

**THE GENUS *MINISTRYMON* CLENCH 1961 IN CHILE
AND A NEW SPECIES FROM THE NORTHERN DESERT BIOTIC PROVINCE
(LEPIDOPTERA: LYCAENIDAE)**

**EL GENERO *MINISTRYMON* CLENCH 1961 EN CHILE
Y UNA NUEVA ESPECIE**

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ABSTRACT

Based on a survey of type specimens, species of the New World hairstreak butterfly genus *Ministrymon* Clench are listed and first records from Chile reported. *M. azia* Hewitson reaches its southwestern range extreme in xeric coastal habitats near the Chile/Perú border (Arica). *M. quebradivaga*, new species, is described from quebrada habitat in the Northern Desert Biotic Province (Quebrada Vitor, Pampa Tamarugal), Tarapacá Region. This new species shares characters with two subgroups of *Ministrymon* and is probably a primitive relict. At least two other Lepidoptera studied to date show the pattern of distribution and endemism exhibited by *Ministrymon* in Chile.

Key words: *Ministrymon quebradivaga* n. sp.; *M. azia*; Chile I. Región Tarapacá; Lycaenidae; Distribution.

RESUMEN

El género *Ministrymon* Clench, 1961, se agrega a la fauna entomológica chilena con las especies *M. azia* Hewitson y la nueva especie del Norte de Chile, *M. quebradivaga* nov.

In 1982, Dr. J. Herrera (Instituto de Entomología, Universidad Metropolitana de Ciencias de la Educación, Santiago, Chile (UMCE) sent the authors two unidentified male Theclinae from "Quebrada Vitor" (found on most maps), (Fig. 1) (mapa I Región Tarapacá), an east-west strip of watershed vegetation isolated within the Northern Desert Biotic Province (Irwin & Schlinger, 1986) of Tarapacá Region, northern Chile. These represented and undescribed species of *Ministrymon*. Subsequently, females of the population were also obtained from Quebrada Vitor and the immediately surrounding Pampa del Tamarugal.

Ministrymon has not been previously reported from Chile (Ureta, 1947, 1949, 1956, 1964). The genus was described by Clench (1961) with

