

Two new species of the genus *Orizabus* Fairmaire (Coleoptera: Scarabaeidae: Dynastinae) from southern and central Mexico

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Abstract

Two new Mexican species, *Orizabus vulcanicus* **sp. nov.** from Iztaccihuatl volcano (Puebla) and *Orizabus dechambrei* **sp. nov.** from the Omilteme mountains (Guerrero), are described. Drawings of the diagnostic structures of the new species and a key to the 14 species now included in the genus are provided.

Key words: Coleoptera: Dynastinae, Pentodontini, *Orizabus*, taxonomy, key, Mexico

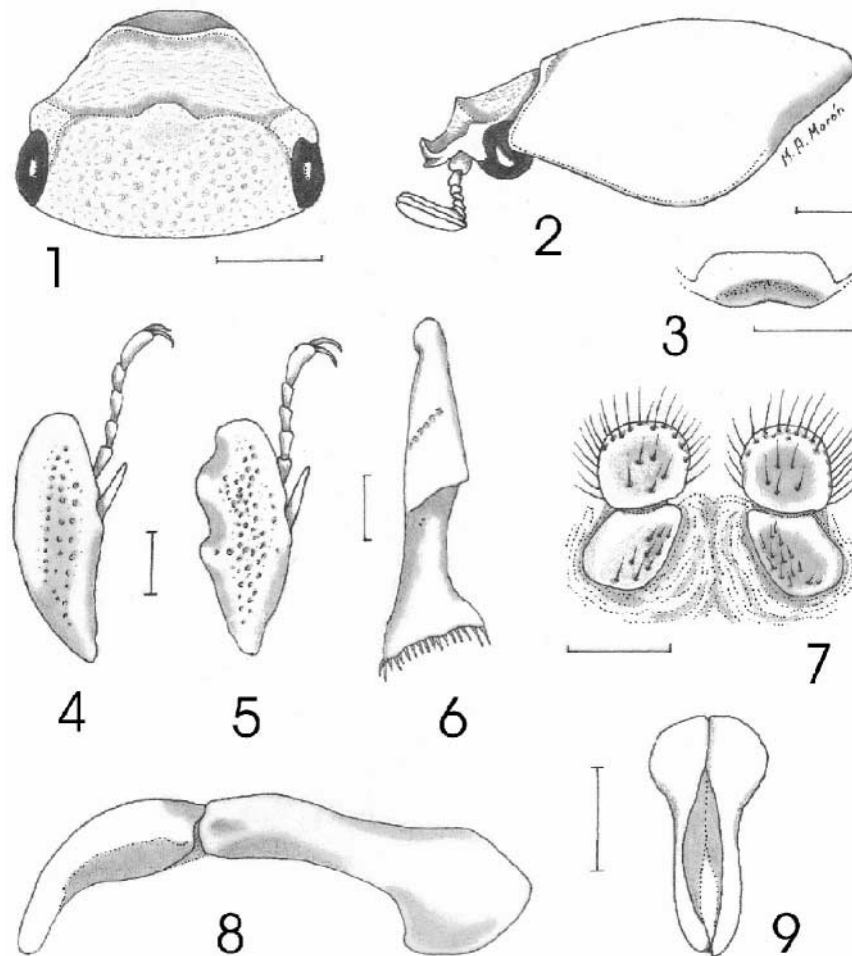
Introduction

Twelve species of the genus *Orizabus* Fairmaire are known from the southern United States, Mexico, Guatemala, and Nicaragua, but all the species occur in Mexico (Endrödi 1969, 1985; Morón 1981; Delgado-Castillo and Deloya 1990; Dechambre 1993; Ratcliffe 1994). Curatorial work of the specimens deposited in Mexican collections, as well as recent collection trips in the mountains of the state of Puebla provided specimens of two undescribed species of this genus.

Drawings were made with the aid of a camera lucida and stereomicroscope, and measurements were obtained using an ocular micrometer or caliper. Holotypes and allotypes are deposited in the collection M. A. Morón / Instituto de Ecología, Xalapa (MXAL/ IEXA). Paratypes are deposited in the same collection, the Muséum national d'Histoire naturelle, Paris (MNHN), and the University of Nebraska State Museum (UNSM).

