

Narrow-range taxa of *Cerion* (Mollusca: Cerionidae) in the northeastern province of Cuba

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ABSTRACT The exceedingly polytypical genus *Cerion* (Röding, 1798), with around 91-92 species described for Cuba is still poorly studied. The urgent need of more studies related to ecology, genetics, environmental components, morphology, conservation status plus a serious taxonomic evaluation of the genus in the archipelago is more than evident. The present paper reviews the narrow-range *Cerion* taxa that occur in the coastal zone of the Holguín province, in northeastern Cuba, including comments on each taxa. Additional observations related to other taxa from the same geographic coastline area are included to reinforce the importance of further research studies that the authors believe need to be conducted.

KEYWORDS Mollusca, *Cerion*, land snails, Holguín, Cuba.

INTRODUCTION

Cerion (Röding, 1798) [Syn. *Strophia* Albers, 1850] derives from the Greek word *kerion* that means honey-comb, alluding to the resemblance of the spire to an old-fashioned bee-hive (Pilsbry, 1902). Of the 15 large groups described for *Cerion* by Pilsbry in the Manual of Conchology (1901-2), belonging to the subgenera *Cerion* (*sensu stricto*), *Strophioops* (Dall, W., 1894), *Diacerion* (Dall, W., 1894) and *Eostrophia* (Dall, W., 1890), only 5 groups or complexes are linked by Pilsbry to Cuba (*striatellum*, *maritimum*, *scalarinum*, *cyclostomum* and *mumia*). Nonetheless, some Cuban species seems to be far related to the *vulneratum* and *dimidiatum* groups as well. The subgenera *Umbonis* and *Pinguitia* from Maynard (1896) are placed by Pilsbry as synonyms of *Strophioops* on his genus revision.

Around 90-92 species including more than 145 forms were described as endemic to the island

of Cuba. In 1957 W. J. Clench stated about the genus that “probably less than 20 per cent of the names now extant actually apply to valid species or subspecies” adding on the next page that “the morphological characters of the shell appear to be exceedingly variable and most of the differences are certainly more apparent than real”. Luckily, in recent years a renewed interest in the Cuban *Cerion* taxa by some malacologists offers new openings to redefine the systematics and understanding of the genus.

The Holguín province in the Cuban archipelago holds around 21 endemic species belonging to the polytypical genus *Cerion* (Röding, 1798) of the more than 50 endemic land snails species reported from the coastal region of that province recently (Fernández, A. *et al.*, 2016). Their “sedentary” populations inhabit the coastal areas with an apparently random geographic distribution (Gould & Woodruff, 1986). The species can be found living under the rotting or dry leaf litter, on sharp karst rocks or in coral

rocks areas adjacent to Sea Grape vegetation, associated to a broad range of plants (from the sand coast vegetation through the xerophytic coastal shrub and reaching occasionally the microphyll evergreen forest) and even over the very small pebbles or thick sand grains close to the seashore and beaches.

It is advocated by some that “the significant proliferation of the *Cerion* diversity was due to the stochastic dispersion by rafts, hurricanes and sea level changes caused by Pleistocene Glaciations which amplifies that diversity by repetitive recombination and hybridizations followed by an isolation of adjacent populations” (Fernández, A., 2015). Many of the Cuban *Cerion* species are in fact micro-located or restricted to a few square kilometers; becoming one of the most threatened species in the “resources struggle” among humans and coastline endemic species (the *Cerion* species’ sedentary life increases their fragility and vulnerability). These peculiar snails occur “on terrestrial vegetation, generally within 100 meters of the shore, but occasionally 1 km or more from the sea, presumably in areas where salt spray can reach them from one or more directions” (Clench, 1957; Harasewych, *et al.*, 2007). Reports of *Cerion* populations over 800 meters inland from the coastline are still not common, and are indeed remarkable findings. A rare anomaly in Cuba, a *Cerion p. peracutum* population was found on a hill over 60 meters above sea level at 1,500 meters from the coastline. (Suárez, *et al.*, 2012).

