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A REVIEW OF THE GENUS *HYPOSTRYMON* (LEPIDOPTERA: LYCAENIDAE)

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The genus *Hypostrymon* is unusual among butterflies in being confined entirely to the western coastal regions of Mexico. It consists of only three known species, but two of these are new and all are poorly represented in collections.

For the loan of additional specimens used in this study I am grateful to Dr. Lee D. Miller, Allyn Museum of Entomology, Sarasota, Florida (AME), and to Dr. Frederick H. Rindge, American Museum of Natural History, New York (AMNH). Specimens in Carnegie Museum are indicated by the abbreviation CM.

Hypostrymon Clench

Clench 1961, in Ehrlich & Ehrlich, *How to know the butterflies*: 214; Cowan 1970, Annot. Rhop. 1970: 11.

Type species: *Thecla critola* Hewitson 1874.

Because my original description of the genus was so brief I give herewith an expanded description:

Eyes sparsely hairy, the hairs rather short. Frons with suberect, declivent, sparsely bristly scaling, excavated mesially in an elongate depression so that the scaling appears in two longitudinal ridges meeting ventrally; the excavation continues dorsad between the antennal bases, where the vestiture is more hair-like, more erect, and the depression quite narrow, ending just posterior to the antennae; dorsal vestiture long, forward-directed, arching up over the chaetosemata and the dorsal end of the depression. Antennae with shaft white-ringed, slender, and a rather abruptly incrassate club; longest shaft segments about as long as three club segments; nudum of club covers the terminal 4 (rarely 5) segments completely, the next 7 to 12 (usually 10) proximal segments only ventrally, the breadth of the nudum decreasing regularly proximad, occasionally continuing as an isolated small spot or two but otherwise with no unscaled patches on the shaft segments. Palpi of normal shape and size, third segment with subappressed vestiture, second with vestiture suberect ventrally and sparsely bristly.

Fore wing with M_2 arising midway between M_1 and M_3 ; male usually with a scent patch centered on the cell-end, but no scent pad. Hind wing with a rather prominent tornal lobe, no tornal cleft, two cubital tails, the longer at Cu_2 as usual.

Male genitalia (Fig. 1). Uncus lobes elongate, lateral edges short, the lobes

strongly arched proximally, separated by a more or less marked median notch; falces ovately curved, rounded, stout; vinculum broad dorsally, narrower ventrally, with a slight anterior angulation but no anterior process; posterior border with no definite shoulder process; vinculum strut diagonal relative to vinculum, joining the thickened anterior border at the angulation. Saccus 1.5 to 2 times as long as breadth at middle, rimmed by a sharply demarcated, thickened border, terminally bluntly rounded. Valvae short, proximally contiguous but not fused, distally becoming widely divergent and recurved. Penis about 4.5 times as long as valvae, sinuate, with a down-bow just beyond middle, not apically flared or upturned and without a terminal ventral keel; cornutus apparently single and well within the shaft, apparently apically broadened and truncate but so lightly sclerotized that it is not always visible or of determinable shape.

Limited male genitalic dissection (2 *adceres*, 2 *critola* and 1 *margaretæ*) suggests a few slight differences among the three species in the configuration of the saccus and adjacent areas. In *critola* the anterior border of the saccus has a wide, thickened edge, this thickening sinuous and connecting across the vinculum on either side to the lateral thickened border. This thickening is absent, or thin, faint and midventral only (1 *adceres*) in the other two species. In *adceres* the saccus itself is relatively more slender than in the other two. In both *adceres* and *margaretæ* the distal end of the saccus has a small, rounded, projecting tooth on either side, absent in *critola*. Whether these differences, slight at best, will hold true in longer series remains to be determined.

Remarks. The genus appears to stand closest to *Electrostrymon* Clench, but the relationship is not certain, nor is it at all close. Among the many differences: *Electrostrymon* has no scent patch; has simple (not complexly recurved) valvae; has an apically upcurved penis with an acuminate, well-sclerotized cornutus within.

