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Part 1. Species Groups *basalis*, *breviscapus*, and
undulatus (Coleoptera, Curculionidae, Cholinae)

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Revision of *Cholus* (*Aphyoramphus*) Part 1. Species Groups *basalis*, *breviscapus*, and *undulatus* (Coleoptera, Curculionidae, Cholinae)

PATRICIA VAURIE¹

ABSTRACT

Nine species of three species groups of *Cholus*, subgenus *Aphyoramphus*, of South America are

reviewed. Four of these are new: *breviscapus*, *goniaeus*, *impunctus*, and *seabrai*.

INTRODUCTION

The species of the large subgenus *Aphyoramphus* Guérin-Méneville are characterized in having long, linear front femora (some species also have long, linear middle and hind femora), and long outer apical combs or setae on the four posterior tibiae, in contrast to the majority of species of *Cholus* (*Cholus*) in which the femora are clavate and the apical combs short. These characters are relative and would not suffice, in my opinion, for generic status; even for a subgenus they are not exclusive. The problem of generic limits in *Cholus* was discussed by me (1976), and the solution is still not clearly envisaged.

In the meantime several distinct, new species have been recognized. The original generic description of *Aphyoramphus*, however, must be modified by the omission of the two characters which Guérin-Méneville (1844) gave for his unique male, i.e., the dilated and carinate humerus of the elytra and the large, truncated mesosternal prominence. These characters are not present in all species of *Aphyoramphus* (as understood by me), and in the female the humerus is only fee-

bly dilated and the mesosternum merely tumid. I use these two "generic" traits of the male to define a species group (*basalis*), and I add to the conception of *Aphyoramphus* a character that defines another species group (*undulatus*), the absence in both sexes of the usual tooth of the front femur.

If one were to restrict Guérin-Méneville's *Aphyoramphus* to a subgenus consisting only of species of the *basalis* group (with the male characters mentioned above), then the next name available for another subgenus of *Cholus* would be *Archarias* Lacordaire (1866) which, like *Aphyoramphus*, was said to have long narrow legs with linear femora and the outer comb of the four posterior tibiae ciliate in at least their terminal third. I do not, however, recommend splitting *Cholus* into further subgenera, and consider *Archarias* a synonym. The species presented herein have already been associated with five different "generic" names: *Cholus*, *Dionychus*, *Atoniscus*, *Archarias*, and *Aphyoramphus*.

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As there are many other species ($50\pm$) of *Aphyoramphus* that have not been fully studied, I do not give detailed description of the subgenus, but do list the shared characters of the species of the three groups considered here. These groups differ from other species of the subgenus in South America either in having the front femora unarmed or in having dilated and carinate elytral humeri coupled with a protuberant mesosternum.

These weevils are medium to very large (12 to 27 mm.), and are adorned with black tubercles and white, yellow, or orange hairs or scales. The males are distinguished from the females either by the more dilated base of the elytra, by the presence of laminae or upturned hooks on the front coxae, by one or more concave impressions on the abdomen, or by the larger or differently shaped mesosternal process.

The species occur in South America, chiefly in Brazil, some in Argentina, Bolivia, Colombia, Ecuador, French Guiana, Paraguay, Peru, and Uruguay.

Araujo e Silva (1968) reported the larvae of *parcus* (synonym of *undulatus*) in São Paulo boring into coconut palms, in the sheaths of "geriva" (*Cocos comosa*), and breeding in species of Gramineae. They have been found also in the fruiting sheaths of *Araeococcus* spp. (Bromeliaceae), and in a palm. Bondar (1940, p.64) remarked that he never observed *parcus* in *Cocos nucifera* although it could readily adapt to that palm. Adults are said to frequent flowers of palms.

I have examined 243 specimens of the five described species and 27 of the four new species, including the types of all the previously named forms with the exception of *basalis* Boheman, *rugosus* Guérin-Ménéville, and *subscutellaris* and *funnebris* Desbrochers des Loges.

ACKNOWLEDGMENTS

Specimens were borrowed from the Entomology Division, Department of Scientific and Industrial Research, Auckland; the American Museum of Natural History, New York; the British Museum (Natural History), London; Museu de Zoologia, São Paulo; Museum für Tierkunde, Dresden; Muséum National d'Histoire Naturelle,

Paris; Naturhistoriska Riksmuseum, Stockholm; Senckenbergische Naturforschende Gesellschaft, Frankfurt; the National Museum of Natural History, Smithsonian Institution, Washington, D. C.; Zoologische Staatssammlung, Munich; and Zoologisches Museum, Humboldt Universität, Berlin. I also examined specimens from the collections of Dr. Carlos A. Campos Seabra of Rio de Janeiro and Dr. Guillermo Kuschel of Auckland. The photographs were made by Peter Goldberg of the American Museum of Natural History, and the inking of the line drawings by the American Museum's Graphic Arts department. Figure 6 of the new species *seabrai* was drawn by Mrs. C. A. O'Brien of the British Museum (Natural History) and was donated by Dr. Guillermo Kuschel of Auckland.

SYSTEMATICS

CHOLUS

Subgenus *Aphyoramphus* Guérin-Ménéville¹

Aphyoramphus Guérin-Ménéville, 1844, p. 158 (type species, by monotypy, *A. rugosus* Guérin-Ménéville, a synonym of *Cholus sparsus* [Gyllenhal]).

Archarias Lacordaire, 1866, p. 38 (type species not designated; *Curculio miliaris* Olivier, here designated).

Sternoxus Chevrolat, 1879a, p. xvi (type species: *Curculio laticollis* Olivier, by original designation).

Lonchocerus Chevrolat, 1879c, p. xl (type species, by monotypy, *Cholus rhomboidalis* Fahraeus).

CHECKLIST OF SPECIES OF THREE GROUPS OF *CHOLUS* (*APHYORAMPHUS*)

THE *BASALIS* GROUP

1. *basalis* Boheman
biflexuosus Chevrolat
2. *sparsus* (Gyllenhal)
rugosus Guérin-Ménéville
3. *calamita* Pascoe
dispersus Desbrochers des Loges
4. *goniaeus*, new species

¹Other spellings have been *Aphioramphus*, *Amphioramphus*, and *Aphyoramphus*.

