

Synonymic notes on North and Central American *Lerodea* Scudder and *Corticea* Evans (Lepidoptera, HesperIIDae, HesperIIDinae) ¹

Andrew D. Warren ² & Olaf H. H. Mielke ³

¹ Contribution number 1498 of the Departamento de Zoologia, Universidade Federal do Paraná.

² Department of Zoology, Oregon State University, Corvallis, Oregon, 97331, USA. E-mail: hesperioidea@yahoo.com

³ Departamento de Zoologia, Setor de Ciências Biológicas, Universidade Federal do Paraná. Caixa Postal 19020, 81531-980 Curitiba, Paraná, Brasil. CNPq Fellowship. E-mail: omhesp@ufpr.br

ABSTRACT. *Lerodea dysaules* Godman, 1900 is confirmed as a synonym of *Lerodea arabus* (W. H. Edwards, 1882). A lectotype for *Lerodea dysaules* is designated. *Corticea similea* (Bell, 1942), **comb. nov.** is removed from *Lerodea* Scudder, 1872.

KEY WORDS. Arizona, Texas, Mexico, Neotropical, variation.

RESUMO. **Notas sinonímicas sobre *Lerodea* Scudder and *Corticea* Evans das Américas do Norte e Central (Lepidoptera, HesperIIDae, HesperIIDinae).** *Lerodea dysaules* Godman, 1900 é confirmada como sinônimo de *Lerodea arabus* (W. H. Edwards, 1882). Um lectótipo para *Lerodea dysaules* é designado. *Corticea similea* (Bell, 1942), **comb. nov.** é removida de *Lerodea* Scudder, 1872.

PALAVRAS CHAVE. Arizona, Texas, México, neotropical, variação.

Following the examination of type specimens in various museums, and extensive fieldwork in many parts of Mexico, Central and South America, several recent changes have been made in the synonymy of Nearctic and Neotropical HesperIIDae (Austin & Warren 2002, Mielke & Casagrande 2002, Mielke & Warren 2004, Warren & Mielke 2004). This note concerns the synonymy and generic placement of some North and Central American species placed by Evans (1955) in the genus *Lerodea* Scudder.