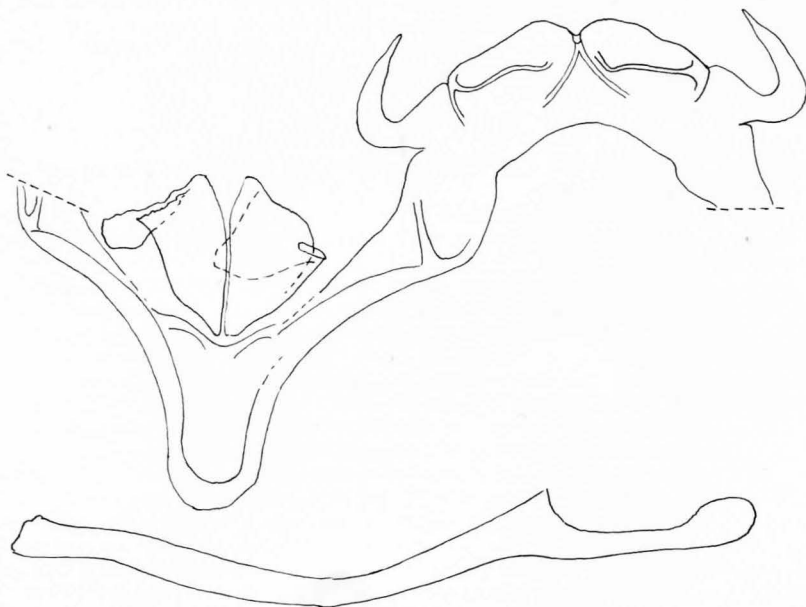


Fig. 1. Male genitalia of *Hypostrymon critola festata* Weeks. Slide C-981, Bahía de Palmas, Baja California Sur, 20.xi.1961.

Key to males of *Hypostrymon*

- 1 a. Upperside of forewing with a large velvety black, discal scent patch centered on cell-end 2
 b. No such scent patch; in its place the purple ground color is slightly darker *margaretæ* n. sp.
 2 a. Underside of fore wing below Cu_2 with a broad, dark, purplish-iridescent patch *aderces* n. sp.
 b. No such patch *critola* Hew.

The interrelationship of the three species here ascribed to *Hypostrymon* is debatable. All three are genitally nearly inseparable (see above) and mutually allopatric (Fig. 2), conditions which suggest that they are merely subspecies within a single collective species. On the other hand: (1) the differences separating them are of a kind more often associated with species than with subspecies; (2) the geographically intermediate entity, *margaretæ*, is not intermediate in its pattern characters (one of the geographic extremes, *aderces*, more nearly occupies that position); (3) *critola* has a minor subspecies in Baja California and the differences separating the two subspecies are of a conventional nature; (4) *critola* and *margaretæ* occupy different climatic and vegetation regions (to what extent *aderces* may differ in these respects is not yet known).

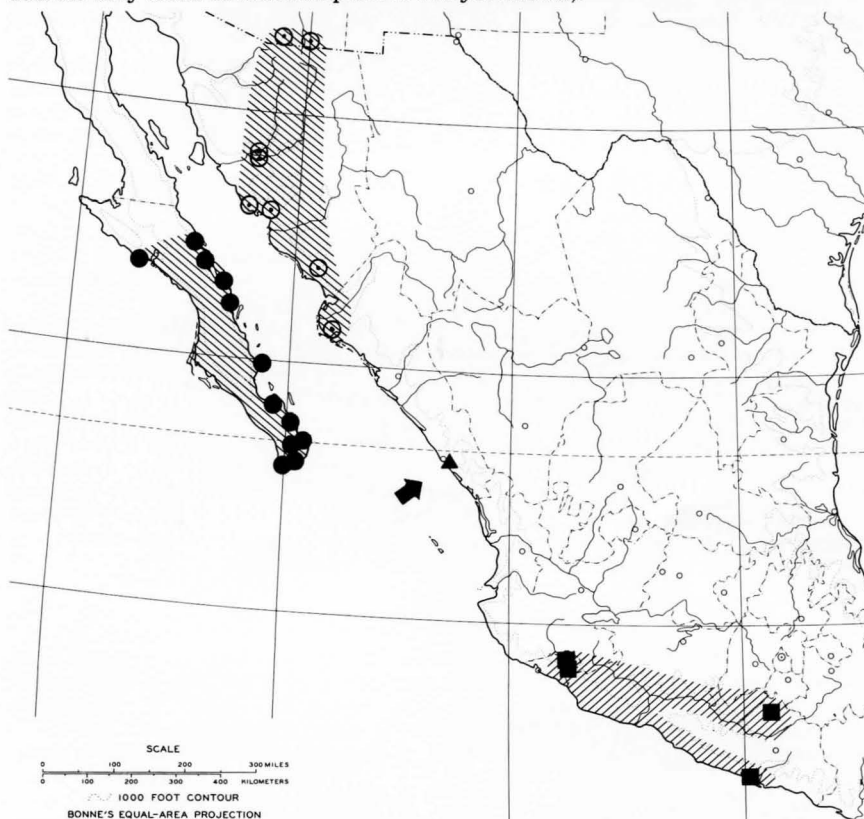


Fig. 2. Known distribution of *Hypostrymon*. Circles, and hatching descending to right, *H. critola* (open circles, ssp. *critola*; solid circles, ssp. *festata*); triangle, *H. margaretæ*; solid squares, and hatching ascending to right, *H. aderces*.

