

A Revision of the South American Genus *Parathyreus* Howden and Martínez (Coleoptera: Scarabaeidae: Geotrupinae)

Author(s): Henry F. Howden

Source: *The Coleopterists Bulletin*, Vol. 39, No. 2 (Jun., 1985), pp. 161-173

Published by: The Coleopterists Society

Stable URL: <http://www.jstor.org/stable/4008130>

Accessed: 10-04-2018 16:15 UTC

## REFERENCES

Linked references are available on JSTOR for this article:

[http://www.jstor.org/stable/4008130?seq=1&cid=pdf-reference#references\\_tab\\_contents](http://www.jstor.org/stable/4008130?seq=1&cid=pdf-reference#references_tab_contents)

You may need to log in to JSTOR to access the linked references.

---

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <http://about.jstor.org/terms>



JSTOR

*The Coleopterists Society* is collaborating with JSTOR to digitize, preserve and extend access to *The Coleopterists Bulletin*

A REVISION OF THE SOUTH AMERICAN GENUS  
*PARATHYREUS* HOWDEN AND MARTÍNEZ  
(COLEOPTERA: SCARABAEIDAE: GEOTRUPINAE)

HENRY F. HOWDEN

Biology Department, Carleton University, Ottawa, Ontario K1S 5B6, Canada

ABSTRACT

The genus *Parathyreus* Howden and Martínez contains four previously described species: *bahiae* (Arrow) from Brazil and Paraguay, *fissicollis* (Arrow) from Brazil, *fulvescens* (Blanchard) from Bolivia, and *trituberculatus* (Klug) from Brazil; two new species, *lobatus* from Brazil, and *rectus* from Brazil and Paraguay, are now included. All six species are here described and illustrated and a key to the species is included.

---

The tribe Athyreini was proposed in 1963 by Howden and Martínez. In the same paper, the genus *Athyreus* Macleay was divided into four genera: *Athyreus* and three new genera, *Neoathyreus*, *Parathyreus* and *Pseudoathyreus*. Except for the African-Oriental genus *Pseudoathyreus*, all members of the tribe occur in Hispaniola and Cuba (Howden 1978) and from subtropical Mexico southward to northern Argentina. The genus *Athyreus* was revised by Howden and Martínez (1978) and all described New World species not in *Athyreus* were assigned to either *Neoathyreus* or *Parathyreus*. At that time the species *bahiae* Arrow and *fissicollis* Arrow were transferred to *Parathyreus*; previously the type of this genus, *trituberculatus* Klug, was the only assigned species. Subsequent examination of the type of *fulvescens* Blanchard showed that the species was incorrectly placed in the genus *Neoathyreus*, and it is now transferred to *Parathyreus*. Two new species are also placed in *Parathyreus*, bringing the total to six species presently in the genus. The South American species placed in *Neoathyreus* will be revised in a paper currently being prepared.

Abbreviations used in the text for museums are those listed by Heppner and Lamas (1982); also see list in Acknowledgments.

*Parathyreus* Howden and Martínez

*Parathyreus* Howden and Martínez, 1963:348; 1978:54.

TYPE SPECIES. *Athyreus trituberculatus* Klug, by original designation (Howden and Martínez 1963).

*Parathyreus* is separated from other Athyreini by the following combination of characters: anterior pronotal margin lacking large foveae; lateral pronotal margin abruptly cleft, the narrow break terminating in a circular fovea; fore coxa visible in lateral aspect through this fovea (the most readily recognizable generic character); elytron feebly, transversely carinate at base; distinct elytral striae obsolete or indicated by rows of punctures, most punctures each with fine seta; surface between striae and punctures shining; metasternum not carinate, rounded in front, convex medially; fore coxa extending to pronotal mar-

gin, coxal cavity with obtuse angulation or spine near lateral margin; under surface of fore tibia relatively smooth, base of anterior and penultimate teeth each with small ventral carina; hind tarsus long and slender, first segment moderately punctate, lacking carina; largest hind tibial spur extending to apical third of second tarsomere.

Except for slight differences in the shape of the pygidium there is no obvious sexual dimorphism.

There are a number of other characters that, while not unique to the genus, are shared by the species in *Parathyreus*. Some of these are as follows: labrum distinctly wider than long, with irregular transverse carina across apical third; clypeus trituberculate, median tubercle slightly anterior to lateral ones; tubercles connected by carina and median tubercle with additional carina on each side extending to anterior lateral clypeal angle; vertex flat to feebly concave, surface moderately to densely granulate, carina posterior to each eye ending in abruptly rounded angle; gena with outer angle slightly elevated, right-angled or abruptly rounded, gena distinctly wider than long; surface of pronotum granulate; scutellum approximately twice as long as wide (between elytra); pygidium feebly convex, apex often more broadly rounded in female than in male; fore tibia with six or seven teeth on outer margin (number often variable within a species); middle and hind tibiae each with well-developed apical and single subapical carinae.

These characters, along with the generic characters listed above, are not included in the species description unless a character varies from the above.

Most of the obvious external morphological differences between species occur on the pronotum, with differences in sculpture often evident on the head, pronotum, and elytra. The configuration of the parameres of the male genitalia is often useful for identification, but in at least two species with distinctly different pronotal characters the genitalia are very similar.

Determination of the limits of variation within and between species has been hampered by the lack of good series, compounded by the lack of precise locality data for many of the specimens. The lack of good series and poor locality data frequently make it impossible to distinguish between local versus geographic variation. Also, females outnumber males in collections by about four to one so that often both sexes are not recorded from one locality. These difficulties are further compounded by heterogonic or allometric growth affecting the development of the carinae and horns on the head and pronotum of both sexes. Large specimens of both sexes show nearly identical well-developed horns and carinae while small specimens may have these structures greatly reduced in size and to some degree in shape. Thus if a few large specimens were taken at one locality and several small specimens from a different area, they may show some consistent differences, but it is presently impossible to determine if these differences have any taxonomic relevance. Because of these problems I have taken a conservative approach, recognizing only consistently and conspicuously distinct populations as species.