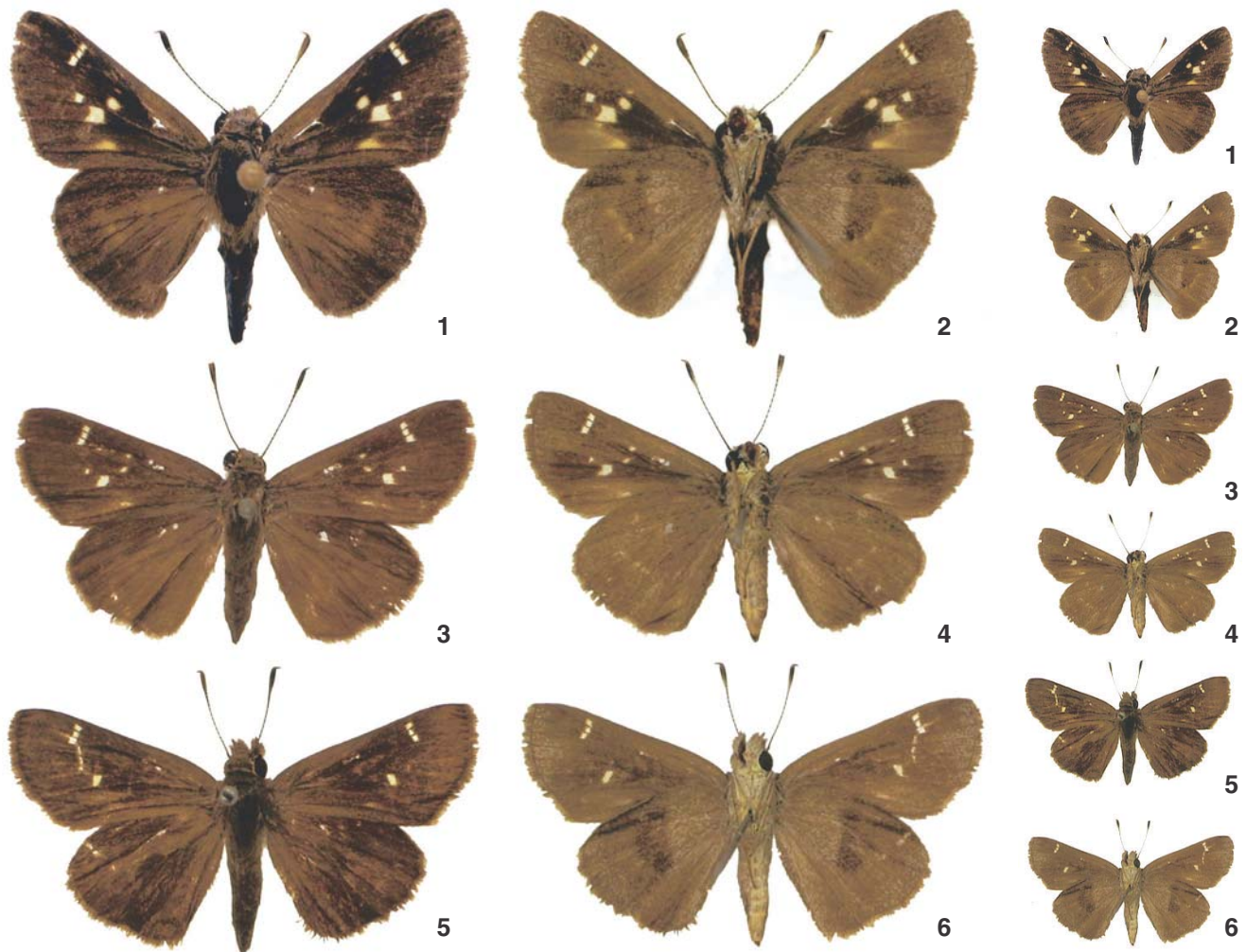
Lerodea arabus (W. H. Edwards, 1882)

Figs 1-6

Pamphila arabus W. H. Edwards, 1882. **Papilio** 2: 26, 29, 1 female [holotype], X-1881, S. Arizona, USA, J. Doll leg.

Lerodea dysaules Godman, 1900, in Godman & Salvin. **Biol. Centr.-Amer., Lep. Rhop.** 2, p. 500; 3, pl. 95, figs 19, 20 (male d, v); 1 male, 1 female, Venta de Zopilote, Guerrero, Mexico, H.H. Smith leg.; collection Godman & Salvin; lectotype here designated (see: "Material examined"); **confirmed synonymy.** – MacNeill, 1962. **Proc. Calif. Ac. Sc.** 30: 11; **syn.: arabus.** – Tilden, 1964. **Jour. Lep. Soc.** 18: 214. – L. Miller, 1970. **Ann. Carnegie Mus.** 41: 170, 171, 197. – MacNeill, 1975, in Howe. **Butt. N. Amer.**, p. 434, pl. 84, fig. 2 (female d, v). – L. Miller & F.M. Brown, 1981. **Mem. Lep. Soc.** 2: 50. – Ferris, 1989. **Mem. Lep. Soc.** 3: 74. – Bridges, 1983. **Lep. Hesp.** 1, p. 37; 2, p. 19. – Bridges, 1988. **Cat. Hesp.** 1, p. 59; 2, p. 30. – R. G. de la Maza E. & J. de la Maza E., 1993. **Marip. Chiapas**, p. 209. – Stanford & Opler, 1993. **Atlas West. USA Butt.**, p.

