

# Notes on *Adeloneivaia* TRAVASSOS: the identity of *A. catharina* (BOUVIER) and the descriptions of female *A. bahiana* BRECHLIN & MEISTER and *A. minuta* (BOUVIER) (Lepidoptera: Saturniidae: Ceratocampinae)

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**Abstract:** *Adeloneivaia apicalis* (BOUVIER, 1927), *stat. rev.*, is removed from the synonymy of *A. catharina* (BOUVIER, 1927), thus resurrected to full species status. *Adeloneivaia catharina* is found to be incorrectly identified since the synonymization of *A. apicalis* with *A. catharina* by LEMAIRE (1976), such that most publications of *A. catharina* actually refer to *A. apicalis*. The females of *A. bahiana* BRECHLIN & MEISTER, 2011 and *A. minuta* (BOUVIER, 1927) are described and figured for the first time. All treated species of *Adeloneivaia* have their geographical distributions updated.

**Keywords:** *Adeloneivaia apicalis* *stat. rev.*, morphology, Neotropical, taxonomy

**Anmerkungen zu *Adeloneivaia* TRAVASSOS: Die Identität von *A. catharina* (BOUVIER) und die Beschreibung der Weibchen von *A. bahiana* BRECHLIN & MEISTER und *A. minuta* (BOUVIER) (Lepidoptera: Saturniidae: Ceratocampinae)**

**Zusammenfassung:** *Adeloneivaia apicalis* (BOUVIER, 1927), *stat. rev.*, wird aus der Synonymie von *A. catharina* (BOUVIER, 1927) entfernt und damit der vollständige Artstatus wiederhergestellt. *Adeloneivaia catharina* wurde seit der Synonymisierung durch LEMAIRE (1976) falsch identifiziert, so daß sich die meisten Veröffentlichungen von „*A. catharina*“ tatsächlich auf *A. apicalis* beziehen. Die Weibchen von *A. bahiana* BRECHLIN & MEISTER, 2011 und *A. minuta* (BOUVIER, 1927) werden erstmals beschrieben und abgebildet. Bei allen behandelten *Adeloneivaia*-Arten wird die geografische Verbreitung aktualisiert.

## Introduction

The present study focuses on some species of *Adeloneivaia* TRAVASSOS, 1940 present in Brazil, Bolivia, Paraguay and Argentina, although the genus as a whole has a much wider distribution with taxa encountered from Mexico to Argentina. In the revision of the Ceratocampinae (LEMAIRE 1988), *Adeloneivaia* was divided into two species-groups: the *Adeloneivaia subangulata* (HERRICH-SCHÄFFER, [1855]) species-group and the *A. acuta* (SCHAUS, 1896) species-group. These groups were based primarily on habitus, specifically differentiated by faint or distinct forewing markings. Habitus was likely relied upon due to the relative homogeneity of the genitalia within the genus, which are wholly unique structures in

Ceratocampinae, having partially membranous valvae (LEMAIRE 1988).

Here we investigate the true identity of *A. catharina* (BOUVIER, 1927) and its junior synonym *Adeloneivaia apicalis* (BOUVIER, 1927) and their respective positions within LEMAIRE's *Adeloneivaia* species-groups. The females of *A. bahiana* BRECHLIN & MEISTER, 2011 and *A. minuta* (BOUVIER, 1927) are described and figured for the first time. In addition, the geographical distributions of all involved species are updated.

## Materials and methods

Dissections were performed as in LAFONTAINE (2004). Figures were manipulated with Gimp 2.8. The map was created with MapCreator 2.0. All GPS coordinates are approximate based on collection data provided on locality labels. GPS data were acquired with Google Earth. The Barcode of Life Data System (BOLD) sample-ID codes refer to the unique identifiers of specimen records in the BOLD database ([www.boldsystems.org](http://www.boldsystems.org)). All records listed in this manuscript are available within the public dataset DS-ADELO1 (DOI: [dx.doi.org/10.5883/DS-ADELO1](https://dx.doi.org/10.5883/DS-ADELO1)) in BOLD; all sequences were also deposited in GenBank, with accession numbers available from BOLD, followed by GenBank access between brackets.

The labels of all primary types are given verbatim, separated by forward slashes. All examined specimens are listed under each species section.

## Collection abbreviations:

AMNH	American Museum of Natural History, New York, New York, USA.
CDH	Coll. Daniel HERBIN, Garidech, France.
CEIOC	Entomological Collection of the Oswaldo CRUZ Institute, Rio de Janeiro, Rio de Janeiro, Brazil.
CGCM	Coll. Carlos G. C. MIELKE, Curitiba, Paraná, Brazil.
CSNB	Coll. Stefan NAUMANN, Berlin, Germany.
CTD	Coll. Thibaud DECAËNS, Sussargues, France.
CUIC	Cornell University Insect Collection, Ithaca, New York, USA.
CWAN	Coll. Wolfgang A. NÄSSIG, in SMFL, Frankfurt am Main, Germany.

