

**A New *Microcalyptis* Species from California
(Lepidoptera: Nepticulidae)**

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Abstract.—A new species of *Microcalyptis* Braun, is described from Antioch, California. The adult, larva and mine are illustrated. The larval chaetotaxy of a *Microcalyptis* species is figured for the first time. The larva forms a serpentine mine in the stem epidermis of *Lotus scoparius* (Nutt. in T. & G.) Ottley. Stem mining has not been reported for *Microcalyptis*.

The eight described species of *Microcalyptis* are restricted to North America (Wilkinson 1979). A new species, *Microcalyptis lotella* is described from Antioch Dunes National Wildlife Refuge, which is a remnant of a once extensive dune system along the San Joaquin River near its confluence with the Sacramento River. The new species shares most characters of the genus as defined by Davis (1978) and Wilkinson (1979). Unlike other *Microcalyptis* species, *M. lotella* is a stem epidermis miner.

***Microcalyptis lotella* New Species**

Description.—External features for male and female (Fig. 1): Forewing length 2.0–3.3 mm. Vertex and frons whitish to tan, scales occasionally dark-tipped; eyecap large, nearly concolorous with vertex. Antenna 42–45 segmented; flagellum shiny dark brown. Dorsum of thorax and forewing irrorated with grayish scales, darkened apically; fringe tan. Hindwing shiny whitish gray; basal third covered with ochraceous androconia; fringe tan. Forewing venter uniformly silver gray-brown, basal third with ochraceous androconia between costal and anal veins. Abdomen with shiny grayish buff scaling. Legs smooth, grayish. Venation (Fig. 2): Forewing with six veins reaching the wing margin (nomenclature follows Wilkinson 1979); radius three-branched (R1, R2 + 3 and R4 + 5), R4 + 5 ending at wing tip; median unbranched, arising from R4 + 5; cubitus absent; anal vein bent basally. Hindwing narrow; five veins reaching wing margin.

Male Genitalia (Figs. 3–5): Tegumen (pseuduncus) hoodlike enclosing the uncus, posterior margin truncate to shallowly emarginate, bearing 20–26 curved setae. Uncus with dorsal knob; gnathos broadly V-shaped with a large medial, dorsally projecting spine. Lateral support rods (Davis 1978) elongate triangular, obliquely truncate posteriorly. Valva simple, elongate, length ca. 4X width; inner surface shallowly concave bearing numerous setae, setae thickened distally. Juxta (Fig. 4) simple, distal portion very lightly sclerotized. Vinculum narrow medially; lobes of saccus about as long as broad. Transtilla well developed, fused, mesad. Aedeagus (Fig. 5) large, elongate, slender; distal end with two subequal, strongly pigmented, curving processes; cornuti increasing in size toward insertion of larger distal process;

