Revision of the Hawaiian Alleculidae (Coleoptera)

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The family Alleculidae (Cistelidae) is represented in Hawaii by nine endemic species contained in two genera. One of the genera, *Labetis,* is also an endemic product; the other genus, *Pseudocistela,* is almost cosmopolitan.

Alleculids are rare insects in Hawaiian forests and it is only occasionally that they are collected. However, they can probably be taken in numbers on blossoming trees at the correct season of the year in favorable localities.

In this paper keys are given for the separation of the genera and species, *Pseudocistela montana* (Perkins) and *P. apicalis* (Perkins) are synonymized under *P. subaenescens* (Perkins), new notes on the distribution and host plants are given, and a new species is described from Maui.

LIST OF SPECIES

1. **Labetis tibialis** Waterhouse.
   Waterhouse: Ent. Mo. Mag. **15**: 267, 1879.
   Blackburn and Sharp: Trans. Roy. Dub. Soc. **3**(2): 167, 248, 1885.
   Perkins: Fauna Haw. **2**: 251, 1900.
   Kauai.
2. **Labetis comitans** Perkins.
   Perkins: *l.c.,* pl. 10, fig. 21.
   Kauai.
3. **Labetis hawaiiensis** Perkins.
   Perkins: Fauna Haw. **2**: 250, 1900.
   Perkins: Proc. Haw. Ent. Soc. **1**: 96, 1907.
   Hawaii.
4. **Pseudocistela kauaiensis** (Perkins).
   Perkins: Fauna Haw. **2**: 248, 1900.
   Kauai.
5. **Pseudocistela nigricollis** (Perkins).
   Perkins: *l.c.*
   Kauai.
6. **Pseudocistela subaenescens** (Perkins).
   Perkins: Fauna Haw. **2**: 249, 1900.
   Cistela apicalis Perkins, new synonym.
   Perkins: *l.c.*
   Perkins: Proc. Haw. Ent. Soc. **1**: 46, 1905.
   Cistela montana Perkins, new synonym.
   Perkins: Fauna Haw. **2**: 249, 1900.
   Oahu, Kauai.
7. **Pseudocistela crassicornis** (Sharp).
   Sharp: Trans. Dub. Soc. **3**(2): 168, pl. 4, fig. 25, 1885.
   Perkins: Fauna Haw. **2**: 248, 1900.
   Perkins: Proc. Haw. Ent. Soc. **1**: 46, 1905.
   Oahu.
8. **Pseudocistela mauiae,** new species.
   Maui.

9. **Pseudocistela konae** (Perkins).
Perkins: Fauna Haw. **2**: 250, 1900.
Hawaii.

KEY TO THE GENERA

1. Fore tibiae laterally flattened and strongly expanded distally on outer side to form a distinct apical angulation ..... **Labetis**
2. Fore tibiae not expanded at apex, rounded off on outer side **Pseudocistela**

Genus **Labetis** Waterhouse, 1879

The species of this genus are larger than the Hawaiian species of *Pseudocistela* and can be easily separated from *Pseudocistela* by the expanded tibiae (this expansion can be seen with the unaided eyes). The genotype is *L. tibialis* Waterhouse.

KEY TO THE SPECIES

1. Head and prothorax black; Hawaii ..... **hawaiiensis** Perkins
Head and prothorax brown 2
2. Second elytral interval sunken and caniculate between the strongly elevated first and third intervals on the declivity; Kauai ..... **comitans** Perkins
Second elytral interval not sunken but on about the same plane as the third interval on the declivity; Kauai ..... **tibialis** Waterhouse

The members of this genus are evidently very rare. I have seen only one specimen collected since Dr. Perkins' time. It is *Labetis tibialis* Waterhouse and was taken by J. A. Kusche at Kaholuamanu, Kauai, April 1920. I know nothing of the habits of the members of the genus except that Perkins found *hawaiiensis* on *Acacia koa.*

The known distribution of the described *Labetis* in the islands is most interesting and peculiar. The described species have been recorded only from the islands of Kauai at the northern extremity and Hawaii at the southern end of the main group of Hawaiian islands. It is strange that specimens have not been found on the four intervening islands. Blackburn (1885, p. 167), however, noted that he found a pair of *Labetis tibialis* "by beating branches of trees on the mountains near Honolulu." However, on page 248 of the same work these two specimens were recorded as "A single pair occurred on the mountains of Oahu, at an elevation of about 1,500 feet, in localities twenty miles apart." It is not clear which statement is in error, but one must be, because they both refer to the same specimens. Perkins considered that these two examples represented two species and were not *tibialis.* It is now about half a century since Blackburn took his specimens on Oahu. It is difficult to understand why no other specimens of the genus have been found in the interim by the numerous collectors who have scoured the island from bottom to top and end to end.