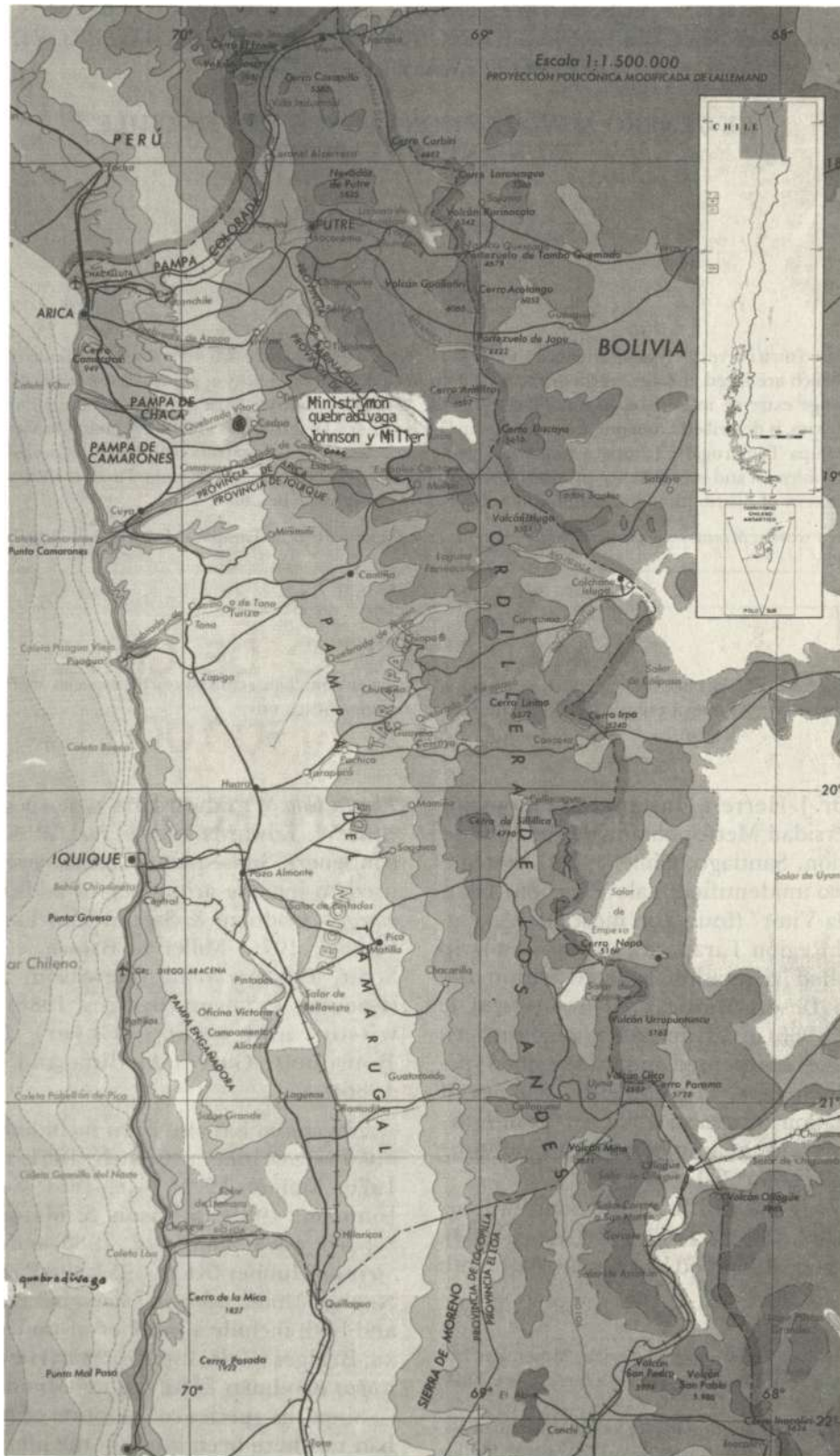
Thecla leda W. Edwards as type species and *T. clytie* W. Edwards and *T. ines* W. Edwards as congeners. Subsequently, *Ministrymon* has been used to include a number of additional taxa: *maevia* (Godman & Salvin) (dos Passos, 1970; Emmel, 1975; Miller & Brown, 1981, 1983; Scott, 1986); *coronta* (Hewitson) and *scopas* (Godman & Salvin) (Bridges, 1988); *azia* (Hewitson) and *phrutus* (Geyer) (Llorente-Bousquets, Garcés Medina and Martínez, 1986).

Thecla azia has also been included in the genus *Tmolus* Hubner (Clench, 1961; dos Passos, 1970; Emmel, 1975; Pyle, 1981; Scott, 1986; Johnson, 1986; Johnson & Matusik, 1988; Schartz, 1988; Smith *et al.*, 1988) and, earlier, in *Strymon* Hubner (Klots, 1951; dos Passos, 1964). Neither *Ministrymon* or *Tmolus* has been revised and both include a number of undescribed taxa; Bridges (1988) listed *coronta* (Hewitson) and *scopas* (Godman & Salvin) as "*Ministrymon*?"

Since the species composition of *Ministrymon* had nowhere been listed in the literature, and to determine the status of the Chilean speci-

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Mapa de la Región de Tarapacá

mens, we compared the original description (Clench 1961: 196) with relevant type material of *Thecla* (AMNH, BMNH, CMNH, IML), and other specimens, to determine species limits for this genus. Based on this study, taxa of *Ministrymon* (as defined by Clench) are listed below, divided into the three major subgroups (or lineages) distinguished therein and in Figures 1-2. Types examined and dissected are noted as "T" and "M" male and/or "F" female, as appropriate. For convenience, the groups are named by the common upper surface ground colors and the early group names of Draudt (1919). Placement of species names which constitute new combinations with *Ministrymon* are marked with an asterisk*:

1. The "gray" or "azia Group" (unique characters: wing under surface with prominent orange lunular band, Fig. 3D, F; female genitalia with prominent cephalic antrum, Fig. 1E): *Thecla azia* Hewitson (TM, BMNH) (pan-Neotropical, = *T. nipona* Hewitson (TM, BMNH).

