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A NEW SPECIES OF *GIGANTOFALCA* FROM ARGENTINA (LYCAENIDAE)

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ABSTRACT. Striking structural characters diagnostic for the hairstreak genus *Gigantofalca* are illustrated through a comparison of ***G. calilegua,*** n. sp., (northern Argentine tropical forest), to a superficially similar, sympatric noncongener *Calystryma phryne*. *Gigantofalca* species, unique in morphological characters of both sexes, show little external sexual dimorphism and are most often mistaken for large females of *Calystryma*. *Gigantofalca* currently contains three described species whose combined distribution suggests members might occur throughout tropical forest regions of South America. Hairstreak butterflies show remarkable diversity and endemism in Andean tropical forest remnants south of the Tropic of Capricorn.

Additional key words: Temperate South America, austral South America, neotropics, endemism, refugia.

Of the twenty genera of Eumaeini treated by Johnson (1991) in the large "*Calycopis/Calystryma* grade," species of *Gigantofalca* (Johnson 1991:16) possess the most striking morphological structures, including unique sculpturing of the genital apparatus and terminal tergites into unusual (sometimes asymmetrical) configurations. However, aside from their relatively large size (forewing alar expanse up to 15 mm) and brown dorsal wing color in both sexes (some *Calycopis/Calystryma* grade show blue), little distinguishes *Gigantofalca* species externally from other sympatric and synchronic members of the grade, particularly brown *Calystryma*.

Specimens of *Gigantofalca* appear to have been overlooked because of initial misdetermination of gender, a problem also reported by Bálint (1993) in Neotropical polyommatine lycaenids. The discovery of the two previously described species, *G. stacya* Johnson (Amazon basin, Brazil) and *G. duida* Johnson (Duida Plateau, Venezuela) (Johnson 1991), resulted simply from random dissections of brown *Calystryma*-like individuals during museum based research.

The recent capture of a new *Gigantofalca* species in Parque Nacional Calilegua of northern Argentina is important for several reasons: 1) generic characters of *Gigantofalca* are re-emphasized by the discovery of a southern Neotropical congener; 2) typical of *Gigantofalca* elsewhere, the new Argentine species is sympatric with a common noncongeneric "look-alike" (in this case *Calystryma phryne* Johnson, Eisele & MacPherson) and distinction of these taxa may facilitate recognition of *Gigantofalca* elsewhere; 3) diversity and endemism in tropical Lepidoptera near the temperate latitudes of the Neotropical Realm have

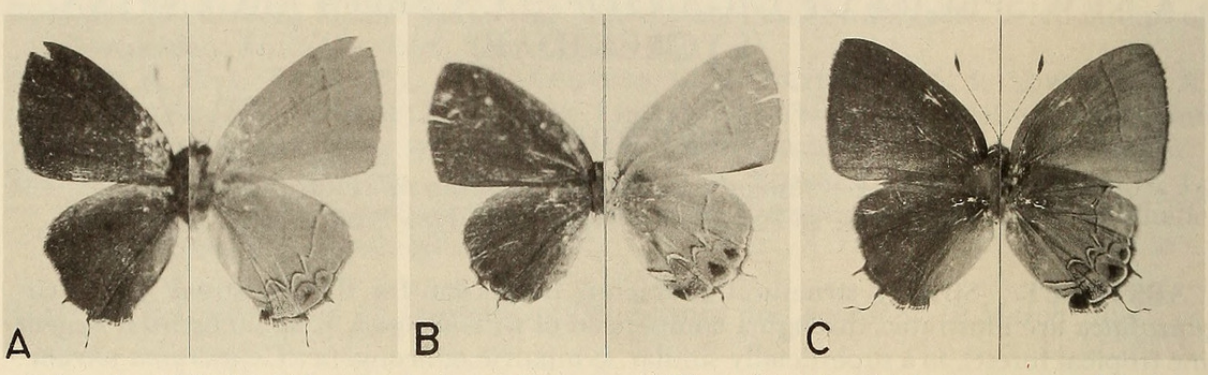


FIG. 1. Side by side comparison of upper (left) and under (right) surfaces of *Gigantofalca calilegua* holotype male (A), and *Calystryma phryne* holotype male (B) and recently collected female (C), same data as *C. calilegua* holotype.

not been widely recognized by biologists as Neotropical "refugia" or "centers of endemism."

