

The Genus *Pholidoforus* Wollaston  
(Coleoptera: Curculionidae)

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(Presented at the meeting of September 14, 1942)

The cossonine genus *Pholidoforus* was erected by Wollaston in his paper "On the Cossonidae of Japan" (Trans. Ent. Soc. London, p. 18, 1873). The genotype is his *Pholidoforus squamosus*. The genus has remained monotypic to this date, but there are now two new species before me, one from Samoa, the other from Hawaii which are described below.

The most conspicuous character that is displayed by the members of the genus is the abundance of squamiform setae. Wollaston (p. 19) commented as follows: "In its densely *scaly* surface the present insect affords a curious exception to what is usual amongst the *Cossonidae*; for although it is true that *Tetratemnus*, *Pentacoptus*, *Coprodema* and *Exodema* are likewise remarkable for the few *mud*-like scales with which they would seem to be more or less partially incrustated; in *Pholidoforus* the body is regularly and somewhat closely set with short, thick, fulvo-cinereous scaliform setae,—a portion of which are slightly erected, and the others altogether decumbent. Yet the structure of its abdomen, tibiae, eyes, rostrum, and 7-jointed funiculus show it to be an unmistakable member of this subfamily. In other respects it may be known by its narrowish and fusiform outline (it being parallel in the middle, but acute both before and behind), by its rather long and slender antennae being inserted just before the middle of its appreciably curved rostrum, by its eyes being small and rounded but very prominent, by its funiculus having the second joint scarcely at all longer than the third, and by its feet being a good deal developed and lengthened,—their third articulation being rather broad (for the *Cossonidae*) and bilobed." The genus is further characterized on p. 465 and p. 546 of the same volume in his paper "On the Genera of the *Cossonidae*".

The discovery of the two new species requires little modification in Wollaston's original characterization of the genus. However, I will give an expanded redescription to include certain characters not mentioned by Wollaston, but which are essential for contemporary comparative studies.

*Body* subcylindrical, derm dull above, coarsely sculptured, conspicuously setose over-all. *Head* subconical, almost as long as broad; postocular constriction at most feebly impressed dorsally and laterally, situated well behind the eyes; eyes lateral, coarsely faceted, prominent, strongly pro-

tuberant, widely separated above and below, separated from the prothorax for a distance slightly greater than, or slightly less than the length of an eye; interocular area only slightly narrower than the base of the rostrum. *Rostrum* slightly longer than the head, slightly more than one-half as long as the pronotum, distinctly arcuate longitudinally, subparallel-sided from the base to the antennal insertions, thence distinctly expanded, thence slightly narrowed to the apex; antennae inserted at about the middle, at about the length of an eye in front of the eyes; scrobes passing downward slightly below the eyes, the scapes, when at rest in the scrobes, not touching the eyes. *Antennae* with the scapes reaching to or almost to the anterior edge of the prothorax, slightly longer than the remainder of the antennae; funicle 7-segmented, the first segment longer and stouter than the second which is about as long or somewhat longer than the third, the following segments progressively more transverse; club ovate, the first segment pilose. *Prothorax* subpyriform, about as broad as long or somewhat longer than broad; with a strong and conspicuous subapical constriction; base subtruncate. *Scutellum* visible, distinct. *Elytra* subparallel-sided, the humeri well developed, broader than any part of the pronotum; coarsely ten-striate, the tenth stria complete or incomplete, intervals and striae punctate. *Wings* fully developed for flight. *Legs* with the femora moderately clavate, not toothed, reaching to the apex of the second ventrite; tibiae normal, slightly expanded distad, strongly uncinat, mucrones small but usually conspicuous; tarsi with the second segment somewhat shorter and distinctly narrower than the third which is broad, cordate and conspicuously bilobed, the fourth segment extending beyond the third for a distance greater than the length of the second and third segments combined; claws long, strong, divergent. *Sternum* with the distance between the fore margins of the fore coxae and the anterior margin of the prosternum more than twice as great as the corresponding distance behind the coxae; fore coxae well separated, the distance between them somewhat greater than one-half the breadth of a coxa; intercoxal process of the mesosternum broad and flat, on the same plane and continuous with the metasternum, about as broad as a metacoxa, about twice as broad as the intercoxal area of the prosternum; metasternum between the mid and hind coxae about as long as the length of the first two ventrites behind a coxa; metacoxae more widely separated than the mesocoxae, about as widely separated as the transverse chord of a metacoxa; metepisterna very narrow, especially cephalad. *Venter* with the intercoxal process of the first ventrite arcuate or subtruncate; the first two ventrites fused; first ventrite as long as two plus three or about as long as two plus three plus four along the median line; ventrite two longer than three plus four which are subequal in length and together are about as long as five.