2. The "white" or "una Group" (unique characters: wing under surface of mottled lunular gray or gray-brown pattern; female genitalia contiguously tapered, male genitalia with swollen valval extension, Fig. 1A): *T. una** Hewitson (TM, F, BMNH), *T. scopas* Godman and Salvin (TF, BMNH), *T. furcifer** Druce (TM, BMNH), *T. maevia* Godman and Salvin (TF, BMNH), *T. inoa** Godman and Salvin (TF, BMNH), *Tmolus albimimicus** Johnson (TF, AME) (differs in having orange band beneath; placed here by structural characters).

3. The "blue" or "phrutus" Group: (unique characters: wing under surface with mottled red and beige pattern elements sometimes fused to a prominent band; female genitalia contiguously tapered to the caudal one-third, thereafter variously specialized, Fig. 1B): *T. phrutus* Geyer (TF, BMNH), *T. leda* W. Edwards (TM [not dissected], CMNH), *T. clytie* W. Edwards (TM [not dissected], CMNH (= *T. ines* W. Edwards (TM [not dissected], CMNH), *T. vena** Druce (TM, F, BMNH), *T. sparsa** Hayward (TM, IML), *T. adria** Hewitson (TM, F, BMNH), *T. gamma** Druce (TM, F, BMNH), *T. cruenta** Gosse (TM, F, BMNH), *T. fidentia** Hewitson (TM, BMNH), *T. zilda* Hewitson (TM, F, BMNH), *T. ligia** Hewitson (TM, BMNH), *T. corona* Hewitson (TM, F, BMNH), *san-*

*guinalis** Burmeister (type deposition not known; unambiguous, identified by topotypes).

Considering these groups, the new species from Chile and *M. victoria* of Hispaniola (*Tmolus victoria* Johnson and Matusik 1989, TF, AMNH) share characters with more than one subgroup of *Ministrymon* and are probably primitive. *M. quebradivaga* shares characters with both the "azia" and "una" Groups.

Ministrymon Species Occurring in Chile

Ministrymon azia (Hewitson)

Figs. 1, 2, 3, 4, 5

Thecla azia Hewitson, 1863-1878 [1873]: (1), 144: (2), pl. 57, figs. 357, 358.

Diagnosis. Wings with upper surface gray black, lighter gray or slightly iridescent blue across hindwing near black anal lobe; male scent brand discrete and without surrounding dark suffusion; under surface concolorous gray or gray-white, hindwing postdiscal band red-orange, generally lunular and forming "W" between cells CuA1 and 2A near black anal lobe. Male genitalia with valvae basally shouldered, caudally trinely tapered; female genitalia with prominent antrum originating in the cephalic onethird to one-fourth of the ductus bursae and cervix bursae with prominent bursal hood comprising about one-fourth of ventral ductal length.

Types. We dissected the syntype male # 2, BMNH, labelled "Mexico, Hewitson Coll. 79-69, *Thecla azia* 2". (latter number refers to BMNH serially labelled Hewitson syntypes (see Johnson, 1989c, 1990) and the holotype male, BMNH labelled "Brazil, Hewitson Coll. 79-69, *Thecla nipona* 1".

Distribution. Widespread, occurring from the west-central United States southward through the Antilles and Central and South America; reaching southern range extremes in Central Argentina (Mendoza Province) and extreme northern Chile (Arica, Tarapacá Región).

Remarks. R.K. Robbins (National Museum of Natural History, Washington, DC) called our attention to specimens of *T. azia* from the vicinity of Arica, Tarapacá Region, Chile. We have studied the morphology of *M. azia* from across

its Nearctic and Neotropical ranges (Material Examined and Figs. 1, 2). Though wideranging, *M. azia* differs little in male genitalia from the southern United States southward to Northern Argentina (Fig. 2a-i). Female genitalia are also very similar throughout the range (Johnson, 1986, Fig. 5; Johnson and Matusik, 1988, Fig. A2) showing a distinct antrum originating in the cephalic one-third to one-fourth of the ductus bursae (Fig. 1). Robbins furnished material representing the coastal xerophilic population of *M. azia* (coastal Ecuador south to Arica, Chile) for dissection (Fig. 1). Wing upper surfaces in this population are dark gray as typical of *M. azia* (*T. nipona* form, TL "Brazil"); the female upper surface shows somewhat more defined iridescent blue on the hindwing than typical *M. azia*. The under surfaces are typical of *M. azia* except the hindwing band is slightly less lunular. The male and female genitalia are typical of *M. azia* with some minor variation (Fig. 1C, E).