The progression of fishing towns close to the seaside areas, industrialization in the coastal zones associated with big city economic development, and the domestic tourism were the first critical threats this genus faced on the island and its keys, but a new menace came not so slowly over the past decades: the international tourism connected to the “beach

and sun attractions” and the infrastructure associated with their expansion. *Cerion* populations had a long history of survival and extinction in the Holguín province. Extinction events always start with the habitat fragmentation and ground degradation leading to disturbances in the populations followed by the unmistakable loss of territory. The remaining *Cerion* species are circumscribed to small geographic areas close to these tourist areas, and are without a doubt doomed if the environmental measures are not implemented before it is too late.

Checklist, records and occasional comments on the narrow-range *Cerion* species and subspecies of the Holguín province

Cerion alberti Clench & Aguayo, 1949

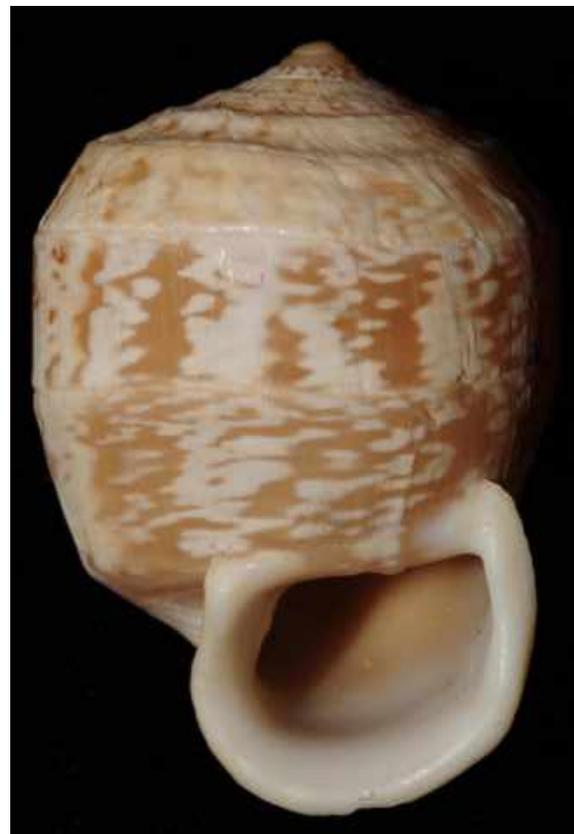


Figure 1. *Cerion alberti* Clench & Aguayo, 1949

Distribution: Next to Punta de Caracolillo in the Ramón de Antilla Peninsula, known locality as El Muelle, just 100 meters to the west of the Lighthouse, near the Banes Bay entrance. The type locality stated as Punta de “El Fuerte” is no longer in use by the locals and no one seems to know where it was exactly (Suárez, A., *et al.*, 2011).

Remarks: The most restricted *Cerion* species in this province is confined to a 20 x 50 meter area of coastal vegetation, mainly on the Sea Grape vegetation (Suárez, A., *et al.*, 2011). Recent findings on the Felipe Poey Natural History Museum historical collection revealed a locality named “Cañón de Banes”, where some forms including *alberti* seems to converge. The shape peculiarity of this species is related to the “square short form” that commonly appears in its population of capricious low-flattened spire shells. This species was reported parapatric with *Cerion humberti* (Clench & Aguayo, 1949) in the localities reported for Antilla vicinity (Fernández, A., *et al.*, 2016). The specific name derives from one of the field work collectors of the expedition of 1945 (Alberto R. Quiñones).

Cerion saetiae Sanchez Roig, 1948

Distribution: The type locality Playa del Cristo on Saetía Key in the Nipe Bay area seems to be a peripheral population for the low quantity of specimens always collected or found there. New locality records like Baracutey Beach and Playita de Fidel (Fidel little beach) enlarge the distribution zone of this peculiar species and the former seems to be the original population nucleus (the distance between Playa del Cristo and Playita de Fidel is around 1.83 km).

Remarks: On Baracutey Beach in the Ramón de Antilla Peninsula vicinity this species inhabits a narrow range no larger than 500 square meters in what the botanists refer as “sand vegetation

complex”, this means that the remaining population in the southeast of this Peninsula is extremely restrained. Crossing the saltwater channel in front on Playita de Fidel at Saetía Key a higher density of individuals can be found (the populations of Baracutey and Cristo beaches presented what it seems to be a demographic cline with very few living specimens). The shell shape of this petite aged-ivory color species shows a remarkable umbilicus depth on the last whorl of the adults and nicely conical first spires.



