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Taxonomic review of *Gallio* Evans, 1955 (*Lepidoptera*, *Hesperiidae*, *Hesperiinae*): one less monotypic genus of Moncini

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ABSTRACT

Moncini is the tribe of *Hesperiidae* that comprises the greatest diversity of small, brown, hard to identify skippers. The group is peculiarly classified as having many monotypic genera, thus offering low informative value to its systematics. This study presents a review of the genus *Gallio* Evans, 1955, a genus formerly recognized as monotypic, and describes three new species, *Gallio imperatriz* sp. nov. from Maranhão, Brazil, *Gallio furtadoi* sp. nov. from Mato Grosso, Brazil and *Gallio eti* sp. nov. from Madre de Díos, Peru and Acre, Brazil (type locality). A lectotype for *Vehilius carasta* Schaus, 1902 is designated. *Gallio* is therefore redescribed and illustrations and diagnosis to its species are provided.

Introduction

Moncini comprises the greatest diversity of small, brown, and unmarked Neotropical skippers, whose systematics is largely unknown (Burns, 1994; Warren et al., 2009). In this group, a substantial number of genera are monotypic (Evans, 1955; Burns, 1994; Austin, 1997; Turland et al., 2012), especially because male genitalia morphology can be very distinct from all other known genitalia.

These particular monospecific combinations may arise from two distinct taxonomic artifacts: (1) although recently investigated, many genera and species still lack figured genitalia, thus making comparisons much more challenging when describing new taxa; (2) some of these monospecific genera might include other species, though they are not yet described. This last case seems to be the reason why *Gallio* Evans, 1955 includes only a single species *Gallio carasta* (Schaus, 1902). In the present study, the genus is redescribed with remarks on its systematics and three new species are described.

Methods

The specimens of *Gallio* used in this study are deposited in: DZUP (Coleção Pe Jesus Santiago Moure, Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Brazil), MUSM (Museo de Historia Natural, Universidad Mayor de San Marcos, Lima, Peru), and OM (Olaf Mielke collection, Curitiba, Brazil), the abbreviation DZ corresponds to the code number of the specimens in DZUP collection. Genitalia of both sexes were prepared with standardized methods and illustrated (scales sizes 1 mm). Morphological terminology used follows Carneiro et al. (2012, 2013). Wings abbreviations are: DFW, dorsal forewing; DHW, dorsal hindwing; VFW, ventral forewing; VHW, ventral hindwing. Size is given as the forewing length from base to apex. The labels of the type material were described separately by a "/" and additional information is given between "[]". Roman numbers in geographical distribution and phenology section state the month of specimen capture. In view of the similarity in general morphological pattern between all species belonging to *Gallio*, a detailed description is given for the genus and only exclusive characters are mentioned in the description of the new species.

Results

Gallio Evans, 1955

Type species: *Stomyles gallio* Mabille, 1904, by original designation.

Gallio Evans, 1955. **Cat. Amer. Hesp. 4**, p. 85, 111; type species: *gallio* Mabille, 1904. – Hemming, 1967. **Bull. Brit. Mus. (Nat. Hist.), Ent.,** Suppl. 9: 195. – Beattie, 1976. **Rhop. Direct**., p. 25. – Okano, 1981. **Tokurana 1:** 30. – Bridges, 1983. **Lep. Hesp. 2**, p. 14. – Bridges, 1988. **Cat. Hesp. 1**, p.23; **App. 2**, p. 2. – Bridges, 1988. **Cat. Fam.-Group & Gen.-Group Nam. 4**, p. 52; **5**, p. 2. – Mielke, 2004.

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Hesperioidea, p. 68, ***in*** Lamas (ed.). **Checklist: Part 4A, Hesperioidea-Papilionoidea**, ***in*** Heppner (ed.). **Atlas Neotrop. Lep. 5A**.

Diagnosis. The genus *Gallio* is distinguished from almost all genera of Moncini by the presence of a unique color ventral wing pattern composed by a continuous yellowish marginal line with thin parallel expansions between veins until or before the discal spots from R_3–R_4 to CuA_1–CuA_2 in VFW and from Sc + R_1 to M_3–CuA_1 in VHW. Additionally, VFW presents a row of small yellowish discal spots in each space from Sc to CuA_2 (poorly defined in DFW) and a yellowish discal spot in the anterior half of the discal cell (sometimes observable in DFW) while in VHW the row of small yellowish discal spots is present from Sc + R_1 to 2A (absent in DHW) and the yellowish discal spot occur at the posterior half of the discal cell (Figs. 1–4).

Only two species of the genus *Vehilius* Godman, 1900, plus the monotypic genus *Inglorius* Austin, 1997 share the above characters with *Gallio*: *Vehilius madius* Bell, 1941, *Vehilius seriatus* Mabille, 1891 and *Inglorius mediocris* Austin, 1997. The genus *Gallio* can be easily distinguished from those species belonging to *Vehilius* by the absence of a long patch of ochre hair-like scales at the base of the males DFW anal margin. On the other hand, the wing pattern of *Gallio* is most similar to *Inglorius*. However, the male genitalia in these genera differ in respect to four characters. The shorter anterior projection of saccus than the tegumen + uncus, uncus longer than wide, with its median distal projection as long as the uncus' arms and the harpe distally long in *Inglorius* (Austin, 1997, Fig. 12) may be used to distinguish these two genera.