Ministrymon quebradivaga,

new species

Figs. 1, 2, 3, 4, 5

Diagnosis. Wings upper surface ground semilustrous bronze, hindwing with submarginal white dots and orange anal lobe; male scent brand orbicular, black, surrounded for about 5 mm by black suffusion. Under surface ground tawny, suffused darker basad of hindwing band; hindwing band orange and lineal, forming "V" shape along vein 2A near orange anal lobe. Genitalia typical of "una" Group, male with valvae caudally swollen, female with ductus bursae elongate and evenly tapered, terminating with indistinct lamellae and with cervix bursal hood small, comprising about one-fifth of ventral ductal length.

Description. *Male.* fig. 1 Upper Surface of the Wings: ground color bronze, forewing costal fold orange. Forewing with orbicular androconial brand at distal end of discal cell, surrounded by black suffusion encompassing most cell's distal area. Hindwing with light, white to cream, markings in each cell along submargin. Anal lobe prominently marked with bright orange dot. Under Surface of the Wings: ground tawny brown; both wings with postdiscal orange band, forewing from costa to inner

margin, hindwing from costa to anal margin. Hindwing band continuous, thin, bending with marked "V" toward anal margin from vein 2A. Hindwing ground color basad of band darker than rest of wing. Anal lobe distally black, basally orange. Length of forewing: 11.5 mm (holotype), 11.5 mm (paratype). *Female.* fig. 5 Marked similar to male but without forewing brand and with slightly lighter ground across caudal one third of hindwing. Length of forewing: 12 mm (allotype).

Male Genitalia. Fig. 2A. Valvae with shouldered base (Fig. 2x), terminus centrally swollen (Fig. 2y). Aedeagus elongate, cephalic portion of shaft and entire caecum exceeding length of remaining genitalia and caecum dorsally inclined about 30°; dorsal aedeagus terminus with three clusters of microtrichia (one at apex, two parallel in subapical area) and three overlapping, lobate and non-furcate cornuti (each successively more slender and elongate proceeding toward the terminus) (see Remarks).

Female Genitalia. Fig. 1A. Ductus bursae, both in ventral and lateral views, evenly tapered from indistinct terminal lamellar lips to cervix bursae; dorsal surface of ductus bursae with wide, lightly sclerotized suture line extending from terminal lamella to two-thirds ductal length; cervix bursae with relatively small sclerotized hood comprising about one-fifth ventral ductal length.

Types. Holotype male, Codpa, hamlet in Quebrada Vitor [(see Remarks)], altitude 2 109 m, 3 February 1954, collector J. Herrera, Tarapacá Region, Chile, deposited AMNH (N.Y.); allotype female, "Pampa del Tamarugal" Herrera coll., 18-VI-87, gen. ♀ 4491 (J.H.), (region immediately surrounding Quebrada Vitor, in which latter is an "oasis" J. Herrera pers. comm.), Tarapacá Region, Chile, deposited UMCE. Paratype male, same data as primary type, but collector "Hrepic", deposited AME. Paratype male, but collector Herrera, 18-VI-87, deposited A. Museum of Natural History (N.Y.).

Distribution. Known only from the type locality (see Remarks) and specimens with data indicating the immediately surrounding region.

Remarks. Irwin and Schlinger (1986) describe the Northern Desert Biotic Province as devoid

of vegetation except in deep valley watersheds ("quebradas") running westward from the Andes to the Pacific Ocean. They state that "various insects" are isolated in these valley systems. Quebrada Vitor is the southern of two major quebradas crossing the Northern Desert Biotic Province in Tarapacá. Codpa is a town located in the central area of the quebrada at about 1,000-1,500 m altitude. The region immediately surrounding Quebrada Vitor is referred to in the colloquial as Pampa del Tamarugal. Isolation of these quebrada systems probably accounts for the distinctness of *M. quebradivaga*. Johnson, Eisele and Mac Pherson (1990) have described unique species of *strymon* from isolated quebradas in northwestern Argentina. Rindge (1987) described an insular geometrid endemic, *Eupithecia tarapaca*, from quebrada habitat near Codpa and contrasted it to a widely distributed sister species, *E. sibylla* Butler.