Orizabus vulcanicus Morón, Tapia and Aragón, sp. nov. (Figs. 1-9)

Diagnosis. This species is distinguished from other *Orizabus* species by the following combination of characters: head with transverse clypeal carina straight, a weak tubercle on fronto-clypeal suture, antennae with 9 segments, pronotum without anterior tubercle and depression, male foretibia lacking teeth; female foretibia tridentate, female pygidium with fine keel along midline.



FIGURES 1-9. *Orizabus vulcanicus* Morón, Tapia and Aragón, sp. nov. 1- Male head, dorsal view; 2- Male head and pronotum, lateral view; 3- Male clypeal carina, frontal view; 4- Male foretibia, dorsal view; 5 - Female foretibia, dorsal view; 6- Male hindtibia, lateral view; 7- Female genital plates, ventral view; 8- Male genital capsule, lateral view; 9- Parameres, distal view. Scale bar 1 mm.

Description. Holotype. Male: Length 15.8 mm; width across humeri 8.1 mm. Color shiny reddish brown dorsally and ventrally. *Head:* clypeus with surface finely and transversely rugose; apex broadly rounded; transverse clypeal carina prominent, nearly straight.

Frons moderately convex, with numerous shallow punctures; with short, rounded tubercle on anterior margin at middle of fronto-clypeal suture. Interocular width equals 7.5 transverse eye diameters (Figs. 1-3). Antenna with 9 segments, club 1.2 times longer than stem. *Pronotum*: surface shiny, disc moderately punctate except along midline; punctures deep and round, with anterior angles rugopunctate. Anterior margin without tubercle and depression. Posterior margin with weak, marginal line, line broadly interrupted at middle. *Elytra*: surface with 7 impressed rows of small, round punctures between suture and lateral edge of humeral umbone, plus 1 short row at base of second interval, sides with 3 irregular rows. Intervals shiny. *Pygidium*: surface moderately convex in lateral view, finely rugopunctate at basal angles; disc nearly smooth, with sparse punctures. *Venter*: prosternal process short, weakly acuminate, densely clothed with long ferruginous setae. *Legs*: foretibia without teeth, blade-like (Fig. 4). Hindtibia with submedial transverse carina distinct (Fig. 6). *Parameres* (Figs. 8-9): apical portion of each paramere progressively curved, not expanded, without tooth or membranes.

Allotype. Length 17.2 mm; width across humeri 8.9 mm. As holotype except as follow: *Head*: tubercle on fronto-clypeal suture broad. *Pronotum*: posterior margin with middle of marginal line represented by punctures. *Pygidium*: disc with fine keel along midline and with weak, irregular, longitudinal striae on each side, striae becoming obsolete before apical border. *Legs*: foretibia nearly tridentate (Fig. 5). *Genital plates* (Fig. 7): basal plates subquadrate, with some short setae. Distal plates shallowly excavated, with apical border widely rounded, with many setae.

Variation (6 paratypes). Length 15.0-18.0 mm. Humeral width 7.0-9.0 mm. Disc of pygidium in females with midline keel shortened or lacking longitudinal striae on each side of keel.

Material examined (8 specimens). Holotype male: MEXICO. Puebla: Parque Iztacñhuatl-Popocatepetl, 3600 m, 9 March 2001, Col. A. M. Tapia (MXAL/IEXA). Allotype female: *ibid.* (MXAL/IEXA). Paratypes. *Ibid.*, 3 males, 2 females; *ibidem*, 3640 m, 15 Aug. 2002, Col. A. Aragón, 1 male (MXAL/IEXA; MNHN; UNSM).

Habitat. The specimens were collected during the sampling of soil in pine forest at 3600-3640 m elevation. *Orizabus vulcanicus* apparently is not attracted to lights. In the same locality males and females of *Orizabus rubricollis* Prell were observed flying in abundance during July, but they also were scarcely attracted to mercury vapor lights.