Taxonomic Descriptions

Terminology follows Johnson (1991): DFW/DFW = dorsal fore- and hindwings; VFW/VHW = ventral fore- and hindwings; band(s) (the VFW, VHW tripartite band(s) basally colored, distally black and white) are referred to by basal color only. Geographic terms enclosed in quotation marks follow Encyclopedia Britannica (1972).

Subfamily Theclinae
Tribe Eumaeini (sensu Eliot 1973)
Infratribe Calycopina (sensu Johnson & Kroenlein 1993b)
Genus *GIGANTOFALCA* Johnson 1991:16, figs. 8, 33–35

Diagnosis. Externally similar to myriad Neotropical taxa that are brown above and brown beneath and have a pronounced W-shaped element in anal area of the VHW disjunct from the rest of band at cell M3 (Fig 1). *Generic Characters* (Fig. 2): Terminal abdominal segments of males and females elaborately sculptured in tergum and sternum. Male genitalia with falces elaborately sculptured and as large or larger than valvae; valvae with highly sculptured terminoventral components, including elements additional to the paired valval lobes typical of the tribe. Female genital plate greatly sculptured and terminolaterally spinescent (elongate pronglike elements asymmetrical in all known species).

Sympatric Noncongeners (based on *Calystryma*, Fig 4.): Terminal abdominal modification limited to an angulate plate along the tergite dorsum (AB, a); male genitalia with simple arched falces (shorter than valvae) (CD, g); valvae, labibes, and saccus of generally even contour and tapered shape (h). Female genitalia with elements of genital plate