THE *BREVISCAPUS* GROUP

- 5. *breviscapus*, new species

THE *UNDULATUS* GROUP

- 6. *undulatus* (Gyllenhal)
 - parvus* Fahraeus, new synonymy
 - subscutellaris* (Chevrolat), new synonymy
 - hypocrita* (Chevrolat), new synonymy
 - subclathratus* Desbrochers des Loges
- 7. *impunctus*, new species
- 8. *niveopunctatus* (Gyllenhal)
 - densatus* (Desbrochers des Loges), new synonymy
 - funebri* Desbrochers des Loges, new synonymy
- 9. *seabrai*, new species

KEY TO THREE SPECIES GROUPS OF *CHOLUS* (*APHYORAMPHUS*)

- 1. Antennal scape short, distant from eye by length of antennal club; diameter of eye greater than base of rostrum (in lateral view); all femora lacking usual subapical tooth; Peru. *breviscapus*
- Antennal scape long, almost attaining border of eye; diameter of eye about equal to base of rostrum (in lateral view); only front femora, if any, lacking subapical tooth. 2
- 2. Front femora unarmed; elytra with humeri not dilated; mesosternum flat or feebly protuberant, much smaller than middle coxae *undulatus*
- Front femora armed; elytra with humeri dilated and carinate-tuberculate; mesosternum sharp protuberance of round tumidity as large as (or taller than) middle coxae *basalis*

The *basalis* Group

Four species are included in this group: *basalis* Boheman; *calamita* Pascoe; *goniaeus*, new species, and *sparsus* (Gyllenhal).

The species are distinguished from other *Cholus* by a combination of basally widened elytra and large mesosternal projection. The elytra of males are dilated widely at the base, the margin of the dilated part being tuberculate and carinate to about the middle of the sides of the elytra; the large mesosternal projection is sharply elevated and truncated (like a capstan), and is rec-

tangular or elongate in shape. In females the humeral area is also tuberculate, but it is less dilated and is shorter than that of males; the projection of the mesosternum is large, but tumid, round, and convex. The three smaller species (*basalis*, *calamita*, and *sparsus*) are exceedingly similar with variable and somewhat intergrading characters.

Description. Eyes round, convex, their diameter (in lateral view) not greater than width of base of rostrum. Antennae inserted at or slightly in front of middle of rostrum; scape reaching to border of eye. Rostrum long, arcuate. Pronotum wider than long, depressed at middle of base where basal margin approaches from each side; postocular lobe not prominent. Scutellum feebly elongate or somewhat transverse. Elytra at humerus distinctly wider than pronotum; subapical callus strong. Middle coxae separated by about same distance as front coxae. Mesosternum strongly protuberant. Middle and hind femora as linear and narrow as front femora; all femora toothed. Middle and hind tibiae with outer apical fringe of setae almost one-half length of tibiae. Aedeagus with parameres; no basal sclerite; short, strongly arcuate, with apex acuminate; apodemes much longer than median lobe; lobe ventrally near base carinate (but not carinate in *goniaeus*).

KEY TO SPECIES OF THE *BASALIS* GROUP

- 1. Large (19 to 25 mm.); elytra in apical third covered with yellowish scales in angular broad band; pronotum with round lateral depressions and median sulcus; male with mesosternal protuberance elongated, longitudinal *goniaeus*, new species
- Smaller (13 to 16 mm.); elytra with white or yellow spots, lateral stripes, or basal bands, or elytra immaculate; pronotum without depressions or median sulcus; male with mesosternal protuberance square or rectangular 2
- 2. Elytra with striae exposed, distinctly punctate, not tuberculate; intervals with widely spaced tubercles, some discal intervals with only three or four tubercles. *calamita* Pascoe
- Elytra with striae indistinctly punctate, distinctly tuberculate, even where tubercles covered partially with minute hairs; inter-

vals generally with tubercles more densely placed. 3

3. Pronotum with minute, dense orange scales among tubercles; elytra with four distinct basal spots of dense white scales (on humerus and on each side of scutellum) or with spots merged into band, and with larger spot on margin behind middle; body below with orange scales. *basalis* Boheman

Pronotum with sparse, minute whitish scales among tubercles; elytra with only two distinct basal spots of dense white scales (on each side of scutellum), and with scattered white flecks elsewhere; body below with white scales. *sparsus* (Gyllenhal)

Cholus basalis Boheman

Figures 7, 14, 20

Cholus basalis Boheman, 1836, p. 559 (Brazil; type, female, said to be in the Zoological Institute, Leningrad).

Aphyoramphus biflexuosus Chevrolat, 1879b, p. xxxiii (Rio de Janeiro, Brazil; type, female, in Naturhistoriska Riksmuseum, Stockholm, examined; synonymized by Kuschel, 1955).

Diagnosis. Differing from other species in having basal and mediolateral white spots of elytra large and distinct (although in a few specimens basal spots merged into band), and minute surface scales of body generally orange instead of white or yellow.

Range. Brazil, Colombia, and French Guiana. (For 59 specimens examined, see Appendix.)

Description. Length 13 to 16 mm. Head densely punctate. Rostrum distinctly longer than pronotum, with dorsal carina extending to middle or to apex of rostrum, or carina obsolete; dorsally widely expanded at apex; ventrally punctate and bicanaliculate. Pronotum evenly convex, tuberculate, some tubercles separated by their diameter, others, generally at middle, denser; areas between tubercles interspersed with minute orange hairs. Scutellum densely punctate. Elytra covered entirely with round tubercles arranged generally in regular rows; tubercles of striae in some specimens smaller than those of intervals; striae punctures not evident; surface with minute yellow-orange hairs among tubercles; at base four dense white spots (at humerus and each side of scutellum), merged in some specimens; behind