M. quebradivaga is superficially similar to *M. azia*, but compared to populations of the latter from the southern United States southward to Argentina (Material Examined and Fig. 2B & a-i), it differs in both wing and genitalic characters. Along with its brownish upper surface coloration and pronounced black scent brand, the large size of *M. quebradivaga* stands out. Forewing length (base to apex) in both known specimens exceeds 11 mm, while 30 males of *M. azia* (AMNH) measure from 8.0 mm to 11.0 mm with a mean of 9.6 mm. On the undersurface, the hindwing band in *M. azia* is consistently lunular, with spots pronounced at the costal margin and discal cell. As noted in Fig. 1, the band in *M. quebradivaga*, though jagged, is thin and linear, with the ground color basad appearing more darkly suffused. The under surface wing markings of *M. quebradivaga* are reminiscent of *M. azia*. In the genitalia, however, the males' swollen valval lobes and females' evenly tapered ductus bursae appear typical of *una* Group taxa.

Character divergence and geographic isolation in *M. quebradivaga* correlates with several other endemic Chilean taxa. Johnson (1988 & in press a, b) and Johnson, Eisele and Mac Pherson (1988) have shown that several eumaeine genera, with otherwise widespread Neotropical species, have distinctive populations isolated on the Chilean side of the Andean continental divide. These include species of *Tergissima* John-

son, *Calycopis* Scudder and *Chlorostymon* Clench. In *Chlorostymon*, a distinctive Chilean endemic, *kuscheli* Ureta, occurs in the high montane areas of Tarapacá Region just east of the Quebrada Vitor drainage. The same is true of the little-known *Thecla flavaria* Ureta. It is anticipated that further examples of distinctive Chilean isolates will be discovered as examination of Chilean eumaeine samples continues.

Etymology. The name adds the Latin suffix "vaga" to "quebrada", meaning "quebrada roamer".

Material Examined: In addition to the types of *M. quebradivaga* we have dissected one male and female *M. azia* from the following locations (including those illustrated in Figs. 1-2) (all AMNH except as noted): Argentina: San Pedro, Jujuy Province; Yariquenda, Salta Province; Río Arrazayal, Salta Province. Brazil: Massaranduba-Blumenau, Santa Catarina State. Colombia: Caldas, Department Caldas. Dominican Republic: Pine forest above Las Abejas, Pedernales Province; Barahona, Barahona Province. Ecuador: Guayquichuma, Dept. el Oro; Loja-Catamayo, Rd mm 28, 1,700 m, Dept. Loja (two males, two females NMNH). Guatemala: Balem. México: (generalized type locality of *M. azia* (Bridges, 1988)). Tuxpanco, Coatepec, Presidio, Córdoba and Jalapa, Vera Cruz State. Panamá: La Boca, Canal Zone. United States: Pharr, State of Texas. Trinidad-Tobago. Portof-Spain. Venezuela: San Cristóbal, Tachira Province.