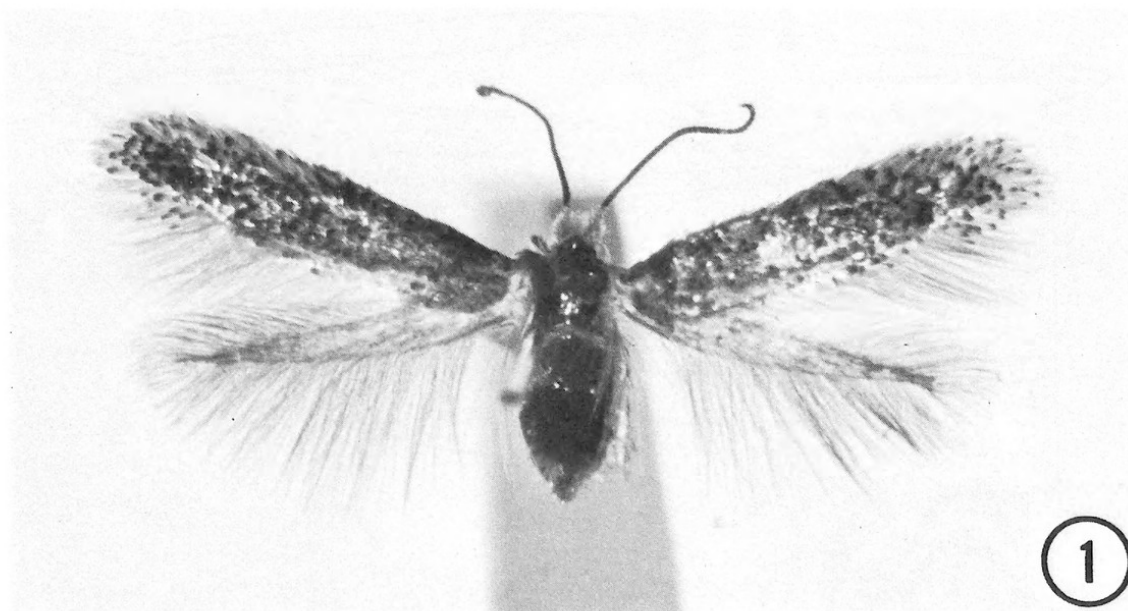


Figure 1. Adult male of *Microcalyptris lotella*.

lateral tooth arising at about $\frac{2}{3}$, bearing numerous minute spines at its base; phallobase elongate, broadly rounded.

Female Genitalia (Fig. 6): posterior apophyses long, nearly 2X length of anterior apophyses. Corpus bursae narrowly ellipsoid, with two large signa that run entire length of bursa, composed of quadrangular spinose plates. Vesicle large, elongate, broadest anteriorad; distinct vestibule intercalated between vesicle and helical ductus spermathecae.

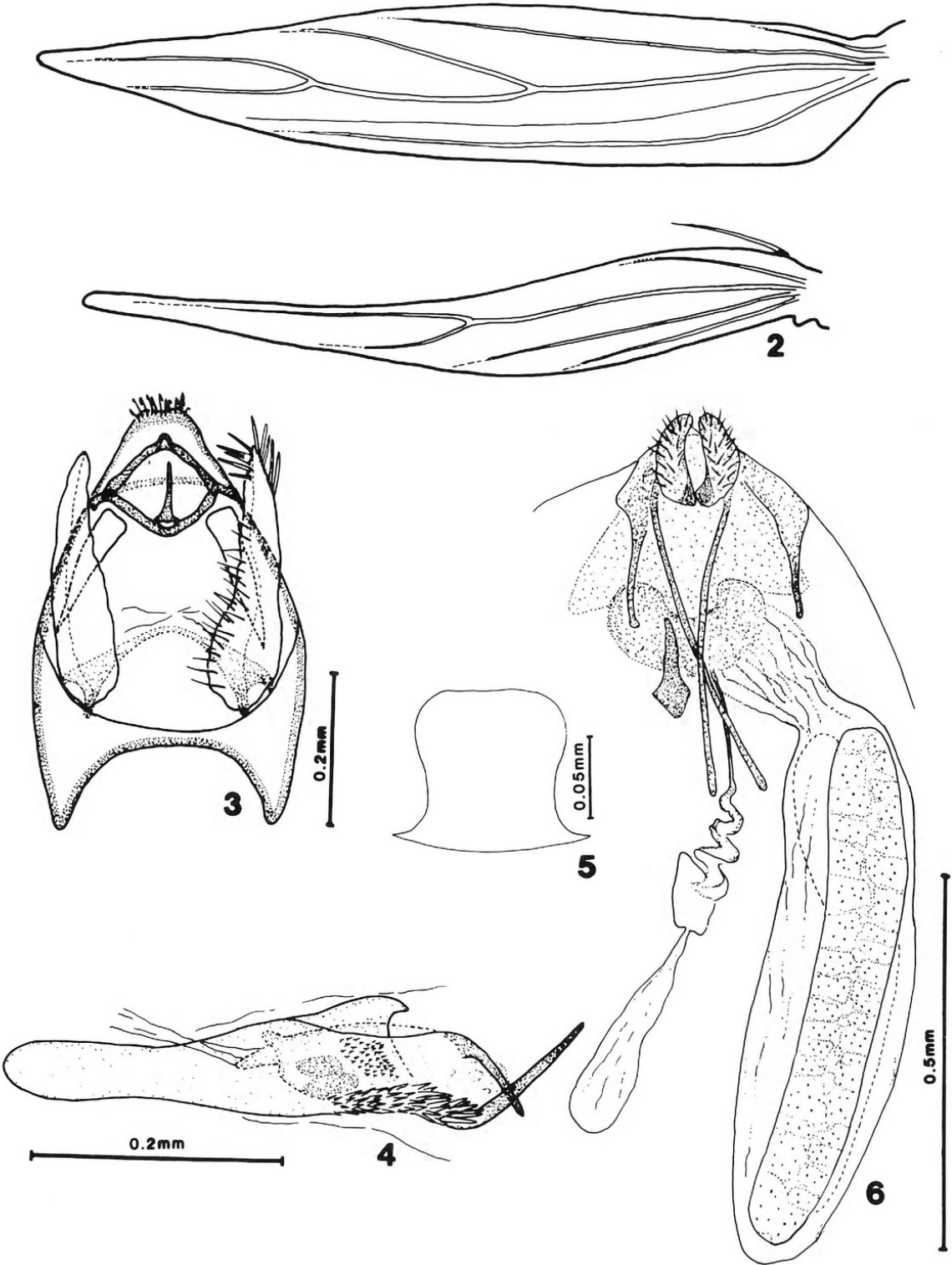
Diagnosis.—Forewings uniformly gray, irrorate. Male with androconia over basal third of DHW and VFW. Saccus lobes as broad as long; juxta weak, simple; tegumen (pseuduncus) with 20–26 curved hairs; valva bearing thickened apical setae; aedeagus with two large apical processes, a lateral tooth and large cornuti. Female with two very large signa running length of corpus bursa.

