

**Lepidoptera from the Pantepui. Part XVI:
A new species of *Thaeides* Johnson, Kruse & Kroenlein, 1997
(Lycaenidae: Theclinae: Eumaeini)**

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Abstract – A new species of Lepidoptera (Papilionoidea) is described on the basis of specimens collected at upper elevations in the Guiana Shield: *Thaeides hyperion* Bálint, Costa & Grishin, n. sp. (Lycaenidae: Theclinae: Eumaeini). Due to its adaptation to mountainous areas, it is probably a taxon endemic to the biogeographic Pantepui Province. With 16 figures, one table.

Key words – Auyán Tepui, endemism, genitalia morphology, molecular analysis, Ptari Tepui, spectral characteristics, Yaví Tepui, wing fragments.

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Resumen – Se describe una nueva especie de Lepidoptera (Papilionoidea) de las zonas elevadas del Escudo guayanés: *Thaeides hyperion* Bálint, Costa & Grishin, n. sp. (Lycaenidae: Theclinae: Eumaeini). Debido a su adaptación a zonas montañosas, es probablemente un taxón endémico de la Provincia biogeográfica del Pantepui. Con 16 figuras, y una tabla.

Palabras clave – Análisis molecular, Auyán Tepui, características espectrales, endemismo, fragmentos de alas, morfología de genitalia, Ptarí Tepui, Yaví Tepui.

INTRODUCTION

The genus *Thaeides* was erected by JOHNSON, KRUSE & KROENLEIN (1997) for the type species *Thecla theia* Hewitson, 1870 (type locality: Ecuador) and a south-eastern Brazilian species described as *Thaeides annandon* (Johnson, Kruse & Kroenlein, 1997). The genus was characterized as “known species with thick brush organs along dorsum of vinculum; male genitalia [stands out] from other macusiines by their narrow, elongate and terminally curvate valvae”. Later, a male genitalic valval character was noted as “pincer-like valve tip”, and because some other eumaeines also possess this trait (although differing in wing shape, colouration, and pattern), they were transferred from other genera and placed in *Thaeides* by ROBBINS (2004a). According to D’ABRERA (1995), ROBBINS (2004b), and WARREN *et al.* (2024) *Thaeides theia* (Hewitson, 1870) is a Transamerican species, recorded from the southern part of Mexico through Central America to the Venezuelan Cordillera de Merida, the Andes of Colombia, Ecuador, Peru, Bolivia, south to Argentina and to south-eastern Brazil, thus including *T. annandon* as a synonym or in subspecific status (ROBBINS 2004b).

Over the course of multiple expeditions to the Pantepui, carried out since 2012 (BÁLINT & COSTA 2012; COSTA *et al.* 2014a,b; 2016; 2017; 2018; 2019a,b,c; 2020; 2021a,b; 2022; 2023a,b), several specimens of a *Thaeides* species were collected or recorded. In the laboratory we found that these males and females have different colouration than specimens originating from the Central American, Andean, or Atlantic populations, and subtle differences in wing pattern and genitalia morphology were noted. Using whole genome sequencing, the distinctiveness of the Pantepui populations has been confirmed and a hidden genetic diversity of *T. theia* (*sensu auctorum*) has been revealed. In this work, we describe the new Pantepui taxon as a new species, *Thaeides hyperion*, and comment on the habitat, life history, genomic data, and dorsal wing surface colouration of *Thaeides*.

MATERIALS AND METHODS

Abbreviations –AM = collection of Alfred Moser, São Leopoldo, Brazil; HNHM = Hungarian Natural History Museum, Budapest, Hungary; LPD = Lycaenidae Pantepui Database of Mauro Costa; MB = collection of Mohamed Benmesbah, Toulouse, France; MC = collection of Mauro Costa, Caracas, Venezuela; MIZA = Museo del Instituto de Zoología Agrícola, Facultad de Agronomía, Universidad Central de Venezuela, Maracay, Venezuela; NECJU = Nature Education Center, Zoological Museum, Jagiellonian University, Krakow, Poland; PB = collection of Pierre Boyer, Le Puy Sainte Réparate, France; SP = spectral peak; [//] = line break.

In addition to the type material (n = 11), the following specimens (n = 17) were used for comparative purposes: *Thaeides annandon* – Brazil (n = 4): 2 males, 1 female (AM), male (HNHM); *Thaeides theia* – Costa Rica (n = 4): 2 males, 2 females (PB); Ecuador (n = 1): female (PB); Peru, Amazonas (n = 1): female (NECJU); Venezuela, Aragua (n = 6): 1 male, 1 female (NECJU), 2 males, 2 females (HNHM); Venezuela, Mérida (n = 1): male (NECJU). Information and data provided by DRAUDT (1919), D'ABRERA (1995), and the website “Butterflies of America” (WARREN *et al.* 2024) were also taken into consideration.

For populations representing different biogeographical regions in South America (BROWN 1993) the species-group names *theia* (Transandean–Andean) and *annandon* (Atlantic) are employed. As our intent is to diagnose and describe the new species, and not to revise *Thaeides theia* (*sensu auctorum*), the usage of these names does not represent any taxonomic decision.