Geographical distribution (Fig. 10). This species is known only from Parque Iztacñhuatl-Popocatepetl, Puebla, Mexico.

Taxonomic relationships. *Orizabus vulcanicus* is in the group of species whose males lack a pronotal tubercle and pronotal depression and have the foretibia without teeth. This group also includes *O. rubricollis* Prell and *O. cuernavacensis* Delgado-Castillo and Deloya. The males of *O. vulcanicus* are easily separated from the other species in this group species by the antenna with 9 segments, small body size, and the apex of parameres without setae.

Etymology. The name refers to the volcanic area where the species was collected, the lower slopes between the volcanoes Iztaccíhuatl and Popocatepetl.

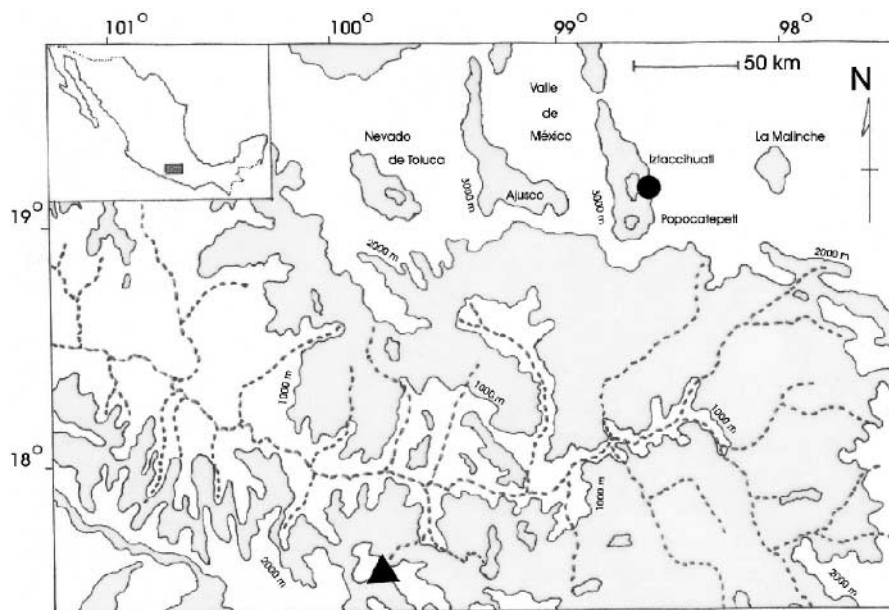


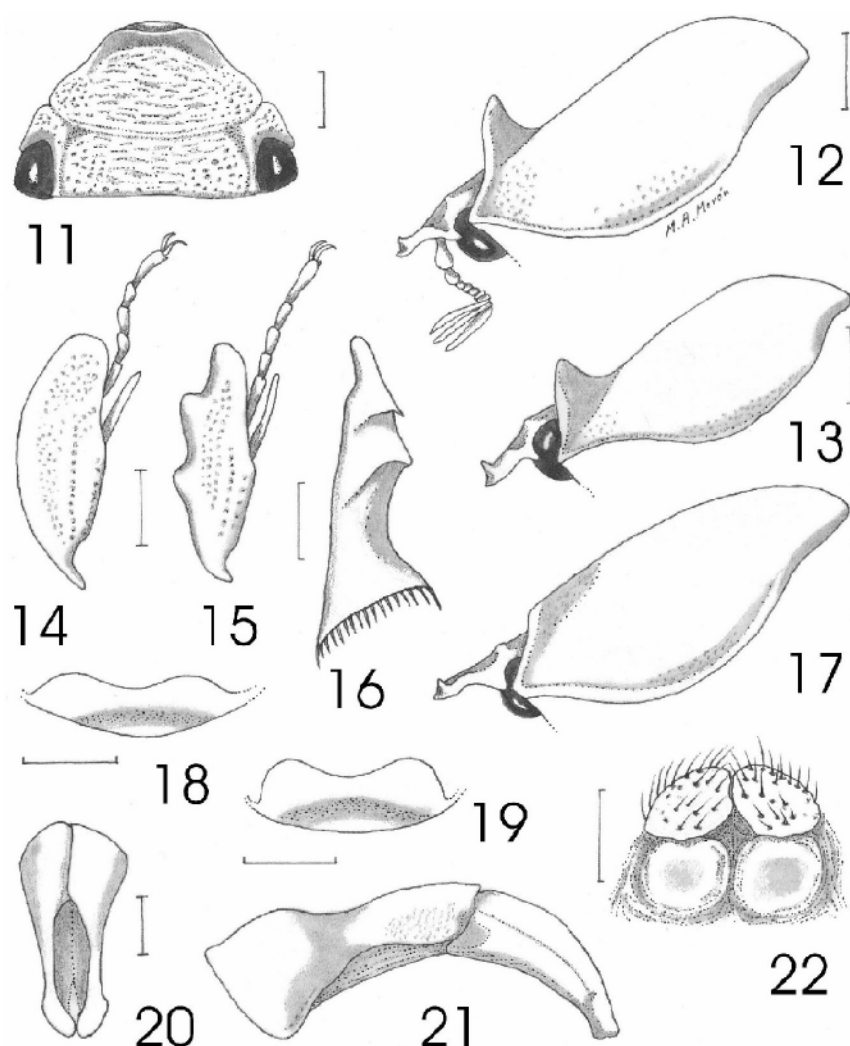
FIGURE 10. Distribution of *Orizabus vulcanicus* (●) and *Orizabus dechambrei* (▲).

