

## A DESERT SUBSPECIES OF *GLOVERIA MEDUSA* (LASIOCAMPIDAE)

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**ABSTRACT.** A brood of a taxon of *Gloveria* was reared from ova of a wild female taken at Pinyon Flat, Santa Rosa Mountains, Riverside County, California, 11 July 1978. The large, lightly marked ova; the large, darkly colored, hairy larvae; and the food plant of *Quercus turbinella californica* set the taxon apart from *Gloveria medusa* Stkr. The adults are larger, the wings differently proportioned, the markings distinctly different and the color darker in the females than in either *Gloveria medusa* or *Gloveria gargamelle* Stkr. This distinct desert subspecies, *Gloveria medusa editha*, is described.

*Gloveria medusa* Strecker, 1898, was described from Los Angeles but occurs widely in the coast ranges of southern and central California (Franclemont, 1973), as far north as Monterey. Larvae from this region have been reared by me and by others, and the life history is well known. However, a population of *medusa* that occupies the high desert east of the coast ranges differs from the nominate form in size, color, genital structure, foodplant, and time of emergence. It clearly represents at least a distinct subspecies that I now describe. The type series of 11 males and 15 females was reared from eggs of a female collected with ultraviolet light at Pinyon Flat, elevation 1250 m, Santa Rosa Mountains in the southern Great Basin, Riverside County, California, by John and Ruth Johnson.

### *Gloveria medusa editha* Johnson, new subspecies

**Ova.** Larger than in ssp. *medusa*, one ovum measuring 2.5 mm in diameter and 3.0 mm in height. A ssp. *medusa* ovum from a wild-caught female measured 2.2 mm in diameter and 2.6 mm in height. Ova of ssp. *editha* more pointed at the apex, those of ssp. *medusa* more rounded; apical brown spot of *editha* smaller, white ring surrounding it narrower than these features on *medusa* ova; enveloping brown ring outside white ring less continuous and less dense in *editha* than in *medusa*; two lateral spots of *editha* ova set in smaller white fields, remaining brown pigmentation of chorion less intense and more irregularly distributed than in *medusa* ova (compare Fig. 1: A, B & C).

**Larvae.** At hatching ssp. *editha* larvae more robust with darker sides and longer setae than those of ssp. *medusa*. The stripe of interrupted addorsal red dashes of the first four instars more vividly red and less orange than in ssp. *medusa*; in later instars, sixth for males and seventh for females, *editha* larvae more densely haired and noticeably darker on sides than larvae of *medusa*; lateral areas of white and grey, so conspicuous on sides of *medusa* larvae, much reduced on *editha* larvae. Refer to Fig. 2, where seventh instar, fully-fed larva of *editha* allotype female, one day before spinning, is photographed with newly moulted, seventh instar, wild-caught, female larva of *medusa*, which has not yet fed to repletion.

**Foodplant.** Subspecies *editha* larvae fed on *Quercus turbinella californica* Tucker (Munz and Keck, 1959). The newly hatched larvae were transported to their native habitat and offered foliage of *Eriogonum fasciculatum polifolium* (Benth.) S. Stokes and that of other native shrubs and trees, but accepted only turbinella oak. As picked supplies