After capture, specimens were placed in glassin envelopes, then transferred to the laboratory where they were set, labelled, digitized, and inventoried with serial numbers of the Lycaenidae Pantepui Database (LPD), edited by MC with identifications by ZB. For morphological studies, we used standard lepidopterological techniques (WINTER 2000). Two male and two female specimens of *Thaeides hyperion* **n. sp.** (HNHM Bálint genitalia preparations nos. 1527, 1725: males; 1723-1724: females), and one male and one female specimen of *Thaeides theia* were dissected (HNHM Bálint genitalia preparations nos. 1730: male; 1731: female). Furthermore, genitalic information provided by JOHNSON, KRUSE & KROENLEIN (1997) and dissections of NECJU were also used.

For spectral measurements, the following specimens (n = 7) were taken: *Thaeides annandon*, male, Brazil, Rio Grande do Sul, São Francisco de Paula, 900 m, 3. V. 1998, Moser; *Thaeides hyperion* **n. sp.**, male, Venezuela, Bolívar Auyán Tepui, Entre el Danto y El Peñón, 1750 m, 25. III. 2013, Costa; *Thaeides hyperion* **n. sp.**, female, Venezuela, Bolívar, Auyán Tepui, El Peñón, 1850 m 1. X. 2017, Costa; *Thaeides hyperion* **n. sp.**, female, Venezuela, Bolívar, Auyán Tepui, El Dragón, 1750 m, 4. II. 2019, Costa/Benmesbah; *Thaeides hyperion* **n. sp.**, male, Venezuela, Bolívar, Auyán Tepui, El Dragón, 1750 m, 6. II. 2019,

Costa/Benmesbah; *Thaeides theia*, female, Venezuela, Aragua, Rancho Grande, 1100 m, X. 1967, Romero; *Thaeides theia*, male, Venezuela, Aragua, Rancho Grande, Cumbre, 1100 m V. 1995, Romero. Wing structural colouration was measured using our in-house spectroboard (BÁLINT *et al.* 2010, KERTÉSZ *et al.* 2021). The terminology of wing venation follows the Comstock-Needham nomenclature system (MILLER 1970).

In genomic analysis, the following specimens ($n = 6$) were used: *Thaeides annandon*, male, Brazil, Rio Grande do Sul, São Francisco de Paula, 900 m, 3. V. 1998, Moser; *Thaeides hyperion* n. sp., female, Venezuela, Bolívar, Auyán Tepui, Entre Libertador y El Oso, 2200 m, 24. XII. 2012, Costa; *Thaeides hyperion* n. sp., male, Venezuela, Bolívar, Auyán Tepui, Entre el Danto y El Peñón, 1750 m, 25. III. 2013, Costa; *Thaeides hyperion* n. sp., male, Venezuela, Bolívar, Auyán Tepui, El Dragón, 1750 m, 3. II. 2019, Costa/Benmesbah; *Thaeides theia*, female, Venezuela, Aragua, Rancho Grande, 1100 m, X. 1967, Romero; *Thaeides theia*, male, Venezuela, Aragua, Rancho Grande, Cumbre, 1100 m, V. 1995, Romero.

Protocol for genomic work followed previous publications (LI *et al.* 2019; ZHANG *et al.* 2019). In brief, genomic DNA was extracted from a single leg, mate-pair libraries constructed and sequenced at 150 bp on Illumina platform. Protein-coding regions were assembled using DIAMOND (BUCHFINK *et al.* 2015) from the resulting sequence reads and a reference protein set of *Calycopis cecrops* (Fabricius, 1793) (CONG *et al.* 2016), and three phylogenetic trees were constructed using IQtree v1.6.12, utilizing the GTR+GAMMA model (NGUYEN *et al.* 2015): (1) from autosomes in the nuclear genome, (2) from the gene predicted to be located in the Z chromosome, and (3) from the mitochondrial genome. Ultrafast bootstrap (MINH *et al.* 2013) was used to indicate statistical support of branches.

RESULTS

Thaeides hyperion Bálint, Costa & Grishin, n. sp. (Figs. 1–3, 7–8)

Classification – Order: Lepidoptera, family: Lycaenidae, subfamily: Theclinae, tribe: Eumaeini, genus: *Thaeides* Johnson, Kruse & Kroenlein, 1997 (type species: *Thecla theia* Hewitson, 1870).

Generic placement – Representatives of *Thaeides* can be recognized by the warm-brown forewing ventral surface with dark-brown postbasal, median, postmedian, submarginal, and marginal transverse bands or lines from wing costa to inner margin. There is no similar member of the Lycaenidae with such a phenotype in the Neotropical fauna. Males have an oval-shaped scent pad (according to FAYNEL & BÁLINT 2012) in the forewing discal cell apical

area. Phylogenetic analysis based on molecular sequencing results in grouping individuals of the new species within the same clade of the type species of *Thaeides*.



