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BARK BEETLES OF THE GENUS *PITYOBORUS* BLACKMAN
(COLEOPTERA: SCOLYTIDAE)

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The genus *Pityoborus* was described by Blackman (1922) to include *Crypturgus comatus* Zimmermann from the southeastern United States. He later added *Pityoborus secundus* (1928) from Utah, and *P. tertius* (1942) from the Federal District of Mexico. In the following pages four previously undescribed species from Mexico are added to the genus.

The writer has been privileged to observe in the field and to collect all seven of the species included here. Because of their characteristic gallery patterns the presence of representatives of this genus in an area is easily detected. Only a fraction of the types of *Pityoborus* galleries observed in the field yielded specimens for study, therefore, it is believed that many more species eventually will be added to the genus from Mexico.

The beetles attack the small shaded-out, partly living, lower branches of standing pine trees. The writer has never taken specimens or observed galleries in slash or broken branches, or in material larger than three inches in diameter. Because of this habit they are not considered as having economic importance, unless the acceleration of natural pruning is regarded as being beneficial. The gallery system engraves the wood rather deeply and consists of a central nuptial chamber from which two transverse egg galleries extend in opposite directions. In small branches the egg tunnels may spiral slightly in order to avoid contact where they overlap at their extremities. For the most part, egg niches were not present in galleries of the first three species listed in the key; in the others they appeared large, but shallow, and irregular in arrangement. Typically the egg niche is enlarged, or a side gallery constructed, by the larva to form a short feeding tunnel that may be as long as 10 or 12 mm., but usually is just long enough and broad enough to accommodate the adult beetle and in this respect, although irregular in size, they resemble somewhat the larval cradles of the Corthylini and Xyloterini. In addition to these galleries, several feeding tunnels may arise from the nuptial chamber and extend in any direction; their length and number apparently depend on the length of time the gallery system is inhabited and on the number of occupants. In one species (*intonsus*) the longitudinal feeding tunnel was almost twice the combined lengths of the egg galleries. Special pupation tunnels, as described and figured by Blackman for *comatus*, have not been observed in the six other species except *tertius*. The species are all believed to be monogamous. An occasional second female may be found in a system of galleries; however, these are presumed to be accidental entrants, or more probably the offspring of the original pair, since both parents and young occupy the same tunnels.

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Pityoborus Blackman

Pityoborus Blackman, 1922, Mississippi Agric. Expt. Sta. Tech. Bull. 11:96; Blackman, 1928, Bull. New York College For. (Syracuse) Tech. Pub. 25:145; Chamberlin, 1939, The Bark and Timber Beetles of North America North of Mexico, p. 343.

Description.—Length 1.7-3.2 mm., about 2.5-2.8 times as long as wide; body color brownish. Frons usually sexually dimorphic, either flat or concave, and ornamented or not by hair of variable length, density and arrangement; eye emarginate; antennal funicle five-segmented, the club large, at least twice as long as the funicle, its first two sutures septate. Pronotum about 0.9-1.0 times as long as wide, not impressed behind the summit; anterior third asperate with the anterior margin armed by about 12-18 serrations of equal size; surface of posterior half reticulate and punctured; lateral areas on anterior two-thirds bearing in the female a pair of yellowish plushlike pubescent patches. Elytra finely sculptured; stria punctures in rows or not, the interstria punctures greatly reduced in number; declivity variable, the second interspace feebly widened and depressed or not, the first and third interspaces usually with a few small setiferous granules. Vestiture hairlike.

Type Species.—*Crypturgus comatus* Zimmermann (monobasic).

Key to the Species of *Pityoborus*

1. Female frons concave from eye to eye, the cavity margined by a dense row of long curved setae; elytral striae not impressed, the punctures of rows one and two confused or at least in very irregular rows (if character indefinite, male frons with frontal setae as in female). 2
 Female frons flat or weakly impressed on a narrow median area, and bearing rather sparse setae only slightly longer on margin; elytral striae often weakly impressed, the punctures in definite rows; male frons never with conspicuous brush of hair. 4
2. Length 2.0 mm.; both sexes with brush of frontal setae; first declivital striae feebly impressed, the third interspace not elevated. *velutinus*, n. sp.
 Length 2.8 mm. or larger; brush of frontal setae only in female; second declivital interspace flat, impressed, third interspace weakly elevated; patch of pubescence on female thorax proportionately smaller. 3
3. Smaller, 2.9 mm.; pubescent patches on female pronotum almost round, smaller, more widely separated from one another, and yellow in color; elytral pubescence shorter and less abundant; male frons with median elevation almost obsolete.
 *hirtellus*, n. sp.
 Larger, 3.2 mm.; pubescent patches on female pronotum ovate, with the narrow point dorsad, larger, less widely separated, and reddish-yellow in color; elytral pubescence longer and