The habits of *Parathyreus* are virtually unknown. All specimens bearing detailed collecting data were attracted to light. In this respect they are apparently similar in their flight activity to species of *Neoathyreus*, which are crepuscular and have very short flight periods. The use of flight interception traps placed in forested areas (Peck and Davies 1980) has collected series of some *Neoathyreus* and this type of trap probably will prove useful in collecting *Parathyreus* as well.

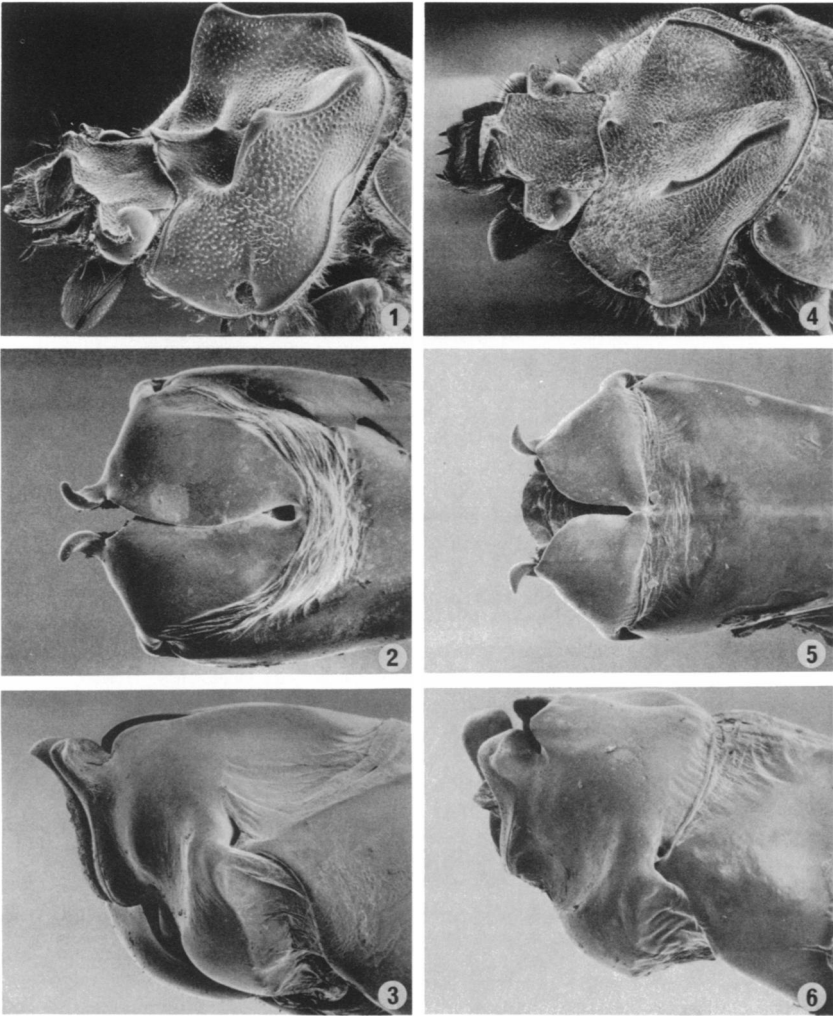
KEY TO THE SPECIES OF *PARATHYREUS* HOWDEN AND MARTÍNEZ

1. Anterior pronotal margin at midline with or without tubercle, but not abruptly elevated into transverse, carinate lobe ..... 2
  - Anterior pronotal margin behind vertex abruptly elevated into transverse carinate lobe, lobe approximately 1.5 mm wide and feebly indented at midline; Brazil ..... *lobatus* n. sp.
- 2(1). Pronotum with single median tubercle contiguous with anterior margin, occasionally with second minute tubercle present posteriorly on midline ..... 3
  - Pronotum with distinct median tubercle or horn just posterior to anterior margin, a small to minute tubercle also present on each side of median tubercle, one minute posterior median tubercle occasionally present ..... 4
- 3(2). Pronotal carina on each side of central concavity appearing sinuous when viewed from above, anterior angulation separated from opposite one by distance approximately equal to distance between outer edges of eyes; Bolivia ..... *fulvescens* (Blanchard)
  - Pronotal carina on each side of central concavity almost straight when viewed from above, anterior angulation separated from opposite one by distance distinctly less than distance between outer edges of eyes; Brazil, Paraguay ..... *rectus* n. sp.
- 4(2). The three tubercles near anterior pronotal margin nearly in straight transverse line or with median tubercle anterior in position ..... 5
  - The three tubercles near anterior pronotal margin with median tubercle posterior in position to line of lateral tubercles; Brazil, Paraguay ..... *bahiae* (Arrow)
- 5(4). The three tubercles near anterior pronotal margin in straight transverse line; pronotal ridge on each side of concavity distinctly cariniform; Brazil ..... *trituberculatus* (Klug)
  - The three tubercles near anterior pronotal margin with median tubercle anterior in position to lateral ones; pronotal ridge on each side of concavity rounded, feebly elevated; Brazil ..... *fissicollis* (Arrow)

*Parathyreus lobatus* Howden, new species

(Figs. 1-3, Map 1)

