

## The genus *Dacne* Latreille (Coleoptera: Erotylidae) in tropical America

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**Abstract.** A new species of *Dacne* Latreille from Brazil, *D. (Dacne) ducke*, n. sp., and a new specimen of *Dacne brodzinskyi* Skelley (amber fossil) show characteristics presently unreported for the genus. *Dacne ducke* is the first member of the tribe Dacnini to be discovered in South America. A checklist of species and updates to an identification key for all known species are presented.

### Introduction

Skelley (1997) reviewed the genus *Dacne* to describe a fossil species, *D. brodzinskyi* Skelley. Since that time, a new fossil specimen of *D. brodzinskyi* has been discovered in which the entire ventral surface is visible. Structures now visible, including mouthparts, firmly establish this species as a member of the genus *Dacne* as presently understood, and confirmed features that make it unique in the genus.

Being primarily a Holarctic genus, the discovery of a new species of *Dacne* from the Amazon Basin was quite a surprise. Closer examination of all available species show that *D. brodzinskyi* and this new Amazonian species share one character not seen in any other member of the genus; a narrow, anteriorly arched meso-metasternal suture. This narrow meso-metasternal articulation is similar to that occurring in most members of the Pharaonothinae, Xenocelinae, and Loberinae, and would indicate a similar monocondylic internal articulation. Most erotylines and cryptophilines possess a broad, straight meso-metasternal suture with a dicondylic internal articulation. Due to insufficient materials the number of condyles in the internal articulation was not confirmed for the new species.

Preliminary phylogenetic analyses of the subfamily Erotylinae have been published by Wegrzynowicz (2002), who studied relationships primarily within erotylines, and Leschen (2003), who used erotylines as exemplar taxa in an extensive analysis of the old families Languriidae and Erotylidae. Both analyses conclude the family Languriidae is paraphyletic in regards to the Erotylidae and merge the old Languriidae+Erotylidae into a single family, the Erotylidae. Both Wegrzynowicz and Leschen place the genus *Dacne* and tribe Dacnini at the base of the Erotylinae lineage. All members of the tribe Dacnini,

including its supposed relatives, need a thorough analysis to understand the relationships between the basal Erotylinae and the remaining members of the Erotylidae (*sensu* Wegrzynowicz 2002 and Leschen 2003).

For various reasons, descriptions of *Dacne* species by Narukawa (1992), Nikitsky and Kompantzev (1995), and Ashida and Kim (1999) were not included in Skelley (1997). This work supplements the description for *D. brodzinskyi*, describes this new species, and updates the key and checklist to the world's species.