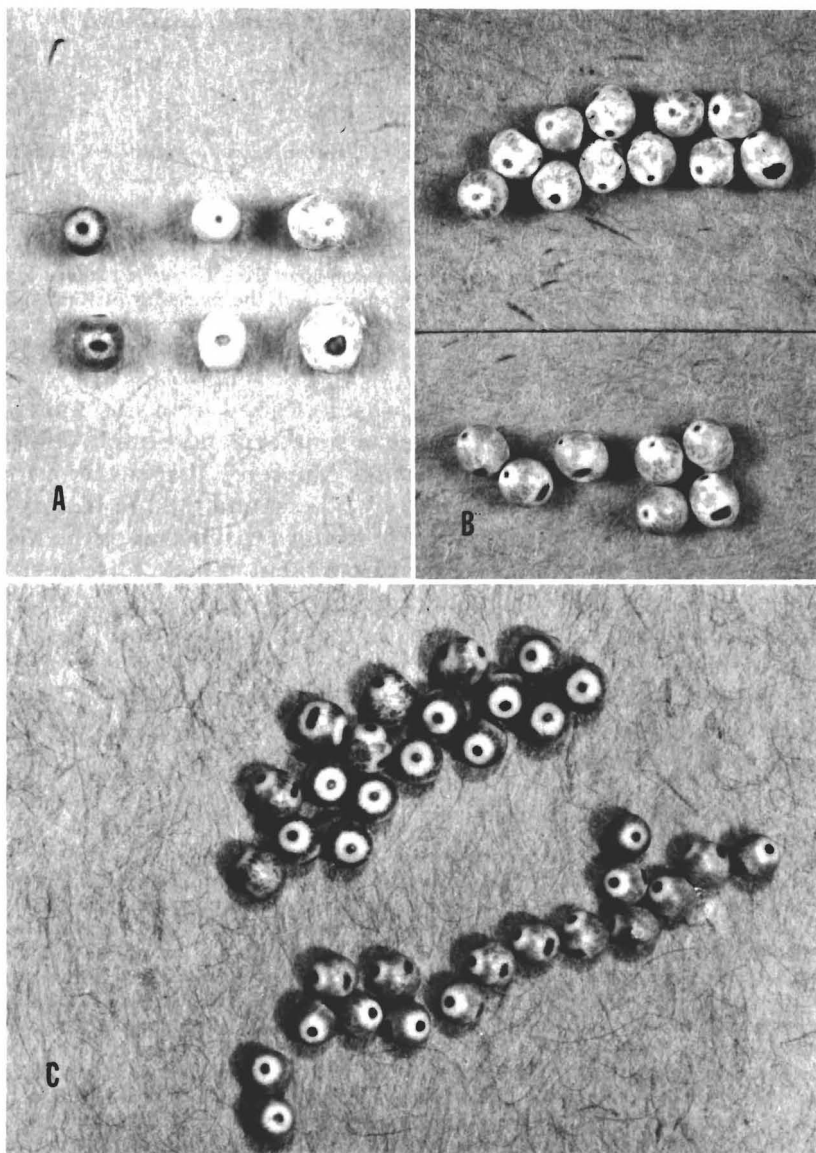


FIG. 1. A. From left to right, recently laid ova of *Gloveria medusa medusa*, *Gloveria arizonensis*, and *Gloveria medusa editha*, showing comparative sizes (Bottom row, lateral view; Top row, dorsal view).  $\times 3$ . B. *Gloveria medusa editha* ova.  $\times 2.5$ . C. *Gloveria medusa medusa* ova, somewhat over-enlarged,  $\times 2.7$ , compared to B.

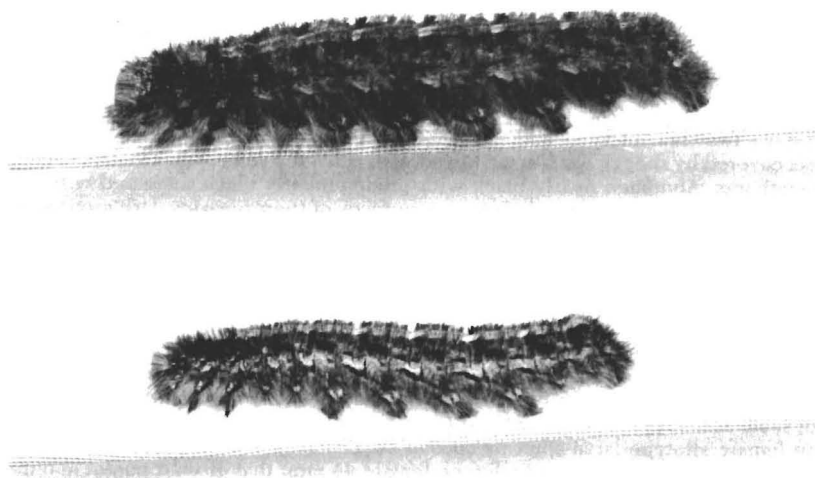


FIG. 2. **Upper larva:** Fully fed seventh instar larva of the allotype female of *Gloveria medusa editha* on 16 June 1979, one day before spinning. **Lower larva:** Newly-moulted, seventh instar female of *G. m. medusa*, not yet fed to repletion, collected 5 June 1979, Orange Co., California.  $\times 1$ .

were exhausted, the author offered the more readily available foliage of *Quercus dumosa* Greene, which the larvae accepted. While ssp. *medusa* has been reported from a number of foodplants (Franclemont, 1973), its usual foodplant is one of several varieties of *Eriogonum fasciculatum* Benth. The ssp. *medusa* larva shown in Fig. 2 was found on *Quercus dumosa*, on which it fed poorly, producing a stunted ssp. *medusa* female. This is the only record of the nominate subspecies feeding on oak. As the larvae of *Gloveria medusa* have a tendency to wander about freely at night, the larva may have strayed from nearby *Eriogonum fasciculatum fasciculatum* bushes into the *Quercus dumosa* thick-et, where it was found. As with ssp. *medusa*, the larvae of ssp. *editha* fed only at night.