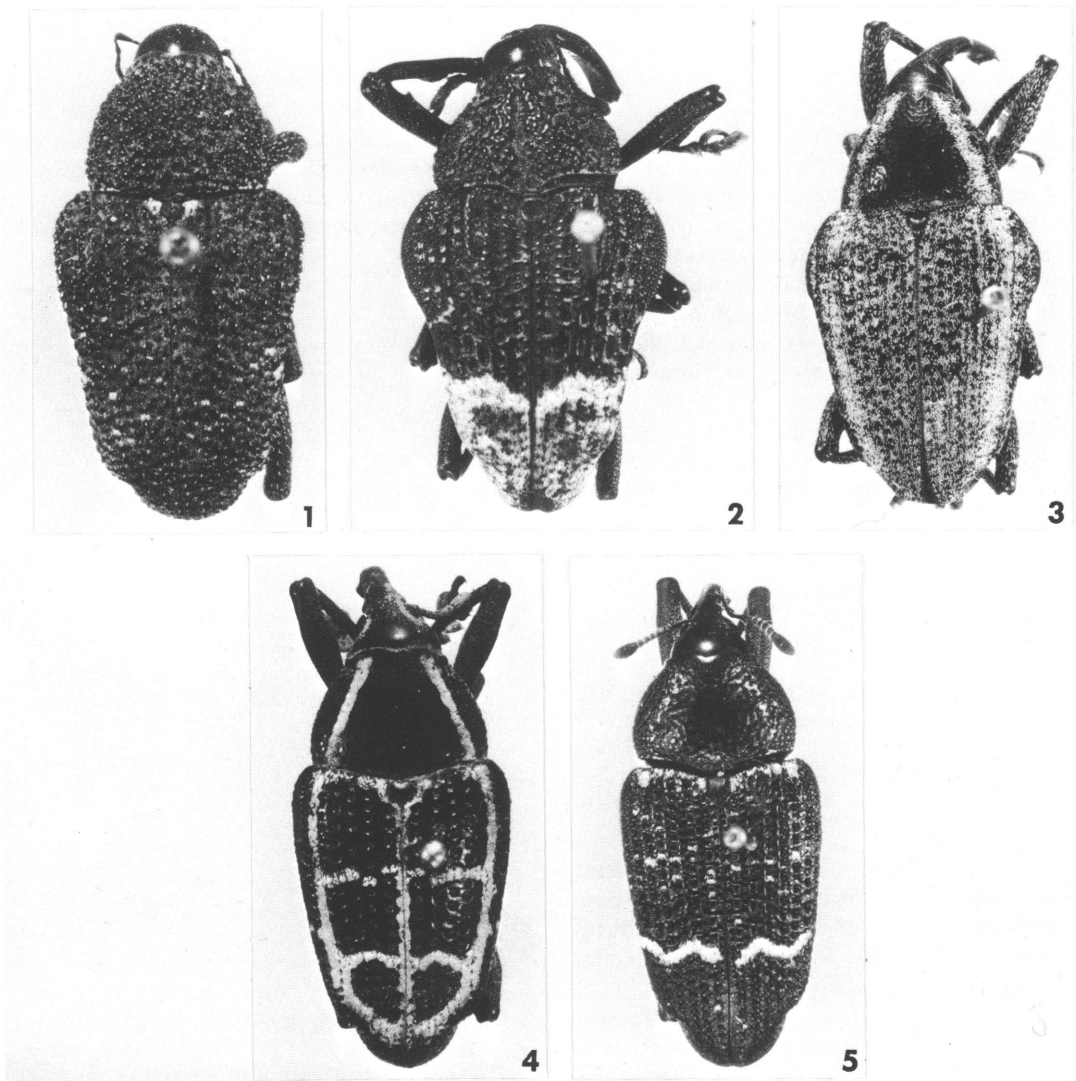
middle laterally with larger white spot; elytra of male with dilated humeri tuberculate-carinate to near middle of elytra (about to white lateral spot); of female less dilated, and tuberculate carina short, accommodating only from five to seven tubercles on its margin, but remainder of interval 7 with widely separated tubercles.

Prosternum flat or feebly concave. Front coxae widely separated by more than width of rostrum at middle. Vestiture below of dense orange scales except on most of abdomen (no scales) and on mesepisternum and basal corner of metasternum (dense white scales). Aedeagus with sides widening from base to middle (fig. 14).

Remarks. All but one or two individuals have the characteristic orange scales ventrally. In several individuals the basal white spots of the elytra are merged into a band, and in one individual six flecks of white scales are present on the disk of the elytra as in *sparsus*.

Although Chevrolat (1879b) described *A. biflexuosus* as a separate species he evidently later considered it a variety of *basalis* as an additional label on the type specimen in Stockholm reads *Aphyoramphus* [sic] *basalis* var. *biflexuosus*. The generic name *Erethistes* appears also on the specimen.

Chevrolat's type is a female as is also Boheman's type of *basalis*. Desbrochers des Loges (1906, p.356) said that *basalis* should form a distinct genus from *Aphyoramphus*, or at least a subgenus, "*Atroniscus mihi*," and he proceeded to state how *basalis* differed from *Aphyoramphus*. (On the same page he named a genus *Atoniscus*, without the "r," which he described on p.359, and which is a synonym of *Homalinotus*.) The characters of *Aphyoramphus* mentioned by Desbrochers des Loges, however, are not those of its author, Guérin-Méneville (1844), but those given by Lacordaire (1866, p.36), who mistook a large species with the pattern of the new species I describe below, for the smaller *A. rugosus* of Guérin-Méneville (see under *goniaeus*). Furthermore, although Desbrochers des Loges mentioned both sexes of *basalis*, he evidently had only females because he said that the mesosternal projection was rounded and scarcely pronounced (as in females), instead of being prominently elevated and truncate (as in males).



FIGS. 1-5. *Cholus*, not to scale. 1. *C. sparsus* (Gyllenhal), 13 to 16 mm. 2. *C. goniaeus*, new species, 19 to 25 mm. 3. *C. breviscapus*, new species, 17 mm. 4. *C. impunctus*, new species, 18 to 23 mm. 5. *C. undulatus* (Gyllenhal), 14 to 24 mm.

Cholus sparsus (Gyllenhal)
 Figures 1, 7, 14

Dionychus sparsus Gyllenhal, 1836, p. 582 (Brazil; type, male, in Naturhistoriska Riksmuseum, Stockholm, examined).

Aphyoramphus rugosus Guérin-Ménéville, 1844, p. 158 (Brazil; type not found; synonymized by Kuschel, 1955).

Diagnosis. Tuberculation of pronotum and elytra almost identical with that of *basalis*, but *sparsus* differing in having scattered white flecks on elytra, two instead of four white scutellar spots, no mediolateral white spots, and white instead of orange scales ventrally.

Range. Argentina, Brazil, and French Guiana. (For 64 specimens examined, see Appendix.)

Description. All characters as described for *basalis* except for whitish, not orange hairs or scales on pronotum, elytra, and venter, and for elytral pattern (see above).

Remarks. The great similarity between *sparsus* and *basalis* is suggestive of conspecificity, especially as the "distinct" basal elytral spots of *basalis* are merged in several specimens and the less distinct white spots on the humerus and sides of the elytra of *sparsus* are in the same areas of the body as the distinct spots of *basalis*. The same can be said for *calamita* in which the scaly pattern varies also. Possibly these three species will be found to be conspecific.

Although I have not seen the type of *rugosus*, Guérin-Méneville's description is detailed and agrees with the type of *sparsus*, as noted by Kuschel (1955), and by me.

Cholus calamita Pascoe
Figures 7, 14

Cholus calamita Pascoe "1873" [1872], p. 467 (Brazil; type, female, in British Museum [Natural History], London, examined).

Cholus dispersus Desbrochers des Loges, 1906, p. 357 (Brazil; type, female, in Muséum National d'Histoire Naturelle, Paris, examined; synonymized by Kuschel, 1955).

Diagnosis. Differing from *basalis* and *sparsus* in having sparse, not dense tubercles on pronotum and elytra, striae of elytra punctate, not tuberculate, and lateral white stripes generally present on pronotum and elytra.

Range. Brazil (Rio de Janeiro and São Paulo). (For 15 specimens examined, see Appendix.)

Description. Length 12 to 16 mm. Head and rostrum as described for *basalis*. Pronotum convex and tuberculate, some tubercles contiguous or confluent, but majority widely and irregularly separated, leaving large circular areas free of tubercles; spaces between tubercles with fine minute hairs; some specimens with oblique, broad lateral stripes of dense round white scales. Scutellum punctate or not. Elytra tuberculate as stated above; some intervals with tubercles separated by seven or more times their diameters; tubercles about same size as those of pronotum, interspersed with scarcely visible fine hairs; elytra with white lateral vittae (generally) or basal white band (rarely).