### *Dacne brodzinskyi* Skelley

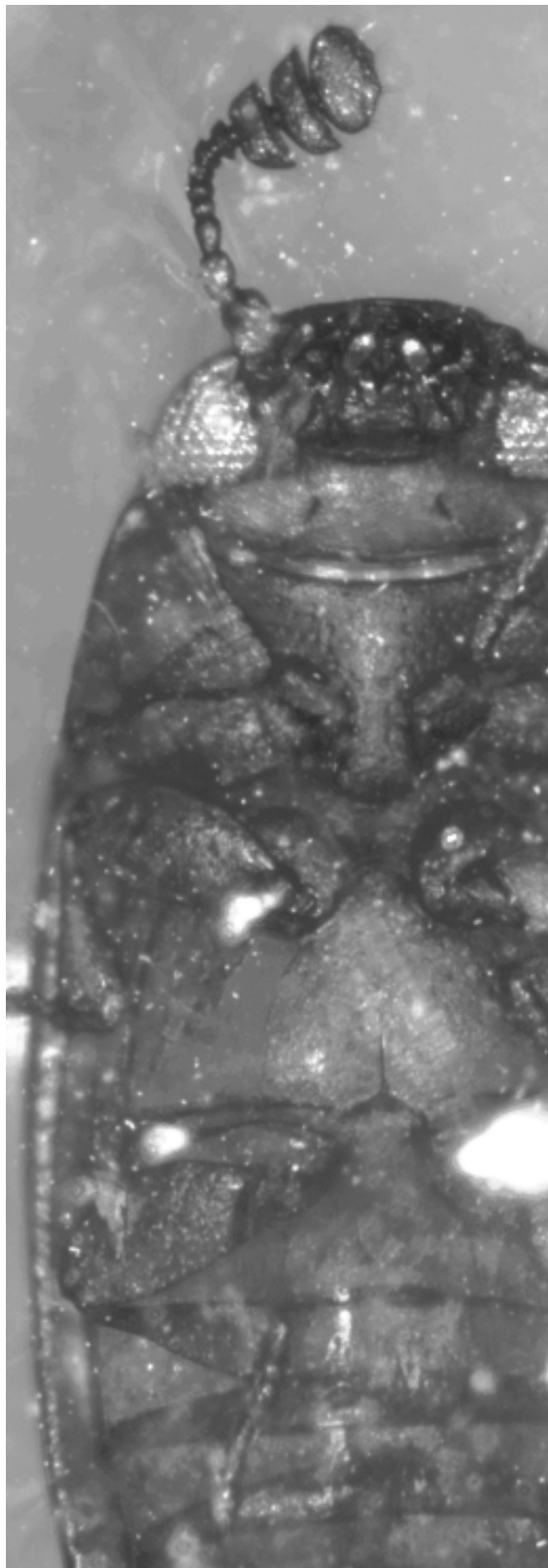
Fig. 1

*Dacne brodzinskyi* Skelley 1997: 51-52.

**Diagnosis:** This species is only known from fossils in Dominican amber. It is readily recognized from all other members of the genus by its dilated tibia (Fig. 1).

**Description:** The following list of characters is presented to supplement the original species description.

Length = 1.9 mm. Maxillary and labial terminal palpomeres acuminate (Fig. 1). Mentum broad, width = 2.5 x width, weakly triangular (as most members of the genus). Prosternum coarsely punctate, puncture size = 0.75 x eye facet diameter; prosternum with anterior edge straight, narrow and rounded basally, basal width less than procoxal diameter; prosternal lines weak, not extending forward onto prosternum. Meso-metasternal suture short (Fig. 1), length distinctly less than mesocoxal diameter, anteriorly arched. Abdomen with distinct coxal line. All legs with tibiae triangularly expanded at apex.



**Figure 1.** *Dacne brodzinskyi* Skelley, ventral view.

**Specimen studied:** The new specimen was presented to me by the late Jake Brodzinski and is deposited in my personal collection (PESC).

***Dacne ducke* Skelley, n.sp.**

**Diagnosis:** This species is easily recognized from all known members of the genus by its small body size, distinct color pattern having entirely yellow-orange elytra with black head and pronotum (Fig. 2), narrowed prosternum, and narrow, anteriorly arched meso-metasternal suture. It is the only known member of the genus from South America.

**Description:** Length = 1.8 mm. Width = 0.8 mm. Body stout, elongate, lacking any dorsal setation. Head, prothorax and antennal club black; pterothorax red-brown; abdomen, elytra, legs, palpi and base of antennae yellow-orange.

Head (Fig. 5) width between eyes = 4 x eye diameter in dorsal view; punctuation coarse, sparse, separated by 5-6 puncture diameters; epistome truncate, lacking marginal line on anterior margin; stridulatory files not evident. Antenna (Fig. 3) reaching middle of pronotum; antennomere III equal in length to II, 1.5 x longer than IV; antennomere IV-VII quadrate; antennomere VIII same length as VII, wider than long; each of antennomeres IX-XI width = 2 x length, 2 x longer than VIII. Maxillary and labial terminal palpomeres acuminate (Fig. 4), sensory area restricted to apex. Mentum broad with anterior projection, almost triangular, slightly more than 2 x wider than long.

Pronotum (Fig. 2) arched, anterior margin projecting in front of anterior angles (typical for the subgenus *Dacne*); base with complete margin; puncture size and density as on head. Scutellum transverse, width = 2 x length. Elytra margined basally; strial punctures confused, although study under normal lighting revealed subcutaneous discoloration of the strial punctures allowing for easy recognition.