Figures 1–3. Type specimens of *Thaeides hyperion* n. sp.; in dorsal (above) and ventral (below) views (scale bar 1 cm): 1 = holotype male (LPD # 311); 2 = allotype female (LPD # 81); 3 = paratype female (LPD # 306); photos by G. Katona



Figures 4–6. Specimens of *Thaeides* species, in dorsal (above) and ventral (lower image) views (scale bar 1 cm): 4 = *T. theia*, male (Venezuela, Aragua); 5 = *ditto*, female; 6 = *T. annandon*, male (Brazil, Rio Grande do Sul); photos by G. Katona

Type material – Holotype male (LPD # 311), set dorsally, in good condition (dorsal wing surfaces slightly worn), forewing costa length: 14 mm; labelled as “VENEZUELA [//] Bolívar [//] Auyán Tepui, El Dragón [//] 1750 m, 6 II 2019 [//] Costa/Benmesbah” (label oblong, paper white, letters and numbers black printed), to be deposited in MIZA. Paratypes, all from Venezuela (n = 10; six males, four females): male (specimen), Amazonas, Cerro Yaví, 2200 m, 24–28. II.1995, 5°43’N; 65°54’W; J. L. García, Exp. Terramar (LPD # 114; MIZA); female, ditto (LPD # 116; MIZA); female, Bolívar, Auyán Tepui, entre Libertador y El Oso, 2200 m, 24.XII.2012, M. Costa (LPD # 165; DNA sample NVG-23032D08; HNHM); male, Bolívar, Auyán Tepui, entre El Danto y El Peñón, 1750 m, 25.III.2013, M. Costa (gen. prep. Bálint no. 1527) (LPD # 158; DNA sample NVG-23032D07; HNHM); male, Bolívar, Talud Ptarií Tepui, 1500 m, 15.XII.2015, M. Costa (LPD # 368; MC, to be deposited in MIZA); male, Bolívar, Auyán Tepui, El Peñón, 1850 m, 10.I.2017, Costa/Benmesbah (LPD # 081; HNHM, to be deposited in MC); male (right hindwing), Bolívar, Auyán Tepui, El Dragón, 1750 m, 03.II.2019, Costa/Benmesbah (LPD # 292; DNA sample NVG-23032D09; HNHM, to be deposited in MB); female, Bolívar, Auyán Tepui, El Dragón, 1750 m, 04.II.2019, Costa/Benmesbah (LPD # 306; HNHM, to be deposited in MIZA); male (left forewing), Bolívar, Auyán Tepui, Campo Lecho, 1750 m, 05.II.2019, M. Costa (LPD # 369; MC; to be deposited in MIZA); male, Bolívar, Auyán Tepui, El Peñón, 1850 m, 07.II.2019, Costa/Benmesbah (LPD # 260; HNHM).

Diagnosis (Figs. 1–6) – In males of *Thaeides hyperion* **n. sp.**, the area around the scent pad in the forewing discal cell is black, whilst it is at least partly blue in all other known *T. theia*-like species and populations. Males of *T. hyperion* **n. sp.** have a shining blue (SP: 465 nm) dorsal wing surface, whilst the male of *T. annandon* is somewhat darker (SP: 450 nm), and in *T. theia*, the colour is closer to purple (SP: 415 nm). The female dorsal wing surface is deep blue (SP: 465 nm) or light purple (SP: 400 nm) in *T. hyperion* **n. sp.**, whilst in *T. theia* it is green (SP: 560 nm). In males of *T. hyperion* **n. sp.**, the ventral hindwing “*Thecla*” spot in the submarginal area of veins Cu1 and Cu2 is larger than in other known populations resulting in a more obvious pattern. Thorax and abdomen dorsal surfaces are a deeper blue in *T. hyperion* **n. sp.**, whilst in the other species these are gleaming blue.

Barcode sequence of a topotypic paratype – Sample NVG-23032D09, GenBankPQ585653, 658 base pairs:

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AACTTTATATTTTATTTTTGGAATTTGAGCAGGTATATTAGGTACATCCT
TAAGAATTTTAATTCGGATAGAATTAGGAACTCCAGGATCATTAATTG
GAGATGATCAAATTTATAATACTATTGTACAGCTCATGCCTTTATTAT
AATTTTTTTCATAGTAATACCTATTATAATCGGAGGCTTTGGAAATTGA
TTAGTACCATTAATATTAGGAGCTCCTGATATAGCATTTCACGAATAA
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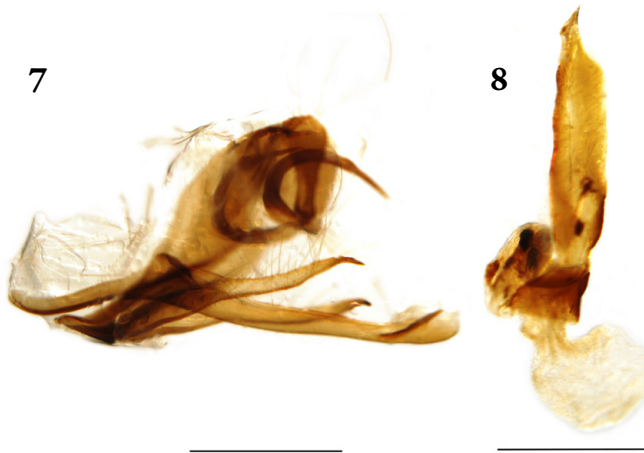
CCCCATTGTCATCTAATATTGCACACAGAGGATCATCAGTTGATTTAG
 CCATTTTTCTTTACATTTAGCAGGTATTTTCATCAATTTTAGGAGCTATT
 AATTTTATTACAACCTATTATTAATATACGAGTAAATAATTTATCTTTTGA
 TCAAATATCATTATTTATCTGAGCTGTAGGGATTACAGCTTTATTACTAT
 TATTATCTCTTCCTGTATTAGCAGGAGCTATCACTATATTATTAACCTGAT
 CGAAATTTAAATACCTCATTCTTTGATCCAGCAGGAGGGGGGAGATCC
 TATTTATATCAACATTTATTT

