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## Taxonomic notes on *Wahydra* Steinhauser (Hesperiidae, Hesperinae, Anthoptini) with description of four new species

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### Abstract

The genus *Wahydra* Steinhauser, 1991 was classified as Anthoptini together with other eight genera, based on the shape of the brand, hind tibial spurs and male genitalia. Species of *Wahydra* are scarcely represented in collections, therefore the taxonomic knowledge of the genus remains poorly explored. Aiming to contribute to the recognition and organization of the diversity of *Wahydra*, in the present study, four new species: *Wahydra trinitas* Henao, Mielke, Carneiro & Casagrande **sp. nov.**, *Wahydra curtis* Mielke, Henao, Carneiro & Casagrande **sp. nov.**, *Wahydra shueyi* Carneiro, Henao, Mielke & Casagrande **sp. nov.**, and *Wahydra mapiriensis* Casagrande, Henao, Carneiro & Mielke **sp. nov.**; are described. In addition *Dalla curia* Evans, 1955 is considered a **syn. nov.** of *Wahydra tassa* Evans, 1955, and *Wahydra obscura* is recognized as a **syn. nov.** of *Wahydra ekka* Evans, 1955 **comb. nov.** Male genitalia is illustrated for all species, except for *Wahydra dores* (Bell, 1959) and *Wahydra thisbe* (Hayward, 1942). The female and genitalia of *Wahydra vola* (Evans, 1955) are described and illustrated here for the first time.

**Key words:** taxonomy, skippers, Anthoptini, genitalia, biological collections

### Introduction

Anthoptini is a tribe of skippers recently established by molecular and morphological phylogeny (Warren *et al.* 2009). As its phylogenetic relationships remain controversy and no putative synapomorphy was assigned to the tribe (Warren *et al.* 2008, 2009), its exact delimitation is still poorly known. On the other hand, Anthoptini members were diagnosed by bifurcated male valvae, whose harpe is hooked-shaped, upturned, and distally dentate (Warren *et al.* 2009).

*Wahydra* Steinhauser, 1991 was classified as Anthoptini together with eight other genera, based primarily on these male genitalia characters (Warren *et al.* 2009). Steinhauser (1991), described *Wahydra*, along with three new species, based on the conspicuous brands on male wings and hind tibial spurs, and shifted six species previously assigned to *Zalomes* Bell, 1947 into the genus. Although they are abundant in high altitude habitats, specimens of *Wahydra* are scarcely represented in worldwide collections (Steinhauser 1991).

As a result, taxonomic information of the group is still briefly explored, e.g. many taxa are known from a few specimens and/or females are unknown. Observing a considerable number of non-identified specimens in the entomological collection in the Departamento de Zoologia of Universidade Federal do Paraná, the present contribution aims to describe new species of *Wahydra*, verify the validity of some available taxa, and finally enhance the descriptions and illustrations of this poorly known skipper group.

### Methods

Specimens used in this study are deposited in: DZUP (Departamento de Zoologia, Universidade Federal do Paraná,

Curitiba), OM (private collection Olaf Mielke, Curitiba) and CEH (private collection Efraín Henao, Manizales-Colombia). Additionally, types of *Wahydra* taxa deposited in the following institutions: AMNH (American Museum of Natural History, New York), BMNH (British Museum of Natural History Museum, London); IMLA (Fundacion e Instituto Miguel Lillo, Tucuman), and MGCL (McGuire Center for Lepidoptera and Biodiversity, Gainesville, including the collection of AME—Allyn Museum of Entomology).

Genitalia of both sexes were prepared with standardized methods and illustrated. Scales sizes 1mm. Abbreviations: DFW—dorsal forewing; DHW—dorsal hindwing; VFW—ventral forewing; VHW—ventral hindwing. Size is given as the measure of forewing.

## Results

### *Wahydra* Steinhauser, 1991

*Wahydra* Steinhauser, 1991. **Bull. Allyn Mus.** 132: 30; type-species: *Pamphila kenava* Butler, 1870.—Lamas, 2003. **Marip. Machu Picchu**, p. 30.—Mielke, 2004. Hesperioidea, p. 84, *in* Lamas (ed.). **Checklist: Part 4A, Hesperioidea-Papilionoidea**, *in* Heppner (ed.). **Atlas Neotrop. Lep.** 5A.—Mielke, 2005. **Cat. Amer. Hesperioidea** 5, p. 1362.—Warren; Ogawa & A. Brower, 2008. **Cladistics** 24: 27.—Warren; Ogawa & A. Brower, 2009. **Syst. Ent.** 34: 498, 516. *Wahydra* sp. Orellana, 2003, *in* Andressen & Monasterio. **Mem. IV Simp. Intern. Des. Sust. Andes**, Mérida, p. 5-61.

**Diagnosis. Male:** Genus traditionally recognized by the presence of orange bands on both DFW and DHW, though some species have those bands reduced. *Anthoptus* Bell, 1942, *Corticea* Evans, 1955, *Cantha* Evans, 1955 and *Zalomes* Bell, 1947 (genera of Anthoptini); *Lento* Evans, 1955, *Vinius* Godman, 1900, *Vinpeius* Austin, 1997 (genera of Moncini), *Molo* Godman, 1900, *Misius* Evans, 1955, and *Racta* Evans, 1955 (genera of Hesperini), all present such orange bands, but lack the elongated tripartite or bipartite band on male DFW. Other genera of Hesperini might also present such bands, but have shorter antennae and/or flatten palp. Additionally, the presence and development of lateral projections in the arms of tegumen besides the gnathos have not been seen in these genera.

**Description. Male:** Forewing length 10.5–14mm. Eyes red. Vertex black scattered with yellowish to range scales. Antennae longer than 1/2 costa; antennal club short (1/4 shaft), shaft ventrally yellowish in basal portion or on whole ventral surface; nudum 12–14, on apiculus extended to the club. Palpus quadrate (inner edge equal to transverse width), second segment ventrally yellowish, third segment of medium length (around half of the second segment length), cylindrical. Thorax and legs black covered with long yellowish to orange scales; midtibiae spined; hindtibiae with two pairs of spurs. DFW marked with orange spots or bands; band thin or large, perpendicular to CuA<sub>1</sub>, extended from CuA<sub>1</sub> to 2A. VFW costal area and apical spots marked from ground color, either yellowish or orange; colored scales compact, present in entire costal area; apical spot contiguous with marginal band, sometimes also with costa; distal cellular spot faint or absent, opaque, yellowish; cell area different by variable yellowish or orange spot. DHW marked with yellowish to orange discal bands, or completely dark brown. VHW yellowish to dark orange; reddish discal spot, yellowish bands and a marked yellowish streak in CuA<sub>2</sub>-2A are variably present according to the species. **Genitalia.** Median posterior apophyses of tegumen present, developed (almost the size or longer than the fenestra), thin or large (lobular), simple or bilobed; fenestra present, triangular or semicircular; lateral apophyses of tegumen present, symmetrical or asymmetrical, pointed, squared or rounded. Saccus reduced (shorter than tegumen length), lobed. Uncus symmetric or asymmetric, bifid (arms projected); arms medially separated with a pair of small spines on each tip. Gnathos developed, hooked with median membranous patch. Valvae symmetrical or asymmetrical, with dorso-posterior cleft dividing ampulla from harpe; sacculus triangular; harpe projected, hook-like, filled with spines on apex; ampulla thin (less than half of valva width), margin smooth. Aedeagus cylindrical, slightly shorter or longer than the saccus + valva length; coecum of aedeagus globular, short, curved or dorsally straight; dorso-posterior end of aedeagus hollowed, hollow long, extending anteriorly on aedeagus, until the of bulbus ejaculatorius; ventro-posterior end of aedeagus projected as a lobe, with lateral dorsal projections folded over the vesica opening; vesica without cornuti. Fultura inferior directed dorsally and posteriorly; projections broad, extending only laterally of aedeagus; antero-ventral lobes reduced or absent.