93. – Mielke, 2004, *Hesperioidea*, p. 70, in Lamas (Ed.). **Checklist: Part 4A. Hesperioidea – Papilionoidea**, in Heppner (Ed.). **Atlas of Neotropical Lepidoptera 5A. *Lerodea arabus***; Woodworth, 1900. **Bull. Univ. Calif. Agric. Exp. Stat.** 1: 40. – Lindsey; Bell & Williams, 1931. **Denis. Univ. Bull., Jour. Sc. Lab.** 26: 133, pl. 32, fig. 34 (gen. male); **syn.: dysaules.** – Rindge, 1948. **Proc. Calif. Ac. Sc.** 24: 309; **syn.: dysaules.** – Evans, 1955. **Cat. Amer. Hesp.** 4, p. 394, pl. 82 (gen. male). – Holland, 1973. **Jour. Res. Lep.** 11: 151. – MacNeill, 1975, in Howe. **Butt. N. Amer.**, p. 433, pl. 84, fig. 1 (male d, v). – Tilden, 1964. **Jour. Lep. Soc.** 18: 215. – L. Miller & F.M. Brown, 1981. **Mem. Lep. Soc.** 2: 50. – Bridges, 1983. **Lep. Hesp.** 1, p. 9, 122; 2, p. 9. – F.M. Brown & L. Miller, 1987. **Trans. Amer. Ent. Soc.** 113: 55, 70, fig. 21 (male d, v), **neotype** male, 21-III-1959, Sabino Canyon, Santa Catalina Mts., Pima Co., Arizona, USA, 2900 ft., Kilian Roever leg., Carnegie Museum of Natural History. – Bridges, 1988. **Cat. Hesp.** 1, p. 1; 2, p. 30. – Ferris, 1989. **Mem. Lep. Soc.** 3: 74. – J. Brown, Real & Faulkner, 1992. **Butt. Baja Calif.**, p. 47, pl. 2, figs 29, 30 (male d, v); **syn.: dysaules.** – R. G. de la Maza E. & J. de la Maza E., 1993. **Marip. Chiapas**, p. 209. – Warren, 2000, in Llorente B.; González S. & Papavero (Eds). **Biodiv., Tax., Biogeogr. Artróp. México**, p. 564; **syn.: dysaules.** – Opler & Warren, 2002. **Butt. N. Amer.** 2, p. 13; **syn.: dysaules.** – Bordelon & Knudson, 2003. **Illustr. Checklist Lep. Lower Rio Grande Valley.** 1: **Butt.**, p. 52, pl. 17, figs 9, 10 (d, v), pl. 21, fig. 4 (v). – Mielke, 2004, *Hesperioidea*, p.



Figures 1-6. *Lerodea arabus*: (1-2) male dorsal, ventral, 2 mi S. Mazatlán, Urias, Mpio. Mazatlán, Sinaloa, Mexico, 29-XII-1992, A.D. Warren leg.; (3-4) female dorsal, ventral, Brownsville, Cameron Co., Texas, USA, 7-VI-1967, H.A. Freeman leg. (5-6) female dorsal, ventral, Brownsville, Cameron Co., Texas, USA, 13-XI-1963, J. W. Tilden leg. Right column natural size.