Description – Wings (Figs. 1–3): Shape: costa length measured from base to apex 11–15 mm (n = 11); hindwing vein Cu1 terminus with tail <1 mm, vein Cu2 terminus with filamentous tail longer than 2 mm; tornal area slightly lobed. Male (Fig. 1): Dorsal wing surface: fringes dark brown; forewing basal and medial area under cubital vein blue (SP: 460 nm) otherwise black in costal, postmedian and marginal areas; hindwing blue with black costa and apex, margin with grey scaling forming a delicate line, tornal lobe with orange scaling, anal fold grey. Ventral wing surface: fringes dark brown; forewing ground colour warm brown with a complicated pattern comprised of five transverse lines or bands (1) postbasal cell area with a short straight band, (2) median area with the widest dark band running straight from costa narrowing progressively to inner margin, (3) postmedian area with a nebulous band, fainter near costa and absent at inner margin, (4) a dark submarginal band slightly bent parallel to outer margin from costa to inner margin, and (5) a dark antemarginal line parallel to outer margin; hindwing ground colour as in forewing but with more complicated pattern comprised of transverse bands and lines basically separated by vein Cu2 to anterior and posterior regions; anterior region with pattern similar to forewing but bands and lines running towards tornal *Thecla* spot; posterior region with veins Cu2, 1A and 2A covered by black scales forming thin lines supplemented by a delicate line between vein 1A and outer margin, all running from base to tornal *Thecla* spot; space Cu1-Cu2 in submarginal area with large orange spot, additional but less extensive submarginal orange scaling in spaces between vein Cu1 and inner margin, tornal lobe black with long fringes. Female (Figs. 2–3): similar to male, but wing dorsal surface ground colour darker blue to purplish, hindwing antemarginal pattern darker, more developed.

Body: Male and female similar. Head: vertex and frontoclypeus covered by black hair-like scales, labial palpus with middle segment black-haired in its lower part with some white scales mixed, terminal segment short and pointed, eyes large and hairy; antennal flagellum and club dorsally black with white ventral scaling in each segment, club tip reddish brown. Thorax and legs: covered with dark hair-like scales, excluding tibia and tarsus with normal scaling. Abdomen: dorsally darker blue, ventrally lighter grey.

Genitalia (Figs. 7–8): Male capsule high and robust with prominent saccus and vinculum equal in length without tegumenal brush organ, tegumen large with a central depression visible only in dorso-ventral aspect, posterior parts

sclerotized with a pair of strong gnathi bent 180 degrees in middle and with pointed apex, valva extremely long and narrow in lateral view with 0.5 length of aedeagus and pointed central process, but smoother and flat in dorso-ventral view, and valve terminus pincer-like, especially evident in dorso-ventral aspect, aedeagus prominent, twice length of valva, vesica with a single large sclerotized cornutus (Fig. 7). Female genitalia comprised of a centrally membranous but otherwise sclerotized ductus with pointed terminal plate, ductus bursae expanded and heavily sclerotized by entrance to corpus bursae, further expanded to the side in this area connecting with the ductus seminalis, and connected by a membranous area to the ductus, corpus bursae appears small, half of ductus length, signa faint (Fig. 8).



Figures 7–8. *Thaeides hyperion* n. sp. genitalia in lateral aspect: 7 = male; 8 = female.
Scale bars = 1.2 mm; photos: Zsolt Bálint, compiled by G. Katona

Variation – There is a marked degree of variation in wing size, forewing length in both sexes is 11–15 mm. Female dorsal wingsurface may be purple instead of blue (see Discussion).

Distribution – *Thaeides hyperion* n. sp. is currently only known from three tepuis, at elevations between 1500 and 2200 m (Fig. 9): Auyán Tepui and Ptari Tepui (in the eastern Pantepui) and from Cerro Yaví (in the north-western Pantepui). Because most tepuis are still unexplored and considering the great distance between Cerro Yaví and Ptari Tepui (about 470 km), it is likely that this new species occurs on other local mountains in suitable habitat and at favourable elevations.

