REVISION OF THE GENUS ENTIMUS WITH NOTES ON OTHER GENERA OF ENTIMINI

(Coleoptera Curculionidae)

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Se emprende por primera vez la revisión del género *Entimus* y con tal ocasión se discute brevemente la extensión de la tribu *Entimini*, se da una clave de los géneros que ella comprende y luego las claves de las especies de cada género en particular.

The acquisition by the American Museum of Natural History of fresh series of these spectacular and colorful South American weevils of the subfamily *Leptopinae* first prompted the author to work on them. It was thought also that, since most these insects could be easily identified by their color pattern, their study might throw some light on the problem of other more difficult weevils of the same general type, such as the tribe *Ophryastini*, in which the majority of species have no especial color pattern, all their scales being of the same gray white color. And it was found, in fact, that two species of *Entimus, imperialis* and *splendidus,* which would never be mistaken one for the other, did in reality differ notably only in the color and distribution of the scales on the elytra (there is a slight difference in the sculpture of the elytra also). Since the scales are brightly colored (gold or green), the resulting effect is very different in the two species.

I believe that illustrations of the genitalia of the *Entimini* have not been published before, nor have certain secondary sexual characters here described. Also new are the differences observed among the genera in respect to the shape and contour of the mentum.

All except perhaps a dozen of the species of the *Entimini* have been known for a hundred years, or more, but there has been no revision with full descriptions of the species since Schoenherr in 1833. This may be because the species, at least in *Entimus*, are so distinctive that no further description was thought necessary, or it may be merely a question of lack of material.

Reference to the small number of specimens examined of the genera other than *Entimus*, at the end of this paper, will show why, in the present instance, no revision of the entire tribe was attempted. Although at least one specimen has been examined of 36 of the 41 species in the tribe, sufficient series of many species, especially in *Cydianerus*, were not available for thorough study. The five species of which no specimens were examined are: Cydianerus humilis, longicollis, perplexus, and wahlbergi, and Rhigus agricola. These species are not in the collection of the American Museum of Natural History nor were they represented in the material examined at the British Museum. The first three were described in 1926 by Hustache, the others were described over a century ago. They have been omitted from the keys to the species.

I wish to acknowledge my gratitude to the authorities of the British Museum for allowing me to examine and to borrow specimens in their collection, and especially Sir Guy A. K. Marshall who gave advice and encouragement. Mr. P. G. Kutchel of Santiago, Chile, kindly supplied me with some additional localities for the species in *Entimus*. Thanks are also due Miss Marjorie Statham for the illustrations.

TRIBE ENTIMINI

The Leptopinae consist of the Promecopini, Leptopini, Ophryastini, Hypsonotini, and Entimini. The genera now composing the Entimini were classified by Schoenherr (1826) and Lacordaire (1863) as the Entimides; Waterhouse (1880) listed the one species Cydianerus ornatus under the family Entimidae: Bovie (1908) made them a subfamily, and Pierce (1913) considered them a tribe of the subfamily, Entiminae. Champion (1911) put the only two species in his region (Cydianerus argenteus and Entimus arrogans) in the Entimina group of the Otiorhynchinae Alatae which included also some genera which are now in the Hypsonotini and Promecopini. According to Schenkling and Marshall (1931), Heller (1932), Voss (1934), and Blackwelder (1947) the Entimini are a tribe of the Leptopinae. This seems to me to be their proper status, as they are not distinct enough to be considered a subfamily unless the Promecopini are also included. I do not know all the species of this latter tribe but most of them have the metasternal swelling acutely spined and it is on this character that Voss (1934, p. 70) divides the Promecopini from the Entimini, placing his new genus, Pseudendius, in the latter. However, Phaedropus of the Entimini also has this swelling acutely spined, or at least acutely tubercular, and this genus would therefore, by his classification, belong in the Promecopini. The genera Eudiagogus, Coleocerus, Promecops, and Eucoleocerus of the Promecopini (in the species I have examined) have the second abdominal segment as long as the first and longer than the next two combined, but this is also true of the genus Rhigus in the Entimini. The two tribes can be separated, in my opinion, only by the fact that the Promecopini of tiny, mostly brownish ones, and all species in the Promecopini are smaller than the smallest of the Entimini. Since a tribe may be considered a convenient grouping of genera when the genera are very numerous, ist limits are more or less arbitrary and not of prime importance. For this reason, and also because I cannot be sure from his description whether Voss' Pseudeudius is represented in the material at hand, I am not including this genus in the Entimin'i. It

consists of four tiny species (three brownish, one with green bands) with the metasternal swelling feeble and the tarsal claws free at the base (tipe, *Sintona duria* Germar). Its species could not be confused with any of the *Entimini* with free tarsal claws (*Entimus, Polydius, Phaedropus*) because of its size (5-7 mm.) and *Cydianerus*, which has small species, has the claws connate, as does *Rhigus* also.

Distribution and description of the tribe Entimini.

The five genera of the tribe *Entimini* (*Entimus*, 5 species, *Phaedropus*, 3 species, *Polydius*, 7 species, *Cydianerus*, 15 species, and *Rhigus*, 11 species) are distributed throughout South America, with two species, *Entimus arrogans* and *Cydianerus argenteus*, being found in southern Central America (southern Mexico, Honduras, Nicaragua, Costa Rica, and Panama).