Figure 2. *Cerion saetiae* Sanchez Roig, 1948

Cerion hessei Clench & Aguayo, 1949

Figure 3. *Cerion hessei* Clench & Aguayo, 1949

Distribution: The type locality is Balcón de Damas in Guardalavaca beach area on Banes municipality. New records of the species point to Baracutey Beach in Antilla vicinity.

Remarks: Graciously plentiful ribbed fat shape *Cerion* species. Found during the July-August, 1945 well known field expedition by William J. Clench, Carlos G. Aguayo, Alberto R. Quiñones

(Banes) and José A. García Castañeda (Holguín). Clench & Aguayo stated in their description that this size-inconstant species from the type locality exhibit “some of the tiniest individuals known for the genus” inhabiting areas under the dry ground foliage of curiously dwarf Sea Grape trees (northern coast keys like Cayo Cruz in Camagüey province and Cayo Santa María in Santa Clara province possess dwarf *Cerion* morphs).

Cerion torrei ornatum Blanes in Pilsbry & Vanatta, 1899 (the date in the pages of the publication was indeed 1898 but the Proceedings of the Academy of Natural Sciences of Philadelphia book printing was 1899)



Figure 4. *Cerion torrei ornatum* Blanes in Pilsbry & Vanatta, 1899

Distribution: Besides the type locality at Faro de Vita in Puerto de Vita, where Francisco E. Blanes collected the described specimens, this subspecies is found nearby on Playa Blanca in the Bariay Bay, and Estero de Pesquero Nuevo, in the Rafael Freyre municipality.

Remarks: Indeed one of the most beautiful fine-ribbed *Cerion* forms strongly associated with the Sea Grape or Uva Caleta (*Coccoloba uvifera*) and other few plants like Almácigo (*Bursera simaruba*), Uvilla (*Coccoloba diversifolia*) or Guao de costa (*Metopium cf. toxiferum*). A problem related to the described *torrei* subspecies in the province (*torrei*, *ornatum*, *moralesi*) is that two of them (*ornatum* and *torrei*) were labeled with the same type locality (what seems to occur is that *C. t. ornatum* inhabits the western side of the Vita Bay, and *C. t. torrei* dwell on the eastern side). This subspecies can be easily confused with *Cerion humberti* by a non-expert. Clench & Aguayo around 1949 indicated that the *torrei* group of species is very complex and shows high pattern variability.

Cerion vulneratum lepidum Clench & Aguayo, 1951

Distribution: Still located in its type locality at Laguna de Punta de Mulas (Lagoon of Punta de Mulas) at 8.2 kilometers east of Lucrecia Lighthouse in Banes municipality.

Remarks: Found on a remarkably small area not bigger than 210 square meters. This is a slender narrower red-brown marble colored *Cerion* subspecies with irregular axial streaks and acute apex, showing a high contrast of white and brown in its coloration (common coloration pattern found on many *Cerion* species were reddish or brownish axial bands cover the shell body). Additional field work is needed in the area between Punta de Mulas and Punta de

Manglito in order to identify another population of this subspecies to clarify doubts about its distribution.



Figure 5. *Cerion vulneratum lepidum* Clench & Aguayo, 1951

Cerion vulneratum vulneratum Küster, 1855

Distribution: Caletones beach in Gibara is the locality where this subspecies is found. Originally was identified from Gibara (named Jibara in old descriptions and labels) and also 15 km west of Caletones.

Remarks: Considered very rare today by experts. Gibara is an area where some *Cerion* endemic species are prolific, making it more difficult to

find species of lower population densities. The other related *vulneratum* subspecies (*pandionis* and *vallei*) are found on Puerto Padre, an area that a long time ago was considered part of the Holguín province (since 1976 this area belongs to Las Tunas province).

Cerion aguayoi bequaerti Torre & Clench, 1932



Figure 6. *Cerion aguayoi bequaerti* Torre & Clench, 1932

Distribution: A continuous distribution of around 6 kilometers in “straight line” from Cabo de Lucrecia dunes (its type locality) to Punta de Manglito, 4.2 kilometers northeast of the Lighthouse; also reaching the proximity of Playa del Muerto (Dead man beach), a beach around 2 kilometers west to the Lighthouse.

