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TWO UNDESCRIBED SPECIES OF PHYLLOPHAGA FROM TEXAS (COLEOPTERA; SCARABAEIDAE)

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THE two species here described were in a large collection of *Phyllophaga* received for study from the Museum of Zoology of the University of Michigan. One is named for F. M. Gaige, former Director and Curator of Insects of the Museum, who collected both species. The holotypes and allotypes are deposited in the above-named institution, and paratypes of one of the species are in the collection of the Illinois Natural History Survey.

In addition to the commonly used structures of the male and female genitalia, an additional set has been figured in this paper. These are here called the "dorsal sclerites," a pair of which lie in the membrane near the anal opening and on the dorsal side of the female genitalia.

Phyllophaga idonea, new species

The two slender and jointed posterior tibial spurs, ten-segmented antennae, glabrous dorsal surface, and crenulate lateral pronotal margins will place this species in the *ignava* group of *Phyllophaga* s. str.

Length, 17–19 mm.; width, 7–8 mm. Color, dark reddish brown.

MALE.—Antennae ten-segmented, club equal in length to stem. Clypeus distinctly emarginate, a little reflexed; clypeus and head finely and unevenly punctured, punctures a little closer toward middle. Pronotum finely punctured, punctures generally separated by about three times their diameters; sides of pronotum distinctly crenulate, parallel in basal half, then narrowed and straight to apex; pronotum nearly one and three-fourths times as wide as median length. Anterior tibiae tridentate. Tarsal claw rather small, with median tooth a little longer than wide and about one-half length of outer tooth. Posterior tibia with spurs very slender, evenly curved, and attached to tibia by movable joints; outer margin of tibial apex with fourteen to nineteen spinules. Metasternum finely though not densely punctured with long yellow hairs equal in length to width of posterior femur. Elytra nearly parallel, more finely punctured than is pronotum, and with outer discal costa entirely absent; remaining discal costae faint. Abdomen finely and sparsely punctured, glabrous in most of median area, and sexually unmodified; penultimate sternite densely punctured on sides and with long hairs arising from punctures; last sternite about one-fourth length of penultimate. Pygidium glabrous, finely and sparsely punctured, and not strongly convex. Genitalia symmetrical, the two halves divided and with apices ventrally curved (Fig. 1*A*).

FEMALE.—Almost indistinguishable from male except as follows: the shorter antennal club is equal in length to the six preceding segments combined; the marginal tibial spinules vary from sixteen to twenty-one, averaging nearly twenty in the females examined. (The average for the males is nearly sixteen.) Pubic process not sclerotized at middle, so that it appears to be divided into two widely separated finger-like structures lying in the membrane (Fig. 1*D*); apex of this sclerotized piece with about five hairs. Dorsal sclerite as shown in Figure 1*C*.

Holotype: male, Juniper Canyon in Chisos Mountains, Brewster County, Texas, July 14, 1928 (F. M. Gaige; field No. 196), Upper Juniper Spring, 5000 ft., at light from oak-pine-

cedar forest. Allotype: a female with same data. Both in University of Michigan Museum of Zoology. Paratypes: all from same locality as holotype; with same data, one male, one female; July 5, 1928, one male (No. 119); July 8, 1928, one

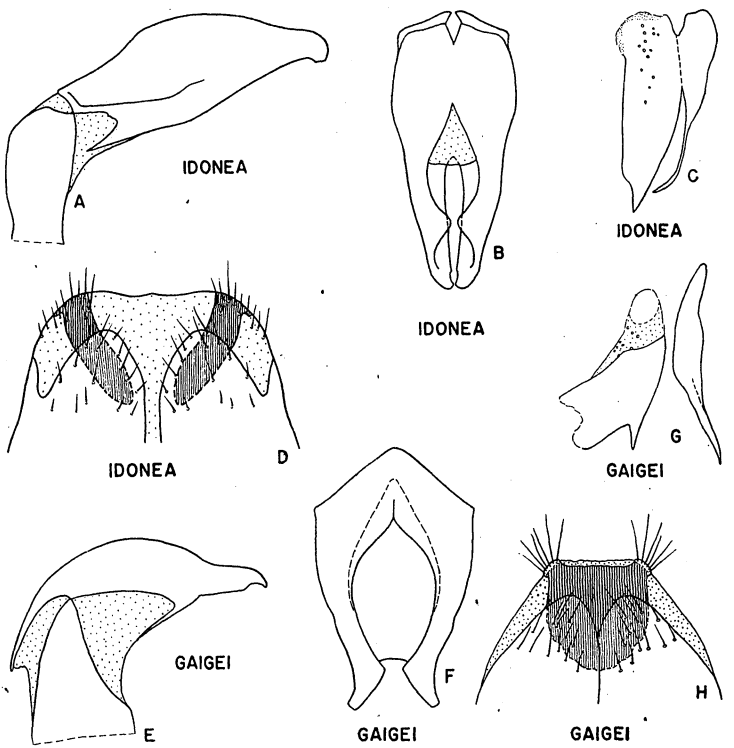

FIG. 1.—Genital structures of new species of *Phyllophaga*.

