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Article

<https://zoobank.org/urn:lsid:zoobank.org:pub:D411F167-CD1A-4DB2-B55E-B59562FCE2C2>

# The genus *Palaeugoa* Durante in Nouabalé-Ndoki National Park, Republic of Congo, with descriptions of two new species (Lepidoptera: Erebidae: Arctiinae: Lithosiini)

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## Abstract

The paper contains a review of six species of the genus *Palaeugoa* Durante, 2012 collected in Nouabalé-Ndoki National Park, north-eastern Republic of Congo, of which two are described as new species to science: *Palaeugoa laszloi* **sp. n.** and *Palaeugoa ndoki* **sp. n.** Three species, *P. camerunensis* (Strand, 1912), *P. takanoi* Volynkin & László, 2020, and *P. asafis* Volynkin & László, 2020, are reported from Republic of Congo for the first time and the hitherto unknown female of *P. asafis* is illustrated and diagnosed. Adults, male and female genitalia of all the species considered are illustrated.

## Résumé

L'article contient une revue de six espèces du genre *Palaeugoa* Durante, 2012, échantillonnées dans le Parc National de Nouabalé-Ndoki, au nord-est de la République du Congo, dont deux sont décrites comme nouvelles espèces: *Palaeugoa laszloi* **sp. n.** et *Palaeugoa ndoki* **sp. n.** Trois espèces, *P. camerunensis* (Strand, 1912), *P. takanoi* Volynkin & László, 2020, et *P. asafis* Volynkin & László, 2020, sont enregistrées pour la première fois en République du Congo et la femelle inconnue de *P. asafis* est figuré et diagnostiqué. Les adultes, les organes génitaux mâles et femelles de toutes les espèces considérées sont illustrés.

**Key words** faunistics, female genitalia, new record, Nudariina.

## Introduction

The genus *Palaeugoa* Durante, 2012 was described to solely include *Xanthetis spurrelli* Hampson, 1914 distributed in West African rainforests (Durante 2012). Subsequently, one additional, new species was described from Sierra Leone by Volynkin (2017), who also placed the genus in the *Asura/Mitochrista* generic complex, and another species was transferred to *Palaeugoa* from *Asura* Walker, 1854 by Volynkin *et al.* (2019) before the genus was revised by Volynkin & László (2020), who assigned eleven species to it (including seven species described by the authors as new to science). In their revision,

Volynkin & László (2020) subdivided the genus *Palaegoa* into three species-groups clearly defined by the male and female genitalia morphology as well as the habitus of adults.

During a series of entomological expeditions recently conducted by the African Natural History Research Trust in Nouabalé-Ndoki National Park, Republic of the Congo, extensive Lithosiini material including the genus *Palaegoa* were collected. Examination of the male and female genitalia structures of the specimens belonging to the *P. peregrina* (Hacker, 2014) species-group (established by Volynkin & László (2020)) led to the discovery that two undescribed species occur at this site. Additionally, four other species of the genus along with the hitherto unknown female of *P. asafis* Volynkin & László, 2020 were found among the specimens collected. The present paper is a review of the genus *Palaegoa* from Nouabalé-Ndoki National Park updating distributional data on three species and describing two species as new to science.

## Material and methods

Abbreviations of the depositories used: ANHRT = African Natural History Research Trust (Leominster, United Kingdom); MfN = Museum of Natural History, Berlin (Museum für Naturkunde, Berlin, Germany); MWM/ZSM = Museum Witt Munich in the Bavarian State Collection of Zoology (Museum Witt München / Zoologische Staatssammlung München, Munich, Germany); NHMUK (formerly BMNH) = Natural History Museum (London, United Kingdom). Other abbreviations used: AV = genitalia slide prepared by A.V. Volynkin; DRC = Democratic Republic of the Congo; NP = national park.

The genitalia were dissected applying standard methods of preparation (Lafontaine & Mikkola 1987; Kononenko 2010), then stained with Eosin Y and embedded in Euparal on microscope slides. The photos of adults were taken using a Nikon D3100/AF-S camera equipped with a Nikkor 18–55 mm or Sigma 105 mm F2.8 EX DG Macro OS lenses while the photos of genitalia were taken using the same camera attached to a microscope with an LM-scope adapter. All pictures were processed using the Adobe Photoshop CC 2018 software.

In the type label citations, information provided in quotation marks is transcribed verbatim. Different labels are separated by a slash (“/”) while the different lines of the same label are separated by an upright slash (“|”). Any additional data are provided in square brackets.

The male and female genitalia terminology follows Volynkin (2024).