Holotype.—Male, California, Contra Costa Co., Antioch Dunes National Wildlife Refuge, 15.iii.85, D. L. Wagner, reared from *Lotus scoparius*, imago issuing 14.iv.85, male genitalic slide DLW 86-01, in the Essig Museum of Entomology, University of California, Berkeley.

Paratypes.—California, Contra Costa Co., Antioch Dunes National Wildlife Refuge, 15.iii.85, D. L. Wagner, J. A. Powell and J. W. Brown collectors, reared from *Lotus scoparius*, imagos issuing 7.iv–13.v.85, 42 males and 57 females. DLW Slide Numbers: larva: 85-22 and 85-23; wing: 85-27, 85-33, 85-40, 85-41 and 85-46; male: 85-45, 86-02 and 86-23; and female: 85-47, 86-06, 86-08, 86-39 and 86-40.

Ovum: Egg laid on epidermis of upper shoots of *Lotus scoparius*. Ovum oval, packed with reddish purple to reddish brown frass, elevated above the epidermal tissue.

Larva (Figs. 7, 8): Fully mature larva elongate, 6.5–7.5 mm in mine, contracting upon removal; yellow with dark brown head capsule. Cranial nomenclature and chaetotaxy follows Gustafsson (1981). Caudal margin of head capsule deeply



Figures 2–6. *Microcalyptris lotella*: 2. Wing venation. 3. Male genitalia. 4. Aedeagus. 5. Juxta. 6. Female genitalia.

emarginate, lateral lobe extending posteriorad $> 1.5 \times$ basal width at tentorial bridge, caudal margin of lobe distinctly thickened; epistomal ridge quadrangular, bulging anteriorad, posterior margin convex; tentorial arms reduced, anterior arms < 0.5 width of bridge; labial palpus 2-segmented, basal segment subequal to apical. Prothorax with two weak dorsal sclerites, all setae present; mesothorax with two SV

