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naime@ibiologia.unam.mx

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Howden, Henry F.

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**NOTES ON BOLBOCERATINI FROM NORTHEASTERN MEXICO
WITH A DESCRIPTION OF A NEW *BOLBOCEROSOMA* SCHAEFFER
(COLEOPTERA: SCARABAEIDAE: GEOTRUPINAE)**

HENRY F. HOWDEN

Canadian Museum of Nature, P. O. Box 3443 Stn "D", Ottawa, Ontario, K1P 6P4, Canada

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ABSTRACT. One new species of Bolboceratini from north eastern Mexico, *Bolbocerosoma mexicanum* from General Terán, Nuevo León, is described, figured and distinguished from its closest relative, *B. confusum* Brown. Specimens collected in Nuevo León indicate that *Bolborhombus sallaei magnus* Howden should be elevated to the species level. Some problems with the *Bolbocerastes imperialis - serratus* species group are discussed.

KEY WORDS: Coleoptera, Geotrupinae, *Bolbocerosoma*, *Bolborhombus*, *Bolbocerastes*, Taxonomy, Mexico.

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RESUMEN. Se describe e ilustra una nueva especie de Bolboceratini del noreste de México: *Bolbocerosoma mexicanum* sp. nov. de General Terán, Nuevo León; y se destacan las diferencias que presenta con respecto a *B. confusum* Brown. La revisión de ejemplares de *Bolborhombus sallaei magnus* Howden colectados en Nuevo León indica que deben ser elevados al nivel de especie. Se discuten algunos problemas taxonómicos en el grupo de especies de *Bolbocerastes imperialis-serratus*.

PALABRAS CLAVE: Coleoptera, Geotrupinae, *Bolbocerosoma*, *Bolborhombus*, *Bolbocerastes*, Taxonomía, México.

When reviewing the Mexican Geotrupinae for the "Atlas de los Escarabajos de México" vol. 2 (Morón, 2003), I noted several species from northeastern Mexico that appeared to be unusual. Subsequently, one species of *Bolbocerosoma* Schaeffer from Nuevo León, closely related to species in the United States, proved to be undescribed. This species has been previously misidentified as *B. confusum* Brown (1928) and is described below. Several other species from Nuevo Leon and San Luis Potosi are also discussed.

***Bolbocerosoma mexicanum* sp. nov**

(Figs. 1-3)

Holotype. Male, length 14.9 mm, greatest width 9.5 mm. Dorsally reddish brown marked with black (Fig. 1) as follows: head except inner part of mandibles, labrum and disc of clypeus brown to brownish black; anterior pronotal margin posterior to vertex, tips of pronotal protrusions, narrow band extending across base of pronotum (no wider than elytral width between anterior angles), scutellum, elytral base, and sutural