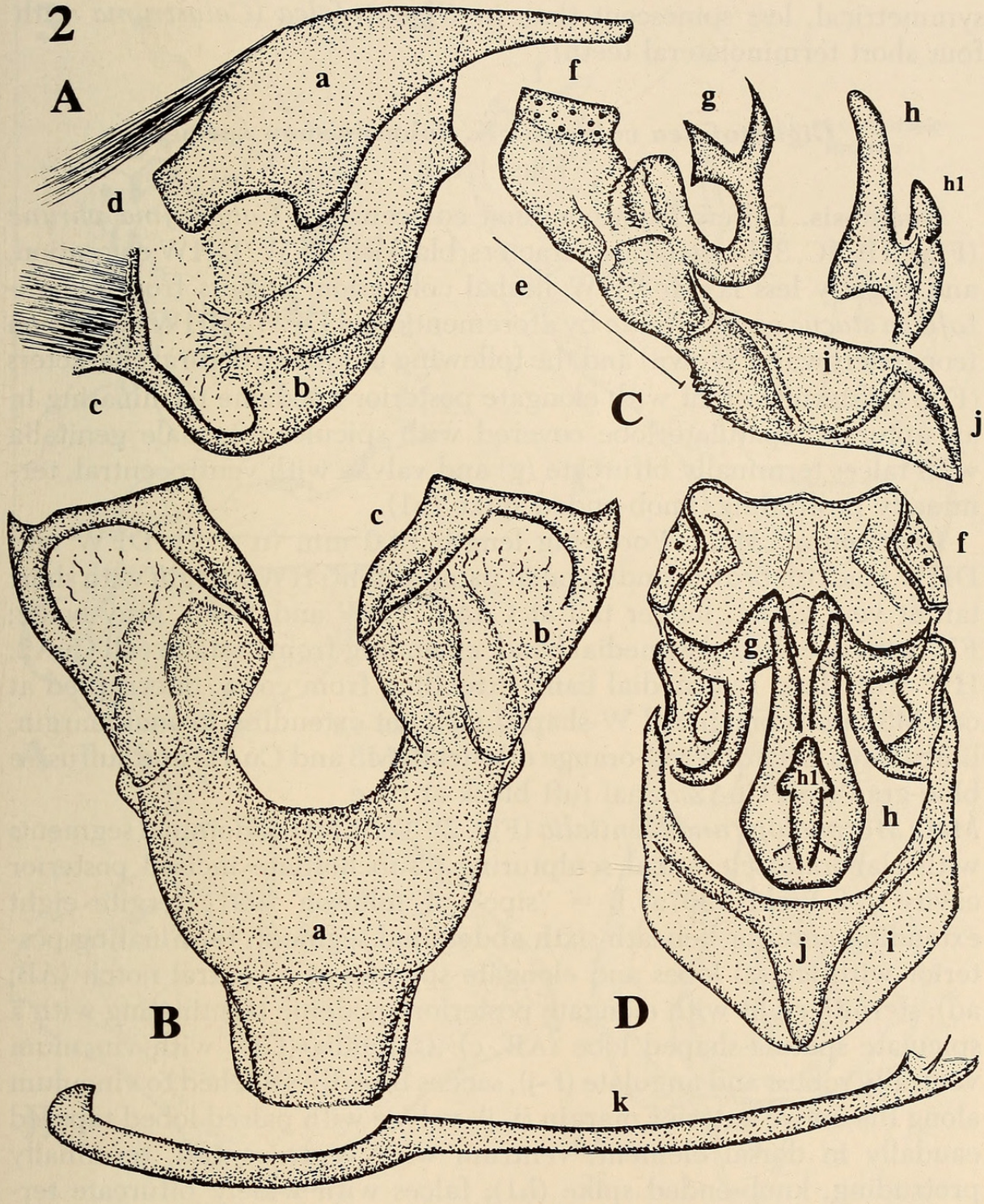


FIG. 2. Morphology of *Gigantofalca* exemplified by *G. calilegua* (lettered for cross reference to *Calystryma phryne*, Fig. 4). A, Tergal/sternal structures, lateral view; B, Tergal/sternal structures, dorsal view; C, Genitalia, lateral view; D, Genitalia, ventral view. Small case a–k, cross reference notations, **bold** indicating elements of generic character for *Gigantofalca*. a, Modified terminal tergite (d, spicules [shown only in A]); **b,** Modified terminal sternite (**c,** apodemial lobe and spicules [latter shown only in A]); e, Length and attachment (cross-line) of brush organs; f, Labibes; **g,** Falces; **h,** Valvae (h1, knob-ended spike, an "additional component" in this species, *sensu* Eliot 1973); i, Vinculum; j, Saccus; k, Aedeagus, lateral view.

symmetrical, less spinescent than in *Gigantofalca* (*Calystryma* with four short terminolateral teeth).

