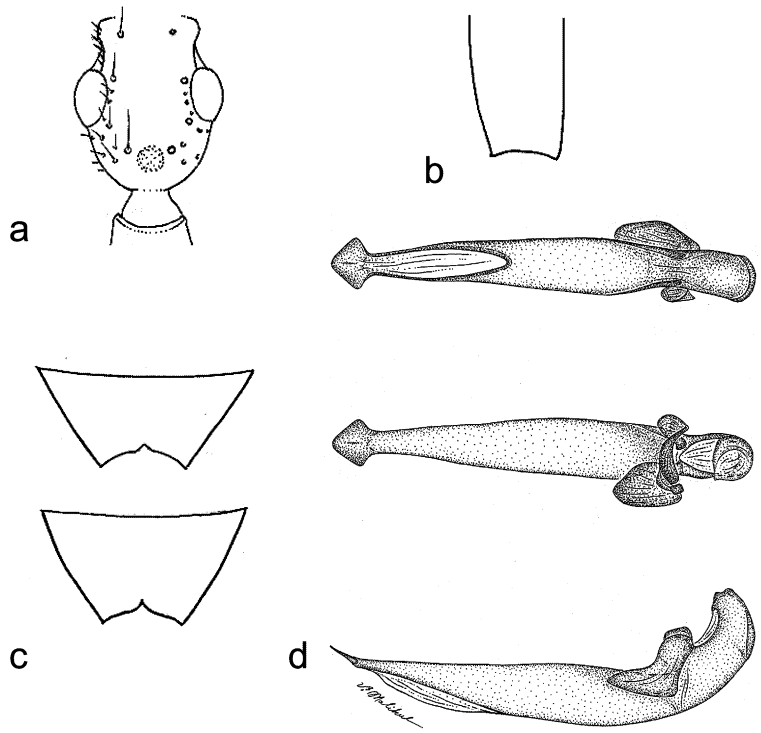

FIGURE 18. *A. ubicki*, male, dorsal aspect: a) head; b) apex of elytron; c) Sternum VI, male (top), female (bottom), ventral aspect; d) aedeagus, dorsal (top), ventral (middle), left lateral (bottom) aspects. Measures (mm): HL = 1.5; WE = 1.5; male SW = 2.2, female SW = 3.0; AL = 2.0.

The **palmata** species-group

Diagnostic combination of the *palmata* species-group includes the following: Labrum flat; mentum with lateral lobes acute, not spiniform. Head elongate or not, broader across middle than occiput, eyes large; head posterior to eyes normally elongate, not ballooned (lateral aspect), eyes less than 1.5 times their own diameter from cervical constriction. Tibia moderately or slightly compressed, laterally barely expanded, apex never prolonged; all tibiae latero-apically oblique. Elytral apex bidentate, dentiform projections small.

The *palmata* species-group was revised by Erwin (1984). At that time, it contained 39 species whose composite range extends from southern México to Paraguay. Since then, 13 new species have been discovered from throughout the overall range, plus another one from Costa Rica, described below.

Four other species of the *palmata* species-group are known from Costa Rica, *A. atriperna* Erwin, *A. costaricensis* Liebke, *A. flavipes* Straneo, and *A. kayae* Erwin.

***Agra granodeoro* Erwin, new species**
(Figs. 19a, 19b, 19c)

Holotype. Male, **COSTA RICA:** Cartago, Turrialba, Chirripo, Grano de Oro, 1120m, 09°53'N 83°38'W, September, (P. Campos)(INBio: CRI000-935857).

Diagnosis. This is the smallest member of the palmata species-group in Costa Rica and the only species with a narrow, tapered prothorax, black knees and tarsi.

Description. Color and luster: Piceous. Legs rufotestaceous with black knees and tarsi. Antennomeres 1-2 and apex of 3-10 infuscated. Female unknown. Form: Head (Fig. 19a) behind eyes moderately long, sides tapered to abruptly obtuse angles. Pronotum widest at base, markedly narrowed just posterior to apical collar; disc sparsely punctate. Elytron with apex (Fig. 19b) markedly oblique, finely dentate suturally, sutural margin sinuate. Aedeagus (Fig. 19c) with two ostial membranes separated by a wide sclerotized bridge, endophallus without vestiture or armature; apex of phallus diamond-shaped. Size: moderately large, 18.1 mm in length, 4.4mm in width.

Other specimens examined. The male Holotype is the only specimen I saw.

Specific epithet. The specific epithet, *granodeoro,* is used as a noun in apposition, and refers in Spanish to a "golden seed," in reference to the brassy glint of the elytra and to the type locality.

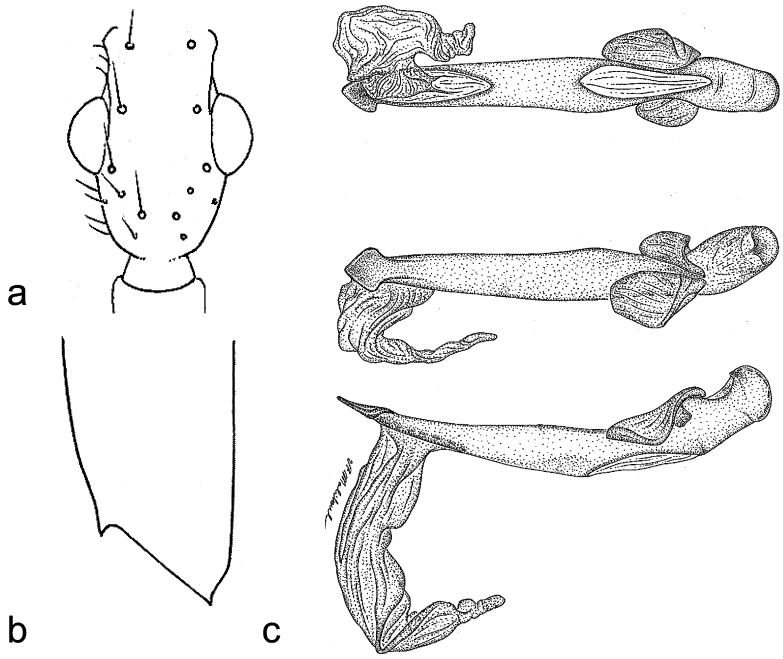

FIGURE 19. *A. granodeoro*, male, dorsal aspect: a) head; b) apex of elytron; c) aedeagus, dorsal (top), ventral (middle), left lateral (bottom) aspects. Measures (mm): HL = 3.3; WE = 2.2; AL = 5.0.

Notes. The Holotype is from the Cordillera Volcánica Central Conservation Area. An illustration of palmata-group stylomere 2 is on the *Agra atriperna* web page.

The **perrinae** species-group

Diagnostic combination of the perrinae species-group include the following: Male with an enormously enlarged middle femur that is pilose along the lower anterior margin. Apical margin of elytron usually tridentate or truncate (Costa Rica species only). Interneurs finely punctuate with evenly spaced larger foveae.

The *perrinae* species-group, newly characterized herein, is now known to contain 7 species that range from Costa Rica south to Bolivia.

***Agra schwarzeneggeri* Erwin, new species**
(Figs. 20a, 20b, 20c, 20d)

Holotype. Male, COSTA RICA: Cartago, Turrialba, 650m, 9º 53'N 83º38'W, February, (H. & A. Howden)(USNM: ADP64794).

Diagnosis. The male of this species has an enormously enlarged middle femur (Fig. 19c); females have elytra with brassy-green tint, black forebody and rufous antennomeres 3-11.

Description. Color and luster: Black. Elytra with brassy green reflections. Antennomeres 3-4 testaceous, infuscated apically, 5-11 testaceous. Form: Head (Fig. 20a) short behind eyes, that of male tapered and rounded behind, that of female quadrate, vertex dimpled. Prothorax widest at middle, markedly tapered anteriorly in male, somewhat "swollen" at middle in female. Middle leg with markedly enlarged femur (Fig. 20d). Elytra broad, not very convex, apex (Fig. 20b) medially dentate, interneurs 2,4,6,8 with very large setigerous foveae, interneurs of fine close-spaced punctures. Sternum VI (Fig. 20c) with deeply circular emargination in female, deeply v-notched in female. Aedeagus (see Notes). Size: medium, 14.0 to 17.0mm in length, 4.6 to 5.16mm in width.

Other specimens examined. Costa Rica: 3 paratypes, females, from the Cordillera Volcánica Central Conservation Area. Costa Rica, 1f, Cartago, Pavones 83°37'W 9°57'N, May, (F.T. Hovore)(FTHC: ADP70530), 1f, Turrialba, 3.0 km SEIICA/CATIE, 83°38'W 9°53'N, April, (E. Giesbert)(FSCA: ADP4420), 1f, August, (D.R. Whitehead)(USNM: ADP61717), 1m, February, (H.F. Howden & A. Howden)(UASM: ADP54794).

Specific epithet. The specific epithet, *schwarzeneggeri* is the Latinized genitive form of the family name of the actor, Arnold Schwarzenegger, in reference to the markedly developed (biceps-like) middle femora of the males of this species reminiscent of the actor's physic.

Notes. The genitalia of the dissected male is missing from the vial pinned beneath the specimen, thus has not been illustrated. The aedeagus of *Agra perrinae* (Straneo 1982) has a moderately long ostium, apex of phallus a simple diamond-shaped lobe which is markedly arched dorsally, parameres glabrous.