### Data on comparative material examined

*Palaegoa peregrina* (Hacker, 2014) (Figs 15, 27, 28). **UGANDA**: 1 male, Mpigi, Mpanga Forest, 25–30.XI.2014, LF, leg. W. Mey, gen. slide No.: AV4252 (MfN); 1 male, Kibale National Park, Biological Field Station, 19–24.XI.2014, LF, leg. W. Mey, gen. slide No.: AV5321 (MfN); **RWANDA**: 1 male, Nyungwe NP, 1800m, Busoro, 2°32’S, 29°11’E, 29.VII.2008, leg. J. & W. De Prins, De Prins Coll. BMNH (E) 2014-125, gen. slide No.: NHMUK010315266 (prepared by Volynkin) (NHMUK).

*Palaegoa aristophanousi* Volynkin & László, 2020. **Holotype** (Figs 20, 32): male, “Gabon, 430m, Mikongo (Rougier), Monts de Cristal (Secondary Forest), 0°29’47”N, 11°10’42”E, 28.vii.–12.viii.2019, LepiLED Light Trap, Albert, J-L., Aristophanous, M., Bie Mba, J., Dérozier, V., Moretto, P. leg., ANHRT:2019.17” / “ANHRTUK 00107454”, gen. slide No.: AV5971 (ANHRT). **Paratypes**: 5 males from Gabon listed by Volynkin & László (2020) (ANHRT).

*Palaegoa ngoko* Volynkin & László, 2020. **Holotype** (Figs 19, 31): male, [Cameroon] “1494, Bitje, Ja River, Cameroons, 2000 ft., Oct.–Nov. 1919” / “1915-113.” / QR-code label with a unique ID “NHMUK010918063”, gen. slide No.: NHMUK010315725 (prepared by Volynkin) (NHMUK).

## Results

### Genus *Palaegoa* Durante, 2012

*Palaegoa* Durante, 2012, *European Journal of Taxonomy*, 22: 5.

Type species: *Xanthetis spurrelli* Hampson, 1914, by original designation (Durante 2012).

**Diagnosis.** The male genitalia of the species of the genus are characterized by the combination of the following characters. (1) The uncus is short, dorso-ventrally flattened and fully fused with the tuba analis (this uncus structure is unique within the *Asura/Miltochrista* generic complex, but similar to certain groups of *Cyana* Walker, 1854 which have, however, only the tip of uncus separated from the tuba analis). (2) The transtilla either bears a large process in its diaphragmal part (in the *P. spurrelli* species-group) or on the anterior section of the editum (in the *takanoi* species-group), or its diaphragmal part is heavily spinulose and fused with the spinulose scobination of the anellus (the *P. peregrina* species-group). (3) The sacculus bears one or two processes, of which the distal one is well-separated from the distal section of the valva ('cucullus'). The female genitalia are characterized by (1) the short or reduced apophyses anteriores; (2) the presence of an antevaginal plate (except in the *P. peregrina* species-group); (3) the tubular and membranous ductus bursae (in other species of the *Asura/Miltochrista* generic complex, the ductus bursae is dorso-ventrally flattened and sclerotised, with the exceptions of the Oriental *Barsochrista* N. Singh & Kirti, 2016 and *Nebulene* Volynkin & Černý, 2018 where the ductus bursae is also membranous but short and broad); (4) the large appendix bursae having a very broad and membranous distal section, which is larger than or about the same size as the corpus bursae (this character is also unique within the *Asura/Miltochrista* generic complex and similar to that of the genus *Cyana*).

**Distribution.** The genus is widespread in the rainforests of West and Central Africa reaching western Kenya (Kakamega Forest) in the east (Volynkin & László 2020).

### Check-list of *Palaeugoa* in Nouabalé-Ndoki National Park

The *P. spurrelli* species-group

– *P. camerunensis* (Strand, 1912)

– *P. smithi* Volynkin & László, 2020

The *P. takanoi* species-group

– *P. takanoi* Volynkin & László, 2020

– *P. asafis* Volynkin & László, 2020

The *P. peregrina* species-group

– *P. laszloi* **sp. n.**

– *P. ndoki* **sp. n.**

### Species accounts

#### The *P. spurrelli* species-group

The group was characterised and described in detail by Volynkin & László (2020), currently comprising six species, two of which are found in Nouabalé-Ndoki National Park.

#### *Palaeugoa camerunensis* (Strand, 1912)

(Figs 1–3, 21)

*Asura camerunensis* Strand, 1912, *Archiv für Naturgeschichte* 78 (A) (9): 102 (Type locality: [Cameroon] "Bibundi in Kamerun").

**Type material examined. Holotype** (by monotypy) (illustrated by Volynkin & László (2020)): female without abdomen, blue label "Kamerun, Bibundi, 16–31.I.[19]05, G. Tessmann S. G." / "*Asura camerunensis* ♀ Strand det." / red label "Type" / "586" / "Photographed. B.M. Neg.15531" (MfN).