- more abundant; male frons with a distinct, narrow median elevation. *rubentis*, n. sp.
4. Antennal club larger and broad, 1.3 times as long as wide; slightly smaller species, usually not more than 2.4 mm.; pubescent area on female pronotum proportionately smaller. 5
- Antennal club smaller and more slender, at least 1.4 times as long as wide; slightly larger species, usually more than 2.6 mm.; pubescent area of female pronotum proportionately much larger. 6
5. Body smaller, 1.7-1.9 mm., and stouter, 2.7 times as long as wide; posterior half of pronotum rather smooth, moderately shining, and rather coarsely and deeply punctured; first declivital striae impressed, third interspace not elevated. *comatus* (Zimmermann)
- Body larger, 1.9-2.6 mm., and more slender, 2.8 times as long as wide; posterior half of pronotum more strongly reticulate, dull, and very finely, shallowly punctured; second interspace weakly impressed, third slightly elevated. *tertius* Blackman
6. Posterior half of pronotum rather closely, deeply punctured; pubescent areas on female pronotum slightly wider than long (less than 1.3 times); first and second declivital punctures usually obsolete, interspace two rather strongly impressed. *secundus* Blackman
- Posterior half of pronotum feebly punctured; pubescent area on female pronotum much wider than long (1.6 times), very narrowly separated dorsally; first and second declivital striae reduced but visible, interspace two rather weakly impressed. *intonsus*, n. sp.

Pityoborus velutinus, n. sp.

Fig. 1

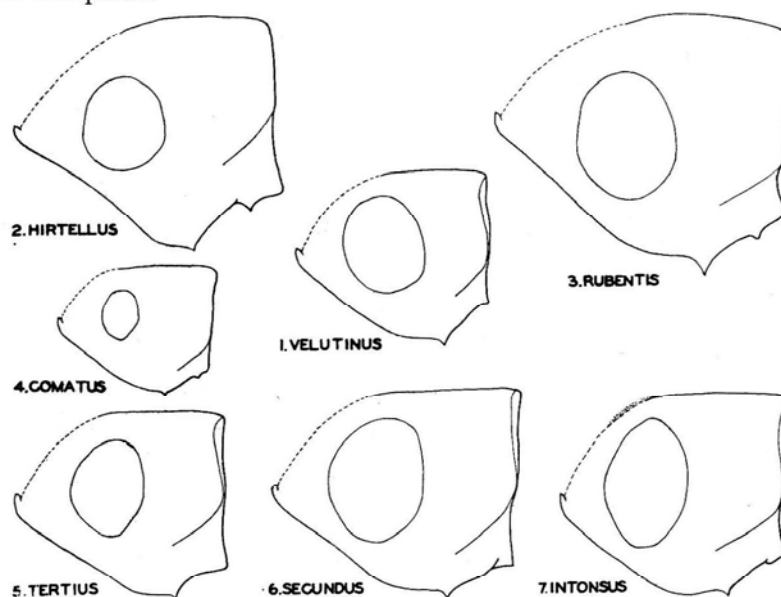
This species differs from all other representatives of the genus in having the declivity simple, almost entirely without modification of the second interspace, the declivital granules are scarcely visible, and the male frons bears a marginal fringe of long hair similar to, but less well developed, than in the female. The size will also serve to distinguish the female from other species having a concave frons.

Female.—Length 2.0 mm., 2.5 times as long as wide; body color brown.

Frons broadly, rather deeply concave from eye to eye and from epistomal margin to well above eyes; concavity smooth with a few minute punctures, and with a marginal fringe of long incurved hair, shorter along epistoma, comparatively longer above than the diameter of the concave area; central area of concavity with a few rather short inconspicuous setae. Antennal club large, ovate, 1.39 times as long as wide, first suture very weakly procurved, second moderately procurved.