<sup>1</sup> 93<sup>rd</sup> contribution to the knowledge of the Saturniidae (92<sup>nd</sup> contribution: NÄSSIG, W. A., NAUMANN, S., & GIUSTI, A. (2020): A new species of the species-group of *Actias maenas* from South India: *Actias keralana* sp. n. (Lepidoptera: Saturniidae). – Nachrichten des Entomologischen Vereins Apollo, Frankfurt am Main, N.F. 41 (1/2): 41–50).

DZUP	Coll. Padre Jesus S. MOURE, Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Paraná, Brazil.
MNHN	Muséum nationale d'Histoire Naturelle, Paris, France.
NHMUK	The Natural History Museum, London, United Kingdom.
SMFL	Senckenberg Museum, Lepidoptera collection, Frankfurt am Main, Germany.
USNM	National Museum of Natural History [formerly United States National Museum], Washington D.C., USA.

#### Other abbreviations used:

BC	specimens with a mtDNA barcode.
DFW	dorsal forewing.
DHW	dorsal hindwing.
FW	forewing.
HT	holotype.
VFW	ventral forewing.
VHW	ventral hindwing.

## Taxonomy

### *Adeloneivaia catharina* (BOUVIER, 1927)

Figs. 1a, 1b, 2a, 2b, 3a, 3b, 13a, 13b, 14.

**Holotype** ♂: Sta Catherina/ TYPE/ TYPE/ *Adelocephala catharina* BOUVIER, Ann. Sc. nat., Zool., (10) 10, 1927, p. 254, pl. II. fig. 8/ *Adelocephala catharina* BOUVIER ♂ type, E. L. BOUVIER det./ *Adelocephala catharina* BOUVIER, Holotype ♂, genitalia 2285, Prep. C. LEMAIRE; MNHN, examined. Figs. 1a, 1b.

**Examined material** (in total 23 ♂♂, 4 ♀♀), all **Brazil: Minas Gerais**: 5 ♂♂, Poté, Córrego Recreio, 650 m, ix.-x. 2015, R. SANTOS leg. (CGCM 30.874, CGCM 31.057, CGCM 31.058, CGCM 31.107, CGCM 31.153 [CGCM]). 7 ♂♂, 3 ♀♀, Poté, 700 m, 20. v. 2004, 31. x. 2004, xi. 2004, 12. xi. 2004 (BOLD Sample-ID codes: BC-Her0929 [MT609938], BC-Her0930 [MT609940], BC-Her0931 [MT609945], BC-Her0932 [MT609937], BC-Her0933 [MT609941] [CDH]). 2 ♂♂, Poté, 15. v. 2004 (CSNB). 1 ♂, Poté, ca. 500 m, 5. iii. 1992, Sueli THÖNY leg. (SMFL). 6 ♂♂, Poté environment, 20. vi. 2004, local people leg.; received vi. 2004 from F. MEISTER (4 specimens with BOLD Sample-ID codes: B3218-wn-G12 [GU703498], B3218-wn-H01 [GU703499], B3218-wn-H02 [GU703500], B3218-wn-H03 [GU703501] [CWAN in SMFL]). — **Rio de Janeiro**: 1 ♀, Itatiaia, L. 41, 1300 m, 6.-10. xii. 1950, TRAVASSOS & H. TRAVASSOS [leg.] (NHMUK). — **Santa Catarina**: 1 ♂, no additional locality data, “223”, ROTHSCHILD Bequest B.M. 1939-1 (NHMUK). 1 ♂, no additional locality data, Coll. DOGNIN (USNM).

## Diagnosis

♂ (Figs. 1a, 1b, 2a, 2b) and ♀ (Figs. 3a, 3b) of *A. catharina* resembles a small, weakly marked *A. fallax* (BOISDUVAL, 1872), a species with a much wider range in wingspan, from 66 to 76 mm for males and 86 to 96 mm for females (LEMAIRE 1988) and well-marked veins on the DFW of both sexes (LEMAIRE 1988: pl. 51, figs. 6, 7; ALBERTONI & DUARTE 2015: figs. 1, 3). In *A. catharina*, the wingspan ranges from 42 to 47 mm for males and 47 to 57 mm for females, and the DFW veins are barely visible.