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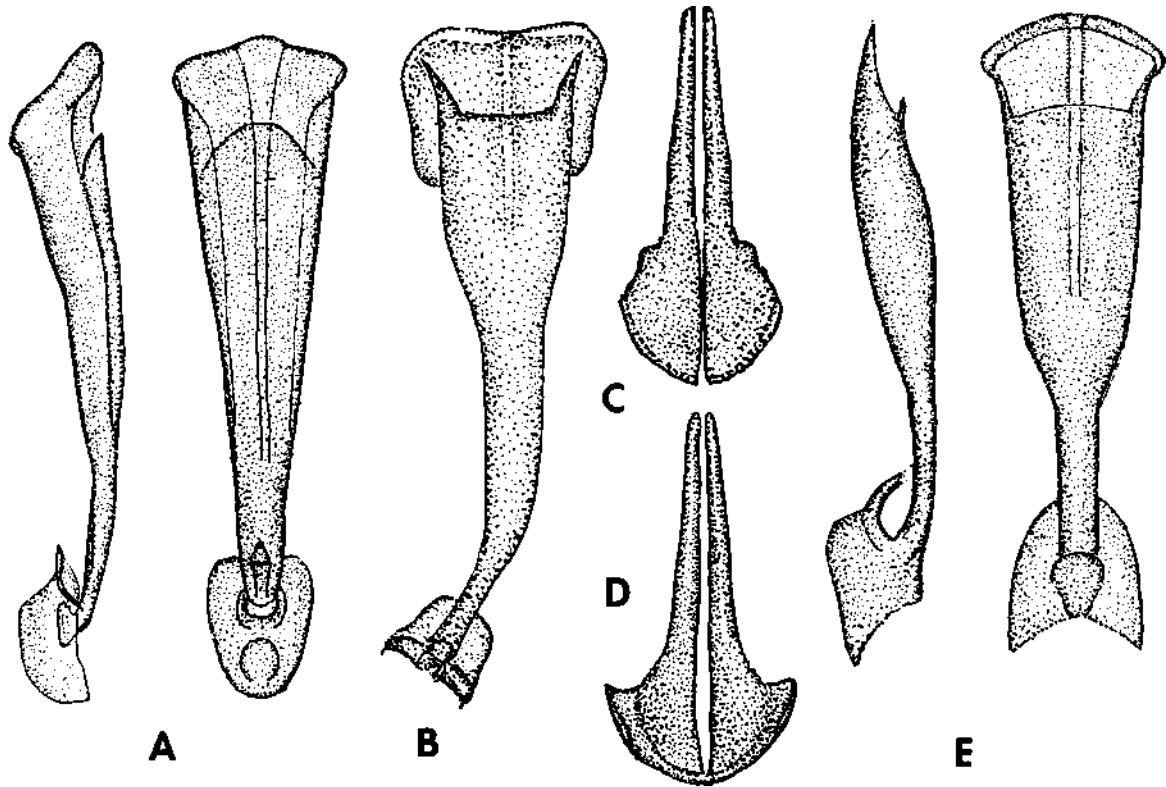


Figura 1. Genitalia of *Ministrymon*. A. Female genitalia, *M. quebradivaga* allotype, lateral view left, ventral view right. B. Female genitalia, *M. phrudus*, type female, ventral view. C. Male genitalia of *M. azia* typifying coastal regions from Ecuador south to Chile (R.K. Robbins pers. comm.), ventral view. D. Male genitalia, valvae, *M. ligia*, type male, ventral view. E. Female genitalia of *M. azia* typifying coastal regions from Ecuador south to Chile (R.K. Robbins pers. comm.), lateral view left, ventral view right.