Prosternum (Fig. 6) with anterior edge straight, lacking margin; posterior process narrow, rounded, width less than diameter of procoxa; prosternal lines apparently lacking; punctures coarse, diameter = eye facet, separated by 1-3 puncture diameters. Meso-metasternal suture medially short, distinctly shorter than width of mesocoxa, distinctly arched anteriorly. Meso- and metasternum with punctures as on prosternum. Abdomen with distinct coxal lines on first ventrite nearly attaining posterior margin. Legs with tibia not dilated at apex.

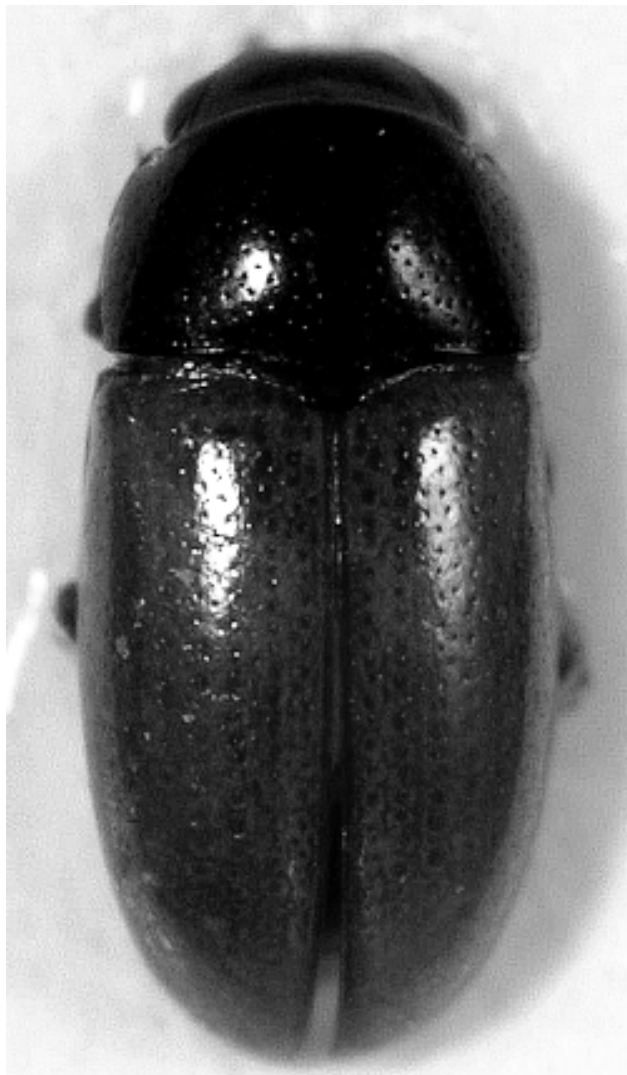


Figure 2. *Dacne ducke* Skelley, holotype, dorsal view.

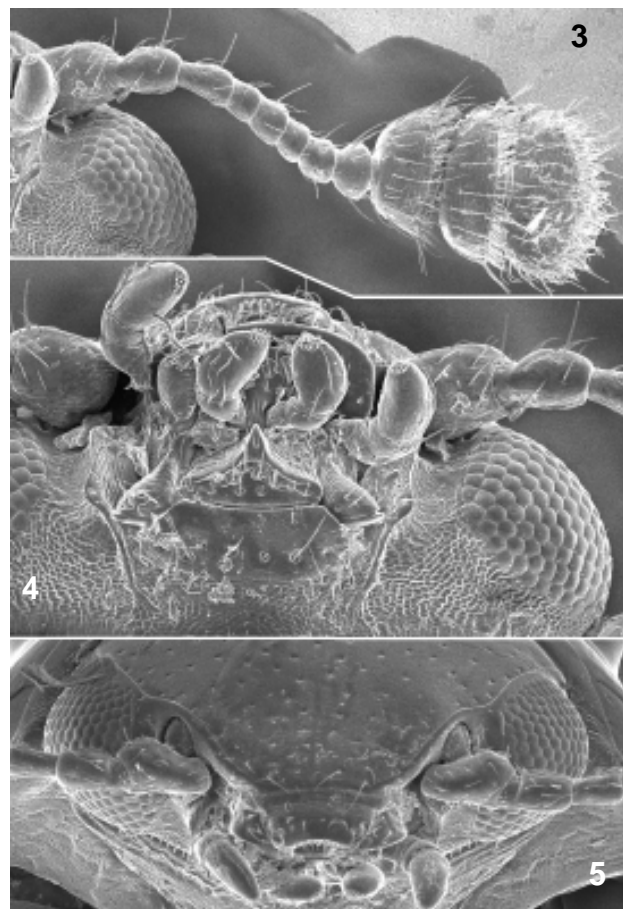
Male genitalia (Fig. 7) with median lobe short, apically pointed; median strut length = 3 x median lobe; tegmen with parameres long, flattened, tightly fitting basal piece and each other.