***Orizabus dechambrei* Morón, Tapia and Aragón, sp. nov. (Figs. 11-22)**

Diagnosis. This species is distinguished from other *Orizabus* species by the following combination of characters: head with transverse clypeal carina sinuate, a small or weak tubercle on fronto-clypeal suture, antennae with 10 segments, pronotum with large anterior tubercle and wide depression, elytra weakly striate, male foretibia without teeth; female foretibia tridentate, female pygidium widely convex and without keel or depressions.

Description. Holotype. Male: Length 26.8 mm; width across humeri 13.9 mm. Color shiny dark brown dorsally and ventrally, nearly black on pronotum and slightly reddish on elytra. **Head:** clypeus with surface transversely rugo-punctate, apex broadly rounded, transverse clypeal carina prominent, sinuate. Frons moderately convex, densely rugopunctate, with small, weak, rounded tubercle on anterior margin at middle of carinate fronto-clypeal suture. Interocular width equals 4.8 transverse eye diameters (Figs. 11-12, 18). Antenna with 10 segments, club 1.4 times longer than stem. **Pronotum:** surface shiny, anterior half of disc densely punctate and aciculate, punctures deep and round, with anterior angles rugopunctate; posterior half of disc only aciculate near weakly furrowed midline, punctuation progressively dense toward sides. Anterior margin with large, horn-like tubercle and wide, deep depression behind tubercle (Fig. 12). Posterior margin with weak marginal line, line not interrupted at middle. **Elytra:** surface aciculate, with 3 weakly

impressed striae between suture and lateral edge of humeral umbone, plus 1 oblique stria near inner side of humeral umbone, sides without striae. Intervals inpunctate. *Pygidium*: surface strongly convex in lateral view, finely rugopunctate at basal angles; disc sparsely punctate, weakly aciculate, nearly smooth, with deep transverse pit before apex. *Venter*: prosternal process large, apex rounded, densely clothed with long, ferruginous setae. *Legs*: foretibia without teeth, blade-like (Fig. 14). Hindtibia with 2 distinct, submedial, transverse carinae (Fig. 16). *Parameres* (Figs. 20-21): Apical portion of each paramere abruptly expanded, without lateral tooth or accessory blades.



FIGURES 11-22. *Orizabus dechambrei* Morón, Tapia and Aragón, sp. nov. 11- Male head, dorsal view; 12- Holotype head and pronotum, lateral view; 13- Paratype *ibid*; 14- Male foretibia, dorsal view; 15- Female foretibia, dorsal view; 16- Male hindtibia, lateral view; 17- Allotype head and pronotum, lateral view; 18- Holotype clypeal carina, frontal view; 19- Paratype clypeal carina; 20- Parameres, distal view; 21- Male genital capsule, lateral view; 22- Female genital plates, ventral view. Scale bar 1 mm.

