

Six new species of *Systemus* (Diptera, Dolichopodidae) from Brazil, with a key to the Neotropical species

[Sechs neue Arten der Gattung *Systemus* (Diptera, Dolichopodidae) aus Brasilien,
mit einem Schlüssel für die neotropischen Arten]

by
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Abstract Six new species of the genus *Systemus* are described from the Amazonas Basin in Brazil: *Systemus nigriatus* spec. nov., *Systemus rafaeli* spec. nov., *Systemus flaviatus* spec. nov., *Systemus amazonicus* spec. nov., *Systemus beatae* spec. nov., *Systemus rarus* spec. nov. A key to all Neotropical species of *Systemus* is given.

Keywords Dolichopodidae, new species, *Systemus*, Neotropical Region, Brazil, Amazonas

Zusammenfassung Aus dem Amazonas-Becken in Brasilien werden sechs neue Arten aus der Gattung *Systemus* beschrieben: *Systemus nigriatus* spec. nov., *Systemus rafaeli* spec. nov., *Systemus flaviatus* spec. nov., *Systemus amazonicus* spec. nov., *Systemus beatae* spec. nov., *Systemus rarus* spec. nov. Ein Schlüssel für alle neotropischen *Systemus* Arten wird gegeben.

Stichwörter Dolichopodidae, neue Arten, *Systemus*, Neotropische Region, Brasilien, Amazonas

Introduction

Only one species of the genus *Systemus* is known from the Neotropical region (ROBINSON 1970). A key to all the species then known was provided by STEYSKAL (1970). Subsequently, new species have been described by VAILLANT (1978), NEGROBOV & SHAMSHEV (1985), BICKEL (1986), OLEJNÍČEK & KOZÁNEK (1997) and MAC GOWAN (1997). An updated catalogue of the world species is included in OLEJNÍČEK & KOZÁNEK (1997). The taxonomic characters of the genus and its systematic position are discussed by BICKEL (1986), and a taxonomic revision of the Palearctic species was given by KASSEBEER (1998).

During my examination of Dolichopodidae material from the Amazonas Basin of Brazil, six new species of the genus *Systemus* LOEW were found from the same locality. This is remarkable, as specimens of this genus are usually rarely taken as adults. Most adults of this genus are found by rearing from tree-hole debris. So far, eight Palearctic, six Nearctic, one Neotropical and two Australian species are known. The Amazonas area seems to be an ideal habitat for *Systemus* species. All specimens were collected by Malaise traps and are preserved as pinned material. All holotypes and most paratypes are deposited in the Instituto Nacional de Pesquisas da Amazonia (Manaus), with some paratypes in the private collection of the author. The morphological terminology follows McALPINE (1981) and the hypopygial terminology BICKEL (1986). The following abbreviations are used:

ac = acrostichal setae
ad = anterodorsal
av = anteroventral
dc = dorsocentral setae

pd = posterodorsal
ppl = proepisternal setae
pv = posteroventral
t₁-t₅ = tarsomeres 1 to 5

Description of new species

Systemus nigriatus spec. nov.

(Fig. 1a-b)

Material: Holotype male: **Brazil**, Amazonas, Manaus, Reserva Ducke, Copa de Arv, 26.XI.1981, leg. J. A. RAFAEL.

Paratypes: same locality, 2 ♂♂, 30.XI.1981, leg. J. A. RAFAEL.

Diagnosis: A small, black species with entirely black antennae and black femora, arista half as long as first flagellomere, and hypopygium with U-shaped surstylus.

Male

Body length 2.1-2.2 mm, wing length 2.0-2.1 mm.

Head: Frons broad, metallic green with brownish pruinosity; face and clypeus narrow, with brownish pruinosity, face at narrowest part about 1/5 as wide as frons at broadest part. Palpi brown, with one strong brown seta and short brown hairs. Proboscis brown with short hairs. Postocular setae uniserial, yellow, becoming black near vertex. Antennae black; scape bare, cylindrical; pedicel short, with a circllet of short setae; first flagellomere (Fig. 1a) tapering, about 2.5 times as long as broadest width, with dense pubescence. Arista apical, with microscopic pubescence, 1/2 as long as first flagellomere; first aristemere very short.