HOLOTYPE. Male, length 13.3 mm, greatest width 8.4 mm. Vertex flat, midline feebly impressed, anterior frons sharply elevated, shallowly concave. Pronotum (Fig. 1) with small fovea present on each side behind eye, diameter of fovea three times diameter of adjacent granule. Anterior margin of pronotum between foveae strongly elevated into broad, transverse lobe, lobe slanted anteriorly, feebly emarginate at midline. Pronotal midline approximately 1.0 mm posterior to lobe with small conical tubercle, pronotum on each side of tubercle with deep, circular concavity about 1 mm in diameter; these two concavities forming anterior portion of broad, shallow central concavity delimited on each side by a carina; much of midline of concavity feebly depressed, impunctate. Pronotal carina delimiting each side of concavity rising nearly vertically from side of circular concavity to abrupt angle; angle approximately 4.5 mm from opposite angle; carina depressed and inwardly arcuate to abruptly rounded posterior end approximately 0.5 mm from posterior margin and 0.9 mm from midline. Pronotum on each side with second, feeble arcuate carina between angulation of inner carina and posterior emargination of pronotal margin near elytral angle. Each elytron with striae indicated by depressed lines of punctures and small tubercles, each stria two or three punctures wide,



Figs. 1–3. *Parathyreus lobatus* n. sp. 1, head and pronotum. 2, male genitalia, dorsal view. 3, male genitalia, lateral view. Figs. 4–6. *P. fulvescens* (Blanchard). 4, head and pronotum. 5, male genitalia, dorsal view. 6, male genitalia, lateral view.

intervals narrow, mostly smooth, impunctate; most punctures each with relatively short (0.2 mm), recumbent seta, longer setae present laterally and posteriorly. Pygidium closely, shallowly rugose. Apex of genitalia as in Figures 2, 3.

**FEMALE.** Unknown.

**TYPE MATERIAL.** Holotype, male, Brazil, Go., Rio Verde, 19–28.XI.1966, G. R. Kloss Col. (MZSP).

Paratypes: 3 males, Brazil: 1, same locality as holotype; 1, Goyas, Jatahy, Felsche collection; 1, S. P., Anhembi, Barreiro Rico, II.1964, E. Dente leg.

Paratypes are in: SMTD, ZMHB, Howden.

REMARKS. While the pronotal characters of *lobatus* differ considerably from those of the other species in the genus, the genitalia are very similar to those of *bahiae*. Conversely, a number of other species in the genus are externally rather similar, but the male genitalia show major differences.

Two females that will key to *fulvescens*, one from Campininas, Mogi Guacu (CNC) and one from Jatahy (SMTD), are probably females of *lobatus*. The anterior median pronotal tubercle is larger and more laterally compressed than is typical for *fulvescens* and the carina on each side of the concavity is more elevated posteriorly. In the latter respect, the two females resemble *lobatus*, but the carinae are more widely separated posteriorly than in male *lobatus* and *lobatus* males lack the anterior median tubercle. Since none of the other species in the genus show sexual dimorphism, I hesitate to definitely place these un-associated females.

*Parathyreus fulvescens* (Blanchard), new combination  
(Figs. 4–6, Map 1)

*Athyreus fulvescens* Blanchard, 1837:190.

TYPE. Female labeled "6427, 1428, *Athyreus fulvescens* B1 [on white label], Museum Paris, Santa Cruz de la Sierra, D'Orbigny 1834," and "*A. fulvescens* Blanch. Bolivie, D'Orbigny [on green label]", and red "Holotype" label, in MHNP.

MALE. Length 11.8 to 13.5 mm, greatest width 7.4 to 8.1 mm. Vertex flat with midline shallowly depressed. Pronotum (Fig. 4) with fovea behind each eye very small with diameter equal to diameter of one adjacent granule. Anterior pronotal margin at midline with single tubercle, base of tubercle contiguous with margin, tubercle laterally compressed, anterior edge of tubercle slanted posteriorly to acute apex, posterior edge nearly vertical in apical half; midline 0.6 to 0.7 mm posterior to base of anterior tubercle with second minute, elongate tubercle, midline impressed immediately posterior to second tubercle; pronotum lacking lateral tubercles. Pronotal concavity shallow, relatively broad anteriorly; concavity delimited on each side by distinctly elevated, anteriorly angulate carina; anterior end of carina beginning about 1.1 to 1.3 mm posterior to anterior margin near fovea, rising for 1.0 mm to sharp obtuse angle, angle from 3.0 to 3.9 mm from opposite angle (wider than distance between eyes); carina then sinuously converging toward midline, ending approximately 0.5 mm from both midline and posterior pronotal margin. Pronotum with feeble second carina on each side between posterior third of carina of concavity and posterior marginal emargination, carina very slightly arcuate, approximately 2.0 to 2.2 mm long. Each elytron with striae obsolete, vaguely indicated by concentration of punctures, punctures scattered over elytral surface, each puncture with elongate, posteriorly inclined seta; surface shining between punctures. Pygidium shallowly, closely rugose. Apex of genitalia as in Figures 5, 6.

FEMALE. Length 12.5 to 14.3 mm, greatest width 7.7 to 8.5 mm. Similar to males except that anterior median pronotal tubercle larger and more upright (in the few specimens seen) and posterior minute tubercle more elongate, cariniform, in one specimen extending to base of anterior tubercle.

MATERIAL EXAMINED. 2 males, 5 females.

Bolivia: Eastern Cordillera; P. del Sara, Buena Vista, XII; Santa Cruz, II.1956; Santa Cruz de la Sierra.

Specimens are in: MHNP, USNM, ZSBS, Howden.

REMARKS. Two morphologically different types of females will key to *fulvescens*. One type, which is certainly *fulvescens*, has the pronotal characters similar to those of the males. The other has the anterior median pronotal tubercle larger and more laterally compressed than in males or "typical" females. It is likely that the "unusual" females belong to a different species; see the Remarks under *lobatus*.

*Parathyreus fulvescens* most closely resembles *rectus* n. sp. in external features.