Description: Antenna longer than one half of costa; antennal club short (equal to ¼ of the shaft); shaft ventrally yellowish; nudum from 10 to 12 segments, only on apiculus. Palpus quadrate (inner edge equal to the transverse width), ventrally yellowish to whitish mixed with brown scales, third segment cylindrical, thin, around half of the second segment length. Wings: forewing length: 9–13 mm. Ground color brown, violet bluish metallic shade on subapical area of VFW and on all VHW, and with yellowish markings. DFW uniformly brown; yellowish discal cell spot in the anterior half of the discal cell; a row of small yellowish discal spots in each space from Sc to CuA_2, sometimes faint or absent; brand absent. DHW uniformly brown. VFW costal area yellowish from base to Sc end; yellowish discal cell spot at the anterior half of the discal cell; a row of small yellowish discal spots in each space from Sc to CuA_2; submarginal area with a continuous yellowish line with thin expansions parallel to the veins until or before reach the discal spots from R_3–R_4 to CuA_1–CuA_2; a whitish long spot in CuA_2–2A, aligned with the discal cell end. VHW costal margin yellowish; yellowish discal cell spot in the posterior half of the discal cell; a row of small yellowish discal spots in each space from Sc + R_1 to 2A; submarginal area with a continuous yellowish line with thin expansions parallels to the veins until or before reach the discal spots from Sc + R_1 to M_3–CuA_1. Legs: laterally iridescent dark yellow, mesotibia covered by small spines and with a pair of distal spurs; metatibia with two pairs of spurs. Abdomen dorsally dark brown, ventrally cream, central longitudinal line thin, weak to absent; pleural spots between segments IV–VI absent on females. Male Genitalia: tegumen without projection; fenestra triangular, developed to reduced, wider than long. Saccus lobed, longer than tegumen + uncus. Uncus shorter than wide, with reduced projected arms, largely separated from each other and with the distal median projection shorter than the uncus arms' length. Gnathos hooked-like, with a membranous patch. Valvae symmetrical, without posterior median cleft dividing ampulla from harpe; sacculus rectangular; harpe projected posteriorly and dorsally, with an inner ventro-posterior protruding line; ampulla rounded, not projected. Aedeagus cylindrical; coecum lobed or reduced; dorso-posterior end of aedeagus hollowed; ventro-posterior end ventrally projected; vesica distally clothed by several reduced spines. Fultura inferior thin; bifid; dorsal projections extending only laterally from aedeagus; ventrally bilobed. Female Genitalia: tergite VIII with an ellipsoid espiracular opening, apart or continuous to external margin. Lamella antevaginalis projected below ostium bursae, forming a tube together with the lamella postvaginalis. Ostium bursae located medially in sterigma. Posterior margin of lamella postvaginalis with lateral projections, truncated, rounded or pointed. Ductus bursae membranous, distally sinuous or folded into a &-shape, with thin lateral signa; proximal sclerotization ends sidewards to the left; corpus bursae oval.

Gallio carasta (Schaus, 1902)
(Figs. 1, 5, 9, 13)

Vehilius carasta Schaus, 1902. **Proc. U. S. Nat. Mus. 24**: 448; male, n° 6.037, Petropolis [Rio de Janeiro State], Brazil; USNM. – Draudt, 1923, in Seitz. **Gross-Schmett. Erde 5**, p. 973. – Evans, 1955. **Cat. Amer. Hesp. 4**, p. 142. – J. Zikán & W. Zikán 1968. **Pesq. agropec. bras.** 3: 64. – Bridges, 1983. **Lep. Hesp. 1**, p. 22; **2**, p. 39. – Bridges, 1988. **Cat. Hesp. 1**, p. 34; **2**, p. 64.

Stomyles gallio Mabille, 1904, ***in*** Wytsman. **Gen. Ins. 17**, p. 132; 1 specimen [holotype], Brazil. – Draudt, 1923, ***in*** Seitz. **Gross-Schmett. Erde 5**, p. 943.

Amblyscirtes gallio: Draudt, 1924, ***in*** Seitz. **Gross-Schmett. Erde 5**, p. 1055.

Gallio gallio: Evans, 1955. **Cat. Amer. Hesp. 4**, p. 111, pl. 60 (male gen.). – Bridges, 1983. **Lep. Hesp. 1**, p. 47; **2**, p. 14. – Bridges, 1988. **Cat. Hesp. 1**, p. 74; **2**, p. 23.

(no genus) *carasta* Beattie, 1976. **Rhop. Direct**., p. 104.

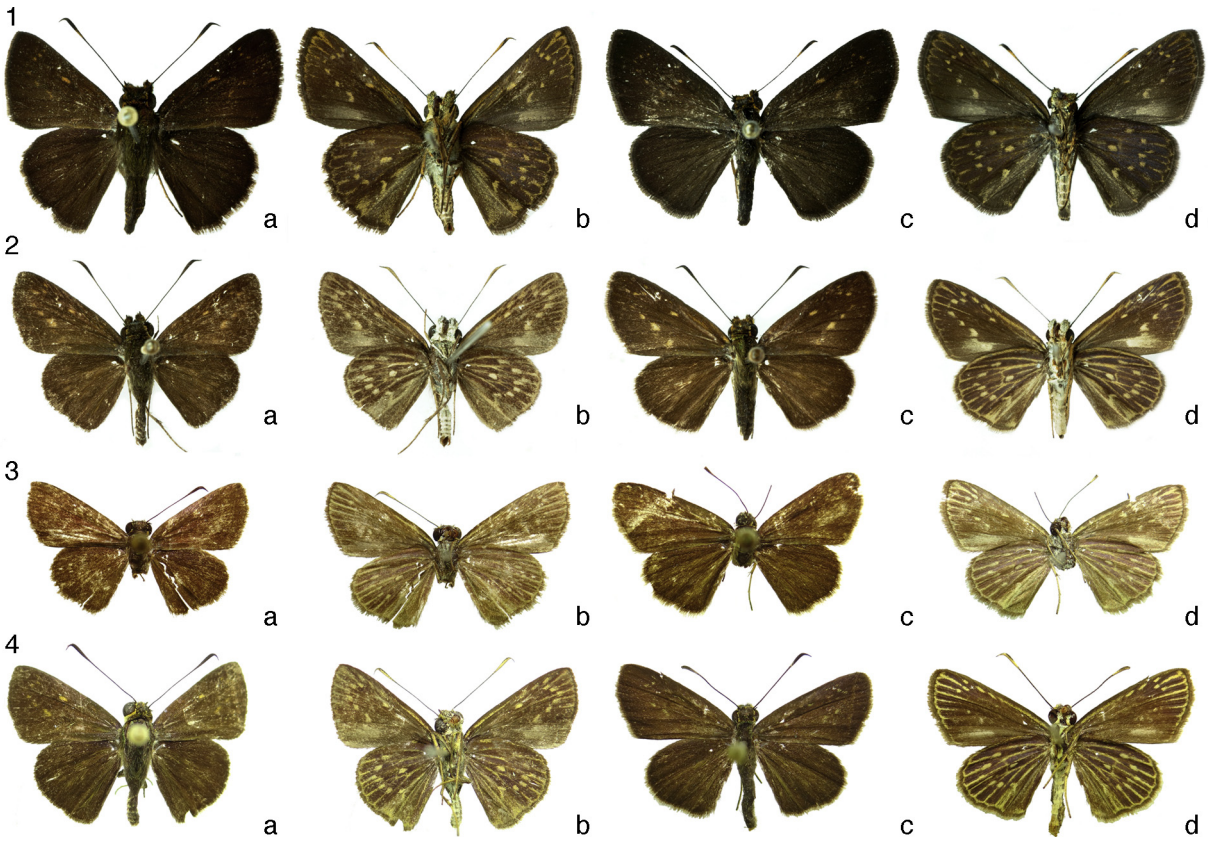
(no genus) *gallio* Beattie, 1976. **Rhop. Direct**., p. 150.