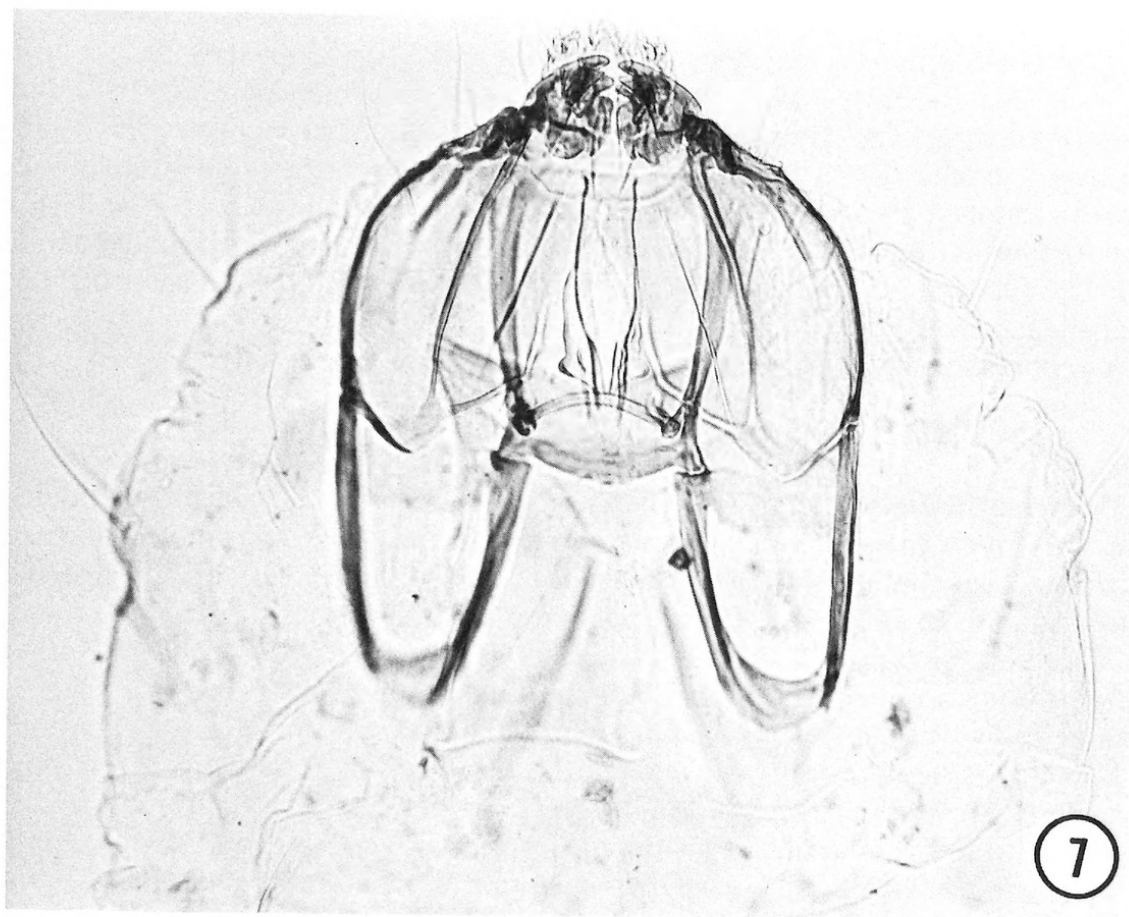
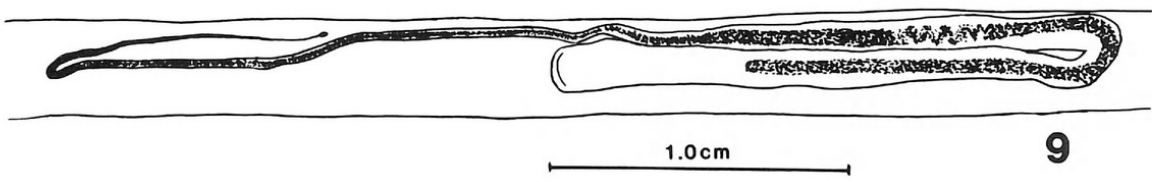
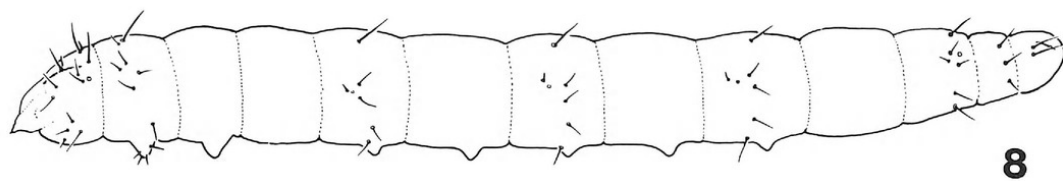