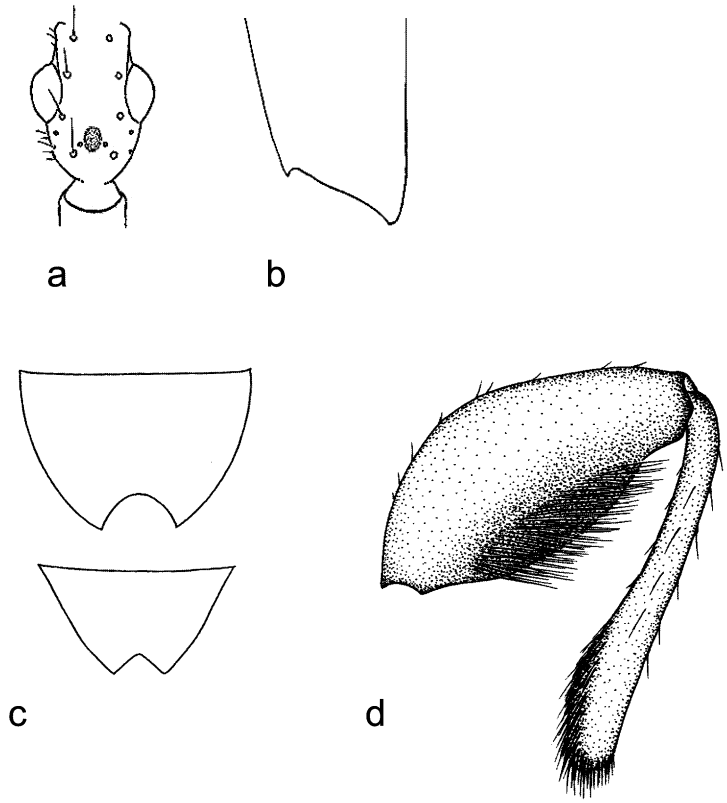

FIGURE 20. *A. schwarzeneggeri*, male, dorsal aspect: a) head; b) apex of elytron; c) Sternum VI, male (top), female (bottom), ventral aspect; d) middle leg, post-dorsal aspect. Measures (mm): HL = 2.7; WE = 2.3; male femur diameter = 1.1; male SW = 4.0, female SW = 4.6.

The ***peruana*** complex

Diagnostic combination of the peruana species-group includes the following: Males with two bilateral patches of long vestiture on at least abdominal sterna IV. Elytral apex spinose medially and laterally, with slight lobe between. Sternum VI apico-laterally acute, apical margin medially arcuate with small v-shaped emargination at center. Aedeagus left pleuropic, parameres multisetose.

The following species belongs to the peruana complex. The group distribution ranges from Guatemala to southern Brazil, and across the Amazon Basin onto the Guyana Shield in Surinam.

Of this group, only the following two new species and *A. ligulata* Liebke are known from Costa Rica and they are arrayed in two species-subgroups.

The **peruana** complex **ligulata** subgroup

Diagnostic combination of the *ligulata* subgroup includes the following: Elytral interneurs finely striatio-punctulate with larger setigerous foveae in 2, 4,and 6. Males with two bilateral patches of long vestiture on abdominal sterna II ñ V; posterior trochanters densely setiferous.

***Agra solanoi* Erwin, new species**
(Figs. 21a, 21b, 21c, 21d)

Holotype. Male, **COSTA RICA:** Limón, Tortuguero National Park, Cerro Tortuguero, 119m, 10°34'N 83°32'W, May, (J. Solano)(INBio: CRI000-242786).

Diagnosis. Males with dense, short vestiture on metasternum and long dense vestiture on abdominal sterna III-V. Elytral apex spinose medially, markedly projected acutely laterally, with slight lobe between; interneurs striatio-punctate with regular unisetose foveae in intervals 2, 4, 6, and 8. Sternum VI of male with lateral angles acute.

Description. Color and luster: Brunneous. Antennae rufotestaceous; slightly infuscated femora contrast with testaceous tibiae and tarsi. Form: Head (Fig. 21a) behind eyes short, markedly angulate posteriorly in male, slightly rounded in female. Prothorax robust, wider than head. Elytron (Fig. 21b) with apex slightly lobed medially, lateral tooth large, acute, sutural apex spinose. Males with dense, short vestiture on metasternum, long dense vestiture on abdominal sterna III-V; middle tibia slightly clavate apico-medially. Sternum VI (Fig. 21c) deeply V-notched in male, narrowly and shallowly V-notched in female. Aedeagus (Fig. 21c) with ostium moderately long, left pleuropic, apex narrowly lobate, parameres setiferous. Size: medium, 14.6 to 17.0 mm in length, 2.4 to 2.8 mm in width.

Other specimens examined. Costa Rica: 17 paratypes, 10 males, 7 females, from the following Conservation Areas: Arenal Tilarán, Cordillera Volcanica Central, Guanacaste, Osa, Pacifico Central, and Tortuguero. Costa Rica, Cartago, 1m, Turrialba, 83°38'W 9°53'N, May, (H.F. Howden & A. Howden)(UASM: ADP85301), 1m, January, (V.M. Kirk)(UASM: ADP21812), 1m, January, (V.M. Kirk)(UASM: ADP21823), 1m, Turrialba, 1200m, 83°38'W 9°53'N, March, (W.R. Enns)(UMoC: ADP100529), 1f, Turrialba, 3.0 km SE, CATIE, 83°38'W 9°53'N, June, (J.A. Chemsak, H. Katasura & A. & E. Michelbacher) (UCB: ADP70518); Guanacaste, 1m, Tilarán, 800m, 84°59'W 10°28'N, (F. Nevermann)(WAR: ADP4224); Heredia, 1f, Estacíon La Selva, Puerto Viejo, 3.0 km S, 50-150m, 83°59'W 10°27'N, January, (D.L. Wagner)(INBIO: CRI002-724432), at light, 1m, June, (F.T. Hovore)(FTHC: ADP87130), 1f, June, (F.T. Hovore)(FTHC: ADP100531), 1m,

Puerto Viejo, 3.0 km S, Finca La Selva, 84°01'W 10°26'N, April, (H.A. Hespenheide)(HAH: ADP5094); Limón, 1f, P.N. Tortuguero, Estacíon Cuatro Esquinas, 0m, 83°32'W 10°34'N, LN 280000,590500, October, (J. Solano)(INBIO: CRI000-296760), 1m, Tortuguero, Cerro Tortuguero, 0-100m, 83°32'W 10°34'N, LN 285000,588000, May, (J. Solano)(INBIO: CRI000-242793), 1m, October, (J. Solano)(INBIO: CRI000-032205), 1f, June, (R. Delgado)(INBIO: CRI001-363770), 1f, Puntarenas, A.C. Osa, Peninsula de Osa, Bosque Esquinas, 200m, LS 301400,542200 #2816, May, (J.F. Quesada)(INBIO: CRI001-862232), 1m, P.N. Manuel Antonio, Quepos, 80m, 84°09'W 9°24'N, LS 370900,448800 #1181, April, (C. Cano)(INBIO: CRI001-718849), 1f, Peninsula de Osa., Rancho Quemado, 200m, LS 292500,511000, September, (F.A. Quesada)(INBIO: CRI001-190451), 1m, Monteverde, 84°48'W 10°18'N, May, (F.T. Hovore)(FTHC: ADP70527).

Specific epithet. The specific epithet, *solanoi*, is the Latinized genitive form of the family name of collector of the Holotype, parataxonomist José Solano of San Isidro del General, San José.

Notes. This widespread species ranges from sea level to 1200m altitude, in both wet and dry forests. Adults of this species are commonly attracted to lights.

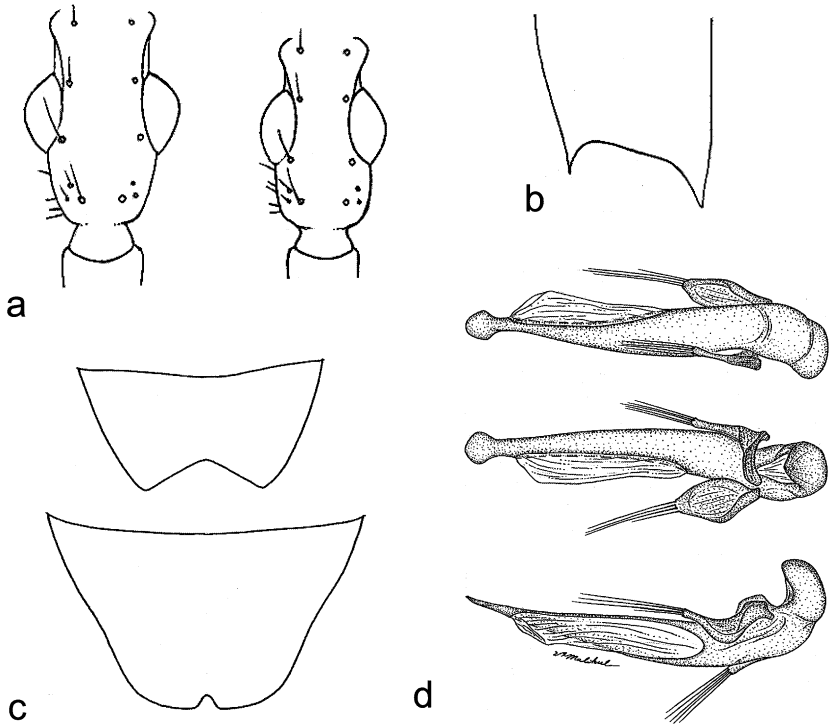

FIGURE 21. *A. solanoi*, dorsal aspect: a) head, male, female; b) apex of elytron; c) Sternum VI, male (top), female (bottom), ventral aspect; d) aedeagus, dorsal (top), ventral (middle), left lateral (bottom) aspects. Measures (mm): HL = 3.0; WE = 2.8; male SW = 4.4, female SW = 4.6; AL = 4.5.