*Parathyreus rectus* Howden, new species  
(Figs. 7-9, Map 1)

HOLOTYPE. Male, length 14.5 mm, greatest width 8.7 mm. Vertex flat, depression of midline obsolete, indicated by slightly reduced granulation. Pronotum (Fig. 7) with small, deep circular fovea behind each eye, diameter of fovea three times diameter of adjacent granule; pronotum anteriorly with single tubercle on margin at midline; apex of tubercle sharply acute, slanted anteriorly over vertex; margin on each side almost straight sloping downward on each side to just anterior of fovea. Pronotal midline posterior to tubercle vaguely carinate at posterior edge of tubercle, then sloping downward to feeble depression 1.1 mm behind apex of tubercle. Pronotum moderately concave from depression to within 1 mm of posterior margin, midline depressed; concavity delimited on each side by strongly elevated angulate carina; carina arising at anterior third of pronotum, almost vertical to sharp angulation 1.5 mm from anterior of carina, angle 3.1 mm from opposite angle; carina slightly depressed posterior to angle, then almost straight to abrupt, obtusely angled termination 0.5 mm from posterior margin and 0.7 mm from midline. Pronotum on each side with second carina almost midway in position between inner carina and shallow posterior emargination of margin, carina low, almost straight, 1.5 mm long. Each elytron with four or five feeble striae in basal third between suture and umbone, elytral surface with numerous punctures, each puncture with anterior granule with recumbent seta arising from posterior base; surface between punctures shining. Pygidium distinctly, closely punctate in basal two thirds; small, scattered punctures present in apical third. Apex of genitalia as in Figures 8, 9.

ALLOTYPE. Female, length 15.0 mm, greatest width 9.0 mm. Differing from holotype in the following: pronotum with anterior median marginal tubercle with apex more rounded; second minute tubercle present on midline posterior to marginal tubercle and immediately anterior to feeble depression at anterior of indented midline; carina on each side of concavity slightly reduced in height; pygidium with apex very slightly more rounded.

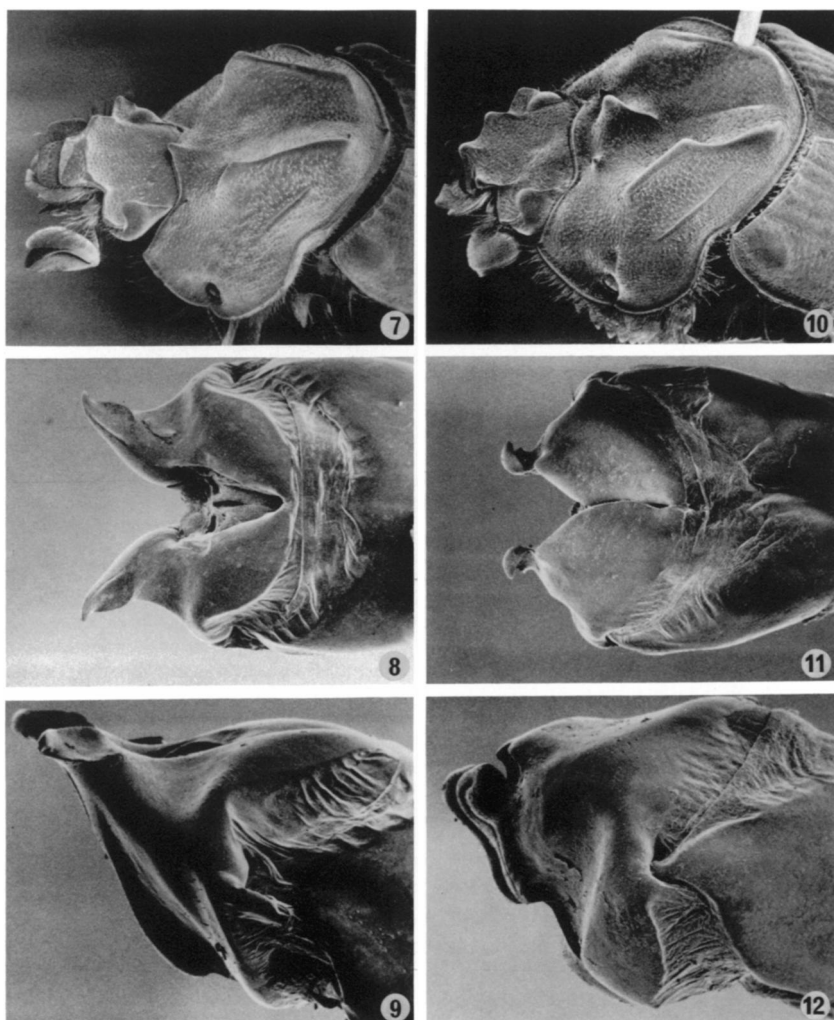
TYPE MATERIAL. Holotype, male, Brésil, Susuapara, Ch. Pujol (MHNP). Allotype, female, Minas Gerais, collection Van de Poll (MHNP).

Paratypes: 3 males, 12 females. Brazil. Goyas: Rio Verde; Parana: Rolandia, XII.1947, I.1949; Sao Paulo; data illegible, "Camp-, - - as."

Paratypes are in: AMNH, MHNP, SMTD, ZMHB, Howden.

REMARKS. Size varies in length from 13.0 to 15.0 mm and in width from 7.8 to 9.0 mm. The height of the carina on each side of the concavity varies, but in all cases the posterior termination is abruptly rounded and declivous and the carina posterior to the median angulation is always nearly straight. All specimens seen except the holotype have a minute tubercle present behind the large tubercle on the anterior pronotal margin at the midline.

The single, anteriorly slanted tubercle on the anterior pronotal midline, lack of distinct tubercle on each side, and the relatively straight portion of the inner carina behind the pronounced angulation are characters that will separate *rectus* from all other species in the genus. In pronotal characters *rectus* and *fulvescens* are most similar, but the male genitalia of *rectus* are radically different.