Prosternum, front coxae, and aedeagus as de-

scribed for *basalis*. Vestiture below yellowish white (but orange in one individual).

Remarks. A specimen of *calamita* with orange scales ventrally (as in *sparsus*) has a basal white band on the elytra (as in *basalis*), yet this specimen resembles other *calamita* in having lateral white stripes, well-separated elytral tubercles, and punctate, not tuberculate striae. The tuber-

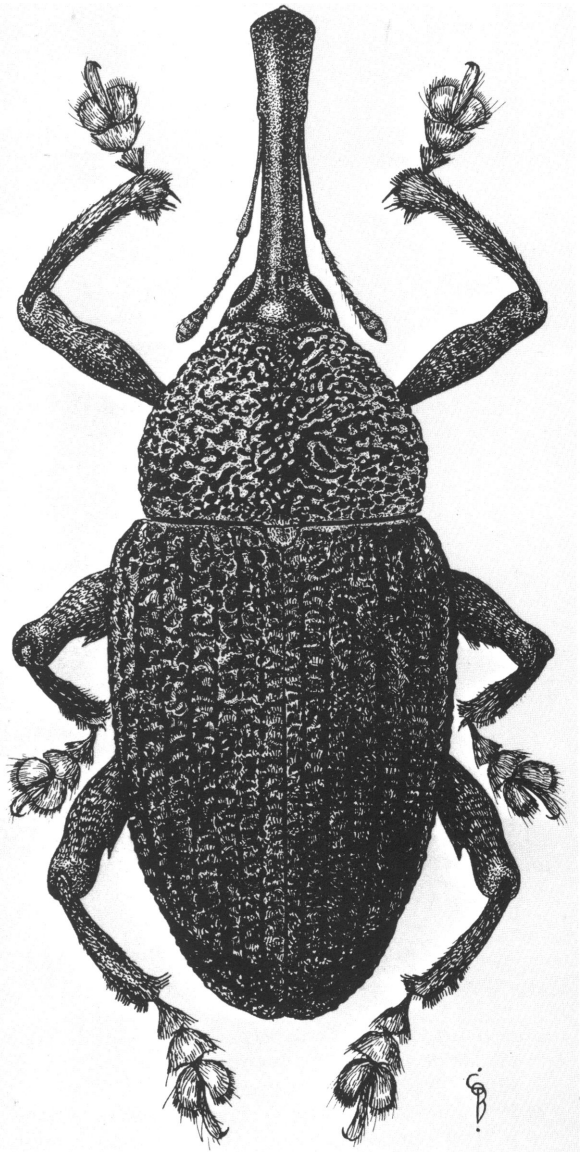


FIG. 6. *Cholus seabrai*, new species, female paratype, 26 mm.

culation and scaling vary in some specimens of all three species. In the majority of *calamita*, however, including the types of *calamita* and *dispersus*, white lateral stripes are present on the pronotum and elytra, and these stripes are lacking in *sparsus* and *basalis*.

In the type of *dispersus* and in one other specimen a small tubercle was found on the prosternum between the front coxae.

Cholus goniaeus, new species

Figures 2, 8, 9, 15, 22

Type Material. Type, male, and paratype, female, "Brazil," in Muséum National d'Histoire Naturelle, Paris; seven paratypes from "Brazil": one male, two females in Kuschel collection, Department of Scientific and Industrial Research, Auckland; one male, one female in the American Museum of Natural History, New York; one female in Zoologisches Museum, Berlin; one male in Zoologische Staatssammlung, Munich; six paratypes: one female, Rio de Janeiro, Brazil, in Muséum National d'Histoire Naturelle, Paris; one female, French Guiana, in National Museum of Natural History, Smithsonian, Washington, D. C.; and one male and three females without locality data in Muséum National d'Histoire Naturelle, Paris.

Diagnosis. Differing from three preceding species in being much larger (19 to 25 mm.), in having apical third of elytra covered with angular crossband of dense yellowish scales, postocular lobe more prominent, pronotum sulcate at middle, and mesosternal projection of male longer than wide, not square or rectangular.

Range. Brazil, French Guiana.

Description of Type. Length 21 mm. Head densely punctate. Rostrum almost twice length of pronotum, sharply carinate at middle from base to about insertion of antenna, having on each side of carina, elongate sulcus of densely reticulate punctures; ventrally punctate and bicanaliculate, with (in lateral view) slight angle formed by elevation of base of postmentum. Pronotum with round lateral depression and median sulcus; sides strongly bulbous at base and strongly narrowed to apex; densely tuberculate, some tubercles confluent. Scutellum densely punctate. Elytra with semicircular, tuberculate-carinate humeral portion about as long as pronotum, reaching halfway to subapical callus; inter-

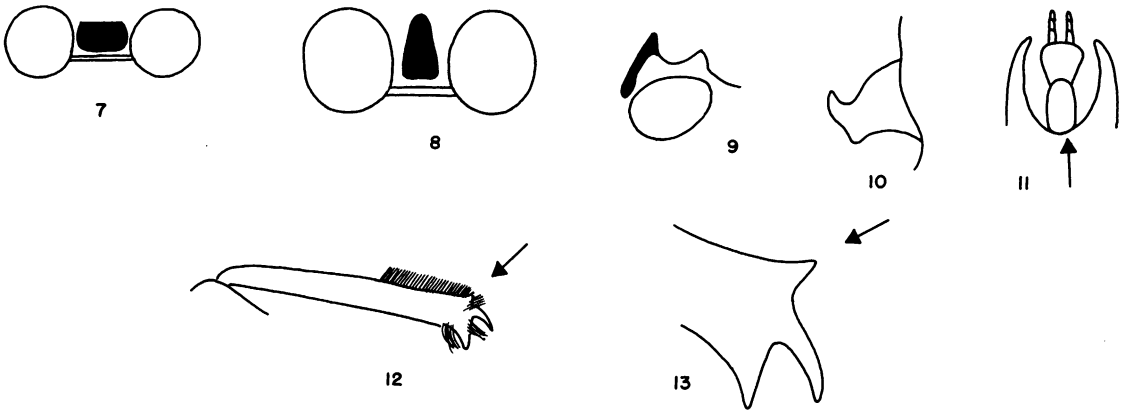
vals 3, 4, and 5 slightly elevated, especially base of interval 4, intervals with row of small tubercles; striae with large, deep, mostly elongate foveae, some filled with yellow scales; apical third covered with fine, elongate yellow hairs forming denser angular band in front; base of elytra within humerus with round depression; epipleura opposite metepisternum with spot of yellow scales.

Prosternum flat. Front coxae widely separated by about width of rostrum. Mesosternum with projection vertical, sharply elevated, taller than coxae, punctate, on sides truncate, in front acuminate. Vestiture ventrally of minute sparse white hairs. Aedeagus (fig. 15) with sides parallel basally, thence gradually narrowing to minute apical angle.