The members of this genus remind me of small, setose, *Oxydema*-like weevils. They will run to or to the vicinity of *Oxydema* in my keys to the genera of Cossoninae of Hawaii (1940), Samoa (1941) and Guam (1942), but they may be readily distinguished because of their setose bodies alone.

**Pholidoforus squamosus** Wollaston, Trans. Ent. Soc. London, p. 19, 1873.

Japan. The type series was beaten from "old hedges" near Nagasaki in the island of Kushiū" (Kyūshū), by Lewis.

A single female specimen from the type series is in a section of the Wollaston collection which was purchased by Dr. E. C. Van

Dyke and is now in the California Academy of Sciences at San Francisco. This specimen was examined by me in January, 1942.

This species closely resembles *P. advena*, new species, but the rostrum and prothorax are narrower, and there is much difference in the elytral striae and intervals. On *P. squamosus* the intervals are narrower in relation to the striae and the setae are not borne from conspicuous punctures as they are on *P. advena*, and the top of the intervals appear hardly wider than the scales they bear. The lower surface of *P. squamosus* is shiny and not at all coarsely reticulate as on *P. advena*. Furthermore, the antennal scape is much more slender on *P. squamosus* than on *P. advena*, and my notebook sketches indicate that it may be even more slender than the scape of *P. setolineatus* which is illustrated here.

### **Pholidoforus advena**, new species (fig. 1, *a, b, d, e, g*).

Male: derm piceous, dull, coarsely sculptured, coarsely reticulate throughout; setae muddy white or pale yellowish white, giving the insect an over-all somewhat "muddy" appearance; dorsum with a rather inconspicuous mud-colored incrustation.

*Head* not quite as long along a line drawn horizontally through the middle of the eye to the prothorax as its basal breadth (1.7:2.0); postocular constriction evident beneath, feeble, but traceable on the sides, obsolete across the dorsum; punctures behind the postocular constriction smaller and shallower than those in front and not bearing erect setae; coarsely and closely punctate beyond the postocular constriction, each puncture bearing a conspicuous, stout, clavate or squamiform, erect seta; median line obviously impressed from about the middle of the eyes to the postocular constriction; eyes a little higher than long (8:7), separated from the prothorax by a distance equal to their height, prominent, strongly protuberant, subhemispherical when viewed from above, each bearing a small number of stout setae between some of the strongly convex facets; distance between the eyes approximately twice as broad as an eye as measured from directly above. *Rostrum* one-tenth longer than the basal breadth of the head, more than one-half as long as the median length of the pronotum (2.2:3.8), greatest breadth just beyond the insertion of the antennae and there one-third broader than the interocular area, rather strongly arcuate in longitudinal dorsal outline, coarsely punctured throughout, punctures confluent or subconfluent and each bearing setae similar to those on the head; antennae inserted at about four-tenths the distance from base to apex, but the scrobes continued prominently on to four-tenths the length from the apex. *Antennae* with the scape capable of very nearly, if not actually touching the prothorax when extended backward, stout and nearly straight beyond its basal petiole and set on the outer side with numerous erect setae similar to but somewhat smaller than those on the head and rostrum, its median thickness between one-fifth and one-sixth of its length, somewhat longer than the remainder of the antenna; funicle with segment one almost as broad as long, as long as two plus three, segment two slightly longer than three; club as long as the preceding four segments, about three-fourths as long as broad. *Prothorax* subpyriform, slightly longer along the median line than the greatest breadth just behind the middle, extreme height from dorsum to hind margin of sternum very nearly as great as breadth of extreme base of dorsum adjoining the elytra; broadest behind the middle, arcuate on the sides to the strongly marked subapical constriction where the sides are sharply excised to form a distinct collar, the constriction distinctly