**Holotype:** Male. Label data: “[white paper] BRAZIL: Amazonas [underlined with green], Reserva Ducke, 26km NE Manaus, Hurtado, J.C.G. / [left half of label green] *Eschweilera atropetiolata* 2.v.1996 / [left half of label pink] Tree No. 5, Tray No. 9 / [yellow label with black border] C91.2 / [red label] HOLOTYPE *Dacne* (*Dacne*) *ducke* P.E.Skelley 2003 /”. It is deposited in the Natural History Museum, London [NHML], and is on a card mount with genitalia on a separate card.

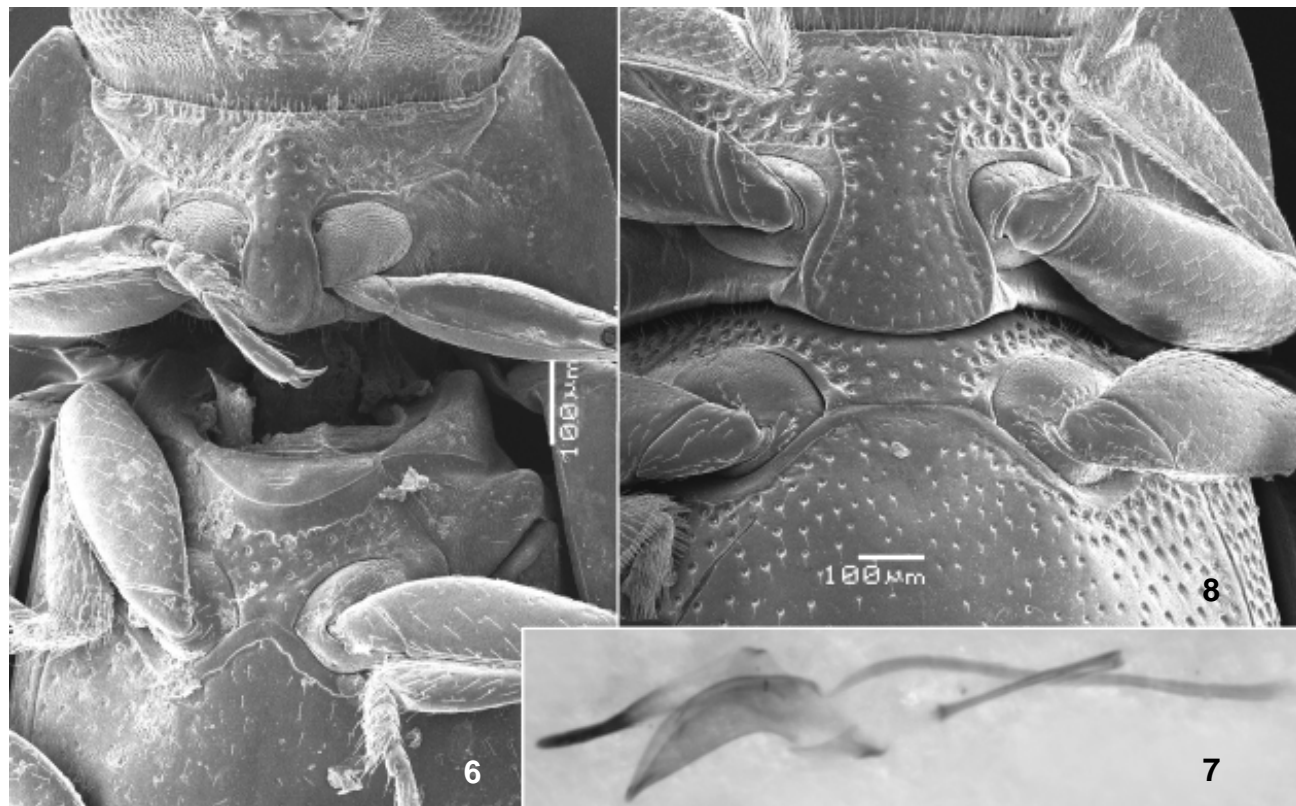
**Additional Specimen:** A single paratype male did not differ significantly from the holotype in any feature studied. The label data are identical to those of the holotype except: “... / [left half of label pink] Tree No. 5, Tray No. 6 / ...” [NHML].

