

FIRST REPORTED MALES, SPECIES STATUS, AND  
AFFINITIES OF *EPARGYREUS SPANNA*  
EVANS (HESPERIIDAE)

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**ABSTRACT.** Two males of *E. spanna*, an Hispaniolan endemic formerly reported from only two females, were collected in Pedernales Province, Dominican Republic, in 1985. Male genitalia and other characters support species status of *E. spanna* but not its long-supposed affinity to *E. antaeus* Hewitson, endemic to Jamaica, and to *E. zestos* Geyer of trans-Caribbean distribution. Genitally, *E. spanna* resembles *E. windi* Freeman of Mexico, *E. aspina* Evans of Colombia and *E. tmolis* Burmeister of western Argentina. Apparent affinities of *E. spanna* and some other recently described Antillean endemics do not support the island subspecies view of Caribbean biogeography. These taxa evidence most immediate kinship to particular mainland taxa, not most geographically proximate Antillean congeners.

*Epargyreus spanna* Evans (1952) has hitherto been known only from the holotype female (labelled "Santo Domingo" [Dominican Republic (DR)]) in the British Museum (Natural History), and a second female reported by Gali and Schwartz (1983) from west of Jayaco, La Vega Province, DR in the Albert Schwartz collection (Miami, Florida).

Brown and Heineman (1972) suggested that *E. spanna* might represent a subspecies of *E. antaeus* Hewitson. The latter is endemic to Jamaica, and among Antillean *Epargyreus*, shares with *E. spanna* the bright silver-white undersurface stripe on the hindwing. Riley (1975) figured both species, and Gali and Schwartz (1983), on the basis of wing character comparison, considered the two different species, pending examination of *E. spanna* males. Both Evans and Freeman (1969, 1977) emphasized the importance of male genitalic characters in differentiating *Epargyreus* taxa.

In 1985, we collected extensively in the DR and, in Pedernales Province, collected two female and two male *E. spanna*. The precise localities of these collections are: (1) a female of 30 mm forewing length (base to apex) taken between 0930 and 1200 h (EDT) on 30 June 1985 at 1,350 m altitude, Aceitillar, 12 km NW of Las Abejas, Pedernales Province, DR, on a mountain path, in mesic broad-leaf deciduous forest, in sunny weather (in David Matusik Collection [DMC]); (2) a female (not measured) taken at same location at about the same time on 1 July 1985 (in the Museo Nacional de Historia Natural, Santo Domin-

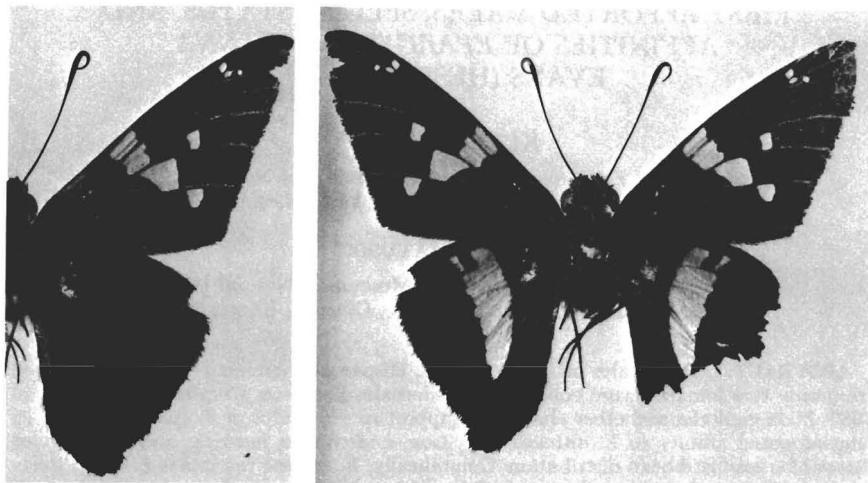


FIG. 1. "Designated allotype" male of *Epargyreus spanna*. Left: upper surface; right: undersurface.