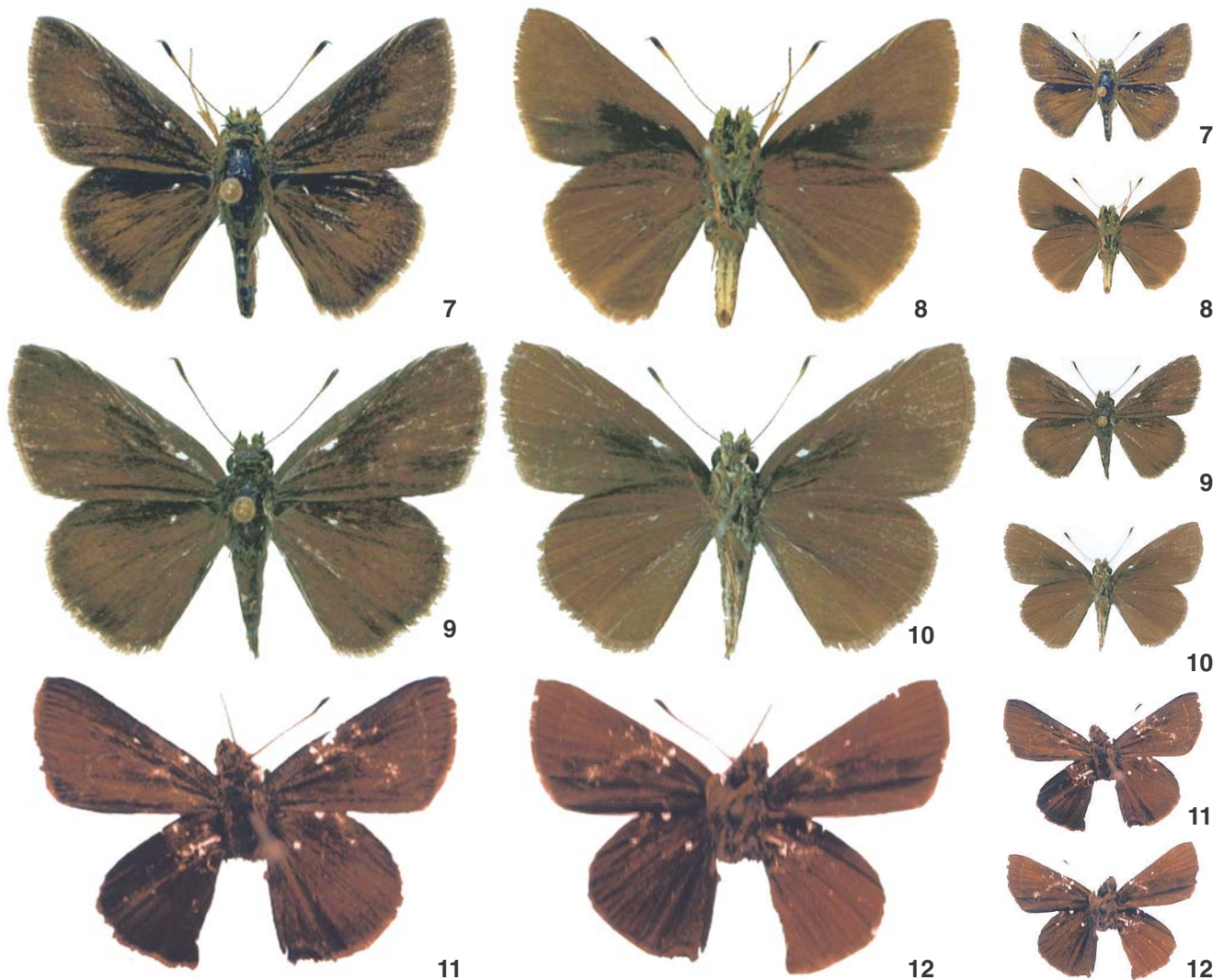
70, in Lamas (Ed.). Checklist: Part 4A. Hesperioidea – Papilionoidea, in Heppner (Ed.). Atlas of Neotropical Lepidoptera 5A.

Lerodea arabus arabus; Scott, 1986. Butt. N. Amer., p. 465, pl. 46, fig. 556a (male v).

Lerodea arabus dysaules; Scott, 1986. Butt. N. Amer., p. 465, pl. 46, fig. 55b, c (female d, v).

GODMAN (1900) described *Lerodea dysaules* from a pair of specimens, but made no mention of, or comparison with *Pamphila arabus* W. H. Edwards, 1882. LINDSEY *et al.* (1931) treated *L. dysaules* as a synonym of *Lerodea arabus*, however EVANS (1955) treated *L. arabus* and *L. dysaules* as distinct species, separating the taxa based on the presence or absence of ventral hindwing discal spots (present in *arabus*, absent in *dysaules*), and on the position of the white forewing cell spot. According to EVANS, *L.*