**Etymology.** The species is named for the reserve in which the type specimens were collected; the Reserva Ducke, near Manaus, Amazonas, Brazil (noun in apposition).

**Remarks:** *Dacne ducke* is the first member of the genus and tribe to be recognized in South America. Specimens were collected in a canopy fogging study in the Reserva Ducke (pers. comm. M. Brendell, NHML via M.Barclay). This opens whole new phylogenetic and zoogeographic hypotheses that will take much more work and specimens to explore. For example, a study of female genitalia for *D. ducke* (female unknown) would help confirm a number of questions about its placement within the genus.



Figures 3-5. *Dacne ducke* Skelley, holotype; 3). antenna, ventral view; 4). head, ventral view; 5). head, anterior view.



**Figures 6-8.** *Dacne* spp.; 6-7. *Dacne ducke* Skelley, holotype; 6). thorax, ventral view; 7). genitalia. 8). *Dacne quadrimaculata* (Say), thorax, ventral view

### Update to world key

The genus *Dacne* should be revised on a world basis. Within the subgenus *Dacne*, there appears to be three groups of species. First are the species *D. brodzinskyi* and *D. ducke* which lack prosternal lines, have a short, arched meso-metasternal suture, have typical antennal club development, and are found in tropical America. Second is a group of species near *D. japonica* Crotch which lack prosternal lines, have a long, straight meso-metasternal suture, have enlarged antennal clubs, and are found from tropical Asia to Japan. Lastly are the typical species which have prosternal lines extending forward beyond the procoxae, have a long, straight meso-metasternal suture, have typical sized antennal clubs, and occur throughout the Holarctic. Because several species are presently unavailable for study, these groups are not formally established, nor is the validity of any previously described species evaluated here.

The following key is updated from that in Skelley (1997). A star by the name indicates that specimens were not studied and key characters are based on the species description.

1. Pronotal disc punctures distinctly larger than punctures at base near scutellum (Fig. 1 in Skelley 1997); metasternal coxal lines distinct, long; elytral base not margined; Africa [Sg. *Afrodacne* Delkeskamp] ..... 24
- Pronotal disc punctures same size as punctures at base near scutellum (Figs 2-3 in Skelley 1997); metasternum lacking coxal lines; elytral base margined or not; northern hemisphere ..... 2
- 2(1). Pronotal lateral margin thin for entire length (Fig. 4 in Skelley 1997); pronotum swollen anteriorly, projecting forward beyond anterior pronotal angles (Figs 2, 8 in Skelley 1997); widespread, northern hemisphere [Sg. *Dacne* Latreille] ..... 7
- Pronotal lateral margin thickened, often broader anteriorly (Fig. 5 in Skelley 1997); pronotal anterior margin normal, not projecting forward beyond anterior angles (Fig. 3 in Skelley 1997); western North America and Japan [Sg. *Xenodacne* Boyle] ..... 3
- 3(2). Body primarily black; elytra black with distinct orange markings; Japan ..... 4
- Body primarily brown; elytra without distinct markings, or with weakly defined stripes; western North America ..... 5