The majority of species in the tribe are medium-sized or large (from 12 to 40 mm.), although a few are under 10 mm., such as Cydianerus ornatus, C. argenteus, C. flexuosus, C. bifasciatus. The body is entirely or in great part clothed with green, blue, gold, white, brown, or buffy scales, except Entimus arrogans which has hairs instead of scales. Many species have granules or tubercles or large, acute, spiny protuberances on the dorsal surface. All species are winged; they have the elytra definitely wider at the base than the base of the pronotum, the humeri distinct and angular. often acute, the punctate striae ten in number, the intervals often ribbed or costate. The beak is robust, rather short, usually with grooves or depressions, feebly or strongly dilated towards the apex which is triangularly cut out or emarginate; the mandibular scars (deciduous cusps) are prominent, the mandibles large, not toothed, the maxillae concealed by the mentum. The antennal grooves descend abruptly or obliquely to a point below and in front of the eye, not opening on to the eye, in some genera passing also inferiorly. Postocular lobes' are present on the apical margin of the prothorax except in some Polydius which have, however, a cluster of hairs at the place where the lobe is barely indicated. The metasternum in front of the hind coxae is feebly or strongly swollen, quite acute in *Phaedropus*; the metasternal episternum is long and narrow, but dilated transversely in front. The epimeron of the mesosternum is a triangular piece about the same size as the episternum and its outer border reaches to the base of the elytra. The tibiae are straight (curved towards the apex in Rhigus), but appear dilated somewhat at the apex because of the hairs in that region, the apex with a blunt inner claw usually hidden by the hairs, but acute, long, and well visible in *Rhigus*; in *Phaedropus* the tibiae are minutely crenulate on the inner side. The articular surface of the hind tibiae (corbel) is concave, wide open, ascending the tibiae in some Rhigus, either wholly glabrous or invaded by the scales of the tibiae. The tarsal claws at the base are either connate (Cydianerus, Rhigus) or divergent (Entimus, Phaedropus, Polydius). The tarsi in all genera are large, dilated, broad, the third segment bilobed, below spongy hairy except for a median narrow line. The male genitalia are heavily chitinized, elongated, strongly curved, with large dorsal orifices (figs. 1-12).

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Key to the genera of the Entimini

	Genus Entimus Germar	
		nnigus
-	Abdomen with second segment at middle definitely lon- ger than third and fourth united; mentum retracted and cavernous, its posterior margin nearly straight (fig. 13); corbels of hind tibiae without scales; front tibiae armed with long, curved claw at apex on inner side	Bhim
4.	Abdomen with second segment at middle equal to or shorter than the third and fourth united; mentum flat not retracted, its posterior margin deeply U-shaped (fig. 14); corbels of hind tibiae with a few invading scales at upper end; front tibiae not visibly armed at apex on inner side, but with blunt tooth hidden in hairs	Cydianerus
_	Antennae with second segment of funicle at least twice as long as first; antennae reaching to middle of protho- rax only; metasternal swelling in front of hind coxae acute and strongly produced; tibiae crenulate within	Phaedropus
8.	Antennae with second segment of funicle scarcely, if at all longer than first; antennae reaching to base of pro- thorax; metasternal swelling in front of hind coxae roun- ded or obtuse; tibiae not crenulate or dentate within.	Futimus
	Articular surface of hind tibiae without scales, wholly glabrous; antennae shorter, reaching to middle or base of prothorax; antennal grooves descending obliquely (fig. 16); mentum flat to slightly concave	ą
2.	Articular surface of hind tibiae (corbel) with cluster of scales invading the glabrous depression; antennae long, reaching beyond prothorax; antennal grooves descending abruptly at rigth angles (fig. 15); mentum convex :	Polydius
	hairs	4
	Tarsal claws counste at base, post-ocular lobe without	2
1.	Talsal claws free and divergent at base; post-ocular lobe	

Entimus Germar, 1817, Mag. Ent., vol. 2, p. 341. Type, by subsequent designation, Curculio imperialis Forster (Schoenherr, 1826, Curculionidum dispositic methodica, p. 84). Spectacular, large (up to 40 mm.), winged weevils clothed with green, blue, or gold iridescent scales, or grey-white hairs, the prothorax and sometimes the elytra strongly granulate, the elytra strongly convex, attenuate, and declivous, the legs very hairy, especially in the male.

Beak broad, robust, longer than head (from tip to in front of eyes), dilated and emarginate at apex, channelled medially and on each side; mentum broadly U-shaped, not retracted, slightly concave. Antennae with funicle seven segmented, the seventh segment not contiguous to the club, the club four segmented; antennae elbowed, inserted subapically in deep, narrow grooves which descend obliquely to a point in front of and below eye, not opening on to eye, antennae extending about to base of prothorax; scape reaching to front of eye, almost as long as funicle, slender, apically widened; funicular segments longer than wide except the last four which are more or less transverse; club elongate, about four times longer than wide. Eyes on sides of head, nearly round but slightly pointed below, somewhat prominent.

Prothorax nearly cylindrical, granulate, pronotum as wide as or wider than long, slightly bisinuate at base, channelled down the middle; post ocular lobes not covering the eyes, but quite prominent, acute or somewhat obtuse, fringed with hairs that often reach to the eye.

Elytra twice as wide as pronotum at base, more or less triangularly shaped, strongly declivous behind, humeri prominent and acutely or obtusely angled, elytra narrowing to apex, each elytron at apex with blunt or acute tooth; elytra with strial punctures sometimes obscured by scales or hairs, the intervals smooth or strongly granulate, or invaded by hairs or scales. Scutellum elongate, usually covered thickly with hairs.

Femora clavate; tibiae straight but widened on both sides at apex and with blunt inner apical tooth hidden in hairs; tibiae with corbels transverse-ovate, more or less cavernous, glabrous within; tarsi large, hairy, more or less transverse, as wide as tibiae, third segment dilated and strongly bilobed, all segments with spongy hairy pads below except for narrow median line; claws simple, free and divergent at base. Legs clothed with scales or long, fine hairs, or both; males with especially hairy legs.

Front coxae prominent, contiguous, middle coxae globular, separated by narrow truncated process, hind coxae more or less transverse, widely separated. Under surface clothed with hairs or scales or both. Metasternum with obtuse swelling in front of hind coxae. Suture between metasternum and first abdominal segment angular. Mesosternal pieces of equal size. Abdomen with first segment at middle twice as long as second, second segment almost as long as three and four united, the sutures between them straight, segments two to four with a fringe of brownish hairs on posterior border. Last segment broadly rounded in male, narrower and more pointed in female. Length: 13 to 40 mm. (including beak).