Figure 7. Head capsule of *Microcalyptris lotella*, ventral aspect.



Figures 8, 9. *Microcalyptris lotella*. 7. Larva. 8. Mine.

setae, L3 absent; ambulatory warts on segments T2, T3 and A2-6. Abdominal segments 1-8 with six setae; A9 with three setae and A10 with two (Fig. 8).

Mine (Fig. 9): Early portion densely packed with dark frass; later frass deposited as broad central band, lateral areas remaining frass-free. Mine elongate, 3.5-7.3 cm in length, making one to three switchbacks; track rarely anastomosing except in very narrow shoots. Larva mines in green bark, usually in shoots one to three years of age; rare or absent from areas of reddish bark or the most recently formed shoots. Larva fully visible beneath epidermis, leaving the mine through a crescent-shaped slit to pupate in surface litter.

Cocoon: Cream to fuscous, loose, broadly pyriform.

DISCUSSION

Microcalyptris lotella appears to be most closely related *M. punctulata* (Braun), the only other member of the genus recorded from California. Shared features include the comparatively large signa and the uniformly pale irrorate forewings (the male genitalia of *M. punctulata* have not been described or illustrated).

The wing venation of *M. lotella* differs from that of *M. scirpi* and other *Microcalyptris* species in lacking a vestigial Cu vein in the forewing. The juxta is simple and very weakly developed in *M. lotella*, unlike some members of the genus which possess a large, relatively complex juxta (e.g., *M. bicornutus* Davis). The lateral support rods characteristic of the genus are well developed in this species.

Little is known about the life history of any *Microcalyptris* species. All apparently form serpentine tracks, and leave the mine prior to pupation. *Microcalyptris scirpi* Braun is a leaf miner in the blades of *Scirpus paludosus* A. Nels. (Braun 1925). Braun (1910) reared *M. punctulata* (Braun) from mines in the leaves of *Ceanothus cuneatus* (Hook.) Nutt. *M. lotella* is unusual in that the larva is a stem miner, feeding in the green epidermal layers of *Lotus scoparius*. Among the Nearctic nepticulids only one other genus, *Ectoedemia* Busck, is known to mine in bark. Curiously, in the Palearctic region, the stem epidermis of *Lotus* is mined by unrelated nepticulids in the genus *Trifurcula* Zeller.

Presumably this species is single brooded as I have been unable to locate active mines from April through July.

The type locality, Antioch, California, is a unique sand dune habitat along the San Joaquin River. The once extensive dune system at Antioch was home to many endemic plants and insects (Powell 1981). What remains of this threatened habitat is now protected as a National Wildlife Refuge managed by the United States Fish and Wildlife Service. Although *M. lotella* is presently known only from this unique locality, abandoned mines which may represent this species were found near Briones Reservoir in Contra Costa County and near Virner, El Dorado County, California.

Stilbosis extensa Hodges (Cosmopterigidae) was reared from the same collections that produced *Microcalyptris lotella*. The larvae of *S. extensa* were frequently found boring in the pith of the upper shoots, beneath mines of the *Microcalyptris*.

ACKNOWLEDGMENTS

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