**Additional material from Nouabalé-Ndoki NP examined** (all in ANHRT). 18 males, 2 females, 365m, Mondika camp, 02°21'50.63"N, 16°16'25.82"E, 07–14.ii.2023, actinic, MV and LepiLED light traps, Bakala, N., Déozier, V., Kirk-Spriggs, A., László, G. leg.; 5 males, 352m, Ndoki formation (secondary forest), 02°12'47.7"N, 16°23'45.8"E, 29.ix.–1.x.2022, LepiLED and actinic light traps, Déozier, V., Fouka, B., Kirk-Spriggs, A., Takano, H. leg., gen. prep. No.: AV8547♂; 6 males, 372m, Sangha Prov., Nouabalé-Ndoki National Park, Mbeli camp (*Gilbertiodendron* forest),

02°14'23.8"N, 16°23'52.1"E, 1–10.x.2022, actinic and MV light traps, Dérozier, V., Fouka, B., Kirk-Spriggs, A., Takano, H. leg.; 3 males, 358m, Bomassa Forest (secondary forest), 02°11'58.1"N, 16°11'16.9"E, 17–23.ix.2022, LepiLED and actinic light traps, Dérozier, V., Fouka, B., Kirk-Spriggs, A., Takano, H. leg.; 2 males, 356m, Ndoki formation camp (secondary forest), 02°12'51.5"N, 16°23'40.1"E, 23.vi.2022, actinic light trap, Dérozier, V. leg.; 2 males, 349m, Makao Forest (secondary forest), 02°36'42.5"N, 17°09'23.8"E, 24–29.ix.2022, actinic light trap, Dérozier, V., Fouka, B., Kirk-Spriggs, A., Takano, H. leg., gen. prep. No.: AV8545♂; 1 male, 370m, Sangha Prov., Nouabalé-Ndoki National Park, Mbeli cam (moist mixed forest), 02°12'48.5"N, 16°23'45.6"E, 25.vi.2022, MV light trap, Dérozier, V. leg.; 1 male, 380m, Bomassa (secondary forest), 02°12'25.7"N, 16°11'39.1"E, 18–22.vi.2022, actinic light trap, Dérozier, V. leg.

**Distribution.** Cameroon (Strand 1912; Delabye *et al.* 2020, as *P. spurrelli*), Gabon, DRC (Volynkin & László 2020), and Republic of Congo (new record).

### *Palaeugoa smithi* Volynkin & László, 2020

(Figs 4–6, 22)

*Palaeugoa smithi* Volynkin & László, 2020, *Ecologica Montenegrina*, 36: 62, figs 12–14, 38–40, 55 (Type locality: “Gabon, 430m, Mikongo (Rougier), Monts de Cristal (...), 0°29'47"N, 11°40'42"E”).

**Type material examined. Holotype** (Fig. 4): male, “Gabon, 430m, Mikongo (Rougier), Monts de Cristal (Secondary forest), 0°29'47"N, 11°40'42"E, 28.vii.–12.viii.2019, LepiLED Light Trap, Albert, J-L., Aristophanous, M., Bie Mba, J., Dérozier, V., Moretto, P. Leg., ANHRT:2019.17” / “ANHRTUK 00137800”, gen. slide No.: AV5974 (ANHRT). **Paratypes:** 69 males and 4 females from Gabon, Cameroon, Republic of Congo, and DRC listed by Volynkin & László (2020) (ANHRT, MWM/ZSM, MfN).

**Additional material from Nouabalé-Ndoki NP examined** (all in ANHRT). 3 males, 352m, Ndoki formation camp (secondary forest), 02°12'48.5"N, 16°23'45.6"E, 23.vi.2022, MV light trap, Dérozier, V. leg.; 1 male, 2 females, 352m, Ndoki formation (secondary forest), 02°12'47.7"N, 16°23'45.8"E, 29.ix.–1.x.2022, LepiLED light trap, Dérozier, V., Fouka, B., Kirk-Spriggs, A., Takano, H. leg., gen. prep. No.: AV8557♂; 3 males, 3 females, 365m, Mondika camp, 02°21'50.63"N, 16°16'25.82"E, 07–14.ii.2023, actinic, MV and LepiLED light traps, Bakala, N., Dérozier, V., Kirk-Spriggs, A., László, G. leg.; 1 male, 1 female, 349m, Makao Forest (secondary forest), 02°36'42.5"N, 17°09'23.8"E, 24–29.ix.2022, actinic and LepiLED light traps, Dérozier, V., Fouka, B., Kirk-Spriggs, A., Takano, H. leg.; 1 male, 380m, Bomassa (secondary forest), 02°12'25.7"N, 16°11'39.1"E, 18–22.vi.2022, actinic light trap, Dérozier, V. leg.; 1 male, 358m, Bomassa forest (secondary forest), 02°11'58.1"N, 16°11'16.9"E, 17–23.ix.2022, LepiLED light trap, Dérozier, V., Fouka, B., Kirk-Spriggs, A., Takano, H. leg.; 1 male, 372m, Mbeli camp (*Gilbertiodendron* forest), 02°14'23.8"N, 16°23'52.1"E, 1–10.x.2022, LepiLED light trap, Dérozier, V., Fouka, B., Kirk-Spriggs, A., Takano, H. leg.