interrupting the longitudinal dorsal contour which is gently arcuate to the base; apical margin shallowly concave; densely set with large, coarse, quadrangular, pentagonal or hexagonal punctures separated by line-like interstices which form a reticulate pattern, each puncture bearing a conspicuous erect seta similar to those on the head and rostrum. *Scutellum* bare. *Elytra* somewhat more than twice as long as broad, about two and one-half times as long as the prothorax, base sinuous and slightly crenulate, subparallel-sided before the apical arcuation; intervals broader than the striae, each with a single row of conspicuous, rounded or ovate punctures set one immediately after the other and bearing conspicuous erect setae similar to those on the pronotum; striae deep, coarse, coarser toward the sides, punctate, without distinct setae, tenth stria terminating above the metacoxa, striae six and seven confluent at their origin on the humerus. *Legs* with the femora and tibiae coarsely and densely punctate, the punctures bearing setae similar to those on the elytra. *Sternum* entirely dull, coarsely reticulate; prosternum coarsely punctured, setae decumbent, subapical constriction continued strongly across it; mesosternum densely punctate, the punctures moderately coarse or coarse, their interstices narrower than their diameters, setae prostrate, shortest distance between mid and hind coxal cavities about one-fifth longer than the median line of the first ventrite. *Venter* entirely coarsely reticulate; ventrite one shallowly concave behind the middle in the male; ventrites one and two densely and rather coarsely punctured, the punctures almost but not quite as close to one another as those on the metasternum, each bearing a conspicuous, prostrate, squamiform seta as on the metasternum; ventrites three and four closely set with setiferous punctures; ventrite five longitudinally concave, densely punctate, the setae narrower than those on the other ventrites. Length (excluding head and rostrum) 3.0-3.25 mm.; breadth: 1.9-2.1 mm.

Oahu, Territory of Hawaii. Holotype male found in a dead branch of *Lucaena glauca* along the roadway on the southeast slope of Punchbowl in the city of Honolulu, July 8, 1940, United States Bureau of Entomology no. 16693, by George Callaghan (the specimen is erroneously labeled "Field 'N', Tantalus Drive", but Mr. Callaghan took me to the exact spot of the capture, and it is on Punchbowl), to be deposited at a later date in the United States National Museum where it was sent to me for determination; one male paratype (with the left elytron broken off by careless mounting) reared from a larva found in a dead twig of *Stephanotis* growing on the grounds of the Hawaiian Sugar Planters' Experiment Station at Honolulu, December 20, 1939, by F. A. Bianchi, deposited in Bishop Museum.

This new species is an obvious immigrant to the Hawaiian Islands, but it is not known from what locality it has originated. It is closely allied to *P. squamosus*. Its habit indicates that it may become a common lowland insect.

***Pholidoforus setolineatus*, new species (fig. 1, c, f, h).**

Male: derm piceous to black, antennae, tibiae and tarsi more distinctly reddish; dorsum with a thin grayish incrustation; setae white or grayish white.