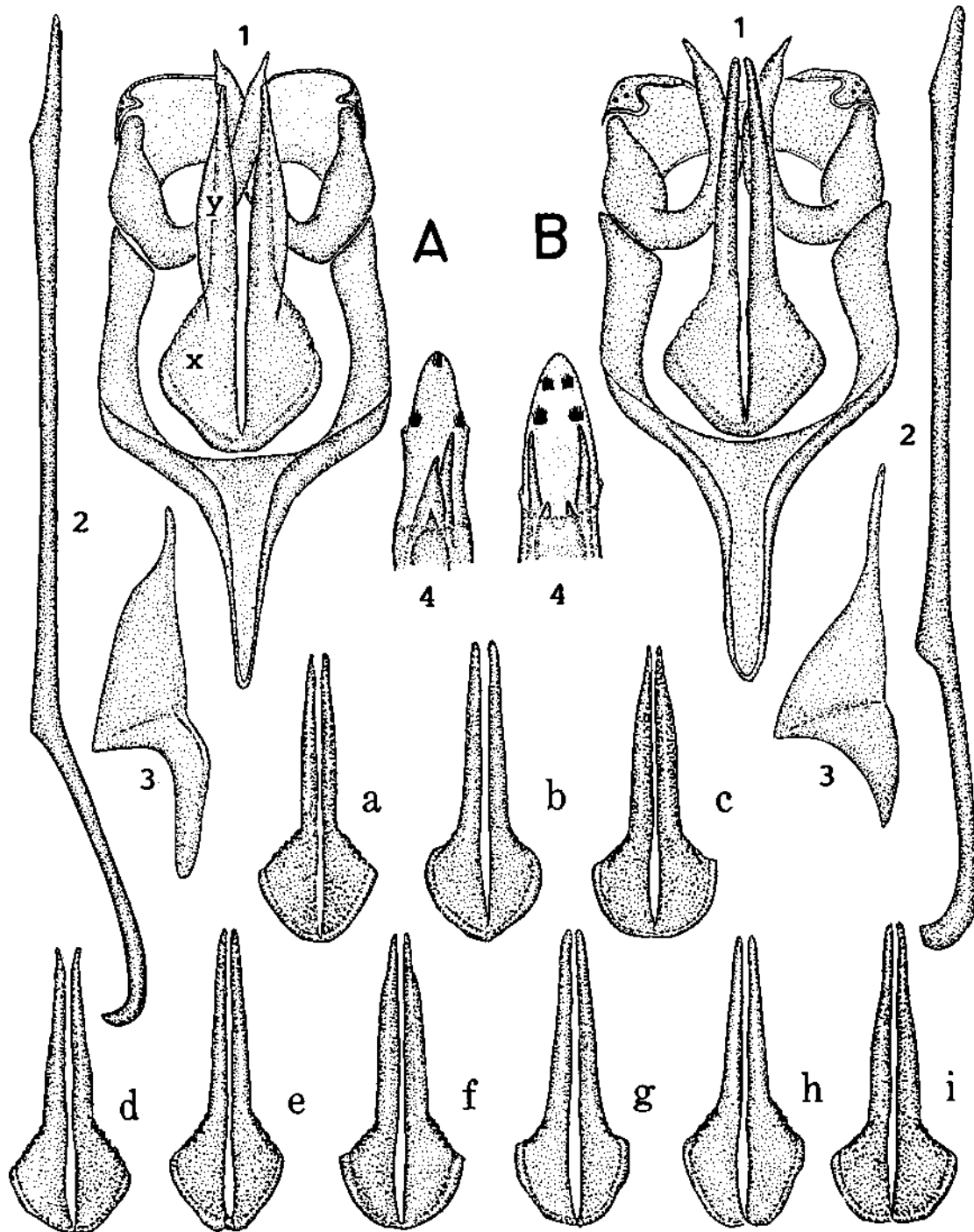


Figura 2. Male Genitalia of *M. quebradivaga* and the neotropical *M. azia* complex. A. *M. quebradivaga*, new species, holotype. B. *M. azia* (San Pedro, Jujuy, Argentina) and, a-i, uniformity in male genitalia of *M. azia*.

For each of A & B: 1. ventral view of genitalia with aedeagus removed (special features of valvae noted in text, shouldered base (x) and swollen caudal extension (y)), 2. aedeagus in lateral view, 3. valvae in lateral view, 4. terminus of aedeagus showing microtrichia clusters and cornuti.

For a-i: uniformity of valvae in *M. azia*, ventral view, showing generally elongate and tapered caudal extension and minor variation in shape of base: a. Pharr, Texas; b. Tuxpanco, México; c. La Boca, Panamá; d. near Las Abejas, Dominican Republic; e. Caldas, Colombia; f. San Cristóbal, Venezuela; g. Port-of-Spain, Trinidad; h. Quayquichuma, Ecuador; i. Massaranduba-Blumenau, Brazil. See Material Examined for more detailed locality data.