Male genitalia. Penis with the apex forming an acute triangle (figs. 9-11).

History and distribution. Only two species, *imperialis* Forster, 1771, and *splendidus* Fabricius, 1792, were included by Germar when he ereted the genus Estimus in 1817, although four other species, referable to the genus, two by Linnaeus, 1758, one by Olivier, 1790, and one by Latreille, 1804, had already been described. Latreille, in 1825, under the heading of short nosed weevils with 11-segmented antennae, tarsi bilobed, wings present, scutellum distinct, antennae short, scape not passing the eye, listed Entimus and other genera, but gave no species. The following year Schoenherr gave a full description of the genus, designating *imperialis* as the type and listing three other species, splendidus, nobilis Olivier, and granulatus Linnaeus, all of which were first described under Curculio. In 1833 he gave descriptions of the above four species and added dives Olivier, merely giving the coloration of the latter. In 1847 Erichson described Entimus speciosus, now considered a synonym of granulatus. Lacordaire (1863) discussed generic characters and mentioned the species without full descriptions, omitting speciosus, and rejecting dives, which he said was a Platyomus. The fifth species of the genus, Entimus arrogans, was described by Pascoe in 1873 and by Roelofs, as *plebejus*, in 1875. In 1908, in the Genera Insectorum, Bovie recognized the five valid species as well as the two synonyms (*plebejus*) and speciosus), giving ranges but not discussing the species.

Entimus is an exclusively New World tropical genus, four of its species occurring in most of South America except Chile and southern Argentina, and the fifth, arrogans, in Nicaragua, Costa Rica, Panama, and possibly Colombia. They seem to be principally lowland or coastal species, going inland up the rivers, but granulatus has been taken in the highlands of Ecuador, Peru, and Bolivia, as well as in the lowlands. This is the widest ranging species; it is distributed over most the northern and northwestern region of South America and, as far as present records indicate, does not come into contact anywhere with the three southern species. It has, however, been taken on the Panama isthmus (an old specimen labeled "Darien, Colombia") where arrogans also occurs. The other three species are distributed on the southeastern coastal strip of South America from Bahia southward to Uruguay and to extreme northeastern Argentina, splendidus not extending as far south as *imperialis* and *nobilis*. (fig. 17).

B i o l o g y. There have been no published accounts known to the author on the feeding habits or host plants of *splendidus, granulatus,* or *arrogans.* Of *imperialis* and *nobilis.* it has been said (Bruch, 1932) that they eat the leaves of the "Paineira" (*Chorisia insignis*) and the "Imbiraassu," a species of *Bombax.* The *Bombacaceae* family, to which both of these trees belong, has 50 or more species in the American tropics, including the well known genus *Ceiba; Chorisia* and *Bombax* are genera of huge trees, with large flowers or fruits.

The only species whose life history has been studied is *nobilis*. Bruch (*loc. cit.*) found it breeding in the tubercular roots of *Stigmaphyllon littorale* along the banks of the Plata and Paraná rivers and in other localities in northeastern Argentina. This is a convolvulaceous plant of a small genus of tropical trees and shrubs, some climbers, native to Brazil and the West Indies. A few of Bruch's observations are given below but for further details on the eggs, larvae, copulation, etc., his paper should be consulted. He found *nobilis* adults feeding on the leaves of the above plant from December to March. During this season the female, after copulation, makes a pocket for her eggs by bringing two leaves together or doubling one in half, holding the ends together with some kind of sticky substance. She then lays 12 to 20 or more elongate eggs, arranged in two or three parallel lines, within the leaf pocket, the entire operation taking from three to five hours. After 15 days the emerging larva breaks through the leaf, falls to the ground, and begins searching for a root of *Stigmaphyllon*. This found, it feeds for about nine months and then pupates, the pupation taking 40 to 60 days. The adult on emergence is already colored and hardened. Bruch observed two pairs for two months and said that they produced a total of about 300 to 350 eggs, in about 20 batches.

There is an old tale, recounted by Lacordaire (1863) and repeated by subsequent writers, of *imperialis* feeding on mimosa trees and being so numerous that the branches would bend under their weight. Bruch expresses doubt both as to the nutritive value of the mimosa and the bending of the branches.

Deyrolle (1881) exhibited to the Société Entomologique de France a living specimen of *nobilis* which had emerged in Paris from the roots of what was said to be an arborescent fern from the region of Petrópolis, Brazil.

Discussion of characters

The beak, head, mentum, antennae, antennal grooves, scutellum, femora, tibiae, tarsi, and tibial corbels seem to be essentially the same in all five species, or at least subject to the same kind of variation. The shape or color of the hairs or scales on these parts may differ, however, and this is discussed below under vestiture.

Prothorax. The post-ocular lobe is acute and similar in four species, but obtusely rounded in *arrogans*. This species has the pronotum definitely wider than long and entirely covered with granules whereas the others have it scarcely wider than long and with a more or less flat, smooth strip on each side of the median depression with small, scattered punctures. Although this strip varies in sculpture, being sometimes very smooth, sometimes irregularly and faintly granular, it is never uniformly granular as in *arrogans*.

Elytra. The angled and prominent humeri characteristic of most Entimini are present in all Entimus; they are more or less obtuse in arrogans and granulatus, somewhat more acute in imperialis and splendidus, and produced into a horizontal tubercle in nobilis. Individuals may vary in the sharpness of the angulation. The size and sharpness of the apical angles of the elytra vary more than the humeral angles but they are often hidden by the thick apical hairs. In general, in granulatus and arrogans the apices are not visibly armed whereas they definitely are in the other three species, being especially acute and produced in nobilis. The strial punctures are about the same in all species although closer together in arrogans. Their true depth and shape cannot, however, always be accurately determined because of the presence of scales or hairs. The structure of the elytral intervals, as well as their vestiture, is perhaps the most important diagnostic character. The intervals are flat and uniformly smooth in *imperialis;* flat and slightly rugose in *splendidus;* somewhat raised and cut up into broad, flat granules, often two across the interval, in *granulatus;* strongly raised in bulbous, round granules, often two across the interval, in *arrogans;* and in *nobilis* strongly and sharply raised to form a single, continuous row of more or less elongated granules.