Remarks: A larger size attractive cylindrical *Cerion* subspecies with opaque porcelain whitish or greyish-white coloration. The axial striation is generally lost in most of the population individuals displaying a smooth appearance.

Cerion banesense Clench & Aguayo, 1949

Distribution: To the east of Samá Bay (the type locality of this species is found from the Lighthouse to one mile east), also found discontinuously from Ensenada de Río Seco (Dry River Cove) to the vicinity of Playa del Muerto and neighboring Cabo Lucrecia, all belonging to Banes municipality.

Remarks: Attractive axial ridged species characterized by a deep red-brown mottled coloration. The shell shape variability of the populations was described by Clench & Aguayo in their notes in the original species description.

Cerion disforme Clench & Aguayo, 1946



Figure 7. *Cerion disforme* Clench & Aguayo, 1946

Distribution: This species was described from the vicinity of Punta Manolito in the Ramón de Antilla Peninsula. Interestingly, both of its subspecies (*disforme* Clench & Aguayo, 1946 and *nodali* Clench & Aguayo, 1953) occur at the same locality. Also in El Arenal (or Arenazo) to Yuraguanal, area very close to Punta Manolito. The proximity among *C. alberti* and *C. disforme* populations is about 2 kilometers.

Remarks: The *disforme* subspecies inhabits different microhabitats with parapatric micro-distribution. *C. disforme disforme* is found associated to karst irregular large rocks and occasionally over some xerophytic shrub palms (*Thrinax radiata* and *Cocothrinax cf. salvatoris*) and the evergreen forest ecotone, and the *C. disforme nodali* (Clench & Aguayo in Aguayo, 1953) subspecies is found on high ground sand dunes-small rocks substrate and frequently over the dead leaves and branches in the evergreen forest ecotone. The three species *disforme*, *alberti* and *geophilus* are considered true gems in the *Cerion* genus due to their divergent and unique morphology, which is contrary to the usual assumption that “geographically closer species can show closer morphological characteristics” (Rodríguez-Ochoa, A., 2014). This is far from being accurate because in just a few kilometers of certain Holguín province areas very different *Cerion* species can be found.

***Cerion geophilus* Clench & Aguayo, 1949**

Distribution: Punta de Piedra (Stone Point) is the type locality but also the geographic range includes Morales Beach, 11 km southeast from Banes city.

Remarks: A large or robust semi-square *Cerion* species adorned with strong axial ridges through all the shell whorls. The resemblance of the semi-square flat spire shaped species *geophilus*, *disforme*, *alberti* and *torrei* is thought-

provoking; their populations are divided by a sea bottleneck from Boca de la Bahía de Banes (Banes Bay Mouth) to the Bay itself. Another strongly and thick ribbed species that can be semi-square from Ensenada de Mora in Granma province that is worth mentioning is *Cerion ramsdeni turgidum* (Torre & Welch, 1934), collected by Henry A. Pilsbry and D’Alte Aldridge Welch on August 8, 1928, but seems to be more related with species from Grand Cayman and Haiti. We also suspect that *geophilus* possibly is related to the *scalarinum* species complex, or that this species is possibly just a very large variety of *disforme*.



Figure 8. *Cerion geophilus* Clench & Aguayo, 1949

***Cerion blanesi bariayi* Aguayo & Jaume, 1957**

Distribution: The type locality of this subspecies is Miramar, east of Bariay Bay.

Remarks: Similar to *C. torrei ornatum* at first sight, but a closer observation shows that *C.*

blanesi baryai has a different ribbed pattern, with less separation between ribs. The population density of this subspecies is still abundant.

Cerion feltoni Sánchez Roig, 1951

Distribution: The type locality of this species is Felton in the Mayarí municipality.

Remarks: One of the authors sought to collect *feltoni* four times between 2012 and 2016 at the type locality, but was unable to find any living or dead specimens. Increased human settlements and deforestation in the area could be the cause.