go); (3) a male of 28 mm forewing length taken between 0930 and 1200 h (EDT) on 4 July 1985 at 1,250 m altitude, about 5 km NNW of the locality cited in (1) in mesic broad-leaf deciduous forest, in partly sunny weather (DMC); and (4) a male of 29 mm forewing length taken at the same location at about the same time on 3 July 1985. Both females were collected while flying about 13 cm above the ground in zigzag flight, which alternated with periods of alighting on patches of bare ground usually about 4 m apart. Both males were collected while perched on broad-leaf deciduous foliage about 2.4 m above the ground, between leaf-to-leaf flights. The flight of males between leaves was notably slower than that of the females between patches of bare ground. The dates cited above, along with that of Gali and Schwartz [17 August], indicate the flight period of *E. spanna* to be at least three weeks.

Considering the apparent rarity of *E. spanna*, and for reference purposes, we follow Smith (1983) and designate the last-cited male as "designated allotype". The specimen, marked as such, is in the collection of the American Museum of Natural History (AMNH), and is illustrated here (Fig. 1). The category "designated allotype" has no status according to the International Commission on Zoological Nomenclature Code, but is viewed as having diagnostic utility (Frizzell 1933, Gloyd 1982, Smith 1983).

Collection of the *E. spanna* male enabled examination of its genitalia (Fig. 2). Comparison of the genitalia with other *Epargyreus* taxa available to us in AMNH genitalic material of W. H. Evans and H. A.

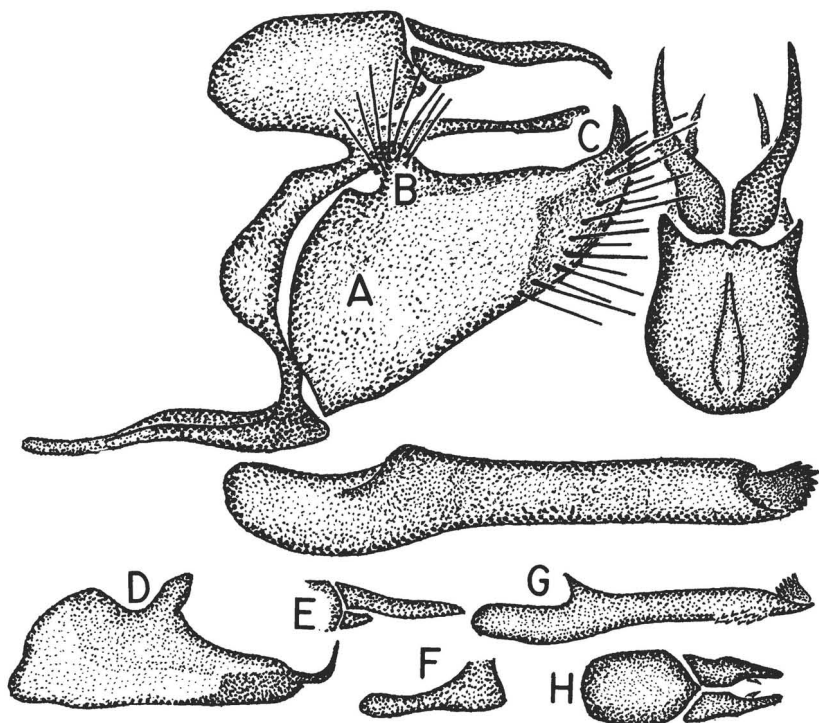


FIG. 2. Male genitalia of *Epargyreus spanna* and *E. antaeus*. Above right: Dorsal view of *E. spanna* uncus and tegumen. Above left: Lateral view of *E. spanna* genitalia with aedeagus removed. A, Broad cephalad area; B, Reduced, cephalad-located dorsal process; C, Broadly thickened terminus with wide-based terminal hook. Immediately beneath: Lateral view of *E. spanna* aedeagus. Bottom: *E. antaeus*. D, Lateral view of valve; E, Lateral view of uncus; F, Lateral view of saccus; G, Lateral view of aedeagus; H, Dorsal view of tegumen and uncus.