Variation from Type. The paratypes vary in size from 19 to 25 mm. The apical yellowish patch of the elytra in some paratypes is slightly larger or smaller than that of the type and it can be more white than yellow (probably bleached). In some individuals there are scattered scales on the elytra, and in six of the paratypes there are two lateral stripes on the pronotum that are rather sparsely and irregularly furnished with yellow scales. In the female paratypes the elytra are distinctly wider than the pronotum and the humerus is prominent, but there is no wide semicircular swirl to the dilation as in the male; the sides of the elytra of females are gradually narrowed to the apex; the mesosternal projection is uniformly convex, tumid, and punctate.

Etymology. The species name is from the Greek *goniaeus*, meaning angular and referring to the elytral band.

Remarks. It seemed curious to me that a large, rather spectacular species such as *goniaeus* remained undescribed. The reason is the mistaken identity of *Aphyoramphus rugosus* perpetrated by Lacordaire (1866) and followed by Desbrochers des Loges (1906). The redescription by Lacordaire of a male of Guérin-Méneville's genus, *Aphyoramphus*, does not agree with Guérin-Méneville's detailed description of *A. rugosus*, but it does agree with my *goniaeus*. Lacordaire recorded *rugosus* as only one-third smaller than *Rhinastus sternicornis* (Germar), which attains 30 mm., whereas Guérin-Méneville gave the length as 14 mm. Lacordaire mentioned for "*rugosus*" the undulate yellow apical part of the elytra, the large elytral foveae or "fossettes,"



FIGS. 7-9. Diagram showing shape of mesosternal projection between middle coxae of males of *Cholus*. 7. *C. basalis*; characteristic also of *calamita* and *sparsus*. 8. *C. goniaeus*. 9. *C. goniaeus*, lateral view.

FIGS. 10-13. Body parts of *Cholus*. 10. Laminate projection or hook of front coxae of males. 11. Ventral apex of rostrum showing base of postmentum. 12, 13, *Cholus seabrai*. 12. Left hind tibia. 13. Apex of tibia, enlarged, showing toothed outer apex (hairs not shown).

the medially canaliculate pronotum, and the rather angulate-bisinate posterior tibia—all characters of *goniaeus*. Desbrochers des Loges also attributed these traits of *goniaeus* to *rugosus*, and specimens in the Paris museum were labeled as *rugosus*. Lacordaire (1866), however, did have the true *rugosus* (or possibly *basalis*) as he described in a footnote an unknown species that had the elytra strongly dilated and carinate at the humerus and the mesosternum with a large, squarish, truncate projection.

The *breviscapus* Group

The unique species of this group, known from the male only, can be considered as a transition between the *basalis* group and the *undulatus* group. The male has the dilated base of the elytra as that of *basalis* and the unarmed front femur as that of *undulatus*. It agrees further with males of *seabrai*, *impunctus*, and *undulatus* in having a tooth or prominence (fig. 10) on the front coxa. There are, however, important differences between *breviscapus* and the other groups (see diagnosis below).

Cholus breviscapus, new species

Figures 3, 16, 21

Type, male, Lower Rio Ucayali, Peru, Jan-

uary 23, 1928, H. Bassler, collector, in the American Museum of Natural History.

Diagnosis. Differing from species of other groups in having unarmed femora on all legs, vague lateral vitta of round, not elongate, white scales on pronotum and elytra, larger eyes, shorter antennal scape that does not reach eye, and dilated base of elytra bent over epipleurae.

Range. Known only from type locality in Peru.

Description of Type. Length 17 mm. Eye large, extending below base of beak. Head and rostrum finely, distinctly punctate. Rostrum longer than pronotum, only feebly arcuate, dorsally unicarinate from base to insertion of antennae; ventrally base of postmentum feebly elevated. Antennal scape distinct from eye by length of antennal club. Pronotum wider than long, rather conical, laterally with confluent flat tubercles; disk irregularly, finely punctate; punctures of different sizes among flat, virtually obsolete tubercles; pronotum with two oblique lateral stripes of dense white scales and scattered minute hairs; postocular lobe feeble. Scutellum heart-shaped, concave, punctate. Elytra widely dilated at basal fourth in large semicircle furnished with flat tubercles, this area thickened and bent slightly down over epipleura, thence sides narrowing to apex; intervals and striae covered with dense tubercles interspersed with mi-

nute elongate white scales; scales laterally condensed in broad stripe from base to subapical callus. Mesosternum virtually flat.

Prosternum somewhat concave. Front coxae narrowly separated by about width of antennal scape, their inner surface with laminate prominence (almost a hook); middle coxae about three times wider than front coxae. All femora linear, narrow (front ones feebly arcuate), unarmed. Middle and hind tibiae with outer apical fringe of setae more than one-third length of tibiae; outer apices rounded. Abdomen with segments 1 and 2 feebly concave; segment 5 flat. Venter and legs with sparse white hairs. Aedeagus with parameres; no basal sclerite; short, unevenly arcuate, narrowing to apex in long triangle; apodemes much longer than median lobe (figs. 16, 21).

Etymology. The species name is from the Latin, *brevis*, short, and *scapus*, scape, referring to the short scape of the antenna.

Remarks. The dilated humerus of the elytra is bent slightly over the edge of the elytra as in males of two quite different species of *Cholus* (*Cholus*) (*mimus* Vaurie and *dilatatus* Taschenberg). It is further rounded off bluntly and only obsoletely tuberculate, whereas in males of the *basalis* group the dilated humerus is horizontal and sharply carinate-tuberculate. The aedeagus (figs. 16, 21) is quite different in shape from that of the other groups.

In another but quite different species of *Cholus* (*Cholus*), *indubitatus* Vaurie, all femora of the male also lack a tooth.

The *undulatus* Group

Four species are included in this group: *impunctus*, new species; *niveopunctatus* (Gyllenhal); *seabrai*, new species; and *undulatus* (Gyllenhal).

The species are distinguished from others of *Cholus* in South America by the absence in both sexes of the usual tooth of the front femur¹ (the

¹In Central America five species (*conicicollis*, *leucostictus*, *limbatus*, and *xanthospilus* Champion, and *scalaris* [Drury]) lack the femoral tooth in some individuals, or in males only. These species do not appear to belong in the *undulatus* group as they have virtually contiguous, not separated front coxae, more protuberant, hooklike mesosternal process, the prosternum of

unique male of *breviscapus* lacks the tooth on all femora). The tarsal claws appear much smaller than those of the *breviscapus* and *basalis* groups and the claw segment is shorter than there and quite thicker. Males of *impunctus*, *seabrai*, and *undulatus* have laminate projections or hooks on the front coxae; males of *impunctus* have the base of the postmentum feebly elevated.

Description. Eyes, antennae, rostrum, pronotum, scutellum, and tibial setae as described for *basalis* group, but postocular lobe virtually obsolete; elytra at humerus not dilated, only slightly wider than pronotum at widest part; front coxae separated by only one-half width of rostrum at middle (slightly more than one-half in *niveopunctatus*); middle coxae more widely separated; mesosternum feebly tumid or tuberculate; middle and hind femora toothed, feebly clavate; front femur lacking tooth. Aedeagus with parameres; no basal sclerite; apodemes (except for *niveopunctatus*) much shorter than lobe.