## ***Wahydra kenava* (Butler, 1870)**

(Figs 1, 2, 27, 41)

- Pamphila kenava* Butler, 1870. **Trans. ent. Soc. London**, p. 506; Venezuela; collection Kaden *in* collection Druce.—Kirby, 1871. **Syn. Cat. Diurn. Lep.**, p. 656.—Godman, 1900, *in* Godman & Salvin. **Biol. Centr.-Amer., Lep.-Rhop.** 2, p. 579.—Godman, 1907. **Ann. & Mag. Nat. Hist. (7)20**: 144; *syn.*: *myrona*.
- Cyclopidides* or *Carterocephalus kenava*; Kirby, 1879. **Cat. Coll. Diurn. Lep. Hewitson**, p. 234.
- Hesperia myrona* Plötz, 1883. **Stett. ent. Ztg.** 44: 201; Venezuela.
- (no genus) *myrona*; Beattie, 1976. **Rhop. Direct.**, p. 207.
- Apaustus konava* [*sic*]; Plötz, 1884. **Stett. ent. Ztg.** 45: 166.
- Butleria kenava*; Plötz, 1884. **Stett. ent. Ztg.** 45: 295.
- Molo kenava*; Mabille, 1904, *in* Wytzman. **Gen. Ins.** 17, p. 158.—Draudt, 1923, *in* Seitz. **Gross-Schmetf. Erde** 5, p. 977, pl. 188b (d); *syn.*: *myrona*.—Hayward, 1942. **Rev. Ent.**, Rio de Janeiro, 12: 530, fig. 12 (male gen.).—Williams & Hayward, 1944. **Acta zool. Lill.** 2: 211; *syn.*: *myrona*.—Bell, 1946. **Bol. Ent. venezol.** 5: 168; *syn.*: *myrona*.—Hayward, 1947. **Acta zool. Lill.** 4: 355; *syn.*: *myrona*.—Hughes, 1962. **Entomol.** 95: 73.
- Zalomes kenava kenava*; Evans, 1955. **Cat. Amer. Hesp.** 4, p. 68, pl. 58 (male gen.); *syn.*: *myrona*.
- (no genus) *kenava*; Beattie, 1976. **Rhop. Direct.**, p. 176.
- (no name) Raymond, 1982. **Marip. Venezuela**, pl. 15, fig. 17 (d, v).
- Zalomes kenava*; Bridges, 1983. **Lep. Hesp.** 1, p. 61, 79; 2, p. 40; *syn.*: *myrona*.—Bridges, 1988. **Cat. Hesp.** 1, p. 96, 125, 184, 187; 2, p. 66; *syn.*: *myrona, tassa, thisbe*.
- Wahydra kenava*; Steinhauser, 1991. **Bull. Allyn Mus.** 132: 32, figs 37 (venation), 87 (male gen.), 108 (female gen.).—Bridges, 1994. **Cat. Fam.-Group, Gen.-Group, Sp. Group Nam. Hesp. (Lep.) World** 7, p. 3; 8, p. 115, 150; 9, p. 74; *syn.*: *myrona*.—Mielke, 2004. Hesperioidea, p. 84, *in* Lamas (ed.). **Checklist: Part 4A, Hesperioidea-Papilionoidea**, *in* Heppner (ed.). **Atlas Neotrop. Lep.** 5A; *syn.*: *myrona, konava*.—Mielke, 2005. **Cat. Amer. Hesperioidea** 5, p. 1363; *syn.*: *myrona, konava*.

**Diagnosis. Male:** Forewing length 11–11.5mm. Nudum 13. DFW brand slim; subapical spot yellowish, in  $R_4-M_1$ . VFW costal area, apical spot and marginal band homogeneous yellowish. VHW with four nonaligned reddish discal spots in  $Rs-CuA_2$ , plus reddish faint markings closer to margin in  $Sc-CuA_2$ . Median apophyses of tegumen developed, large, bilobed; lateral projections pointed. Harpe thin, curved. Ventro-posterior end of aedeagus triangular-shaped.

**Studied material:** Colombia 1 male, no data (DZUP 11.129); Venezuela, Aragua, Colonia Tovar, 2000m, 12-VII-1981. Mielke & Casagrande leg. 3 males (DZUP 29.908, DZUP 29.909, DZUP 29.910)

**Type:** There is a syntype male in BMNH, here designated as lectotype aiming to give atability to the name, with the following labels: Type / Type H T / Druce Coll. Kaden Coll / *P. kenava* Butl. Type / *Pamphila kenava*, Type. Butl. / ♂ / Genus ? *kenava*, Butl. Godman-Salvin Coll. 1914.-5. / Venezuela. Druce Coll. / Compared with Plotz's drawing of *myrina* Plötz / Photo AA / 76 / BMNH(E) #806107 /; therefore, also the following label will be added and sent to the curator: /Lectotypus/ Lectotype *Pamphila kenava* Butler, 1870 Henao, Carneiro, Mielke & Casagrande, 2014/.

## ***Wahydra bella* (Hayward, 1939)**

(Figs 3, 4, 28, 42)

- Phlebodes bella* Hayward, 1939. **An. Soc. cient. arg.** 126: 455, fig. 26 (male gen.); holotype male, Rio Ochuna, Tucumán, Argentina; collection Hayward.—Hayward, 1941. **Rev. Mus. La Plata, n. s., Zool.** 2: 312.—Hayward, 1950. **Gen. Sp. Anim. Arg.** 2, p. 200, 201, pls 9, fig. 1 (male gen.), 21, fig. 12 (d).—Hayward, 1964. **Acta zool. Lill.** 19: 323.
- Zalomes kenava bella*; Evans, 1955. **Cat. Amer. Hesp.** 4, p. 69.—Hayward, 1973. **Op. Lill.** 23: 65.—Bridges, 1983. **Lep. Hesp.** 1, p. 15; 2, p. 40.—Bridges, 1988. **Cat. Hesp.** 1, p. 23; 2, p. 66. (no genus) *bella*; Beattie, 1976. **Rhop. Direct.**, p. 94.
- Wahydra bella*; Steinhauser, 1991. **Bull. Allyn Mus.** 132: 33.—Bridges, 1994. **Cat. Fam.-Group, Gen.-Group, Sp. Group Nam. Hesp. (Lep.) World** 8, p. 28; 9, p. 74.—Mielke, 2004. Hesperioidea, p. 84, *in* Lamas (ed.). **Checklist: Part 4A, Hesperioidea-Papilionoidea**, *in* Heppner (ed.). **Atlas Neotrop. Lep.** 5A.—Mielke, 2005. **Cat. Amer. Hesperioidea** 5, p. 1362.

**Diagnosis. Male:** Forewing length 11.5–12mm. Nudum 12–13. DFW brand large; subapical spot orange, in  $R_4-M_1$ . VFW costal area, apical spot and marginal band homogeneous yellowish. VHW with yellowish discal bands plus a

marked streak in CuA<sub>2</sub>-2A. Median apophyses of tegumen developed, large, simple; lateral projections pointed. Harpe large, curved. Ventro-posterior end of aedeagus truncated.

**Studied material:** Argentina, Salta, Chorrillos, 2280m, 22-II-2000, A. Varga, 1 male, OM 51.261; Salta, Toldos, 20-II-1960, Golbach leg., 1 male, DZUP 29.905; Jujuy, Las Lancitas, 4-II-2006, Klimaitis leg., 1 male, DZUP 29.907; Tucumán, Tafi Viejo, Horco Molle, 800m, 1 male, DZUP 29.904.

**Type:** Holotype male in IML

### ***Wahydra nieblensis* Steinhauser, 1991**

(Figs 5, 6, 29, 43)

*Wahydra nieblensis* Steinhauser, 1991. **Bull. Allyn Mus.** 132: 35, figs 42–45 (male, female d, v), 89 (male gen.), 110 (female gen.); holotype male, VIII-1971, Niebli, NW slope Vol. Pichincha, Pichincha, Ecuador, 3500 m, R. de Lafebre leg.; AME, transferred to MGCL.—Bridges, 1994. **Cat. Fam.-Group, Gen.-Group, Sp. Group Nam. Hesp. (Lep.) World** 8, p. 154; 9, p. 754.—Mielke, 2004. *Hesperioidea*, p. 84, *in* Lamas (ed.). **Checklist: Part 4A, Hesperioidea-Papilionoidea**, *in* Heppner (ed.). **Atlas Neotrop. Lep. 5A**.—Mielke, 2005. **Cat. Amer. Hesperioidea** 5, p. 1363.

**Diagnosis. Male:** Forewing length 10.5mm. Nudum 12. DFW brand large, subapical spot yellowish, in R<sub>5</sub>-M<sub>1</sub>. VFW costal area, apical spot and marginal band homogeneous yellowish. VHW with faint yellowish discal band and streak in CuA<sub>2</sub>-2A. Median apophyses of tegumen developed, large, simple, with a proximal constriction; lateral processes pointed. Harpe thin, curved. Ventro-posterior end of aedeagus truncated.