The dark yellow to yellowish orange uniform ground colour and the arrangement of the ante- and postmedial lines, which are oblique and somewhat convergent

posteriorly with the former well marked, distinguish *A. catharina* from all other species of the genus. The male genitalia (Figs. 13a, 13b, 14) resemble those of *A. fallax*, but are smaller overall. Analysis of the mtDNA (COI) will also allow positive identification (see discussion below).

## Geographical distribution

Although all specimens collected in the 20<sup>th</sup> Century were labelled as originating from either “Sta. Catherina” [*recte* Santa Catarina], Joinville, Santa Catarina (MAY et al. 2014), and Itatiaia, Rio de Janeiro, this taxon has not been recorded from these states for over five or six decades, although these areas have been relatively well prospected by collectors for over 70 years. Recently, *A. catharina* was rediscovered in the central-eastern portion of Minas Gerais, where it was frequently collected at light traps (Fig. 17).

## Discussion

Due to the misidentification of *A. catharina*, LEMAIRE (1988) was likely led to place this species in the *A. subangulata* species-group. The well-marked ante- and postmedial lines in both males and females of *A. catharina* suggests that this species is better placed within the *A. acuta* species-group. A figure of a female *A. catharina* was first published by MAY et al. (2014) as a drawing by E. MAY based upon a specimen in the collection of Julius ARP (destroyed in 2018).

DNA barcodes of the nine sequenced *A. catharina* specimens form a genetic cluster (maximum uncorrected distance of 0.15%L; with Barcode Index Number [BIN] Registry for BOLD: AAC9307) which is closest in genetic distance to the cluster that includes sequence of *A. acuta* with BIN Registry for BOLD: AAB2846, at 9.31% (uncorrected p-distance) and not, as expected, to the cluster that includes all available sequences of *A. fallax* (BOLD Sample-ID code: BC-Dec0342). The genetic distance between these two clusters is higher than 10%, corroborating the strong distinction between the two species (*A. fallax* and *A. catharina*).

### *Adeloneivaia apicalis* (BOUVIER, 1927), stat. rev.

Figs. 4a, 4b, 5a, 5b, 6a, 6b, 15a, 15b, 16.

**Holotype** ♀: Sta Catherina/ TYPE/ TYPE/ *Adelocephala apicalis* BOUVIER, Ann. Sc. nat., Zool., (10) 10, 1927, p. 255, pl. I. fig. 1/ *Adelocephala apicalis* BOUVIER ♀ type, E. L. BOUVIER det.; MNHN, examined. Figs. 5a, 5b.

**Examined material** (in total 90 ♂♂, 24 ♀♀): **Brazil: Minas Gerais**: 1 ♂, Conceição dos Ouros, 800 m, x. 2013, E. PEREIRA leg. (CGCM 27.273 [CGCM]). — **Rio de Janeiro**: 1 ♂, Cachoeiras de Macacu, 13. x. 1985, V. O. BECKER leg. (CGCM 11.007 [CGCM]). 1 ♂, “Dist. Fed. Brasil” [*recte* Rio de Janeiro], 19. xii. 1935, Fritz HOFFMAN leg. (USNM). 3 ♂♂, Campo Bello [*recte* Itatiaia], 26. x. 1926, 3. iv. 1927, 25. iii. 1928, J. F. ZIKÁN leg., ROTHSCHILD Bequest B.M. 1939-1 (NHMUK). — **São Paulo**: 3 ♂♂, Pereira Barreto, Ilha Seca, 18.-26. ii. 1940, Exc. IOC leg. (15882-15884 [CEIOC]). 1 ♂, Teodoro Sampaio, Porto Cabral, 1.-10. xi. 1941, L. TRAVASSOS FILHO leg. (18.159 [CEIOC]). 1 ♂, Campinas, Rib. Cachoeira,