KEY TO THE SPECIES OF THE *UNDULATUS* GROUP

1. Pronotum between scaly lateral vittae virtually impunctate, glabrous; elytra with lateral stripe or stripes of dense whitish scales *impunctus*, new species
Pronotum between vittae, if vittae present, tuberculate or punctate, and finely pubescent; elytra immaculate or with whitish spots or bands, no lateral stripes. 2
2. Large (26 mm.); elytra with minute yellow scales among tubercles; tibiae with small tooth at outer apex (figs. 12, 13)
. *seabrai*, new species
Smaller (14 to 24 mm.); elytra with yellow scales condensed in spots or bands; tibiae with outer apex rounded. 3
3. Pronotum punctate, umbilicate; scutellum not hairy; prosternum in front of each coxa flat or only feebly tumid; male with hooks on front coxae . . . *undulatus* (Gyllenhal)
Pronotum tuberculate, not punctate; scutellum (unless worn) with whitish hairs; prosternum in front of each coxa distinctly tumid; male without coxal hooks
. *niveopunctatus* (Gyllenhal)

the male transversely ridged and prominent, larger eye, and the front tibia of the male ciliate.

Cholus undulatus (Gyllenhal)

Figures 5, 18, 23

Dionychus undulatus Gyllenhal, 1836, p. 581 (Brazil; type, female, in Naturhistoriska Riksmuseum, Stockholm, examined).

Cholus parvus Fahraeus, 1844, p. 3 (Brazil; type, female, in Naturhistoriska Riksmuseum, Stockholm, examined). NEW SYNONYMY.

Archarias parvus var. *subscutellaris* Chevrolat, 1879a, p. xv (Brazil; type not found). NEW SYNONYMY.

Archarias hypocrita Chevrolat, 1879a, p. xv (Brazil; type, female, in Naturhistoriska Riksmuseum, Stockholm, examined). NEW SYNONYMY.

Cholus undulatus var. *subclathratus* Desbrochers des Loges, 1908, p. 244 (Brazil; type, male, in Muséum National d'Histoire Naturelle, Paris, examined; synonymized by Kuschel, 1955).

Diagnosis. Extremely variable in extent and arrangement of yellow scales. Differing from *impunctus* in having disk of pronotum punctate, not virtually impunctate, and from *niveopunctatus* in having flattish tubercles of pronotum umbilicate and partially or entirely convergent, not separated.

Range. Chiefly Brazil, but also Argentina, Bolivia, Colombia, Ecuador, and Uruguay. (For 73 specimens examined, see Appendix.)

Description. Length 14 to 24 mm. Head generally densely punctate. Rostrum distinctly longer than pronotum, scarcely punctate except at base; in dorsal view widening feebly at apex; ventrally (male) densely punctate and bicanaliculate; (female) scarcely punctate and bicanaliculate. Pronotum with dense, flattish, confluent, punctate tubercles that in several specimens converge entirely on disk; interstices with tiny pale hairs not visible to naked eye; in some specimens two oblique vittae of yellow, horizontal scales present or pale scaly spots each side of middle. Scutellum punctate. Elytra with sides narrowing to apex; with, generally, small pearly tubercles on intervals and striae, but in three specimens tubercles appearing effaced and strial punctures very large, fovea-like; yellowish white scales in clusters forming from as few as four spots on disk to many spots behind or in front of middle; spots converging in some specimens in undulating band or bands; scales around scutellum and at humerus converging in banded specimens to form

basal band; non-spotted areas of elytra generally filled with minute pale scales.

Prosternum between coxae flat or somewhat concave. Front coxae separated by width of antennal club, with inner surface (of male) furnished with upturned hook. Tibiae with outer apical angle rounded. Abdomen with segments 1 and 2 concave in male, flat in female; remainder of venter hairy-scaly; apex of abdomen with or without depression. Aedeagus (figs. 18, 23) including apodemes almost as long as rostrum, in dorsal view about same width throughout but sinuously inclined to one side; apex broadly rounded; apodemes only one-half length of lobe.

Remarks. Although the elytra, when spotted, resemble those of *niveopunctatus*, *undulatus* differs distinctly in lacking the hairy white scutellum, in having coxal hooks in the male, different tuberculation and punctation, and aedeagus rounded, not acuminate. Of 15 males and 15 females of *undulatus* examined, about half of each sex were spotted, as in *niveopunctatus*, and half had one, two, or three irregular scaly bands; several specimens had orange hairs as in *niveopunctatus*. Pronotal white vittae are generally present in those specimens with the most scales on the elytra. The pattern and orange hairs being variable have resulted in synonyms, and I agree with Kuschel (1955) who synonymized *hypocrita* with *parvus*, and later (in lett.) both names, and *subclathratus*, with *undulatus*. A name of Schoenherr (1826, p. 265) is associated in the catalogues of Blackwelder (1947) and Klima (1936) with *undulatus*, but Schoenherr's name is a *nomen nudum*, having been merely listed without description.

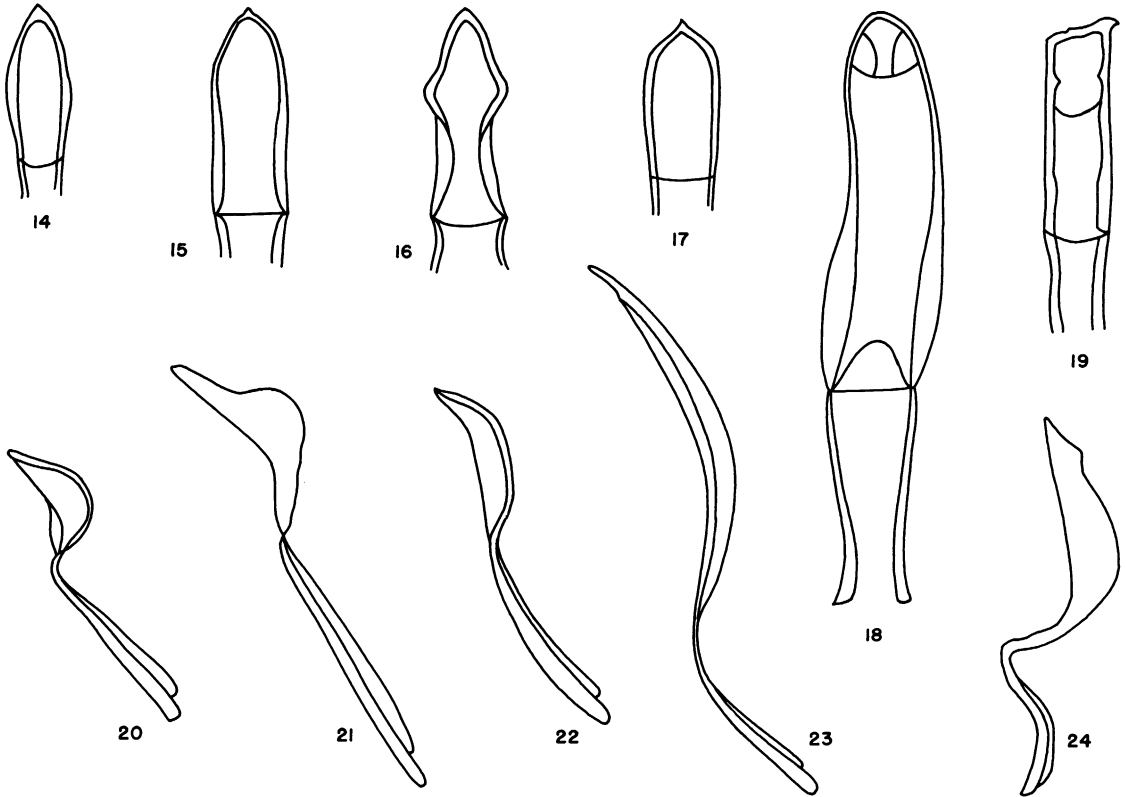
Biology. A specimen without locality data is labeled as having been collected "in Bromeliaceae."

