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Apioninae and Brachyderinae of Fiji
(Coleoptera, Curculionidae)

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INTRODUCTION

In 1938 the Henry G. Lapham Expedition to Fiji was sent out by Bishop Museum to collect in several islands in the Fijian archipelago. This paper is based upon the collections made during the Lapham expedition and upon other collections of Fijian Curculionidae in Bishop Museum. Only two small groups of Fijian weevils are included in this report, but it is planned that other papers will follow as time and opportunity permit until all of the assembled Fijian material is described and recorded. It will, however, be a long time before the task is completed, because the collections already made by Bishop Museum and other institutions contain many thousands of specimens. The Bishop Museum collection alone contains about 50,000 undetermined Fijian insects.

I must express my appreciation to the Hawaiian Sugar Planters' Association Experiment Station for their cooperation in allowing Mr. W. Twigg-Smith to prepare the photographs for this report.

SUBFAMILY APIONINAE

I have seen only three species belonging to this subfamily from Fiji. It is manifest that the group is weakly developed in those islands. Fiji probably marks the easternmost limit to which the subfamily has naturally extended into Polynesia. Careful collecting has not revealed endemic species from any island east of Fiji.

The three species of Apioninae recorded from Fiji are *Cylas formicarius elegantulus* (Summers) (immigrant), *Cybebus gibbipennis*

Fairmaire (endemic) and *Apion vitiensis* Zimmerman (endemic). Fairmaire's species *gibbipennis* has been incorrectly assigned to the Madagascar genus *Cybebus*, and I have found it necessary to erect a new genus for it.

Key to the Genera of Apioninae found in Fiji

1. Trochanters all so short that bases of femora are within circumference of coxae, the dorsal edges of their bases touching, or almost touching coxae and not held at a distance from coxae by elongated trochanters (tribe Eurhynchini).....2
- Trochanters of at least fore and middle pairs of legs elongated, so that femora are held at a distance from coxae with their bases outside of the circumference of coxae, or at least always well separated from coxae at all points (tribe Apionini).....3
- 2(1). Club of antenna of male greatly elongate, longer than funicle and scape together; funicle eight-segmented; prothorax strongly and conspicuously constricted dorsally and laterally behind middle; scutellum not visible; mesocoxae narrowly separated by a distinct sclerite; tarsal claws not toothed.....**Cylas** Latreille.
- 3(1). Tarsal claws simple; mesocoxal cavities confluent; elytra extraordinarily strongly gibbose, striate only near side margins; scutellum not visible; body glabrous.....**Apotapion** Zimmerman.
- Tarsal claws toothed; mesocoxal cavities separated by a distinct sclerite; elytra not unusually gibbose, completely striate; scutellum visible, conspicuous; body squamose in the Fijian species.....**Apion** Herbst.

Genus **CYLAS** Latreille, 1802

The species of this genus are endemic to the Ethiopian and Indo-Pacific regions.

Cylas formicarius elegantulus (Summers).

Otidocephalus elegantulus Summers, New Orleans Home Journal and Rural Southland 10(3) : 68, 1875.

This color form with the almost black, steel blue elytra, black head, rostrum, metasternum and abdomen, reddish mesothorax, prothorax and appendages is represented in the Fijian material before me by seven male examples collected by J. M. Valentine at light at Korovou, Tailevū, Viti Levu in August, September, and November 1937. This is the well known, tropicopolitan pest of sweet potatoes, and it also breeds in other morning-glories. In Samoa, I have taken it from the common beach morning-glory (*Ipomoea pes-caprae*),

which is common in Fiji, and the weevil will probably be found on it there.

For further details and illustrations of young and adults, reference may be made to two papers by W. D. Pierce: "Weevils which affect Irish potato, sweet potato and yam" [Jour. Agricultural Research 12(9): 601-612, pls. 28-34, 1918] and "Studies of the sweet potato weevils of the subfamily Cyladinae" [Bull. Southern California Acad. Sci. 39(3): 205-228, pls. 36-38, 1941].