Pronotum 0.91 times as long as wide; sides of basal half weakly arcuate and very slightly converging anteriorly, anterior margin

very broadly, evenly rounded and armed by 18 rather large teeth of almost equal size; anterior area moderately asperate, more finely at summit, summit area not impressed behind; posterior areas reticulate, dull, finely, shallowly punctured; slightly more than the middle third of the length and from lateral margin to about three-fourths of the distance to median line (dorsal aspect) occupied on each side by a patch of dense, plushlike, yellow pubescence (Fig. 1), each patch slightly wider transversely than long (about 1.26 times), the two patches separated dorsally by the length of one patch.



Figs. 1-7. *Pityoborus* spp., lateral aspect of female prothorax: 1, *velutinus*; 2, *hirtellus*; 3, *rubentis*; 4, *comatus*; 5, *tertius*; 6, *secundus*; and 7, *intonsus*.

Elytra 1.6 times as long as wide, 1.7 times as long as the pronotum; sides straight and subparallel on basal three-fourths, moderately rounded behind; striae not at all impressed, the punctures small, shallow, rather obscure, moderately confused on striae one and two; interstriae minutely subcrenulate, rather dull, the punctures reduced greatly in size and irregular in spacing. Declivity steep, evenly rounded; first striae weakly impressed, the punctures greatly reduced and scarcely visible on rows one and two, small but more evident on others; interstriae with rows of minute punctures, those on first evidently very feebly granulate. Strial punctures each bearing a minute microseta, interstitial punctures with erect bristles more abundant and slightly longer on sides and declivity, the longest bristles about equal in length to distance to nearest bristle in any direction.

Male.—Similar to female except: frons flat, gradually elevated

toward epistomal margin, marginal fringe of setae reduced in number and length of the hairs, the longest slightly less than a distance equal to the diameter of the frontal area, the ring of hairs not entirely complete above; pubescent patches on sides of pronotum absent; and very minute granules evident on declivital interstriae one and three.

Type Locality.—Fourteen miles northwest of Guadalajara, Jalisco, Mexico.

Host.—*Pinus* sp.

Type Material.—The female holotype, male allotype and 37 paratypes were collected at the type locality on July 19, 1953, at an elevation of 5000 feet, by S. L. Wood. They were taken from a shaded-out branch of a mature dwarf(?) pine about 20 feet in height, and were associated with *hirtellus*. Galleries of this species were not fully developed; the egg niches were few in number and very minute.

The holotype, allotype and some paratypes are in the Snow Entomological Collection, other paratypes are in the collection of the writer.

Pityoburus hirtellus, n. sp.

Fig. 2

This species is more closely allied to *rubentis* than to other species of the genus, but may be distinguished by the smaller size, by the less strongly impressed second declivital interspace and more finely developed tubercles on interspaces one and three, and by the different color and shape of the pubescent patches on the female thorax.

Female.—Length 2.9 mm., 2.5 times as long as wide; body color reddish-brown.

Frons broadly, rather deeply concave from eye to eye and from epistomal margin to well above eyes; concavity smooth, with a few minute punctures, and with a marginal fringe of long incurved hair, shorter along epistoma, comparatively longer above than the diameter of the concave area; central area of concavity with a few rather short inconspicuous setae. Antennal club oval, 1.36 times as long as wide, sutures one and two about equally, weakly arcuate; widest through segment three.

Pronotum 0.93 times as long as wide; sides on basal half weakly arcuate and very slightly converging anteriorly, anterior margin broadly, evenly rounded and armed by 18 rather small teeth of almost equal size; anterior area moderately asperate, more finely at summit; summit area not impressed behind; posterior areas reticulate, dull, finely, shallowly punctured; slightly more than the middle third of the length and from lateral margin to about one-half of the distance to the median line (dorsal aspect) occupied on each side by a patch of dense, plushlike, yellow pubescence (Fig. 2), each patch almost circular in outline (1.1 times as wide as long) and separated from one another by about twice the diameter of one patch.

Elytra 1.8 times as long as wide, 1.8 times as long as the pronotum; sides straight and subparallel on basal three-fourths, moderately rounded behind; striae not at all impressed, the punctures small, shallow, moderately confused on striae one and two; interstriae dull, evidently very minutely subcrenulate or punctate, the punctures greatly reduced in size and number. Declivity steep; interspace two impressed, one and three weakly elevated and armed by several small, blunt tubercles; stria punctures greatly reduced but visible. Strial microsetae not evident except on sides where not destroyed by abrasion; interstitial bristles erect, rather short and very sparse on disc, much longer and more abundant on sides and declivity, some about one and one-half times as long as the distance between rows of bristles.