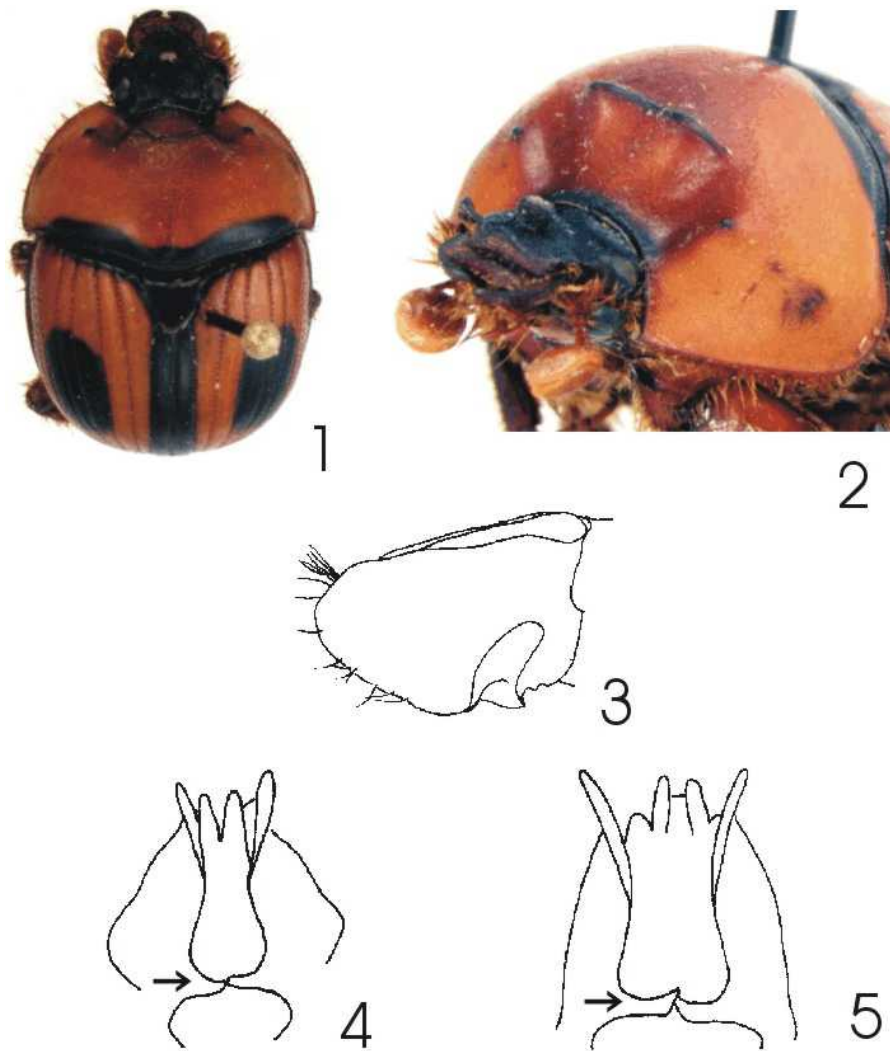
Howden: Bolboceratini from Northeastern Mexico

and marginal intervals of elytra except near humeral umbones; elytral disc with slightly post median oval black spot on fourth to sixth intervals, spot slightly less than twice as long as wide. Head with sides of clypeus converging to abruptly reflexed, narrowly rounded apex, disc shallowly concave on each side, surface closely, finely rugose-punctate. Median horn on vertex at base of clypeus broad, approximately one-third width of vertex at clypeal base; apex of horn rounded, worn. Vertex posterior to horn moderately punctate, most punctures not contiguous; basal third of vertex shallowly concave on each side, surface with scattered small punctures. Gena with eye divided by canthus, margin of gena anterior to eye forming distinctly elevated angle or small horn; surface anterior to eye punctate-rugose. Pronotum (Fig. 2) with well-developed transverse sinuate ridge on anterior half; ridge extending across median third of pronotum, distinctly higher and rounded near each end, depressed medially; longitudinal concavity present anterior to each end of ridge extending almost to anterior margin behind eye; small conical tubercle present on each side laterad of depression, about 1.1 or 1.2 mm from end of transverse ridge; declivity anterior to ridge with small to very small punctures medially and near anterior margin, almost impunctate just anterior to lateral lobes of transverse ridge. Pronotum laterally and posteriorly convex; surface medially irregularly, coarsely punctate, finely punctate laterally. Scutellum approximately as long as wide, almost flat, surface very finely punctate basally and with scattering of several indistinctly defined coarse punctures near middle. Elytron (Fig. 1) with five well-developed, complete, punctate striae between suture and umbone; intervals slightly convex, smooth; intervals two and four each with incomplete row of longitudinal small punctures indicating reduced striae. Laterally elytron with five irregular striae defined by large, somewhat confused rows of punctures, punctures on disc

lacking setae. Epipluron and edge of elytron with scattered, erect yellowish setae. Pygidium slightly convex, apex broadly rounded, surface finely, closely punctate, setose. Ventrally similar to *B. confusum* and *B. biplagiatum* Dawson and McColloch, except fore leg with eight well-defined marginal teeth (worn) and middle leg with indication of third transverse carina at middle of outer surface. Genital capsule (Fig. 3) with apex of lateral lobe rounded, fringed with scattered long setae. Parameres of genitalia acute, slightly reflexed apically.