Genus **Pseudocistela** Crotch, 1873

Cistela, name cited in error by various authors.

The Hawaiian species have all been described under the generic name *Cistela.* I have followed the more recent use of *Pseudocistela.*

The males of our species can be distinguished from the females not only by the broader distal segments of the antennae, but also by the fore femora being somewhat flattened on the lower side in the basal half, thus making the longitudinal ventral contour of the femora angulate. The end of the angulation is usually developed into a minute tooth.

KEY TO THE KAUAI SPECIES

1. Dorsum entirely black ..... **subaenescens** (Perkins)
   Elytra reddish brown 2
2. Prothorax black ..... **nigricollis** (Perkins)
   Prothorax reddish brown ..... **kauaiensis** (Perkins)

The only Kauaian specimens that I have seen collected since Perkins' type series are as follows: one specimen of *P. kauaiensis* collected by O. H. Swezey from *Metrosideros* at Lihue, 800 feet, May 13, 1923, nine specimens of the same species collected by me, seven of them beaten from *Metrosideros* blossoms near Kokee, July 11, 1937, one from South Mohihi Ridge, July 15, 1937, and one at light at Kokee, July 6, 1937 and 14 specimens taken by Swezey at Kalalau and Kumuela in June, 1932, most of them were dug from a rotten log of *Acacia koa,* four were bred from pupae; three specimens of *P. subaenescens* were beaten by me from *Metrosideros* in blossom near Kokee, July 11 and 14, 1937.

KEY TO THE OAHU SPECIES

1. Pronotum and at least basal part of elytra concolorous, dorsum either entirely black with aeneous sheen or with the apical parts diluted with yellow ..... **subaenescens** (Perkins)
2. Pronotum almost black, obviously darker than base of elytra and contrasting with it in color; elytra entirely brown ..... **crassicornis** (Sharp)

When Dr. Perkins wrote his descriptions of *subaenescens, apicalis,* and *montana,* he had about 10 specimens. I have examined about 20 specimens and have come to the conclusion that there is only one species represented in the series. The following synonymy is, I believe, essential:

Pseudocistela subaenescens (Perkins).

Cistela apicalis Perkins, **new synonym.**
Cistela montana Perkins, **new synonym.**

Dr. Perkins separated his species on minor characters of degree only. He did not mention any, and there are no good morphological differences between his "species." One can readily under-

stand, however, how an author working with a small series of specimens of a variable species could come to such conclusions. The specimens before me vary in size from 4.0 mm. to 6.5 mm. In dorsal coloration there is an intergradation of specimens from entirely aeneous black (*subaenescens* and *montana*) through specimens with the tips of the elytra diluted with yellow to specimens in which the distal half of the elytra are yellowish (*apicalis*) through specimens in which the elytra are mostly obscurely diluted with yellow to a specimen which is entirely brown. I have dissected out and studied the male genitalia of a male of each of Perkins' species and found them all similar in structure and shape. (The species described and figured in Biologia Centr. Amer. are remarkably distinct in their genitalia.) Dr. K. G. Blair kindly compared some of our specimens with Perkins' types and came to the conclusion that *montana* was the same as *subaenescens,* independent of any suggestion on my part.

This synonymy makes necessary a change in Perkins' remark that all the species are insular specific, for now at least one species is known to occur on two islands.

This species is represented in the collection before me by specimens giving the following data from Oahu: Palikea, in June from *Broussaisia* and *Suttonia;* Mt. Kaala, August and September; Haleauau Valley from *Antidesma* in April; Opaeula, in July; Manini Gulch, from *Bidens,* in September; Aiea in June. All the localities, excepting Aiea, are in the Waianae Mountains.

Pseudocistela crassicornis (Sharp).

Dr. Perkins found but one female specimen in Pauoa Valley that he considered this species. I have before me a female collected by Mr. Swezey in Kaimuki, which has been compared with Sharp's type of this species and considered identical with it by Dr. Blair. This example, except for its color, is practically identical to larger examples of *subaenescens* in structural details. Without a larger series including the male, I can offer no definite conclusion as to its status. I am inclined to believe that it is a variant of *subaenescens.* If this is shown to be true, then Sharp's name, which has many years' priority, must be used instead of *subaenescens.*

MAUI SPECIES

Pseudocistela mauiae, new species.

