

A New Subspecies of *Sandia macfarlandi* from the Sierra Madre Oriente of Mexico (Lepidoptera: Lycaenidae)

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Abstract

Sandia m. madreoriente is distinguished from the nominate of monobasic *Sandia* which occurs from montane southwest Texas northwestward to northern New Mexico.

Introduction

Sandia macfarlandi was described in 1960 by Ehrlich and Clench as the type species of their monotypic genus *Sandia*. The type locality was La Cueva canyon, western slope of the Sandia Mountains, 1200 m. altitude, Bernalillo County, New Mexico, U.S.A. The original description included some brief life history observations and, later, Stallings, Turner and Ehrlich (1962) described the life history, subsequent notes being added by McFarland (1965). Holland (1974) presented additional distributional and biological notes indicating the species occurred in the Sandia, Sacramento, Manzano, and Magdalena mountains of New Mexico, and on and around Ladron Peak, New Mexico. Ehrlich and Clench (1960) mentioned specimens from the Davis Mountains of western Texas and subsequently, specimens have been recorded from the Chisos Mountains of western Texas as well as north-central Chihuahua State, Mexico (Ferris, 1981).

In the tribe Eumaeini (*sensu* Eliot, 1973), Johnson (in press) is revising the infratribal assemblage of which *Sandia* is a part, indicating *Sandia* includes a number of taxa distributed from extreme northern South America northward to the range of *S. macfarlandi*. Documented

are more collecting localities within the general range of *S. macfarlandi* along with a single record some 1000 km. to the south, in the disjunctly-located Sierra Madre Oriente of extreme southeast Saltillo and Nuevo Leon states in Mexico (Fig. 2). The latter collection was made by Dr. William F. and Mrs. Nadine M. McGuire in 1978, the specimen subsequently being placed in the Carnegie Museum of Natural History (CMNH), Pittsburgh. I have been able to acquire additional specimens from the Sierra Madre Oriente. These specimens represent an extremely disjunct segregation of *S. macfarlandi* and differ from the nominate form in several major wing characters. Physiographic, climatological, autecological and paleobotanical studies (Martin and Mehringer, 1965; Mayer, 1979; Van Devender and Spaulding, 1979) clearly distinguish the Sierra Madre Oriente element of montane Mexico from (a) the Sierra Madre Occidentale, (b) the disjunct cluster of small mountain ranges south of the Mogollon Rim of Arizona (they include the Ajo, Sierra Blanca, Comobabi, Coyote, Baboquivari, Silver Bell, Tucson, Santa Catalina, and Rincon mountains of Arizona, the Animas Mountains of New Mexico and the Davis, Chisos, Sierra Diablo, Tierra Vieja and Chinati mountains of west Texas [they do not name the Mexican elements of this grouping but illustrate the Sierra Madre Occidentale as beginning contiguously some 75 km. south of the United States/Mexican border (at Arizona/New Mexico border) with the discontinuous elements northward being part of the above-named disjunctive group]), and (c) the Colorado Plateau element of the United States Rocky Mountain region (Fig. 2). The previously known dis-

tribution of *S. macfarlandi* is limited to the second region above and some extreme southern elements of (c). Within this range, *S. macfarlandi* is generally homogeneous in wing characters (see Remarks, below). The Sierra Madre Oriente population (some 750 km. south of west Texas *S. macfarlandi* disjuncts and some 1200 km. south of the *S. macfarlandi* type locality) represents a new subspecies. There is no evidence to date that *S. macfarlandi* occurs in the Sierra Madre Occidentale, though this region is poorly sampled. The Chihuahuan record (Rancho Campana Agricultural Station, about 100 km. N. of Chihuahua City) is from xeric rolling hill habitat at about 750m. altitude.

To document the character differences and above-mentioned distributional distinctions, as well as to encourage eventual determination of the southward range and biogeographical characteristics of the Sierra Madre Oriente *S. macfarlandi* population, the following subspecies is described.

***Sandia macfarlandi madreoriente*,
new subspecies**

Figs. 1A-B, 3B

Diagnosis: *S. m. madreoriente* differs from nominate *S. macfarlandi* in the following salient wing characters: *S. m. madreoriente* (1) lacks the postmedian band on the under surface of the forewing (the band is prominent in the nominate); (2) has a nearly flat, straight postdiscal band across the hindwing under surface (the line is arc-shaped and wavy toward the anal margin in the nominate); (3) lacks all or nearly all limbal spotting in the vein interspaces distad the postdiscal band (the spots are generally prominent in most if not all vein interspaces about 1 mm. distad the postdiscal line in the nominate).