Genus **APOTAPION**, new genus

Body glabrous above, not squamose, sparsely setose beneath. *Head* subconical, produced behind eyes, distance between hind margins of eyes and prothorax greater than length of an eye; eyes lateral, extending from dorsal to ventral cephalic margins, well separated above and below, protruding distinctly beyond longitudinal lateral cephalic outlines, facets individually gently convex and not individually protuberant, dorsal interocular area narrower than breadth of base of rostrum. *Rostrum* slightly longer than head from fore margin of eyes to prothorax, longitudinal dorsal contour gently arcuate, lateral outlines slightly, gradually, almost evenly expanded from base to apex; antennae inserted laterally at slightly behind middle; scrobes slanting down beneath eyes, not contiguous to eyes, confluent below; left mandible bidentate, right mandible unidentate in genotype. *Antennae* with scape somewhat longer than first three funicular segments in genotype, not capable of extending back as far as eyes; first and second funicular segments each nearly twice as long as any one of the others, first stoutest, segments 3-7 moniliform; club ovoid, shorter than funiculus. *Prothorax* subcylindrical, without a post-median, neck-like constriction. *Scutellum* not visible. *Elytra* strikingly gibbose, rising high above pronotum, incompletely striate. *Hind wings* reduced to narrow straplike appendages useless for flight. *Legs* with fore coxae contiguous, bluntly subconical, long, longer than head behind eyes; mesocoxae contiguous, strongly protuberant; metacoxae protuberant only at insertion of trochanters; all trochanters elongate, each longer than breadth of base of its femur, separated from femora by deep, conspicuous constrictions; femora moderately clavate, unarmed, hind pair extending slightly beyond apex of elytra; tibiae straight beyond basal arch, gradually, slightly expanded toward apex, all unarmed at apex, corbels oblique, open; tarsi with first segment longer than broad, second strongly transverse, third deeply bilobed, fourth extending far beyond apex of 3, claws divaricate, unarmed. *Sternum* with prosternum narrow in front of and behind the confluent coxal cavities; mesosternum short, nearly vertical in front, coxal cavities confluent, pleural sclerites obscure, episternum narrow, horizontal; metasternum pointed in front, much shorter between mid and hind coxae than cephalad-caudad chord of a hind coxa, episternum narrow. *Abdomen* with first ventrite about as long as three following ventrites together, intercoxal process broad, subtruncate in front, longer than postcoxal area, coxal cavities extending nearly to elytra; ventrite 2 longer than ventrite 3 plus 4; ventrite 5 normal, about as long as 2.

Genotype: *Cybebus gibbipennis* Fairmaire, 1881.

This genus is founded upon a peculiar, smooth, shiny, black, gibbose insect erroneously placed in the Madagascar genus *Cybebus* Schoenherr, 1839, by Fairmaire. This species has no close affinity with *Cybebus*. *Cybebus* has toothed tarsal claws, separated mesocoxae, completely 10-striated elytra, a visible scutellum, completely developed wings, as well as other fundamental characters which are different from those of *Apotapion*. At first sight, *Apotapion gibbipennis* appears to belong to the Australian genus *Myrmacicelus* Chevrolat, 1833, because it closely resembles the genotype of that genus, *M. formicarius* Chevrolat. However, *A. gibbipennis* cannot be placed in *Myrmacicelus* because in that genus the prothorax is strongly constricted behind (but not to such an extreme degree as in *Cylas*), the wings are fully developed for flight (at least they are in specimens of *M. formicarius* which I have examined), the mesocoxae are separated by a distinct intercoxal sclerite, the metasternum is much longer between the mid and hind coxae than the longitudinal chord of a hind coxa, the intercoxal process of the first ventrite is much shorter, the trochanters are greatly elongated (more than one half as long as the femora on *M. formicarius*), and the fourth tarsal segment hardly reaches beyond the apex of the third. Among the characters shared by the genotypes of *Myrmacicelus* and *Apotapion*, the following are of such nature as to lead one to associate the genera before a more careful examination is made: the general body form, shiny, black, bare derm, the invisible scutellum, and the strongly gibbose elytra which have only two incomplete striae near the side margins.

The removal of *gibbipennis* from the list of *Cybebus* eliminates an erroneous example of extreme discontinuity in geographical distribution. The genus *Cybebus* is confined to Madagascar.

Apotapion gibbipennis (Fairmaire), new combination (fig. 1, *h*; fig. 2, *a, b*).