These points individually are merely suggestive, but collectively they make it more likely that the three entities are actually different, though admittedly closely allied, species. It is a situation that would benefit from additional material, particularly from geographically intermediate regions.

***Hypostrymon critola critola* Hewitson**

Thecla critola Hewitson 1874, Ent. Mo. Mag. 11: 105 (type locality: Mexico); *ibid.* 1877, Ill. D. Lep. Lycaenidae: 197, pl. 78 figs. 633, 634; Godman & Salvin 1887, Biol. Centr. Amer., Lep. Rhop. 2: 72; Dyar 1904, J. New York Ent. Soc. 12: 39 (Patagonia Mts., Arizona, new for the United States); Draudt 1920, in Seitz, Grossschmett. Erde 5: 794, pl. 157 i; Comstock & Huntington 1959, J. New York Ent. Soc. 67: 196.

Hypostrymon critola: Clench 1961, in Ehrlich & Ehrlich, *How to know the Butterflies*: 214, fig. 408.

Hypostrymon critola critola: Clench 1967, J. Lepid. Soc. 21: 183 (type locality designated: Guaymas, Sonora, Mexico).

Locality records:

ARIZONA. Huachuca Mts., v, *leg.* Osler; Patagonia Mts., 19-20.v.1903 (both CM); Patagonia Mts., iv, v, *leg.* Osler, and 3-12.v.1923 [collector?], *ex coll.* O. Buchholz (preceding all AMNH).

SONORA. Guaymas, 24.iii.1937, *leg.* F. H. Rindge; between Hermosillo and Magdalena, 25.iii.1937, *leg.* F. H. Rindge (all AMNH); Guaymas (British Museum, cf. Clench 1967); 12 mi S Hermosillo, 20.x.1961; 16 mi S Guaymas, 21.x.1961, all *leg.* Cary - Carn. Mus. Exp. (CM); 6 mi E Navojoa, 26.vii.1971, *leg.* P. Hubbell (CM).

SINALOA. 10 mi SE Los Mochis, 23.x.1961, *leg.* Cary - Carn. Mus. Exp. (CM).

In our experience on the Cary - Carnegie Museum Expedition, nominate *critola* was by no means as common as its Baja California subspecies, *festata*. It flies in desert scrub and coastal halophilous heath, often within a few dozen feet of the sea. From available dates it would seem to fly all year.

The material at hand, though limited, shows some evidence of seasonal dimorphism. Summer individuals have, on the hind wing underside, no cross-striations; larger orange cap on the *Thecla* spot; and somewhat brighter orange in the pm line. Winter specimens have the cross-striation variable (absent to fairly strong), the orange cap of the *Thecla* spot smaller (only slightly so in October specimens; extremely so—even absent—in March specimens, in which the black core spot is also strongly reduced), the orange of the pm line duller and even entirely changed to fuscous. In some of the March specimens the ground is also darkened in a broad band just basad of the pm line and contiguous with it. These differences apply equally to both sexes. In males only, the ground color above seems to be slightly darker purple in summer than in winter specimens.

***Hypostrymon critola festata* Weeks**

Hypolycaena festata Weeks 1891, Ent. News 2: 102 (type locality: near sea level, San José del Cabo [Baja California Sur]); *ibid.* 1905, Ill. Diurn. Lep. [vol. 1]: 1, pl. 1 figs. 1, 2; Comstock & Huntington 1960, J. New York Ent. Soc. 68: 108.

Strymon festata: Rindge 1948, Proc. California Acad. Sci. 24: 302.

Hypostrymon critola festata: Clench 1967, J. Lepid. Soc. 21: 183-184.