Thorax: Dorsum metallic green with brownish pruinosity, with a bronze stripe in area of ac; posterior third of mesonotum flattened. Pleura green with brownish pruinosity. Thoracic setae black. 12–14 pairs of ac, anterior pairs parallel, posterior 2 pairs more separated. 6 pairs of strong dc, decreasing in size anteriorly. 2 pairs of scutellars, laterals about 1/3 length of medians; 1 pale ppl above fore coxa. **Legs:** All coxae dark brown, tip of coxae and trochanters yellow. All femora brownish-black, the extreme tip yellow. Remaining legs yellow, middle and hind tarsomeres darkened, only t_5 of fore tarsomere darkened. Fore leg: Coxa with short yellow hairs and 5 strong yellow setae at apex; femur with short yellow hairs ventrally, tibia and tarsomeres with short yellow hairs, without any setae. Mid leg: Coxa with some yellow setae inside; trochanter with some short black setae; tibia with a strong ad and a smaller pd at 1/4 and with a pair of small ad and pd at 2/3. Hind leg: Coxa with 1 strong yellow lateral seta, inserted about 1/3 from base; trochanter with a short black seta; tibia with row of 4-5 dorsal black setae. Relative podomere ratios (femur, tibia, tarsomere 1/2/3/4/5): I: 55, 60, 29/13/10/7/7; II: 65, 75, 39/23/17/12/8; III: 65, 87, 19/32/20/14/8. **Wings:** Hyaline; R_{2+3} and R_{4+5} diverging towards wing apex; R_{4+5} and M practically parallel distally, R_{4+5} running straight to wing-margin, M slightly sinuous in middle between cross-vein (m-cu) and wing margin; cross-vein (m-cu) about 1.5 times as long as distance between R_{4+5} and M at wing apex; cross-vein (m-cu) about 0.7 times as long as distal section of CuA. Anal vein and anal cell present. Lower calypter yellow, with yellow setae; haltere yellow.

Abdomen: Metallic green, with brownish pruinosity and with short black setae, posterior margin of tergum 1 with much longer setae; tergum 5 and 6 black; segment 7 elongate-pedunculate, brownish, with black setae; segment 8 brown with black setae. Hypopygium (Fig. 1b): dark brown; cerci yellow, narrow and long, about 2 times as long as epandrium, bearing yellow setae; surstyli U-shaped, yellow, narrow, with black apex.

Female unknown.

Remarks: This species can be distinguished from all other Neotropical species by the black femora, the shape of the first flagellomere (Fig. 1a), and the arista which is half as long as first flagellomere.

***Systemus rafaelli* spec. nov.**

(Fig. 2a-b)

Material: Holotype male: **Brazil**, Amazonas, Manaus, Reserva Ducke, Copa de Arv, 26.XI.1981, leg. J. A. RAFAEL.**Paratypes:** same locality, 1 ♂, 23.XI.1981; 3 ♂♂, 26.XI.1981; 2 ♂♂, 30.XI.1981; all leg. J. A. RAFAEL.**Diagnosis:** A small species with entirely black antennae and yellow legs, abdominal segment 7 glabrous, hypopygium with short apically broadened cerci, and surstyli as long as cerci and with an apical spine.**Male****Body length** 2.1-2.3 mm; wing length 2.1-2.2 mm.**Head:** Frons broad, metallic green with brownish pruinosity; face and clypeus metallic green, narrow; face with brownish pruinosity, clypeus shining, face at narrowest part about 1/4 as wide as frons at broadest part. Palpi brown, with one strong black seta and short brown hairs. Proboscis brown with short hairs. Postocular setae uniserial, yellow, becoming black near vertex. Antennae brownish-black; scape bare, cylindrical; pedicel short, with a circlet of short setae; first flagellomere (Fig. 2a) broad basally, progressively tapering from about middle and forming a long slender projection, about 3.5 times as long as broadest width, with dense pubescence. Arista apical, bare, about 1/4 as long as first flagellomere; first arisotomere very short.**Thorax:** Dorsum metallic green with greyish pruinosity, with a bronze stripe in area of ac, extended to posterior part of mesonotum; posterior third of mesonotum flattened. Pleura green with greyish pruinosity. Thoracic setae black. 12-14 pairs of ac, anterior pairs parallel, posterior 2 pairs more separated. 6 pairs of strong dc, decreasing in size anteriorly. 2 pairs of scutellars, laterals about 1/3 length of medians; 1 pale ppl above fore coxa. **Legs:** Fore coxa yellow, middle and hind coxae dark greyish-green, yellow at extreme tip; trochanters and remaining legs yellow, t₅ of all legs darkened. Fore leg: Coxa with short yellow hairs and 5-7 strong yellow setae at apex; femur, tibia and tarsomeres with short hairs, without any setae. Mid leg: Coxa with some yellow setae inside; tibia with a strong ad and pd at 1/4 and a short ad and pd at 3/4, and with 2-3 short pv. Hind leg: Coxa with 1 strong yellow lateral seta, inserted at about middle; tibia with 1 short ad and 3-4 short pd. Relative podomere ratios (femur, tibia, tarsomere 1/2/3/4/5): I: 62, 62, 30/19/12/7/7; II: 70, 80, 37/27/19/12/7; III: 75, 88, 17/37/23/13/9. **Wings:** Hyaline; R₂₊₃ and R₄₊₅ diverging towards wing apex; R₄₊₅ and M practically parallel distally, R₄₊₅ running straight to wing-margin, M slightly sinuous in middle between cross-vein (m-cu) and wing margin; cross-vein (m-cu) about 1.5 times as long as distance between R₄₊₅ and M at wing apex; cross-vein (m-cu) about 0.8 times as long as distal section of CuA. Anal vein and anal cell present. Lower calypter yellow, with yellow setae; haltere yellow.**Abdomen:** Metallic green, with bronze reflections and with short black setae, posterior margin of tergum 1 with much longer setae; segment 7 elongate-pedunculate, brownish, glabrous; segment 8 brown with brown setae. Hypopygium (Fig. 2b): dark brown; cerci yellow, narrow, broadened apically, about as long as epandrium, bearing yellow setae; surstyli yellow, as long as cerci, with an apical spine.**Female** unknown.**Remarks:** This species can be distinguished from the other species with black antennae as follows: from the similar *S. nigriatus* spec. nov. by the yellow femora, the shape of the first