Cholus impunctus, new species

Figures 4, 18

Type Material. Type, male, Parana, Brazil, and paratype, female, Bahia, Brazil, in Kuschel collection, DSIR, Auckland; five paratypes from "Brazil": one female, Muséum National d'Histoire Naturelle, Paris; one male, two females, Kuschel collection; one female, the American Museum of Natural History, New York.

Diagnosis. Similar to some *undulatus* but



FIGS. 14-19. Aedeagus of *Cholus*, dorsal views. 14. *C. basalis*; characteristic also of *calamita* and *sparsus*. 15. *C. goniaeus*. 16. *C. breviscapus*. 17. *C. niveopunctatus*. 18. *C. undulatus*; characteristic also of *impunctus*. 19. *C. seabrai*.

FIGS. 20-24. Aedeagus of *Cholus*, lateral views. 20. *C. basalis*; characteristic also of *calamita* and *sparsus*. 21. *C. breviscapus*. 22. *C. niveopunctatus*; characteristic also of *goniaeus*. 23. *C. undulatus*; characteristic also of *impunctus*. 24. *C. seabrai*.

differing from them and from other species of group in having disk of pronotum glabrous and virtually impunctate, and disk separated from lateral tubercles by impressed vittae filled with yellow scales (vittae of *undulatus*, when present, not impressed).

Range. Brazil.

Description of Type. Length 20 mm. Head and rostrum sparsely punctate. Rostrum longer than pronotum; in dorsal view widening feebly at apex; ventrally densely punctate and bicanaliculate, with base of postmentum feebly elevated. Pronotum on sides densely tuberculate; disk smooth, virtually impunctate; diskal area delimited by two oblique scale-filled troughs, and yellow

scales also in narrow line along base. Scutellum faintly punctate. Elytra with sides narrowing to apex; sides and epipleura densely tuberculate-foveate; disk smooth, not tuberculate; intervals virtually impunctate; striae as wide as intervals, with large, round, deep foveae, forming reticulate pattern; base with line of overlapping yellow scales from humerus to humerus; sides (at intervals 6 and 7) with stripe of white scales; suture entirely scaly; in front of and behind middle of elytra two yellow crossbands join lateral scaly stripes, enclosing squarish black areas.

Prosternum between coxae concave. Front coxae separated by about width of antennal club,

their inner surface with upturned hook. Middle and hind tibiae with outer apex rounded. Abdomen with segments 1 and 2 concave; segment 5 abundantly hairy, at middle feebly depressed. Aedeagus as described for *undulatus*, but apex rather narrowly rounded.

Variation from Type. The length of the paratypes ranges from 18 to 23 mm. The females differ from the males in lacking coxal hooks. In one paratype the scutellum is much wider than long, not so wide as long; in another paratype the rostrum is virtually impunctate. In the type and three of the paratypes the elytral pattern of yellowish horizontal and vertical lines encloses six squarish black spots or "boxes," but in the other paratypes the scaly lines are fuzzed, there are additional flecks of scales in the black areas and the elytra thus appear mottled. All the paratypes but one show the white line on the sides of the elytra and even in that one the line is faintly visible. In several paratypes the intervals of the elytra are tuberculate or punctate.

Etymology. The species name is from the Latin negative of *punctus*, referring to the impunctate disk of the pronotum.

Remarks. At first glance this species could be mistaken for one of the many variations of *undulatus* because the elytra of some individuals of both forms scarcely differ, yet *impunctus* always differs in the pronotum (as stated in the diagnosis) and in having lateral white stripes on the elytra. These two species are more similar to each other than they are to *niveopunctatus*. Kuschel (in litt.), who had done preliminary work on *Cholus*, had separated *impunctus* as a new species.

Cholus niveopunctatus (Gyllenhal)

Figures 17, 22

Dionychus niveopunctatus Gyllenhal, 1836, p. 582 (Brazil; type, sex not determined, in Naturhistoriska Riksmuseum, Stockholm, examined).

Anotiscus densatus Desbrochers des Loges, 1906, p. 369 (Brazil; type, male, in Muséum National d'Histoire Naturelle, Paris, examined). NEW SYNONYMY.

Cholus funebris Desbrochers des Loges, 1908, p. 243 (Brazil; type not found). NEW SYNONYMY.

Diagnosis. Form like that of *undulatus* and with four similar white spots on the elytra as in

some *undulatus*, but no scaly bands as in other *undulatus*. Differing from other species of group in having white scales on scutellum and orange scales elsewhere (several *undulatus* also have orange scales), in having no coxal hooks in the male and a very small, not large aedeagus.

Range. Brazil, Colombia, and Paraguay. (For 32 specimens examined, see Appendix.)

Description. Length 14 to 19 mm. Head and base of rostrum densely punctate. Rostrum in apical half finely punctate, in basal half carinate or with impunctate line; ventrally feebly punctate and bicanaliculate. Pronotum with round and semilunular tubercles separated by their diameters or more; some specimens with white scaly spot each side of middle; interstices with elongated orange scales; pronotum at center distinctly sulcate. Scutellum with white hairs or scales. Elytra with sides narrowing to apex; with small tubercles like those of pronotum, but generally partially hidden by orange hairs; striae punctures when visible separated by their diameters or more; white scaly spots numbering from two to about 16.

Prosternum at middle concave, in front of each coxa generally tumid. Front coxae separated by rather more than width of antennal club, their inner surface without hook. Tibiae with outer apical angle rounded. Ventrally with orange hairs. Abdomen with segments 1 and 2 of male deeply concave, punctate; of female convex and virtually impunctate; segment 5 of some females densely punctate and depressed at middle. Aedeagus small as in *basalis* group; apex acuminate; apodemes long as in *basalis* group (figs. 17, 22).