Ventral side. No differences were discerned in the structure ventrally. The swelling in front of the hind coxae seems to be of the same size in all species although the thick hairs in that region obscure the actual shape of the angle.

Vestiture. The hairs, setae, and scales covering most parts of the body vary in color, iridescence, shape, and density. The species arrogans is the only species in which the vestiture forms a vague transverse band on the elytra; it also differs from all the others in the complete lack of scales anywhere on the body, the scales being replaced by long, light colored, fine or thick hairs. The following remarks therefore apply only to the other species. Both hairs and scales may be iridescent (green, blue, gold) although this iridescence may be lost in various areas of the same individual. Some of this bleaching may be due to the age of the specimen, but some hairs are probably never iridescent. Dorsally, except for the beak and head, scales are predominant; ventrally, various types of hairs are predominant. On the head, beak, and legs some of the hairs are broad enough to be called scales, but the vestiture of the elytra and sides of the prothorax is usually definitely scaly in character, being also highly polished, and iridescent or metalic. In granulatus the vestiture, especially in the median channel of the pronotum and on the scutellum, seems often to consist of hairs but this is because the scales are so elongate. Golden scales predominate in *splendidus* and give that species its unique appearance, but they are also present in the other green-blue species. In the latter, the general color may be green or blue but on close examination the scales are seen to be either green, blue, or gold in various proportions, and whichever scales are most numerous produce the over all color. In splendidus, imperialis, and nobilis the majority of scales are broadly oval in shape, but in granulatus they are exceedingly narrow and more than twice as long as wide. The distribution of the elvtral scales is not random as it might appear, but is specifically constant. The scales in *splendidus* are not present in every strial puncture as they are in *imperialis*, and they may overlap two punctures or extend on to the intervals, which never occurs in imperialis. In nobilis and granulatus the strial scales form a continuous line, covering the punctures and the spaces between them, but in granulatus dense scales are present also so on the intervals between the granules, whereas only solitary scales appear on the intervals in nobilis. Ventrally, in the middle of the abdomen and metasternum, hairs are generally more numerous than scales, thick, dense, whitish, appressed hairs being

interspersed with fine, iridescent green or blue hairs. White, sparse, stiff setae, semi erect, occur here and there. The same combination of types of hairs is present on the femora and tibiae; the tarsi have appressed, bluish, iridescent, fine hairs..

Size. The average length, excluding the beak, of all species, is perhaps about 25 mm., but individuals of half this size, both male and female, have been seen.

Secondary sexual characters. The most obvious character differentiating the sexes is the amazing hairiness of the male legs, especially the tibiae. Hairs more than twice as long as the tibiae are wide are set at right angles to the tibiae, giving them the appearance of some kind of bottle washer. The females, however, also have the legs quite hairy and it is only after the male has been that one can really judge the difference. In arrogans and granulatus the hairs are not so long nor so numerous as in the males of the other species

The only other sexual difference noted is the shape of the last abdominal segment which is less truncate rounded, more pointed, and narrower in the female. Unfortunately this segment is often wedged under the apical sides of the elytra so that its apex is hidden.

Genitalia. The penis appears to be of the same general type in all species (no male of arrogans was available for dissection), that of *splendidus* and *imperialis* showing no discernible exterior difference, that of *nobilis* having the apex broadly chitinized and depressed behind, and that of granulatus having the chitinous, rolled-over side borders much broader (figs. 9-11). Because of the strong curvature of the penis, only the apical third or half is shown in the illustrations.

Key to the Species of Entimus.

1.	Dorsal surface without scales, but with abundant, fine colorless hairs	
	Dorsal surface with elongate or oval, green, blue, or gold,	arrogans
	iridescent scales	2
2.	Disc of elytra not granular in appearance: elytral inter-	
		3
	Disc of elytra either strongly granular or feebly granu- lar; elytral intervals invaded by scales	
0	Striel appetung on slytral disc uniformly filled with	4
э.	green scales, the scales not spreading outside the punctures	
_	Strial punctures on elytral disc irregularly filled with	imperialis
-	golden (sometimes greenish) scales, the scales often sprea- ding over two or three punctures or skipping some punc- tures entirely	
		splendidus

Elytral scales broadly oval, not more than twice as long as wide; elytral humeri and apices acutely produced; scutellum with sparse greenish hairs

nobilis

 Elytral scales norrowly clongate, at least three times as long as wide; elytral humeri obtusely produced, apices produced feebly, if at all; scutellum with abundant, dense, whitish hairs

granulatus

Entimus splendidus (Fabricius)

Curculio splendidus Fabricius, 1782, Entomología Systematica, vol. I, p. 448. Brachyrhinus fastuosus Lastreille, 1804, Histoire naturelle... insectes, vol. 11, p. 158.

Large, black, elytral intervals smooth, striae with scattered clusters of iridescent golden scales.

Beak sparsely clothed with fine blue hairs, the punctures on top dense, some small, some larger. Head also with fine blue hairs and a few scales, the front with sparse, fine punctures becoming denser towards the rear. Pronotum very slightly wider than long, with median depression clothed with dense gold or green-gold scales, a broad band on either side bare of scales, with occasional small punctures, the surface either smooth or feebly granular, sides of prothorax strongly granular, with dense green or gold oval scales at the base of the granules. Post ocular lobe acute. Scutellun elongate, covered with bluish white or bluish gold hairs. Elytra with humeri and apices angularly and acutely produced; intervals bare, smooth or slightly rugose, not elevated, striae with punctures well separated, some of them filled with clusters of gold or green scales which may overlap two or three or more punctures or overlap on to the intervals, some puntures bare of scales; suture with narrow line of blue hairs (often worn). Under side clothed with gold scales, appressed blue hairs, and sparse, erect, very long, fine, whitish hairs. Legs without scales, but with same two types of hairs as on under side, males with the fine erect hairs nearly twice as long as the tibiae are wide and much more numerous than in the female. Length (excluding beak): 17-34 mm.