Female.—Chestnut brown in color, suffused above and below with darker brown; prothorax and head darker brown and less reddish than elytra; antennae with segments 1–5 paler than 6–11, segments 1–3 obviously paler; segments 4–5 intergrading to the very dark brown of following segments; clypeus and labrum somewhat paler than front; legs slightly paler than venter.

Head with labrum rather obscurely punctate, with numerous stiff setae; clypeus hexagonal, truncate at apex, from some directions appearing strongly and evenly convex at base, but base really formed of three segments of hexa-

gon, three basal segments and two lateral segments equal in length, apex twice as long as any of the other five segments of hexagon, shallowly and densely punctate, less coarsely and densely punctured than front, with short fine, scattered setae; front coarsely and densely punctate throughout and with very fine prostrate hair-like setae; eyes as long as narrowest interocular distance, distance across head between lateral margins of eyes twice that of interocular area. *Antennae* capable of reaching metacoxae, length of segments as follows: (1, 7) (2, 25) (3, 7) (4 to 5, 9) (6 to 8, 10) (9 to 11, 9). *Prothorax* one third broader than long, broadest at basal angles; base subtruncate, but with a feeble prescutellar convexity; hind angles obtuse, almost right angles; sides almost straight and very slightly convergent from base to between basal half and apical third, thence gently arcuate to the subtruncate apex; longitudinal dorsal outline almost evenly and gently convex, but with a slight median, subbasal depression; puncturation comparatively coarse, dense, interstices narrower than punctures, each bearing a prostrate, posteriorly directed hair-like seta. *Elytra* quite shiny, five eighths as broad as long, four times as long as prothorax, broadest behind the middle at a distance from base equal to breadth; base truncate, even and straightly divergent from base about to point of greatest breadth, thence evenly arcuate to apex; striae deep, conspicuous, well marked, making intervals appear slightly convex, their punctures close, slightly broader than striae, each bearing a prostrate hair-like seta that does not quite reach back to base of following seta; intervals with well-defined punctures, discal punctures almost as large as, but shallower than those of pronotum, each puncture bearing a rather short hair-like seta that does not reach back much beyond apex of its puncture; second interval with a single row of punctures for most of its length, other discal intervals more confusedly punctate; tenth interval evidently impunctate, excluding its lateral bounding row of punctures, and with its dorsal margin developed into a distinct carina that extends back to and joins the lateral margin near apex of fifth ventrite. *Legs* with fore femora entire, evenly convex internally; fore tibiae with apical spurs subequal in size, dorsal one slightly broader; hind tibiae with inner spur about one third longer than outer; hind tarsus with first segment about one fourth longer than following segments together. *Sternum* with prosternum rather coarsely punctate, punctures tending to be somewhat laterally confluent, intercoxal process about half as broad as a coxa, slightly rounded caudad, polished, with scattered punctures; mesosternum rather coarsely punctate, intercoxal process margined on either side, about as broad as apex of first tarsal segment, mesepisternum punctate mostly on disk only, mesepimeron impunctate except for a few punctures near base; metasternum with well-defined punctures separated by interstices one to three times their breadth, episternum with closer punctures. *Venter* shiny, with fine, shallow, scattered punctures bearing fine hair-like setae throughout; fifth ventrite strongly and evenly convex throughout. Length: 5.5 mm.: breadth: 2.5 mm.

Maui, Hawaiian Islands. Holotype female, in Bishop Museum, collected by E. H. Bryan, Jr., at Halehaku, June 16, 1920.

This species may be readily recognized by its elytra, which are more inflated caudad than those of the other Hawaiian species. The coarser, more distinct puncturation of the elytra in addition to the short, inconspicuous setae together with the deeper striae are other characters that will serve to distinguish this species.

From the description of *P. konae* one might expect that these species were closely allied. Dr. Blair has kindly compared this specimen with the holotype of *konae* and notes the following characters of *konae* that do not agree with those of *mauiae;* clypeus as closely

and coarsely punctured as frons; prothorax broadest at about one third from base, more coarsely and closely punctured than in *mauiae;* elytra with flatter intervals, striae less marked and the pubescence longer.

HAWAII SPECIES

Pseudocistela konae (Perkins).

I have not seen this species, nor do I know of any specimens of the genus having been collected on Hawaii since Perkins took his unique female type from a spider's web at 5,000 feet in Kona. This is evidently a well-marked species.

Although it is probable that the islands of Molokai and Lanai are inhabited by Alleculidae, none have, to my knowledge, ever been collected on those islands.