G. carasta: Mielke and Casagrande, 2002. **Revta bras. Zool. 19**, Suppl. 1: 53; ***syn***.: *gallio*. – Mielke, 2004. Hesperioidea, p. 68, ***in*** Lamas (ed.). **Checklist: Part 4A, Hesperioidea-Papilionoidea**, ***in*** Heppner (ed.). **Atlas Neotrop. Lep. 5A**; ***syn***.: *gallio*. – Mielke, 2005. **Cat. Amer. Hesperioidea 4**, p. 967; ***syn***.: *gallio*. – Carneiro; Mielke & Casagrande, 2008. **Shilap Revta lepid. 36**(142): 266. – Dolibaina, Mielke & Casagrande, 2011. **Biota Neotrop. 11**(1): 345.

Diagnose: *G. carasta* has the antenna shaft ventrally yellowish only on its basal portion; longer forewing, with the length around 11–13 mm (Fig. 1a–d); forewing subapical yellow spots in R_3–M_1 aligned with each other (Fig. 1b); submarginal yellow line of ventral forewing proximally projected (Fig. 1b); forewing ventral surface with the yellow submarginal line in M_1–M_2 not exceeding proximally the subapical yellow spot (Fig. 1b). Dorsal projection of ampulla developed, spined and distally inclined. Distal margin of aedeagus abruptly thinned toward the right side. Lamella antevaginalis bifid as in *Gallio imperatriz* sp. nov., but with shorter and rounded projections. Posterior margin of lamella postvaginalis with lateral fingered projections.

Type material: The description of *V. carasta* Schaus, 1902 was based on the male, but the author also mentions a female, indicating at least two specimens used to describe the species. Additionally, Schaus (1902) mentions the type locality as Petropolis (Rio de Janeiro state, Brazil) and the type code number #6037. However, as verified by Dolibaina et al. (2014), the code numbers mentioned by Schaus (1902) may include more than one specimen. After the study of the USNM collection a single syntype belonging to this species was located with the following labels:/Petropolis [Rio de Janeiro] Brazil/Collection W. Schaus/*V. carasta* T[y]pe Sch[au]s/Type No 6037 U.S.N.M./. Thus, aiming to provide stability to the name proposed by Schaus (1902), the above syntype is here designated as the lectotype of *V. carasta* and the following labels will be added:/LECTOTYPUS/Lectotypus *V. carasta* Schaus, 1902 Carneiro, Dolibaina, Mielke & Casagrande det. 2015/; these labels will be send to the curator of the USNM.

A second name was proposed to this species, *S. gallio* Mabille, 1904, that was considered a subjective synonym junior of *G. carasta*



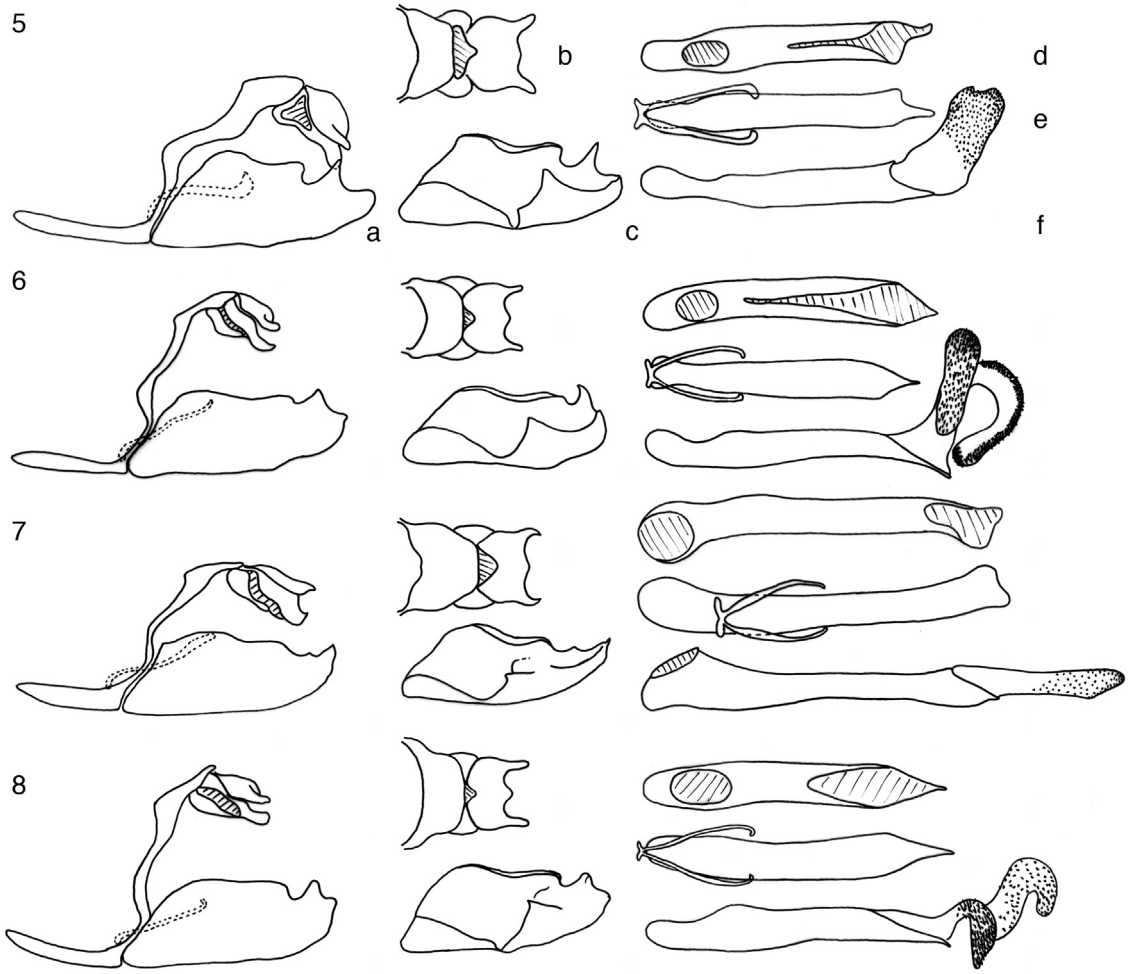
Figs. 1–4. 1. *Gallio carasta* (Schaus, 1902); 2. *Gallio imperatriz* Carneiro, Dolibaina, Mielke & Casagrande sp. nov., holotype (DZ 31.501) and alotype (DZ 31.571) respectively; 3. *Gallio furtadoi* Carneiro, Dolibaina, Mielke & Casagrande sp. nov., holotype (DZ 31.651) and alotype (DZ 31.641) respectively; 4. *Gallio eti* Carneiro, Dolibaina, Mielke & Casagrande sp. nov., holotype (OM 64.567) and allotype (DZ 31.230) respectively. Dorsal views (a, c); ventral views (b, d); males (a, b); females (c, d).