The **peruana** complex **notcatie** subgroup

Diagnostic combination of the peruana species-group, notcatie subgroup includes the following: Elytral interneurs a series of large deep foveae. Male with sparse and scattered setae on metasternum and abdominal sterna II, III, V and VI, only IV with two small bilateral tufts.

This new subgroup is known at present only from Costa Rica and includes the following new species.

***Agra notcatie* Erwin, new species**
(Figs. 22a, 22b, 22c, 22d)

Holotype. Male. COSTA RICA: Limón, Tortuguero National Park, Estacíon Cuatro Esquinas, sea level, 10°34'N 83°32'W, November, (R. Delgado)(INBio: CRI000-298655).

Diagnosis. Femur concolorous. Elytron with sutural and lateral apices prolonged, spinose. Male middle not excavate nor densely setose in apical half; posterior tibia with apical excavation and dense brush. Elytral apex shallowly arcuate between lateral and apical apices. Abdominal sterna III-V with 2 bilateral patches of sparse setae.

Description. Color and luster: Somber colored beetles with pale antennae, slightly infuscated femora which contrast with the pale testaceous tibiae and tarsi.
Form: Head (Fig. 22a) behind eyes moderately elongate, rounded in both sexes. Male middle and posterior tibiae neither excavate nor densely setose in apical half. Elytron with apex (Fig. 22b) shallowly arcuate between lateral and apical apices; interneurs a series of large deep foveae. Male with sparse and scattered setae on metasternum and sparse patches of setae on abdominal sterna II, III, V and VI, only IV with two small bilateral tufts. Sternum VI (Fig, 22c) moderately V-notched, female shallowly V-notched. Aedeagus (Fig. 22d) with ostium moderately short, apex simple, cordiform, parameres glabrous. Size: medium, 16.3 to 18.1mm in length, 3.6 to 4.2mm in width.

Other specimens examined. Costa Rica: 7 paratypes, 2 males, 5 females from the following Conservation Area: Arenal Tilarán, Cordillera Volcanica Central, Tortuguero. I have seen one additional female from Panamá and labeled it as a paratype. Costa Rica, Alajuela, 1f, P.N. Arenal, Laguna Arenal, East side, Tunel del ICE, 10°27'58'N 84°44'46"W January, (D.H. Janzen)(INBIO: CRI000-111882); Cartago, 1f, Turrialba, 3.0 km SE, CATIE, 83°38'W 9°53'N, June, (F.T. Hovore)(FTHC: ADP70509); Heredia, 1f, Estacíon La Selva, Puerto Viejo, 3.0 km S, 50-150m, 83°59'W 10°27'N, October, (INBIO-OET: CRI002-231750), FVK/19/16, Virola koschnyi, 1m, Puerto Viejo, 3.0 km S, Finca La Selva, 84°01'W 10° 26'N, May, (H.A. Hespenheide)(HAH: ADP5097), 1f, March, (H.A. Hespenheide)(HAH: ADP62308); Limón, 1m, P.N. Tortuguero, Estacíon Cuatro Esquinas, 0m, LN 280000, 590500, November, (R. Delgado)(INBIO: CRI000-298655), 1f, P.N. Tortuguero, Tortuguero, Cerro Tortuguero, 0-120m, LN 285000, 588000, April, (J.

Solano)(INBIO: CRI000-794066), 1m, Finca de E. Rojas, Sector Cerro Cocori, 150m, November, (E. Rojas)(INBIO: CRI000-308104).

Specific epithet. The specific epithet, *notcatie*, is used as a noun in apposition based on the acronym of CATIE (see above), and in reference to the species described above, *A. catie*, which this is not, because of the attributes described above.

Notes. This species was collected on *Virola koschnyi* at La Selva Biological Station by the ALAS Project. Notcatie-subgroup stylomere 2 are similar to those of *Agra castaneipes*, see that web page. F. Hovore collected a female at combined "MV & UV lights" at CATIE.

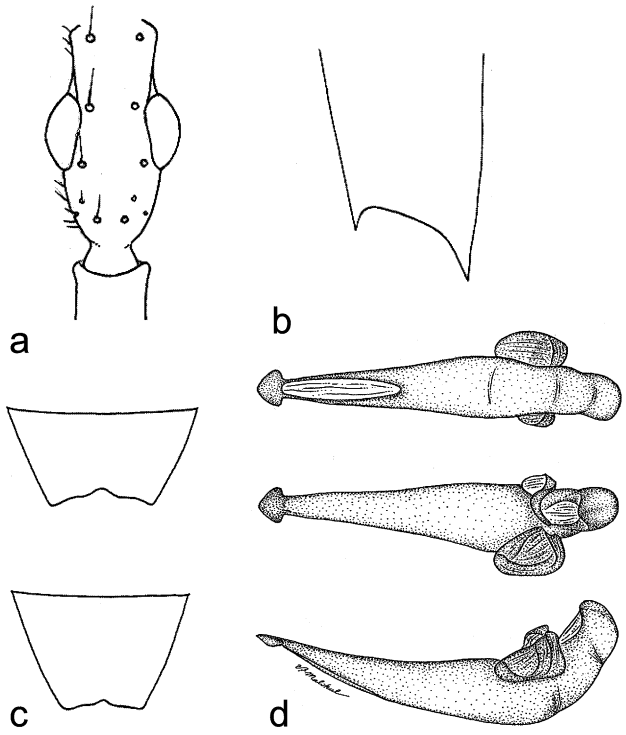

FIGURE 22. *A. notcatie*, male, dorsal aspect: a) head; b) apex of elytron; c) Sternum VI, male (top), female (bottom), ventral aspect; d) aedeagus, dorsal (top), ventral (middle), left lateral (bottom) aspects. Measures (mm): HL = 3.0; WE = 1.8; male SW = 3.4, female SW = 4.0; AL = 3.4.

The **pia** species-group

Diagnostic combination of the pia species-group includes the following: Head with vertex dimpled dorsally. Elytra metallic purple with slightly prominent sutural and lateral dentiform projections. Male venter without accessory patches of setae. Aedeagus with ostium elongate.

The range of this species-group with one species known at present is Costa Rica.

***Agra pia* Liebke**
(Figs. 23a, 23b, 23c, 23d)

Agra pia Liebke 1940:236. Holotype: Presumed lost. **Neotype**, here designated, Costa Rica: Puntarenas, Las Cruces, 08º46'N 82º 57'W, February (F.T. Hovore)(INBio: ADP100515)

Diagnosis. *Agra pia* is the only species in Costa Rica whose adults have the following attributes: Metallic purple elytra with slightly prominent sutural tooth. Pronotal disc with raised median keel on the anterior portion. Black, pronotum with light greenish brasslike luster, elytra purple, with light green brasslike luster. Antennae, legs and ventral side black.

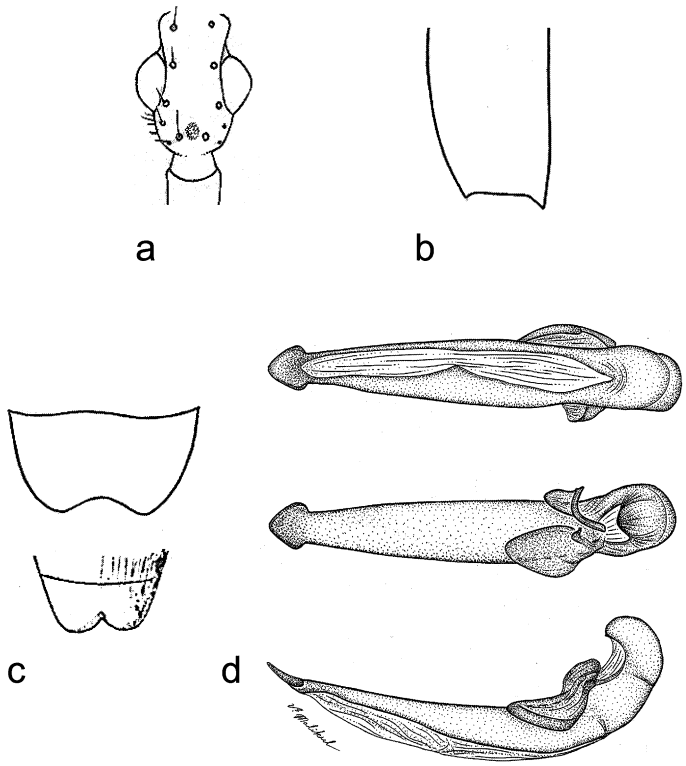

FIGURE 23. *A. pia*, male, dorsal aspect: a) head; b) apex of elytron; c) Sternum VI, male (top), female (bottom scanned from Liebke, 1940), ventral aspect; d) aedeagus, dorsal (top), ventral (middle), left lateral (bottom) aspects. Measures (mm): HL = 2.1; WE = 1.5; male SW = 2.8, AL = 3.1.

Description. Color and luster: Black. Antennae, legs and ventral side black. Shiny, pronotum with light greenish brasslike luster, elytra purple, with light green brasslike luster. Form: Female (see Notes). Head (Fig. 23a) behind eyes short and quadrate, slightly

tapered in male, vertex dimpled dorsally. Elytron (Fig. 23b) with apex slightly oblique, lateral tooth small, sutural tooth produced, acute; interneurs of very fine nearly contiguous punctulae; intervals slightly convex on disc. Male venter without accessory patches of setae. Sternum VI (Fig. 23c) deeply emarginate in male, narrowly v-notched in female. Aedeagus (Fig. 23d) with ostium elongate, slightly constricted medially, apex a simple cordiform lobe, parameres glabrous. Size: small, 12.9mm in length, 3.2mm in width in width.

Other specimens examined. Only the Neotype is known.

Notes. Liebke's description was adequate to allow recognition of this species without access to the types.