**Flight period.** Subspecies *medusa* flies in late August and early September, the males being active from about 10:00 A.M. to 4:00 P.M. PDT. Subspecies *editha* flies at Pinyon Flat in July. One field observation suggests that its daily flight time might also be different from *medusa*'s. One, or possibly two, males were seen flying at dusk in the type locality at about 7:30 P.M. PDT, 29 July 1978.

**Holotype male.** Antennae, head, eyes, thorax, and superior surfaces of primaries dark brown, contrasting strongly with lighter color of secondaries and abdomen. Across primaries, a well-defined, transverse, median band. Discal spot white. Semi-hyaline area in middle of primaries distad of discal spot; submarginal area dark brown, with row of subdued, darker brown spots from apical to inner angle; white setae scattered over primaries, heavier in basal area, along costal margin distad of median band, and

in submarginal area of wings. Primaries of holotype of ssp. *editha* noticeably more pointed and longer in proportion to width than for ssp. *medusa*, the over-all size of the former markedly greater. Holotype forewing length 32 mm, outer margin width 19 mm; compared to mean forewing length of three wild-caught ssp. *medusa* males 29.5 mm, and margin width 18.8 mm. Abdomen and secondaries rich cinnamon brown as for ssp. *medusa*, but caudal tuft of long setae darker on *editha*.

Inferior surfaces: pro- and mesothoracic legs dark brown, metathoracic legs cinnamon brown. Primaries paler than on superior surface; discal spot white; large semi-hyaline patch across median area of wings; basal area cinnamon brown. The *editha* holotype larva spun its cocoon between 8 and 13 June 1979, the adult (Fig. 3) emerging 21 July 1979.

**Allotype female.** Antennae and eyes black, head black with scattered yellow setae. Thorax covered by shaggy black setae mixed with pale grey setae, latter more numerous on metathorax. Abdomen nearly black with predominantly black setae and with scattered brown and light grey setae. Superior surfaces of the primaries dark grey, nearly black, overlaid by white setae; discal spot white, allotype's transverse median band very faint, band present in some paratypes; submarginal row of black spots absent on allotype, present on some paratypes, but much subdued from apical to inner angle. Primaries proportionately wider than in ssp. *medusa*. Superior surfaces of secondaries dark grey to nearly black, submarginal areas darkest, lacking brown tones of ssp. *medusa*. Secondaries more rounded and ample than in ssp. *medusa*. Inferior surfaces of primaries nearly black throughout, with semi-hyaline area across postmedian field on some paratypes. Inferior surfaces of secondaries nearly black throughout, with white setae and scales along costal and outer margins.

The female allotype larva spun its cocoon on 17 June 1979, the adult emerging 25 July 1979. Length of forewing of allotype female 44 mm; that of wild parent about 46 mm (Fig. 4).

## DISCUSSION

Genitalia preparations of two males were made of each ssp., *editha* and *medusa* (Fig. 5). In *Gloveria* the aedoeagus is dorsal between two wing-like alary processes, the endophallus evertting from the base of the aedoeagus into a membranous structure. The valves are ventral, enclosing the saccus. Variations were observed in the shape of the aedoeagus of ssp. *medusa*: One was very long and pointed; the second was shorter and blunt at the end. In both *editha* specimens the aedoeagus was heavier and sharply pointed, with a prominent dorsal tooth near the tip and small teeth on the ventral edge. Aedoeagal tooth size and arrangement varied in the pairs of genitalia of both subspecies. In both, the teeth were confined to the distal half of the aedoeagus, unlike the arrangement described for *Gloveria garmelle* Stkr. (1884) by Franclemont (1973, p. 69; fig. 19).

In *editha* the outer sclerotized portions of the valves ended sharply and abruptly, being more round in *medusa*. The alary processes to either side of the aedoeagus tended to be shorter and wider in *editha* than in *medusa*.