Type Locality.—Brazil; here restricted to the state of Santa Catharina.

D i s t r i b u t i o n. –BRAZIL, on the coastal strip from Rio de Janeiro south into Santa Catharina.

Specimens Examined. – BRAZIL. Santa Catharina: Rio Natal, January through April, November, December, 1945-1946 (A. Maller), eight males, ten females; Rio Vemelho, December, 1941 (A. Maller), one male; Corupa or Hansa Humbolt, January, 1944, December, 1945 (A. Maller), two males. Rio Jan (Rio de Janeiro), 15. Other specimens of this species have been reported from São Paulo, Brazil (Bondar, Kuschel).

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4.

Dorsally, this species has more black, exposed areas, without scales or hairs, than any of the other species. It also has the scaled clusters more unevenly distributed. There does, however, seem to be a certain pattern in this irregularity; in 19 specimens it was noticed that in all, on the third and fourth striae of the elytra, on the slope of the declivity, the cluster of scales forming the gold spots were larger and more elongate, due to the spreading of the scales over two, three, or more punctures. This overlapping of the scales onto more than one puncture is present also towards the apex of the elytra and on the reflexed sides, but on the disc it is more rare in occurrence. The scales in the strial punctures do not usually form round, regular spots of color as in *imperialis*, but are rather uneven and ragged in outline. For comparison with *imperialis*, see that species.

Latreille's factuosus was synonymized by Schoenherr in 1833.

Entimus imperialis (Forster)

Curculio imperialis Forster, 1771, Novae species insectorum, p. 34.

Large, black, elytral intervals smooth, flat, striae with regularly placel clusters of iridescent green scales.

Beak, head, pronotum, scutellum, elytral humeri and apices as in *splendidus*. Elytral intervals bare, smooth, not elevated, striae with each puncture uniformly filled with green, sometimes gold scales, none overlapping the space between the punctures or onto the intervals. Underside and legs as in *splendidus*. Lenght (excluding beak): 16-32 mm.

Type Locality.-Brazil; here restricted to Rio de Janeiro.

D i s t r i b u t i o n. -BRAZIL from Bahia south to the state of Rio Grande do Sul; also northeastern ARGENTINA.

S p e c i m e n s E x a m i n e d. -Brazil. Five males, seven females. Rio de Janeiro, two males, three females. Bahia and Rio de Janeiro, 24. Others specimens have been seen by Kuschel (letter) from Espirito Santo and Rio Grande do Sul in Brazil, and from Misiones in northeastern Argentina.

As can be seen from the above description, this species, except for the structure of the elytral intervals and the distribution and color of the elytral scales, is otherwise almost identical to *splendidus*. The two species have, however, a very different aspect and could not readily be confused, the regular, neat rows of uniformly round scale clusters in *imperialis* contrasting with the irregularly placed, spreading scale clusters of *splendidus*. *E. imperialis* is also generally green in scale color and *splendidus* golden. Of 41 *imperialis*, seen with in the eye, three appear blue, seven gold, and 31 green. The shape of the elytra in the two species is not quite the same, that of *imperiails* appearing relatively slightly longer, and less rapidly narrowing to the apex. Both species occur in the same area, although *splendidus* seems more restricted in distribution. On one of the older specimens the ground color is not black, but pale dull red, perhaps faded.

Differs from the other three species by having the elytra smooth and flat, not at all granulate.

Entimus nobilis (Olivier)

Curculio nobilis Olivier, 1790, Encyclopédie méthodique, vol. 5, p. 228.

Large, black, elytral intervals strongly granular, striae with more or less continuous row of green scales.

Same as *splendidus* and *imperialis* except for the following: Elytral humeri so acute as to be nearly tuberculate, intervals bare except for random scales in the depressed areas, strongly elevated and strongly granular, the granules usually in single row, occasionally double, striae with punctures and spaces between punctures clothed with green, broadly oval scales less than twice as long as wide. Length (excluding beak): 13-25 mm.

Type Locality.-Brazil; here restricted to Rio de Janeiro.

Distribution.-BRAZIL, URUGUAY (Kuschel), and northeastern ARGENTINA (Kuschel, Bruch), along the coastal strip from Rio de Janeiro to Río La Plata.

S p e c i m e n s E x a m i n e d. –BRAZIL. Two males, one female (Schaus), one male (Miss Norton), one male, one female. Rio de Janeiro, 28. Other specimens were reported by Bruch (1932) from the following localities in Argentina: Rio de Santiago; Punta Lara; Delta del Paraná; Río La Plata; and Santo Tomé in Corrientes. By Kuschel (letter) from Buenos Aires Misiones; Entre Ríos.

This species has the elytral humeri more acute than in any of the other species and the elytral intervals more sharply, narrowly, and strongly costate and granular. The humeral angle in nine out of eleven specimens is produced into a tubercle and in the other two is still sharper than in the other species. In two rather old specimens the granules on the elytral intervals on the disc are more flattend, perhaps due to wear, but in the others they are prominent and distinct. The intervals in arrogans and granulatus are broader; in the former they are interspersed with hairs, not scales, and in the latter they are quite flattened, not so elevated, and each broad granule is surrounded by elongated scales. The intervals are not at all granular in *imperialis* or *splendidus*. In the general roughness of the elytra, nobilis is more similar to granulatus but nobilis can be readily separated superficially by the acute humeri and the absence of the thick whitish hairs on the scute llum. It differs also from granulatus in the much less clongate scales on the elytra. In color, of 37 specimens seen, four are blue and 33 green, three of the latter having a somewhat green gold aspect. The smallest specimen (13 mm.), happens to be a female.