The **pitilla** species-group

Diagnostic combination of the pitilla species-group includes the following: Head short behind eyes, quadrate in both sexes. Elytral apex moderately projected acutely. Male metasternum and posterior coxae with fine short pubescence, abdominal sterna II-VI with same, but not so densely arranged. Abdominal sternum VI projected acutely at posteriolateral corners. Male tibiae without supplemental vestiture. Male parameres unisetose.

The pitilla species-group, newly characterized herein, is now known to contain a single species from Costa Rica.

***Agra pitilla* Erwin, new species**
(Figs. 24a, 24b, 24c, 24d)

Holotype. Male. COSTA RICA: Guanacaste, P.N. Guanacaste, Estacíon Pitilla, 9.0 km S Santa Cecilia, 700m, 10°59'26"N, 85°25'40"W, January, (GNP Biodiversity Survey)(INBio: CRI001-024216).

Diagnosis. Black fore body with rufinistic elytral apex, the apical margin infuscated and markedly lobed at middle. Hind trochanter sparsely setiferous.

Description. Color and luster: Black. Apical 2/3 of elytra rufinistic, margin of elytral apex, abdominal sternum VI, and tergum VI infuscated; tarsi and abdomen rufotestaceous. Form: Labrum flat. Head (Fig. 24a) markedly short behind eyes, quadrate in both sexes. Elytra with markedly and evenly punctulate interneurs, apex (Fig. 24b) slightly lobed between lateral and sutural angles. Metasternum of male densely pubescent; abdominal sterna each with long scattered setae. Apex of sternum VI (Fig. 24c) in male and female acutely angulate apicolaterally, caudal margin emarginate, slightly u-notched in male, v-notched in female. Male middle tibia with small apicomedial brush. Aedeagus (Fig. 24d) ostium short, slightly left pleuropic; apex of phallus a simple diamond-shaped lobe; left

paramere unisetose, right paramere glabrous. Size: medium, 13.0 to 13.5 mm in length, 3.1 o 3.7 mm in width.

Other specimens examined. Costa Rica: 7 paratypes, 5 males, 2 females, from the Guanacaste Conservation Area. Costa Rica, Alajuela, 1f, Dos Rios, 2.0 km W, N slope of Volcán de Rincon, 550m, 10° 50' N, 085° 22' W, May (J.T. Doyen & P.A. Opler)(UCB: ADP80686); Guanacaste, 1f, Santa Cecilia, 9.0 km S, 700m, 10° 59' 26 N, 85° 25' 40' W, LN 330200,380200, June (C. Moraga)(INBio: CRI002047455), 6 males, P.N. Guanacaste, Estacíon Pitilla, April (P. Rios)(INBio: CRI001794228), March (P. Rios, C. Moraga & R. Blanco)(INBio: CRI000-211428), December (C. Moraga)(INBio: CRI000-637527), May (P. Rios & M. Zumbado) (CRI000-269888), LN 330200, 380200 #3262, October (P. Rios)(INBio: CRI001-997986), January (GNP Biodiversity Survey)(INBio: CRI00-1024216).

Specific epithet. The specific epithet, *pitilla*, is a noun in apposition based on the name of the INBio Field Station at which the Holotype was collected.

Notes. All specimens are from the Guanacaste Conservation Area, 7 of them from Estacíon Pitilla.

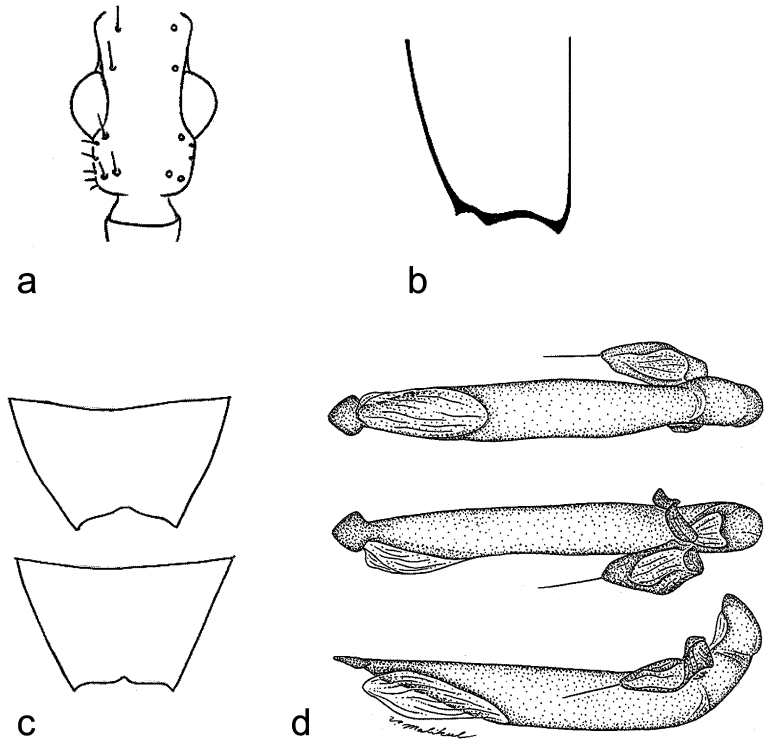

FIGURE 24. *A. pitilla*, male, dorsal aspect: a) head; b) apex of elytron; c) Sternum VI, male (top), female (bottom), ventral aspect; d) aedeagus, dorsal (top), ventral (middle), left lateral (bottom) aspects. Measures (mm): HL = 2.3; WE = 2.9; male SW = 4.2, female SW = 4.4; AL = 3.5.

Diagnostic combination of the purpurata species-group includes the following: Elytral apex tridentate. Male with dense plumose vestiture on base of each femur, metasternum, mid and posterior coxae, trochanter, abdominal sterna II-VI; sternum VI of both sexes deeply incised, male broadly, female narrowly.

The purpurata species-group, characterized by the tridentate elytral apex and combination of ventral male vestiture, is used here for the first time to separate Liebke's (1940) mixed "*cancellata* Obergruppe" into natural components. The following species belong to the new *purpurea* species-group whose adults have markedly tridentate elytral apex and regular interneurs. Its present known distribution ranges from Costa Rica to Panamá, but it undoubtedly also occurs in South America.

Three species are known from Costa Rica; the new species below, *Agra purpurea* Bates and *A. semifulva* Bates.

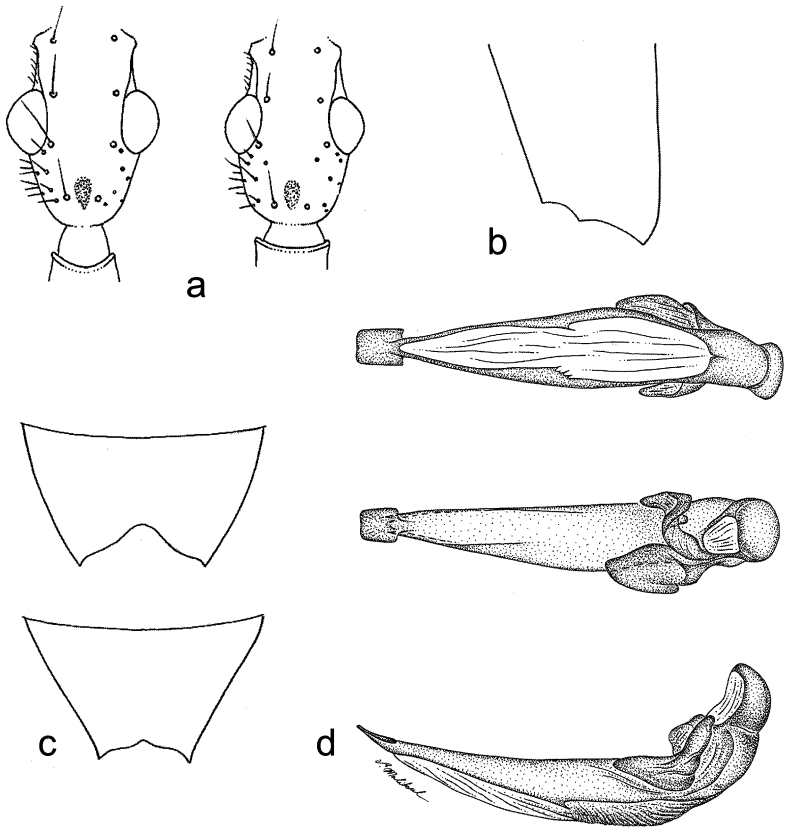

FIGURE 25. *A. catbellae*, dorsal aspect: a) head, male, female; b) apex of elytron, male; c) Sternum VI, male (top), female (bottom), ventral aspect; d) aedeagus, dorsal (top), ventral (middle), left lateral (bottom) aspects. Measures (mm): HL = male 2.8, female 2.5; WE = 2.3; male SW = 4.2, female SW = 2.8; AL = 4.0.

***Agra catbellae* Erwin, new species**
(Figs. 25a, 25b, 25c, 25d)

Holotype. Male, **COSTA RICA:** Cartago, Turrialba, 600m, 09º53'N 83º 38'W, January (F.T. Hovore)(USNM: ADP6384).

Diagnosis. Large, coppery beetles with apparently semi-catenate elytral interval and tridentate elytral apex. Male head tapered, female head rounded. Elytral foveae in interneurs 2,4, and 6 very large, adjacent intervals constricted at each fovea.