A very consistent and marked difference in the shape of the saccus differentiated the two sets of genitalia. In *editha* the saccus is large and extended, while in *medusa* the saccus is much shorter and smaller.



A



B

FIG. 3. **A.** Holotype male of *Gloveria medusa editha*.  $\times 1$ . **B.** A wild-caught, newly-emerged male of *Gloveria medusa medusa*, collected 18 August 1979, Orange Co., California.  $\times 1$ .

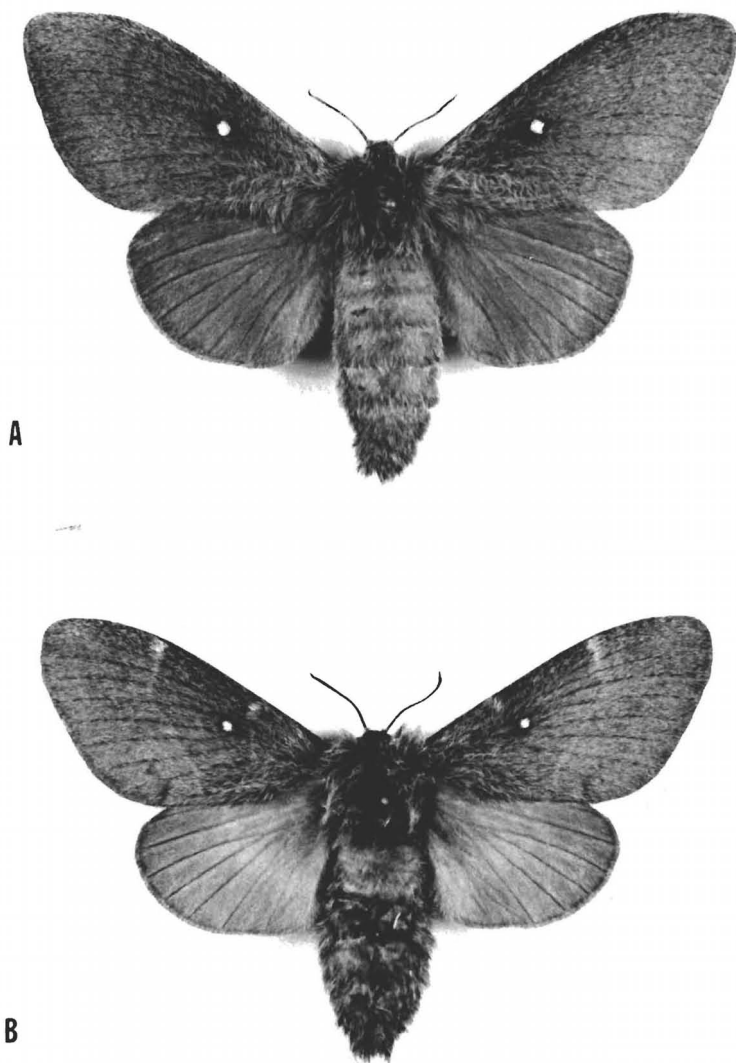


FIG. 4. **A.** Allotype female of *Gloveria medusa editha*.  $\times 1$ . **B.** Female of *Gloveria medusa medusa*, reared from an ovum taken from wild female, Orange Co., California (contrasting black or brown tones of subspecies not evident in photographs).  $\times 1$ .