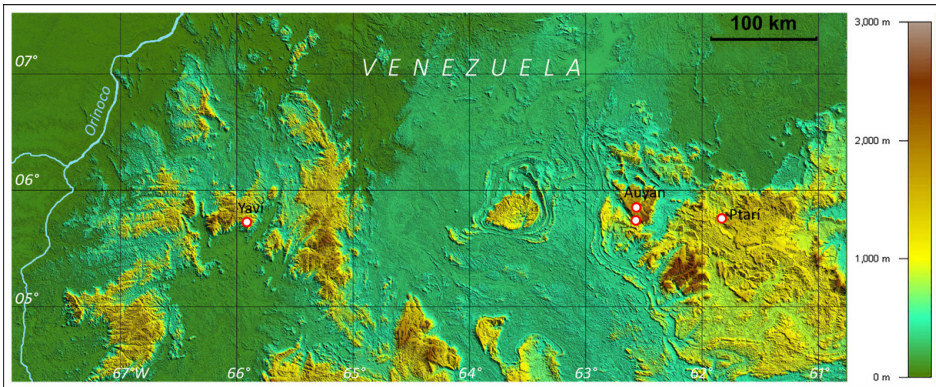


Figure 9. Known distribution of *Thaeides hyperion* n. sp. (red circled white points); compiled by M. Costa

Etymology – In Greek mythology, Hyperion was one of the titans, like Theia. Selecting this mythological name, we emphasize the close relationship between *T. theia* and *T. hyperion* n. sp. Furthermore, the name Hyperion means “the one who walks in the heights”, indicating that the species does not occur in the lowlands, but in the highlands of the Pantepui.

DISCUSSION

Habitat – The habitat of *Thaeides hyperion* n. sp. is defined as upper montane evergreen low growing forest by HUBER & RIINA (1997). On most tepuis, between about 1600 and 2200 m elevation, there is a belt of low upper montane forest that usually extends along the higher slopes until it reaches the base of the vertical cliffs; this is the case of the cloud forest at El Peñón (Fig. 10) on Auyán Tepui, characterized by a very high frequency of orographic mist during most of the year. Predominant plants are members of the families Theaceae, Podocarpaceae, Magnoliaceae, Cunoniaceae, and Araliaceae. Tree trunks and branches are covered densely by lichens, mosses, ferns, and other epiphytes. The understory is also very dense with Xyridaceae, Cyperaceae, Bromeliaceae, and bambusoid grasses, as well as numerous low shrubs. Similar habitat also occurs on the summits of some tepuis, where there are no vertical rock walls separating the summit from the slopes; this is the case of El Dragón (Fig. 11), also on Auyán Tepui, where there is a low evergreen high tepui forest that grows mostly on organic substrates (peat) overlying sandstone, with plants between 6 and 12 m high (COSTA *et al.* 2020: 34–35).



Figure 10. Upper montane evergreen low growing cloud forest at El Peñón, Auyán Tepui, Bolívar, Venezuela; photo by M. Costa



Figure 11. Low growing evergreen high tepui forest at El Dragón, Auyán Tepui, Bolívar, Venezuela; photo by M. Costa

Life history – Very little is known about the behaviour of this species. The few specimens of the type series were collected in flight or feeding on flowers; their flight is fast and deceptive, which makes capture difficult. It appears to be a rare butterfly. However, the fact that rather fresh wings of *Thaeides hyperion n. sp.* were found on the ground (probably remains of bird predation events)

in two different places (Auyán Tepui and Ptarií Tepui) (Figs. 12–13), indicates that perhaps it is more common than it appears to human observers and that the species is palatable to predators. In all our expeditions to the tepuis, it has been very rare to find fresh butterfly wings on the ground and this is the only case in which wings of the same species were found on two occasions. The presence of *Thaeides hyperion* n. sp. on the slope of Ptarií Tepui, where this species has never been seen alive, is confirmed by the finding of a single slightly worn male hindwing on the ground, extending its known distribution to the heights of the Sierra de Lema.



Figures 12–13. *Thaeides hyperion* n. sp., paratype male wings collected in the wild, showing left dorsal and right ventral surfaces. 12 = Campo Lecho, Auyán Tepui, 5. II. 2019, Costa (LPD # 369); 13 = Talud Ptarií Tepui, 1500 m, 15. XII. 2015, Costa (LPD # 368); photos by M. Costa

Genomic analysis – The analysis of protein-coding regions of autosomes in the nuclear genome, the Z chromosome, and the mitochondrial genome yields identical tree topologies (Fig. 14). *Thaeides muela* (Dyar, 1913) and *T. pyrczi* (Johnson, Le Crom & Constantino, 1997) form a sister clade to *T. theia* (which we define here as the *T. theia* species group, which is the genus *Thaeides* in strict sense; see Bálint 2022), in agreement with ROBBINS (2004b), who placed these species in *Thaeides*. In all three trees, *T. hyperion* n. sp. is sister to other sequenced members of the *T. theia* group and differs from them by 4.7–5.1% (31–34bp), being strongly differentiated genetically in all DNA regions. Furthermore, based on the

genetic differentiation shown in the nuclear, Z chromosome and mitochondrial trees (Fig. 14 a, b, c), *T. annandon* seems to be distinct from *T. theia*, although its status would have to be verified through a larger number of samples.