Allotype. Length 27.1 mm; width across humeri 13.5 mm. As holotype except as follows: *Head*: fronto-clypeal suture and frontal tubercle slightly larger. *Pronotum*: widely convex, without anterior tubercle and depression (Fig. 17); anterior half of disc densely punctate; posterior half of disc aciculate at middle, with deep punctures near latero-basal borders. *Pygidium*: surface slightly convex, without preapical transverse pit. *Legs*: foretibia nearly tridentate (Fig. 15). *Genital plates* (Fig. 22): basal plates subquadrate, without setae. Distal plates widely convex, with apical border widely curved, with many setae.

Variation (1 paratype). Length 24.2 mm. Humeral width 13.1 mm. Male: *Head*: clypeus with transverse clypeal carina prominent, deeply sinuate (Fig. 19). *Pronotum*: anterior margin with tubercle and fovea smaller (Fig. 13). *Elytra*: with 8 weak impressed rows of small, round punctures between suture and lateral edge of humeral umbone, plus 1 short row at base of second interval, sides with 4 irregular rows; 1 oblique stria near inner side of humeral umbone; intervals shiny, aciculate. *Pygidium* less convex.

Material examined (3 specimens). Holotype male: MEXICO. Guerrero: Rancho Omiltemi, 5 June 1985, Col. A. Luis (MXAL/IEXA). Allotype female: Guerrero, Tlacotepec, 6 km W Puerto del Gallo, El Iris, 2200 m, 4 August 1983, Col. A. Luis (MXAL/IEXA). Paratype male; Guerrero: Omiltemi, 5 July 1985, Col. I. Vargas (MXAL/IEXA).

Habitat. The specimens were collected on the soil in pine-oak or oak forests at 2200-2300 m elevation.

Geographical distribution (Fig. 10). This species is known only from Parque Ecológico Estatal Omiltemil and the surrounding areas near Chilpancingo, Guerrero, Mexico.

Taxonomic relationships. *Orizabus dechambrei* is in the group of species whose males have a pronotal tubercle and pronotal depression and have the foretibia lacking teeth. This group also includes *O. tuberculatus* Prell and *O. clunalis* LeConte. The males of *O. dechambrei* are easily separated from the other species in this group by the weak frontal tubercle, pronotum with wide and deep depression behind the anterior large, horn-like tubercle, elytra weakly striate or nearly smooth, and the apex of the parameres abruptly expanded, without lateral tubercles.

Etymology. This species is named after Roger-Paul Dechambre in recognition of his extensive work done on the Dynastinae of the world.

Key to species of *Orizabus* Fairmaire (Modified from Delgado-Castillo & Deloya, 1990)

- 1- Pronotum with tubercle and depression on anterior half 2
- Pronotum without tubercle or depression on anterior half..... 6
- 2- Frons with tubercle in middle of anterior border. External margin of foretibia without teeth or tridentate. Body length 21-27 mm 3
- Frons with straight transverse carina. External margin of foretibia bisinuate. Body length 14-19