Cybebus gibbipennis Fairmaire, Soc. Ent. France, Ann., p. 289, 1881.

Derm shiny black excepting tarsi and antennae which are diluted with red.

Head conspicuously transversely concave dorsally behind eyes, straightly narrowing on sides from base to eyes; distance across eyes almost or quite as great as basal breadth of head; interocular area shallowly, longitudinally impressed; minutely reticulate, microscopically transversely strigate caudad. *Rostrum* varying to give indexes of 1.2-1.4 when length of head from fore margin of an eye to nearest point on prothorax is divided into length of rostrum; lateral outlines only slightly interrupted at insertion of antennae; longitudinal dorsal contour usually appearing slightly and inconspicuously undulant; min-

utely reticulate, minutely punctate, punctures bearing microscopical setae excepting a few longer ones at apex. *Antennae* with scape as long as first three funicular segments plus one half of 4, as broad at apex as funicular segment 1; funiculus with segment 1 as long as 2 but stouter, about five sixths as broad as long, 2 as long as 3 plus one half of 4, two thirds as broad as long; club nearly twice as long as broad, as long as five preceding segments together. *Prothorax* bare, slightly longer than broad, arcuate on sides, broadest at about middle, base and apex subtruncate, dorsal contour arcuate, highest anterior to middle, with two shallow, vertical impressions on sides behind coxae which slightly interrupt lateral outlines near base when viewed from directly above; impunctate. *Elytra* bare, extraordinarily gibbose, rising abruptly to far above level of pronotum, ovoid in shape when viewed from directly above, breadth divided into length equals about 1.4, height approximately as great as breadth, two and one third or more times as long as prothorax; with two incomplete punctate striae above each lateral margin beginning above mesocoxae, outer one extending to above fifth ventrite or near apex, inner one shorter and not extending beyond third ventrite, usually not extending that far caudad, some impressions dorsad of inner stria on some specimens, elytra otherwise impunctate. *Wings* on specimen dissected, 1.25 mm. long, 0.15 mm. broad, sickle-shaped. *Legs* sparsely setose except

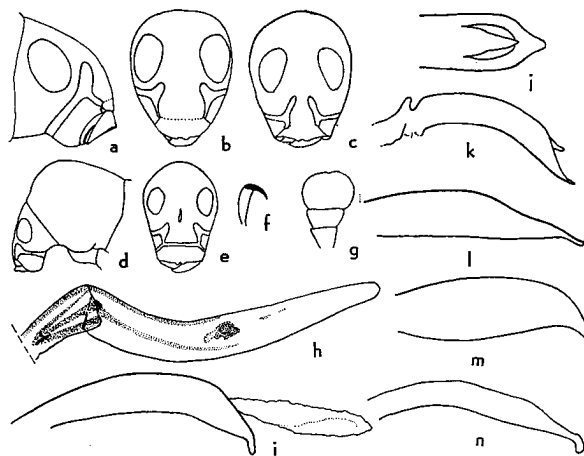


FIGURE 1.—Diagrams of structural details of Fijian Apioninae and Otistitirini: a, side view and b, front view of head and rostrum of *Ottinychus gemmatus gemmatus* Zimmerman; c, front view of head and rostrum of *O. comptus* Zimmerman; d, side view of prothorax, head and rostrum of *Nesogenocis cucullus* Lea; e, front view of head and rostrum and f, fourth tarsal segment bearing the single claw of *Leacis vitiensis* (Lea) Zimmerman; g, tarsus of *Viticis bidentatus* Lea; h, left wing of *Apotapion gibbipennis* (Fairmaire) Zimmerman, folded near base; i, side view of aedeagus of *Nesogenocis maculosus* Zimmerman, protruding from body and with internal sac everted; j, dorsal view of apex and k, side view of aedeagus of *Viticis bidentatus* Lea, from a dissection; l, side view of end of weakly sclerotized aedeagus of *Ottinychus gemmatus gemmatus* Zimmerman, from a dissection; m, side view of end of aedeagus of *Leacis vitiensis* (Lea) Zimmerman, from a dissection; n, side view of aedeagus of *Nesogenocis cucullus* Lea, protruding from body.