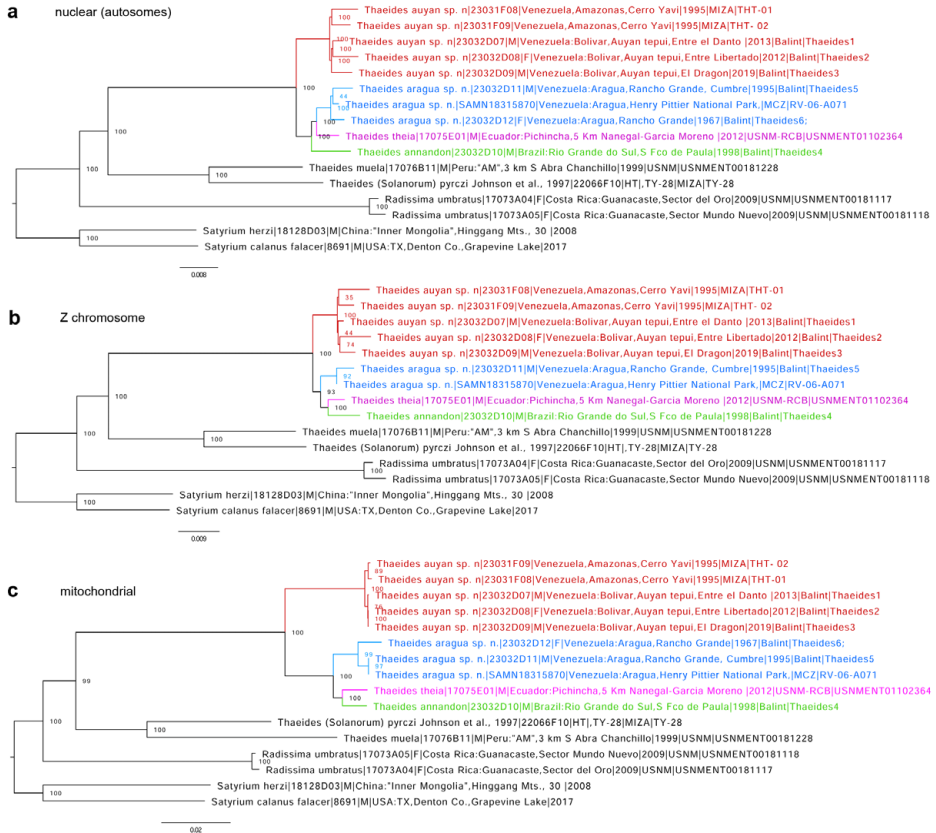


Figure 14. Phylogenetic trees of *Thaeides* and outgroups inferred from protein-coding regions of **a)** the nuclear genome (autosomes, 9,558,282 positions), **b)** the Z chromosome (227,031 positions, too few positions were sequenced in NVG-23032D12 to be included in this tree), and **c)** the mitochondrial genome. The sequence of SAMN18673399 is taken from the alignment provided by KAWAHARA *et al.* (2023). For each specimen, its species name is followed by the DNA sample number (without NVG- prefix), type status (if relevant; HT = holotype; PT = paratype), general locality, and year of collection (when known); compiled by N. Grishin

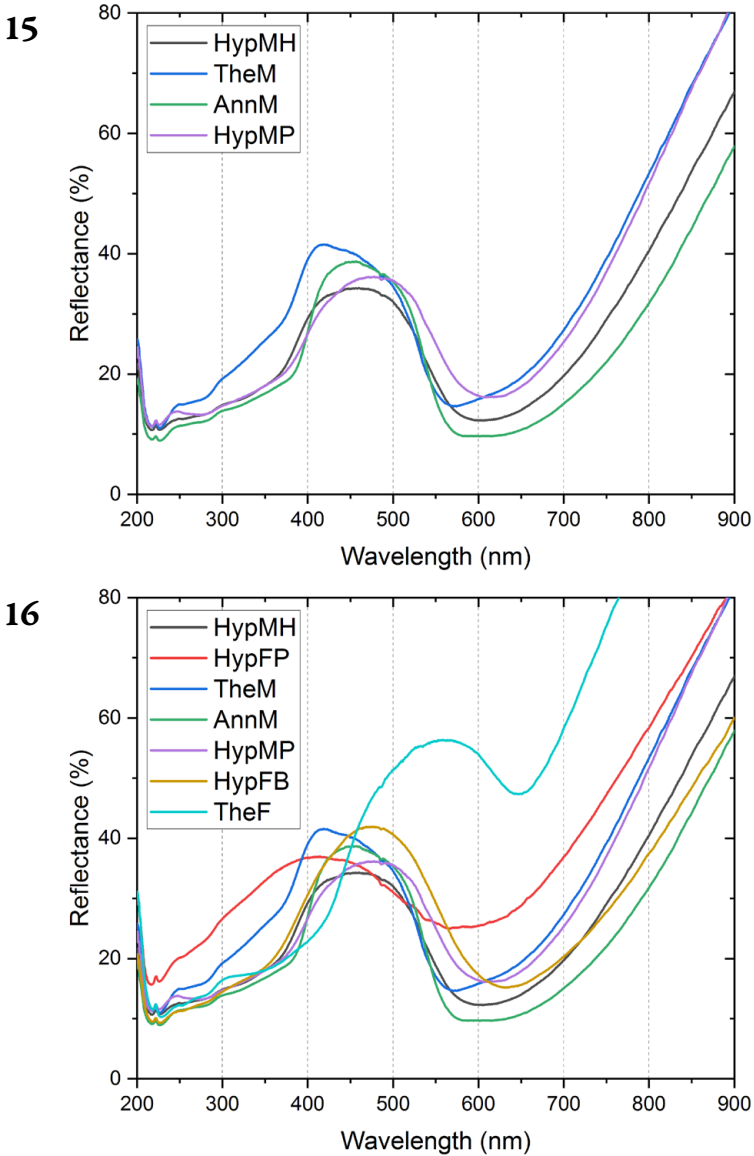
Diversity of Thaeides – Speciation among *T. theia* relatives needs further exploration. A recent study of Colombian *Thaeides* revealed an additional species in the Sierra Nevada de Santa Marta sympatric with *T. theia* (PRIETO *et al.* 2024), although not as strongly differentiated genetically as *T. hyperion* n. sp. The results provided by genetic analysis (Fig. 14), and spectral measurements (Figs. 15–16)