Male.—Similar to female except: frons flat, gradually elevated toward epistomal margin, marginal fringe of setae absent; pubescent patches on sides of pronotum absent; and declivital tubercles more prominent.

Type Locality.—Fourteen miles northwest of Guadalajara, Jalisco, Mexico.

Host.—*Pinus* sp.

Type Material.—The female holotype, male allotype and one female paratype were collected at the type locality on July 19, 1953, at an elevation of 5000 feet, by S. L. Wood. They were taken from one gallery system in the same branch as *velutinus*. The gallery system was not as fully developed as might have been expected; two larval cradles appeared complete, two were about half developed, and the two egg niches were undeveloped. The three specimens represent one mature female and her two somewhat callow young.

The holotype and allotype are in the Snow Entomological Collection, and the paratype is in the collection of the writer.

Pityoborus rubentis, n. sp.

Fig. 3

This is the largest known species in the genus. It is more closely allied to *hirtellus* than to other representatives of the genus, but is readily distinguished by the reddish-yellow color of the pubescence, by the more coarsely sculptured elytral declivity, by the median frontal elevation of the male, and by the smaller, ovate pubescent patches on the thorax of the female.

Female.—Length 3.2 mm., 2.6 times as long as wide; body color reddish-brown.

Frons broadly, rather deeply concave from eye to eye and from epistomal margin to well above eyes; concavity smooth with a few minute punctures, and with a marginal fringe of long curved hair, the hair much shorter on epistoma and longer above than in the allied species; central area of concavity with a few rather short inconspicuous setae. Antennal club oval, 1.28 times as long as wide,

sutures one and two about equally, weakly arcuate; widest through segment three.

Pronotum 0.96 times as long as wide; sides on basal half weakly arcuate, widest just behind middle, anterior margin rather broadly rounded and armed by 18 rather small teeth of somewhat irregular size; anterior area moderately asperate, more finely at summit; summit area not impressed behind; posterior areas reticulate, dull, finely, shallowly punctured; slightly more than middle third of the length and from lateral margin to about one-half of the distance to the median line (dorsal aspect) occupied on each side by a patch of dense, plushlike, reddish-yellow pubescence (Fig. 3), each patch subovate, narrower above, 1.3 times as wide as long, and separated from one another by about twice the diameter of one patch.

Elytra 1.6 times as long as wide, 1.8 times as long as the pronotum; sides straight and subparallel on basal three-fourths, moderately rounded behind; striae not impressed, the punctures rather small, shallow, confused on striae one and two, interstriae dull, evidently very minutely subcrenulate or punctate, the interstitial punctures reduced in number, distinguished from striae punctures by the presence of a bristle. Declivity steep; interspace two impressed, one and three weakly elevated and armed by several moderately large tubercles; striae punctures reduced in size but visible. Strial microsetae not evident except on sides where not destroyed by abrasion; interstitial bristles erect, rather short and sparse on disc, much longer and more abundant on sides and declivity, some about one and one-half times as long as the distance between rows of bristles.

Male.—Similar to female except: frons weakly convex, epistomal margin elevated, a rather broad median carina extending from epistomal margin to above eyes, marginal fringe of hair reduced to a few long setae at sides on lower half, surface coarsely, rather closely punctured except along carina; pubescent patches on sides of pronotum absent; and declivital tubercles evidently somewhat larger.

Type Locality.—Fourteen miles west of Texmelucan, Puebla, Mexico.

Host.—*Pinus* sp.

Type Material.—The female holotype, male allotype and one female paratype were collected at the type locality on July 14, 1953, at an elevation of 8600 feet, by S. L. Wood. They were taken from one gallery system in a shaded-out branch one and one-half inches in diameter. The galleries lacked egg niches and the larval galleries were a maximum of 10 mm. long; there were no other feeding tunnels.

The holotype and allotype are in the Snow Entomological Collection, and the paratype is in the collection of the writer.

Pityoborus comatus (Zimmermann)

Fig. 4

Crypturgus comatus Zimmermann, 1868, Trans. American Ent. Soc. 2:143.
Cryphalus comatus, Leconte, 1868, Trans. American Ent. Soc. 2:155.
Pityophthorus comatus, Leconte, 1876, Proc. American Philos. Soc. 15:355.
Pityoborus comatus, Blackman, 1922, Mississippi Agric. Expt. Sta. Tech. Bull. 11:96-98, figs. 51-52, 79-80; Blackman, 1928, Bull. New York Coll. For. (Syracuse) Tech. Pub. 25:145, fig. 51; Chamberlin, 1939, The Bark and Timber Beetles of North America North of Mexico, p. 343.