**Type:** Holotype male in MGCL.

**Studied material:** Colombia, Antioquia, Cerro del Padre Amaya, 2500m, 18-XII-1989, 1 male, OM 50.981; Antioquia, Envigado, 2200m, 18-I-1989, 1 male, OM 51.142.

### ***Wahydra ekka* (Evans, 1955) comb. nov.**

(Figs 7, 8, 30, 44)

*Moeris ekka* Evans, 1955. **Cat. Amer. Hesp.** 4, p. 151, pl. 63 (male gen.); [holo]type male, Ecuador, ex coll. Hewitson; (BM(NH)).—Bridges, 1983. **Lep. Hesp.** 1, p. 1. 38; 2, p. 21.—Bridges, 1988. **Cat. Hesp.** 1, p. 59; 2, p. 34.—Bridges, 1994. **Cat. Fam.-Group, Gen.-Group, Sp. Group Nam. Hesp. (Lep.) World** 8, p. 71; 9, p. 38.—Mielke, 2004. *Hesperioidea*, p. 72, *in* Lamas (ed.). **Checklist: Part 4A, Hesperioidea-Papilionoidea**, *in* Heppner (ed.). **Atlas Neotrop. Lep. 5A**.—Mielke, 2005. **Cat. Amer. Hesperioidea** 5, p. 1074.

(no genus) *ekka*; Beattie, 1976. **Rhop. Direct.**, p. 134

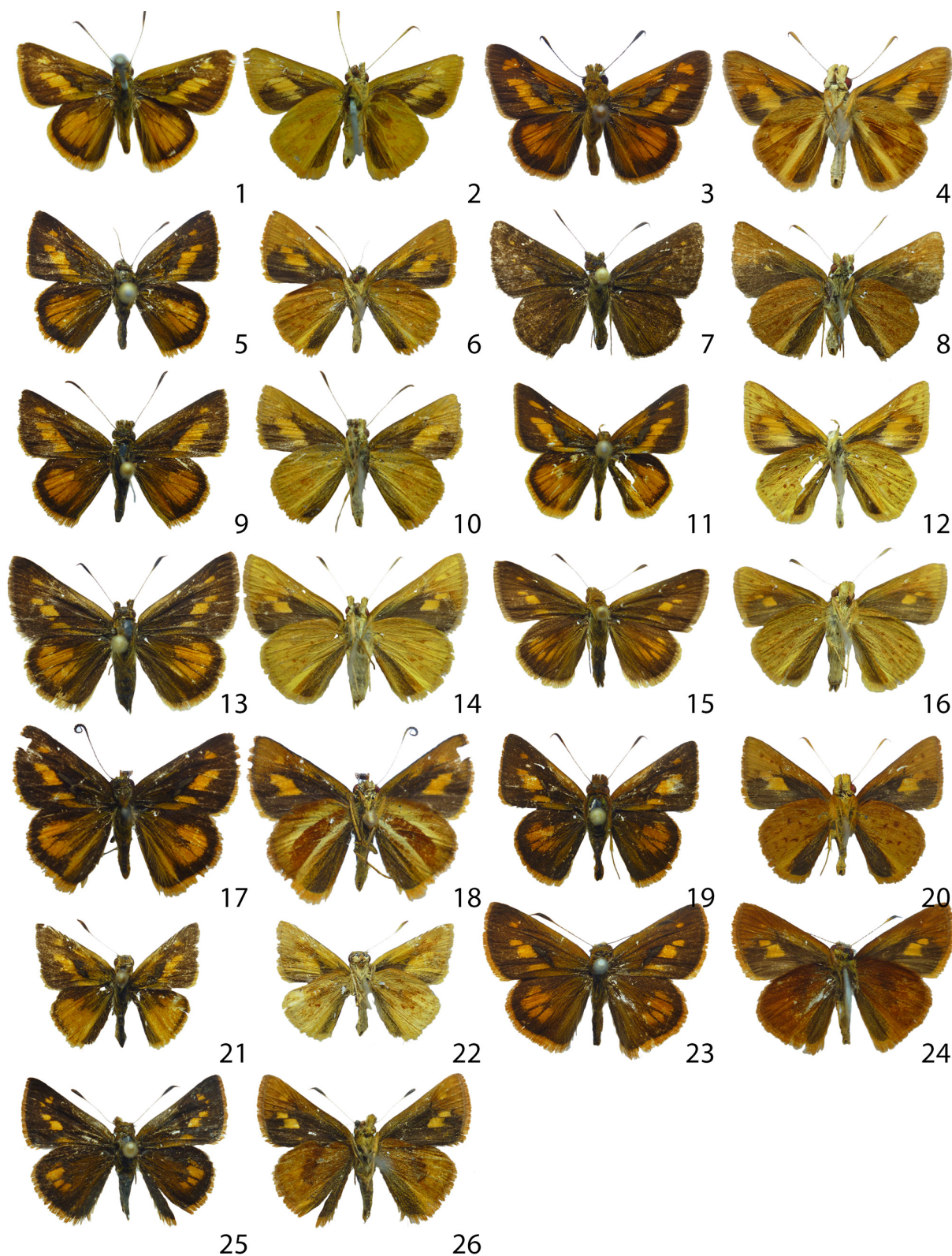
*Wahydra obscura* Steinhauser, 1991. **Bull. Allyn Mus.** 132: 36, figs 46–49 (male, female d, v), 90 (male gen.), 111 (female gen.); holotype male, IV-1971, Rio Mulatos, Cotopaxi, Ecuador, 3800 m, R. de Lafebre leg.; AME.—Bridges, 1994. **Cat. Fam.-Group, Gen.-Group, Sp. Group Nam. Hesp. (Lep.) World** 8, p. 159; 9, p. 74.—Mielke, 2004. *Hesperioidea*, p. 84, *in* Lamas (ed.). **Checklist: Part 4A, Hesperioidea-Papilionoidea**, *in* Heppner (ed.). **Atlas Neotrop. Lep. 5A**.—Mielke, 2005. **Cat. Amer. Hesperioidea** 5, p. 1363; *New synonymy*.

**Diagnosis. Male:** Forewing length 12.5mm. Nudum 13. Wings dorsally dark brown, without bands, though only reduced orange spots in M<sub>3</sub>-CuA<sub>2</sub>. DFW brand thin; subapical spot also reduced, orange, in R<sub>5</sub>-M<sub>1</sub>. VFW costal area, apical spot and marginal band homogeneous orange. VHW ground color dark orange, with faint discal reddish spots. Median apophyses of tegumen developed, large, simple; lateral projections square. Uncus and valvae asymmetric, both with longer projections on the right side. Harpe large, sharply angled. Ventro-posterior end of aedeagus lobed, triangular.