Locality records:

BAJA CALIFORNIA SUR. 14 mi S Santa Rosalía; La Paz and vic.; Rancho El Novillo; Rancho Vinoramas; Rancho Ensenada de Palmas; Bahía de Palmas; road 3 km S Rancho Buenavista; Boca de la Sierra; Arroyo San Bernardo; San José

del Cabo; Puerto Chileno; Cabo San Lucas; 4 mi S Arroyo Candelaria; Rancho Palmarito; the preceding all between 23.x and 5.xii.1961, *leg.* Cary - Carnegie Mus. Exp. (CM). In all 150♂, 76♀. Additional localities are listed by Rindge (1948), from Punta Abreojos and Bahía de la Concepción south to Cabo San Lucas.

This subspecies occupies about the southern third of the peninsula of Baja California. Except for the region south of La Paz, however, it seems to be uncommon on the western side, and most of the records are along the eastern coast.

The peninsular subspecies is only weakly differentiated from the nominate mainland form. It averages slightly larger; males above have the purple slightly bluer, in some specimens markedly so; the large black scent patch fails to reach Cu_2 in a considerable proportion of the specimens, whereas on the mainland it nearly always does so; females have the dull steel blue above slightly brighter and a little more extensive. On the underside I can see no differences: both the peninsular and the mainland subspecies are highly variable in the amount and development of the fine cross-strigulations, from dense and strong to completely absent. Some of this variability may be seasonal, as noted below.

Most of the places where we took *festata* were on or very near the coast, usually within sight of the sea. In the few inland localities where we found it (such as Boca de la Sierra or Rancho Vinoramas) it was uncommon. Coastal specimens were associated with a halophilous shrub, possibly a larval foodplant and tentatively identified as *Maytenus phyllanthoides* Benth (Celastraceae). It grows just back of the beach in some localities, usually where the seaward slope is slight. The shrub, which we soon dubbed "critola bush," forms dense, impenetrable clumps from four to ten or more feet across and about six to eight feet in height. The branches of the shrub are gnarled but, unusual in this desert region, without spines. Its nearly circular leaves are about three quarters of an inch across and dead ones often persist on the branches, turning first yellow then a silvery gray. *H. c. festata* perched on the outer branches of this shrub and its resemblance to these gray, dead leaves was striking. A large series from the southeastern shore of La Paz Harbor (93♂, 39♀) was from just such an environment. On our northward trip from La Paz to Tijuana we found *festata* just south of Santa Rosalía, again in association with this same shrub.

As with the mainland subspecies, *festata* appears to fly all year, and may be similarly seasonally variable. Available specimens were all taken from late October through early December, most of them in November, so there is no opportunity to compare material from different seasons directly. In the specimens at hand, however, there is a whole gamut of variation from those with characters like summer specimens of nominate *critola* to those with characters like winter specimens. Similar variation in seasonally sensitive traits has been noted in long series of *Ministrymon leda* Edwards taken in southern Baja California at the same time as the *festata*. Apparently winter temperatures in the southern part of the peninsula hover in the vicinity of the critical value for seasonal pattern changes. The result is a great individual variation among winter specimens in characters whose variation elsewhere is associated with different times of the year. The same is probably true of *H. critola festata*.

***Hypostrymon aderces*, new species**

Thecla critola: Hoffmann 1941, An. Inst. Biol. (Mexico) 11: 715.

Male. Upperside ground color shining purple; fore wing with a large diffuse black scent patch centered on cell-end; terminal fuscous border of fore wing moderately thick (about an interspace width or a little less), thickening apically still more, its inner edge somewhat indefinite (more so than in *critola*, less than in *margaretæ*); border of hind wing similar. Underside: both wings gray-tan, moderately cross striate with fine, short dark lines all over except the tornal third of the hind wing; pm line of fore wing predominantly orange, disjunct and thinning

slightly in the costal area but not noticeably darker and not lost among the cross striae; between Cu_2 and 2A a large, prominent, dark purple-iridescent patch, extending from near base to or beyond level of pm line; subterminal line elements present but faint and diffused. Hind wing: pm line as on fore wing but slightly broader and brighter, distally white-edged, in form and pattern of dislocation as in *critola*; Thecla spot black, capped by a prominent orange lunule somewhat thicker than the core spot; tornal lobe black surmounted by orange.

Length of fore wing: males, 12.0 - 14.5 mm, mean (of 4), 13.1 mm; females, 14.0 - 15.0 mm, mean (of 2), 13.5 mm.

HOLOTYPE, male, Comala, 2100 ft., Colima, Mexico, 23.viii.1967, leg. R. G. Wind. A. C. Allyn Acc. 1968-7. In AME.