by Mielke and Casagrande (2002). Mabille (1904) used of a single specimen on the description of *S. gallio*, interpreted as a holotype by subsequent authors (Evans, 1955; Mielke and Casagrande, 2002; Mielke, 2005). According to Evans (1955), the type specimen is a male deposited at the BMNH having the following labels:/Type/Bresil/*Stomyles gallio* Mab[ille]./R. Oberthür Coll. Brit. Mus. 1931-136/.

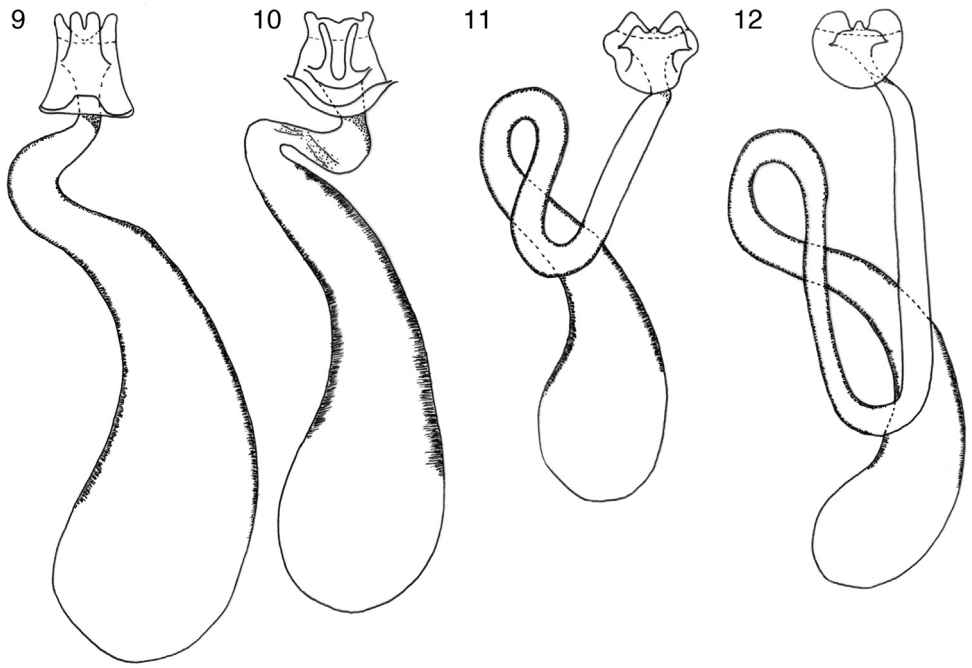
Images of the lectotype of *V. carasta* Schaus, 1902 and the holotype of *Stomyles gallio* Mabille, 1904 are available in Warren et al. (2015).

Distribution: Brazilian coast, from south Bahia to Santa Catarina. Scarce in western Paraná state and Paraguay.

Examined material: BRAZIL – *Bahia*: Amargosa, 6-8.IV.2002, O.-C. Mielke leg. 7♂ and 5♀ (OM 48.089, OM 48.489, OM 51.487, OM 55.845, OM 55.887, OM 56.128, OM 56.143, OM 56.180, OM 56.187, OM 56.194, OM 56.215, OM 56.220, OM 56.243, OM 56.290); Camacan, I.1992, Becker leg., 1♂ (OM 50.778). *Espírito Santo*: Santa Teresa, 24.IX.1966, C. & C. T. Elias leg., 2♂ (DZ 31.233, DZ 31.352), 25-29.III.1970, Ebert leg., 1♂ (DZ 31.452), (Parque Santa Lúcia), 12.II.1991, Tangerini leg., 1♂ (DZ 31.783), (São João de Petrópolis), 10.IV.1967, C. & C. T. Elias leg., 1♂ (DZ 31.224); Sooretama, (Reserva Biológica Sooretama), 21-25.I.2014, Mielke & Casagrande leg., 1♂ (DZ 31.363). *Minas Gerais*: Catas Altas (Caraça), 1-5.II.1985, Mielke & Casagrande leg., 1♂ (DZ 31.353); Itaipé, 29.VI.1969, Ebert leg., 1♂ (DZ 31.743); Poços de Caldas, 17.XII.1966, Ebert leg., 1♀ (DZ 31.372). *Rio de Janeiro*: Cachoeira de Macacu (Boca do Mato), 16.VI.2001, Tangerini leg., 1♂ (DZ 31.332), 1.VI.2003, Tangerini leg., 1♂ (DZ 31.722), 4.III.2006, Tangerini leg., 1♂ (DZ 31.642), 31.III.2008, Tangerini leg., 1♂ (DZ 31.523); Petrópolis (Alto da Serra), 15.IV.1962, Mielke leg., 1♂ (OM 4.286), 5.XII.1965, Mielke leg., 2♀ (OM 7.592, OM 7.593); Rio de Janeiro (Camorim), 18.IV.1965, Mielke leg., 3♂ (OM 6.578, OM 6.579, OM 6.580). *São Paulo*: Cananéia, 23.IV.1999, Mielke & Casagrande leg., 1♂ and 1♀ (OM 50.028, OM 50.056); Ubatuba, 28.VII.1963, Ebert leg., 1♂ (DZ 31.502), 14.XII.1965, Ebert leg., 1♂ (DZ 31.242). *Paraná*: Antonina (Cacatú), 16.IV.1977, Mielke leg., 1♂ (DZ 31.554), 21.IV.1998, Mielke leg., 1♀ (OM 49.089), (Cedro), 6.IV.2013, Mielke & Siewert leg., 1♂ (OM 74.403), 18.IV.2013, Mielke, Siewert & Zacca leg., 1♂ (DZ 31.472); Balsa Nova (São Luiz do Purunã), 28.X.1986, Mielke & Casagrande leg., 1♀ (DZ 31.603); Campina Grande do Sul (6 km NW de Jaguatirica), 1.III.2003, Mielke & Casagrande leg., 1♀ (OM 59.852), 5.IV.2003, Mielke & Casagrande leg., 1♂ (OM 59.621); Campo Largo (16 km NO de Bateias), 11.III.2000, Mielke leg., 2♂ (OM 51.534, OM 51.646), (Três Córregos), 7.III.1998, O.-C. Mielke & Bizarro leg., 1♀ (OM 48.264); Guaratuba (Limeira), 21.IV.2001, Mielke leg., 1♂ and 1♀ (OM 51.550, OM 51.771), 15.IV.2003, Mielke leg., 4♂ and 1♀ (OM 51.699, OM 51.706, OM 51.713, OM 51.720, OM 51.727); Jaguariaíva (Parque Estadual do Cerrado), 20.XI.2009, Mielke, Carneiro, Maia, Ribeiro & Dolibaina leg., 1♀ (DZ 31.222); Morretes, 19.IV.1997, Mielke leg., 1♂ and 1♀ (OM 45.843, OM 45.851), 12.III.1997, Mielke leg., 3♂ and 2♀ (OM 45.842, OM 45.914, OM 45.922, OM 45.930, OM 45.938), (Alto da Serra), 28.I.1993, Mielke leg., 1♂ (OM 33.718), (Morro Alto), 31.III.2001, Mielke leg., 1♀ (OM 53.290), 11.IV.2001, Mielke leg. 1♂ (OM 51.550), 14.IV.2001, Mielke leg., 1♂ and 1♀ (OM 51.532, OM 51.798), 12.IV.2003, Mielke leg., 1♂ and 3♀ (OM 60.605, OM 60.640, OM 60.647, OM 60.654), 9.IV.2005, Mielke leg., 1♀ (DZ 31.792), 4.IV.2009, Mielke leg., 1♂ (DZ 31.503); Paranaguá, 16.IV.1995, Mielke leg., 3♂ and 2♀ (OM 40.653, OM 40.661, OM 40.725, OM 40.757, OM 40.781), (Alexandra), 27.IV.1968, Mielke leg., 1♂ and 1♀ (DZ 31.272, DZ 31.612), 6.IX.1968, Mielke leg., 1♀ (DZ 31.703); Pontal do Paraná, 26.XII.2001, Mielke leg., 1♂ (OM 55.409), (Atami), 31.III.1991, Mielke leg., 1♀ (OM 26.679),