Figure 9. *Cerion feltoni* Sánchez Roig, 1951

Cerion nipense Aguayo, 1953

Distribution: The type locality is Playa de Juan Díaz on Nipe Bay, Mayarí municipality, however, noted on the map Playa de Juan Vicente could possibly be the same location, albeit with a slightly revised name.

Remarks: One of the authors unsuccessfully searched for *nipense* several times between 2012 and 2015 at the Playa de Juan Vicente locality but found only dead specimens.



Figure 10. *Cerion nipense* Aguayo, 1953

Cerion prestoni Sánchez Roig, 1951

Distribution: Preston on Nipe Bay, Mayarí municipality.

Remarks: This is similar to the *feltoni* situation. A species that somehow resembles a *Cerion* from the *scalarinum* complex, but morphologically differs in having thick ribs with several striations. The *scalarinum* species complex “represent[s] a divergent element, rather strikingly from other members of the genus *Cerion*” (Clench, W. J., 1957), and for that reason it is important to try to locate this population.



Figure 11. *Cerion prestoni* Sánchez Roig, 1951

Cerion paucisculptum Clench & Aguayo, 1952

Distribution: The type locality is in Punta de Música, Samá Bay, Banes municipality. It is only known from this type locality.

Remarks: There are no actual records of field work in the type locality. However we are hopeful that these organisms are not extinct because the *C. banesense* populations inhabit in the neighboring localities of Arroyo Seco (Dry Stream), Río Seco (Dry River) and Ensenada de Río Seco area (Dry River Cove area). This species, *paucisculptum*, was collected by Alberto R. Quiñones around 1947 when Samá Bay was less fragmented and undisturbed. With numerous slender axial ribs this *Cerion* can be distinguished from the *scalarinum* species complex and differs from other closely related forms like *sueyrasi* in the shell shape roughness of the axial ribs. Future research on the subgenus *Umbonis* might confirm a closer relationship between several nominate species.

OBSERVATIONS AND CONCLUSIONS

Studies of *Cerion* species in areas like Gibara, Banes and Antilla verify what Pilsbry indicated around 1902, writing that “the species are subject to a remarkable range of individual and local variation. Thus many species vary from strongly and conspicuously ribbed to entirely ribless and smooth”. Some of the above mentioned species have hybridized in the areas where their populations overlap, which is nothing new in *Cerion*, but it is worth mentioning that the large *Cerion torrei moralesi* (Clench & Aguayo, 1951) hybridize with the species *aguayoi*, *geophilus* and *banesense* (although we have doubts about hybrids with *banesense*), and possibly other species as were recently collected by one of the authors distant from the Cocos vicinity, Gibara area. In our opinion, the hybridized specimens among

restricted range taxa are not any less important in conservation terms. We could say that one of the most awesome sharply ribbed shaped subspecies, the creamy color *Cerion (Umbonis) scalarinum sueyrasi* (Blanes in Pilsbry & Vanatta, 1899), with its wide-ranging distribution from west of Samá Bay to Antilla (the type locality is further western into Vita vicinity) are not recounted as part of any hybridization process on the same area where the ones we mention dwell.

From Gibara Bay area to Caletones beach there is an interesting congregation of some taxa like *C. a. aguayoi* (Torre & Clench, 1932), *C. b. blanesi* (Clench & Aguayo, 1951), *C. dimidiatum* (Pfeiffer, 1847), *C. j. josephi* (Clench y Aguayo, 1949), *C. m. microdon* and *C. m. pygmaeum* (syn. *C. tenuilabre pygmaeum*) [both Pilsbry & Vanatta, 1896], *C. s. scalarinum* (Pfeiffer & Gundlach, 1860) [*Strophlops faxoni* Maynard, 1896], *C. torrei moralesi* (a new locality record) and *C. v. vulneratum* (Küster, 1855). We considered this to be a “hot spot” area and most relevant for *Cerion* diversity in the Oriente region of the island, but until further studies of the narrow range of the taxa inhabiting this region occur we did not consider them as significant enough to be included in this paper.