arabus has a conspicuous spot in the upper half of the forewing cell, while *L. dysaules* lacks this spot but has a similar spot in the lower half of the forewing cell. EVANS (1955) examined only 1 male specimen of *L. arabus* from Arizona, USA, and one pair of *L. dysaules* from Guerrero, Mexico (the type material). Despite EVANS' total sample size of three specimens, and his disclaimer (1955) that *L. dysaules* may be a subspecies of *arabus*, his arrangement of *L. arabus* and *L. dysaules* as two species has been generally followed (TILDEN 1964, MACNEILL 1975, L. MILLER & F.M. BROWN 1981, FERRIS 1989, MIELKE 2004). However, MACNEILL (1962, 1975) and J. BROWN *et al.* (1992) noted significant variability in the characters used to separate the taxa, and SCOTT (1986) treated *L. dysaules* as a subspecies of *L. arabus*. More recently, several authors (WARREN 2000, OPLER & WARREN 2002, BORDELON & KNUDSON 2003) have treated *L. dysaules* as a



Figures 7-12. *Corticea similea*: (7-8) male dorsal, ventral, Caracha, 1320 m, Mpio. Ziracuaretiro, Michoacán, Mexico, 14-V-1997, Lamberto González-Cota leg.; (9-10) female dorsal, ventral, Zirimicuaro, ca. 1450 m, Mpio. Ziracuaretiro, Michoacán, Mexico, 15-VI-1996, Lamberto González-Cota leg.; (11-12) holotype male dorsal, ventral, Guerrero, Mexico, VII, R. Müller leg. (AMNH). Right column natural size.

synonym of *L. arabus*, without elaboration. Here the status of these taxa is discussed, and an explanation of why *L. dysaules* should be treated as a synonym of *L. arabus* is offered.

Neither of the characters used by EVANS (1955) to distinguish the two taxa show consistency when large series of specimens are examined. The expression of ventral hindwing discal spots appears to vary individually and seasonally, with individuals in drier months being better maculated. Of two female individuals examined from Brownsville, Cameron Co., Texas, USA, the June (dry season) individual (Figs 3, 4) shows well-developed ventral hindwing discal spots as in the neotype of *L. arabus* (designated by M. Brown & L. Miller 1987), while the November (rainy season) individual (Figs 5, 6) lacks these spots (as would

dysaules), and has a more strongly contrasting ventral hindwing pattern. This pattern of variation is typical for what is seen throughout Mexico, with individuals from transition months (December, January, June, July) showing the greatest phenotypic variation. Consistent patterns of geographic variation in ventral hindwing maculation have not been noticed.

The position of the forewing cell spot has proven to be even less reliable than ventral hindwing maculation in diagnosing the two taxa. For example, the June individual (Figs 3, 4) from Brownsville, Texas, USA, has both upper and lower cell spots, while the November individual (Figs 5, 6) from Brownsville lacks any trace of forewing cell spots. These extremes in variation represent the typical range of variation seen

at all sites from which series of specimens have been examined, but according to EVANS (1955), represent neither taxon. Indeed about 40% of the Mexican specimens examined have both upper and lower forewing cell spots, which is not typical for either *L. arabus* or *L. dysaules*.

Male genitalia (n = 12) of individuals representing all combinations of wing spotting patterns were compared (from Arizona – USA, Sinaloa, Nayarit, Jalisco and Michoacán – Mexico), including typical *arabus*, typical *dysaules*, and all other variants seen; no differences of any kind could be deciphered between them. The supposed differences between *L. arabus* and *L. dysaules* in male genitalia illustrated by EVANS (1955) are inaccurate. The actual structure of the valvae of the species is most like Evans' illustration of *L. dysaules*, while the uncus and gnathos, from lateral view, actually appear intermediate between Evans' illustrations for *L. arabus* and *L. dysaules*.

After examining the type material of both taxa, as well as over 80 specimens from throughout the range of both taxa, it is concluded that *Lerodea arabus* shows much individual and seasonal variation, and that its junior synonym *L. dysaules* represents just one of many forms seen in the species throughout its geographic range.