indicate that the Atlantic *Thaeides* population represents a distinct taxon. Many parallel cases of similar biogeographical patterns have been detected among the Papilionoidea, where the Atlantic forest representatives are divergent from their Pantepuian and even more from their Andean congeners; a few examples from the Lycaenidae are presented in Table 1.

Table 1. Examples of Panamerican Lycaenidae genera with divergent Atlantic representatives (according to the source given)

Genus	Atlantic species	Species in genus
<i>Arcas</i> Swainson, [1832]	<i>A. arcadia</i> Bálint, 2006, <i>A. ducalis</i> (Westwood, [1851])	10 (BÁLINT 2006)
<i>Atlides</i> Hübner, [1819]	<i>A. cosa</i> (Hewitson, [1867]), <i>A. mishma</i> D'Abbrera, 1995, <i>A. polama</i> (Schaus, 1902)	20 (ROBBINS 2004b)
<i>Denivia</i> Johnson, 1992	<i>D. chaluma</i> (Schaus, 1902), <i>D. curitabaensis</i> Johnson, 1992, <i>D. deniva</i> (Hewitson, [1874]), <i>D. espiritosanto</i> Bálint & Moser, 2007	16 (BÁLINT & MOSER 2007)
<i>Ipocia</i> Brévignon, 2000	<i>I. batesii</i> (Hewitson, [1865])	3 (BRÉVIGNON 2000)
<i>Lamprospilus</i> Geyer, [1832]	<i>L. japola</i> (Jones, 1912)	18 (WARREN <i>et al.</i> 2024)
<i>Paraspiculatus</i> Johnson & Constantino, 1997	<i>P. catrea</i> (Hewitson, [1874]), <i>P. hannelore</i> Bálint & Moser, 2001, <i>P. vossoroca</i> Bálint & Moser, 2001	17 (BUSBY <i>et al.</i> 2017)
<i>Theritas</i> Hübner, 1818	<i>T. drucei</i> (Lathy, 1926)	8 (BÁLINT <i>et al.</i> 2007)

Wing dorsal surface colouration – The dorsal wing surface of *Thaeides hyperion n. sp.* males is blue, having normalized SP 465 nm (460 nm and 470 nm measured in two specimens) with a reflectance slightly less than 40%. The *T. hyperion n. sp.* spectrum shape is relatively flat, similar to that of *T. annandon*, but the latter specimen is more reflective and has a somewhat darker blue with SP 450 nm, therefore it shows a slightly different shape. The shape of the spectrum of the Aragua *T. theia* male differs from others. It has a steep side below 400 nm and a sharp peak at 410 nm, then the spectrum has a wide plateau smoothly descending to 500 nm (Fig. 15). This northern Venezuelan population has a characteristic female with the most different spectrum (Figs. 15–16), which may indicate a distinct taxonomic status.



Figures 15–16. Normalized dorsal forewing spectra of *Thaeides* species. In Figure 15 only males are shown for clarity, in Figure 16 male and female spectra are shown together. HypMH= *T. hyperion* n. sp., male (holotype); HypFP= *ditto*, female (purple morph); TheM= *T. theia*, male (Venezuela: Aragua); AnnM= *T. annandon*, male; HypMP= *T. hyperion* n. sp., male (paratype); HypFB= *T. hyperion* n. sp., female (blue morph); TheF= *T. theia*, female (Venezuela: Aragua); compiled by K. Kertész

Three of the four known *Thaeides hyperion* n. sp. female individuals have a dorsal wing surface ground colour that is similar to the male as evidenced by the specimens measured. The difference between the sexes is the degree of reflectance, which seems to be higher in the female. Notably, there is a purple-coloured female specimen with a spectrum characteristically shaped with a SP just over 400 nm and a 40% reflectance. Probably, there are two colour morphs of *T. hyperion* n. sp. female, a hypothesis that should be tested by additional sampling. Nevertheless, the females of the Andean and northern Venezuelan (Aragua) populations are green coloured with very high reflectance (Fig. 16, D'ABRERA 1995: 1127; PRIETO *et al.* 2024: fig. 5), which facilitates the distinction of *T. hyperion* n. sp. females.