Description. Color and luster: Rufous. Dorsal surface bright metallic coppery green. Form: Head (Fig. 25a) behind eyes moderately elongate, tapered in male, rounded in female, occiput dimpled. Elytron (Fig. 25b) with apex markedly lobed medially, lateral tooth moderately small, sutural angle rounded, not projected acutely, but prolonged; foveae in interneurs 2,4, and 6 very large, adjacent intervals constricted at each fovea. Sternum VI (Fig, 25c) deeply V-notched in male, shallowly V-notched in female. Aedeagus (Fig. 25d) with ostium elongate, apex quadrate, longer than wide. Size: medium, 13.8 to 17.5mm in length, 3.4 to 4.6mm in width.

Other specimens examined. Costa Rica: 86 paratypes, 46 females, 40 males, from the following Conservation Areas: La Amistad Pacifico, Arenal Tilarán, Cordilleria Volcánica Central, Guanecaste, Tortuguero. Costa Rica, Alajuela, 1m, 790m, March, (H. J. Lezama)(MIUCR: ADP108575), 1m, 1f, 840m, March, (H. J. Lezama)(MIUCR: ADP108581, ADP108583), 1f, P.N. Volcán Tenorio, Upala, Bijagua, Albergue Heliconias, Sendero Heliconias, 700m, LN 422600,299100, April, (A. Lopez)(INBIO: INB0003476210), 1f, August, (A. Lopez)(INBIO: INB0003302213), 1m, 1f, November, (W. Porras)(INBIO: INB0003421011, INB0003421012), 1m, Upala Sector, Alto Los Brenes, 650m, LN 300600,422800, May, (A. Lopez)(INBIO: INB0003328227), 1f, Dos Rios, Finca San Gabriel, 600m, 85°22'W 10°50'N, May, (II curso Parataxonomos)(INBIO: CRI000644731), 1f, Alajuela, Peñas Blancas, 84°37'W 10°04'N, March, (E. Cruz)(CMNC: ADP005548), 1f, April, (E. Cruz)(CMNC: ADP005552), 1m, September - October (E. Cruz)(CMNC: ADP005549), 1f, 1m, December (E. Cruz)(UASM: ADP005589, ADP005590), 1m, Sect. San Ramon de Dos Rios, Hda. Nueva Zelandia, 620m, LN 318100,381900, July, (D. Briceño)(INBIO: CRI002468971), 1f, August, (F.A. Quesada)(INBIO: CRI002483507), 1f, September, (C. Cano)(INBIO: CRI002146268), 1m, 3f, Río San Lorencito, 850m, 84°35'W 10°13'N, LN 245500,470800, March, (A. Azofeila)(INBIO INB0003035066 INB0003035065), (R.A. Zuñiga)(INBIO: INB0003025841), (C. Viquez)(INBIO: INB0003025465), 1f, Sector Colonia Palmareña, 700m, LN 245900,475900, April, (E. Fletes)(INBIO: CRI002248223); Cartago, 1m, 1250m, 83°46'22”W 9°43'02”N, August, (F.A. Quesada)(INBIO: CRI000485925), 1f, Tucurrique, 83°43'W 9°51'N, (MNHP: ADP001947), 1m, IICA EXPERIMENTAL STATION ñ CATIE, Turrialba, Rio Reventazon, 600m, 83°39'W 9°53'N, LN 574947,208307, September, (G. Fonseca) (INBIO:CRI002093230), 1m, January, (F.T. Hovore)(FTHC:

ADP006384), 1m, June, (E. Giesbert)(FSCA: ADP004425), 1f, (WAR: ADP004066), 1m, (A. Heyne)(WAR: ADP004060); Guanacaste, 1m, A.C.G. Liberia Mayorga, Estacíon Primario, 1000m, LN 322740,375198, March, (Espinoza)(INBIO: INB0003359189), 1m, Bagaces, Fortuna, Sendero Cabro Muco, 980m, LN 299151,410000, June, (A. Lopez)(INBIO: INB0003328390), 2f, 1m, Guanacaste, 9.0 km S Santa Cecilia, Estacíon Pitilla, 700m, 85°25'40" W 10°59'26"N, LN 330200,380200, January, (GNP Biodiversity Survey)(INBIO: CRI001024198, CRI001024200, CRI001024208), 1f, (P. Rios)(INBIO: CRI000605989), 1m, 2f, February, (P. Rios, C. Moraga, & R. Blanco)(INBIO: CRI000175875, CRI000175854, CRI000124346), 1m, (P. Rios)(INBIO: CRI001961467), 1m, March, (GNP Biodiversity Survey)(INBIO: CRI000034318), 1f, (C. Moraga)(INBIO: CRI002524455), 2m, (P. Rios, C. Moraga, & R. Blanco)(INBIO: CRI000211525, CRI000211528), 1f, 1m, April, (GNP Biodiversity Survey)(INBIO: CRI000090738, CRI001024199), 1m, (C. Moraga)(INBIO: CRI000748636), 1f, April, (P. Knight)(INBIO: CRI000336602), 1m, (C. Moraga)(INBIO: CRI000637525), 1f, (P. Kazan, C. Moraga, & R. Blanco)(INBIO: CRI000211526), 1m, (P. Rios)(INBIO: CRI000615374), 1m, May, (F. Araya)(INBIO: CRI000805112), 1m, (Z. Fuentes)(INBIO: CRI000734037), 1m, (C. Moraga & P. Rios)(INBIO: CRI000166083), 1f, 2m, (C. Moraga)(INBIO: CRI000342062, CRI000409528, CRI002047454), 1f, (GNP Biodiversity Survey)(INBIO: CRI001024207), 1f,1m, (P. Opler)(INBIO: CRI000959387, CRI000389746), 1m, July, (GNP Biodiversity Survey)(INBIO: CRI000129484), 1m, August, (C. Moraga)(INBIO: CRI001869856), 2f, September, (C. Moraga & P. Rios)(INBIO: CRI000609350), 1f, (P. Rios)(INBIO: CRI002005180, CRI000609311), 1m, November, (P. Opler)(INBIO: CRI001355290), 1m, (C. Moraga)(INBIO: CRI002018042), 1f, 1m, (P. Rios)(INBIO: CRI000389747, CRI000959394), 1m, December, (GNP Biodiversity Survey)(INBIO: CRI001024209), 1f, (P. Opler)(INBIO: CRI000610299), 1f, (C. Moraga)(INBIO: CRI001975285), 1f, Volcán Cacao, Estacíon Cacao,1000 ñ 1400m, 85°25'40"W 10°59'26"N, LN 323300,375700, April, (C. Chaves)(INBIO: CRI000633297); Heredia, 1f, 1m, 3.0 km S Puerto Viejo, Finca La Selva, Estacíon Biologica La Selva, 50 ñ 150m, 84°00'32"W 10°25'55"N, LN 535500,268000, January, (F.T. Hovore)(FTHC: ADP006447 ADP006448), 1f, January, (P.J. Landolt)(USNM: ADP004428), 2f, October, (Paul Hanson)(MIUCR: ADP100517 ADP100519), 1f, July, (H.A. Hespenheide)(HAH: ADP006915), 1f, April, (INBIO: CRI000627519), 1m, February, (H.A. Hespenheide)(HAH: ADP005091), 2f, April, (H.A. Hespenheide)(HAH: ADP005090 ADP005092); Limón, 1f, Cariari, Sector Cerro Cocori, Finca de E. Rojas, 150m, 83°42'29"W 10°35'29"N, LN 285700,568400, January, (E. Rojas) (INBIO: CRI001675492), 1f, Estacíon Hitoy Cerere, 100m, LN 643400,184600, January-December, (G. Carballo)(INBIO: INB0003430486), 1m, Estacíon Hitoy Cerere, Rio Cerere, Send. Bobocara, 740m, 83°01' W 9°40' N, LN 184750,639500, May, (W. Arana)(INBIO: INB0003114978); Puntarenas, 1f, 4.0 km S San Vito de Java, Coto Brus, Estacíon Biológica Las Alturas, 1520m, 83°50'17"W 8°47'07"N, LS 591100,322800, January,

(M.A. Zumbado)(INBIO: CRI000401758), 1m, Quepos, 80m, 84°09' W 9°24' N, LS 370900,448800, (INBIO: CRI001393998).

Specific epithet. The specific epithet, *catbellae*, is the Latinized genitive form of the combined name of the actress starring on the current TV program "JAG," Catherine Bell. These beetles share the forest with an elegant cat, the Jaguar.

Notes. This species has been collected more often than any other *Agra* in INBio's inventory process except the ubiquitous *A. strangulata*. An illustration of purpurea-group stylomere 2 is on the *Agra purpurea* web page.

The **rufiventris** species-group

Diagnostic combination: Labrum flat, entire. Elytra with markedly and evenly punctulate interneurs; apex slightly lobed between lateral and sutural angles. Metasternum of male densely pubescent; abdominal sterna each with long scattered setae. Apex of sternum VI angulate laterally, corner obtuse. Male legs unmodified, similar to females. Aedeagus with apex a simple lobe, ostium elongate.

The *rufiventris* species-group is used here for the first time to begin the separation of Liebke's (1940) mixed "*brevicollis* Obergruppe" into natural components along with the *zumbado* group mentioned above. The remaining "*brevicollis* group" members Liebke included occur only in South America. Members of the *rufiventris* species-group range from Mexicó to Bolivia and east to Bahia, Brazil.

In addition to the 2 species described below this group also includes *A. rufiventris* Bates.

***Agra delgadoi* Erwin, new species**
(Figs. 26a, 26b, 26c, 26d)

Holotype. Male, Panamá, Panamá Province, Cerro Campana, 800m, 08º40'N 79º56'W, July, (H. Stockwell)(USNM: ADP59923).

Diagnosis. This is the only species of *Agra* in Costa Rica with metallic purple nearly truncate elytra, and completely pale antennae.