Entimus granulatus (Linnaeus)

Curculio granulatus Linnacus, 1758, Systema naturae, ed. 10, vol. 1, p. 386. Curculio sumptuosus Olivier, 1790, Encyclopédie methodique, vol. 5, p. 525. Entimus speciosus Erichson, 1847, in Wiegmann Arch. f. Naturgesch. vol. 1, p. 127. Large, black, elytral intervals weakly, flatly granular, striae and intervals interspersed with green scales.

Beak and head as in the three preceding species. Pronotum with median depression clothed with dense, greenich white, yellowish, or blue scales, the broad bare band on either side interspersed with elongate green scales and small punctures, the surface smooth or feebly granular, sides of pronotum strongly granular, with dense, elongate, green scales at the bare of the granules. Post ocular lobe acute. Scutellum elongate, very densely covered with thick, whitish or yellow hairlike scales. Elytra with humeri angularly produced, but obtuse y rounded, apices scarcely, if at all, produced; intervals partly bare, partly scaly, with broad, slightly elevated flat granules, the granules often double, striae with punctures and space between punctures clothed with green or blue, elongate scales (more than twice as long as wide), the punctures scarcely visible. Under side and legs as in the other species but the male with the leg hairs not so long nor so numerous. Length (excluding beak): 11-30 mm.

Type Locality.-Cayenne, French Guiana.

D i s t r i b u t i o n. -Lowlands and highlands in northern half of South America in BRAZIL, FRENCH GUIANA, BRITISH GUIANA, COLOMBIA, ECUADOR, PERU, and BOLIVIA. Also the PANAMA isthmus (old specimen "Darien, Colombia").

S p e c i m e n s E x a m i n e d. –Brazil: Manaos Region, November, December, 1924 (H. Bassler), two males, two females, British Guiana: Tumatumari on Río Potaro, April, 1912, one mæle. Ecuador: Quito, one mæle. Peru: Chanchamayo [Chanchosmayo River?], March, 1928, four females; Río Santiago, December 15, 1928, one female; Middle Río Ucayali, December 1, 1923, one female; Iquitos, February 16, 1924, one female; Río Abujao - (?), February, 1929, one female (above Peru specimens collected by H. Bassler); Satipo, Jauja Province, February, 1945 (P. Paprzycky), one male, one female; Iberia, Madre de Dios, 500 feet, May 1, 1947 (J. C. Pallister), one male.

Twenty specimens were seen at the British Museum from Cayenne, from Peru, Ecuador, and Panama (Darien). Additional localities are (Kuschel): Tingo María in San Martín, Perú; Santa Cruz and Cochabamba in Bolivia.

Olivier's sumptuosus was made a synonym by Schoenherr (1826) and Erichson's speciosus by Marshall (1930).

In fresh specimens the white or yellow-white scutellum is at once noticeable and, along with the less angulate elytral humeri and apices, serves to distinguish this species from all the others. The dorsal scales, especially those on the elytra, differ from those of the three preceding species in being very narrow and elongate, yet they are not fine hairs as in *arrogans*. As in the latter species, the vestiture on the elytral disc covers all but the raised granules and is not confined to the striae as in the three other species. The elytral apices actually are angular as in *arrogans*, also, but they are not so produced as in the other three species. In 17 specimens before me, only one has the angles of the apices readily visible. There appears to be a greater proportion of blue individuals in this species, ten of 37 being so colored; the rest are green.

Entimus granulatus has a more extensive range than the other species and is widely separated from all of them except *arrogans* with which it may come into contact in the isthmus of Panama. It is not confined to the lowland coastal belt although it occurs in such regions as well as in the highlands.

Entimus arrogans Pascoe

Entimus arrogans Pascoc, 1873, Jour. Linn. Soc. London, vol. 11, p. 448. Entimus plebejus Roelofs, 1875, Ann. Soc. Ent. Belgique, vol. 18, p. XXXVIII.

Large, black or dark red, elytral intervals strongly granular, interspersed with whitish hairs, no scales.

Beak rather densely clothed with yellowish fine hairs, the punctures on top rather dense. Head with same hairs, the punctures denser toward the rear. Pronotum with median depression clothed with yellowish hairs, the surface uniformly and closely granulate, the granules interspersed with yellowish hairs which become denser on the sides of the prothorax; pronotum transverse, about one and one-half times wider than long. Post ocular lobe obtusely rounded. Scutellum elongate, covered with thick yellowish hairs. Elytra with humeri produced, but obtusely rounded, apices scarcely, if at all, produced; intervals partly bare, partly hairy, with bulbous, elevated granules, in more or less single rows, sometimes double, striae with punctures almost touching, the punctures clothed with hairs; hairs behind the middle much denser, forming a short transverse band, sometimes the entire apical half with denser hairs. Under side and legs with yellowish hairs, tibiae with additional bristle like erect hairs. Length (excluding beak): 24 mm.

(Only one specimen, a female, was available at the time of description.)

Type Locality.–Panama.

D is tribution.-costa RICA, NICARAGUA, the isthmus of PANAMA, and possibly northwestern colombia (Roelofs gave "Nouvelle Grenade (?)" as the locality for *plebejus*).

S p e c i m e n s E x a m i n e d. –Costa Rica and Nicaragua: six. Panama, Canal Zone: Barro Colorado Island, January 4, 1929 (C. H. Curran), one female. Champion (1911) had seen specimens from Chontales in Nicaragua, and from Cariblanco in Panama.

This species differs from the others in the genus in the complete absence of scales, in the more transverse pronotum, the rounded, not acute, post ocular lobe, the granular disc of the pronotum, and the transverse white band on each elytron. The latter character is only faintly traced in worn specimens; it is caused by a greater density of hairs. This is the most northern representative of the genus and its southern limits, according to present records, overlap the northern limits of granulatus somewhere in the Panama isthmus. *E. arrogans* appears to be much rarer in collections than the other species.