600 m, 13.–15. i. 2001, V. O. BECKER leg. (CGCM 12.855 [CGCM]). 2 ♂♂, Alto da Serra, ix. 1933, Coll. R. SPITZ, ROTHSCHILD Bequest B.M. 1939-1 (NHMUK). 1 ♂, Capão Bonito, 900 m, 5.–7. xii. 2001, V. O. BECKER leg. (CGCM 12.855 [CGCM]). 3 ♂♂, Guapiara, Capinzal, 800 m, 16.–19. vii. 2006, C. MIELKE leg. (CGCM 29.554, CGCM 30.281, CGCM 30.322 [CGCM]). 7 ♂♂, Guapiara, Paivinha, 800 m, 6.–8. iii. 2005, 2.–5. v. 2005, 16.–19. ix. 2005, 22.–24. i. 2006, 23.–25. x. 2006, 12. x. 2007, C. MIELKE leg. (CGCM 26.214, CGCM 27.445, CGCM 28.560, CGCM 28.868, CGCM 28.884, CGCM 29.031, CGCM 29.841 [CGCM]). 11 ♂♂, Apiaí, 750 m, 12. i. 2006, 9.–12. ix. 2007, C. MIELKE leg. (CGCM 27.921, CGCM 30.693, CGCM 30.701, CGCM 30.788, CGCM 31.001, CGCM 31.012, CGCM 31.024, CGCM 31.039, CGCM 31.049, CGCM 31.124, CGCM 31.149 [CGCM]). 1 ♂, no locality, Dr. R. LUCK & B. GEHLEN, Berlin, ROTHSCHILD Bequest B.M. 1939-1 (NHMUK). 1 ♀, ROTHSCHILD Bequest B.M. 1939-1 (NHMUK). — **Paraná:** 2 ♂♂, 1 ♀, Guaratuba, Road to Castelhanos, 500 m, 8. xi. 1996, 1. xii. 1997, O. & C. MIELKE leg. (CGCM 10.819, CGCM 10.996, CGCM 11.039 [CGCM]). 1 ♂, Telêmaco Borba, 750 m, 13.–19. x. 1995, V. O. BECKER leg. (CGCM 10.813 [CGCM]). 2 ♂♂, Foz do Iguaçu, 29.–31. i. 1971, LAROCA & JENSEN leg. (Coll. BECKER No. 15613 [MNHN]). 1 ♂, Foz do Iguaçu, 20. xi. 1921, ROTHSCHILD Bequest B.M. 1939-1 (NHMUK). 3 ♂♂, Foz de Iguaçu, 200 m, 19. v. 2006; BOLD Sample-ID codes: BC-Dec0362 [MT609944], BC-Dec0363 [MT609932], BC-Dec0364 [MT609935] (CTD). — **Santa Catarina:** 2 ♂♂, Jaraguá do Sul (MNHN). 2 ♂♂, x. 1932, ii. 1934, F. HOFFMAN leg., ROTHSCHILD Bequest B.M. 1939-1 (NHMUK). 4 ♂♂, Corupá, x. 1956, xii. 1956, viii. 1958, ii. 1971, C. LEMAIRE genitalia prep. 1595 (MNHN). 1 ♂, Corupá, 3. xi. 1987 (CSNB). 1 ♂, Joinville, ix. 1969 (MNHN). 2 ♂♂, 3 ♀♀, Road Vila Nova-Schroeder, Km 15, 300 m, 4.–6. i. 1981, D. BERTRAND leg. (MNHN). 1 ♂, São Bento do Sul, x. 2004 (CSNB). 1 ♀, São Bento do Sul, 750 m, 1.–8. i. 1981, D. BERTRAND leg. (MNHN). 1 ♂, [São Bento do Sul], Rio Vermelho, xii. 1956 (MNHN). 4 ♂♂, São Bento do Sul, Rio Vermelho, viii. 2009, x. 2011, O. RANK leg. (CGCM 24.858, CGCM 26.199, CGCM 26.340, CGCM 27.101 [CGCM]). 4 ♂♂, 11 ♀♀, São Bento do Sul, Rio Natal, 450–550 m, 1. xi. 1996, 1. xi. 1997, 28. vi. 2014, iii. 2014, vii.–viii. 2014, x. 2014, RANK leg. (CGCM 10.423, CGCM 10.471, CGCM 11.107, CGCM 28.980, CGCM 29.194, CGCM 29.294, CGCM 29.330, CGCM 29.349, CGCM 29.365, CGCM 29.374, CGCM 29.429, CGCM 29.436, CGCM 29.487, CGCM 29.489, CGCM 29.583 [CGCM]). 1 ♂, Neu Bremen [*recte* Dalbérgia], Rio Laeiss, iv. 1936, F. HOFFMAN leg., ROTHSCHILD Bequest B.M. 1939-1 (NHMUK). 1 ♂, 18. ix. 1957, Coll. J. C. HOPFINGER 1962 (USNM). 1 ♂, [Seara], Nova Teutônia, 27°4' S, 52°23' W, Fritz PLAUMANN leg. (USNM). 2 ♂♂, 1 ♀, [Seara], Nova Teutônia, 5. xi. 1948, 21. ii. 1958, 4. viii. 1961 (MNHN). 3 ♂♂, 3 ♀♀, [Seara], Nova Teutônia, 27°11' S, 52°23' W, 300–500 m, 24. v. 1957, 21. ii. 1958, 9. viii. 1961, 4. vii. 1962, viii. 1970, Fritz PLAUMANN leg., C. LEMAIRE genitalia prep. 3972 (MNHN). 1 ♂, 1 ♀, Seara, Nova Teutônia, 17. i. 1974, x. 1977, PLAUMANN leg. (CGCM 10.484, CGCM 10.718 [CGCM]). 1 ♀, Blumenau, Coll. Frank JOHNSON (USNM). 1 ♂, Blumenau, 18. vii. 1953, C. BIEZANKO leg., BIEZANKO No. 4467, St. LAURENT dissection: 4-20-15:2 (CUIC). 7 ♂♂, 1 ♀, no specific locality, Coll. Frank JOHNSON (USNM); F. JOHNSON donor (USNM); A. MALLER leg., Coll. Frank JOHNSON (USNM); ROTHSCHILD Bequest B.M. 1939-1 (NHMUK). — **Rio Grande do Sul:** 4 ♂♂, Guarani [das Missões], “IV.6.IX”, “IV.3.IX”, “II: 4.1933”, C. BIEZANKO leg., BIEZANKO Nos. 974, 978, St. LAURENT dissection: 4-20-15:1 (CUIC). 1 ♂, Hamburgo Velho [*recte* Novo Hamburgo], C. ERTL leg., ROTHSCHILD Bequest B.M. 1939-1 (NHMUK). — **Paraguay:** 1 ♂, Salto del Guairá, xi. 1987 (CSNB).