flagellomere (Fig. 2a), the length of the arista which is $\frac{1}{4}$ the length of first flagellomere, and the hypopygium (Fig. 2b); and from *S. raptor* BECKER by the absence of yellow terga and the length of the arista, which is about $\frac{1}{4}$ the length of first flagellomere.

Derivatio nominis: This species is dedicated to the Brazilian dipterist and collector of all the material examined, Jose Albertino RAFAEL.

Systemus flaviatus spec. nov.

(Fig. 3a-b)

Material: Holotype male: **Brazil**, Amazonas, Manaus, Reserva Ducke, Copa de Arv, 23.XI.1981, leg. J. A. RAFAEL.

Paratypes: same locality, 2 ♂♂, 24.IX.1981; 1 ♂, 9.X.1981; 3 ♂♂, 23.XI.1981; 1 ♂, 30.XI.1981; 1 ♂, 22.I.1982; 1 ♂, 26 km N. of Manaus, 27.VIII.1982; 1 ♂, 26 km NE Manaus, 13.X.1988; all leg. J. A. RAFAEL.

Diagnosis: A larger species with partly yellow antennae and yellow legs, with conspicuous yellow lateral patches on terga 1-3 or 1-4, and hypopygium with long cerci bearing long dorsal setae.

Male

Body length 3.0-3.6 mm; wing length 2.7-3.2 mm.

Head: Frons broad, metallic blue-green, shining, without pruinosity; face and clypeus narrow, with dense greyish pruinosity, the green ground barely visible; face at narrowest part about $\frac{1}{4}$ as wide as frons at broadest part. Palpi yellow, with one strong black seta and short brown hairs. Proboscis brown with short yellow hairs. Postocular setae uniserial, yellow, becoming black near vertex. Antennae yellow from base to middle of first flagellomere, apical part brownish-black; scape bare, cylindrical; pedicel short, with a circlet of short setae; first flagellomere (Fig. 3a) broad basally, progressively tapering from about middle and forming a long slender projection, about 3.5 times as long as broadest width, with dense pubescence. Arista apical, bare, about $\frac{1}{5}$ as long as first flagellomere; first aristomere very short.

Thorax: Dorsum metallic green with greyish pruinosity, with a bronze stripe in area of ac; posterior third of mesonotum flattened. Pleura green with greyish pruinosity. Thoracic setae black. 8-10 pairs of ac, anterior pairs parallel, posterior pair more separated. 6 pairs of strong dc, decreasing in size anteriorly. 2 pairs of scutellars, laterals about $\frac{1}{3}$ length of medians; 1 yellow ppl above fore coxa.

Legs: All coxae yellow, middle coxa with brown stripe anteriorly; trochanters and remaining legs yellow, t_5 of fore leg and all tarsomeres of middle and hind leg darkened. Fore leg: Coxa with short yellow hairs and 6-8 strong yellow setae at apex; femur with short yellow hairs ventrally, tibia with a short ad at $\frac{3}{4}$ (sometimes barely developed). Mid leg: Coxa with some yellow setae inside and golden-brown setae apically; tibia with a pair of strong ad and pd at $\frac{1}{4}$ and another pair at $\frac{2}{3}$, and with 2 shorter pv and 1 av, tarsomeres with short black hairs. Hind leg: Coxa with 1 strong yellow lateral seta, inserted at about middle; tibia with 2 ad at $\frac{1}{4}$ and $\frac{2}{3}$ and a row of 6-8 pd, an irregular row of ventral setae. Relative podomere ratios (femur, tibia, tarsomere 1/2/3/4/5): I: 52, 50, 28/15/9/6/6; II: 65, 68, 38/29/24/17/8; III: 69, 87, 16/42/30/20/9. **Wings:** Hyaline; R_{2+3} and R_{4+5} diverging towards wing apex; R_{4+5} and M bowed outwards subapically; cross-vein (m-cu) about 1.5 times as long as distance between R_{4+5} and M at wing apex; cross-vein (m-cu) about 0.9 times as long as distal section of CuA. Anal vein and anal cell present. Lower calypter yellow, with yellow setae; haltere yellow.