**Studied material:** Peru, Huánuco, Carpish, 2800m, III-1997, Büche leg, 1 male, OM 46.834.

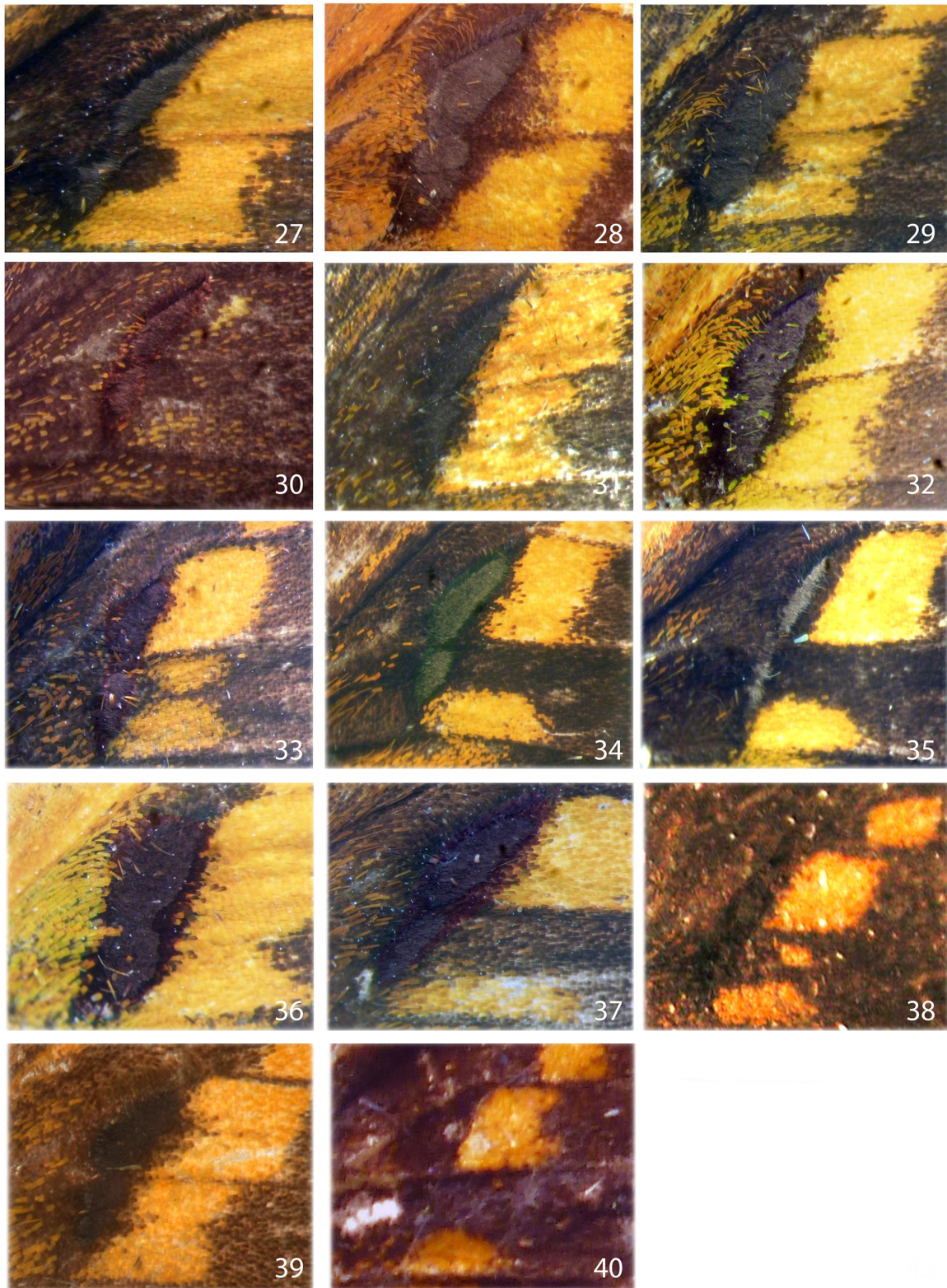
**Types:** Holotype male of *Moeris ekka* in BMNH and holotype male of *Wahydra obscura* in MGCL.

**Remarks.** The study of the holotypes of *Moeris ekka* and *Wahydra obscura* confirmed this new synonymy. The description of *M. ekka* Evans, 1955 is similar to *W. obscura*, additionally, both brands are practically identical and the genital structures are not considerably different (see Warren *et al.*, 2013).

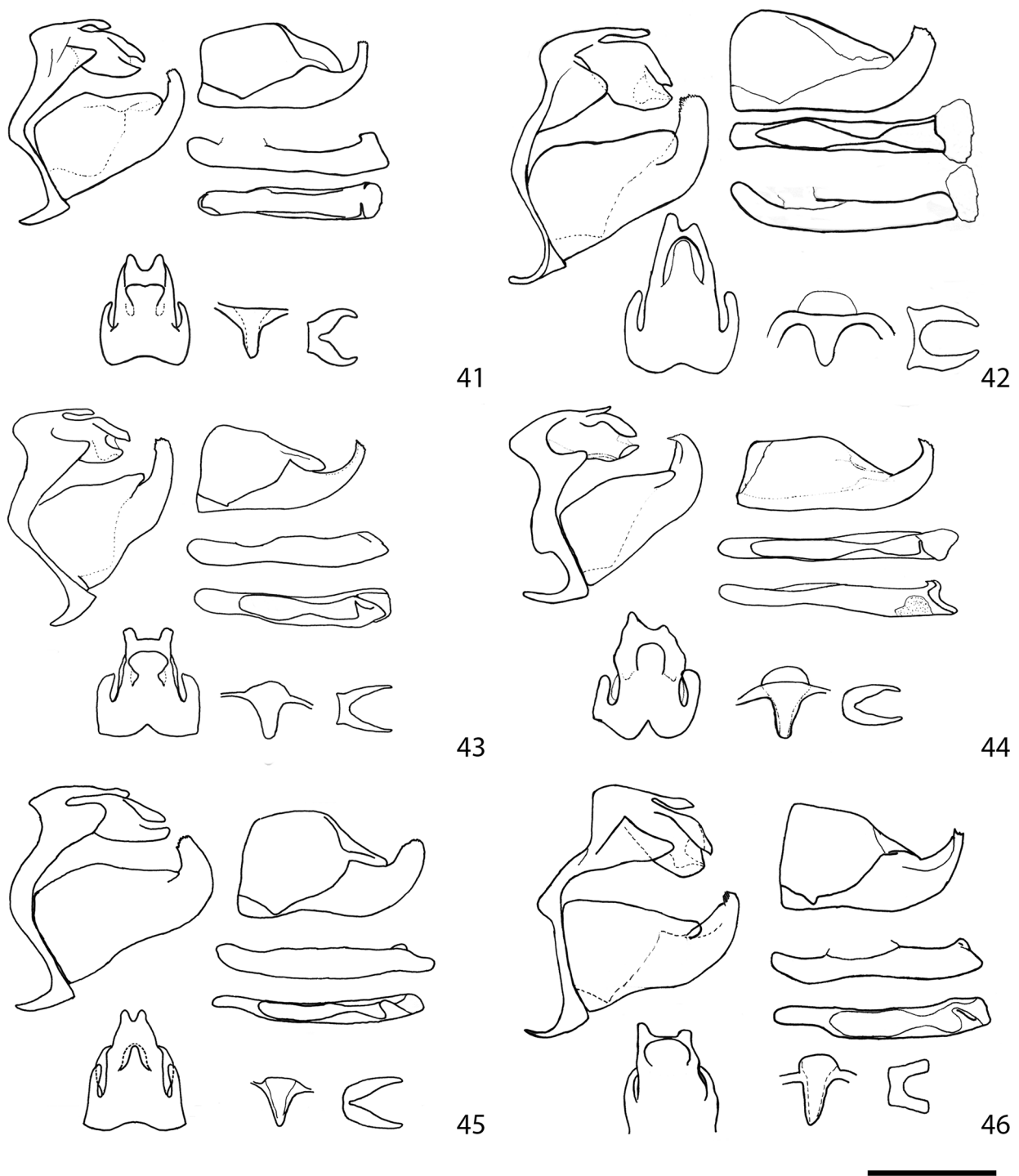


**FIGURES 1–26.** Dorsal and ventral views of *Wahydra* Steinhauser, 1991 species. Figs 1–2: *Wahydra kenava* (Butler, 1870); Figs 3–4: *Wahydra bella* (Hayward, 1939); Figs 5–6: *Wahydra nieblensis* Steinhauser, 1991; Figs 7–8: *Wahydra ekka* (Evans, 1955) **comb. nov.**; Figs 9–10: *Wahydra subhebetis* Steinhauser, 1991; Figs 11–12: *Wahydra tassa* (Evans, 1955); Figs 13–16: *Wahydra vola* (Evans, 1955) (male left, female right); Figs 17–18: *Wahydra trinitas* Henao, Carneiro, Mielke & Casagrande **sp. nov.** (Holotype); Figs 19–20: *Wahydra curtis* Mielke, Henao, Carneiro & Casagrande **sp. nov.** (Paratypus); Figs 21–22: *Wahydra shueyi* Carneiro, Henao, Mielke & Casagrande **sp. nov.** (Paratypus); Figs 23–24: *Wahydra mapiriensis* Casagrande, Henao, Carneiro & Mielke **sp. nov.** (Holotype); Figs 25–26: *Wahydra* sp. (unidentified female).