Description: Male: upper surface of the wings: ground color dark brown to dark tawny-olive brown, fringe much lighter, often white. Androconial scent

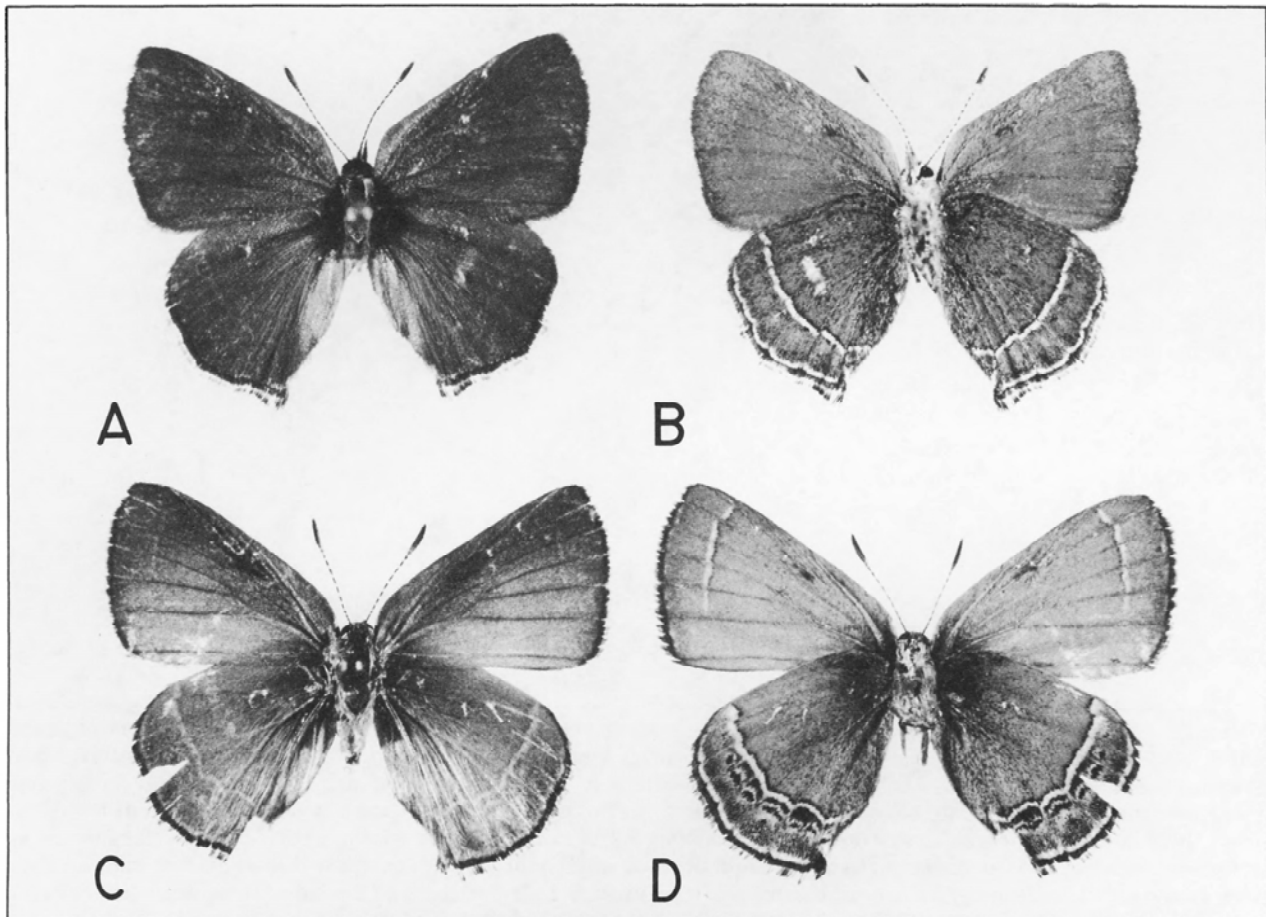


Figure 1. Holotype male of *S. macfarlandi madreoriente* (A, Upper surface; B, undersurface) (CMNH); holotype male of *S. macfarlandi macfarlandi* (C, upper surface; D, under surface) (AMNH).