Abdomen: Metallic green, tergum 1 wholly yellow, terga 2-3 or 2-4 with a yellow side patch, more or less extended dorsally and becoming smaller on posterior segments; with short black setae, posterior margin of tergum 1 with much longer setae. Segment 7 elongate-pedunculate, brownish, with black setae; segment 8 brown with golden-brown setae. Hy-

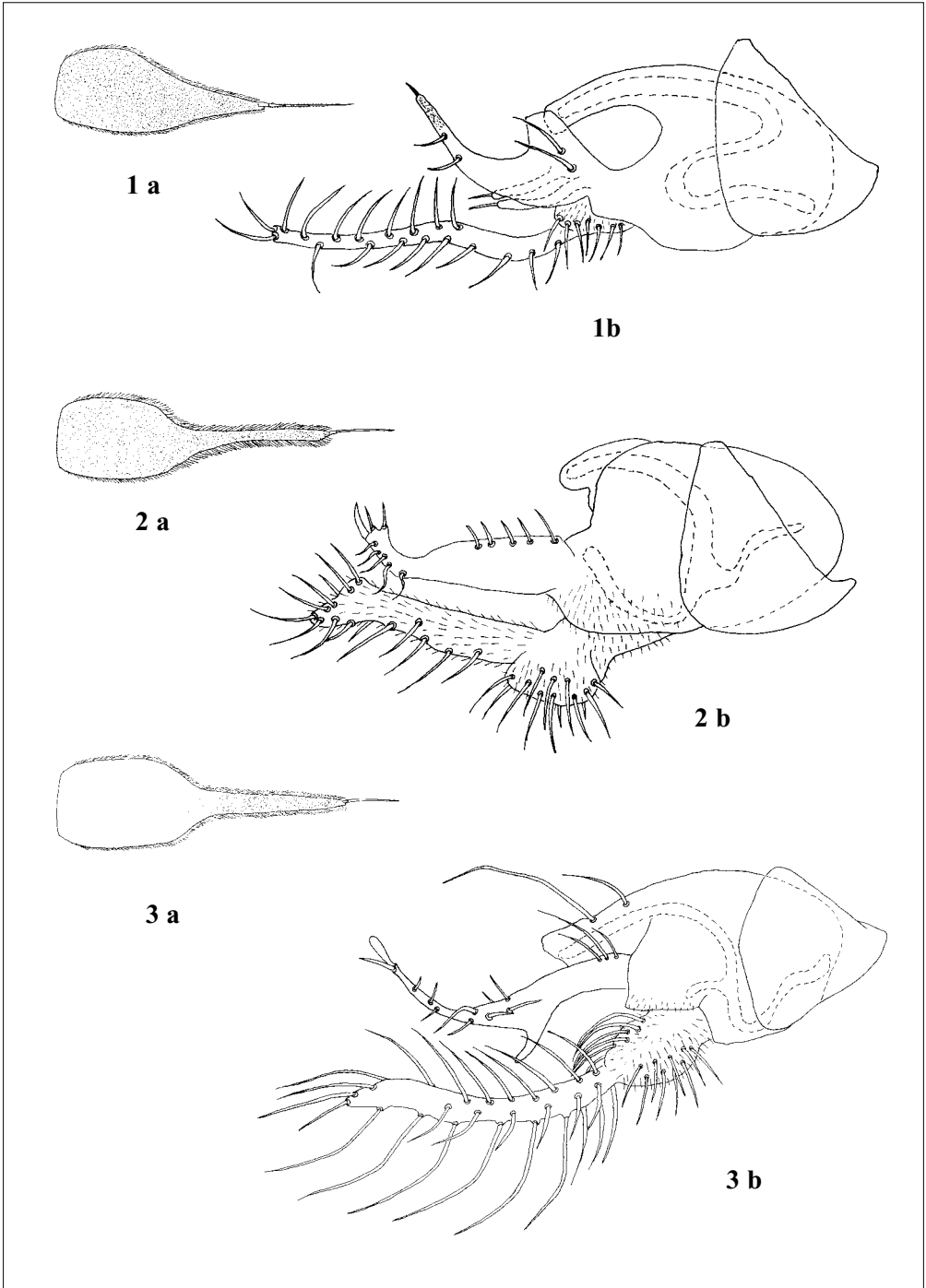


Fig. 1a-b: *Systemus nigriatus* spec. nov., male. – **a:** first flagellomere, right lateral; – **b:** hypopygium, left lateral.
Fig. 2a-b: *Systemus rafaeli* spec. nov., male. – **a:** first flagellomere, right lateral; – **b:** hypopygium, left lateral.
Fig. 3a-b: *Systemus flaviatus* spec. nov., male. – **a:** first flagellomere, right lateral; – **b:** hypopygium, left lateral.