Remarks. The description of *funebris* (type not found) agrees with *niveopunctatus* in the white scutellum, the pronotal tubercles, the deep median sulcus of the pronotum, and the general shape, but evidently Desbrochers des Loges's unique specimen of *funebris* lacked the characteristic orange hairs of the species. Orange hairs are missing also from the type of *densatus* (examined) and from several additional specimens. The other characters mentioned by Desbrochers des Loges indicate that *funebris* is indeed a synonym of *niveopunctatus*. As for *densatus*, in the type and in two females from Colombia and Brazil, the pronotal tubercles are distinctly denser than are those of other specimens, and the type

has no white scutellum and no orange hairs, yet these specimens appear also to be conspecific with *niveopunctatus*.

In both *niveopunctatus* and *undulatus*, including the types of *densatus* and *undulatus* var. *subclathratus*, a scaly white spot is generally present on the sides of the pronotum and at the base of the metasternum between the coxae and the metepisternum. Other markings, however, are extremely variable in both species.

Individuals with the orange scales or hairs appear brown to the naked eye.

Cholus seabrai, new species

Figures 6, 12, 13, 19, 24

Type Material. Type, male, and paratype, female, Garanhuns, Pernambuco, Brazil, September 8, 1938, A. Maller, collector, in the collection of C. A. Campos Seabra, Rio de Janeiro; female paratype with same data but collected July, 1938, in the American Museum of Natural History, New York; female paratype, Pernambuco, in collection of G. Kuschel, DSIR, Auckland.

Diagnosis. Large species, appearing entirely black and finely tuberculate to naked eye, but actually with all interstices among tubercles replete with clusters of minute yellowish, almost round scales; elytral sides subparallel, not narrowing to apex; tibiae toothed at outer apex.

Range. Pernambuco, Brazil.

Description of Type. Length 26 mm. Head and rostrum faintly, densely punctate. Rostrum much longer than pronotum, ventrally feebly bicanaliculate. Pronotum laterally densely tuberculate; disk reticulate with tubercles flattened and convergent, leaving punctures of various sizes filled with scales; tubercles umbilicate. Scutellum punctate. Elytra with sides virtually subparallel; surface scaly, tuberculate; intervals with two or three rows of dense tubercles; striae with one

row of tubercles separated by their diameters and interspersed with scale-filled punctures.

Prosternum at middle concave in front of coxae. Front coxae narrowly separated by about width of antennal club, their inner surface with upturned hook. Tibiae at outer apex with minute tooth (fig. 12). Abdomen with segments 1, 2, and 5 concave and hairy. Aedeagus (figs. 19, 24) with sides parallel; apex obliquely asymmetrically truncate; apodemes shorter than lobe.

Variation from Type. The females are 25 to 27 mm. long, without coxal hooks and with the venter flat or feebly convex. In the three females the elytral striae punctures appear larger and denser, probably because they are filled with a greater amount of scales.

Etymology. The species is named for C. A. Campos Seabra, who owns one of the largest collections of South American weevils.

Remarks. It is curious that such a large species could have escaped notice, but Pernambuco has not been thoroughly collected. The type locality, Garanhuns, is near the coast.

The sharp little tooth on the outer apex of the tibia of *seabrai* resembles that of *Homalinotus hystrix* (Olivier). The tooth, best seen from below where it is less hidden by the setae, is actually a prolongation of the carina from which arises the uncus. At first glance, *seabrai* could be mistaken for one of the non-flattened species of *Homalinotus*, but it differs from species of *Homalinotus* in having a smaller, round, not elongate eye, pincer-like mandibles, a basal sclerite in the aedeagus, and the front femur and the tibiae unarmed on their inner margins.

The aedeagus of *seabrai* is unusual in having the apex oblique and drawn to one side in a little hook. Although *seabrai* is a larger species (25 to 27 mm.) than *undulatus* (14 to 25 mm.) and *impunctus* (18 to 25 mm.), the aedeagus is proportionally smaller (figs. 18, 19, 23, 24).

APPENDIX SPECIMENS EXAMINED

For convenience, the species, as well as the countries under each species, are listed alphabetically.

Cholus basalis Boheman

BRAZIL: 32. *Bahia*: 1. *Espirito Santo*: 3.

Parana: 1. *Rio de Janeiro*: 10 (including type of *biflexuosus*); *Petropolis*, 1. *Serra da Macahe*, 1.

COLOMBIA: 1.

FRENCH GUIANA: 1; *Cayenne*, 1.

NO LOCALITY: 6.

Cholus breviscapus, new species

PERU: (see under the species in the text).

Cholus calamita Pascoe

BRAZIL: 9 (including types of *calamita* and *dispersus*). *Rio de Janeiro*: Angra dos Reis, 2. *São Paulo*: Cantareira, 1; Piassaguera, 1; Raiz da Serra, 1; Santos, 1.

Cholus goniaeus, new species

BRAZIL: (see under the species in the text).

Cholus impunctus, new species

BRAZIL: (see under the species in the text).

Cholus niveopunctatus (Gyllenhal)

BRAZIL: 9 (including types of *niveopunctatus* and *densatus*). *Amazonas*: 1. *Minas Gerais*: 1; Guape, 2. *Rio de Janeiro*: 1. Petropolis, 1. *Santa Catarina*: Blumenau, 1; Hansa Humboldt, 2; Rio Natal, 1; Rio Vermelho, 4. *São Paulo*: Ilha Queimado Grande, 4.

COLOMBIA: 1.

PARAGUAY: Haut Parana, 1.

NO LOCALITY: 3.

Cholus seabrai, new species

BRAZIL: (see under the species in the text).

Cholus sparsus (Gyllenhal)

ARGENTINA: Misiones: Rio Parana, 1.

BRAZIL: 20 (including type). *Distrito Federal*: Alto da Boa Vista, Tijuca, 8; Corcovado, 1. Floresta da Tijuca, 10; Guaritiba, 4. *Espirito Santo*: 4. *Rio de Janeiro*: 5.

FRENCH GUIANA: Cayenne, 1.

NO LOCALITY: 9.

STATE?: Payta, Voyage de la Benite, 1.

Cholus undulatus (Gyllenhal)

ARGENTINA: Patagonia, 1.

BOLIVIA: 1.

BRAZIL: 22 (including types of *parvus*, *subclathratus*, and *undulatus*). *Bahia*: 1. *Espirito Santo*: 6; Santa Leopoldina, 1. *Minas Gerais*: Bello Horizonte, 1; Caraça, 1; Lassance, 1. *Rio de Janeiro*: 3. *Santa Catarina*: 2; Corupa (Hansa Humboldt), 6; Fazenda Sucavão near Therezopolis, 1; Rio Natal, 3; Rio Vermelho, 5; São Francisco, 1; Therezopolis, 4. *São Paulo*: Peruihybe, 2.

COLOMBIA: 1 (type of *hypocrita*).

ECUADOR: 1.

URUGUAY: Montevideo, 1.

NO LOCALITY: 8.

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