*Head* three-fourths as long along a line drawn through the middle of the eye to the prothorax on a horizontal plane with the after body as the extreme basal breadth; postocular constriction feebly impressed, traceable, but nearly obsolete; coarsely reticulate; densely punctate behind the post-

ocular constriction almost to the base, the interstices narrower than the punctures and the sublanceolate setae borne from these punctures prostrate instead of erect as beyond the constriction; coarsely and densely punctate in front of the constriction, the setae lanceolate, erect, conspicuous; median line with an enlarged puncture opposite the hind edges of the eyes; eyes a

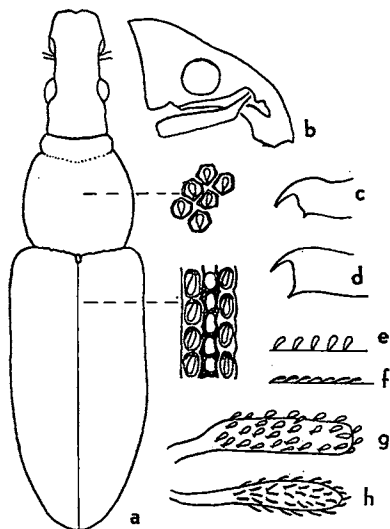


Fig. 1.—Diagrams of features of *Pholidoforus*. *a*, *Pholidoforus advena*; *b*, outline of head and rostrum of *P. advena*; *c*, apex of hind tibia of *P. setolineatus*; *d*, apex of hind tibia of *P. advena*; *e*, arrangement of elytral setae of *P. advena* as viewed from the side; *f*, the same of *P. setolineatus*; *g*, antennal scape of *P. advena*; *h*, the same of *P. setolineatus*.

little higher than long (9:8), separated from the prothorax by a distance equal to the length of an eye, prominent, subhemispherical when viewed from above, not or indistinctly setose, distance between the eyes twice as broad as an eye measured from directly above. *Rostrum* only slightly longer than the basal breadth of the head (20:19), two-thirds as long as the median length of the pronotum, greatest breadth just beyond the insertion of the antennae one and three-tenths broader than the interocular area; rather strongly arcuate in longitudinal dorsal outline; coarsely, densely, indefinitely punctured throughout and bristling to the apex with erect setae similar to those on the front of the head; antennae inserted close to the middle of the rostrum, the scrobes continuing prominently on to about the distal one-third. *Antennae* with the scape capable of reaching to the fore edge of the prothorax when extended backward, slightly arcuate, evenly expanded from base to apex, its median thickness only about one-tenth as great as its length, its length distinctly greater than that of the remainder of the antenna, coarsely reticulate, clothed with numerous, inclined setae similar to but smaller than those on the rostrum; first funicular segment two-thirds as broad, across its broadest part, as its length, as long as segments two plus three, segment two one-fourth longer than broad, as long as segment three plus about one-half of four, the fol-