Figs. 7–9. *Parathyreus rectus* n. sp. 7, head and pronotum. 8, male genitalia, dorsal view. 9, male genitalia, lateral view. Figs. 10–12. *P. bahiae* (Arrow). 10, head and pronotum. 11, male genitalia, dorsal view. 12, male genitalia, lateral view.

*Parathyreus bahiae* (Arrow)  
(Figs. 10–12, Map 1)

*Athyreus bahiae* Arrow, 1913:463.

*Parathyreus bahiae*: Howden and Martínez, 1978:54.

**TYPES.** Lectotype, here designated: Male, labeled “Bahia (Salvador); 20002; Fry Coll. 1905-100,” with “type” and “syntype” labels and Arrow’s handwritten label “*Athyreus bahiae* Arrow type” and my lectotype label, in BMNH.



Paralectotypes: 1 female, labeled "Bahia; 28067; Fry Coll. 1905-100" and with syntype and paralectotype labels. 1 male (?), labeled "Haparica I. [Island], Brazil, 28.12.06, E. G. B. Meade-Waldo, 1910-71" and with syntype and paralectotype labels. 1 male, labeled "Jatahy, Prov. Goyas, Brésil" and with syntype labels. All paralectotypes in BMNH.

**MALE.** Length 12.0 to 14.5 mm; greatest width 7.8 to 8.3 mm. Vertex of head feebly concave, midline between eyes briefly depressed in larger specimens (including lectotype), depression frequently obsolete in small specimens. Pronotum (Fig. 10) with fovea behind each eye very small, diameter of fovea equal to one or two times diameter of adjacent granule; three tubercles present about 0.5 mm posterior to anterior margin behind vertex; median tubercle much larger, laterally compressed (in two cases cylindrical) and with acute apex, posterior median edge occasionally (lectotype) with fine carina and minute basal tubercle; median tubercle with center of base posterior to line of lateral tubercles; pronotum concave posterior to tubercles, concavity on each side with sharply elevated carina; carina beginning anteriorly at anterior third of pronotum midway between lateral fovea and midline, slanting inward to abrupt angle approximately 1.0 to 1.5 mm from anterior end, posterior to angle slightly bowed outward or nearly straight posteriorly converging slightly toward midline and slightly wider near posterior end, carina approximately 1.9 to 2.1 mm long behind angle and terminating about 0.4 mm in front of posterior margin; thickness of carina variable but always distinctly elevated above granulate pronotal surface. Pronotum laterally on each side with second distinct carina present between posterior marginal emargination (by elytral angle) and inner carina; carina closer to lateral margin than to inner carina, of nearly uniform height (much less than inner carina), very feebly arcuate and from 1.5 to 2.1 mm in length. Each elytron with five to seven striae feebly indicated between suture and umbone by doubled row of setose punctures, line of punctures sometimes feebly impressed (lectotype) with intervals slightly raised, smooth and shining. Pygidium closely, irregularly, shallowly punctate to rugose. Apex of genitalia as in Figures 11, 12.

**FEMALE.** Length 12.1 to 14.3 mm, greatest width 7.1 to 8.2 mm. Not differing significantly from male except apex of pygidium slightly more broadly rounded.

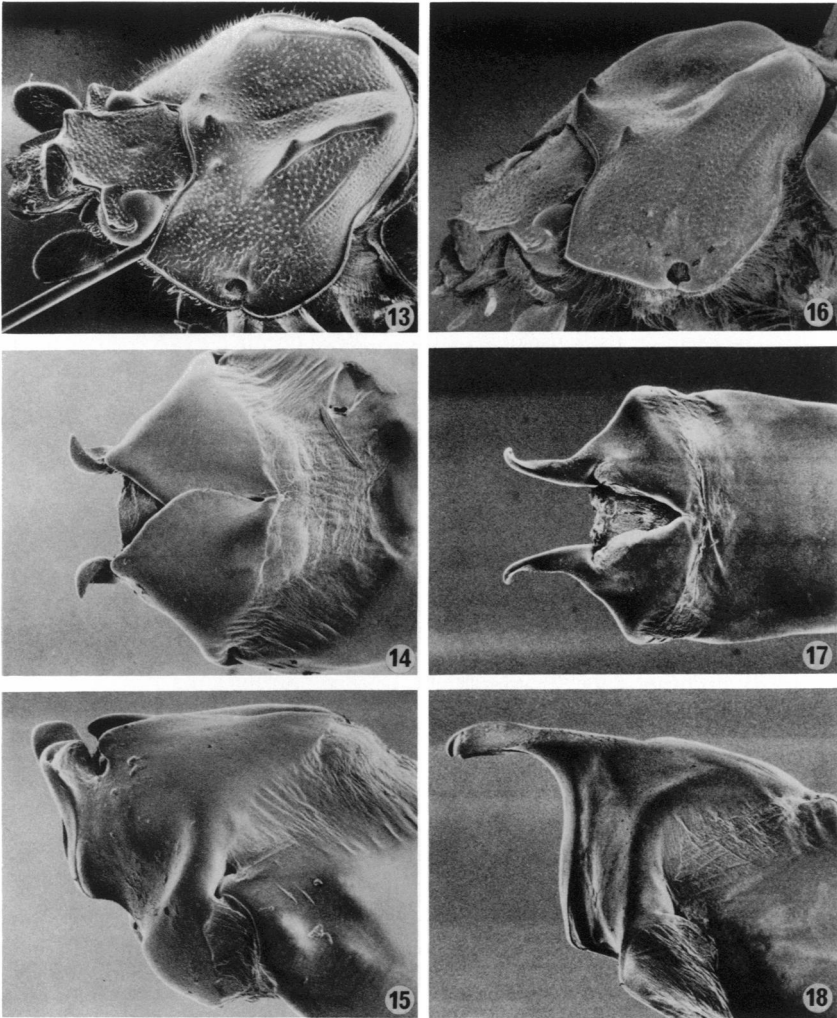
**MATERIAL EXAMINED.** 9 males, 22 females.