on distal part of tibiae; derm duller than on dorsum. *Sternum* coarsely reticulate; intercoxal process of metasternum triangular, acutely pointed, metasternum less than one half as long between mid and hind coxae as cephalad-caudad chord of a metacoxa. *Abdomen* dull, obscurely and indefinitely punctured, sparsely setose; intercoxal process as broad as length of first ventrite behind a coxa, anterior margin arcuate, conspicuously longitudinally concave, the concavity extending laterally around basal margin of first ventrite, entire length of ventrite 1 slightly greater than following three ventrites combined; ventrite 2 longer than 3 plus 4, sloping dorso-caudad, its hind margin nearly vertical; ventrites 3 and 4 convex, sutures between them broad and deep; ventrite 5 as long or somewhat longer than 2, convex, more so in male than female. Length, 1.75-2.6 mm. (excluding head and rostrum); length of head and rostrum, 0.8-1.25 mm.; breadth of body, 0.75-1.4 mm.

The following 41 specimens are from Viti Levu: one example taken by J. M. Valentine at Navai Mill south of Nandarivatu, October 13, 1937; two examples beaten by me from shrubbery at the same locality, one taken September 7, 1938, at 2,700 feet, the other on September 15 at 2,500 feet; 18 specimens beaten by me from shrubbery at Nandarivatu, one of these at 3,000 feet and two at 3,700 feet on September 3, six at 3,600 feet, September 5, four at 3,600 feet, September 6, and six at 3,700 feet, September 10; three specimens beaten by me from shrubs on the ridge west of Vatuthere, near Nandarivatu, on September 8 between 2,600 and 3,000 feet; three specimens beaten by me from shrubbery on the ridge west of Nandarivatu, two on September 9 between 2,600 and 3,000 feet, and one September 11 at 2,800 feet; nine specimens collected on Mt. Victoria, Tholo North, September 10, between 3,000 and 4,000 feet by Y. Kondo, and four specimens beaten by me from shrubs on the west slope of the same mountain, three of these on September 13 between 3,000 and 4,000 feet, the other on September 16 at 3,000 feet.

I have not seen any record of the capture of this species since it was originally described in 1881. The species is easily recognized because of its smooth, shiny, black derm and unusually conspicuous gibbose elytra. It may be found on leaves walking about in association with various species of *Trigonopterus*. I recall taking specimens on the lower surfaces of leaves of *Piper* and *Pandanus* as well as other kinds of shrubs and trees.

Genus **APION** Herbst, 1797

Apion vitiensis Zimmerman, Haw. Ent. Soc., Proc. 10(2) : 319, fig. 1, 1939.