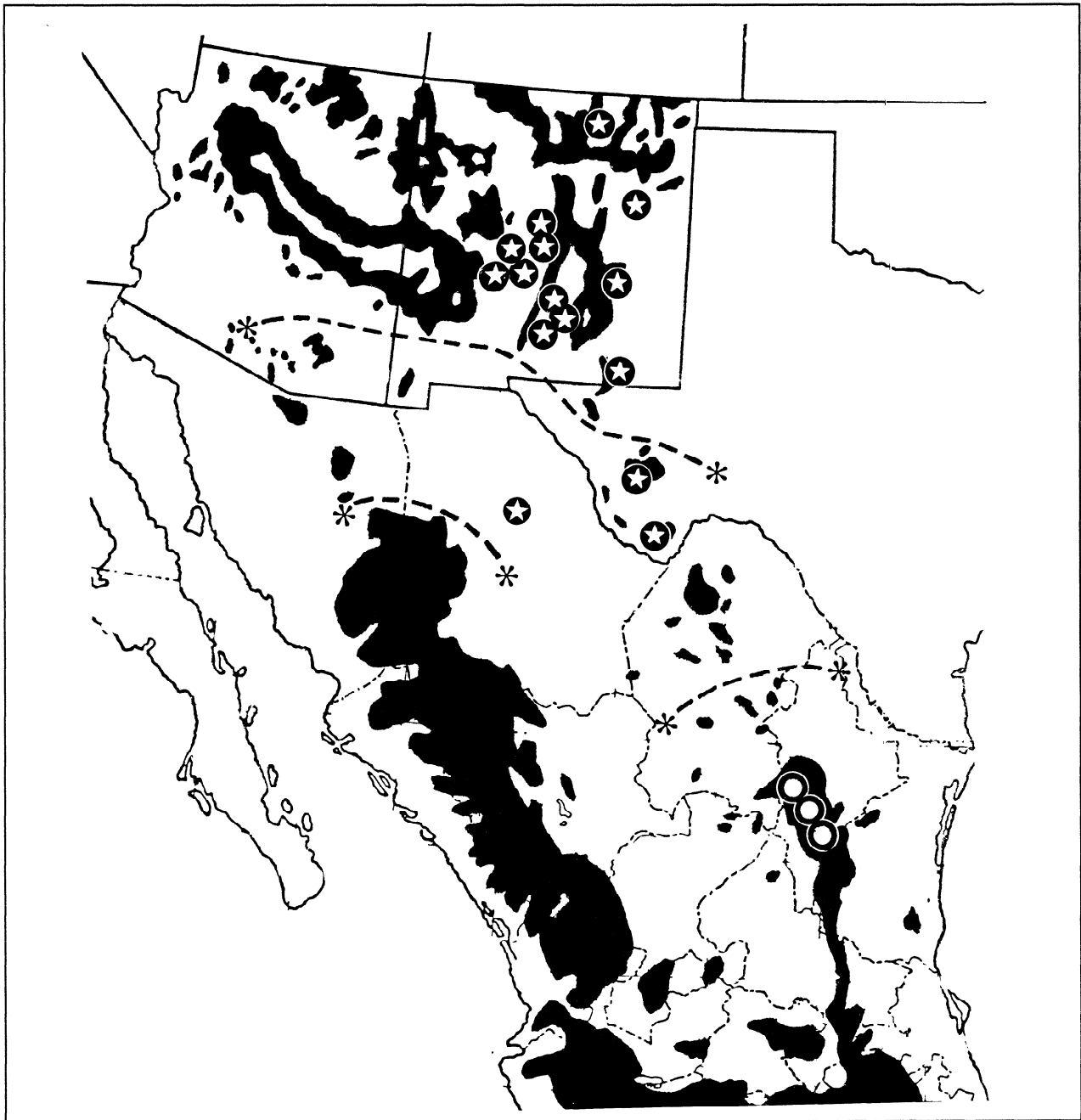


Figure 2. Map of southwest United States and northern Mexico illustrating distribution of *S. macfarlandi macfarlandi* (stars) and *S. macfarlandi madreoriente* (open circles). Data summarizes localities in literature cited, specimens in the AMNH, and "Season's Summary" published yearly by The Lepidopterists' Society. Stars indicating the range of *S. m. macfarlandi* often represent multiple closely proximate collecting localities. Black shading shows montane areas as defined by Martin and Meh-ringer (1965), Mayer (1979) and Van Devender and Spaulding (1979) as noted in text and in Mexico indicates areas including elevations exceeding 2500 m. for land extending south of study areas of above authors. Dashed lines marked with asterisks show boundary of biogeographical region defined for southwestern United States and northern Mexico disjunct montane vegetation elements according to Van Devender and Spaulding (1979). Areas north of this region comprise the Colorado Plateau and southward the Sierra Madre Occidentale (left) and Sierra Madre Oriente (right) as noted in the text. The map is extended southward to include the central Mexican juncture of these two mountain ranges.

