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# THE PASSALIDAE OF THE UNITED STATES

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ABSTRACT

Only 1 species of Passalidae is known to occur naturally in the U.S.: *Odontotaenius disjunctus* (Ill.) from the eastern deciduous forest. Previously unreported records of *Passalus punctiger* Lepeletier and Serville and *P. punctatostriatus* (Percheron) from Arizona (1908–9) are given, but no evidence of present U.S. populations of these species is known. *P. punctatostriatus* represents a new U.S. record. *P. punctiger* had been previously cited from Texas, but that record is doubtful. Mexican species near the U.S. border are noted. A key is given to larvae and adults of possible U.S. species.

RESUMEN

Se conoce solo 1 especie de Passalidae ocurriendo naturalmente en los E.U.A.: *Odontotaenius disjunctus* (Ill.) de los bosques caducifolios del este. Previas colectas no reportadas de *Passalus punctiger* Lepeletier y Serville y *P. punctatostriatus* (Percheron) de Arizona (1908–9) se presentan, pero no hay evidencia de poblaciones actuales de estas especies en los E.U.A. La cita de *P. punctatostriatus* es nueva para los E.U.A. Se ha citado previamente *P. punctiger* de Texas, pero la cita es dudosa. Se anotan especies mexicanas halladas cerca de la frontera estadounidense. Se presenta una clave para larvas y adultos de especies que posiblemente ocurran en los E.U.A.

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In the past, passalids ranged as far north as Oregon, as shown by the presence of *Passalus indormitus* Cockerell in Oligocene deposits. This species is very similar to *Passalus punctiger* Lepeletier and Serville (Reyes-Castillo 1977), the species with the widest geographic range in the Western Hemisphere.

At present, according to Blackwelder (1944), 3 species of Passalidae occur in the U.S. *Odontotaenius disjunctus* (Ill.) (formerly *Passalus cornutus* Fabr. and *Popilius disjunctus* Ill.) is confined to the deciduous forests of the east (Fig. 1) in spite of various old, undoubtedly erroneous, records from California, Latin America, and Haiti (Reyes-Castillo 1970). Its actual range is from mid-Florida to Massachusetts (though 1 specimen in the Harvard collection is labeled "New Hampshire" (pers. comm., M. K. Thayer 1980)), and southern Texas to Minnesota (Fig. 1). Ramsey Co., Minnesota (pers. comm., E. F. Cook 1980) is the northern-most world record for Passalidae. New state records not listed in Reyes-Castillo (1970) include Nebraska, Minnesota, and Rhode Island.

Blackwelder lists *Passalus punctiger* and *P. interruptus* (L.) from Texas. Both of these are probably erroneous citings. *P. interruptus* apparently occurs only as far north as Panama (Schuster 1978, 1983). *P. punctiger* has been collected no closer to Texas than Gomez Farías, Tamaulipas, Mexico, 275 miles from the Texas border (Schuster 1978). *P. punctiger,* however, and *P. punctatostri-*

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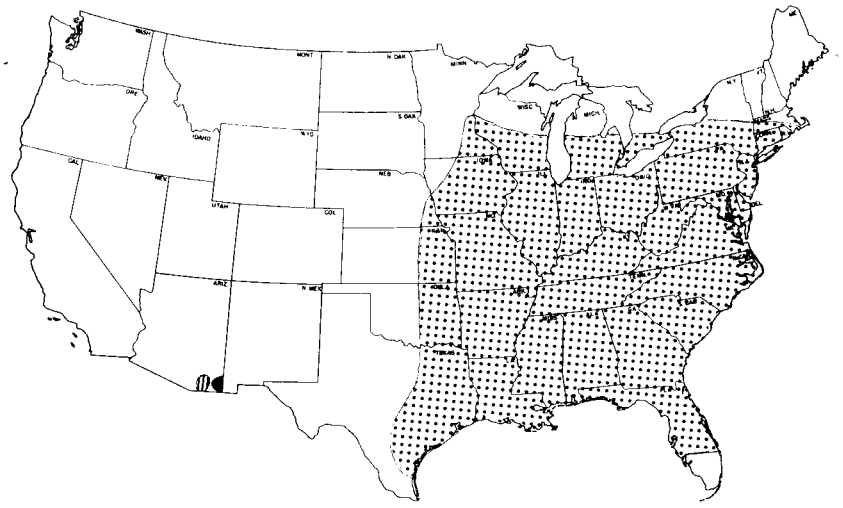

Fig. 1. U.S. Passalidae: distributions of *Odontotaenius disjunctus* (stippling), *Passalus punctiger* (vertical bars), and *Passalus punctatostriatus* (fine cross hatching).

*atus* (Percheron) have been collected in the U.S. only in Arizona. The California Academy of Sciences has a specimen of *P. punctiger* labeled as follows: Arizona, Cochise Co., Huachuca Mtns, Aug. 6, 1908, R. Hopping Collection. It had been determined as *Neleus tlascala*, a name which should probably be synonymized with *P. punctiger* (Reyes-Castillo 1973). Also present in the Academy are 4 specimens of *P. punctatostriatus* collected in the Chiricahua Mtns. of Arizona with the following additional data for each specimen: (1) VI-12-1908, Collector: V. W. Owen; (2) V-4-1909, Van Dyke Collection; (3) V-14-1909, Van Dyke Collection; and (4) V-1909, E. S. Ross Collection. The latter specimen has a determination label reading *N. tlascala* Perch. I know of no other specimens of Passalidae collected in the western U.S.