Figs. 5–8. Male genialia of *Gallio* species. 5. *Gallio carasta* (Schaus, 1902), OM 30.007; 6. *Gallio imperatriz* Carneiro, Dolibaina, Mielke & Casagrande sp. nov. DZ 922; 7. *Gallio furtadoi* Carneiro, Dolibaina, Mielke & Casagrande sp. nov. DZ 31.641; 8. *Gallio eti* Carneiro, Dolibaina, Mielke & Casagrande sp. nov. OM 64.567. a. lateral view of genitalia without aedeagus; b. dorsal view of tegumen and uncus; c. inner view of the right valva; d, e and f. aedeagus dorsal, ventral and lateral views respectively.



Figs. 9–12. Female genitalia of *Gallio* species in ventral view. 9. *Gallio carasta* (Schaus, 1902) DZ 31.270; 10. *Gallio imperatriz* Carneiro, Dolibaina, Mielke & Casagrande sp. nov. DZ 31.751; 11. *Gallio furtadoi* Carneiro, Dolibaina, Mielke & Casagrande sp. nov. DZ 31.641; 12. *Gallio eti* Carneiro, Dolibaina, Mielke & Casagrande sp. nov. OM 64.567.

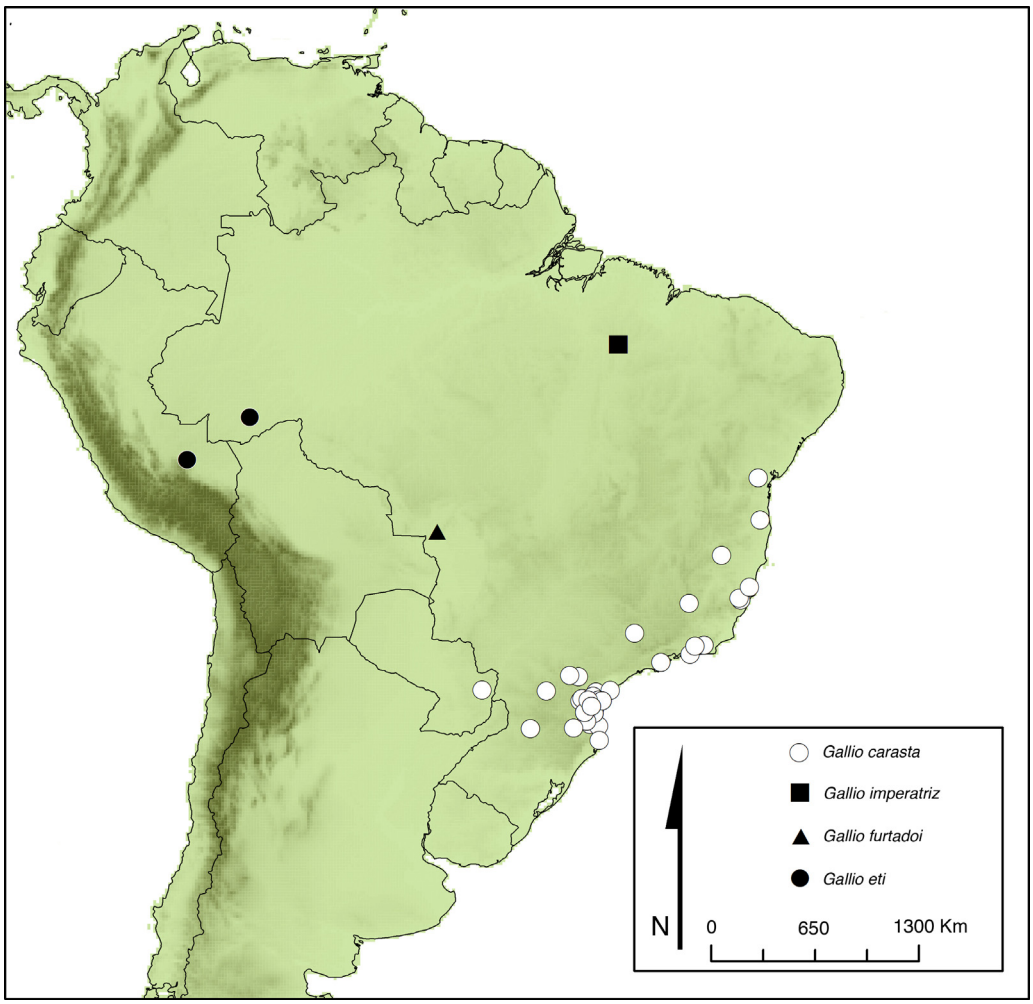


Fig. 13. Geographical distribution of *Gallio* species.