**Brazil:** (2) no other data. Bahia (type locality): Barro Preto, Santa Rita. Goias: Jatahy [Jatai]; Trindade. Mato Grosso: Murtinho, XII.1929, I.1930; Rio Verde, XI.1964; Vacaria, XII.1922. Mato Grosso Sud: Campo Grande. Minas Gerais: Pouso Alegre, XII.1965. Rio de Janeiro (State). São Paulo: Anhembi, XI.1926; Ribeirao Preto (Coqueiros), I.1956.

**Paraguay:** (2) no other data. Caaguazu: Estancia Primera, I.1932. Concepcion: Horqueta, I, II.1934, X.1938.

Specimens are in: BMNH, IRSN, MHNG, MHNP, MZSP, USNM, ZMHB, Glaser, Howden.

**REMARKS.** Variation noted in the specimens placed in this species is considerable and it is possible that a complex of several species is involved. One female from Mato Grosso, Brazil (ZMHB) has the central pronotal tubercle only slightly compressed, very elongate, and bent posteriorly; however, in other respects, the specimen does not vary greatly from the lectotype. During the initial part of this study I suspected that the male paralectotype from Jatahy, Brazil, represented a different species since the pronotal carina on each side of the median concavity differed slightly in shape and was much wider than that of the lectotype; also the genitalia differed slightly. However, a large female with an identical label (same greenish color and printing, in MNHN) from Jatahy is certainly the same species as the lectotype, and I can only conclude from this that the differences noted are mostly caused by allometric growth, and that only one species is probably involved.



Figs. 13–15. *Parathyreus trituberculatus* (Klug). 13, head and pronotum. 14, male genitalia, dorsal view. 15, male genitalia, lateral view. Figs. 16–18. *P. fissicollis* (Arrow). 16, head and pronotum. 17, male genitalia, dorsal view. 18, male genitalia, lateral view.

*Parathyreus bahiae* is probably most closely related to *trituberculatus*, which differs mainly in the position of the median pronotal tubercle as noted in the key.

*Parathyreus trituberculatus* (Klug)  
(Figs. 13–15, Map 1)

*Athyreus trituberculatus* Klug, 1845:26.

*Neoathyreus trituberculatus*: Howden and Martínez, 1963:348.

TYPE. Male, labeled "trituberculatus Klug. Brasil. Verm [green label]; 25637 [white label]; typus" [red label]; in ZMHB.

MALE. Length 9.8 to 15.4 mm, greatest width 6.6 to 9.2 mm. Vertex flat with midline feebly depressed in anterior half. Pronotum (Fig. 13) with fovea behind each eye minute, diameter of fovea usually less than diameter of adjacent granule; three tubercles present about 0.5 mm posterior to anterior margin behind vertex; tubercles conical to feebly, laterally compressed, median tubercle two to three times size of lateral tubercle; all three tubercles in almost straight transverse line, median tubercle not noticeably posterior in position. Pronotum posterior to tubercles shallowly concave, most of midline of concavity feebly indented, non-granulate; concavity on each side delimited by moderately elevated, angulate carina; carina beginning anteriorly at anterior third of pronotum, rising almost vertically to feebly inflexed, right angled or sharply obtuse angulation; carina briefly depressed posterior to angulation, then of relatively uniform height to enlarged posterior end 0.4 to 0.5 mm before posterior margin and 0.7 to 0.8 mm from midline. Pronotum laterally on each side with second distinct carina present between posterior marginal emargination (by elytral angle) and inner carina; carina 1.7 to 2.0 mm in length, straight to feebly arcuate, and positioned approximately midway between margin and inner carina. Each elytron with seven or more feebly impressed striae, striae punctures confused, frequently in irregular single or double row, intervals with an occasional puncture; most punctures each with semirecumbent seta with minute basal granule anteriorly; surface of intervals shining. Pygidium in basal half shallowly, closely rugose; minutely punctate in apical half. Apex of genitalia as in Figures 14, 15.

FEMALE. Length 10.1 to 15.3 mm, greatest width 7.1 to 9.3 mm. Not differing from males in any major feature. Inner pronotal carinae of female often slightly less elevated than in male of similar size.

MATERIAL EXAMINED. 15 males, 17 females.

**Brazil:** no other data (2). Maranhao: Igarape Gurupi-Uma Aldela Aracu, 50 km E de Caninde, V.1963. Para, no other data (5): Amaz., Prata, 100 km de Para; Benevides, II.1895; Marco da legua, III.1895; Soure Marajo; Sto. Isabel do Para, III.1962; Sto. Antonio do Taua, I.1980. Para (?): Pamaiba, Mamanguape, VII.1957; Sto. Paulo d'Olivencia, VI-VII.1883. Rio Grande do Norte: Natal, VIII.1953.

Specimens are in: MHNP, ZMHB, ZMSP, Howden.

REMARKS. *Parathyreus trituberculatus* shows considerable variation both in size and in the development of the pronotal carinae. This is probably partly related to the greater number of specimens of this species in collections. Unfortunately, there are few good series with good data taken from widely separated localities. Possibly because of this, none of the variation noted can be related to geographic differences.