Material examined (Roman numbers refer to months of capture, Arabic numbers between parenthesis indicate the number of specimens examined): **Lectotype** of *Lerodea dysaules* Godman, 1900 here designated: male with the following labels: /Type/ Type H. T./♂/ Sp. figured/ Venta de Zopilote, Guerrero, 2800 ft. Oct. H. H. Smith/ B. C. A. Lep. Rhop. *Lerodea dysaules*, Godm./ Godman-Salvin Coll. 1913. –2/ "paper with the genitalia"/; BMNH. MÉXICO, Colima: Mpio. Colima III (1); Mpio. Comala IV (1); Guerrero: Mpio. unknown X (3); Jalisco: Mpio. Chapala VII (1), IX (1); Mpio. Puerto Vallarta XII (4); Michoacán: Mpio. Arteaga VI (1), VII (2); Mpio. Gabriele Zamora VIII (1), X (1), XII (1); Mpio. Parácuaro VIII (1); Mpio. Taretan VII (1); Mpio. Uruapan: I (1), II (2), V (1), X (1), XI (2); Nayarit: Mpio. Bahía de Banderas I (1); Oaxaca: Mpio. San Pedro Totolapan VIII (2); Puebla: Mpio. Acatlán de Osorio VIII (1); San Luis Potosí: Mpio. Valles VI (2), VII (1), VIII (1); Sinaloa: Mpio. Mazatlán I (5), IV (1), X (1), XI (10), XII (11); SONORA: Mpio. Hermosillo X (1); Mpio. Yecora III (2); Tabasco: Mpio. Tepescuintle IX (3); Tamaulipas: Mpio. Victoria I (1), XII (4). USA: ARIZONA: no locality (2); Santa Cruz Co., VII (5); TEXAS: Cameron Co., VI (1), XI (1).

Literature records of this species from the following Mexican states include, in addition to those listed above: Baja California Sur (RINDGE 1948 [as *L. arabus*], MACNEILL 1962 [as *L. dysaules*], L. MILLER 1970 [as *L. dysaules*], HOLLAND 1973 [as *L. arabus*], MACNEILL 1975 [as *L. arabus*], J. BROWN *et al.* 1992 [as *L. arabus*]), Campeche (POZO *et al.* 2003 [as *L. arabus*]), Chiapas (de la MAZA & de la MAZA, 1993 [as *L. arabus* and *L. dysaules*]), Durango, Nuevo León (STANFORD & OPLER 1993 [as *L. dysaules*]), and Veracruz (unpublished). *Lerodea arabus* has not been recorded from Guatemala (AUSTIN *et al.* 1998).

Corticea similea (Bell, 1942), comb. nov.