20.IV.1992, Mielke leg., 1♀ (OM 32.846), 10.IV.1993, Mielke leg., 1♂ (OM 34.899), 7.IX.1997, Mielke leg., 3♀ (OM 45.549, OM 45.557, OM 45.658), 26.XII.2009, Mielke leg., 1♂ (DZ 31.772), 26-31.XII.2009, Mielke leg., 3♂ and 1♀ (DZ 31.572, DZ 31.673, DZ 31.762, DZ 31.773), (Rio Guaraguatá), 27.III.2011, Mielke leg., 3♂ (DZ 31.303, DZ 31.672, DZ 31.742), 3.V.2014, Mielke leg., 1♂ (DZ 31.312); São José dos Pinhais (Castelhanos), 24.II.1994, Mielke leg., 1♀ (OM 37.541); Tijucas do Sul (Vossoroca), IV-1971, Moure & Mielke leg., 3♀ (DZ 31.623, DZ 31.713, DZ 31.793), 7.IV.1971, Moure & Mielke leg., 8♂ and 3♀ (DZ 31.270, DZ 31.292, DZ 31.423, DZ 31.443, DZ 31.453, DZ 31.493, DZ 31.573, DZ 31.613, DZ 31.682, DZ 31.702, DZ 31.763), 8.III.1972, Mielke leg., 1♂ and 1♀ (DZ 31.232, DZ 31.740), 24.II.1980, Mielke leg., 1♂ (DZ 31.354); Turvo (Britador), 15.II.2010, Dolibaina leg., 1♂ (DZ 31.413); Ventania (12 Km NO), 30.XI.2008, Mielke leg., 1♀ (DZ 31.622). *Santa Catarina*: Blumenau, 2.III.1973, Lauterjung leg., 1♂ (DZ 31.373); Camboriú, 27.I.1984, Mielke leg., 1♂ (DZ 31.583); Florianópolis (Naufragados), 16.IV.2005, Santos leg., 1♂ (DZ 31.552); Garuva, 22.I.1987, Mielke & Casagrande leg., 1♂ (OM 13.356); Joinville, 10.X.1967, Miers leg., 1♂ (DZ 31.262), 12.III.1967, Mielke leg., 1♀ (DZ 31.782), 27.III.1970, Mielke leg., 1♂ (DZ 31.323), 20.XI.1970, Mielke leg., 1♂ (DZ 31.662), 7.II.1971, Mielke & Miers leg., 1♂ (DZ 31.342), 21.IV.1971, Miers leg., 3♂ (DZ 31.243, DZ 31.422, DZ 31.482), 24.IV.1971, Mielke leg., 1♂ (DZ 31.553), 6.XI.1971, Mielke & Miers leg., 1♂ (DZ 31.383), 28.IV.1973, Mielke & Miers leg., 1♂ (DZ 31.393), 18.I.1976, Mielke leg., 1♂ and 1♀, (DZ 31.723, DZ 31.614), 27.III.1980, Mielke leg., 1♂ and 1♀ (DZ 31.492, DZ 31.732), 23.I.1984, Miers & Mielke leg., 1♂ (DZ 31.462), 7.I.1987, Mielke leg., 1♂ (OM 13.365), 16.I.1989, Miers leg., 1♂ (OM 21.537), 22.XI.1982, Miers leg., 1♂ (OM 30.007); Rio dos Cedros (Alto Rio dos Cedros), 4.II.1972, Lauterjung leg., 1♂ (DZ 31.692), 15.II.1972, Lauterjung leg., 1♂ (DZ 31.302); São Bento do Sul (Morro da Igreja), 17.V.2003, Moser & Rank leg., 1♂ (DZ 31.473), (Rio Natal), 13.III.1987, Mielke & Rank leg., 2♀ (OM 14.379, OM 25.089), 23.IV.2002, Rank leg., 1♂ (OM 58.591), 5.IV.2011, Rank leg., 1♀ (DZ 31.764), (Rio Vermelho), 1.IV.1974, Rank leg., 1♀ (DZ 31.681), 11.III.1984, Mielke & Rank leg., 2♂ and 2♀ (DZ 31.223, DZ 31.293, DZ 31.442, DZ 31.663), 7.III.1987, Rank leg., 1♂ (OM 17.129); Seara (Nova Teutônia), I.1971, Plaumann leg., 1♀ (DZ 31.720), III.1971, Plaumann leg., 1♀ (DZ 31.252), VIII.1977, Plaumann leg., 1♀ (DZ 31.513); Taió, 24.I.1982, Mielke & West leg., 1♂ (DZ 31.563). PARAGUAY – *Alto Paraná*: Itakyry, 15-20.I.1980, Mielke & Miers leg., 2♂ and 1♀ (DZ 31.432, DZ 31.392, DZ 31.683).

Gallio imperatriz Carneiro, Dolibaina, Mielke & Casagrande, sp. nov. (Figs. 2, 6, 10, 13)

Diagnose: This new species can be immediately distinguished from *G. carasta* by its smaller size, with the forewing length around 9–10 mm (Fig. 2), and by the unaligned forewing subapical yellow spots in R_3–M_1 due to the proximal position of the spot R_4–R_5 (Fig. 2). However, the characters listed above are also present in *G. furtadoi* sp. nov. and *G. eti* sp. nov. Thus, *G. imperatriz* sp. nov. is rightly separated from *G. furtadoi* sp. nov. and *G. eti* sp. nov. by its distribution only known to southwestern Maranhão, consequently allopatric from the remain two species, and by the characters from

both male and female genitalia including the ampulla with a dorsal hook-shaped projection proximally inclined; distal margin of harpe medially rounded; aedeagus distal opening medially longer and larger; vesica bilobed, producing two long projections covered by several reduced spines of different sizes; lamella antevaginalis bifid from the base producing two long distally divergent arms; ostium bursae proximal; lamella postvaginalis longer than wide, without a distal broad deep indentation, additionally with two short and curved lateral projections; ductus bursae shorter than *Gallio carasta* with a sclerotization patch within the sinuous part; corpus bursae wider.

