



5-2-2002

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Recommended Citation

Evans, Howard E. and Leatherman, David A. (2002) "New records and range extensions of species of *Dipogon* (Hymenoptera, Pompilidae) in Colorado," *Western North American Naturalist*. Vol. 62 : No. 2 , Article 8.

Available at: <https://scholarsarchive.byu.edu/wnan/vol62/iss2/8>

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NEW RECORDS AND RANGE EXTENSIONS OF SPECIES OF *DIPOGON* (HYMENOPTERA, POMPILIDAE) IN COLORADO

Howard E. Evans¹ and David A. Leatherman²

ABSTRACT.—Four species of *Dipogon* are recorded from Colorado for the first time. These are *hurdi* Evans, *pulchripennis* (Cresson), *graenicheri* Banks, and *brevis* (Cresson). All are inhabitants of wooded areas and are believed to nest in cavities in trees. Notes are presented on habitat and prey of these 4 species and of the recently described species *kiowa* Evans.

Key words: Hymenoptera, Pompilidae, *Dipogon*, distribution, prey, spiders.

Wasps of the genus *Dipogon* are largely confined to wooded areas where several of the species are known to nest in cavities in trees. Townes (1957) recorded 12 species, but 7 more have since been described (Wasbauer 1960, 1966, Evans 1974, 2000). These wasps are rarely taken by conventional collecting methods, and several of the species are known from only a few specimens. Clearly, some of the species have much broader ranges than previously appreciated, and we report here on range extensions for 4 of these. Ten species have now been recorded from Colorado, 6 of them not included in a recent checklist of Colorado Pompilidae (Evans 1997). We include here notes on individual specimens and on the habitat and behavior of 2 species of subgenus *Deuteragenia* and 3 species of subgenus *Dipogon*. Fieldwork reported here was done by DAL in the course of surveys of trees throughout the state.

Dipogon (Deuteragenia) *hurdi* Evans

This species was described from mountains in the state of Durango, Mexico, based on a female taken with a spider of the genus *Icius* (Salticidae). An allotype was described from Portal, Arizona, at about 5000 feet elevation. Known range of this species is now extended to the mountains of Colorado. A female was taken by DAL on the trunk of a dead, standing, large-diameter ponderosa pine (*Pinus*

ponderosa) at Lake Isabel, Custer County, at about 9000 feet elevation, 8 July 1998. In size and structural details this specimen resembles the type closely. Color is also similar except that the legs are darker, the coxae and fore and middle legs being partially infuscated, while the hind legs are wholly dark beyond the coxae.

HABITAT.—Lower montane forest characterized by mixed conifers: ponderosa pine, Douglas-fir (*Pseudotsuga menziesii*), and white fir (*Abies concolor*). The tree from which the female was collected had been killed within the last 2 years by bark beetles of the genus *Dendroctonus* and still retained some complement of brown needles. Recently fallen ponderosa pines, also killed by bark beetles, were in the immediate vicinity.

Dipogon (Deuteragenia) *pulchripennis* (Cresson)

This species is characteristic of woodlands of the northeastern United States and southeastern Canada, but it has also been taken in mountainous areas in Arkansas and Arizona. Thus, it is not surprising to discover it in the mountains of Colorado. A female was collected by DAL as it emerged from a wood-boring beetle tunnel at the base of a live but fire-damaged ponderosa pine within the Black Tiger Fire area, 0.2 miles southeast of Sugarloaf Mountain, Boulder County, 22 August 1998. Another female was taken by DAL at

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Beulah, Pueblo County, 23 August 2000, associated with a ponderosa pine killed by *Dendroctonus ponderosae*. This individual was observed expelling boring dust from a bark beetle exit hole, which presumably was the entrance to a nest within a wood borer tunnel.

HABITAT.—The 1st female was taken in a ponderosa pine/Douglas-fir forest, which sustained a fire in summer 1990. The forest is now quite open and characterized by mature live trees with basal fire scars on their north sides, dead standing snags, and fallen trees devoid of foliage and in moderate states of decay (bark beginning to sluff, wood softening and full of insect holes and cracks). The 2nd female was taken in a mature ponderosa pine forest sustaining considerable mortality from recent bark beetle attacks.

Dipogon (Dipogon)
graenicheri Banks

This species was described from South Miami, Florida, by Banks (1939). Townes (1957) reported it from New Jersey to Florida and west to Louisiana. Hook (1998) recently reported it from Travis County, Texas. A single female was taken by DAL on the trunk of a living, large-diameter Siberian elm (*Ulmus pumila*) at Willow Creek Park, Lamar, Prowers County, 16 August 1998. Although Lamar is at one of the lowest elevations in the state (3600 feet), the occurrence of *graenicheri* here was unexpected. This female differs from south Florida specimens in having the frons lightly alutaceous, less polished than in the type, and the eyes somewhat more convergent above. In this specimen the basal 1.7 metasomal tergites and all sternites are rufous; the amount of rufous on the metasoma is variable in eastern specimens we have seen.