**FIGURES 27–40.** Right dorsal forewing of the male of *Wahydra* Steinhauser, 1991 species, showing general aspect of brands (27–39). Fig. 27: *Wahydra kenava* (Butler, 1870); Fig. 28: *Wahydra bella* (Hayward, 1939); Fig. 29: *Wahydra nieblensis* Steinhauser, 1991; Fig. 30: *Wahydra ekka* (Evans, 1955) **comb. nov.**; Fig. 31: *Wahydra subhebetis* Steinhauser, 1991; Fig. 32: *Wahydra tassa* (Evans, 1955); Fig. 33: *Wahydra vola* (Evans, 1955); Fig. 34: *Wahydra trinitas* Carneiro, Mielke & Casagrande **sp. nov.** (Holotype); Fig. 35: *Wahydra curtis* Mielke, Henao, Carneiro & Casagrande **sp. nov.** (Paratype); Fig. 36: *Wahydra shueyi* Carneiro, Henao, Mielke & Casagrande **sp. nov.** (Holotype); Fig. 37: *Wahydra mapiriensis* Casagrande, Henao, Carneiro & Mielke **sp. nov.** (Holotype); Fig. 38: *Wahydra dores* (Bell, 1959); Fig. 39: *Wahydra thisbe* (Hayward, 1942); Fig. 40: *Wahydra* sp. (unidentified female) dorsal discal spots.



**FIGURES 41–46.** Male genitalia of *Wahydra* Steinhauser, 1991 species. Fig. 41: *Wahydra kenava* (Butler, 1870); Fig. 42: *Wahydra bella* (Hayward, 1939); Fig. 43: *Wahydra nieblensis* Steinhauser, 1991; Fig. 44: *Wahydra ekka* (Evans, 1955) **comb. nov.**; Fig. 45: *Wahydra subhebetis* Steinhauser, 1991; Fig. 46: *Wahydra tassa* (Evans, 1955).

***Wahydra subhebetis* Steinhauser, 1991**  
(Figs 9, 10, 31, 45)

*Wahydra subhebetis* Steinhauser, 1991. **Bull. Allyn Mus.** 132: 33, figs 38–41 (male, female d, v), 88 (male gen.), 109 (female gen.); holotype male, 3-V-1974, La Linea (Quindio Pass), Tolima-Quindio, Colombia, 3100 m, S. R. & L. M. Steinhauser

leg.; AME.—Bridges, 1994. **Cat. Fam.-Group, Gen.-Group, Sp. Group Nam. Hesp. (Lep.) World 8**, p. 215; **9**, p. 74.—Mielke, 2004. Hesperioidea, p. 84, *in* Lamas (ed.). **Checklist: Part 4A, Hesperioidea-Papilionoidea**, *in* Heppner (ed.). **Atlas Neotrop. Lep. 5A**.—Mielke, 2005. **Cat. Amer. Hesperioidea 5**, p. 1363.—González M. & Andrade-C., 2008. **Rev. Acad. Colomb. Cienc. 32(124)**: 430.

**Diagnosis. Male:** Forewing length 11.5–12mm. Nudum 13. DFW brand thin, subapical spot yellowish, reduced in  $R_4$ – $R_5$ , but developed in  $R_5$ – $M_1$ . VFW costal area, apical spot and marginal band homogeneous yellowish. VHW with fainted reddish discal spots and streak in  $CuA_2$ –2A. Median apophyses of tegumen developed, thin, simple; lateral processes pointed. Harpe large, sharply angled. Ventro-posterior end of aedeagus truncated.

**Studied material:** Ecuador, Tungurahua, Rio Blanco, V-1977, Lafebre leg, 1 male, DZUP 29.902; Colombia: Tolima-Quindio, La Linea, 3100m, 3-V-1974. S. R. & L. M. Steinhüser, 3 males, MGCL.

**Type:** Holotype male in MGCL.

### ***Wahydra tassa* (Evans, 1955)**

(Figs 11, 12, 32, 46, 56)

*Zalomes kenava tassa* Evans, 1955. **Cat. Amer. Hesp. 4**, p. 68; [holo]type male, interior of Colombia; BM(NH).—Bridges, 1983. **Lep. Hesp. 1**, p. 116; **2**, p. 40.

(no genus) *tassa*; Beattie, 1976. **Rhop. Direct.**, p. 270.

*Wahydra tassa*; Steinhüser, 1991. **Bull. Allyn Mus. 132**: 32.—Bridges, 1994. **Cat. Fam.-Group, Gen.-Group, Sp. Group Nam. Hesp. (Lep.) World 8**, p. 221; **9**, p. 74.—Mielke, 2004. Hesperioidea, p. 84, *in* Lamas (ed.). **Checklist: Part 4A, Hesperioidea-Papilionoidea**, *in* Heppner (ed.). **Atlas Neotrop. Lep. 5A**.—Mielke, 2005. **Cat. Amer. Hesperioidea 5**, p. 1363.

*Dalla curia* Evans, 1955. **Cat. Amer. Hesp. 4**, p. 44; [holo]type female, January 1918, environs of Bogota, Colombia; Frère Apollinaire-Marie; BM(NH).—Bridges, 1988. **Cat. Hesp., Annot. 5**, p. 2, 5.—Bridges, 1994. **Cat. Fam.-Group, Gen.-Group, Sp. Group Nam. Hesp. (Lep.) World 8**, p. 59; **9**, p. 20.—Bridges, 1994. **Cat. Fam.-Group, Gen.-Group, Sp. Group Nam. Hesp. (Lep.) World 8**, p. 71; **9**, p. 38.—Mielke, 2004. Hesperioidea, p. 59, *in* Lamas (ed.). **Checklist: Part 4A, Hesperioidea-Papilionoidea**, *in* Heppner (ed.). **Atlas Neotrop. Lep. 5A**.—Mielke, 2005. **Cat. Amer. Hesperioidea 6**, p. 1404; *New synonymy*.

(no genus) *curia*; Beattie, 1976. **Rhop. Direct.**, p. 120.

*Eumesia curia*; Bridges, 1983. **Lep. Hesp. 1**, p. 31; **2**, p. 13.—Bridges, 1988. **Cat. Hesp. 1**, p. 49; **2**, p. 22.

**Diagnosis. Male:** Forewing length 12mm. Nudum unknown. DFW apex pointed, brand large, subapical spot yellowish, large, in  $R_5$ – $M_1$ . VFW apical and marginal areas distinctly lighter than costa and cellular areas. VHW with several nonaligned reddish spots. Median apophyses of tegumen reduced, thin, simple; lateral processes pointed. Harpe thin, sharply angled. Ventro-posterior end of aedeagus truncated.

**Studied material:** Colombia, Cundinamarca, Guasca-Gachetá, 2500m 10-VII-1984, 1 male, DZUP 18.179. Facatativa, Vereda La Tribuna, Finca El Triunfo, 04°52'18.6"N 74°24'43.8"W, 2826m, 2-VII-2015, E. Henao leg., 1 female, CEH-085. Interior of Colombia, Wheeler leg., 1 male, BMNH. Colombia, Env. Bogotá, Frère Apollinaire Marie leg., 1918, 1 female, BMNH.

**Types:** Holotype male of *Zalomes kenava tassa* in BMNH and holotype female of *Dalla curia* in BMNH.

**Remarks.** The study of the holotypes of *Dalla curia* and *Zalomes kenava tassa* confirms the new synonymy. In reviewing the holotype of *Dalla curia* Evans, 1955 it was realized that the specimen antennae and wing markings are consistent with diagnostic characters of *Wahydra*. Additionally, its peculiar forewing apex and geographical distribution corroborate this new synonymy.

### ***Wahydra vola* (Evans, 1955)**

(Figs 13–16, 33, 47, 52 female)

*Zalomes kenava vola* Evans, 1955. **Cat. Amer. Hesp. 4**, p. 69; [holo]type male, IV-1904, dry season, Carabaya, S. E. Peru, G. Ockenden. leg.; BM(NH).—Bridges, 1983. **Lep. Hesp. 1**, p. 116; **2**, p. 40.—Bridges, 1988. **Cat. Hesp. 1**, p. 199; **2**, p. 66.

(no genus) *vola*; Beattie, 1976. **Rhop. Direct.**, p. 286.