popygium (Fig. 3b): brownish; cerci yellow, long and slender, about 2 times as long as epandrium, bearing very long yellow setae; surstyli long and very slender, yellow, almost as long as cerci.

Female unknown.

Remarks: This species can be easily differentiated from all other Neotropical species by the conspicuous yellow lateral patches on terga 1-3 or 1-4. The other species with yellow terga, *S. raptor* BECKER, has only tergum 2 yellow and has wholly black antennae with the arista as long as first flagellomere.

Systemus amazonicus spec. nov.

(Fig. 4a-b)

Material: **Holotype** male: **Brazil**, Amazonas, Manaus, Reserva Ducke, 26.XI.1981, leg. J. A. RAFAEL. **Paratypes:** same locality, 1 ♂, 28.IX.1981; 1 ♂, Copa de Arv, 23.XI.1981; 2 ♂♂, 26.XI.1981; 4 ♂♂, Copa de Arv, 30.XI.1981; 2 ♂♂, 26 km NE Manaus, 22.IX.1988; 2 ♂♂, Roraima, Pacaraima, 5.-8.III.1988; all leg. J. A. RAFAEL.

Diagnosis: A larger species with partly yellow antennae and yellow legs, hypopygium with glabrous abdominal segment 7 and short square-shaped cerci.

Male

Body length 3.1-3.3 mm; wing length 2.9-3.2 mm.

Head: Frons broad, metallic blue-green, shining, with slight greyish pruinosity; face and clypeus narrow, with dense greyish pruinosity; face at narrowest part about 1/4 as wide as frons at broadest part. Palpi yellow, with one strong black seta and short brown hairs. Proboscis brown with short yellow hairs. Postocular setae uniserial, yellow, becoming black near vertex. Antennae yellow, apical half of first flagellomere brownish-black, basal half more or less darkened dorsally (variable); scape bare, cylindrical; pedicel very short, with a circlet of short setae; first flagellomere (Fig. 4a) broad basally, progressively tapering from about middle and forming a long slender projection, about 4 times as long as broadest width, with dense pubescence. Arista apical, bare, about 1/5 as long as first flagellomere; first aristomere very short.

Thorax: Dorsum metallic green with greyish pruinosity, with a bronze stripe in area of ac; posterior third of mesonotum flattened. Pleura green with greyish pruinosity. Thoracic setae black. 11-12 pairs of ac, anterior pairs parallel, posterior pair more separated. 6 pairs of strong dc, decreasing in size anteriorly. 2 pairs of scutellars, laterals about 1/2 length of medians; 1 yellow ppl above fore coxa. **Legs:** Fore coxa yellow, middle and hind coxae brown, yellow at apical 1/4; trochanters and remaining legs yellow, tarsomeres of middle and hind legs darkened. Fore leg: Coxa with short yellow hairs and 7-9 strong yellow setae at apex; tibia without any setae. Mid leg: Coxa with some yellow setae inside; tibia with a strong ad and pd at 1/4 and a strong ad at 1/2 and a pd at 2/3, and with 1 av and a row of 4-5 pv; tarsomeres with short black hairs. Hind leg: Coxa with 1 strong yellow lateral seta, inserted at about middle; tibia with an ad and pd at 1/5 and a row of 5-8 dorsals, an irregular row of short ventral setae. Relative podomere ratios (femur, tibia, tarsomere 1/2/3/4/5): I: 64, 64, 31/21/14/9/8; II: 75, 81, 44/31/23/14/9; III: 83, 100, 21/43/31/20/11. **Wings:** Hyaline; R₂₊₃ and R₄₊₅ diverging towards wing apex; R₄₊₅ and M bowed outwards subapically; cross-vein (m-cu) about 1.5 times as long as distance between R₄₊₅ and M at wing apex; cross-vein (m-cu) about 0.6 times as long as distal section of CuA. Anal vein and anal cell present. Lower calypter yellow, with yellow setae; haltere yellow.