- mm. Mexico *O. isodonoides* Fairmaire, male
- 3- External margin of foretibia without teeth, without emarginations. Frontal tubercle weak, short, rounded 4
- External border of foretibia tridentate. Frontal tubercle large, erect, with rounded apex. Mexico *O. subaziro* Ratcliffe, male
- 4- Clypeal carina straight. Apical third of parameres with 2 lateral tubercles. Mexico, Guatemala and Nicaragua *O. tuberculatus* Prell, male
- Clypeal carina sinuate, forming 2 rounded teeth. Apical third of parameres without tubercles. 5
- 5- Pronotum with narrow, deep depression behind small, anterior tubercle. Elytra deeply punctate-striate. Body length 21-26 mm. U.S.A. and Mexico *O. clunalis* LeConte, male
- Pronotum with wide, shallow depression behind large, anterior horn-like tubercle. Elytra weakly striate or nearly smooth. Body length 24-27 mm. Southern Mexico *O. dechambrei* sp. nov. male
- 6- Frons with transverse carina. External margin of foretibia tridentate. Body length 14-19 mm. Northwestern and central Mexico *O. isodonoides* Fairmaire, female
- Frons with tubercle on middle of anterior border. External margin of foretibia without teeth, bisinuate, or tridentate. Body length 14-28 mm 7
- 7- Antenna 9-segmented. Body length 15-18 mm. Central Mexico *O. vulcanicus* sp. nov. male and female
- Antenna 10-segmented. Body length 14-28 mm 8
- 8- External margin of foretibia without teeth 9
- External margin of foretibia bisinuate or tridentate 11
- 9- Transverse clypeal carina straight. Mexico, Guatemala and Nicaragua *O. tuberculatus* Prell, female
- Transverse clypeal carina sinuate, bidentate 10
- 10- Elytra with second interval smooth. Parameres with lateral carina on apical third, the apex notched and glabrous. Body length 20-24 mm. Mexico.... *O. rubricollis* Prell, male and female
- Elytra with second interval with scattered punctures near apical callus. Parameres without lateral carina on apical third, the apex entire and with long setae. Body length 15-19 mm. Southern Mexico *O. cuernavacensis* Delgado-Castillo and Deloya, male
- 11- Posterolateral area of pronotal disc sparsely punctate 12
- Posterolateral area of pronotal disc densely punctate 13
- 12- Apex of inner spur of hind tibia curved. Parameres short and widely bifurcate. Pygidium of female with deep preapical pit. Body length 16-18 mm. Hidalgo, Mexico *O. endrodianus* Morón, male and female
- Apex of inner spur of hind tibia straight. Parameres long and narrowed, weakly notched at apex. Pygidium of female without preapical pit. Body length 16-19 mm. Western and south-eastern Mexico *O. batesi* Prell, male and female
- 13- Pygidium densely, entirely rugopunctate. Body length 14-16 mm. U.S.A and northern Mexico. *O. pyriformis* LeConte, male and female
- Pygidium rugopunctate on base and sides 14
- 14- Elytra weakly striate or nearly smooth. Body length 24-27 mm. Southern Mexico..... *O. dechambrei* sp. nov. female
- Elytral deeply punctate striate. Body length 15-28 mm..... 15
- 15- Apex of metatibia with 15-18 spine-like setae. Pygidium without punctures on center of disc 16
- Apex of metatibia with 20-28 spine-like setae. Pygidium with minute or shallow punctures on

- center of disc 17
- 16- Body length 18-21 mm. Parameres with triangular, strong tooth near middle of lateral border. Oaxaca, Mexico *O. rawlinsi* Dechambre, male and female
- Body length 15-19 mm. Morelos, State of Mexico, Guerrero, and Jalisco, Mexico
..... *O. cuernavacensis* Delgado-Castillo and Deloya, female
- 17- Anterior margin of pronotum with middle of marginal bead broader than dorsal area of clypeal apex. Oaxaca and Guerrero, Mexico..... *O. subaziro* Ratcliffe, female
- Anterior margin of pronotum with middle of marginal bead as broad or narrower as dorsal area of clypeal apex 18
- 18- Central and basal area of pronotal disc with numerous deep, round punctures. Distal half of parameres narrowed, with preapical, rounded projection on lateral border. Body length 17-18 mm. Eastern and southeastern Mexico *O. fairmairei* Bates, male (female unknown)
- Central and basal area of pronotal disc with scattered, minute punctures or lacking punctures. Parameres without preapical, rounded projection on lateral border. Body length 20-28 mm. Southern U.S.A. and Mexico 18
- 19- Body length 20-23 mm. Parameres narrowed, curved outward, with a small tooth-like projection at middle of lateral border, slightly expanded and bifid at apex. Upper genital plates of female with basal projections and short setae..... *O. brevicollis* Prell, male and female
- Body length 22-28 mm. Upper genital plates of female without basal projections and long setae *O. clunalis* LeConte, female.

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