Gigantofalca calilegua K. Johnson, new species
Figs. 1A, 2

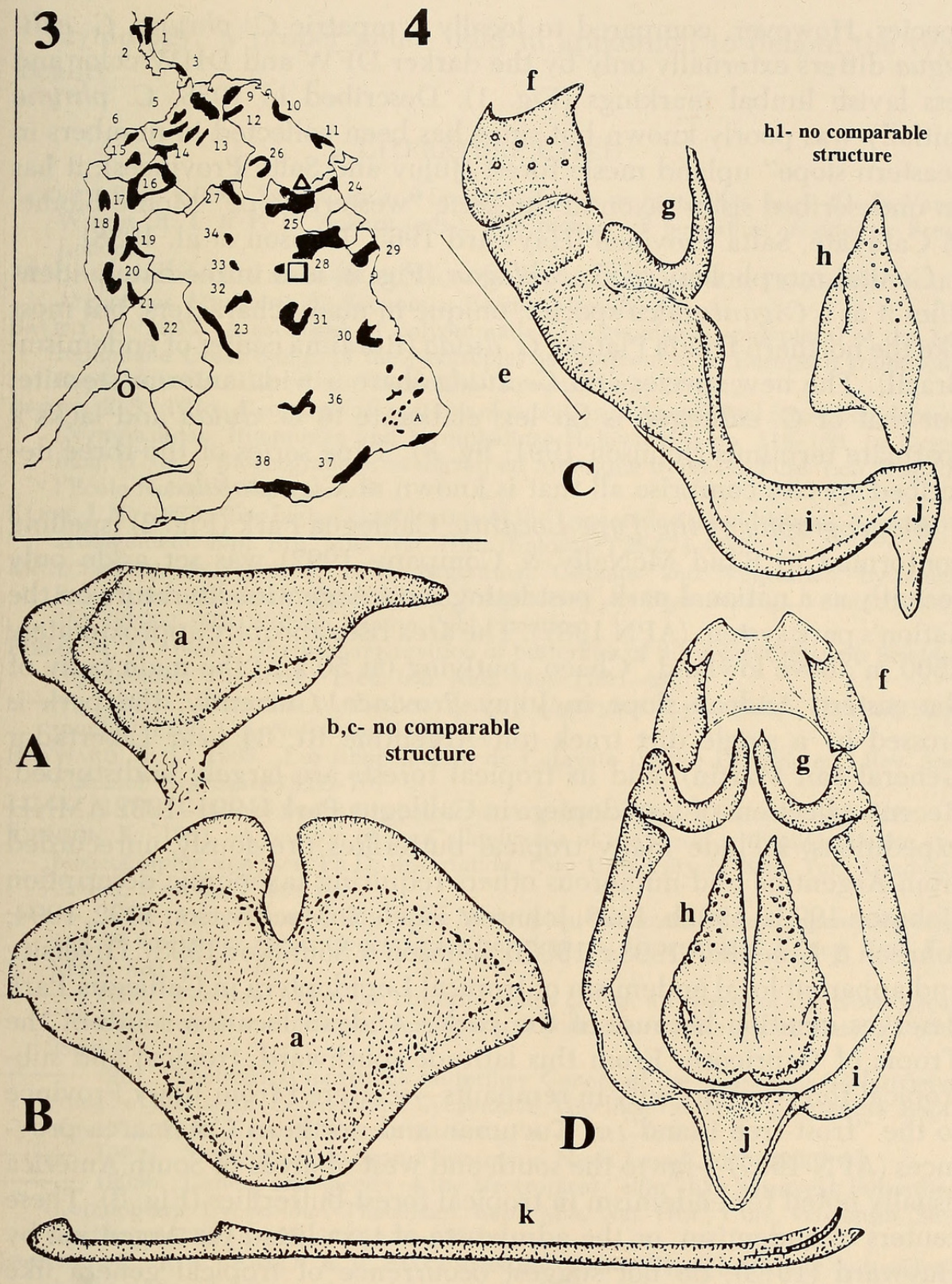
Diagnosis. Differs from common co-occurring *Calystryma phryne* (Figs. 1B, 1C, 3) by generic characters, blackish DFW/DHW coloration, and slightly less lavish VHW limbal coloration. Differs from *Gigantofalca stacya* and *G. duida* by aforementioned DFW/DHW coloration (congeners warm brown) and the following unique structural characters (Fig. 2): sternite eight with elongate posterior apodeme terminating in an upturned spatulate lobe covered with spicules (c); male genitalia with falces terminally bifurcate (g) and valvae with ventrocentral, terminally protruding, knob-ended spike (h1).

Description. *Male:* Forewing length 14.0 mm (n = 1). DFW and DHW blackish brown, androconial patch absent; HW margin with short tail at vein CuA1, longer tail at CuA2. VFW and VHW gray-beige; FW with deep red postmedial band, extending from costa to cell CuA2; HW with deep red medial band extending from costa, interrupted at cell M3 into pronounced W-shaped element extending to anal margin; limbal area with dull red-orange orbs (cells M3 and CuA1) and suffusive blue-gray (cell CuA2); anal tuft black at base.

Male Morphology and Genitalia (Fig. 2): Terminal abdominal segments with elaborate sclerotinal sculpturing ["subchordate incised posterior cavity" of Field 1967a, b = "sipc" of Johnson 1991]; tergite eight extending anterior beneath sixth abdominal segment, terminating posterior with lateral lobes and elongate spicules at a central notch (AB, ad); sternite eight with elongate posterior apodeme terminating with a spiculate spatula-shaped lobe (AB, c). Genitalia (CD) with vinculum ventrally robust and angulate (f–j), saccus broadly attached to vinculum along the entire anterior margin (i, j); valvae with paired lobed tapered caudally in dorsal element, ventrum with ventrocentral, terminally protruding, knob-ended spike (h1); falces with widely bifurcate terminal lobes (g); aedeagus robust with straight shaft, length exceeding rest if genitalia by about one-fifth, caecum comprising about one-third aedeagal length (k).