- 4(3). Each elytron with one orange mark; pronotum black ..... *D. (X.) zonaria* Lewis  
 — Each elytron with two orange markings; pronotum orange ..... *D. (X.) maculata* Chûjô
- 5(3). Prosternal lines not extending in front of procoxae; epistome elliptical, separated from vertex by a distinct suture ..... *D. (X.) cyclochilus* Boyle  
 — Prosternal lines extending in front of procoxae; epistome not separated from vertex ..... 6
- 6(5). Elytra with fine basal margin; prosternal lines widely separated, lateral pronotal margin strongly swollen anteriorly, body dorsally glabrous ...  
 ..... *D. (X.) picea* LeConte  
 — Elytra without basal margin; prosternal lines narrowly separated; lateral pronotal margin weakly swollen anteriorly; body dorsally pubescent .....  
 ..... *D. (X.) pubescens* Boyle
- 7(2). Meso-metasternal suture shorter than mesocoxal diameter (Fig. 6), strongly arched anteriorly (tropical America) ..... 27  
 — Meso-metasternal suture as long as mesocoxal diameter (Fig. 8), straight or sinuate with middle arched posteriorly (Holarctic, primarily boreal) ..... 8
- 8(7). Antennomere IX broad, width greater than 2.5 times length; antennomere XI asymmetrical; club shape somewhat triangular (Fig. 6 in Skelley 1997); each elytron with one orange band at base, approaching the base near the humerus, but usually not touching base; head and pronotum orange (pronotal disc may be darkened) ..... 9  
 — Antennomere IX not broad, width usually less than 2.5 times length; antennomere XI symmetrical or not; club shape usually oval (Fig. 7 in Skelley 1997); color not as above, basal elytral mark (if present) broadly touching base, usually a simple spot; head and pronotum orange or black ..... 12
- 9(8). Head with broad, dorsal groove between eyes; Sri Lanka ..... *D. (D.) pulchella* Arrow  
 — Head lacking notable groove ..... 10
- 10(9). Orange elytral mark a jagged diagonal band; Japan ..... *D. (D.) japonica* Crotch  
 — Orange elytral mark smoothly rounded ..... 11
- 11(10). Pronotum entirely orange ..... 28  
 — Pronotum with darkened disc; Japan, Korea .....  
 ..... *D. (D.) picta* Crotch
- 12(8). Elytron unicolor, entirely reddish-brown ..... 13  
 — Elytron distinctly bicolored, black with orangish basal spot ..... 14
- 13(12). Procoxal lines lacking; body entirely reddish-brown; India ..... *D. (D.) indica* (Crotch)  
 — Procoxal lines extending forward beyond coxae; body usually darker ventrally, elytra usually with basal spot; western North America .....  
 ..... *D. (D.) californica* (Horn)
- 14(12). Elytron black with basal and apical spot ..... 15  
 — Elytron black with basal spot only ..... 17
- 15(14). Head and pronotum reddish-brown; antennomeres IX and XI same width ..... 16  
 — Head and pronotum black; antennomere XI distinctly wider than antennomere IX; eastern USA and Canada ..... *D. (D.) quadrimaculata* (Say)
- 16(15). Pronotal disc punctures dense, separated by less than their diameter; western North America ...  
 ..... *D. (D.) californica* (Horn)  
 — Pronotal disc punctures sparse, separated by more
- 17(14). Metasternum reddish, contrasting with black of elytra ..... 18  
 — Metasternum dark, not contrasting with elytra ..... 19
- 18(17). Pronotum black; Japan ..... *D. (D.) kidoi* Nakane  
 — Pronotum red ..... 30
- 19(17). Head and pronotum same color, not contrasting ..... 20  
 — Reddish head and black pronotum contrasting in color ..... 22
- 20(19). Head and pronotum black; Europe, Siberia .....  
 ..... *D. (D.) notata* (Gmêlin)  
 — Head and pronotum reddish-brown; Europe, western North America ..... 21
- 21(20). Basal elytral spot poorly defined, often lacking, when present large and occupying most of elytral base; western North America .....  
 ..... *D. (D.) californica* (Horn)  
 — Basal elytral spot well defined, small, occupying less than half of elytral base; Europe, Siberia .....  
 ..... *D. (D.) bipustulata* (Thunberg)
- 22(19). Elytral mark not reaching epipleural fold, broadly separated ..... 23  
 — Elytral mark reaching epipleural fold; Europe, western Asia ..... *D. (D.) pontica* (Bedel)
- 23(22). Each elytral spot width a third of body width; Europe, Siberia ..... *D. (D.) rufifrons* (Fabricius)  
 — Each elytral spot width a quarter of body width; Japan ..... *D. (D.) fungorum* Lewis
- 24(1). Antennal club strongly elongate, length = 2 times width ..... *D. (A.) clavata* Delkeskamp\*