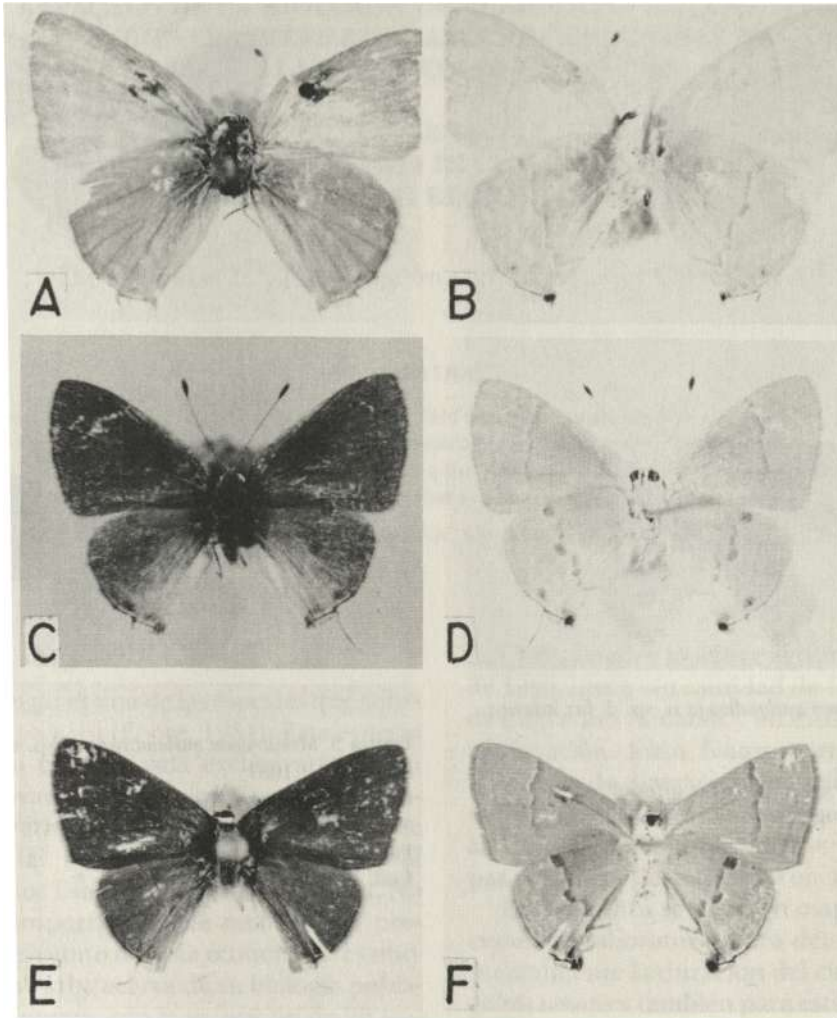


Figura 3. Adult of *M. quebradivaga* and *M. azia* (upper surface left, under surface, right). A, B. holotype, *M. quebradivaga* C, D. generalized topotype *M. azia* (TL "Mexico") Tuxpanco, México (AMNH). E, F. *M. azia* (= *T. nipona*), San Pedro, Jujuy, Argentina (AMNH).



Figura 4. *Ministrymon quebradivaga* n. sp. ♂ faz inferior.
 Codpa 9.VI.1987
 Coll. José Herrera
M. quebradivaga n. sp. ♀ 4491 faz inferior
 Pampa del Tamarugal
 Coll. José Herrera

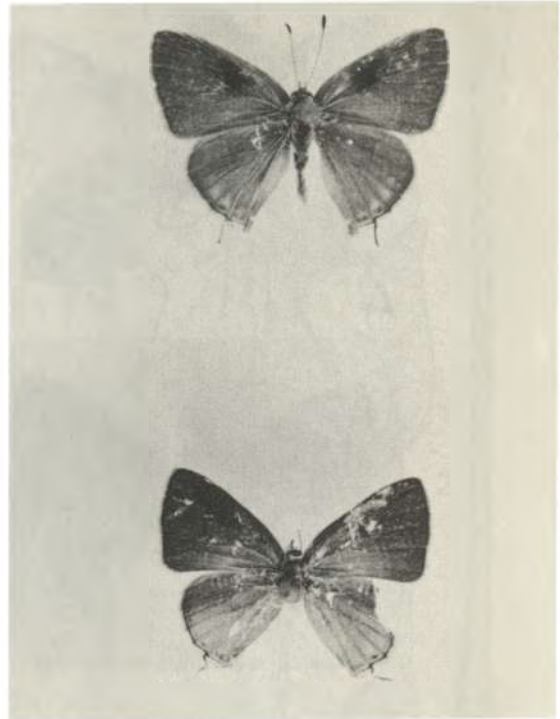


Figura 5. *Ministrymon quebradivaga* n. sp. ♂ faz superior.
 Codpa 9.VI.1987
 Coll. José Herrera
M. quebradivaga n. sp. ♀ 4491 faz superior
 Pampa del Tamarugal
 Coll. José Herrera