Description: Forewing length: 9–10 mm. Antenna: nudum 11 to 12. Male genitalia: fenestra reduced. Harpe dorsal projection developed, pointed, posterior projection truncated with a reduced spine. Coecum of aedeagus short, lobed, dorsally straight, slightly curved to the left; distal opening of aedeagus elongated, V-shaped; distal ventral margin of aedeagus medially projected and pointed; vesica bilobed, distally clothed by several reduced spines of different sizes in each lobe. Female genitalia: spiracular opening of eighth tergite closed and ellipsoid. Lamella antevaginalis deeply bifid, with thin and long arms. Distal margin of the lamella postvaginalis with two lateral, short and curved processes. Ductus sinuous and short, with a distinct sclerotization patch within the sinuous part.

Types: Holotype male with the following labels:/HOLOTYPUS/Imperatriz, MA[ranhão, Brazil] 3-VII-1974 Exc[ursão]. Dep[ar]t[ament]o. Zool[ogia]./DZ 31.501/HOLOTYPUS *Gallio imperatriz* Carneiro, Dolibaina, Mielke & Casagrande det. 2015/. DZUP.

Allotype with the following labels:/ALLOTYPUS/Imperatriz, MA[ranhão, Brazil] 25-VIII-1974 Exc[ursão]. Dep[ar]t[ament]o. Zool[ogia]./DZ 31.571/ALLOTYPUS *Gallio imperatriz* Carneiro, Dolibaina, Mielke & Casagrande det. 2015/. DZUP.

Paratypes: BRAZIL – *Maranhão*: Imperatriz, 1.VII.1974, 1 macho (DZ 31.671), 2.VII.1974, 1 ♀ (DZ 31.631), 3.VII.1974, 1 ♂ (DZ 31.491), 4.VII.1974, 1 ♂ (DZ 31.701), 29.VII.1974, 1 ♀ (DZ 31.581), 5.VIII.1974, 1 ♂ (DZ 31.280), 19.VIII.1974, 1 ♂ (DZ 922), 25.VIII.1974, 1 ♀ (DZ 31.571) all collected by Excursão do Departamento de Zoologia da UFPR.

Distribution: Known from a single location in southwestern Maranhão, close to the eastern limits of Amazon forest.

Etymology: The name is a reference to the type locality, the only place known for the occurrence of this species.

Gallio furtadoi Carneiro, Dolibaina, Mielke & Casagrande, sp. nov.
(Figs 3, 7, 11, 13)

Diagnose: *Gallio furtadoi* sp. nov. is distinguished from *G. carasta* by its smaller size, with forewing length around 9.5–10 mm (Fig. 3a–d); unaligned forewing subapical yellow spots in R_3–M_1 due to the proximal position of the spot R_4–R_5 (Fig. 3b); submarginal yellow line of ventral forewing (Fig. 3b); the forewing ventral surface with the yellow submarginal line in M_1–M_2 exceeding proximally the subapical yellow spots (Fig. 3b). However, as mentioned on the diagnosis of *G. imperatriz* sp. nov., the characters listed above are shared with both *G. imperatriz* sp. nov. and *G. eti* sp. nov., thus *G. furtadoi* sp. nov. can be distinguished from these species by the trapezoid tegumen; developed fenestra; distal margin of harpe thinner and pointed; dorsal projection of ampulla reduced; aedeagus longer than the anterior projection of saccus + valva; ejaculatory bulb opening on the anterior margin of the coecum; distal opening of aedeagus short, proximally not projected in dorsal view; distal margin of aedeagus truncated and with a minor rounded projection on the right side; vesica lobed, end covered with several reduced spines; lamella antevaginalis shorter, distal margin with three short projections, two laterals and one at the center; distal margin of the lamella postvaginalis with a developed V-shaped indentation.

Description: Forewing length 9.5–10 mm. Antenna: nudum 11. Male genitalia: fenestra developed. Harpe's dorsal projection as small reduced spine; posterior projection aculeate. Aedeagus longer than valva + saccus length, coecum reduced, elbowed, slightly curved to the left; dorso-distal end of aedeagus hollowed, hollow wide, short, not extended anteriorly on aedeagus; ventro-distal end of aedeagus truncated, with a minor rounded projection on the right side; vesica distally clothed by several reduced spines. Female genitalia: lamella antevaginalis projection wide, with lateral and median, rather reduced rounded projections. Distal margin of lamella postvaginalis with lateral triangular processes separated by a V-shaped line. Ductus bursae folded in &-shape.

Types: Holotype with the following labels:/HOLOTYPUS/Rio Vermelho, C[oron]el. Rio Branco, Cáceres M[a]T[o Grosso, Brazil], 400 m, 3-VII-1972 Mielke & Brown leg./GEN. PREP. E. CARNEIRO 2014/DZ 31.651/HOLOTYPUS *Gallio furtadoi* Carneiro, Dolibaina, Mielke & Casagrande det. 2015/. DZUP.

Allotype with the following labels:/ALLOTYPUS/Rio Vermelho, C[oron]el. Rio Branco, Cáceres M[a]T[o Grosso, Brazil], 400 m, 3-VII-1972 Mielke & Brown leg./GEN. PREP. E. CARNEIRO 2014/DZ 31.641/ALLOTYPUS *Gallio furtadoi* Carneiro, Dolibaina, Mielke & Casagrande det. 2015/. DZUP.

Distribution: Known from a single locality in southern Mato Grosso, Brazil.

Etymology: This species honors the butterfly specialist and friend Eurides Furtado, given his valuable contribution to the Brazilian lepidopteran biodiversity.

Gallio eti Carneiro, Dolibaina, Mielke & Casagrande, sp. nov.
(Figs. 4, 8, 12, 13)

Gallio sp. Lamas, 1994, in Foster et al. **RAP Working Papers 6**: 175. – Robbins et al., 1996, *In* Wilson & Sandoval. **Manu**, p. 249.