**Distribution.** The species is currently known from Cameroon, Gabon, Republic of Congo, DRC, Uganda, and western Kenya (Volynkin & László 2020). In Republic of Congo, the species was previously known from Odzala-Kokoua National Park (Volynkin & László 2020).

### The *P. takanoi* species-group

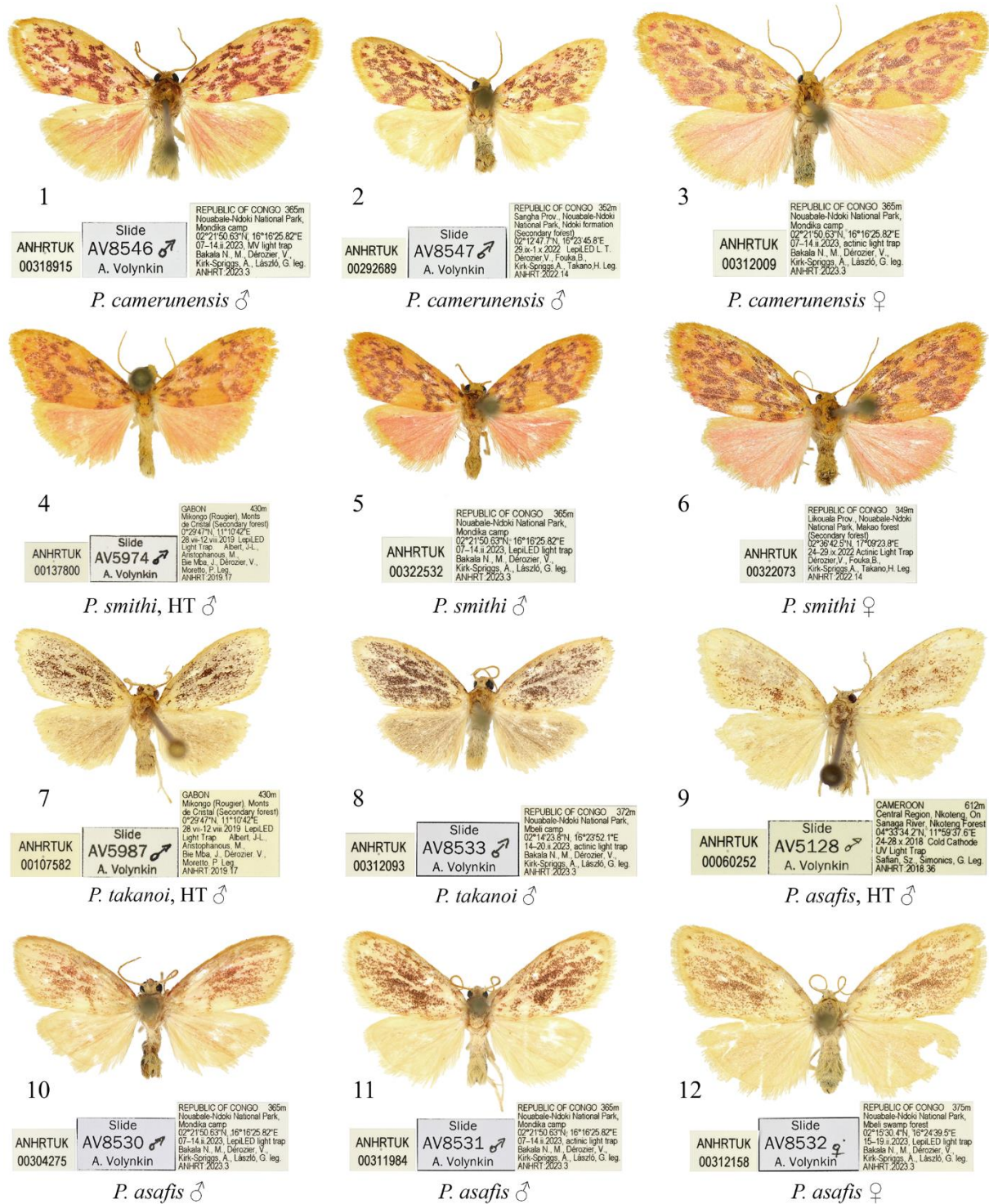
The group was characterised and described in detail by Volynkin & László (2020) and currently comprises two species, both of which are found in Nouabalé-Ndoki National Park.