Type. Holotype male, ARGENTINA, Jujuy Province, Parque Nacional Calilegua, upland on vehicle track at 5–6 km W of Rt. 34 Park entrance, in hot humid forest break, 1200 hrs, 14 February 1991, swarming with many other butterflies in bright sun after morning rain (see Remarks), K. Johnson and D. Kroenlein, deposited in AMNH.

Remarks. *Affinities of the New Species:* The genitalia and terminal tergite structure of *C. calilegua* easily distinguish it from *Calystryma*



FIGS. 3–4. Distribution map and genital morphology. **3,** Centers of endemism (cd) generalized by Johnson (1981) showing known occurrences of *Gigantofalca* species; open triangle = *G. duida* (Roraima ce), open square = *G. stacya* (Manaus ce), open circle = *G. calilegua* (ce not recognized; nearest centers are Bolivian "Yungas" (#22) and SE Brazilian centers (#37 and 38). **4,** Morphology of *Calystryma phryne* sympatric and synchronic with G. calilegua (lettered for cross reference to latter) Major differences: **b, c.** (denoting no structures comparable to sternal elements of *G. calilegua*); f, Labibes prolonged; **g,** Falces small, nonbifucate; **h,** Valvae simple, tapered (**h1** denoting no structure comparable to knob-ended spike of *G. calilegua*); i, j, Vinculum/saccus bifurcate; k, Aedeagus straight.

species. However, compared to locally sympatric *C. phryne*, *G. calilegua* differs externally only by the darker DFW and DHW color and less lavish limbal markings (Fig. 1). Described in 1988, *C. phryne* initially was poorly known but since has been collected in numbers in "eastern slope" upland mesic forest (Jujuy and Salta Provinces); it has an undescribed sister taxon in the xeric "western slope" Monte biome, in Cafayate, Salta Province (Hayward 1965, Johnson et al. 1988).

Genital morphology of *G. calilegua* (Fig. 2) also immediately identifies it as a *Gigantofalca* species, unique in many characters, but most like the northern Duida Plateau *G. duida* (Roraima center of endemism, Brazil). The new species and *G. duida* share a wide anterior sternite, but that of *G. calilegua* is far less elaborate in *G. duida* and lacks a spatulate terminus (Johnson 1991: fig. 8). Type series of the three described species comprise all that is known of *Gigantofalca*.

Biogeography of the Type Locality: Calilegua Park (Fig. 3) (spelling conformed to Rand McNally & Company 1992) was set aside only recently as a national park, postdating most Argentine literature on the nation's park system (APN 1987). The area rises abruptly approximately 2500 m above lowland "Chaco" outlying (at 50 km) the main body of the eastern Andean slope in Jujuy Province. Currently, the park is crossed by a single dirt track (off Argentine Rt. 34 near Libertador Géneral San Martín), and its tropical forests are largely undisturbed. Recent collections of Lepidoptera in Calilegua Park (1991–1992 AMNH expeditions) include many tropical butterflies previously unrecorded from Argentina and numerous others requiring taxonomic description (Johnson 1992a, 1992b, 1993; Johnson, Eisele & MacPherson 1992, 1994; Johnson & Kroenlein 1993a, 1993b; Johnson & Sourakov 1993). Diversity and apparent local endemism of tropical Lepidoptera in Calilegua Park deserves mention because of the park's Andean location south of the Tropic of Capricorn. From this latitude southward, tropical and subtropical forest occurs only in remnants—scattered from Jujuy Province to the "frost-free island" of Tucuman and northern Catamarca provinces (APN 1987)—far to the south and west of areas of South America usually noted for endemism in tropical forest butterflies (Fig. 3). These centers of endemism, or the admixture of taxa listed for Argentina by Hayward (1973), do not suggest occurrence of tropical genera like *Gigantofalca* in northwestern Argentina. The recent descriptions of numerous tropical forest Theclinae from Calilegua Park (and other northwestern Argentine tropical forests) suggest that earlier characterizations of low tropical diversity in this region were influenced by sampling error (Ackery 1984 [following Hayward 1973]) or restriction of study to particular taxonomic groups (Brown 1976, among other "refugia" literature).

Etymology. A proper noun, used in apposition to denote the type locality.

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