*

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**A pántepui lepkéi, XVI. rész:
A *Thaeides* Johnson, Kruse & Kroenlein, 1997 génusz új faja
(Lycaenidae: Theclinae: Eumaeini)**

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Összefoglalás – A Guyana-pajzs táblahegyeinek (tepui) magaslatán gyűjtött példányok alapján új nappali lepkefaj (Lepidoptera: Papilionoidea) kerül leírásra: *Thaeides hyperion* Bálint, Costa & Grishin, n. sp. (Lycaenidae: Theclinae: Eumaeini = Lángszinérfélék: Farkröpérfarmák: Farkincás-rokonúak). A hegyvidéki területekhez való alkalmazkodása miatt valószínűleg a Pántepui állatföldrajzi tartomány endemikus faja. 16 ábrával, egy táblázzal.

Kulcsszavak – Auyán Tepui, Brazília, endemizmus, nemi szervek morfológiája, molekuláris analízis, Ptarí Tepui, spektrális jellemzők, szárnytöredékek, Yaví Tepui, Venezuela

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ÁBRA ÉS TÁBLAMAGYARÁZATOK

1–3. ábrák. *Thaeides hyperion* n. sp. típuspéldányok, a szárnyak felszíne (fenti kép) és fonákja (alsó kép) (méretléc: 1 cm). 1 = hím holotípus (LPD # 311); 2 = allotípus (nőstény) (LPD # 81); 3 = hím paratípus (LPD # 306); képek: Katona Gergely.

4–6. ábrák. *Thaeides* példányok, a szárnyak felszíne (fenti kép) és fonákja (alsó kép) (méretléc: 1 cm). 4 = hím *T. theia* (Venezuela, Aragua); 5 = nőstény, *ditto*, female; 6 = hím *T. annandon*, (Brazília, Rio Grande do Sul); képek: Katona Gergely.

7–8. ábrák. *Thaeides hyperion* n. sp. ivarszervek oldalnézetben. 7 = hím; 8 = nőstény; méretléc: 1.2 mm; képek: Bálint Zsolt, összeállította: Katona Gergely.

9. ábra. A *Thaeides hyperion* n. sp. ismert elterjedése (fehér pöttyök piros gyűrűvel); összeállította: Mauro Costa.

10. ábra. Táblahegy lábánál alacsonyan növő örökzöld esőerdő: Venezuela, Bolívar, Auyán Tepui, El Peñón; kép: Mauro Costa.

11. ábra. Táblahegy tetején alacsonyan növő örökzöld erdő: Venezuela, Bolívar, Auyán Tepui, El Dragón; kép: Mauro Costa.

12–13. ábrák. Szabadban gyűjtött *Thaeides hyperion* n. sp. paratípus hím szárnyak felszíne (bal oldal) és fonákja (jobb oldal). 12 = jobb elülső szárny, Campo Lecho, Auyán Tepui, 2019. II. 5., Costa (LPD # 369); 13 = bal hátulsó szárny, Talud Ptarí Tepui, 1500 m, 2015.XII.15, Costa (LPD # 368); képek: Mauro Costa.

14. ábra. A *Thaeides* génusz és kulcsoportjainak fehérjekódolól régiókból kikövetkeztetett filogenetikus fái; a = nukleáris genomból (autoszómák, 9 558 282 pozíció); b = Z kromoszómából (227 031 pozíció, túl kevés pozíciót szekvenáltak az NVG-23032D12-ben ahhoz, hogy bekerüljenek ebbe a fába); c = a mitokondriális genom. A SAMN18673399 szekvenciáját a KAWAHARA és munkatársai (2023) által megadott illesztésből vettük. A *T. theia* csoport fajait különböző színekkel ábrázoltuk. Minden példány esetében a fajnevet követi a DNS-minta száma (NVG-előtag nélkül), a típus jellege (HT = holotípus és PT = paratípus), az általános lelőhely és a gyűjtés éve (ha ismert); összeállította: Nick Grishin.

15–16. ábrák. *Thaeides* fajok elülső szárnyainak felszínén mért normalizált spektrumok. Az áttekinthetőség kedvéért a 15. ábrán csak a hímek, a 16. ábrán a hím és nőstény spektrumok együtt láthatók. HypMH = *T. hyperion* n. sp., hím (holotípus); HypFP = u. a., nőstény (lila változat); TheM = *T. theia*, hím (Venezuela: Aragua); AnnM = *T. annadon*, hím; HypMP = *T. hyperion* n. sp., hím (paratípus); HypFB = *T. hyperion* n. sp., nőstény (kék változat); TheF = *T. theia*, nőstény (Venezuela: Aragua). Összeállította: Kertész Krisztián.

1. táblázat. Pánamerikai elterjedésű Lángszinérfélék (Lycaenidae) nemzetségei, különösképpen eltérő atlantikus fajokkal (a megadott források szerint).