This is the smallest known species in the genus and the only one that occurs in the eastern half of the United States. The characters given in the key will serve to distinguish it from allied species. Blackman (1922, 1928) described and figured both the male and female and the galleries.

It is 1.7-1.9 mm. long, 2.7 times as long as wide; antennal club 1.28 times as long as wide; pronotum equal in length and width, the pubescent patches (Fig. 4) each 1.36 times as wide as long; elytra 1.7 times as long as wide, and 1.7 times as long as pronotum.

Type Locality.—South Carolina.

Hosts.—*Pinus* spp.

Distribution.—Southeastern United States from North Carolina south to Florida, and west to Mississippi. Specimens taken by the writer were from the following localities. *North Carolina*: Cherokee. *Florida*: Big Pine Key, and Everglades National Park. *Georgia*: Kingsland.

Pityoborus tertius Blackman

Fig. 5

Pityoborus tertius Blackman, 1942, Proc. U.S. Natl. Mus. 92(3147): 202.

This Mexican species is distinguished from allied species by the characters mentioned in the key. As might be expected from its close relationship to that species, its galleries resemble very closely those of *comatus* in their irregularity presumably caused by the "pupation" tunnels.

It is 1.9-2.6 (most specimens 2.3) mm. long, 2.8 times as long as wide; antennal club 1.34 times as long as wide; pronotum equal in length and width, the pubescent patches (Fig. 5) each 1.36 times as wide as long; elytra 1.9 times as long as wide, and 1.9 times as long as the pronotum.

Type Locality.—Chalco, D. F., Mexico.

Host.—*Pinus leiophylla*.

Distribution.—In addition to the type series, the writer took this species at 11 miles northeast of Jacala, Hidalgo, Mexico, on June 22, 1953, at an elevation of 5100 feet, from shaded-out branches about three-fourths to one and one-half inches in diameter.

Pityoborus secundus Blackman

Fig. 6

Pityoborus secundus Blackman, 1928, Bull. New York Coll. For. (Syracuse) Tech. Pub. 25:146; Chamberlin, 1939, The Bark and Timber Beetles of North

America North of Mexico, p. 345.

All previous references to this species were to the unique female type specimen. It is the only representative of the genus known to occur in the western half of the United States. It is readily distinguished from allied species by the larger pubescent patches on the thorax of the female and by the characters given in the key.

The gallery pattern includes regularly placed shallow egg niches, and larval cradles not more than 6 mm. long branching at right angles to the egg galleries. In addition, as many as five feeding tunnels, each not more than 10 mm. in length, may arise separately from the nuptial chamber.

It is 2.2-2.8 mm. (most specimens 2.7) long, 2.8 times as long as wide; antennal club 1.47 times as long as wide; pronotum equal in length and width, the pubescent patches (Fig. 6) each 1.3 times as wide as long; elytra 1.8 times as long as wide, 1.8 times as long as pronotum.

Male.—Previously unknown, but reported here for the first time.

Frons feebly convex, epistomal margin slightly elevated, median line raised, surface coarsely reticulate, indistinctly, rather shallowly and coarsely punctured, pubescence of a few scattered inconspicuous hairs; sides of pronotum feebly arcuate, subparallel on basal half, narrowly rounded in front, anterior margin armed by 14-16 rather coarse teeth; posterior areas finely reticulate, almost shining, rather coarsely, closely and somewhat deeply punctured; stria punctures of moderate size, deep, close, in distinct rows; interstriae almost impunctate; declivity rather steep, second interspace rather strongly impressed, punctures of striae one and two virtually obsolete, interspaces one and three raised and each bearing about six rather coarse pointed tubercles; pubescence consisting of stria microsetae and interstria bristles, confined largely to sides and declivity, longest declivital bristles not quite as long as distance between rows of bristles.

Type Locality.—LaSal Mountains, Utah.

Host.—*Pinus ponderosa*.

Distribution.—Known only from the LaSal Mountain area of Utah where it attacks the small shaded-out branches of healthy yellow pine. On July 5, 1958, the writer and D. E. Bright found it rather common at Two Mile Creek Canyon in the LaSal Mountains.

Pityoborus intonsus, n. sp.