C. microdon subspecies above mentioned inhabit allopatric areas, one in the west of Gibara Bay and the other in the east section of the bay, however no living individuals have been found since 2001 (hurricanes and flooding likely devastated the populations on both bay sides). Nevertheless, a recent find of what appears to be *pygmaeum* by one of the authors in Punta Goleta, leaving Gibara city on the road to Caletones looks very promising. The *microdon*-like *crassiusculum* and *hessei* are among the tiniest of the Holguín province Cerionidae species reported (by that we mean

that in their populations it is common to find dwarf morphs), regrettably there are no serious studies on their genetic, ecology, taxonomy or conservation status.

Likewise the *Cerion* populations from Levisa Bay to Moa lack enough field work to include them into this article. The so-called infraspecific taxa from *Cerion alleni* (that includes *alleni* Pilsbry, 1929; *madama* Sánchez-Roig, 1951; *migueleti* Sánchez-Roig, 1951; *sanchezi* Clench & Aguayo, 1953), *Cerion tanamensis* (Sánchez-Roig, 1951) or the *Cerion crassiusculum smithi* (Blanes in Pilsbry, 1902) remain under study by the authors.

Note: The *dimidiatum* groups were initially related to long cylindrical-conical shells, rib-striate or smooth (*Pupa dimidiata* Pfeiffer 1847); on the other hand the *proteus* group was known for having stronger and squatter shells (*Pupa proteus* Pfeiffer & Gundlach, 1860/1861). Pilsbry (1901-2) described the characteristics of the Cuban Groups like this: *cyclostomum* [Fine-ribbed or striate and rather small species, with the parietal tooth short and central, sometimes obsolete. Species difficult to discriminate.]; *maritimum* [Rather large, stout, cylindric species, ribbed, rib-striate or smooth, the sutures but slightly impressed; the parietal tooth usually short (but sometimes lengthened).]; *scalarinum* [Shell strongly ribbed and densely sculptured with incised spiral striae. Parietal tooth short and median.]; *mumia* [The species are cylindric, usually quite long, sculptured with rather wide spaced ribs, which are occasionally wanting on the cone; color whitish or marbled and speckled; parietal lamella varying from rather long, the inner termination not readily visible from the aperture, to shorter or obsolete. The whorls are rather convex.] and *striatellum* [The parietal lamella is long, extending inward to a dorsal position, and usually interrupted or partially so in the middle, when it would be described as

two lamellae, one behind the other. A short infraparietal lamella lies between the middle of the parietal lamella and the axis.]. In the historical collections it is easy to find Holguín province *Cerion* species labeled as *C. proteus alberti* or *C. proteus percostatum* (= *Cerion geophilus*).

Note: This is not a systematics, classification or taxonomic paper, but rather an account and commentary about the narrow-range *Cerion* species from the Holguín province in Cuba, accordingly we have consciously chosen to use historically recognized names of Cuban *Cerion* taxa rather than follow the latest informal internet systematics of M.G. Harasewych and others. We have done so in order to preserve the diversity of the many species, subspecies and forms and secondarily because a number of species have been synonymized without sufficient explanation.

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Figure 12. *Cerion moralesi* x *geophilus* hybrid on rock at Playa de Morales (Morales beach), Banes Municipality.



Figure 13a. *Cerion torrei ornatum* on leaf at Faro de Vita (Vita Lighthouse), Vita Bay, Rafael Freyre Municipality.



Figure 13b. *Cerion torrei moralesi* on rock, at Playa de Morales (Morales beach), Banes Municipality.