It would be interesting to know if the male genitalia were of the same type as in the other species, but unfortunately no males were available for dissection.

Of the six specimens seen at the British Museum, three had the ground color dark red, three black.

Roclof's plebejus was synonymized by Marshall (1930).

Other genera of the Entimini

Since the generic characters of *Phaedropus*, *Polydius*, *Cydianerus*, and *Rhigus* have been given repeatedly in the literature (Schoenherr, 1826, 1833, Lacordaire, 1863, Bovie, 1908) and since a key including all the principal characters of the genera has been given above in this paper, these characters will not be repeated in the pages that follow.

The sexes can be differentiated in the same way as in *Entimus* (although males of these genera have no hairy legs) by the fact that the last abdominal segment is usually somewhat more truncate in the male, more pointed and slightly narrower in the female.

Genus Phaedropus Schoenherr

Phaedropus Schoenherr, 1826, Curculionidum dispositio methodica. p. 112. Type, by original designation, *Curculio candidus* Fabricius.

Key to the species of *Phaedropus*

1.	Pronotum with dark longitudinal band in middle third,
	the sides white
	candidus Fabricius
	Pronotum with white longitudinal band in middle third,
	the sides dark
	2
2.	Basal half of elytra with two brown longitudinal bands
	laterally, the middle part white and with two large tu-
	bercles of equal size
	togatus Boheman
	Basal half of elytra entirely white or yellow-white and
	with six tubercles of varying size
	albobrunneus Bovic

These species are of medium size (12 to 15 mm.) with a predominance of white scales, closely set, and varying amounts of brown. All have spiny protuberances on the elytra. The acute metasternal tubercle and crenulate tibiae of *Phaedropus* are not present in the other genera.

The male genitalia in the only species dissected, *togatus*, are different from those of any of the other genera. In the first place, the

penis is tubular for at least two thirds of its length, the apical third being open dorsally as in other genera. Secondly the apex is pointed, narrow, and bent downward, with a noticeable contriction behind the deflexed portion (fig. 12).

Genus Polydius Schoenherr

Polydius Schoenherr, 1826, Curculionidum dispositio methodica, p. 82. Type, by subsequent designation, Polyteles steveni Gyllenhal, = Polydius coelestinus Perty (Gyllenhal, 1833, Genera et species Curculionidum, vol. 1, p. 452).

Polyteles Schoenherr, 1833, Genera et species Curculionidum, vol. 1, p. 452. Change of name of genus.

Polytelidius Bovie, 1908, Ann. Soc. Ent. Belgique, vol. 52, p. 43. Type, by original designation and monotypy, Polyteles guerini Fahreus.

Key to the species of Polydius

(Note: Except for the addition of atrox and the omission of setosus, the following key is an abridgement- of Heller's key (1932, p. 3).

1.	Elytra with two large spines on the elytral declivity
	atrox Germar
	Elytra without large spines on the declivity
	2
2.	Disc of pronotum with at most indistinct transverse de-
	pressions
	Die of menoder with the literation of the second second
	Disc of pronotuin with two distinct, deep, transverse de-
	4
3.	Elvtra light green or blue, with black spots
	coelestinus Perty
	Elytra unicolorous, dark blue-black
	uniformis Heller
4.	Alternating elytral intervals and the suture raised above
	the striae; elytra brown with two pale transverse fasciae.
	guerini Fahreus
	Elytral intervals and suture flat, not raised; elytra green or
	Dide, with black markings
5.	Autennal club about three times longer than wide, elytre
0.	with post median fascia nearly transverse short not rea-
	ching outward beyond the fourth stria
	decussatus Pascoe
	Antennal club more than five times longer than wide;
	elytra with post median fascia oblique, long, usually rea-
	ching outward to the seventh stria
	inka Heller

I have omitted setosus Kirsch, 1874, which Heller placed in the key before decussatus and inka, distinguishing it from those species by the presence of dense, short, black hair. My two specimens of inka also have black hairs on the dorsal surface and if I remember correctly, so do the specimens of decussatus seen at the British Museum. P. setosus is probably a synonym of the latter with which it agrees in the pattern of the fascia.

The male genitalia in two species, *inka* and *atrox*, have an elongate, narrow projection at the apex of the penis; it is a third or more of the entire length of that organ, and is sharply keeled medially. Other details are shown in figures 1 and 2.

Genus Cydianerus Schoenherr

Cydianerus Schoenherr, 1840, Genera et species Curculionidum. vol. 5, pt. 2, p. 737. Type, by original designation, Cydianerus mannerheimi Gyllenhal = Cydianerus latruncularis Perty.

Cydianirus Cemminger and Harold, 1871, Catalogus Coleopterorum, vol. 8, p. 2326. Evidently a misspelling.

Dacnirus Pascoe, 1881, Ann. Mag. Nat. Hist., ser. 5, vol. 7, p. 300. Type, by original designation and monotypy, Dacnirus flexuosus Pascoe.

Key to the species of Cydianerus

1.	Green or yellowish above four round black sports on the
	pronotum and nine to fourteen on each elytron; small,
	9 mm
	2
	Not colored as above, small or large
	. 3
2.	Elytral margins parallel; spots large, clearly marked, dis-
	tinct
	ornatus Pascoe
	Elytral margins narrowing from humeri to apex; spots
	smaller, less clearly marked, often indistinct
	wagneri Bovic
3.	Elytra strongly tuberculate-spiny, the many tubercles espe-
	cially numerous in apical two-thirds; color greenish with
	large median brown mark on elytra; 12 mm
	Pischeri Gynennal
	Eight costate of smooth, not tuberculate-spiny
4	Elutra strongly and acutely costate
т.	Eight strongly and acutory costate
	Flytra not or very feebly costate
	high a not of very record conduct
5.	Antennal club as long as funicle or at least four-fifths as
	long: buffy scales in median proportal depression not attai-