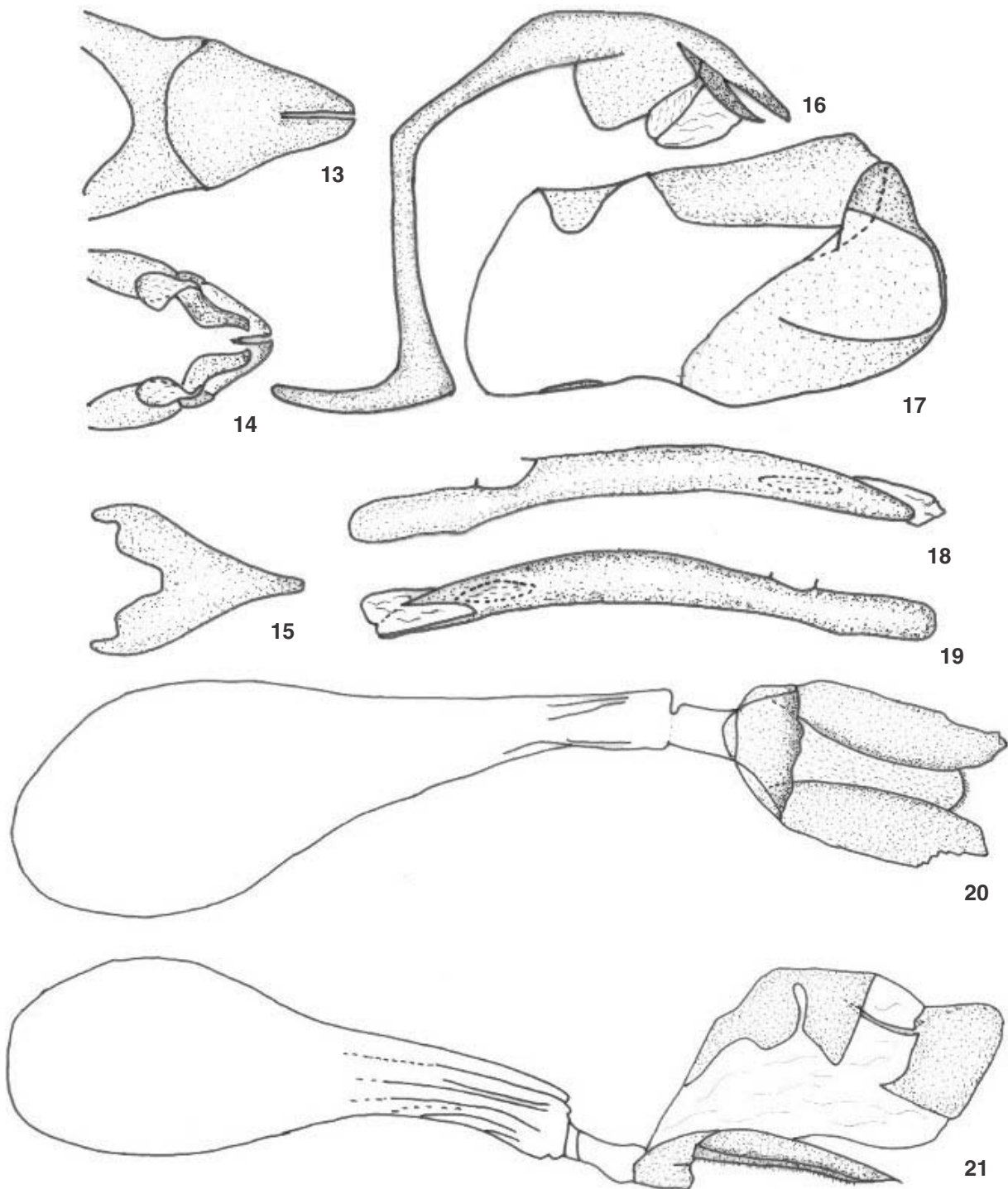
Figs 7-21

Lerodea similea Bell, 1942. *An. Esc. Nac. Ciencias Biol.*, Mexico, 2: 466, fig. 9 (gen. male); holotype male, July, Guerrero, Mexico, R. Müller *leg.*, no. 14.098; Escuela Nacional de Ciencias Biológicas, Mexico [AMNH]. – Evans, 1955. *Cat. Amer. Hesp.* 4, p. 396. – Okano, 1981. *Tokurana* 1: 60. – Bridges, 1983. *Lep. Hesp.* 1, p. 109; 2, p. 19. – Bridges, 1988. *Cat. Hesp.* 1, p. 173; 2, p. 31. – Llorente-Bousquets; Luis-Martínez & Vargas-Fernández, 1990. *Publ. esp. Mus. Zool.*, Mexico, 1: 42. – J. de la Maza E.; White & R. G. de la Maza E., 1991. *Rev. Soc. Mex. Lep.* 14: 41. – Warren, 2000, *in* Llorente B.; González S. & Papavero (Eds). *Biod., Tax., Biogeogr. Art. Mex.* 2, p. 543, 564. – Mielke, 2004, *Hesperioidea*, p. 70, *in* Lamas (Ed.). **Checklist: Part 4A. Hesperioidea – Papilionoidea**, *in* Heppner (Ed.). **Atlas of Neotropical Lepidoptera 5A.**