### *Palaeugoa takanoi* Volynkin & László, 2020

(Figs 7, 8, 23, 33)

*Palaeugoa takanoi* Volynkin & László, 2020, *Ecologica Montenegrina*, 36: 69, figs 17–19, 43, 56 (Type locality: “Gabon, 430m, Mikongo (Rougier), Monts de Cristal (...), 0°29'47"N, 11°10'42"E”).

**Type material examined. Holotype** (Fig. 7): male, “Gabon, 430m, Mikongo (Rougier), Monts de Cristal (Secondary Forest), 0°29'47"N, 11°10'42"E, 28.vii.–12.viii.2019, LepiLED Light Trap, Albert, J.-L., Aristophanous, M., Bie Mba, J., Dérozier, V., Moretto, P. leg., ANHRT:2019.17” / “ANHRTUK 00107582”, gen. slide No.: AV5987 (ANHRT). **Paratypes**: 7 males and 1 female from Gabon listed by Volynkin & László (2020) (ANHRT).



10 mm

Figures 1–12. *Palaeugoa* spp.: adults. The specimens are deposited in ANHRT.



13  
 ANHRTUK 00322627  
 Slide AV8536 ♂  
 A. Volynkin  
 REPUBLIC OF CONGO 365m  
 Nouabalé-Ndoki National Park,  
 Mondika camp  
 02°21'50.63"N, 16°16'25.82"E  
 27.i-05.v.2023, MV light trap  
 Dérozier, V., Kirk-Spriggs, A.,  
 László, G., Mvouende, S. leg.  
 ANHRT 2023.6

*P. laszloi* sp. n., HT ♂



14  
 ANHRTUK 00304246  
 Slide AV8535 ♂  
 A. Volynkin  
 REPUBLIC OF CONGO 365m  
 Nouabalé-Ndoki National Park,  
 Mondika camp  
 02°21'50.63"N, 16°16'25.82"E  
 07-14.ii.2023, actinic light trap  
 Bakala N., M., Dérozier, V.,  
 Kirk-Spriggs, A., László, G. leg.  
 ANHRT 2023.3

*P. laszloi* sp. n., PT ♂



15  
 Slide AV4252 ♂  
 A. Volynkin  
 Uganda, Mpigi  
 Mpanga Forest  
 25-30.XI.2014, LF  
 leg. W. Mey

*P. peregrina* ♂



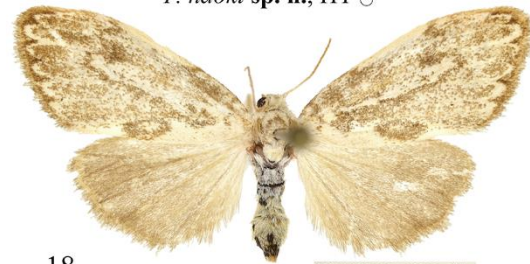
16  
 ANHRTUK 00312053  
 Slide AV8537 ♂  
 A. Volynkin  
 REPUBLIC OF CONGO 372m  
 Nouabalé-Ndoki National Park,  
 Mbéli camp  
 02°14'23.8"N, 16°23'52.1"E  
 14-20.ii.2023, actinic light trap  
 Bakala N., M., Dérozier, V.,  
 Kirk-Spriggs, A., László, G. leg.  
 ANHRT 2023.3

*P. ndoki* sp. n., HT ♂



17  
 ANHRTUK 00312028  
 Slide AV8538 ♂  
 A. Volynkin  
 REPUBLIC OF CONGO 372m  
 Nouabalé-Ndoki National Park,  
 Mbéli camp  
 02°14'23.8"N, 16°23'52.1"E  
 14-20.ii.2023, actinic light trap  
 Bakala N., M., Dérozier, V.,  
 Kirk-Spriggs, A., László, G. leg.  
 ANHRT 2023.3

*P. ndoki* sp. n., PT ♂



18  
 ANHRTUK 00304249  
 Slide AV8539 ♀  
 A. Volynkin  
 REPUBLIC OF CONGO 365m  
 Nouabalé-Ndoki National Park,  
 Mondika camp  
 02°21'50.63"N, 16°16'25.82"E  
 07-14.ii.2023, actinic light trap  
 Bakala N., M., Dérozier, V.,  
 Kirk-Spriggs, A., László, G. leg.  
 ANHRT 2023.3

*P. ndoki* sp. n., PT ♀



19  
 NHMUK 010918063  
 1915-113.  
 1494  
 Bitje Ja River  
 Cameroons  
 2000ft.  
 Oct-Nov 1912

*P. ngoko*, HT ♂



20  
 ANHRTUK 00107454  
 Slide AV5971 ♂  
 A. Volynkin  
 GABON 430m  
 Mikongo (Rougier), Monts  
 de Cristal (Secondary forest)  
 02°23'47"N, 11°10'42"E  
 28.vii-12.viii.2019 LepiLED  
 Light Trap Albert J-L.,  
 Aristophanous, M.,  
 Bie Msa, J., Dérozier, V.,  
 Moretto, P. Leg.  
 ANHRT 2019.17