*Wahydra vola*; Steinhüser, 1991. **Bull. Allyn Mus. 132**: 32.—Bridges, 1994. **Cat. Fam.-Group, Gen.-Group, Sp. Group Nam. Hesp. (Lep.) World 8**, p. 239; **9**, p. 74.—Lamas; Grados & Valencia, 1999. **Rev. peruana Ent. 41**: 3.—Lamas,



2003. **Marip. Machu Picchu**, p. 30, 178, 189, 214, fig. 57 (d).—Mielke, 2004. *Hesperioidea*, p. 84, *in* Lamas (ed.). **Checklist: Part 4A, Hesperioidea-Papilionoidea**, *in* Heppner (ed.). **Atlas Neotrop. Lep. 5A**.—Mielke, 2005. **Cat. Amer. Hesperioidea 5**, p. 1364.—Gareca *et al.*, 2006, *in* Gareca & Reichle. **Marip. diurn. Bolivia**, p. 25.

**Diagnosis. Male:** Forewing length 11.5–14mm. Nudum 13. DFW brand thin; subapical spot orange, in  $R_3$ - $M_1$ . VFW costal area, apical spot and marginal band homogeneous yellowish. VHW with faint yellowish discal bands and reddish discal spots. Median apophyses of tegumen developed, large, proximally constricted, simple; lateral projections pointed. Harpe thin, smoothly angled. Ventro-posterior end of aedeagus triangular. Lamella antevaginalis projected below ostium bursae, and with symmetrical triangular posterior projections besides the ostium bursae. Lobes of posterior margin of lamella postvaginalis large, medially shallow divided.

**Studied material:** Peru, Cuzco, Machu Picchu, Camino Inca, 2400m 22-26-X-2001, Mielke leg, 9 males, 2 females, OM 55.848, OM 55.960, OM 55.967, OM 56.016, OM 56.093, OM 56.107, OM 56.128, OM 56.135, OM 56.142, OM 56.247, OM 56.339; Urubamba, 28-VIII-1973, 1 female, DZUP 29.912; Puno, Carabaya, Limbani, dry S. 9500 ft, 04-04-?, G. Ockenden in BMNH.

**Type:** Holotype male in BMNH

***Wahydra trinitas* Henao, Carneiro, Mielke & Casagrande sp. nov.**

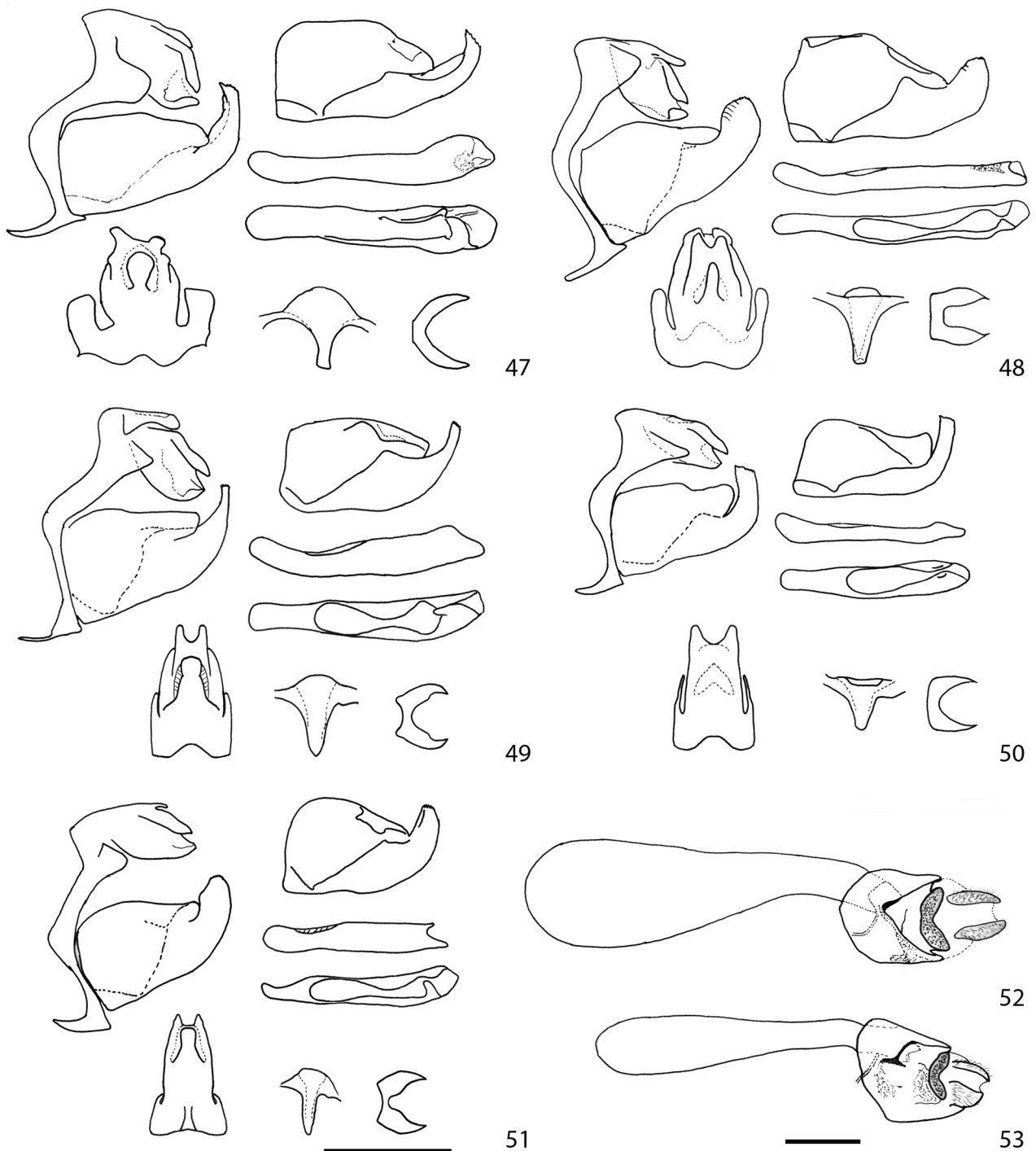
(Figs 17, 18, 34, 48)

**Diagnosis. Male:** Forewing length 12–13mm. Nudum 13. DFW brand thin; subapical spot orange, reduced in  $R_4$ – $R_5$  but developed in  $R_5$ - $M_1$ . VFW costal area, apical spot and marginal band homogeneous orange. VHW with a central reddish streak from base to margin, flanked by whitish margins. Median apophyses of tegumen developed, simple; lateral projections pointed. Harpe large, sharply angled.

**Description. Male:** DFW orange spots in  $R_4$ - $M_1$ ,  $M_2$ - $CuA_2$  and from posterior half  $CuA_2$  area to anal margin; sparse dark orange scales present on costal and discal cell areas. Brand black, bipartite, anterior part elongate, emarginated with  $CuA_1$  and slightly angled towards  $CuA_2$ , posterior part short, drop-shaped, emarginated anteriorly with  $CuA_2$ . DHW orange spot large, from  $R_s$  to slightly beyond  $CuA_2$ ; also with an elongated orange longitudinal spot along 2A, from base to apex; elongated bristles orange, mainly concentrated on discal cell and anal areas. VFW ground color dark brown; costal area and apical spots dark orange; faint orange spots in  $R_4$ - $M_1$  and developed in  $M_3$  to  $CuA_2$ ; VHW ground color yellowish, with a central transversal reddish streak from base to margin, flanked by whitish margins; anal fold dark brown. **Genitalia:** median apophyses of tegumen slightly longer than the fenestra, thinner than half of fenestra; fenestra triangular, as wide as long; lateral apophyses of tegumen symmetrically pointed. Saccus shorter than tegumen length, lobed. Uncus symmetric; arms separated from each other by a short distance. Valvae symmetrical; harpe projection large, apex rounded with reduced groove markings on inner margin and reduced spines on tip; sacculus short, triangular. Aedeagus longer than valva + saccus length; coecum slightly curved dorsally; dorso-posterior end of aedeagus hollowed, hollow long, extending anteriorly and contiguous with opening of ejaculatorius bulbus; ventro-posterior end of aedeagus with large sclerotized foldings. Fultura inferior as lateral fusiform lobes united medially by a thin bar. **Female** unknown.

**Studied material:** HOLOTYPE male with the following label: / Holotypus / 18-VIII-1992, San Pedro, S.[ierra], Nevada [de] S.[anta] Marta, Col.[ombia], 2800m / DZ 18.311 / Holotypus *Wahydra trinitas* Henao, Carneiro, Mielke & Casagrande det. 2014 / (DZUP). PARATYPES: 1 male, same label as holotype, DZ 18.312 (DZUP); 1 male, Colombia, Magdalena, Cienaga, San Pedro de la Sierra, Martinez farm, 10°53'N 73°56'W, 2760m 29-I-1973, J.F. Martinez Leg./CEH-085.