The male holotype (Figs 11, 12), examined by the authors on two separate occasions at the American Museum of Natural History (AMNH), is from the Roberto Müller collection. In its original description, BELL noted the superficial similarity of *L. similea* to *L. noctis* (Plötz, 1883), a species currently placed in *Corticea* (MIELKE 1969). EVANS (1955) listed *L. similea* as one of 13 species unknown to him (and not identified in the BMNH collection) that were described in *Lerodea*. Clearly, EVANS did not know the identity of *L. similea* when he described the genus *Corticea*. Unknown to all subsequent authors (LLORENTE-BOUSQUETS *et al.* 1990, J. de la MAZA E. *et al.* 1991, LUIS-MARTÍNEZ *et al.* 2003, MIELKE, 2004), *L. similea* has remained in *Lerodea* Scudder, 1872 until now.

Upon examining the holotype male of *L. similea* (Figs 11, 12), the authors were immediately impressed by the unmistakable superficial similarity of *L. similea* to various *Corticea* Evans, 1955 species, as noted by BELL (1942). The male genitalia of *similea*, as illustrated by BELL (1942), are unlike most other described *Corticea* species only in that the distal tips of the valvae are not elongated, although valvae of some specimens of *C. lysias potex* Evans, 1955 (see MIELKE 1969) approach the rounded shape seen in *C. similea*. The genitalia of one male *C. similea* from Michoacán (Figs 13-19) were dissected and compared to the genitalia of the holotype of *L. similea*, and with that of other *Corticea* species in the laboratory and in the literature (MIELKE 1969). Details of the uncus, gnathos, saccus, aedeagus, and even valvae (except their distal tips) of *C. similea*, when viewed from all angles, are very consistent with other described species of *Corticea*, leaving no doubt that *L. similea* shares a very close relationship with other *Corticea* species. Female genitalia of *L. similea* (Figs 20-21) are illustrated herein for the first time.

Due to very significant external and genitalic similarities between *similea* and other *Corticea* species, it is concluded that *similea* belongs in *Corticea* (*sensu* MIELKE 1969). To date, *Corticea similea* is known only from the southwestern Mexican



Figures 13-21. (13-19) *Corticea similea*, male genitalia, from Santa Rosa, Mpio. Uruapan, Michoacán, Mexico, 31-VIII-1990, 1640 m, Lamberto González-Cota *leg.*: (13) dorsal view of tegumen and uncus; (14) ventral view of gnathos and uncus; (15) ventral view of juxta; (16) lateral view of tegumen, saccus, uncus and gnathos; (17) internal view of right valva; (18) left lateral view of edeagus; (19) right lateral view of edeagus; (20-21) *Corticea similea*, female genitalia, from Santa Rosa, Mpio. Uruapan, Michoacán, Mexico, 13-VIII-1991, 1640 m, Lamberto González-Cota *leg.*: (20) ventral view; (21) left lateral view.

states of Guerrero and Michoacán, and appears to be endemic to Mexico (LUIS-MARTÍNEZ *et al.* 2003). A recently collected male (Figs 7-8) and female (Figs 9-10) are illustrated herein.

Material examined (includes all known specimens): MEXICO: *Guerrero*: (no locality) VII, R. Müller colln. n114.098, 1 male, holotype, AMNH; same locality, VIII, R. Müller colln. n114.152, 1 female, AMNH; *Michoacán*: Mpio. Uruapan: Santa Rosa, 1640 m, 31-VIII-1990, 13-VIII-1991, L. González-Cota *leg.*, 1 male, 1 female; Mpio. Ziracuaretiro: Caracha, 1320 m, 14-V-1997, L. González-Cota *leg.*, 1 male; same locality, 27-VIII-1997, Andrew D. Warren *leg.*, 1 male; Zirimicuaro, ca. 1450 m, 15-VI-1996, 6-VII-1996, 1 female, 1 male, L. González-Cota *leg.*

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