In western Mexico, *P. punctatostriatus* has been collected as far north as 27°12′ in Sonora. I know of no records of *P. punctiger* from that state. Both species present a typical Neotropical distribution in the sense of Halffter (1964), ranging into South America.

The habitats of the Arizona specimens are not described on the labels. In the tropics, *P. punctiger* inhabits decomposing hardwood, and sometimes palm, below 1,500 m elevation, in dry or wet tropical forests. *P. punctatostriatus* inhabits decomposing hardwood and pine logs below 2,000 m elevation. I found 1 under a palm log in Guatemala. I have not found them in forests as dry as some in which *P. punctiger* occur. They are more common than *P. punctiger* above 1,000 m, at least in Guatemala. Apparently, no passalid populations are presently known in Arizona. Possibly passalids were brought into Arizona in cargo during early times as certain carpenter bee nests probably were (F. G. Werner, pers. comm. 1981).

Four other species, *Odontotaenius striatopunctatus* (Perch.), *Heliscus tropicus* (Perch.), *P. punctatostriatus*, and *Petrejoides* n. sp., have been collected as close as 100 miles from the Texas border. Another species, *Ptichopus angulatus*

(Perch.) has been collected at Monterrey and on the Texas border at Matamoros (specimens in National Museum of Natural History and Cal. Academy collections, respectively). This species could very well occur in southern Texas, though it has never been reported from there. It lives in the detritus chambers of leaf-cutter ants (*Atta mexicana* Fr. Smith) even in dry desert regions, a habitat quite different from the moist, rotting wood preferred by other passalid species (Hendrichs & Reyes-Castillo 1963). This species also occurs in western Mexico as far north as Alamos, Sonora.

The following key should separate to species level the adult and larval passalids possibly occurring in the U.S.:

### Key to the Passalidae of the United States

Adults (adapted from Reyes-Castillo 1970)

1. Head with prominent, hooked dorsal horn; clypeus exposed in dorsal view ..... *Odontotaenius disjunctus*
1′. Head with straight horn or horn absent; clypeus hidden below frons in dorsal view ..... 2
2(1′). Prothoracic tibiae very wide; anterior margin of labrum bisinuate; antennal lobes curved; mandibles with 2 apical teeth ..... *Ptichopus angulatus*
2′. Prothoracic tibiae narrow; anterior margin of labrum straight or slightly concave; antennal lobes straight, lying in one plane; mandibles with 3 apical teeth ..... 3
3(2′). Anterior margin of frons straight, inner tubercles absent; lateral metasternal fossa bare; body length 20–27 mm ..... *Passalus punctatostriatus*
3′. Anterior margin of frons with 2 inner tubercles; lateral metasternal fossa with hairs; body length 29–44 mm ..... *Passalus punctiger*

Third Instar Larvae (adapted from Schuster & Reyes-Castillo, 1980)

1. Ninth abdominal sternite with 2 or more pairs of long setae; tenth abdominal segment with 14 or more primary setae forming a ring around anus; pronotum with 3 or more pairs of long primary setae ..... 2
1′. Ninth abdominal sternite with 2 long setae; tenth abdominal segment with 10–12 primary setae forming a ring around anus; pronotum usually without primary setae (but occasionally with up to 3 pairs) ..... 3
2(1). Maxilla with uncus of lacinia bifid; long primary setae present on all abdominal sternites ..... *Ptichopus angulatus*
2′. Maxilla with uncus of lacinia entire; long primary setae absent on all abdominal sternites except ninth ..... *Odontotaenius disjunctus*
3(1′). Tergites 3–6 mostly with 2 pairs of primary setae each; third instar head width 5.0–6.3 mm ..... *Passalus punctiger*
3′. Tergites 3–6 mostly with 1 pair of primary setae each; third instar head width 3.9–4.4 mm ..... *Passalus punctatostriatus*

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## Oscar L. Cartwright

Oscar L. Cartwright, a world authority on scarab beetles and a former curator at the Smithsonian Institution, died March 21, 1983, at his Falls Church, VA home, of heart failure. He was 82.

He held several positions at the Smithsonian Institution during a long career and published numerous scientific papers.

Born April 12, 1900, in Sharpsville, PA Mr. Cartwright received a B.S. degree from Allegheny College in 1923 and a M.S. degree from Ohio State University in 1925. After graduating, Mr. Cartwright joined the staff of the South Carolina Experiment Station at Clemson University.

From 1945 to 1947, he was captain in the U. S. Public Health Service, researching control of malaria. In 1948, Mr. Cartwright was made associate curator of the insect division of the National Museum of Natural History. In 1963 he was named curator of Coleoptera.

Throughout the 1950s, he traveled on field assignments to study insects in Europe, Central America, the Caribbean and the United States. Mr. Cartwright's research led to the development of new museum exhibits which the Secretary of the Smithsonian commended as being "modern, attractive and enlightening." He retired from his work in 1970 at the age of 70 and was made a curator emeritus.

He is survived by his wife, Marie Cartwright, of Falls Church.