Description. Color and luster: Rufopiceous. Elytra metallic purple. Venter and appendages paler; antennomeres 4-11 testaceous. Surface shiny. Form: Head (Fig. 26a) of female behind eyes short, hind angles rounded. Pronotum and prosternum finely punctate, prothorax widest at middle. Elytron with apex (Fig. 26b) slightly oblique, lateral tooth small, sutural apex rounded, not projected acutely, apical margin very slightly emarginate. Aedeagus (Fig. 26d) with ostium short, apex rounded, shorter than wide; parameres unisetose. Size: small, 8.5 to 10.0mm in length, 2.30 to 2.66mm in width.

Other specimens examined. Three female paratypes. Costa Rica: Tortuguero and Cordillera Volcánica Central Conservation Areas. Costa Rica: Limón, Tortuguero National Park, Cerro Tortuguero, 0m - 120m, LN 285000,588000, April (R. Delgado)(INBio: CRI000242885); Cartago, Turrialba, CATIE, 600m, 09º53'N 83º38'W, May (H. & A. Howden)(USNM: ADP66237). Panamá, Panamá Province, Cerro Campana, 800m, 08º40'N 79º56'W, July, (H. Stockwell)(USNM: ADP68252).

Specific epithet. The specific epithet, *delgadoi*, is the Latinized genitive form of the family name of the collector of one of the secondary type specimens, parataxonomist, Roberto Delgado of Cartago, Costa Rica.

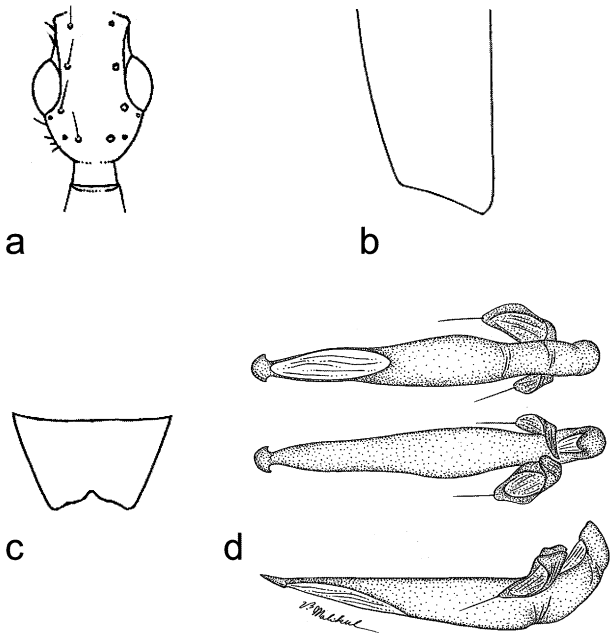

FIGURE 26. *A. delgadoi*, male, dorsal aspect: a) head; b) apex of elytron; c) Sternum VI, male (top), female (bottom), ventral aspect; d) aedeagus, dorsal (top), ventral (middle), left lateral (bottom) aspects. Measures (mm): HL = 1.6; WE = 1.2; SW = 2.1; AL = 2.6.

***Agra julie* Erwin, new species**
(Figs. 27a, 27b, 27c)

Holotype. Female, **COSTA RICA:** Cartago, Turrialba, 600m, 09º53'N 83º38'W, (CAS: ADP10007).

Diagnosis. This is the only species of *Agra* in Costa Rica with brassy nearly truncate elytra and moderately long pubescence on the venter of the prothorax. Head quadrate behind with a marked dimple on the occiput.

Description. Color and luster: Rufous. Elytra brassy green. Appendages rufotestaceous. Form: Head (Fig. 27a) behind eyes short, hind angles quadrate; vertex dimpled. Pronotum and prosternum finely punctate, prothorax broad, widest at middle. Elytron with apex (Fig. 27b) slightly oblique, lateral tooth small, sutural apex rounded, not projected acutely, apical margin very slightly lobed. Metasternum of male densely pubescent; trochanter and abdominal sterna each with long scattered setae. Apex of sternum VI (Fig. 27c) angulate laterally in male, in female corner obtuse. Male legs unmodified, similar to females. Size: small, 9.0 to 11.0mm in length, 2.98 to 3.38mm in width..

Other specimens examined. Costa Rica: 4 paratypes, 3 females, 1 (very teneral) male, from the following Conservation Areas: Cordillera Volcánica Central, Osa, Pacifico Central. Costa Rica, Cartago, 1f, Turrialba, 83°38'W 9°53'N, (O. Bryant)(CAS: ADP10006), 1m, January, (V.M. Kirk)(UASM: ADP21784); Puntarenas, 1f, P.N. Manuel Antonio, Quepos, 80m, 84°09'W 9°24'N, LS 370900, 448800, August, (G. Valera)(INBIO: CRI001-318173), 1f, Piedras Blancas, 24.0 km W, 200m, March - May, (P. Hanson)(UCOR: ADP100533).

Specific epithet. The specific epithet, *julie*, is a used as a noun in apposition honoring Julie Parenas, past Entomology Department secretary at CAS (Depository for the Holotype of this species), who has contributed so much to the welfare of that department and its curators and staff beyond the job description.

Notes. An illustration of rufiventris-group stylomere 2 is on the *Agra rufiventris* web page. The available male is so teneral that dissection of the aedeagus proved impossible.

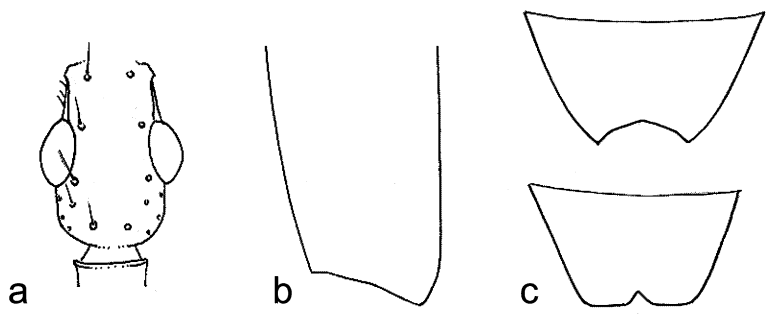

FIGURE 27. *A. julie*, female, dorsal aspect; a) head; b) apex of elytron; c) Sternum VI, male (top), female (bottom), ventral aspect. Measures (mm): HL = 1.8; WE = 1.5; male SW = 2.7, female SW = 3.1.

The **soccata** species-group

Diagnostic combination of the soccota species-group includes the following: Elytra with interneurs of large, poorly organized foveae; apex more or less truncate, with small lateral tooth, sutural tooth absent. Male abdominal sterna III and IV with small bilateral patches of long setae; posterior tibia excavated and densely setiferous apico-medially.

These 2 species belong to the soccata species-group whose overall distribution ranges from México to Colombia.

***Agra ichabod* Erwin, new species**
(Figs. 28a, 28b)

Holotype. Female, COSTA RICA: Alajuela, Atenas, 9º58'N 84º23'W, May, (C. Aviles)(UCOR) ADP7607.

Diagnosis. This is the only species of Costa Rican *Agra* with aeneous elytral foveae and slightly oblique apex without a sutural tooth; foveae nearly contiguous.

Description. Male unknown. Color and luster: Rufopiceous, aeneous. Legs rufopiceous with slightly infuscated knees; venter rufoaeneous. Foveae of interneurs with metallic blue reflections. Form: Head unknown. Pronotum with large punctures along each side of midline. Female slender, with elytra slightly flared behind middle. Elytron with apex (Fig. 28a) moderately oblique, lateral tooth small, sutural apex rounded; foveae of interneurs large and positioned irregularly, some separated by their own diameter, other coalesced. Sternum VI (Fig. 28b) of female nearly truncate. Size: small, 12mm in length (length of head estimated based on proportions of *Agra monteverde* Erwin (see below), 3.0mm in width.

Other specimens examined. The female Holotype is the only specimen I saw.

Specific epithet. The specific epithet, *ichabod*, is used as a noun in apposition, and refers to the fact that the Holotype is missing its head and the illusion is that of the frightened Schoolteacher Ichabod Crane's phantom nemesis, the Headless Horseman, in The Legend of Sleepy Hollow from The Sketchbook of Geoffrey Crayon, by the American author, Washington Irving, published in 1819-20.

Notes. The Holotype is from the Cordillera Volcánica Central Conservation Area. This very distinctive species is represented only by the female Holotype, which is headless, however, its unique elytral attributes justify giving it a name and bringing it to the attention of collectors. The head may be described later, based on discovery of a second, complete, specimen. The closely related species, *Agra soccata* Bates of Panamá with which this female agrees in attributes provided the information on male attributes, hence my assignment of this species to the soccata group.

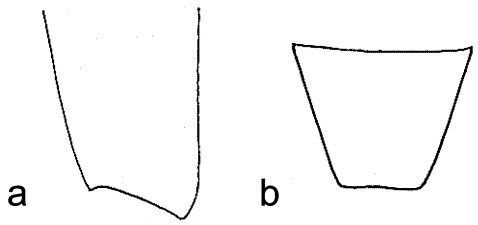

FIGURE 28. *A. ichabod*, female, dorsal aspect; a) apex of elytron; b) Sternum VI, female, ventral aspect. Measures (mm): WE = 1.5; SW = 2.8.

***Agra monteverde* Erwin, new species**
(Figs. 29a, 29b, 29c, 29d)

Holotype. Female, COSTA RICA: Puntarenas, Monteverde, 1380m, 10º50'N 85º37'W, January, (F.T. Hovore)(USNM: ADP93375).

Diagnosis. This is the only species of Costa Rican *Agra* with aeneous elytral foveae and slightly oblique apex without a sutural tooth AND foveae separated by their own diameter or more.