## Diagnosis

See diagnosis given by LEMAIRE (1988: 345) for *A. catharina*, which actually corresponds to *A. apicalis* (see discussion below). The species most similar to *A. apicalis* (Figs. 4a, 4b, 5a, 5b, 6a, 6b, 15a, 15b, 16) is *A. paracatharina* BRECHLIN & MEISTER, 2011 (HT: BOLD Sample-ID code BC-FMP-2147 [HM382633]). *Adeloneivaia paracatharina* and *A. apicalis* are morphologically nearly indistinguishable, though the bifurcated uncus of the holotype of *A. paracatharina* figured in BRECHLIN & MEISTER (2011, fig. 106) is narrower than in the preparation shown in our Figure 15. The available barcodes of both species reveal a close relationship, the minimum interspecific distance is 0,8%. The specific status of *A. paracatharina* deserves further investigation, particularly in light of the true identity of common and widespread *A. apicalis*.

## Geographical distribution

Southeastern to Southern Brazil, in the states of Minas Gerais, Rio de Janeiro, São Paulo, Paraná, Santa Catarina, and Rio Grande do Sul as well as Paraguay. LEMAIRE (1988) mentions specimens from central Brazil and Bolivia, which based on our understanding of material from these countries, may not exactly correspond to true *A. apicalis* due to minor differences in morphology and DNA barcoding results, suggesting that more cryptic diversity could be involved. Further investigation is needed for clarification. See Fig. 17 for records that we verified to be *A. apicalis*. Reports of this species (as *A. catharina*) from Argentina are also known to us (see RACHELI 2008, NÚÑEZ BUSTOS 2015), however without examining photos of specimens it is difficult to say if both *A. catharina* and *A. apicalis* are found in Argentina. That being said, we are aware of verifiable *A. apicalis* from Misiones, Argentina, on iNaturalist.org, thus we know at least that this species is found in the country.

## Discussion

LEMAIRE (1976) synonymized *A. apicalis* with *A. catharina* likely on the grounds that they were thought to be the corresponding ♀ and ♂, respectively, of the same species. LEMAIRE (1988) restated this and maintained the synonymy, which has been the classification ever since. Prior to the present work, an undetermined *Adeloneivaia* was known to C. MIELKE and W. NÄSSIG from southeastern Brazil. St. LAURENT was made aware of this taxon and upon examining the Saturniidae type collection of the MNHN, the incorrect synonymization of *A. apicalis* with *A. catharina* became clear. The primary types of both species, which are part of the BOUVIER collection in the MNHN, were examined in detail and it was readily apparent that the HT ♂ of *A. catharina* (Figs. 1a, 1b) is in fact this “undetermined” species known to the other authors, while the ♀ HT of *A. apicalis* (Figs. 6a, 6b) is *A. catharina sensu* LEMAIRE (1988). As far as we can tell, all publications except MAY et al. (2014), subsequent to LEMAIRE’s synonymization of both species, which men-