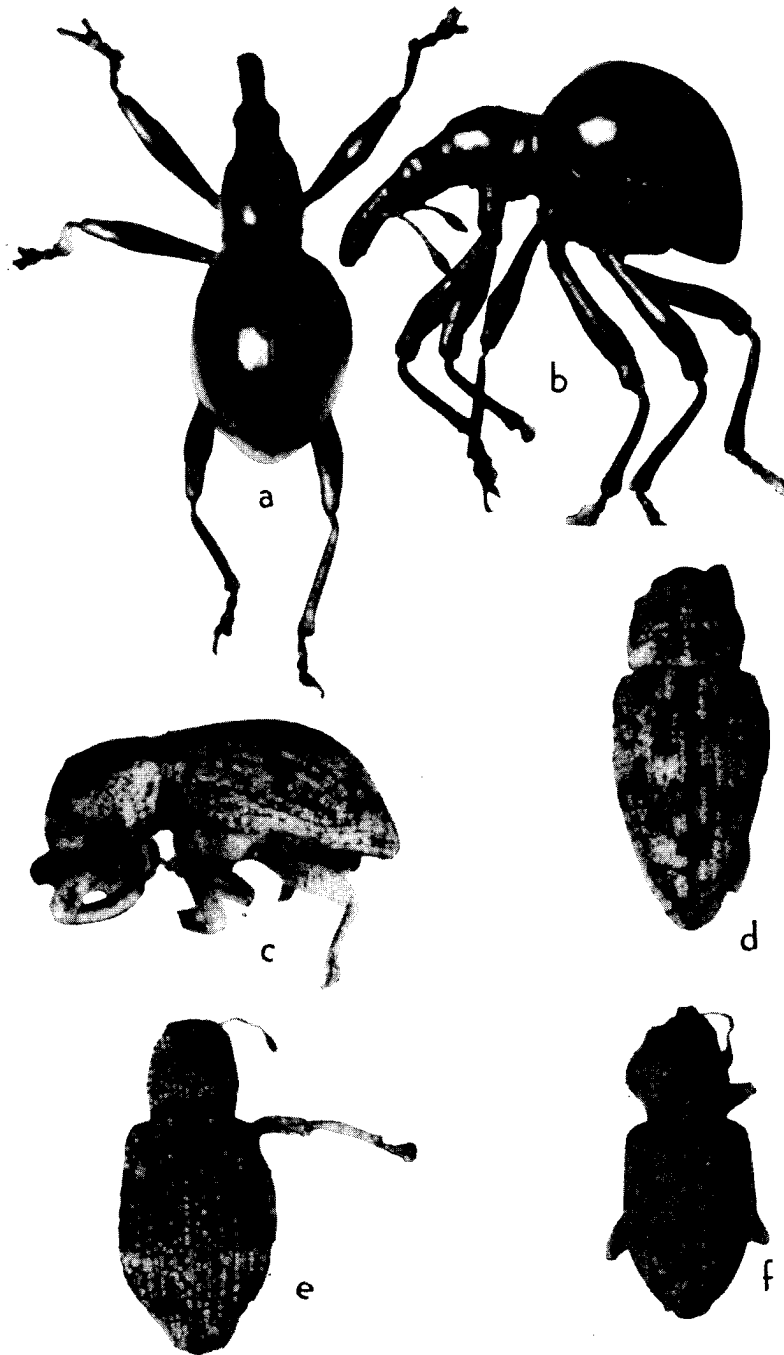


FIGURE 2.—Fijian Apioninae and Ottistirini: a, b, *Apotapion gibbipennis* (Fairmaire) Zimmerman (from two individuals); c, d, *Ottinychus gemmatus gemmatus* Zimmerman; e, *Viticis bidentatus* Lea; f, *Ottinychus comptus* Zimmerman. (Photographs by W. Twigg-Smith.)

I have only one note to add to my original description and discussion of this species. Since my paper was published, another specimen has been found in my 1938 collection from another locality. This additional specimen was beaten by me from shrubbery on the belt road between 42 and 44 miles west of Suva at 300 feet on July 28.

SUBFAMILY BRACHYDERINAE

As far as I know, the only genera representing the subfamily Brachyderinae in Fiji belong to the tribe Ottistirini. The literature pertaining to new Fijian genera and species consists of the following two papers: Lea, A. M., Descriptions of New Species of Australian Coleoptera XXI, Linnean Soc. New South Wales, Proc. **55**: 450-467, 1930 (pp. 461-464 include descriptions of new Fijian genera and species), and Zimmerman, E. C., Revision of the Fijian Ottistirini, B. P. Bishop Mus., Occ. Papers **14**(15): 301-312, fig. 1, 1939. Fritz van Emden in his "Die Anordnung der Brachyderinae-Gattungen im Coleopterorum Catalogus", Stett. Ent. Zeitung **97**: 211-239, 1936, gives a key to the genera of Ottistirini (pp. 233-235) which contains the genera described by Lea.

When I wrote my "Revision of the Fijian Ottistirini", I had the good fortune to have before me all of Lea's holotypes and most of his paratype material. In addition to Lea's collection, I had a few specimens from collections of the British Museum and Bishop Museum. Altogether, the number of specimens upon which the two papers were based numbered less than 20. During my research in the field in Fiji, I was fortunate in being able to assemble a collection of almost 100 specimens, including series of all of the previously described species. This additional material adds to our knowledge of the geographical distribution of the species, and shows that a considerable amount of variation occurs within the specific limits of the various forms.

LIST OF FIJIAN OTTISTIRINI

1. **Nesogenocis cucullus** Lea.
Viti Levu; Ovalau.
2. **Nesogenocis maculosus** Zimmerman, new species.
Viti Levu; Ovalau.
3. **Leacis vitiensis** (Lea) Zimmerman.
Viti Levu; Ovalau; Taveuni.