Description. Color and luster: Castaneous. Legs paler than body and with infuscated knees; antennomeres infuscated apically. Form: Male unknown. Body and legs castaneous, legs paler than body and with infuscated knees. Head (Fig. 29a) behind eyes elongate, posteriorly rounded. Female slender, with elytra slightly flared behind middle, apex (Fig. 29b) slightly oblique, lateral tooth very small, sutural apex rounded. Sternum VI (Fig. 29c) with shallow emargination in female. Stylomere 2 (Fig. 29d). Size: medium, 15.1mm in length, 3.8mm in width.

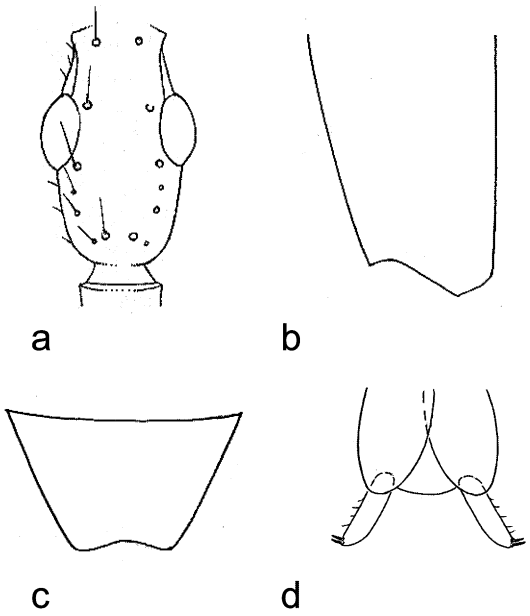

FIGURE 29. *A. monteverde*, female, dorsal aspect; a) head; b) apex of elytron; c) Sternum VI, ventral aspect; d) stylomere 2, ventral aspect. Measures (mm): HL = 2.8; WE = 1.9; SW = 3.6; S2L = 0.4.

Other specimens examined. The female Holotype is the only specimen I saw.

Specific epithet. The specific epithet, *monteverde*, is used as a noun in apposition, and refers to the type locality, Monteverde, Costa Rica.

Notes. The Holotype is from the Arenal Tilarán Conservation Area. The closely related species. *Agra soccata* Bates of Panamá with which this female agrees in attributes

provided the information on male attributes, hence my assignment of this species to the soccata group.

The **zumbado** species-group

Diagnostic combination: Labrum flat, entire. Elytra with markedly and evenly punctulate interneurs; apex moderately lobed between lateral and sutural angles. Metasternum and abdominal sterna II-V of male densely pubescent, sternum VI with long scattered setae. Apex of sternum VI angulate laterally, corner slightly obtuse. Male legs unmodified, similar to females. Aedeagus with apex a broad axe-shaped lobe, ostium elongate, parameres glabrous.

The zumbado species-group is used here for the first time to begin part of the separation of Liebke's (1940) mixed "brevicollis Obergruppe" into natural components, as described above.

The range of this species-subgroup with one species known at present is Costa Rica.

***Agra zumbado* Erwin, new species**
(Figs. 30a, 30b, 30c, 30d)

Holotype. Male, COSTA RICA: Guanacaste, Guanacaste National Park, Estacíon Pitilla, 9.0 km S Santa Cecilia, 700m, 10°59'26"N 85°25'40"W, April, (C. Moraga & P. Rios)(INBio: CRI000-166003).

Diagnosis. This is the only species of Costa Rican *Agra* with ferrugineus venter and appendages and bright brassy elytra and tri-dentate elytral apex.

Description. Color and luster: With ferruginous venter and appendages and bright brassy elytra. Form: Head (Fig. 30a) behind eyes short, quadrate with broadly rounded hind angles. Elytron with striatio-punctate interneurs, 2, 4, and 6 with setigerous foveae; apex (Fig. 30b) slightly oblique, lateral tooth small, sutural apex rounded, not projected acutely, margin slightly lobed at middle. Male metasternum, abdominal sterna 2-6, and trochanters densely pubescent. Middle tibia of male with sparse medial brush. Sternum VI (Fig. 30c) of male shallowly V-shaped with acute posterio-lateral angles, that of female deeply notched medially with obtuse posterio-lateral angles. Aedeagus (Fig. 30d) with ostium elongate; apex of aedeagus a broad medieval axe-shaped lobe, parameres glabrous. Size: Small: 11.0 to 12.0mm in length, 3.48 to 3.62mm in width.

Other specimens examined. Costa Rica: 3 paratypes, 1 female, 2 males, from the Guanacaste Conservation Area. Costa Rica, Guanacaste, 1m, March, (C. Moraga & R. Blanco)(INBIO: CRI000-211532), 1f, March - April, (C. Moraga)(INBIO: CRI000-748607), 1m, May, (P. Rios)(INBIO: CRI001-877475).

Specific epithet. The specific epithet, *zumbado*, is used as a noun in apposition based on the family name of the collector of many interesting *Agra* specimens, ex-parataxonomist, and now INBio Inventory chief, Manuel A. Zumbado of San Antonio de Belén, Heredia, Costa Rica.

Notes. This species features all the external attributes of typical purpurea group members, however, I have classified it in its own subgroup because of the shorter stylomere 2 and the broad-ax shape of the aedeagal apex.

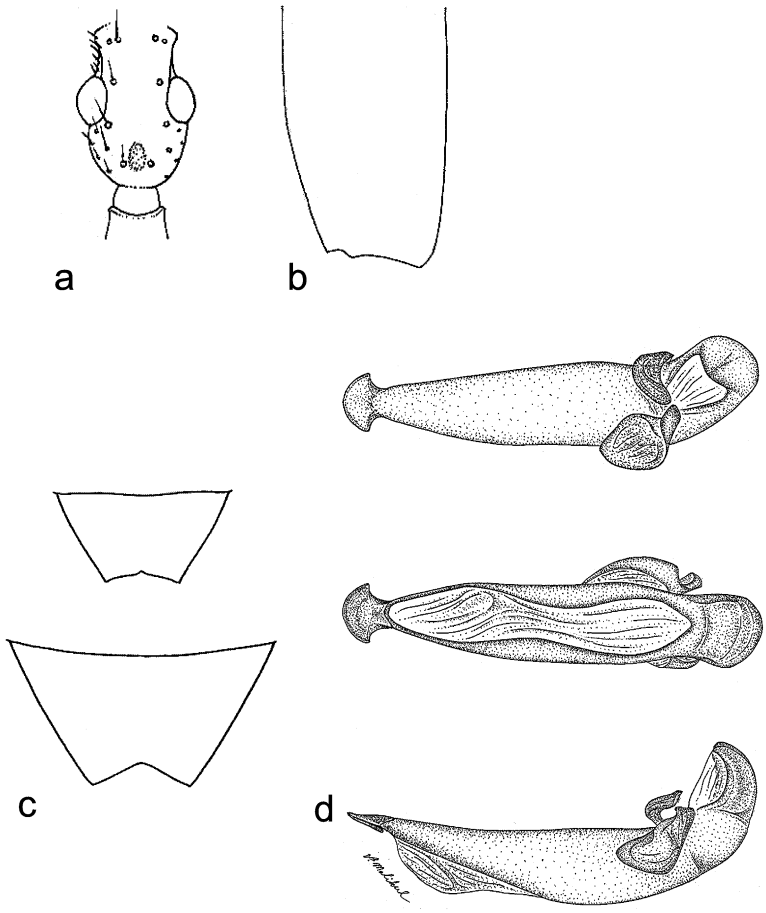

FIGURE 30. *A. zumbado*, male, dorsal aspect: a) head; b) apex of elytron; c) Sternum VI, male (top), female (bottom), ventral aspect; d) aedeagus, dorsal (top), ventral (middle), left lateral (bottom) aspects. Measures (mm): HL = 1.7; WE = 1.8; male SW = 3.2, female SW = 3.4; AL = 3.0.

The **zuniga** species-group

Diagnostic combination of the zuniga species-group includes the following: Elytra metallic purple with slightly prominent sutural and lateral dentiform projections. Male venter

with extensive accessory patches of setae; ostium of medium length, left pleuropic; apex subscimitariform.

The distribution of this group is known at present only from Costa Rica.

The following new species belongs to the new zuniga species-group.

***Agra zuniga* Erwin, new species**
(Figs. 31a, 31b, 31c, 31d, 31e)

Holotype. Female. COSTA RICA: Puntarenas, Manual Antonio National Park, Quepos, 80m, 09°23'N 84°09'W, February (R. Zuñiga)(INBio: CRI000-625744).

Diagnosis. *A. zuniga* adults do not have a raised median keel on the anterior portion of the pronotal disc (Fig. 31c) as in *A. pia*, although the area appears "polished."