**Etymology.** This species is in homage to the Trinity represented by the Father, Son and the Holy Spirit, for all the gifts received.



**FIGURES 47–53.** Male genitalia of *Wahydra* Steinhauser, 1991 species. Fig. 47: *Wahydra vola* (Evans, 1955); Fig. 48: *Wahydra trinitas* Henao, Carneiro, Mielke & Casagrande **sp. nov.** (Paratype); Fig. 49: *Wahydra curtis* Mielke, Henao, Carneiro & Casagrande **sp. nov.** (Paratype); Fig. 50: *Wahydra shueyi* Carneiro, Henao, Mielke & Casagrande **sp. nov.** (Paratype); Fig. 51: *Wahydra mapiriensis* Casagrande, Henao, Carneiro & Mielke **sp. nov.** (Holotype). Figs 52 to 53: Female genitalia of *Wahydra* Steinhauser, 1991 species. Fig. 52: *Wahydra vola* (Evans, 1955); Fig. 53: *Wahydra* sp. (unidentified female).

***Wahydra curtis* Mielke, Henao, Carneiro & Casagrande sp. nov.**

(Figs 19, 20, 35, 49)

**Diagnosis. Male:** Forewing length 12–13mm. Nudum 14. DFW brand thin; subapical spot orange in  $R_5-M_1$ . VFW costal area, apical spot and marginal band homogeneous yellowish. VHW with faint yellowish discal bands and

reddish discal spots. Median apophyses of tegumen developed, large, proximally constricted, simple; lateral projections pointed. Harpe thin, curved.

**Description. Male:** DFW orange spots present in costal area,  $R_5-M_1$ , from  $M_2$  to slightly beyond  $CuA_1$ , and from posterior half of  $CuA_2$  area to anal margin; sparse dark orange scales present on costal and discal cell areas. Brand black, bipartite and constantly thin, anterior part elongated, emarginated with  $CuA_1$  and slightly angled towards  $CuA_2$ , posterior part also elongated and equally thin, emarginated anteriorly with  $CuA_2$ . DHW orange spot large, from  $Rs$  to slightly beyond  $CuA_2$ ; also with a faint elongate orange longitudinal spot along 2A, from base to margin; elongated sparse orange bristles, mainly concentrated in discal cell and anal areas. VFW ground color dark brown; costal area and apical spots dark orange; orange spots in  $R_4-M_1$  absent, but space flanked by two reddish spots; orange spots in  $M_3$  to  $CuA_2$  developed; VHW ground color orange, with reduced reddish spots in discal area between  $Rs-2A$ , one in discal cell, and several faint on submarginal area in  $Rs-CuA_2$ ; anal fold dark brown. **Genitalia:** median apophyses of tegumen slightly longer than the fenestra, larger than half of fenestra; fenestra semicircular, wider than long; lateral apophyses of tegumen symmetrically pointed. Saccus shorter than tegumen's length, lobed. Uncus symmetric; arms separated from each other Valvae symmetrical; harpe projection thin, apex truncate; sacculus short, triangular. Aedeagus as long as the valva + saccus length; coecum slightly curved dorsally; dorso-posterior end of aedeagus hollowed, hollow long, extending anteriorly and contiguous with the opening of bulbus duct; ventro-posterior end of aedeagus with large sclerotized foldings, the left one with an additional folding turned upwards. Fultura inferior as lateral fusiform lobes united medially by a thin bar. **Female** unknown.

**Studied material:** HOLOTYPE male with the following label: / Holotypus / 21-IX-1997, W[est] Chulumani, La Paz, **Bolivia**, 2500m, Callaghan leg. / OM 49.268 / Holotypus *Wahydra curtis* Mielke, Henao, Carneiro & Casagrade det. 2014/ (OM). PARATYPE: 1 male, same labels as holotype, OM 49420 (OM).

**Etymology.** This species honors Dr. John Curtis Callaghan, for his significant contribution to butterfly biodiversity, not only for his special contribution to the Riodinidae, but also to his collecting efforts of Neotropical Hesperiiidae.

### *Wahydra shueyi* Carneiro, Henao, Mielke & Casagrade sp. nov.

(Figs 21, 22, 36, 50)

**Diagnosis. Male:** Forewing length 11mm. Nudum 13. Forewing apex pointed. DFW brand large, subapical spot yellowish, short, in  $R_5-M_1$ . VFW apical and marginal areas distinctly lighter than costa and cellular areas. VHW with several nonaligned reddish spots. Median apophyses of tegumen reduced, thin, pointed; lateral processes pointed. Harpe thin, sharply angled. Ventro-posterior end of aedeagus rounded.

**Description. Male:** DFW with orange spots in costal area,  $R_4-M_1$  (with variable minor spots around this area) and from  $M_2$  continuously to anal margin, but deeply hollowed in  $CuA_2-2A$ ; sparse dark orange scales present in costal and discal cell areas, especially concentrated proximally to brand. Brand black, bipartite, large, anterior part oval, emarginated with  $CuA_1$  and slightly angled towards  $CuA_2$ , posterior part also oval and equally large, emarginated anteriorly with  $CuA_2$ . DHW orange spot large, from  $Rs$  to slightly beyond  $CuA_2$  extending to external margin; elongated sparse bristles orange, mainly concentrated in discal cell and anal areas. VFW ground color dark brown; apical spot slightly lighter than costal area and discal spot; yellowish faint spots in  $R_5-M_1$ , and developed in  $M_2-2A$ . VHW ground color yellowish, with reduced and scattered reddish spots in discal area between  $Rs-2A$ , one in discal cell, and several faint in submarginal area; post-discal band slightly marked by a lighter yellowish band; anal fold dark brown. **Genitalia:** median apophyses of tegumen slightly shorter than half fenestra, triangular-shaped; fenestra also triangular, as wide as long; lateral apophyses of tegumen symmetrically pointed. Saccus shorter than tegumen's length, lobed. Uncus symmetric; arms separated from each other by a short distance. Valvae symmetrical; harpe projection thin, apex quadrate, but inner margin longer than external; sacculus short, triangular. Aedeagus as long as the valva + saccus length; coecum slightly curved dorsally; dorso-posterior end of aedeagus hollowed, hollow long, extending anteriorly and contiguous with the opening of ejaculatorius bulbus; ventro-posterior end of aedeagus with two large sclerotized foldings, both with additional foldings turned upwards. Fultura inferior as lateral fusiform lobes united medially by a thin bar. **Female** unknown.

**Studied material:** HOLOTYPE male with the following labels: / Holotypus / 26-VIII-1982, Rio Tumbamba, Cuenca, Ecuador, 3000m Lafebre leg. / DZ 18.178 / Holotypus *Wahydra shueyi*, Henao, Mielke & Casagrande det. 2014 / (DZUP). PARATYPES: 2 males, same label as holotype, DZ 18.299, DZ 18300 (DZUP).

**Etymology.** This species honors Dr. John Shuey (The Nature Conservancy, Indianapolis, USA), for his significant contribution to butterfly biodiversity, especially in regard to Hesperiidae taxonomy and systematics.

***Wahydra mapiriensis* Casagrande, Henao, Carneiro & Mielke sp. nov.**

(Figs 23, 24, 37, 51)

**Diagnosis. Male:** Forewing length 12mm. Nudum 13. DFW brand thin; subapical spot orange in  $R_5-M_1$ . VFW costal area, apical spot and marginal band homogeneous orange. VHW dark orange with faint dark brown central band. Median apophyses of tegumen developed, large, straight; lateral projections pointed. Harpe large, sharply angled.