**Figs. 1–6:** Adult specimens of *Adeloneivaia*. **Figs. 1–3:** *A. catharina*, HT ♂ dorsal (1a), ventral (1b) (Brazil, Santa Catarina); ♂ dorsal (2a), ventral (2b) (Brazil, MG, Poté; CGCM 31.057); ♀ dorsal (3a), ventral (3b) (same locality as Fig. 2 (BC-Her0933 [MT609941])). — **Figs. 4–6:** *A. apicalis*, ♂ dorsal (4a), ventral (4b) (Brazil, São Paulo, Guapiara; CGCM 29.841); ♀ dorsal (5a), ventral (5b) (Brazil, Santa Catarina, São Bento do Sul; CGCM 29.489); HT ♀ dorsal (6a), ventral (6b) (Brazil, Santa Catarina). — Scale bars 1 cm; specimens not exactly to the same scale.

tion *A. catharina*, actually refer to *A. apicalis*, a common and widespread species. True *A. catharina* is actually a poorly known species that is sparsely represented in major collections. The *A. catharina* genetic cluster mentioned above in the diagnosis section for *A. catharina* has a genetic distance from the cluster of records for *A. apicalis* of more than 11%, corroborating the strong distinction between the two species.

### *Adeloneivaia minuta* (BOUVIER, 1927)

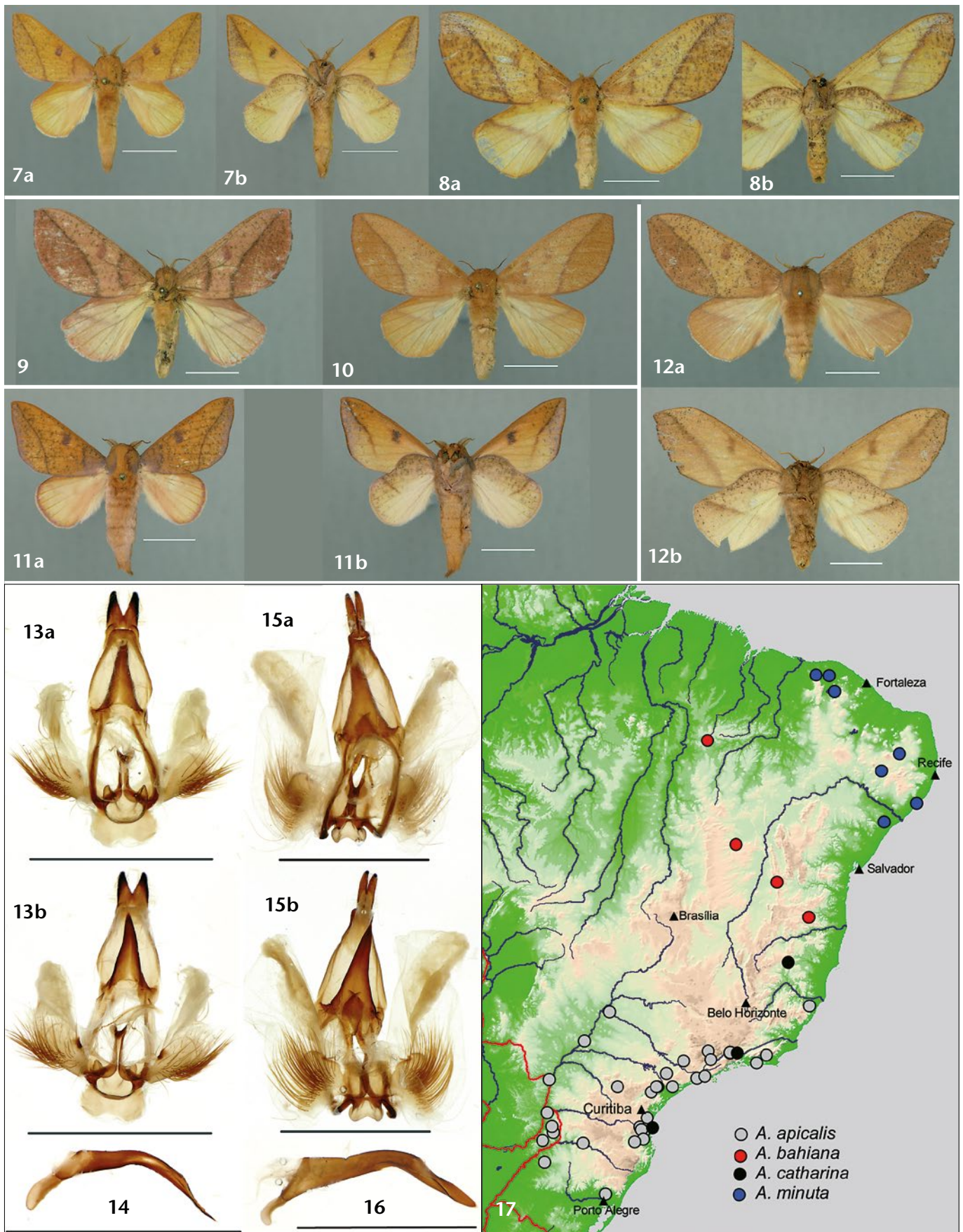
Figs. 7a, 7b, 8a, 8b, 9, 10.