Fig. 7

The last four species in the key form a very compact group. This species is readily separated from the other three by the transversely very broad pubescent patches on the female pronotum that are narrowly separated dorsally. Like *secundus*, the antennal club is slender, but it may readily be separated from that species by the more dull, less deeply, less closely punctured posterior areas

of the pronotum, and by the less strongly sculptured declivity.

Female.—Length 2.6 mm., 2.8 times as long as wide; body color dark brown.

Frons convex, except median third flattened or indistinctly impressed, epistomal area gradually raised, more strongly at margin; surface strongly reticulate and obscurely, rather coarsely punctured; vestiture inconspicuous, consisting of sparse fine hair, gradually becoming longer toward margin, but not forming a definite row. Antennal club rather slender, 1.42 times as long as wide; sutures one and two weakly procurved; widest through segment two.

Pronotum equal in length and width; sides weakly arcuate and converging slightly toward the moderately rounded anterior margin; anterior margin armed by 12 small teeth of subequal size the lateral pair minute; anterior area moderately asperate, more finely at summit, finely punctured between asperities; summit not impressed behind; posterior area reticulate, dull, finely and shallowly punctured; slightly more than the middle third of the length and from lateral margin to about five-sixths of the distance to median line (dorsal aspect) occupied by a patch of dense, plushlike, yellow pubescence (Fig. 7), each patch elongate-ovate, only slightly narrower above, about 1.6 times as wide as long, the two patches separated dorsally by half the length (longitudinally) of one patch.

Elytra 1.8 times as long as wide, 1.8 times as long as pronotum; sides subparallel on basal three-fourths, moderately rounded behind; striae not impressed, except basal half of one, the punctures small, rather deep, in definite rows; interstriae reticulate, impunctate. Declivity rather steep, evenly rounded, dull; interspace two impressed, one moderately and two weakly elevated, both armed by a few rather widely spaced setiferous granules; punctures of striae one and two greatly reduced but distinct. Vestiture of minute striae microsetae and long interstriae bristles; almost restricted to sides and declivity; the longest bristles about equal in length to the distance between rows of bristles.

Male.—Similar to female except: frons more nearly flattened, feebly convex, with a broad median elevation from epistoma to upper level of eyes, surface reticulate, finely punctured laterally; pubescent patches on thorax absent; and declivital granules slightly larger and the bristles slightly longer.

Type Locality.—Fourteen miles west of Texmelucan, Puebla, Mexico.

Host.—*Pinus* sp.

Type Material.—The female holotype, male allotype and one female paratype were taken at the type locality on July 14, 1953, at an elevation of 8600 feet, by S. L. Wood. These specimens were taken from one gallery system in the same shaded-out branch one and one-half inches in diameter as *rubentis*. These galleries are

peculiar in the length and pattern of the feeding tunnels. The combined lengths of the two egg galleries was 28 mm. From the nuptial chamber extended five feeding tunnels; four of these were simple in form and less than 15 mm. in length, the fifth was 40 mm. long and from it there arose in a regular pattern seven short lateral tunnels, each 3-8 mm. long, that curved so as to run parallel to the central tunnel. Only two niches, apparently for eggs, were present in the entire system; these were in the long feeding tunnel.

The holotype and allotype are in the Snow Entomological Collection, the paratype is in the collection of the writer.

A Wolverine in Utah

On the afternoon of July 6, 1958, Mr. D. E. Bright and myself were collecting insects at Geyser Pass in the LaSal Mountains at an estimated elevation of about 9,000 feet. At 3:30 p.m. we returned to the car which was directed down hill and, without starting the motor, released the brakes and coasted slowly down the narrow dirt road. On the north side of the road near the point of junction between sections three and four, Township 27 South, Range 24 East of the Salt Lake Meridian (about a mile below the Holy Oak Ranger Cabin) was a heavily grazed clearing in the aspen. This clearing extended about 125 yards from the road and was about 50 yards wide. On a mound of earth made by a Uinta Ground Squirrel just west of the center of the clearing a wolverine was crouched waiting for the squirrel to appear. When the animal spotted the car it immediately ran to the far (eastern) side of the clearing, angling slightly away from the road. It ran at least fifty yards in full view. The large size, stocky build, shortened tail, and typical mustelid gait left no room for doubting the identity of the animal. The light dorsolateral stripe was poorly developed and extended from the front shoulder only about half the distance to the base of the tail. —Stephen L. Wood.