lowing segments successively more transverse; club about as long as the preceding five segments. *Prothorax* approximately as broad as long (30:29), extreme height from dorsum to hind margin of sternum, approximately equal to the extreme basal breadth and five-sixths as great as the median length of the dorsum, broadest within the basal third, arcuate, but with a very slight sinuation at about the middle, to the strongly marked subapical constriction where the sides are sharply excised to form a conspicuous collar, the constriction distinctly interrupting the longitudinal dorsal contour which is gently arcuate behind it; apical margin truncate; densely set with large coarse punctures, the interstices of which are narrow and form a reticulate pattern; the punctures bearing setae similar to those on the rostrum, but all prostrate or at most slightly inclined, all those on the disk directed toward the center, those along the anterior margin more erect and directed toward the median line. *Scutellum* bare, shiny. *Elytra* slightly more than twice as long as broad (4.3:2.0), not quite three times as long as the pronotum (4.3:1.5); base slightly sinuous, subparallel-sided before the apical arcuation; intervals (excepting parts of the first) narrower than the striae on the disk, each bearing a single row of posteriorly inclined sublanceolate setae similar to those on the pronotum so arranged as to partially obscure the punctures that bear them, which are about as broad as the tops of the narrower intervals, and each almost overlapping or overlapping its posterior neighbor, thus resulting in the setae forming almost continuous lines; the first interval with a double row of setae on its apical part, the second, fourth, sixth, seventh and eighth with double rows at the base; striae deep, coarse, punctate, without distinct setae; tenth stria entire, but the tenth interval greatly narrowed caudad so that the ninth and tenth striae coalesce above the apex of the second ventrite. *Legs* with the femora and tibiae coarsely and densely punctured, the punctures bearing setae similar to those on the elytra, but with some more slender ones on the tibiae. *Sternum* finely reticulate, moderately shiny; prosternum closely set with large, coarse punctures, setae inconspicuous, the subapical constriction strong; mesosternum not coarsely and densely punctured as the prosternum, but with moderately large, round, distinctly separated punctures bearing prostrate setae; metasternal sculpture similar to that of the mesosternum, some of the punctures on the disk separated by interstices as wide or wider than their diameters, but denser and coarser on the sides, shortest distance between the mid and hind coxal cavities as great as the length of the first plus about one-half the length of the second ventrite measured along the median line. *Venter* finely reticulate and moderately shiny, with the punctures and setae of the first two ventrites similar to those of the metasternum; the first ventrite broadly and shallowly concave behind in the male; ventrites three and four closely set with setiferous punctures; ventrite five longitudinally concave, coarsely and densely punctate, the setae narrower than those on the other ventrites. Length (excluding head and rostrum): 2.8 mm.; breadth: 1.0 mm.

Tutuila, Samoa. Holotype male, in Bishop Museum, beaten by me from a dead branch of *Hibiscus tiliaceus* in a clearing at 700 feet elevation on the slope behind the village of Fagatogo, August 12, 1940.

This species is allied to *Pholidoforus advena* but may be easily distinguished by several salient characters. The most conspicuous of these is the type and arrangement of the dorsal setae of the pronotum and elytra. On this species the setae are narrower, inclined or prostrate and easily distinguished from the stubby, erect, peg-like, individually separated setae of *P. advena*. When viewed from

directly above, the elytral setae of *P. advena* each stand out distinct and well separated, but those of *P. setolineatus* are so bent back toward their neighbors as to give the impression of a continuous line, especially when viewed under low magnification. On *P. setolineatus* the elytral striae are broader than the intervals, but on *P. advena* the intervals are broader than the striae and their punctures are more distinctly defined. The obvious differences in shape of the antennal scapes and the apices of the tibiae are easily seen in the illustrations. The setae on the eyes of *P. advena* are conspicuous, but I am not able to ascertain if there are any setae on the eyes of *P. setolineatus* from the unique specimen at hand. A larger series might show that this species has a few microscopical setae on the eyes. The venter of *P. advena* is much duller than that of *P. setolineatus*.

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### Immigrant Species of *Drosophila* in Hawaii (Diptera: Drosophilidae)

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In 1939, Prof. Th. Dobzhansky arranged with Mr. Gordon Mainland, then at the University of Hawaii, to have stocks of *Drosophila melanogaster* sent from Hawaii to California for the purpose of conducting some experiments in crossing geographically isolated populations. Accordingly, some material which was identified in Honolulu as *D. melanogaster* was forwarded to Dobzhansky. The anticipated experiments were never carried out, because the Hawaiian flies proved to be *Drosophila simulans*—a closely allied species. An active interest in this problem was taken by the genetics seminar group which assembles at the University of Hawaii each week, and I, as the entomologist in the group, offered to do what I could regarding the situation. Various members of the seminar brought me specimens from several localities, and I trapped others about Honolulu. Cultures were established from this material and breeding experiments were conducted over a period of several months. This work revealed that there were at least six immigrant species in Honolulu (a seventh species was found recently).

The collections in local institutions had specimens of several immigrant species listed under the following four names: *D. melanogaster*, *D. immigrans*, *D. mulleri* and *D. repleta*. Study of part of these collections, including the softening of the dried and