**Holotype ♂:** *Adelocephala minuta* ♂ type, E. L. BOUVIER det./  
*Adelocephala minuta* BOUVIER, Holotype ♂, genitalia 2284

prep. C. LEMAIRE/ *Adelocephala minuta* BOUVIER, Ann. Sc. nat., Zool., 10(10), 1927, p. 257, pl. II, fig. 6. — The holotype was described from Brazil, Pernambuco, Serra de Bernarda, i. 1895, L. GOUNELLE [leg.], ex-coll. OBERTHÜR, ex-coll. DE BRETEUIL, ex-coll. PHILIPON; MNHN, examined. Figured in LEMAIRE (1988: pl. 49, fig. 13).

**Examined material** (in total 16 ♂♂, 8 ♀♀), all **Brazil**: Ceará: 1 ♂, 1 ♀, Santa Quitéria, Faz. Bem Posta, 20. iii. 2005, A. PESSOA leg. (CGCM 17.990, CGCM 18.278 [CGCM]). 2 ♀♀, Meruoca, 9. iii. 2005, 21. ii. 2006, A. PESSOA leg. (CGCM 18.294, CGCM 20.298 [CGCM]). 3 ♂♂, Meruoca, Floresta, 10. iii. 2005, A. PESSOA leg. (CGCM 18.117, CGCM 18.133, CGCM 18.389 [CGCM]). 1 ♂, Viçosa do Ceará, Quatiguaba, 15. v. 2008, A. PESSOA leg. (CGCM 23.395; BOLD Sample-ID:





**Figs. 7–12:** Adult specimens of *Adeloneivaia*. **Figs. 7–10:** *A. minuta*, ♂ dorsal (7a), ventral (7b) (Brazil, Ceará, Meruoca; CGCM 18.133); ♀ dorsal (8a), ventral (8b) (same locality as Fig. 7; CGCM 18.294); ♀ dorsal (9) (same locality as Fig. 7; CGCM 20.298); ♀ dorsal (10) (Brazil, Ceará, Santa Quitéria; CGCM 17.990). — **Figs. 11–12:** *A. bahiana*, ♂ dorsal (11a), ventral (11b) (Brazil, Maranhão, Feira Nova do Maranhão; CGCM 25.109); ♀ dorsal (12a), ventral (12b) (Brazil, Bahia, Barreiras; CGCM 11.139). — Scale bars 1 cm; specimens not exactly to the same scale. — **Figs. 13–16:** *Adeloneivaia* ♂ genitalia. **Figs. 13–14.** *A. catharina*: dorsal view (13a), ventral view (13b), phallus lateral view (14) (CGCM 31.057). **Figs. 15–16.** *A. apicalis*: dorsal view (15a), ventral view (15b), phallus lateral view (16) (CGCM 31.057). — Scale bars 5 mm. — **Fig. 17:** Geographical distribution of the four species within Brazil, Paraguay and Argentina.

BC-CGCM 23.395 [GU663175] [CGCM]). 1 ♂, Serra da Meruoca, Meruoca, 800 m, 2. iii. 2006, BOLD Sample-ID: BC-Dec0414 [MT609943] (CTD). 1 ♀, Floresta, 800 m, 12. ii. 2006, BOLD Sample-ID: BC-Dec0413 [MT609939] (CTD). — **Paraíba**: 1 ♂, Independência, L. S. Jr. U. Lot 546 Sub (AMNH). — **Pernambuco**: 2 ♂♂, 1 ♀, Custódia, 25. vi. 1974, V. O. BECKER leg. (CGCM 10.485, CGCM 10.675, CGCM 11.043 [CGCM]). 6 ♂♂, 3 ♀♀, no additional locality data, Coll. Frank JOHNSON, St. LAURENT dissection: 4-20-15:3 (AMNH, CUIC). — **Sergipe**: 1 ♂, no additional locality data: Coll. Frank JOHNSON (AMNH).

## Diagnosis

See LEMAIRE (1988: 354). Comparison between *A. minuta* and the most similar species, *A. bahiana*, is given under the diagnosis section of the latter. Barcode Index Number Registry for BOLD: AAC9306.