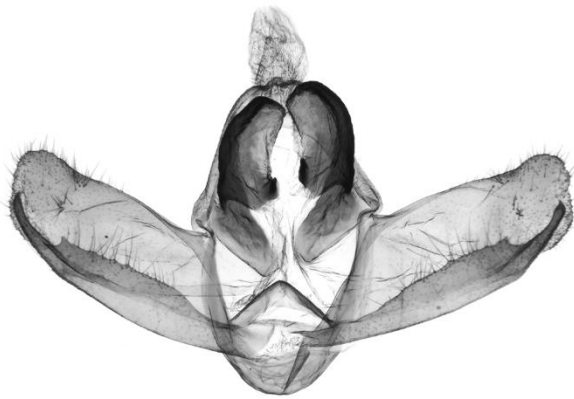
*P. aristophanousi*, HT ♂

10 mm

Figures 13–20. *Palaeugoa* spp.: adults. Depositories of the specimens: 13, 14, 16–18, and 20 in ANHRT; 15 in MfN; 19 in NHMUK (©The Trustees of NHMUK).

**Additional material from Nouabalé-Ndoki NP examined** (all in ANHRT). 1 male, 1 female, 372m, Mbéli camp, 02°14'23.8"N, 16°23'52.1"E, 14–20.ii.2023, actinic light trap, Bakala, N., Dérozier, V., Kirk-Spriggs, A., László, G. leg., gen. prep. Nos.: AV8533♂, AV8534♀.

**Distribution.** Gabon (Volynkin & László 2020) and Republic of Congo (new record).



21

*P. camerunensis*

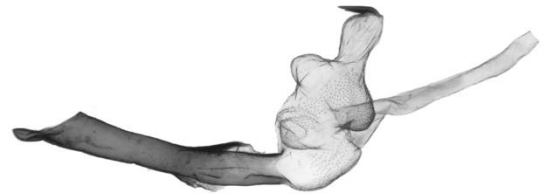
Republic of Congo, Nouabalé-Ndoki NP, slide AV8546



22

*P. smithi*

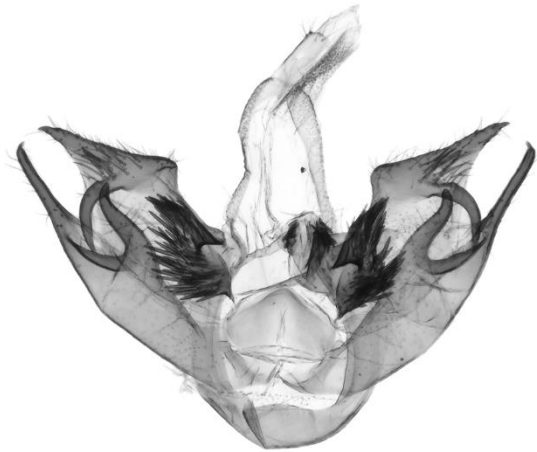
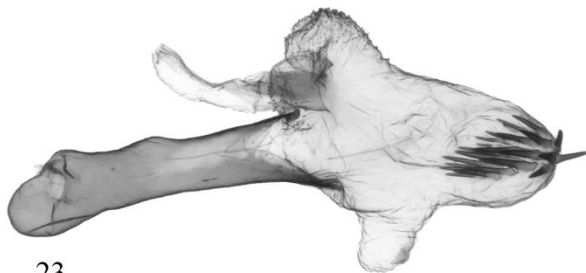
Republic of Congo, Nouabalé-Ndoki NP, slide AV8557



23

*P. takanoi*

Republic of Congo, Nouabalé-Ndoki NP, slide AV8533



24

*P. asafis*

Republic of Congo, Nouabalé-Ndoki NP, slide AV8531



**Figures 21–24.** *Palaeuogoia* spp.: male genitalia. The specimens dissected are deposited in ANHRT.

*Palaegoa asafis* Volynkin & László, 2020  
(Figs 9–12, 24, 34)

*Palaegoa asafis* Volynkin & László, 2020, *Ecologica Montenegrina*, 36: 70, figs 20, 21, 44, 45 (Type locality: “Cameroon, 612m, Central Region, Nkoteng, On Sanaga River, Nkoteng Forest, 04°33'34.2"N, 11°59'37.6"E”).

**Type material examined. Holotype** (Fig. 9): male, “Cameroon, 612m, Central Region, Nkoteng, On Sanaga River, Nkoteng Forest, 04°33'34.2"N, 11°59'37.6"E, 24–28.x.2018, Cold Cathode UV Light Trap, Safian, Sz., Simonics, G. Leg. ANHRT:2018.36” / “ANHRTUK 00060252”, gen. slide No.: AV5128 (ANHRT). **Paratype**: male, same data as holotype, gen. prep. No.: AV5134 (ANHRT).