**Description. Male:** DFW orange spots in  $R_4-M_1$ ,  $M_2-CuA_2$  and posterior half of  $CuA_2$  area to anal margin; compact dark orange scales present on costal, central and anal areas close to base. Brand thin, black, bipartite, anterior part elongated, emarginated with  $CuA_1$  and slightly angled towards  $CuA_2$ , posterior part shorter and thinner, comma-shaped, emarginated anteriorly with  $CuA_2$ . DHW orange spot large, from  $R_s$  to  $CuA_2$ ; bristles elongated and dark orange, mainly concentrated in discal cell and anal areas. VFW ground color dark brown; costal area and apical spots dark orange; faint orange spots in  $R_5-M_1$ , and developed in  $M_3$  to  $CuA_2$ . VHW ground color dark orange, with a central dark, poorly marked reddish band from base to margin. **Genitalia:** median apophyses of tegumen as long as fenestra, larger than half of fenestra; fenestra semicircular, longer than wide; lateral apophyses of tegumen symmetrically pointed. Saccus shorter than tegumen's length, lobed. Uncus symmetric; arms separated from each other by a short distance. Valvae symmetric; harpe's projection large, apex truncated with reduced spines on tip; sacculus short, triangular. Aedeagus shorter than valva + saccus length; coecum dorsally straight; dorso-posterior end of aedeagus hollowed, hollow long, extending anteriorly and contiguous with the opening of ejaculatorius bulb; ventro-posterior end of aedeagus with right large and left thin sclerotized foldings. Fultura inferior as lateral fusiform lobes united medially by a thin bar. **Female** unknown.

**Studied material:** HOLOTYPE male with the following labels: / Holotypus / Mapiri, La Paz, **Bolivia** / DZ 12.077 / Holotypus *Wahydra mapiriensis* Casagrande, Henao, Carneiro & Mielke det. 2014/ (DZUP).

**Etymology.** The name comes from the city where the holotype was collected.

***Wahydra* sp.**

Figs (25, 26,40,53).

**Description. Female:** Forewing length 13. Nudum 13. DFW orange spots in  $R_4-CuA_2$  and posterior half of  $CuA_2-2A$  to anal margin; sparse dark orange scales present on costal, central and anal areas close to base. DHW orange spot thin, from  $R_s$  to  $CuA_2$ ; dark orange elongated bristles, mainly concentrated in discal cell and anal areas. VFW ground color dark brown; costal area and apical spots dark orange; faint orange spots in  $R_5-M_1$ , and developed in  $M_3$  to  $CuA_2$ . VHW ground color dark orange, with a central dark, marked reddish band from base to margin; anal fold dark brown. Genitalia: 8th tergite with spiracular opening present, ellipsoid. Lamella antevaginalis projected below ostium bursae; triangular posterior projections developed only in the right side of ostium, which is distinctly asymmetrically located in the right side of sterigma. Lobes of posterior margin of lamella postvaginalis large, medially shallow divided.

**Studied material:** Peru, Amazonas, Rodríguez de Mendoza, 17-VI-2003, 1800m, OM 63.640 (OM).

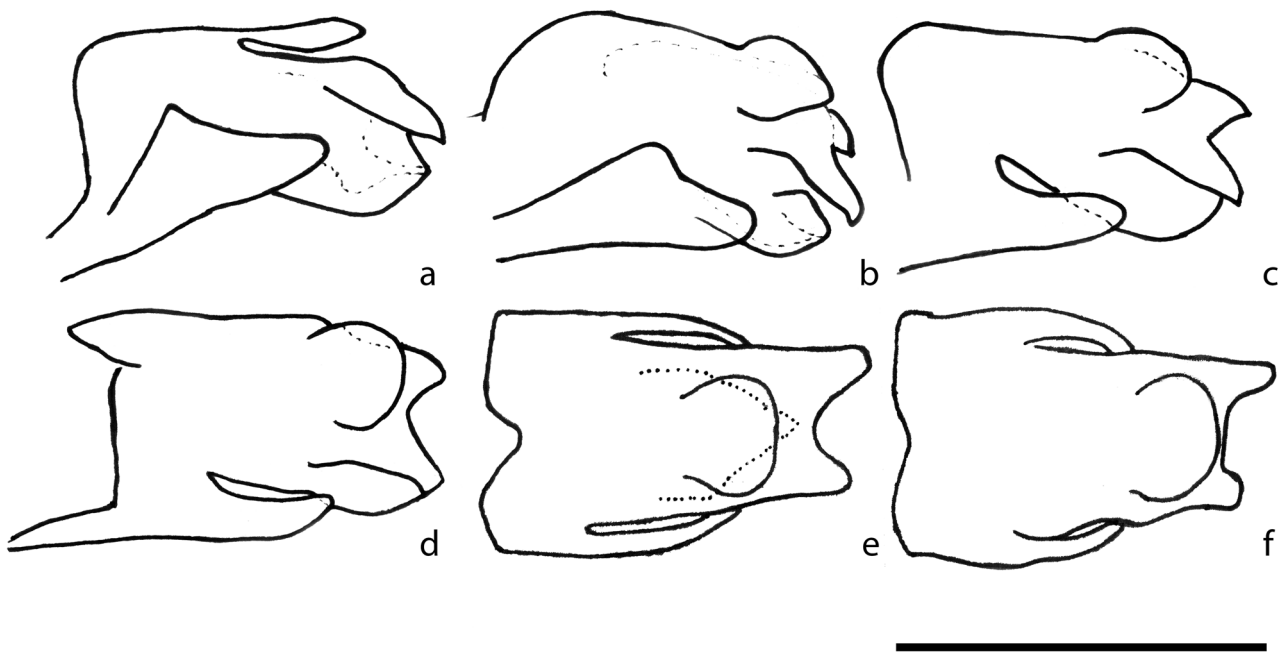
**Remarks.** This female is here illustrated without identification due to lack of evidence to which male it should be coupled, or if it belongs to a un-described species. Although only other five female genitalia of *Wahydra* species are so far illustrated, it is worth to describe the present specimen for the purpose of future studies in the taxonomy of the genus.



## Discussion

*Wahydra* is composed of species with remarkable similarities in adults, male and female genitalia. As mentioned by Warren *et al.* (2009), the valva of *Wahydra* corroborates the diagnostic characters given to Anthoptini, in regard to the format of valva and ampulla. On the other hand, Anthoptini genera usually lack such an elongated, divided stigma and present smooth meso and metatibiae (Warren *et al.* 2009). The exceptions for these characters are *Mnaseas* Godman, 1901 and *Zalomes* Bell, 1947. *Mnaseas* was classified into Anthoptini because its male genitalia resemble that of *Corticea* (Evans 1955), but its valvae however does not present the diagnostic characters of Anthoptini proposed by Warren *et al.* (2009). Furthermore, some Moncini genera, such as *Mnasitheus* Godman, 1900, *Pamba* Evans, 1955, *Psoralis* Mabilie, 1904 and *Saniba* Mielke & Casagrande, 2003, also present the same diagnostic characters given to the valva of Anthoptini, or in some, also a similar elongated brand, which is uncommon in Anthoptini but strikingly developed in all *Wahydra* species.

Male and female genitalia of *Wahydra* species are remarkable similar, thus justifying the generic proposition of Steinhauser (1991). Some characters however require special taxonomic attention. The median apophyses of tegumen for example is quite variable among species in matter of length, width and format, but can be easily omitted during genitalia illustration procedures (see Fig. 54). Despite being very thin in lateral view, a tuft of long bristles on proximal part of uncus also blocks the clear visualization of median apophysis, as observed in some illustrations of tegumen lateral views (Hayward 1939; Evans 1955; Steinhauser 1991). The same adversity in observing the median apophyses is found in the posterior end of aedeagus of *Waydra* species. Its vesica is flanked by little sclerotized foldings extending from ventral side of aedeagus. The membranous aspect of vesica together with these poorly sclerotized folding are hardly distinct from each other, which could be easily confounded or interpreted as a cornuti (Hayward 1942; Steinhauser 1991). Cornuti were not found in any *Wahydra* species.



**FIGURE 54.** Different perspectives of male genitalia of *Wahydra tassa* Evans, 1955, from full lateral (a) to full dorsal (f) perspectives.

The Identification of *Wahydra* species can be quite precise by following the description and illustrations of genitalia given by Steinhauser (1991) and holotype photographs (Warren *et al.* 2015). However, it should be noted that the diversity of the genus is still incipient. Most *Wahydra* species are recognized after a few specimens (including the new described species), females are unknown or not illustrated for most species, and collections worldwide rarely present series of species. In DZUP for example, two individuals (one male and one female) of a non-identified *Wahydra* remain to be studied. Genitalia dissections were carried for these specimens, but more material is required to assume any conclusive finding. Thus, there is no reason to believe that all species have

already been described, and a taxonomic review of the genus should be desirable as long as more data representing both sexes and geographic distribution of its species begins to accumulate in entomological collections.

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pp. 25–86.

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