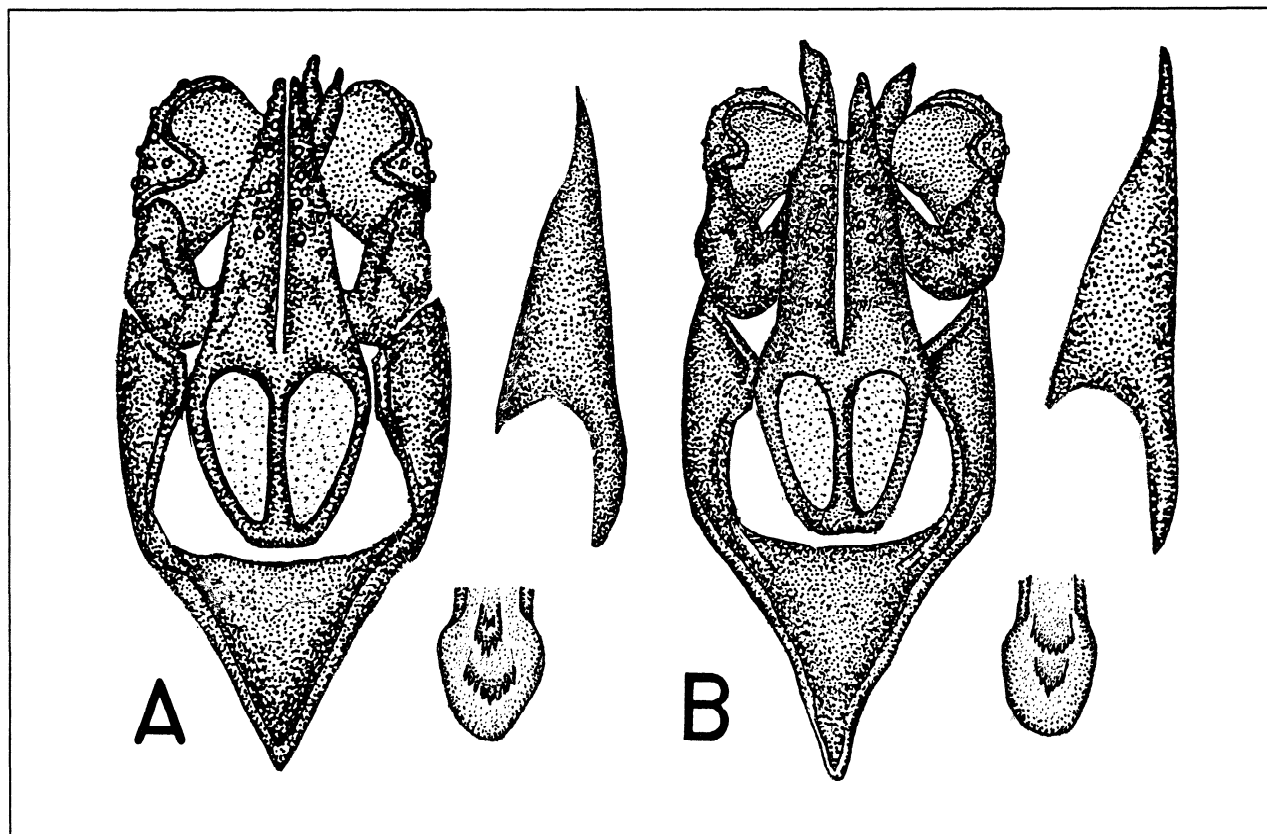


Figure 3. Genitalia, holotype males of *S. macfarlandi macfarlandi* (A) and *S. macfarlandi madreoriente* (B). Display format: left, ventral view, genitalia with aedeagus removed; right, lateral view, valvae; below, between, terminus of aedeagus.

patch prominent distad in discal cell, slightly darker than rest of wing. No tail on hindwing; anal lobe blackish, fringe lighter to white. **Under surface of the wings:** forewing ground color brown basad subapical area; apex and subapex green. Hindwing ground color mostly brown basad, overcast with green and then more markedly yellow-green distad; postdiscal line flat to mildly arched across entire wing, suffused slightly brown basad, black centrad, white distad. Limbal area brownish, heavily overlaid with green; devoid of markings except for occasional slight black slashes barely separated, if at all, distad from the mesial line in cell M_2 to the costa. Thin but bright white marginal line bordered distad by a companion blackish line followed by whitish wing fringe. Length of forewing: 14.0 mm. (holotype), 13.0 mm. (each of two paratype males). **Female:** presently unknown but assumed to be similar to male (but lacking forewing androconia) as in *S. m. macfarlandi*. **Male Genitalia.** Fig. 3B. Similar to *S. m. macfarlandi* (Fig. 3A) differing only in having a slightly longer saccus and more irregular caudad tapering of the valvae.