PARATYPES, all from Mexico: 2 males, same locality and collector as holotype, 16.xi.1967 (A. C. Allyn Acc. 1968-7), 6.xi.1967 (A. C. Allyn Acc. 1971-22); 1♂, La Salada, 1000 ft., Colima, 15.v.1967, leg. R. G. Wind (A. C. Allyn Acc. 1971-22); 1♀, 4 mi W Chapultepec, sea level, Guerrero, 1.ix.1967, leg. L. D. Miller & R. Pine (sta. 18, coastal desert scrub); the preceding all in AME. 1♂, Acapulco, Guerrero, no date, ex coll. C. C. Hoffmann (cat. no. 1442), in AMNH. 1♂ 1♀, "Southern Mexico" [possibly either Colima or Guerrero], leg. C. H. T. Townsend, ex coll. W. J. Holland; 1♀, Colima, Colima, no date or collector, ex coll. Acad. Nat. Sci., Philadelphia; the preceding three all C. M. Ent. type series no. 676.

Remarks. In addition to the type series I have seen the following specimen: 1♂, Iguala, Guerrero, Mexico, viii.1932, leg. C. C. Hoffmann, ex coll. C. C. Hoffmann (AMNH). This male differs from the others in its decidedly blue (not purple) ground color above, somewhat smaller scent patch above and, on the underside, by the reduction of the normally black core spot of the Thecla spot to gray and by the reduction of all orange color (pm line, Thecla spot, etc.) to gray. If these differences should prove constant then a distinctive subspecies would seem to occur in this inland locality, part of the arid valley of the Rio Balsas. They are closely matched, however, by the seasonal differences suggested above for nominate *critola*, and the La Salada paratype, further, shares most of them.

H. adersces differs from *critola* in the male by the thicker terminal border of both wings above and by the presence of a large, dark, iridescent purple patch in Cu_2 -2A of the fore wing below; and in the female possibly by the more restricted blue of both wings above (although the Guerrero female is almost like *critola* in this respect). From *margaretæ* (male only) it differs in the presence of the large black scent patch on the fore wing above; in the somewhat thinner terminal border of both wings above; and in the prominence of the Cu_2 -2A dark iridescent patch on the fore wing below, which is much fainter in *margaretæ*.

The habitat note, "coastal desert scrub," on the Guerrero paratype is the only environmental information at present available for this species. It sounds rather similar to the habitat of *margaretæ*, or perhaps intermediate between those of *margaretæ* and *critola*.

Hypostrymon margaretæ, new species

Male. Upperside ground color dark lustrous purple, darkening slightly in the vicinity of the cell-end; terminal fuscous border of fore wing thick (about 1 1/2 interspace widths), thickening apically still more, the proximal edge diffuse; border of hind wing similar. Underside: both wings gray-tan, strongly cross striate with fine, short, dark lines all over except in tornal third of hind wing; pm line of fore wing orange, becoming thinner, darker and disjunct costad, almost lost among the cross striae; between Cu_2 and 2A, and from near base to about level of pm line, a faint but definite purplish-iridescent patch; subterminal line elements apparently present but exceedingly faint. Hind wing: pm line as on fore wing but visible throughout, distally white-edged, in form and pattern of dislocation as in *critola*; Thecla spot black, capped by a prominent orange lunule as thick as the spot;

tornal lobe black, surmounted by orange.

Length of fore wing: male, 13.5 mm.

HOLOTYPE, male, Urias, 2 mi S Mazatlán, Sinaloa, Mexico, 31.x.1961, leg. Cary - Carnegie Museum Exp., ♂ genitalia slide C-974. C. M. Acc. 20082. C. M. Ent. type series no. 677.

Remarks. *H. margaretae* differs from *critola* (male) in its darker purple color above; in the absence of the black discal scent patch on the fore wing above; in the much thicker, less crisply defined terminal border on both wings above; and in the presence of a faint but definite iridescent patch on the fore wing below, in Cu₂-2A, completely lacking in *critola*. From *aderces* it differs as already noted in the description of that species.

This single specimen was taken at the edge of a dry thorn forest and no others were seen (although looked for): in contrast to the halophilous open desert scrub or heath situations in which we found nominate *critola* farther north, or *critola festata* in Baja California.

This species is named in memory of the late Mrs. Margaret M. Cary, whose generosity made possible the expedition on which the type specimen was found.