## Description

♀ (Figs. 8a, 8b, 9, 10): FW length: 23–26 mm; wingspan: 47–52 mm. DFW elongated, subtriangular, outer margin slightly convex with barely pronounced apex; ground colour light yellowish-brown to reddish-brown, lighter median area weakly to moderately contrasting with darker ante- and postmedian areas, with brown speckling throughout; antemedial line smooth, slightly curving outward from thorax, postmedial line preapical, smoothly curving, both lines thin and brown; discal spot light brown, ovoid. VFW as in dorsum but lighter, all markings less pronounced, speckling only present proximal to apex; antemedial line absent. DHW yellowish-brown to light brown, almost no maculation present apart from weakly curved incomplete postmedial line. VHW as in VFW but with darker scaling near costal and outer margin, postmedial line more developed than on dorsum. Abdomen dorsally rufous-brown and ventrally darker.

## Geographical distribution

*Adeloneivaia minuta* is restricted to the Caatinga, a dry area of northeastern Brazil, in Ceará, Paraíba, Pernambuco, Alagoas, and Sergipe. We provide two new Brazilian state records, Ceará and Sergipe, expanding what was previously known about the distribution of this species (Fig. 17).

## Discussion

Only three DNA barcode sequences are available for *A. minuta*, revealing a maximum uncorrected intraspecific distance of 1.83%; the nearest neighbour is *A. apicalis* (minimum uncorrected distance to nearest neighbour is 4.33%), and the genetic distance to *A. bahiana* is 5.5%. Both species, *A. minuta* and *A. bahiana*, are inhabitants of northeastern Brazil, although they are apparently not sympatric, but do occur in similar habitats. The specimen shown in LEMAIRE (1988: pl. 49, fig. 14) from Alagoas, Brazil, examined at the MNHN by the second author, is here assigned to *A. minuta*, and not *A. bahiana* as stated in BRECHLIN & MEISTER (2011: 7).

## *Adeloneivaia bahiana* BRECHLIN & MEISTER, 2011

Figs. 11a, 11b, 12a, 12b.

**Holotype** ♂: **Brazil**: Bahia, Rte. Br. 116, Encruzilhada, km 34, 600 m, 9. iii. 1997; ex-coll. Frank MEISTER, in Coll. R. BRECHLIN, stated to be in Museum WITT, Munich, Germany; not examined. BOLD Sample-ID: BC-FMP-0936 [MT609934].

**Examined material** (in total 9 ♂♂, 1 ♀), all **Brazil**: **Maranhão**: 3 ♂♂, Feira Nova do Maranhão, Retiro, 480 m, 24.–31. xii. 2011, C. MIELKE leg. (CGCM 24.837, CGCM 25.109, CGCM 25.253 [CGCM]). — **Bahia**: 3 ♂♂, 1 ♀, Barreiras, 500 m, 20. ii. 1996, CAMARGO leg. (CGCM 10.829, CGCM 10.851 (BOLD Sample-ID: BC-CGCM-10.851, 381 bp [JX215933]), CGCM 11.037, CGCM 11.139 [CGCM]). 1 ♂, Igarorã, 750 m, 28. iii. 2000, V. O. BECKER leg. (CGCM 10.941 (BOLD Sample-ID: BC-CGCM-10.941, 381 bp [JX215932]), [CGCM]). 2 ♂♂, Caetitê, Maniaçú, 850 m, 8. xii. 2005, O. MIELKE & CASAGRANDE leg. (DZ 9.868 (BOLD Sample-ID: BC-DZ-9.868 [JX215931]), DZ 9.876 (BOLD Sample-ID: BC-DZ-9.876 [JX215930]) [DZUP]).

## Diagnosis

♂ of *A. bahiana* (Figs. 11a, 11b; wingspan: 41–49 mm) can be differentiated from the ♂ of the similar *A. minuta* (Figs. 7a, 7b; wingspan: 32–43 mm) by slightly larger size overall and somewhat broader and longer forewings with sharper apices. ♀ of *A. bahiana* (Figs. 12a, 12b; wingspan: 56 mm, instead of 47–52 mm in *A. minuta*) is slightly larger with the light brown central area contrasting against the darker brown ante- and postmedian areas. In similar forms of the somewhat variable female of *A. minuta*, the ante- and postmedian areas are less contrasting and of a redder hue than that of *A. bahiana*.

## Description

♀ (Figs. 12a, 12b): FW length: 27 mm; wingspan: 56 mm. As for *A. minuta*, but ground colour light brown, median area much lighter brown, distinctly contrasting with darker brown ante- and postmedian areas.

## Geographical distribution

This species is only known from a handful of sites within northeastern Brazil in the states of Maranhão and Bahia. The distribution surrounds the Caatinga, the most arid biome within Brazil. We provide a new Brazilian state record, Maranhão, expanding what was previously known about the distribution of this species (Fig. 17).

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