Types. Holotype, male, Coahuila State, Mexico, Hwy. 57, 17 mi. SE Saltillo, 2,270 m. altitude, 29 April 1978, leg. William W. and Nadine M. McGuire, deposited CMNH. Paratypes. AMNH: Nuevo Leon State, Mexico, off Hwy. 57, 5 km. E. El Potosi, altitude not noted, 14 May 1984, leg. L. Ramos-Lopez (one male); David Matusik Collection (Skokic, Illinois): Nuevo Leon State, Mexico, off Hwy. 57 near San Jose de Raices, altitude not noted, 14 May 1984, leg. and gender ditto.

Distribution. Presently known from the northern tip of the Sierra Madre Oriente in extreme southeastern Saltillo State and northern Nuevo Leon State. Anticipated to be distributed southward, this area being poorly sampled by lepidopterists.

Remarks. I have viewed large series of *S. m. macfarlandi*, most recently in the AMNH and CMNH. Variation in the wing characters of the nominate occurs mostly in the shape of the undersurface hindwing mesial line and the degree of associated limbal markings. The most profusely marked specimens (comprising some 78 per cent of 126 specimens recorded by me) exhibit notable wavi-

ness to the mesial line and limbal markings generally like those of the type. Of this 78 per cent, 27 per cent exhibit markings variously more profuse than the type, including extremes with very large limbal spots from the anal area to the costa and some with iridescent highlights distad these. A smaller number, 13 per cent outside the 78 per cent mentioned above, exhibit mesial line and limbal markings more reduced than the type. These reductions include limitation of the waviness of the mesial line, and reduction of any limbal markings. The remaining 9 per cent include specimens approaching the reduction characteristic of *S. m. madreoriente* and it is noteworthy that these include Texas specimens viewed by me. However, none of the above exhibits lack of the postmedian band on the forewing underface. Any tendency toward reduction of this band in the nominate appears to be limited to slight reduction.

In regard to the subspecific status of *S. m. madreoriente* it is significant that *S. m. macfarlandi* from north central Chihuahua (Ferris, 1981) exhibits an emphatic undersurface postmedian line on the forewing and on the hindwing a distinctly wavy median band with marked spotting distad. These characters are typical of the 27 per cent of nominate *S. macfarlandi* cited previously which are more profusely marked than the type.

I have conformed the name "*macfarlandi*" [sic] (Ehrlich and Clench, 1960) to *macfarlandi* according to Recommendation D. III. 21. (a). of the International Code of Zoological Nomenclature (1985 edition).

Etymology. The name is derived from the area of distribution.

Acknowledgments

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Literature Cited

Ehrlich, P. R. and H. K. Clench.

- 1960. A new subgenus and species of *Callophrys* (*s.l.*) from the southwestern United States. (Lepid. : Lycaenidae). Ent. News 71: 137-141. Ferris, C. D.
- 1981. Field notes on four western hairstreaks (Lycaenidae: Theclinae). J. Lepid. Soc. 35: 325-330.

Holland, R.

- 1974. Butterflies of six central New Mexico mountains with notes on *Callophrys* (*Sandia*) *macfarlandi* (Lycaenidae). J. Lepid. Soc. 28: 38-52.

Johnson, K.

- (in press). Revision of the Callophryina of the world with phylogenetic and biogeographic analyses. ms. [in part] at Ph.D. dissertation, Graduate Center, City University of New York, 1981. 902 p.

McFarland, N.

- 1965. Observations on *Callophrys macfarlandi* (Lycaenidae) in the Sandia Mountains, New Mexico. J. Lepid. Soc. 19: 177-179.

Martin, P. S., and P. J. Mehringer.

- 1965. Pleistocene pollen analysis and biogeography of the Southwest. p. 433-451 in Wright, W. E., and D. G. Freys, eds. The Quaternary of the United States. Princeton Univ. Press, Princeton, New Jersey, x + 922 p.

Mayer, L.

- 1979. Evolution of the Mogollon Rim in central Arizona. Tectonophysics 61: 49-62.

Stallings, D.B., J. R. Turner, and P. R. Ehrlich.

- 1962. Preliminary notes on the life history of *Callophrys* (*Sandia*) *macfarlandi*. J. Lepid. Soc. 16: 55-57.

Van Devender, T. R., and W. G. Spaulding.

- 1979. Development of vegetation and climate in the southwestern United States. Science 204: 701-710.