**Additional material from Nouabalé-Ndoki NP examined** (all in ANHRT). 6 males, 372m, Mbeli camp, 02°14'23.8"N, 16°23'52.1"E, 14–20.ii.2023, actinic and MV light traps, Bakala, N., Dérozier, V., Kirk-Spriggs, A., László, G. leg.; 15 males, 365m, Mondika camp, 02°21'50.63"N, 16°16'25.82"E, 07–14.ii.2023, actinic, MV and LepiLED light traps, Bakala, N., Dérozier, V., Kirk-Spriggs, A., László, G. leg., gen. prep. Nos.: AV8530♂, AV8531♂; 1 male, 352m, Ndoki formation (secondary forest), 02°12'47.7"N, 16°23'45.8"E, 29.ix.–1.x.2022, actinic light trap, Dérozier, V., Fouka, B., Kirk-Spriggs, A., Takano, H. leg.; 1 female, 375m, Mbeli swamp forest, 02°15'30.4"N, 16°24'39.5"E, 15–19.ii.2023, LepiLED light trap, Bakala, N., Dérozier, V., Kirk-Spriggs, A., László, G. leg., gen. prep. No.: AV8532♀.

**Note.** The species was recently described from two males collected in central Cameroon (Volynkin & László 2020). In Nouabalé-Ndoki National Park, a series of specimens of both sexes was collected and the previously unknown female and its genitalia are illustrated and diagnosed herein.

**Diagnosis of female** (Figs 12, 34). The forewing length is 8.5 mm. The female is similar to the male in its appearance but larger. The female genitalia of *P. asafis* (Fig. 34) are easily distinguishable from *P. takanoi* (Fig. 33) in the longer antevaginal plate having postero-lateral processes, which are absent in the congener, the shorter ductus bursae having a caliciform antrum (absent in the congener), the posteriorly narrower corpus bursae bearing sparser and finer scobination anteriorly, and the appendix bursae having a markedly shorter and narrower proximal section and a broader distal section. In addition, the 7<sup>th</sup> sternite of *P. asafis* has elongate sclerotised plates along its lateral margins, which are absent in *P. takanoi*.

**Distribution.** Cameroon (Volynkin & László 2020) and Republic of Congo (new record).

### The *P. peregrina* species-group

The species-group was characterised and described in detail by Volynkin & László (2020). It currently comprises five species, two of which are hereby described as new to science from Nouabalé-Ndoki National Park.

### *Palaegoa laszloi* sp. n.

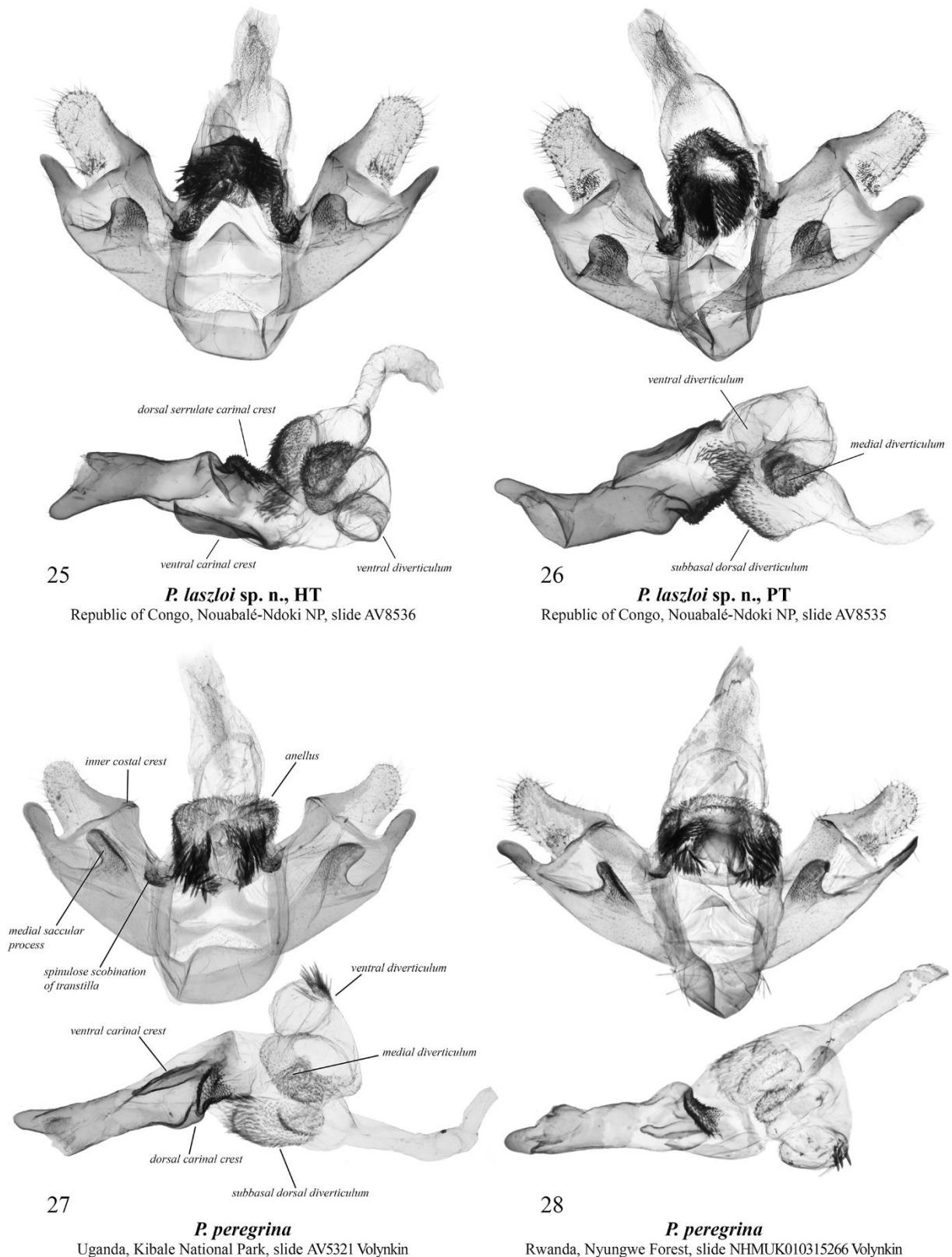
<https://zoobank.org/urn:lsid:zoobank.org:act:D5839151-907D-4A95-833C-C1336E924307>