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ning apex; pronotum with the four longitudinal black bands usually well marked, entire
bonemant Boneman
Antennal club only three-fifths as long as funicle; buffy
scales in median pronotal depression attaining apex;
longitudnal black bands on pronotum usually obsolete
especially the lateral area
especially the fateral ones ,
araneiformis Dalman
Elytra without transverse fasciae
, 7
Flytra with two or more transverse facting not always and
Lighta with two of more transverse fasciae, not always rea-
ching side margins
10
Pronotum granular: size usually large, 14-15 mm
Burnard and the state of the st
Pronotum smooth, without granules; size usually small,
8-9 mm
· 9
Scales white
latruncularis Perty
Scales green
virescens Lucas
Scales whitish or silvery
argenteus Boheman
Scales deuk blue
Scales dark blue
pascoei Bovie
Elytral fasciae formed of different color scales (light
brown, dark brown, nearly white), all fasciae reaching side
marging: heak (from above) not more than twice as wide
margnis, beak (nom above) not more than twice as which
at apex as on front between eyes; pronotum almost enti-
rely covered with scales
bifasciatus Hustache
Elytral fasciae formed of dark areas depuded of scales.
these have areas not reaching the margins; heak (from
these bare areas not reaching the margins, beak (nom
above) about four times wider at apex than on front bet-
ween eyes; pronotum with only a few scattered scales
flexuosus Pascoe

This genus has more species (15) than any of the other genera of the *Entimini* it includes some quite dissimilar looking species, also the smallest ones in the tribe.

Of the two species in which males were available for dissection, *bifasciatus* has the penis with the apex broadly rounded, spatulate, and reflexed, somewhat as in *Rhigus nigrosparsus*, and *bohemani* has the apex triangularly pointed, as in *Entimus*, but with the chitinous apical and side margins much broader and flatter (figs. 3, 4).

Genus Rhigus Germar

Rhigus Germar, 1824, Insectorum species novae, p. 438. Type, by original designation, Curculio tribuloides Pallas.

Key to the species of Rhigus

1.	Elytra with the apex and three broad fasciae black, the		
	rest white or yellow	leratus I	Perty
	Elytra not as above		2
2.	Elytra without spines		3
	Elytra with two or more large spines		5
3.	Ventral surface with buffy scales; dorsal surface dark		J
	falderman	<i>nni</i> Bohe	man
	Ventral surface with blue or green scales; dorsal surface	intr Done	
	blue or green interspersed with black, or buffy; large or small		
			4
4	Elytra mostly blue or green, with black spots; sides of pronotum abruptly widened and bulging at middle; lar- ger, 20 mm. or more; hairs surrounding articular depres-		
-	sion of hind tiblae (cordel) black	charry -	Porty
	Elytra mostly brown or black, with blue or green spots;	spursus 1	erty
	sides of pronotum feebly, evenly rounded; smaller. 10 to		
	15 mm.; hairs surrounding articular depression of hind tibiae golden		
	irrorat	us Boher	nann
5.	Pronotal disc without spines		6
	Pronotal disc with prominent spines		U
	1. L		7
6.	Sides of pronotum strongly tuberculate; color brownish		
	vest	pertilio P	ascoe
	Sides of pronotum evenly rounded or slightly granulate; color bright iridescent green, yellow green, or blue		
	speci	osus Lini	naeus
7.	Elytra with six large, subequal, pinkish spines (no coun- ting humeral spines); general color green or buffy		
	schu	ppeli Ge	rmar .

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	Elytra either with two large subequal spines or elytra with
	8
8.	Elytra with six large, brown subequal spines
	horridus Dejean
	Elytra with two large, brown subequal spines on the elytra
	declyvity (other much smaller ones may also be present).
	9
9.	Ventral surface entirely, and dorsal surface in part, clo
	thed with greenish, yellow-green, or blue scales
	dejeani Gyllenhal
	Ventral surface entirely, and dorsal surface in part, clo-
	thed with brown, slightly coppery scales
	- tribuloides Pallas

This genus is distinctive, both by the cavernous, retracted mentum with its straight hind margin (fig. 13) and by the long second abdominal segment, characters which do not occur in the other genera of the *Entimini*.

Only six species were avalable for dissection. The male genitalia of R. *irroratus* (fig. 7) have the penis triangularly pointed, much as in the genus *Entimus*; in *speciosus* (fig. 5), *dejeani* (fig. 6), and *tribuloides*, the penis is less abruptly narrowed to the apex and the apex itself has a small knob or projection not present in *irroratus*. R. *nigrosparsus*, on the other hand, differs from all the preceding species by having the penis broadly rounded, chitinized, and reflexed at the apex (fig. 8), somewhat as in the tiny *Cydianerus bifasciatus*. Fringes of fine hairs are also present.

Some secondary sexual characters not mentioned in the literature were found in *Rhigus*: males of *speciosus* have two small but noticeable tubercular swellings each side of the middle of the second abdominal segment; females of *dejeani*, *nigrosparsus*, *tribuloides*, and *faldermanni* have a row of large, stout, sparse teeth on the inner side of the corbels of the middle and hind tibiae, these teeth being replaced by a fringe of hairs or fine spines in the males.

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Figs. 1-8. Apices of penis, dorsal view, of I. Polydius inka Heller; 2, P. atrox Germar; 3, Cydiamesus bohemani Boheman; 4. C. bifascialus Hustache; 5. Rhigus parsus speclosus Linnaers; 6. R. dejeani Schoenherr; 7. R. irroratus Boheman; 8. R. nigrosparsus Perty.

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Figs. 9-16. 9. Entimus imperialis Forster, penis, dorsal view; 10. E.nobilis, idem; vv. E.granulatus Yinnaeus, idem; 12. Phaedropus togatus Boheman, idem; 13. Rhigus nigrosparsus Perty, mentum; 14 Cydianerus bohemani Boheman, idem; 15. Polydius atrox Germar, head and antennal grooves; 16. Entimus imperialis Forster, idem.



Fig. 17. Distribution of the species of Entimus