Abdomen: Metallic green, with black marginal band on terga 3 and 4, terga 2-4 with white pruinosity laterally, terga 5 and 6 black; with short black setae, posterior margin of tergum 1

with much longer setae. Segment 7 elongate-pedunculate, brownish, glabrous; segment 8 brown with brown setae, anterior setae golden. Hypopygium (Fig. 4b): brownish; cerci yellow, short, almost square, shorter than epandrium, bearing long yellow setae apically; surstyli short, basally broad, tapered, with a hook-like and a blade-like apical appendage.

Female unknown.

Remarks: This species resembles *S. flaviatus* spec. nov. but differs by the absence of yellow lateral terga, by the glabrous abdominal segment 7, and by the shape of the cerci (Fig. 4b).

***Systemus beatae* spec. nov.**

(Fig. 5a-b)

Material: **Holotype** male: **Brazil**, Amazonas, Manaus, Reserva Ducke, 30.XI.1981, leg. J. A. RAFAEL. **Paratype:** 1 ♂ same locality and date, leg. J. A. RAFAEL.

Diagnosis: A small species with orange-yellow antennae and yellow legs, and hypopygium with distinct long broad surstyli that are visible to the naked eye.

Male

Body length 2.6-3.0 mm; wing length 2.2-2.4 mm.

Head. Frons broad, metallic blue-green, with slight greyish pruinosity; face and clypeus narrow, with dense greyish pruinosity; face at narrowest part about $\frac{1}{4}$ as wide as frons at broadest part. Palpi yellow, with one strong black seta and short yellow hairs. Proboscis brown with short yellow hairs. Postocular setae uniserial, yellow, becoming black near vertex. Antennae yellow, scape brownish dorsally, first flagellomere brownish-black on apical half and on basal half dorsally; scape bare, cylindrical; pedicel short, with a circlet of short setae; first flagellomere (Fig. 5a) broad basally, progressively tapering from about middle and forming a long slender projection, about 3.5 times as long as broadest width, with dense pubescence. Arista apical, bare, about $\frac{1}{3}$ as long as first flagellomere; first aristemere very short.

Thorax: Dorsum metallic green with greyish pruinosity, with a bronze stripe in area of ac; posterior third of mesonotum flattened. Pleura green with greyish pruinosity. Thoracic setae black. 9–11 pairs of ac, anterior pairs parallel, posterior pair more separated. 6 pairs of strong dc, decreasing in size anteriorly. 2 pairs of scutellars, laterals about $\frac{1}{3}$ length of medians; 1 yellow ppl above fore coxa. **Legs:** Fore coxa yellow, middle and hind coxae brown, yellow at apical $\frac{1}{4}$; trochanters and remaining legs yellow, t_5 of fore, middle and hind legs darkened. Fore leg: Coxa with short yellow hairs and 7-9 strong yellow setae at apex; tibia without any setae. Mid leg: Coxa with some yellow setae inside; tibia with a pair of ad and pd at $\frac{1}{4}$ and a pd at $\frac{3}{4}$, and with 2 short yellow ventrals (barely visible). Hind leg: Coxa with 1 strong yellow lateral seta, inserted at about $\frac{1}{3}$ from base; tibia with a row of 5-6 dorsal setae, no ventral setae. Relative podomere ratios (femur, tibia, tarsomere 1/2/3/4/5): I: 55, 58, 27/18/13/8/7; II: 67, 72, 36/30/22/14/9; III: 66, 90, 18/39/26/19/10. **Wings:** Hyaline; R_{2+3} and R_{4+5} diverging towards wing apex; R_{4+5} and M bowed outwards subapically; cross-vein (m-cu) about 1.5 times as long as distance between R_{4+5} and M at wing apex; cross-vein (m-cu) about 0.7 times as long as distal section of CuA. Anal vein and anal cell present. Lower calypter yellow, with yellow setae; haltere yellow.

Abdomen. Metallic green, tergum 6 black; with short black setae, posterior margin of tergum 1 with much longer setae. Segment 7 elongate-pedunculate, brownish, with brown setae; segment 8 brownish-yellow with brown setae. Hypopygium (Fig. 5b): brownish; cerci yellow, long and slender, about 2 times as long as epandrium, bearing yellow setae; surstyli long and broad, ribbon-like, almost as long as cerci.

Female unknown.

Remarks: This is a small species with orange-yellow antennae and yellow legs. It resembles *S. rarus* spec. nov., but can be distinguished by the long broad surstyli, which are as long as the cerci and are clearly visible to the naked eye, and by the other characters given in the key below.

Derivatio nominis: This species is dedicated to my wife Beata, who has always supported me in my dipterological studies.

***Systemus rarus* spec. nov.**

(Fig. 6a-b)

Material: Holotype male: **Brazil**, Amazonas, Manaus, Reserva Ducke, 23.XI.1981, leg. J. A. RAFAEL.