Holotype. Male, Mexico, N.[uevo] L.[eón], Gral. [General] Terán, 19.IX.1961, Hernandez (H. and A. Howden collection in Canadian Museum of Nature, Ottawa).

Remarks. *Bolbocerosoma mexicanum* will key to *B. confusum* Brown in couplet 9 in the key to species of the genus in Howden (1955, p. 165), based on the elongate black spot on the elytral disc. It can be distinguished from *B. confusum* by its very finely punctate declivity anterior to the transverse ridge of the pronotum and by the rounded apices of the lateral lobes of the genital capsule. Brown (1928) figured the "genitalia" of the seven species of *Bolbocerosoma* recognized at that time, referring to the genital capsule as the "aedeagus" and the sides as "lateral lobes" (the term used here for the sides of the capsule). He figured the capsule of one additional species, *B. hamatum* Brown (1929), a year later. *Bolbocerosoma quadricornum* Robinson (1941) was subsequently described and figured; its genital capsule is almost identical to that of *B. pusillum* Dawson and McColloch. Figures of the capsules of other species described subsequently are in Howden (1955, 1964). The black markings of the dorsum, the pronotal punctation and shape of the ridge and tubercles, lack of setae on the elytral disc, shape of the genital capsule and, to a lesser degree, the shape of the parameres will serve to separate *B. mexicanum* from the other species in the genus.



FIGURES 1 - 5. 1) *Bolbocerosoma mexicanum*, n. sp., dorsal view. 2) *B. mexicanum*, n. sp., frontal view. 3) *B. mexicanum*, n. sp., lateral view of male genital capsule. 4) *Bolborhombus sallaei* (Bates), male genitalia, ventral view with inward, rod-like, basal projections indicated by arrow. 5) *B. magnus* Howden, male genitalia, ventral view with inward, rod-like, basal projections indicated by arrow.

While I have described this species from a single male, I have seen a pair of this species from Monterrey, N. L., Mexico, in the collection of G. Halffter, Coatepec, Veracruz, Mexico. A male of this species was illustrated by Morón (2003) in Vol.2 of the "Atlas de los Escarabajos de México" under the name *B. confusum* (my misidentification). Unfortunately, when this paper was being written the pair could not be located.

Three species of *Bolbocerosoma* are currently known to occur in Mexico: *B. ritcheri* Howden, *B. pusillum townesi* Howden, and *B. mexicanum*.

The larger size, lack of setae on the elytral disc and the position of the black markings of the dorsum will distinguish *B. mexicanum* from these other species.

Etymology. The name "*mexicanum*" seems appropriate as it is the only known species in the genus that is restricted to Mexico.

***Bolborhombus* Cartwright**

When Cartwright (1953) established the genus *Bolborhombus* he recognized three species: *B. angulus* (Robinson), *B. parvulus* Cartwright and *B. schaefferi* (Boucomont). In 1964, I synonymized *B. schaefferi* under *B. sallaei* (Bates) and added the subspecies *B. sallaei magnus* Howden and a new species, *B. nitidus*. With the exception of *B. parvulus*, which is recorded only from extreme southern Arizona and the Big Bend region of west Texas, all of the other species occur, at least in part, in Mexico. Of these species only one, the subspecies *B. sallaei magnus*, was known until now from northeastern Mexico. In the G. Halffter collection there are both "forms" of *B. sallaei* that were collected at Apodaca, Nuevo Leon, on August 26, 1960 (at light?). There are five typical *B. s. sallaei* and four *B. s. magnus* represented. When I described "*magnus*" as a subspecies only four specimens were known, ranging from Kingsville in southeastern Texas to southern Nuevo León; none of the typical "*sallaei*" were known to occur in the area. Since