4. **Ottinychus comptus** Zimmerman.
Viti Levu.
5. **Ottinychus gemmatus gemmatus** Zimmerman.
Viti Levu; Ovalau.
6. **Ottinychus gemmatus griseus** Zimmerman.
Ovalau.
7. **Viticis bidentatus** Lea.
Viti Levu.

It is noteworthy that all of the Brachyderinae thus far recorded from Fiji have been found only on Viti Levu, Ovalau, and Taveuni. A careful search failed to lead to the discovery of any specimens in Lau Province or Moala where I collected. I believe that representatives will surely be found on the other main islands of Fiji, such as Kandavu and Vanua Levu, but there has been little collecting done on those islands.

I have studied the balsam mounted wings of *Leacis vitiensis*, *Ottinychus gemmatus gemmatus*, and *Viticis bidentatus*. They are all surprisingly similar and differ only in a few minor details which might be useful as specific differences.

A revised copy of my key to the genera follows:

Key to the genera of Fijian Ottistirini

1. Epistome delimited posteriorly by a deep, distinct, transverse sulcus2
Epistome not delimited posteriorly by a deep, transverse sulcus.....3
- 2(1). Tarsi with two claws, connate at base but distinctly divergent distad; prothorax with apical part bent downward.....**Nesogenocis** Lea.
Tarsi with single claws; prothorax normal.....**Leacis** Zimmerman.
- 3(1). Tarsi 4-segmented, the claw segment distinct, bearing a single claw; femora edentate; funiculi of antennae 7-segmented.....**Ottinychus** Marshall.
Tarsi 3-segmented, claw segment absent, third segment broad, truncate at apex; femora toothed; funiculi of antennae 6-segmented....**Viticis** Lea.

Genus **NESOGENOCIS** Lea, 1930

This genus has not been represented in any of the extra-Fijian collections that I have seen thus far, and in so far as my knowledge goes, the genus remains restricted to Fiji. However, I believe that it may eventually be found in neighboring island groups.

Nesogenocis cucullus Lea, Linn. Soc. New South Wales, Proc. 55: 464, 1930. Zimmerman, B. P. Bishop Mus., Occ. Papers 14(15): 305, fig. 1, *d*, 1939 (fig. 1, *d, n*; 3, *a, b*).

This species was described from two male specimens collected by Lea and labeled simply "Viti Levu, Fiji" without further details regarding locality.

There is much more individual variation displayed in the series now before me than I was able to indicate when I redescribed Lea's two type specimens. The following observations may be appended to my 1939 description: the derm varies from pale reddish brown to black; the dorsal scaling is basically dark brown variegated with patches of pale yellowish white scales or black variegated with patches of green scales (there are 17 specimens with the black and green scale pattern and six with brown and yellowish scales); on some specimens the yellowish white scales are more numerous and give the appearance of brown spots on a pale background; the dark scales on the head usually extend down between the eyes in an attenuated, roughly V-shaped mark which occasionally continues on to the rostrum; the pale area mentioned in my previous description as situated on the prothorax above the coxa may or may not be present; the color pattern of the pronotum varies considerably, it may vary from being almost immaculate to having a complete median vitta with a large pale patch on either side in the anterior half, two similar patches at the hind angles and with a pale basal band; the basal patch on each elytron is usually on the bases of intervals four and five, rather than three, four and five; the transverse pale fascia at the top of the declivity may vary from conspicuous to absent; the scaling on the legs is normally predominantly that of the paler dorsal scales and usually more brilliantly iridescent. The distance between the eyes and prothorax may be twice as great as the distance between the eyes and the scrobes; the interocular area may be slightly broader than the interscrobular area. The prothorax is subject to considerable variation in shape and proportion, it may be as long as broad or slightly broader than long, although in some individuals, especially the larger ones, it may appear to be strongly transverse; the longitudinal dorsal contour varies much, and the measurement I used to indicate the comparative lengths between the summit and apex and the distance between the base of the head and the scrobe is too variable for use; the illustration I gave of a side view of the prothorax indicates nearly an average individual; in some individuals the extreme breadth of the prothorax is only slightly