Diagnosis: A small species with ochreous-yellow antennae, yellow legs, and hypopygium with long apically narrowed surstyli.

Male

Body length 2.6 mm; wing length 2.2 mm.

Head: Frons broad, metallic green, with greyish pruinosity; face and clypeus very narrow, with greyish pruinosity; face at narrowest part about 1/6 as wide as frons at broadest part. Palpi brownish-yellow, with one strong black seta and short brown hairs. Proboscis brown with short yellow hairs. Postocular setae uniserial, yellow, becoming black near vertex. Antennae brownish-black, scape yellowish ventrally, first flagellomere ochreous-yellow on basal part ventrally; scape bare, cylindrical; pedicel short, with a circllet of short setae; first flagellomere (Fig. 6a) broad basally, progressively tapering from about 1/3 and forming a long slender projection, about 3.5 times as long as broadest width, with dense pubescence. Arista apical, bare, about 1/4 as long as first flagellomere; first aristomere very short.

Thorax: Dorsum metallic green with greyish pruinosity, with a bronze stripe in area of ac; posterior third of mesonotum flattened. Pleura green with greyish pruinosity. Thoracic setae black. 9-11 pairs of ac, anterior pairs parallel, posterior pair more separated. 6 pairs of strong dc, decreasing in size anteriorly. 2 pairs of scutellars, laterals about 1/3 length of medians; 1 yellow ppl above fore coxa. **Legs:** Fore coxa yellow, middle and hind coxae brownish, yellow on apical 1/4; trochanters and remaining legs yellow, t₅ of fore and middle legs darkened. Fore leg: Coxa with short yellow hairs and 7-9 strong yellow setae at apex; tibia without any setae. Mid leg: Coxa with some yellow setae inside; tibia with a strong ad and a smaller pd at 1/4, and a small pd at 2/3, no ventrals. Hind leg: Coxa with 1 strong yellow lateral seta, inserted at about 1/3 from base; tibia with a row of 5-6 stronger dorsal setae and additional smaller ones, an irregular row of short ventral setae (t₄ and t₅ lacking). Relative podomere ratios (femur, tibia, tarsomere 1/2/3/4/5): I: 70, 64, 32/17/11/7/7; II: 74, 84, 43/30/21/14/8; III: 73, 97, 19/40/24/?/? **Wings:** Hyaline; R₂₊₃ and R₄₊₅ diverging towards wing apex; R₄₊₅ and M bowed outwards subapically; cross-vein (m-cu) about 1.5 times as long as distance between R₄₊₅ and M at wing apex; cross-vein (m-cu) about 0.7 times as long as distal section of CuA. Anal vein and anal cell present. Lower calypter yellow, with yellow setae; haltere yellow.

Abdomen: Metallic green, terga 3-5 with black marginal band, tergum 6 black; with short black setae, posterior margin of tergum 1 with much longer setae. Segment 7 elongate-pedunculate, brownish, with brown setae; segment 8 brownish-yellow with brown setae. Hypopygium (Fig. 6b): brownish; cerci yellow, long and slender, about 2 times as long as epandrium, bearing yellow setae; surstyli long and narrow apically, 2/3 as long as cerci.

Female unknown.