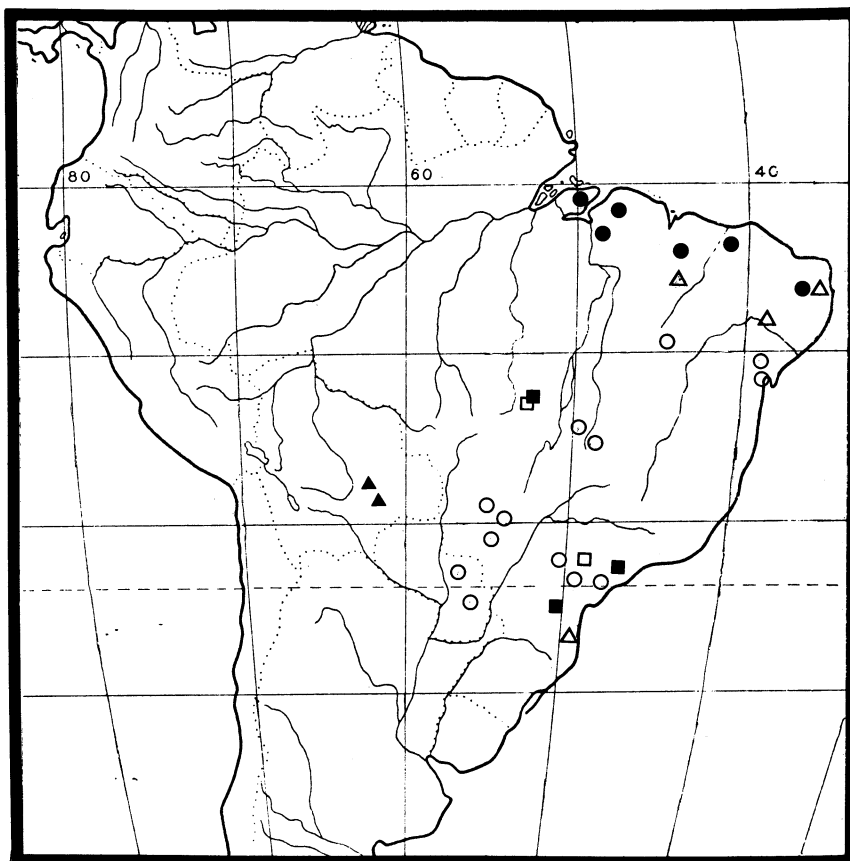
The three almost conical tubercles in a transverse line 0.4 to 0.5 mm behind the anterior pronotal margin, with the median tubercle only two to three times the size of the lateral ones, seem to be sufficient for species recognition. The closest relative of *trituberculatus* appears to be *bahiae*, which has the median pronotal tubercle posterior in position, larger and laterally compressed.

*Parathyreus fissicollis* (Arrow)  
(Figs. 16-18, Map 1)

*Athyreus fissicollis* Arrow, 1913:462.

*Parathyreus fissicollis*: Howden and Martínez, 1978:54.

TYPE. Female, labeled "Natal, Brazil W. M. Mann; Brazil, Stanford Exped. 1913-56"; and Arrow's handwritten label "Athyreus fissicollis Arrow, type" and with two holotype labels, in BMNH.



Map 1. Distribution of *Parathyreus* spp. (□) *lobatus* n. sp.; (▲) *fulvescens* (Blanchard); (■) *rectus* n. sp.; (○) *bahiae* (Arrow); (●) *trituberculatus* (Klug); (△) *fissicollis* (Arrow).

**MALE.** Length 15.0 mm, greatest width 9.4 mm. Vertex almost flat, midline in male feebly depressed, depression only vaguely indicated in females. Pronotum (Fig. 16) with small circular fovea behind each eye, diameter of fovea equal to diameter of an adjacent granule; three tubercles present, larger median tubercle anterior in position with base contiguous with margin; small lateral tubercle on each side approximately 0.5 mm posterior to anterior margin and almost directly posterior to fovea; pronotum posterior to tubercles abruptly concave, lateral edges of concavity bowed outwardly in anterior two thirds, then obtusely angled and inwardly arcuate in narrowed, posterior one third; posterior two thirds of sides of concavity feebly, broadly carinate, carina indicated by smooth, non-granular rounded ridge; midline of concavity shallowly, distinctly impressed, bottom of concavity with widely scattered, small granules. Pronotum posteriorly between posterior third of edge of concavity and near shallow posterior marginal emargination with feebly arcuate, low carina 1.5 to 2.0 mm in length. Each elytron with eight or nine shallowly indented striae, most striae with distinct single row of punctures, punctures laterally each with single, posteriorly inclined seta; elytral intervals smooth

and shining. Pygidium closely, shallowly punctate to rugose. Apex of genitalia as in Figures 17, 18.

**FEMALE.** Length 11.8 to 15.1 mm, greatest width 6.9 to 9.1 mm. Not differing significantly from male except median clypeal tubercle not as pronounced as in male. Shape of pygidium similar to that of male.

**MATERIAL EXAMINED:** 1 male, 4 females.

**Brazil:** Bahia: Terra Nova. Maranhao: Barra do Corda. Rio Grande do Norte: Natal. Santa Catarina: Blumenau.

Specimens are in: BMNH, MHNP, ZMHB, Howden.

**REMARKS.** The five specimens seen are very uniform, the only notable variation occurring in the female from Barra do Corda (ZMHB); in this specimen the lateral pronotal tubercles are relatively large, almost half the height of the central tubercle, and each lateral tubercle is compressed and twisted 45° from the longitudinal axis. In other respects all of the females are similar. The rather polished, shining dorsum, low rounded pronotal carina, distinct elytral striae, and rather different male genitalia indicate that *fissicollis* is the most divergent species in the genus.

#### ACKNOWLEDGMENTS

Without the assistance of a number of curators and individuals this study would have been impossible. The following have been most generous with their assistance: American Museum of Natural History, New York (AMNH), L. Herman; Canadian National Collection, Biosystematics Research Institute, Ottawa (CNC), A. Smetana and J. M. Campbell; British Museum (Natural History), London (BMNH), L. Jessop; Institut Royal des Sciences Naturelles de Belgique, Bruxelles (IRSN), L. Baert; Museum d'Histoire Naturelle, Geneva (MHNG), I. Löbl; Museum National d'Histoire Naturelle, Paris (MHNP), Y. Cambefort and P. Arnaud; Institut für Pflanzenschutzforschung, Eberswalde (DEI), G. Morge; Zoologisches Museum, Humboldt Universität, Berlin (ZMHB), M. Uhlig; Museu de Zoologia, Universidade de São Paulo, São Paulo (MZSP), U. Martins; Staatliches Museum für Tierkunde, Dresden (SMTD), R. Krause; J. Glaser, Baltimore, Maryland; A. Hardy, Sacramento, California; and B. Ratcliffe, Lincoln, Nebraska.