- Antennal club not strongly elongate, length = 1.4 times width ..... 25
- 25(24). Punctures of elytral stria strong; eyes coarsely faceted; each elytron with a basal and apical mark (possibly forming a band) .....  
..... *D. (A.) aequinoctialis* (Thomson)
- Punctures of elytral stria fine; eyes finely faceted; markings variable ..... 26
- 26(25). Pronotum and elytra entirely reddish-brown .....  
..... *D. (A.) rufa* Delkeskamp\*
- Pronotum and elytra with black marks .....  
..... *D. (A.) nigropicta* Delkeskamp\*
- 27(7). Tibia dilated (Fig. 1 and Skelley 1997: Figs. 8-10); Dominican Republic (amber fossil) .....  
..... *D. (D.) brodzinskyi* Skelley
- Tibia not dilated (figs. 6); Brasil (extant) .....  
..... *D. (D.) ducke*, n.sp.
- 28(11). From Thailand and Burma .....  
..... *D. (D.) optabilis* Gorham
- From Chejudo Island, South Korea .....  
..... *D. (D.) osawai* Ashida and Kim\*
- 29(16). Pronotum entirely reddish-brown; basal elytral mark not continuous across base, black near scutellum; Caucasus .....  
..... *D. (D.) semirufula* (Reitter)
- Pronotum with dark basal mark; pale basal elytral mark continuous across base, reddish-brown near scutellum; Russian Far East .....  
..... *D. (D.) minima* Nikitsky and Kompantzev\*
- 30(17). Elytra with base entirely reddish; Japan .....  
..... *D. (D.) akitai* Narukawa\*
- Elytra with black mark over scutellar area; Japan .....  
..... *D. (D.) japonica* Crotch

### Checklist of known *Dacne* species

#### *Dacne* Latreille

- Sg. *Afrodacne* Delkeskamp  
*Dacne (Afredacne) aequinoctialis* (Thompson)  
*Dacne (Afredacne) clavata* Delkeskamp  
*Dacne (Afredacne) nigropicta* Delkeskamp  
*Dacne (Afredacne) rufa* Delkeskamp
- Sg. *Dacne* Latreille  
*Dacne (Dacne) akitai* Narukawa  
*Dacne (Dacne) bipustulata* (Thunberg)  
*Dacne (Dacne) brodzinskyi* Skelley [fossil]  
*Dacne (Dacne) californica* (Horn)  
*Dacne (Dacne) ducke* Skelley  
*Dacne (Dacne) fungorum* Lewis  
*Dacne (Dacne) indica* (Crotch)

- Dacne (Dacne) japonica* Crotch  
*Dacne (Dacne) kidoi* Nakane  
*Dacne (Dacne) minima* Nikitsky and Kompantzev  
*Dacne (Dacne) notata* (Gmelin)  
*Dacne (Dacne) optabilis* Gorham  
*Dacne (Dacne) osawai* Ashida and Kim  
*Dacne (Dacne) picta* Crotch  
*Dacne (Dacne) pontica* (Bedel)  
*Dacne (Dacne) pulchella* Arrow  
*Dacne (Dacne) quadrimaculata* (Say)  
*Dacne (Dacne) rufifrons* (Fabricius)  
*Dacne (Dacne) semirufula* (Reitter)

#### Sg. *Xenodacne* Boyle

- Dacne (Xenodacne) cyclochilus* Boyle  
*Dacne (Xenodacne) maculata* Chûjô  
*Dacne (Xenodacne) picea* LeConte  
*Dacne (Xenodacne) pubescens* Boyle  
*Dacne (Xenodacne) zonaria* Lewis

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**Note: After this paper was accepted for publication, a fourth specimen of *Dacne brodzinskyi* was discovered. It is deposited in the collection of Albert Allen, Boise, ID, USA.**