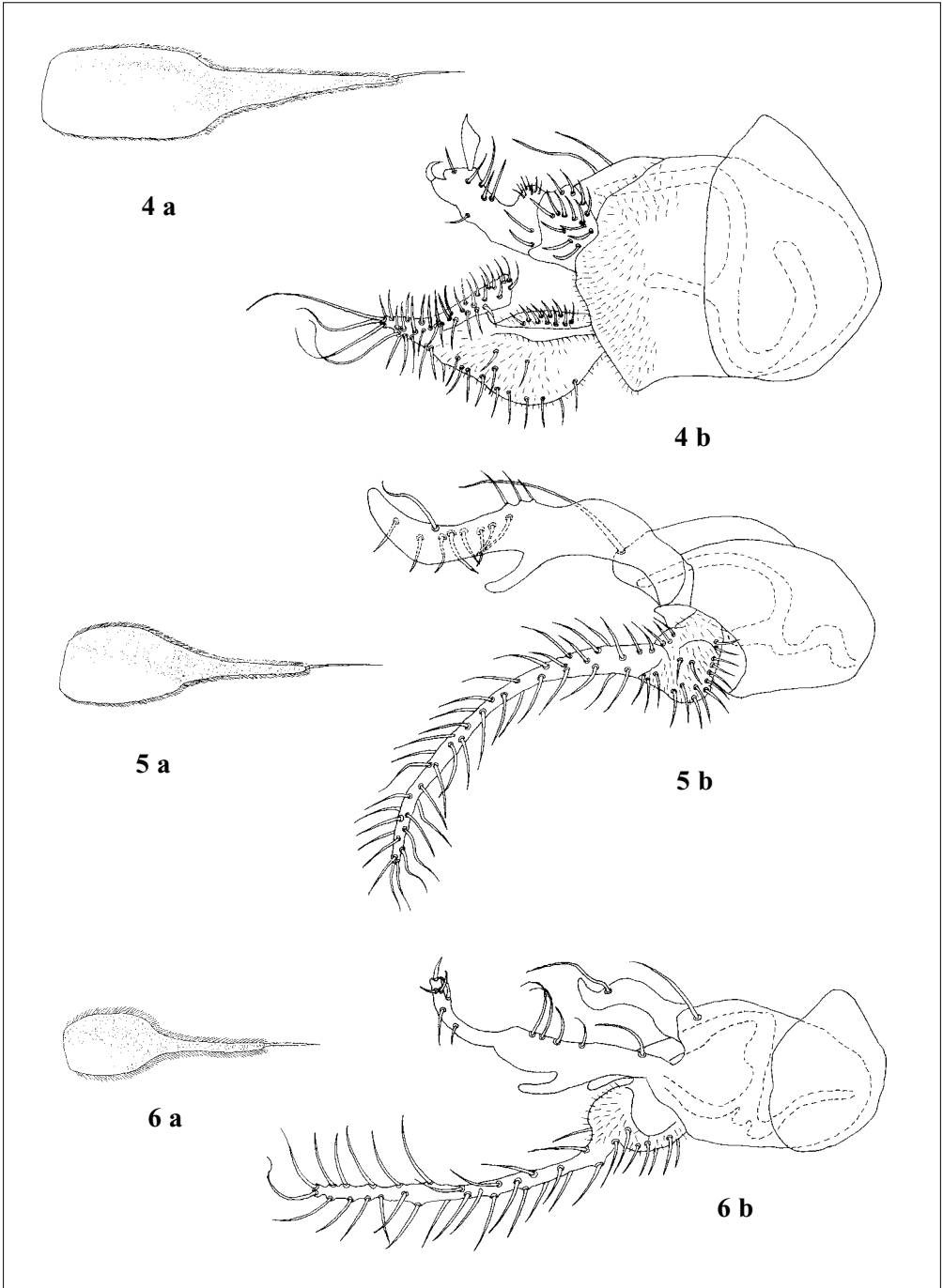


Fig. 4a-b: *Systemus amazonicus* spec. nov., male. – **a:** first flagellomere, right lateral; – **b:** hypopygium, left lateral.

Fig. 5a-5b: *Systemus beatae* spec. nov., male. – **a:** first flagellomere, right lateral; – **b:** hypopygium, left lateral.

Fig. 6a-b: *Systemus rarus* spec. nov., male. – **a:** first flagellomere, right lateral; – **b:** hypopygium, left lateral.

Remarks: This species is closely related to *S. beatae* spec. nov., but differs by the characters given in the key below.

Key to Neotropical *Systemus* (males)

- 1 Antennae entirely brownish-black 2
- Antennae partly yellow 4
- 2 Arista as long as first flagellomere, tergum 2 yellow **raptor** BECKER, ????
- Arista at most half as long as first flagellomere, terga not yellow 3
- 3 Femora black, fore coxa brown, arista half as long as first flagellomere (Fig. 1a), abdominal segment 7 setose **nigriatus** spec. nov.
- Femora yellow, fore coxa yellow, arista ¼ as long as first flagellomere (Fig. 2a), abdominal segment 7 without setae **rafaeli** spec. nov.
- 4 Tergum 1 to tergum 3 or 4 with a yellow lateral patch **flaviatus** spec. nov.
- Terga without a yellow patch laterally 5
- 5 Cerci broad and short, not longer than epandrium (Fig. 4b) ... **amazonicus** spec. nov.
- Cerci narrow and long, much longer than epandrium 6
- 6 Basal half of first flagellomere broad (Fig. 5a), yellow part orange. Surstyli broad apically, about as broad as basally (Fig. 5b) **beatae** spec. nov.
- Basal third of first flagellomere broad (Fig. 6a), yellow part ochreous-yellow. Surstyli narrow apically, about half as broad as basally (Fig. 6b) **rarus** spec. nov.

Acknowledgements

I am very grateful to Jose Albertino RAFAEL (Manaus), for lending me his material of Dolichopodidae for study. I also thank Bernhard MERZ (Genève) for helpful comments to the manuscript, and Adrian PONT (Reading) for checking the English text.

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The paper was accepted for printing on 2 February 2000.

Editum: 15 July 2000.