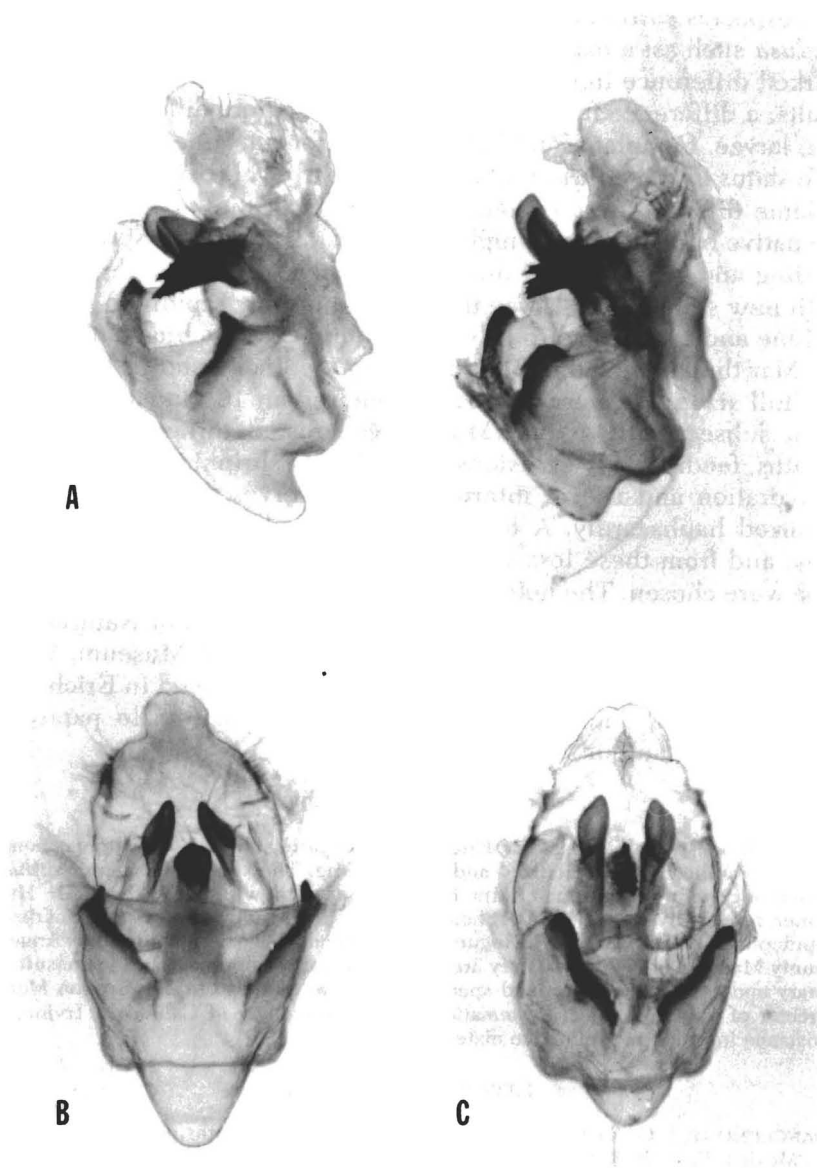


FIG. 5. Male genitalia of the two subspecies of *Gloveria medusa*. **A.** Lateral view: left, *editha*; right *medusa*. **B.** Ventral view: *editha*. **C.** Ventral view: *medusa*.  $\times 25$ .

Subspecies *editha*, thus, shows many points of distinction from ssp. *medusa* such as: a marked difference in the shape of the genitalia; a marked difference in size and details of wing shape and color in the adults; a difference in the season of flight; distinct differences in the ova, larvae, foodplant, and habitat. Therefore, I believe the subspecific status of the *editha* population is clearly valid and justified.

Some difficulty was encountered in rearing the *editha* larvae. In the native habitat the cold nights of late fall, winter, and spring retard feeding and development until April, when the turbinella oak puts forth new shoots. The larvae then feed and grow rapidly to pupation in June and emergence in July. In the mild coastal climate of Corona del Mar the larvae fed rapidly, reaching the final instar in December and full size in January, one larva spinning on 16 January 1979, the pupa subsequently dying. Most larvae rested through the spring months, feeding only occasionally, gradually shrinking in size due to dehydration and use of internal tissue reserves. Cocoon formation occurred haphazardly. A few larvae resumed feeding in April and May, and from these less stunted specimens, the holotype and allotype were chosen. The holotype and allotype will be deposited in the type collection of the Los Angeles County Museum of Natural History, with a pair of paratypes going to the National Museum, Washington, D.C. Three pairs of paratypes have been placed in Erich Walter's collection, and six male paratypes and ten female paratypes remain in the author's collection.

#### ACKNOWLEDGMENTS

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#### LITERATURE CITED

- FRANCLEMONT, J. G., in Dominick, R. B. et al. 1973. The Moths of America North of Mexico. Fasc. 20.1, Mimallonoidea; Bombycoidea (in part): 3-86, pls. 1-11.
- MUNZ, P. & D. P. KECK. 1959. A California Flora. Univ. Calif. Press, 1681 pp., 134 figs.
- STRECKER, H. 1884. Description of new species of North American Heterocera. Proc. Acad. Nat. Sci. Philadelphia 36: 283-286.
- . 1898. *Lasiocampa medusa* n. sp. Ent. News 9: 13.