I doubt that two subspecies with similar habits can coexist in the same place, it seems that there is either one extremely variable species or that two species are represented. I suspect the latter for the following reasons. In the two sympatric series there is a considerable difference in size (Figs. 6, 7). In addition there are small differences in the shape of the clypeal horn and lack of the carina which extends toward the anterior clypeal edge on each side in the larger (*magnus*) form. The large specimens also seem to have more secondary punctures, but in those there is considerable variation. The most obvious difference occurs in the male genitalia: the large males have the apical sac, in the non-extended position, apically blunt with non-protruding chitinized plates or struts on each side. The small form has the internal sac narrowed apically and the lateral plates extend beyond the end of the sac. There is also a small difference in the inner rod-like extension at the base of each paramere (Figs. 4, 5). In the large form the "rod" is thicker and more curved than in the smaller form.

These differences, plus the sympatric distribution, indicates that two species are involved. Hence, I now consider *Bolborhombus magnus* Howden to be a valid species.

In general, the genus *Bolborhombus* has a western range in the United States and southward into Mexico. Over this range *B. sallaei* varies in a number of ways. Specimens are rarely as large as *B. magnus*, while others have alutaceous, dull elytra, this type being found primarily in Arizona specimens. Mexican specimens often have smooth, shiny elytra and various clypeal shapes. I suspect that *B. sallaei* may represent a complex of close forms, the problem being that series of specimens are needed from different areas, and at present, these are not available. This same problem occurs in several other bolboceratine genera: only one or two specimens are known from many localities.



FIGURES 6 - 9. 6) *Bolborhombus sallaei* (Bates), dorsal view; specimen from Apodaca, Nuevo León. 7) *B. magnus* Howden, dorsal view, specimen from Apodaca, Nuevo León. 8) *Bolbocerastes imperialis* Cartwright, dorsal view, male from Matehuala, San Luis Potosi. 9) *B. imperialis* Cartwright, dorsal view, male from Phoenix, Arizona. Figures 6 and 7 to same scale; Figures 8 and 9 to same scale.

***Bolbocerastes* Cartwright**

Originally a series of ten specimens from Matehuala, San Luis Potosí, Mexico, was suspected to represent a new species of *Bolbocerastes*, as all but two of the series are unusually large specimens. Seven of the ten are females. Of the three males two are large, measuring 18.1 and 19.6 mm in length (Fig. 8) and one is smaller, measuring 15.1 mm in length. Since no species of *Bolbocerastes* is recorded from San Luis Potosí, the two most likely species were examined, *B. serratus* Leconte and *B. imperialis* Cartwright. Since the external characters of the Matehuala specimens did not exactly coincide with either species, genitalia were examined from specimens of both species from as many different areas as possible. Male genitalia of the *serratus-imperialis* complex were examined from southeast Texas to California and northward to Nevada, Utah and Colorado. The problem of inadequate series was encountered and it was difficult to identify some specimens from the Arizona-New Mexico border as either *B. imperialis* or *B. serratus*. Many specimens from intermediate areas, particularly New Mexico and Utah, were collected after Cartwright's revision (1953) and were not seen by him. Variation in some of the characters used by Cartwright indicated that there is either one extremely variable species or more than the two recognized species. After checking the genitalia and the serrations on the sides of the pronotum, there is no doubt that the Matehuala specimens should, at present, be identified as *B. imperialis*. However Cartwright saw 212 specimens of *B. imperialis*, the largest measuring 19 mm with the average size (Fig. 9) measuring much smaller than the Matehuala specimens. If I am correct, this is a major extension of the known range of *B. imperialis*, as the only previously published Mexican localities for the species are in Sonora and

Baja California. The eastern records for the southern United States are from Brewster County and Marathon in western Texas; there were no eastern records, until now, for Mexico.

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