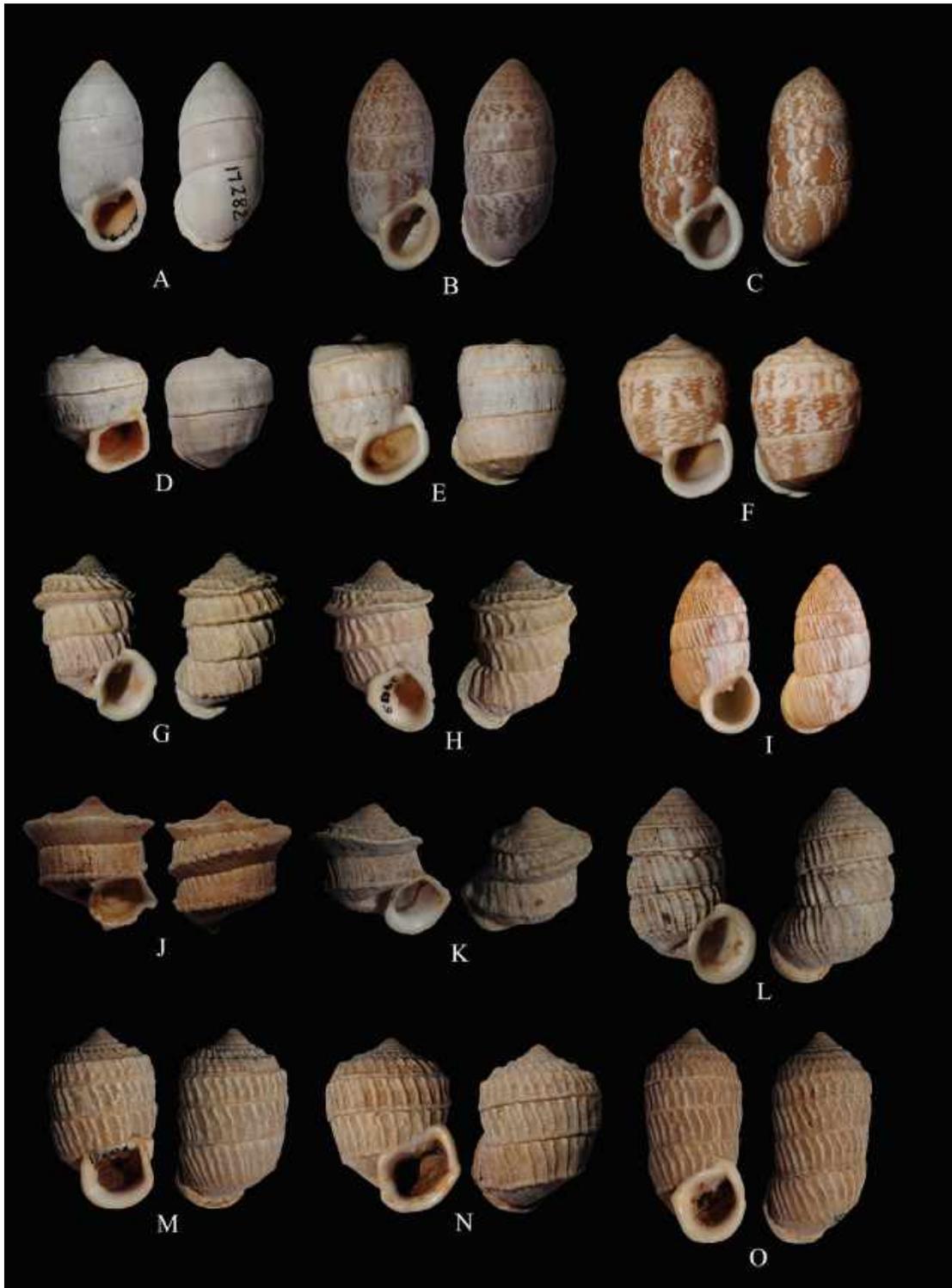


Figure 14. A, B, C = *Cerion aguayoi bequaerti*, from Faro de Lucrecia and Punta de Mulas, Banes; D, E, F = *C. alberti*, Punta del Fuerte and Cañde Banes, Bothon Banes; G, H = *C. disforme disforme*, Punta Manolito, Banes; I = *C. feltoni* Mavari, Paratype MFP (Museum of Natural History “Felipe Poey”, Havana University); J, K, L = *C. disforme nodali* = Cañon de la entrada de Banes cerca del Faro de Banes; M, N, O = *C. geophilus*, Ensenada de Morales, Banes.