A–D. Phyllophaga idonea, new species. *A,* male genitalia, lateral view; *B,* male genitalia, dorsal view; *C,* female genitalia, dorsal sclerite; *D,* female genitalia, ventral view.

E–H. Phyllophaga gaigei, new species. *E,* male genitalia, lateral view; *F,* male genitalia, dorsal view; *G,* female genitalia, dorsal sclerite; *H,* female genitalia, ventral view.

male, two females (No. 150); July 10, 1928, two males (No. 166); July 16, 1928, one female (No. 214); July 17, 1928, two males, one female (No. 238).

One female (No. 214) was taken flying about oaks in the lower canyon. The remaining specimens were collected at a lighted sheet, placed sometimes at the edge of the dry creek bed below the cabin at the spring, where it is bordered by brush and oaks; sometimes in open scrub oak forest; and sometimes on a hillside among oaks, pines, and cedars.

This species is closely related to *ignava* Horn, which was collected with it by Gaige at the type locality. From that species it can be distinguished satisfactorily only by the differences in the genitalia. The opening for the aedeagus is double in *idonea,* with the basal opening very elongate (Fig. 1*B*). In *ignava* there is a single circular opening. The head and pronotum are more strongly punctured in *ignava,* and the tooth of the tarsal claw is a little nearer the base in that species. The females of the two are very similar, but may be distinguished by the genitalia. The apex of each half of the pubic process in *ignava* has about eight hairs instead of the four or five present in *idonea,* and the dorsal sclerites are differently shaped in the two species.

Phyllophaga gaigei, new species

The two movable spurs of the posterior tibia and the nine-segmented antenna place this species in the *quercus* group of *Phyllophaga* s. str. as defined by Horn.[1]

Length, 15–16 mm.; width, 6.5–7.5 mm. Color, dark reddish brown.

MALE.—Antenna nine-segmented, club longer than stem. Clypeus subtruncate, slightly reflexed; clypeus and head finely and unevenly punctured, the punctures denser and somewhat coalescent near clypeo-frontal suture. Pronotum finely and sparsely punctured, punctures separated by one to about four times their diameters; sides of pronotum entire, parallel in basal half, then narrowed and straight to apical angles; pronotum nearly twice as wide as median length. Anterior tibia tridentate. Tarsal claw slender, the lower tooth

[1] *Trans. Amer. Ent. Soc.,* 14 (1887): 209–96.

small, about one-half as long as the outer tooth and situated beyond middle of lower margin of claw. Posterior tibia with both spurs attached by movable joints; spurs slender and evenly curved; outer margin of tibial apex with sixteen spinules. Metasternum finely and densely punctured and thickly clothed with yellow hairs, which are equal in length to about one-half the length of metasternum between middle and posterior coxae. Elytra scarcely inflated behind and only a little wider than pronotum; punctures shallow and irregular but larger than those on pronotum; sutural, submarginal, and three discal costae present but obscured. Abdomen finely and sparsely punctured at middle; penultimate sternite with a short row of irregular rugosities near posterior margin; last sternite flattened and with a slight longitudinal depression at middle; pygidium nearly glabrous, shallowly and irregularly punctured, shining and distinctly convex. Genitalia symmetrical, the two parts of claspers divided at apex, each somewhat footlike when viewed caudally (Fig. 1*F*).

FEMALE.—Similar to male but less parallel behind. Sides of pronotum more flared behind and with posterior angles right. Club of antennae very short and equal in length to the five preceding segments combined. Penultimate sternite of abdomen coarsely and irregularly punctured near posterior margin; last sternite convex. Outer margin of posterior tibia with nineteen or twenty spinules. Pubic process of genitalia complete, heavily sclerotized and broadly depressed (Fig. 1*H*); dorsal sclerite as in Figure 1*G*.

Holotype: male, Juniper Canyon in Chisos Mountains, Brewster County, Texas, July 5, 1928 (F. M. Gaige; field No. 119); Upper Juniper Spring, 5000 ft., at light set at edge of dry creek bed below cabin. Allotype: a female from the same locality, July 15, 1928 (F. M. Gaige, field No. 205); at light from oak-pine-cedar hillside. Both in University of Michigan Museum of Zoology.

This species differs from *quercus* Knoch and allies by having the small tooth on the lower margin of the tarsal claw situated beyond the middle instead of at the middle or near the base.

It also has much finer and denser punctures on the metasternum. *Phyllophaga gaigei* bears a close superficial resemblance to *psiloptera* Sanderson,[2] which was also described from the Chisos Mountains. It differs from this species by having nine instead of ten antennal segments, and the anterior margin of the clypeus is more nearly subtruncate instead of emarginate as in *psiloptera.* From all species related to *quercus,* it differs in the genitalia (Fig. 1*E*), which resemble more closely those of some species in the subgenus *Listrochelus.*

[2] *Journ. Kans. Ent. Soc.,* 12, 1 (1939): 7.