The scanning electron microscope pictures were taken by L. E. Ling, Carleton University, and A. T. Howden reviewed the manuscript. The laboratory portion of the work has been supported by an operating grant from Natural Sciences and Engineering Research Council of Canada. My thanks to all of the above individuals and institutions for their cooperation and support.

#### LITERATURE CITED

- ARROW, G. J. 1913. Some new species of lamellicorn beetles from Brazil. *Ann. Mag. Nat. Hist. London* 11:456-466.
- BLANCHARD, E. 1837. *In*: A. Brullé, *Insectes de l'Amérique Méridionale recueillis par Alcide d'Orbigny*. Vol. 2, pt. 2, pp. 105-222. Paris.
- HEPPNER, J. B., AND G. LAMAS. 1982. Acronyms for world museum collections of insects, with an emphasis on neotropical Lepidoptera. *Bull. Ent. Soc. Amer.* 28: 305-315.
- HOWDEN, H. F. 1978. Descriptions of some West Indian Scarabaeidae primarily in the Natural History Museum, Basel. *Ent. Basiliensia* 3:377-393.
- , AND A. MARTÍNEZ. 1963. The new tribe Athyreini and its included genera (Coleoptera: Scarabaeidae, Geotrupinae). *Can. Ent.* 95:345-352.

- , AND ———. 1978. A review of the New World genus *Athyreus* Macleay (Scarabaeidae, Geotrupinae, Athyreini). *Contrib. Amer. Ent. Inst.* 15:1–70.
- KLUG, J. C. F. 1845. Die Coleopteren-Gattungen: *Athyreus* und *Bolboceras*, dargestellt nach den in der Sammlung hiesiger Königl. Universität davon vorhandenen Arten. *Abh. Preussische Akad. Wiss.* 1843:21–57.
- PECK, S. B., AND A. E. DAVIES. 1980. Collecting small beetles with large-area "window" traps. *Coleopt. Bull.* 34:237–239.

(Received 30 July 1984; accepted 7 September 1984)

### LITERATURE NOTICES

- ERYSCHOV, V. I., & O. L. TROPHIMOVA. 1984. Changes in the ground beetles (Coleoptera, Carabidae) in a clearing in the mountain taiga of the Kuznetsky Alatau foothills. (In Russian). *Zool. Zhurn.* 63:848–852.
- VIENNA, P. 1983. Paromalini nuovi dell'estremo oriente (Coleoptera Histeridae). *Atti Soc. ital. Sci. nat. Museo civ. Stor. nat. Milano* 124:249–256.
- MARIANI, G., & R. PITTINO. 1983. Gli *Aphodius* italiani del sottogenere *Calamosternus* e considerazioni sulle specie mediterranee del gruppo *granarius* (Coleoptera Aphodiidae). *Atti Soc. ital. Sci. nat. Museo civ. Stor. nat. Milano* 124:145–161.
- KLIMASZEWSKI, J. 1984. A revision of the genus *Aleochara* Gravenhorst of America north of Mexico (Coleoptera: Staphylinidae: Aleocharinae). *Mem. Ent. Soc. Can.* 129:1–211.
- TYNDALE-BISCOE, M. 1984. Adaptive significance of brood care of *Copris diversus* Waterhouse (Coleoptera: Scarabaeidae). *Bull. Ent. Res.* 74:453–461.
- STRUBE, H. G. R., & A. BENNER. 1984. Über die mit dem Gestreiften Nutzholzborkenkäfer *Trypodendron lineatum* Olivier (Coleoptera, Ipidae) vergesellschafteten Milben (Acari). *Z. Angew. Ent.* 98:103–109.
- VARIS, A. L., J. K. HOLOPAINEN, & M. KOPONEN. 1984. Abundance and seasonal occurrence of adult Carabidae (Coleoptera) in cabbage, sugar beet and timothy fields in southern Finland. *Z. Angew. Ent.* 98:62–73.
- THOMPSON, R. T. 1984. A taxonomic review of the genus *Isoleptus* (= *Nothoballus*) (Coleoptera: Curculionidae: Cryptorhynchinae). *Int. Jl. Ent.* 26:206–221.
- BRINCK, P. 1984. Evolutionary trends and specific differentiation in *Merodineutus* (Coleoptera: Gyrinidae). *Int. Jl. Ent.* 26:175–189.
- AUDISIO, P. 1984. Notes sur les Meligethinae d'Europe et d'Afrique du Nord, conservés au M.N.H.N., à Paris (Coleoptera, Nitidulidae). *Revue fr. Ent. (N.S.)* 6:147–152.
- ZACK, R. S. 1984. Catalog of types in the James Entomological Collection. *Melandria* 42:1–41.
- GAUDET, M. D., & J. T. SCHULZ. 1984. Association between a sunflower fungal pathogen, *Phoma macdonaldi*, and a stem weevil, *Apion occidentale* (Coleoptera: Curculionidae). *Can. Ent.* 116:1267–1273.
- HANULA, J. L., & C. W. BERISFORD. 1984. Seasonal flight activity of the smaller European elm bark beetle, *Scolytus multistriatus* (Coleoptera: Scolytidae) and associates in Georgia. *Can. Ent.* 116:1251–1258.
- CAMPBELL, J. M. 1984. A review of the North American species of the omaliine genera *Porrhodites* Kraatz and *Orochares* Kraatz (Coleoptera: Staphylinidae). *Can. Ent.* 116:1227–1249.