HABITAT.—Typical city park with mature, widely spaced trees, mostly Siberian elm and plains cottonwood (*Populus deltoides* var. *monifera*) with an irrigated bluegrass understory. Many of the deciduous trees displayed bacterial wetwood disease, which has killed patches of trunk bark, exposing bare wood, borer tunnels, and cracks. The park is bisected by Willow Creek, characterized along its banks by thickets of coyote willow (*Salix exigua*). An undeveloped woodland immediately south of the park contains plains cottonwood, Siberian elm, Russian-olive (*Eleagnus angustifolia*), and tamarisk (*Tamarix ramosissima*).

Dipogon (Dipogon)
brevis (Cresson)

This species was recorded by Townes (1957) from New England to Georgia, with specimens of his subspecies *recalvus* west to Michigan and Wisconsin. Specimens recently taken in southeastern Colorado differ in no important structural details from *brevis* but match in color none of the 3 subspecies recognized by Townes. We have 7 females, taken by DAL on plains cottonwood and Siberian elm trunks in Lamar, Prowers County, 1 October 1997, 4–7 September 1998, and 15 September 2000.

These specimens vary in fore wing length from 3.8 to 5.4 mm and have the close, silvery to golden pubescence characteristic of *brevis*. The body is black with ferruginous markings as follows: antennae, clypeus, pronotum over its anterior 0.3 to 0.8, metapleura and sides of propodeum in 3 specimens, and a spot on the mesopleura in 1 specimen. The legs are dark, variably suffused with ferruginous. In the series the metapleura vary from mat to shining, and there is much variation in the spacing of the punctures on the propodeum. These 2 features were used by Townes to characterize his subspecies *recalvus*.

Despite the fact that these females do not fit well into presently recognized subspecies, we do not feel it is appropriate to add still another subspecies at this time. Wasbauer (1960) described a species from California (*leechi*) that resembles *brevis* in many details, but it differs from our Colorado series in having appressed hairs on the propodeum and 1st metasomal tergite, as well as more weakly banded wings.

HABITAT.—Specimens were collected at both Willow Creek Park (described above under *graenicheri*) and the southeastern section of Lamar Community College grounds (similar to Willow Creek Park and directly adjacent to the undeveloped riparian woodland described under *graenicheri*).

Dipogon (Dipogon)
kiowa Evans

This species was described from 9 females taken by DAL in Lamar, Prowers County, at sites described under the preceding 2 species and at various dates July–September 1998–1999. One female was taken on the ground within 1 foot of the trunk of a tree, the others on the trunks. The wasps were never found

prior to midmorning, and most were collected on shaded sides of trunks of large deciduous trees in late afternoon and early evening. Two of the females were taken with their spider prey: a female *Tutelina harti* (Emerton) and an immature *Phanias* sp. (both Salticidae).

Another female was reared by DAL on 24 August 1999 from a bolt of dead Utah juniper (*Juniperus utahensis*) trunk wood collected at Crawford State Park, Delta County, Colorado, on 5 August 1999. The primary hole maker found associated with this same wood was the horntail wasp, *Sirex areolatus* (Cresson) (Siri-cidae). Species of *Rhyssa* (Ichneumonidae) and *Ibalia* (Ibaliidae) also emerged from the wood; presumably, these were parasites of the *Sirex*. This was a very different habitat from Lamar, comprising mostly scattered juniper and other aridland plants characteristic of the Colorado Plateau. The elevation is about 6200 feet.

DISCUSSION

With the exception of 2 female *pulchripennis*, which were taken as they emerged from presumed nest holes at the extreme bases of trees, and the Crawford female *kiowa*, all *Dipogon* individuals mentioned were observed on the bark surface of large-diameter trees at heights of 2–8 feet aboveground (or in one case on the ground near such a tree). Presumably, they forage for prey outside this range, and their capture at this height is probably as much a function of convenient observation height as a true reflection of their behavior. Most trees where *Dipogon* individuals were observed also supported foraging ants, the resemblance to which was enhanced by the wasps' banded wings. The wasps differed in foraging behavior only in that they occasionally "jumped" across bark fissures or other obstacles. Otherwise, they ran across the bark and explored crevices in patterns and rates very similar to the ants with which they shared space.

So far as known, members of the subgenus *Dipogon* prey on jumping spiders (Salticidae). In addition to the records for *kiowa* presented above, there are records of *brevis* preying upon salticids of the genera *Phidippus* and *Pellenes* (Evans and Yoshimoto 1952, Kurczewski and Kurczewski 1968). Several species of subgenus *Deuteragenia* also utilize Salticidae, but

the North American *sayi* Banks and the European *variegata* (L.) prey almost exclusively on crab spiders (Thomisidae). Various other members of this subgenus are known to prey on Agelenidae, Amaurobiidae, Areneidae, Clubionidae, Gnaphosidae, and Segestriidae. Useful reviews of the biology of the genus have been presented by Richards and Hamm (1939) and Evans and Yoshimoto (1962). More recently, there have been detailed studies of *sayi* by Fye (1965), Krombein (1967), and Jennings and Parker (1987), as well as studies of several Palearctic species by Gros (1997). Much remains to be learned about the biology of these reclusive insects.

ACKNOWLEDGMENTS

Spider determinations were made by Paula Cushing of the Denver Museum of Nature and Science and David B. Richman of New Mexico State University. Michael S. Kelley, of the Museum of Comparative Zoology, Harvard University, loaned us the type of *Dipogon hurdi* and several other specimens important for identification of our material.

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Received 23 October 2000
Accepted 12 February 2001