Diagnose: As in previous new species, *Gallio eti* sp. nov. is distinguished from *G. carasta* also by its smaller size, with forewing length around 9.5–10 mm (Fig. 4a–d); unaligned forewing subapical yellow spots in R_3–M_1 due to the proximal position of the spot in R_4–R_5 (Fig. 4b); submarginal yellow line of ventral forewing on the outer margin (Fig. 4b); and the forewing ventral surface with the yellow submarginal line in M_1–M_2 exceeding proximally the subapical yellow spot (Fig. 4b). On the other hand, these characters also occur in *G. imperatriz* sp. nov. and *G. furtadoi* sp. nov., thus *G. eti* sp. nov. is separated from these two species by the rounded dorsal projection of ampulla, not exceeding the dorsal margin of costa; distal margin of aedeagus thin and pointed, with the distal opening not projected proximally as in *G. imperatriz* sp. nov.; lamella antevaginalis distal margin with a single median projection; lamella postvaginalis rounded, with its distal margin with a developed U-shaped indentation.

Description: Forewing length: 9.5–10 mm. Antenna: nudum 11 to 12. Male genitalia: fenestra reduced. Harpe's distal projection short and rounded, slightly turned dorsally. Ampulla's dorsal projection short and rounded. Coecum of aedeagus short, laterally straight; dorso-posterior end of aedeagus hollowed; hollow wide and elongated; ventro-distal end of aedeagus medially projected, pointed in apex; vesica bilobed, distally clothed by several reduced spines of different sizes in each lobe. Female genitalia: eighth tergite with an ellipsoid spiracular opening separated from the external margin. Lamella antevaginalis with a median, rounded projection. Distal margin of lamella postvaginalis with lateral truncated processes separated by a U-shaped margin. Ductus bursae membranous folded in &-shape.

Types: Holotype male with the following labels:/HOLOTYPUS/ 20-23-VII-2004 50 KM NO DE BUJARI, BUJARI, ACRE [BRAZIL] 200 m, O.-C. MIELKE LEG./GEN. PREP. E. CARNEIRO 2014/OM 64.567/HOLOTYPUS *Gallio eti* Carneiro, Dolibaina, Mielke & Casagrande det. 2015/. DZUP.

The Allotype female has the following labels:/ALLOTYPUS/PERU, M[adre] de Dios, Parque Manu, Pakitza 340 m, 11°55′48″ S 71°15″18″ W 13 Oct 1991 Leg. O. Mielke/GEN. PREP. E. CARNEIRO 2014/DZ 31.230/ALLOTYPUS *Gallio eti* Carneiro, Dolibaina, Mielke & Casagrande det. 2015/. DZUP.

Paratype: PERU – *Madre de Díos*: Parque Nacional Manu (Pakitza), 340 m, 29.IX.1991, G. Lamas leg. 1♂ (MUSM).

Distribution: Known from two localities from western Amazon in Inambari endemism area: Bujari (Acre, Brazil) and Parque Nacional Manu (Madre de Díos, Peru).

Etymology: The name comes from the resemblance between the shape of the ductus bursae and the "&" symbol.

Systematic remarks

The name *V. carasta* was first described in this genus probably due to the presence of yellowish discal spots and lines in both wings ventral surface (Schaus, 1902). Later, Mabille (1904) described *Stomyles gallio*, whose genus is considered a synonym of *Amblyscirtes* Scudder, 1872 since Watson (1893). In the catalog of American skippers, Evans (1955) transferred *Stomyles gallio* from *Amblyscirtes* Scudder, 1872 to his new proposed genus *Gallio*, without observing *V. carasta*, otherwise both names would not be mentioned separately in his catalog. The oldest name was thereafter proposed (Mielke and Casagrande, 2002; Mielke, 2005), and also here maintained as a senior synonym of *Stomyles gallio*.

Combination of Evans (1955) was probably influenced by its classification system, using in this case the absence of nudum in the antennal club as a character to place *Gallio carasta* in the "*Phanes* subgroup" of the "*Apaustus* group". Given the disparate wing pattern and male genitalia between *Gallio* and all other genera ascribed to "*Phanes* subgroup", Evans (1955), created the genus to include a single species based on its shorter antennae and absence of nudum in club, absence of stigma and by "the facies and the form of genitalia". "*Phanes* subgroup" however, has been showed to group a miscellaneous of unrelated Moncini and Anthoptini species given the absence of morphological characters that supports it (Carneiro et al., 2015). Furthermore, *Gallio* presents more similar characters with some *Vehilius* species, than all other species classified in "*Phanes* subgroup". For example, *Vehilius seriatus* and *V. madius* both present basically the same ventral surface wing pattern, which includes: yellowish marked lines between veins, presence of the same yellowish discal and cell spots, and the ground color brown with bluish metallic shade. Additionally, *Vehilius*'s nudum in 12 segments agree in number to the variation found in *Gallio* (10–12 segments), although it differs in its extension to the club.

Nevertheless, although the characters used to describe *Gallio* are actually misleading (e.g. antennae length is rather longer than half of costa; nudum varies from 10 to 12) or ambiguous (absence of stigma and broad uncus are present in several similar genera), there is no reason until now to include its species in another genus. The uncus, projection of harpe, fultura, and projection of lamella postvaginalis have quite distinct formats, configuring what taxonomists usually calls "genitalia pattern or genitalia form" (e.g. Lindsey, 1921; Evans, 1955; Freeman, 1973). All *Vehilius* species present a distinct modification in all those characters, plus the long aedeagus, cornuti shape and sclerotized ductus bursae close to the ostium, which are characters shared with species of *Cymaenes* (E.C. pers. obs.).

Less than two decades ago a new genus named *Inglorius* Austin, 1997 was described from Central America to include a single species *I. mediocris* Austin, 1997. This species regards many ressemblance with *Gallio*. No external differences can be observed among them mainly in the wings color pattern. Even though, Austin (1997) did not explicitly propose any relationship between *Inglorius* and *Gallio*, he choose to place *Inglorius* in the "*Apaustus* subgroup". However, according to Austin (1997) the nudum in *Inglorius* extends to the club, while in *Gallio* it occurs only on apiculus. The recognition of this character however is quite difficult, and can be considered as a "subjective judgment" (Steinhauser, 1989). The placement of *Inglorius* close to *Gallio* appears to be correct. Nevertheless the rarity of *I. mediocris* in collections (this species was only examined by us through its original description and a male illustrated by Warren et al., 2015), and the fact that the female remains unknwon does not allow a more accurate taxonomic treatment for *Inglorius*.

Although the phylogenetic information of Moncini lineages remains unexplored, *Gallio* currently represents an informative taxonomic group, supported by unique morphological characters in male and female genitalia. It is however, more likely that it is more closely related to genera included "*Cymaenes* subgroup" than to all taxa listed in "*Phanes* subgroup".

Conflict of interest

The authors declare no conflicts of interest.

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