Freeman indicates that *E. spanna* is specifically distinct from its congeners. These taxa are *spina* Evans, *aspina* Evans, *antaeus*, *orizaba* Scudder, *exadeus* Hübner, *windi*, *cruza* Evans, *deleoni* Freeman, *spinosa* Evans, *clarus* Cramer, *brodkorbi* Freeman, *zestos*, *tenda* Evans, plus additional taxa studied from figures in Evans (1952). The genitalia do not reflect the close relation claimed for *E. spanna*, *E. antaeus* and *E. zestos* by Brown and Heineman (1972) and Riley (1975). Although *E. spanna* is similar to *E. antaeus* on the wing undersurface, the genitalia of *E. spanna* are most like *E. windi* Freeman (type locality [TL] Ajijic [Jalisco], Mexico) and also similar to *E. aspina* Evans (TL Bogotá, Colombia) and *E. tmolis* Burmeister (TL Buenos Aires, Argentina). Along with *E. spanna*, the above three taxa have on the male valvae a broad cephalad area (Fig. 2, A), a reduced and cephalad located

dorsal process (Fig. 2, B), and a broadly thickened terminus with wide-based terminal hook (Fig. 2, C). *Epargyreus zestos* and *E. antaeus* share more elongate valvae, with centrad located dorsal process, narrow terminus, and thin terminal hook (Fig. 2). *Epargyreus windi* exhibits a large, but centrally limited, silver-white patch on the hindwing under-surface, which might further suggest affinity to *E. spanna*.

The above genitalic similarities do not necessarily override the close sister species relation posited by some for *E. spanna*, *E. antaeus* and *E. zestos*. No one has done a cladistic analysis of *Epargyreus*, but the apparent affinity of genitalic and wing characters summarized above suggests that Antillean *Epargyreus* species exhibit character states rooting them as primitively in phylogenetic diagrams as their mainland congeners. The suggested genitalic affinities of *E. spanna* are remarkable because they suggest phylogenetic and zoogeographic relations contrary to the common practice of associating Antillean endemics as subspecies of various mainland or Greater Antillean taxa (Riley 1975, Clench 1965). If the latter were true, one would expect the wing character affinities for *E. spanna*, *E. antaeus*, and *E. zestos* to be closely supported by characters of the genitalia.

Johnson and Matusik (1986) noted a similar situation in the genitalic characters of a new, apparently endemic Hispaniolan *Tmolus* (Lycaenidae). This species does not resemble its most geographically proximate Antillean or mainland congener. Steven Steinhauser [Allyn Museum of Entomology] (pers. comm.) concurs regarding the genitalic characters of *Astraptus christyi* Sharpe of Hispaniola. *Astraptus christyi* has long been treated as a subspecies *A. xagua* Lucas (Riley 1975), even though it differs from that taxon in characters of the wing. Genitalic examination of *A. christyi* indicates species status and affinities not simply reducible to sympatric *E. xagua*. Schwartz and Miller (1985), in describing a new endemic Hispaniolan *Strymon*, demonstrate other affinities than might be presupposed from the most geographically proximate congener. We recently collected in Hispaniola an undescribed species of *Nesiostrymon* which cannot be regarded as *N. celida aibinito* Comstock & Huntington of Hispaniola, or of the *N. celida* Lucas complex now divided into island subspecies. The practice of placing Antillean populations of butterflies as subspecies of other, more common Antillean or mainland species seems to have resulted from certain zoogeographic assumptions. Many authors believed that Antillean butterfly distributions represent results of recent (Pleistocene and post-Pleistocene) waif dispersal (Comstock & Huntington 1943, Clench 1965). Such assumptions have been strengthened by limiting comparisons to wing patterns and interpreting differences in these as "variation" without reference to structural characters.

In zoogeography there is currently an increased appreciation of the possible correlation of late Mesozoic and Cretaceous plate tectonic splitting, and allopatric speciation of biological populations now representing various areas of endemism (Rosen 1975). This view predicts Antillean endemics may exhibit arrays of characters as primitive as any of their mainland counterparts. It is apparent that the affinities of *E. spanna* do not support the simplistic island subspecies view of Caribbean biogeography. We expect that future cladistic analyses of *Epargyreus* and other butterfly groups will suggest the early origin of many endemic Antillean taxa.

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