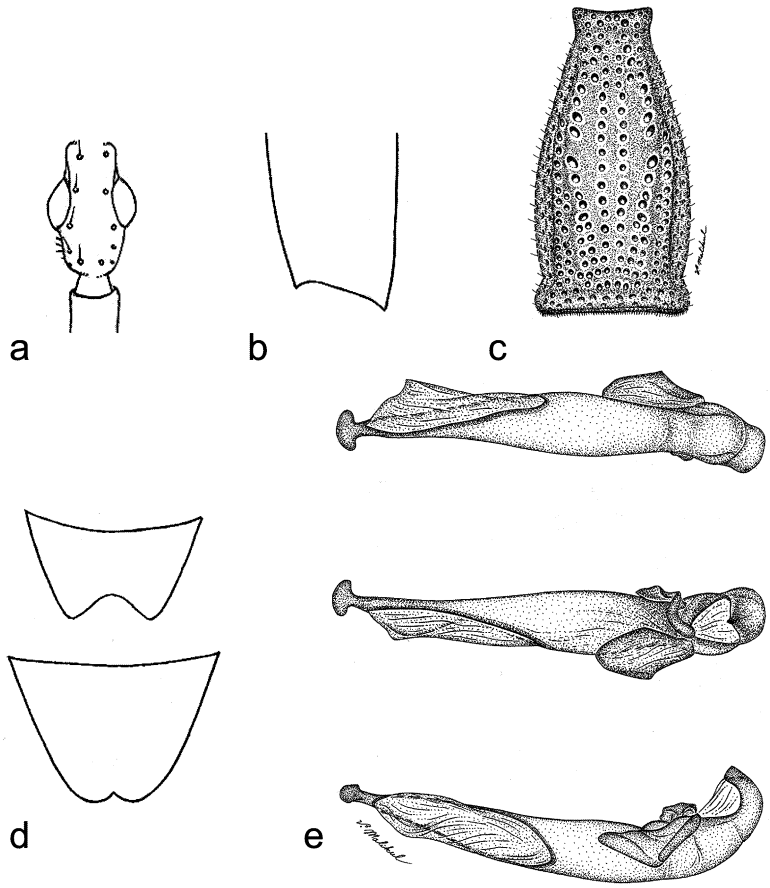

FIGURE 31. *A. zuniga*, male, dorsal aspect: a) head; b) apex of elytron; c) prothorax; d) Sternum VI, male (top), female (bottom), ventral aspect; e) aedeagus, dorsal (top), ventral (middle), left lateral (bottom) aspects. Measures (mm): HL = 1.9; PL = 2.8; WE = 1.8; male SW = 3.0, female SW = 3.0; AL = 3.2.

Description. Color and luster: Head and pronotum black, elytra metallic purple, legs and venter very dark rufous, infuscated; surface shiny. Form: Head (Fig. 31a) behind eye moderately elongate, quadrate, slightly rounded in female. Pronotum (Fig. 33c) without a raised median keel on the anterior portion. Elytron (Fig. 31b) with apex slightly oblique, projected acutely at both sutural and lateral corners, dentiform projections small, margin nearly straight medially. Male venter with extensive accessory patches of setae on metasternum, posterior coxae, trochanter, and abdominal sterna II-VI. Sternum VI (Fig. 31d) deeply U-notched in male, shallowly V-notched in female. Aedeagus (Fig. 31e) with apical orifice moderately short, left pleuropic; apex a transverse ellipse. Size: small, 12.0 to 12.1mm in length, 3.2mm in width.

Other specimens examined. Costa Rica: 1 paratype, male, also from the Pacifico Central Conservation Area. Costa Rica, Puntarenas, 1m, Res. Biol. Carara, Estacíon Quebrada Bonita, 50m, LN 194500,469850, May, (R. Zuñiga)(INBIO: CRI000-195164).

Specific epithet. The specific epithet, *zuniga*, is used as a noun in apposition honoring the collector of the Holotype specimen, parataxonomist, Rodolfo Zuñiga of Orotina, Alajuela, Costa Rica.

Notes. Both known specimens are damaged. I selected the female as Holotype because it is a more complete specimen.

Acknowledgements

I heartily thank the following for their efforts at making this a respectable treatment of the new *Agra* species from Costa Rica: George Ball and an anonymous reviewer for many excellent suggestion of which I incorporated nearly all (even so, any mistakes that might remain are my fault); the Smithsonian's Vichai Malikul for illustrations and the recently retired George Venable for teaching me how to put them together in Adobe Illustrator; the Smithsonian's Warren Steiner for dissections and directing the artwork; my personal research assistant, Milagros Servat, for data basing all the specimens in FileMakerPro; David Kavanaugh and Wendy Moore, my partners in the Costa Rica Carabid Project for continuing encouragement and making sure I had all the *Agra* specimens they came across as they processed collections. And, special thanks to the team at INBio, Alvaro Herrera, Angel Solis, Elena Ulate Arce, María Auxiladora Sanchez, and Rodrigo Gamez for their many forms of assistance, whenever and wherever I needed it.

A list of codens for museums and private collections used in this publication and the Costa Rica Carabidae Project in general, their addresses, and curators in charge of said collections will soon be found at the INBio web site: see the "Information Services" icon on the home page and go to Carabidae. I thank all the curators and technicians listed there for their support with loans over many, many years.

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Literature cited

Arndt, E., Kimse, S. & Erwin, T.L. (2001) Arboreal beetles of Neotropical forests: *Agra* Fabricius, larval descriptions with notes on natural history and behaviour (Coleoptera, Carabidae, Lebiini, Agrina). *The Coleopterists Bulletin*, 55(3), 297-311.

Bates, H.W. (1878) On new genera and species of geodephagous Coleoptera from Central America. *Proceedings of the Scientific Meetings of the Zoological Society of London*, 1878, 587-609.

Bates, H.W. (1883) Biologia Centrali-Americana, Insecta, Coleoptera, Carabidae, Cicindelidae supplement. 11, 153-256.

Chevrolat, L.A.A. (1856) Diagnoses de six carabiques découverts par M. A. Sallé, au Mexique. *Revue et Magasin de Zoologie*, 8, 351-352.

Csiki, E. (1932) Carabidae: Harpalinae VII, pars 124. *In*, Schenkling, S. (ed.), Coleopterorum Catalogus, W. Junk, Berlin.

Erwin, T.L. (1978) Systematic, natural history, and zoogeographic notes on the Genus *Agra* Fabricius, with a description of a new species from Panamá (Coleoptera: Carabidae: Lebiini). *The Coleopterists Bulletin*, 32(4), 261-268.

Erwin, T.L. (1983) *Agra*, arboreal beetles of Neotropical forests: famula and formicaria groups systematics (Carabidae). *Systematic Entomology*, 8, 263-292.

Erwin, T.L. (1984) *Agra*, arboreal beetles of Neotropical forests: palmata species-group systematics (Carabidae). *Systematic Entomology*, 11, 293-316.

Erwin, T.L. (1986) *Agra*, arboreal beetles of Neotropical forests: *mixta*-group, *virgata*-group, and *ohausi*-group systematics (Carabidae). *Systematic Entomology*, 11, 293-316.

Erwin, T.L. (1991) *Agra*, arboreal beetles of Neotropical forests: rufoaenea and quararibea group systematics (Carabidae). *Revista peruana de Entomologia*, (1993) 34, 15-28.

Erwin, T.L. (1996) Arboreal Beetles of Neotropical Forests: *Agra* Fabricius, the *cayennensis* complex (Coleoptera: Carabidae: Lebiini: Calleidina). *Annales Zoologici Fennici*, 33(1),17-21.

Erwin, T.L. (1998) Evolution at the equator arboreal and alticolous beetles and their taxon pulses with descriptions of a new *Agra* subclade and its species (Coleoptera: Carabidae: Lebiini). *In:* Ball, G.E. Casale, A. & Vigna Taglianti, A. (Eds). *Phylogeny and classification of Caraboidea (Coleoptera: Adephaga)*. Proceedings of a Symposium (28 August, 1996, Florence, Italy), XX International Congress of Entomology Museo Regionale Scienze Naturali- Torino, Atti. Torino, pp 491-510.

Erwin, T.L. (2000a) Arboreal beetles of Neotropical forests: *Agra* Fabricius, the Novaurora Complex (Coleoptera: Carabidae: Lebiini: Agrina). *Smithsonian Contributions to Zoology*, No. 608, pp. i-iv, 1-33.

Erwin, T.L. (2000b) A new genus and species of Lachnophorini and two new species of Lebiini from Costa Rica (Coleoptera: Carabidae). *Coleopterists Bulletin*, 54(3), 279-283.

Erwin, T.L. & Kavanaugh, D.H. (1981) Systematics and Zoogeography of *Bembidion* Latreille: I. The *carlhi* and *erasum* Groups of Western North America (Coleoptera: Carabidae: Bembidiini). *Entomologica scandinavica*, Supplement 15, 33-72.

Erwin, T.L., Kavanaugh, D.H. & Moore, W. (2002) Key to the Tribes and Genera of Costa Rican Carabidae (Coleoptera). http://www.inbio.ac.cr [Information Services icon].

Erwin, T.L. & Pogue, M.G. (1988) *Agra*, arboreal beetles of Neotropical forests: Biogeography and the forest refugium hypothesis (Carabidae). *In:* Heyer, W.R. & Vanzolini, P.E. (Eds.), *Neotropical Distribution Patterns: Proceedings of a 1987 Workshop*. Proceedings of the Brasilian Academy of Sciences, pp. 161-188.

Fabricius, J.C. (1801) *Systema eleutheratorum*, I, 506 pp. Hafniae.

Liebke, M. (1938) Beschreibung neuer Arten der Gattung *Agra* F. Coleoptera-Carabidae. *Proceedings of the Royal Entomological Society of London, B*, 7, 53-72.

Liebke, M. (1940) Bausteine zu einer Monographie der Gattung *Agra* Fabr. (Coleoptera). *Folia Zoologica et Hydrobiologica,* 10(1, 2), 1-258.

Straneo, S.L. (1955) Sul genere *Agra* Fabricius (Coleoptera Carabidae). *Bulletin de Institut Royal de Sciences Naturelles de Belgique*, 31, 1-28.

Straneo, S.L. (1965) On some species of the genus *Agra* F. Coleoptera, Carabidae. *Annales Zoologici*, 19, 459-481.

Straneo, S.L. (1982) Nuove specie del genere *Agridia* Chaudoir et *Agra* Fabricius Coleoptera, Carabidae. nelle Collezioni del Laboratoire d'Entomologie del Muséum National d'Histoire Naturelle di Parigi. *Annales de la Société Entomologique de France*, 18, 391-417.