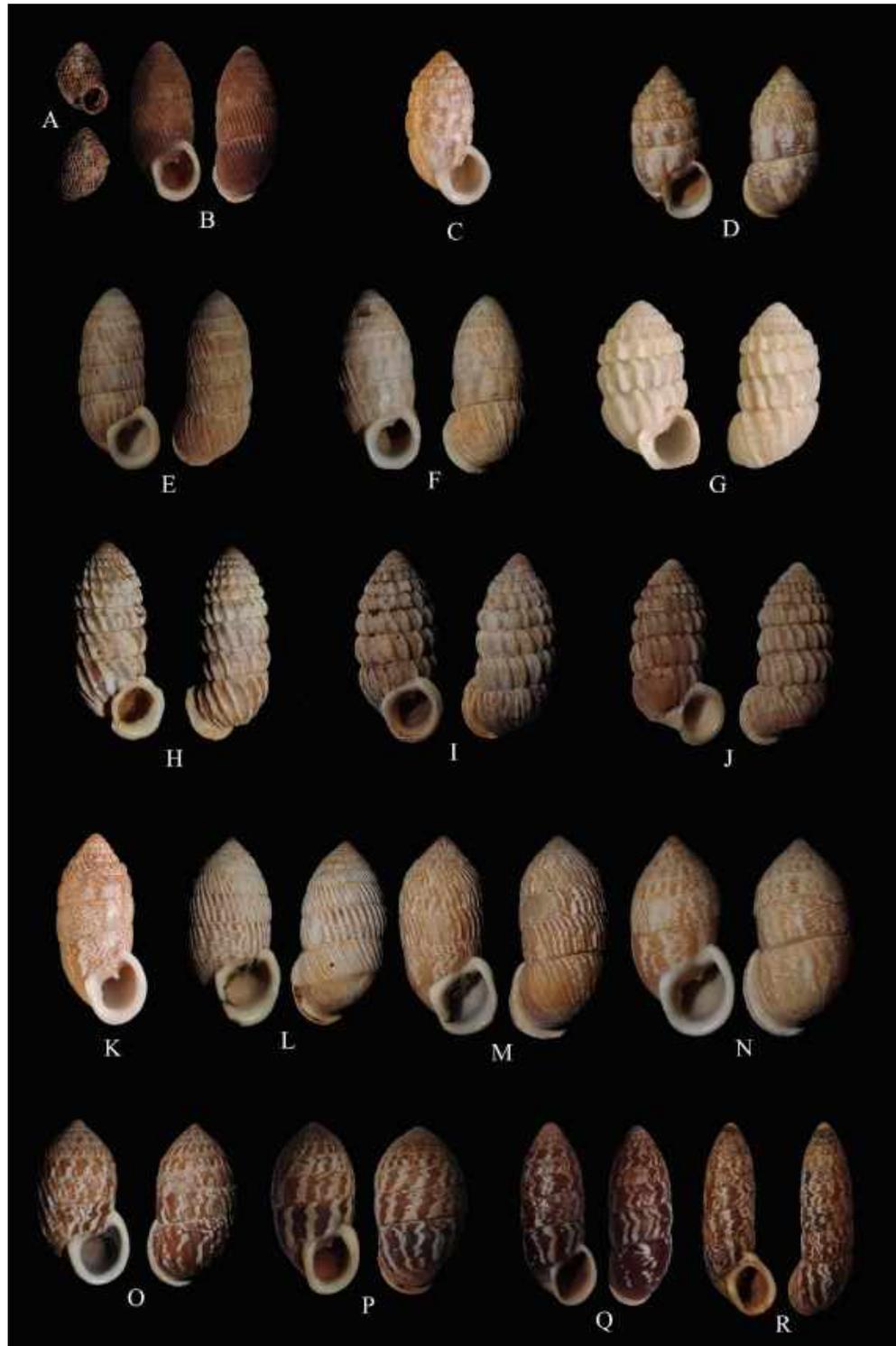


Figure 15. A, B = *Cerion hessei*, Balcon de las Damas, Guardalavaca, Banes; C = *C. migueleti*, Cayo Miguel, Boca del Yaguaneque, Cananova, Sagua de Tánamo; D = *C. nipense*, Playa Juan Díaz, Nipe Bay, Mayarí; E, F = *C. paucisculptum*, Punta de Música, Samá, Banes; G = *C. prestoni*, Nipe Bay, Matarí; H, I, J = *C. scalarinum sueyrasi*, from Boca de Samá to 1 km west, Banes; K = *C. tanamensis*, Sagua de Tánamo, Paratype MFP; L, M, N = *C. torrei moralesi*, Punta Morales, Banes; O, P = *C. torrei ornatum*, west side of Puerto de Vita, Rafael Freyre; Q, R = *C. vulneratum lepidum*, Laguna en Punta de Mulas, Banes.