(Figs 13, 14, 25, 26)

**Type material. Holotype** (Figs 13, 25): male, “Republic of Congo 365m | Nouabalé-Ndoki National Park, | Mondika camp | 02°21'50.63"N, 16°16'25.82"E | 27.iv.–06.v.2023, MV light trap | Dérozier, V., Kirk-Spriggs, A., | László, G., Mvouende, S. leg. | ANHRT:2023.6” / “ANHRTUK | 00322627” / “Slide | AV8536♂ | A. Volynkin” (ANHRT).

**Paratypes** (5 males, all in ANHRT). **REPUBLIC OF CONGO:** 3 males, same data as holotype, MV and actinic light traps, gen. prep. No.: AV8535; 1 male, 372m, Nouabalé-Ndoki National Park, Mbeli camp, 02°14'23.8"N, 16°23'52.1"E, 14–20.ii.2023, actinic light trap, Bakala, N., Dérozier, V., Kirk-Spriggs, A., László, G. leg.; 1 male, 370m, Sangha Prov., Nouabalé-Ndoki National Park, Mbeli camp (moist mixed forest), 02°12'48.5"N, 16°23'45.6"E, 25.vi.2022, MV light trap, Dérozier, V. leg.

**Diagnosis.** The forewing length is 8.5–9.5 mm in males. *Palaegoa laszloi* sp. n. (Figs 13, 14) externally differs from similar species (Figs 15–20) in the reduced medial spot at the anal margin of the forewing. Additionally, compared to the sympatric *P. ndoki* sp. n. (Figs 16–18), the new species has a



**Figures 25–28.** *Palaeugoa* spp.: male genitalia. Depositories of the specimens dissected: 25 and 26 in ANHRT; 27 in MfN; 28 in NHMUK (©The Trustees of NHMUK).

remarkably paler hindwing. The male genitalia structure of *P. laszloi* sp. n. (Figs 25, 26) is most similar to *P. peregrina* (Figs 27, 28) known from Uganda and Rwanda but, unlike the latter, the genital capsule

of the new species has a longer and broader distal section of the valva, a less prominent collis, a reduced inner costal crest, a broader medial saccular process, and more robust spinulose scobination on the dorsal side of the anellus. The phallus of *P. laszloi* **sp. n.** is distally broader than in *P. peregrina* and has a longer and broader ventral carinal crest, and a distally tapered dorsal serrulate carinal crest, which is distally dilated in the congener. In the vesica structure, the new species differs from *P. peregrina* in the longer spinulose cluster of the subbasal dorsal diverticulum extending into the vesica base laterally, the narrower medial diverticulum bearing a cluster of more robust spinulose scobination, and the shorter ventral diverticulum lacking the cluster of spinules.

The female is unknown.

**Distribution.** Currently only known from northeastern Republic of Congo.

**Etymology.** The new species is named after Dr Gyula M. László, Collections Manager, ANHRT, an expert of the subfamilies Nolinae and Thyatirinae, and the family Geometridae, and one of the collectors of the holotype and the majority of paratypes. The name is a noun in the genitive case.

***Palaeogoa ndoki* sp. n.**

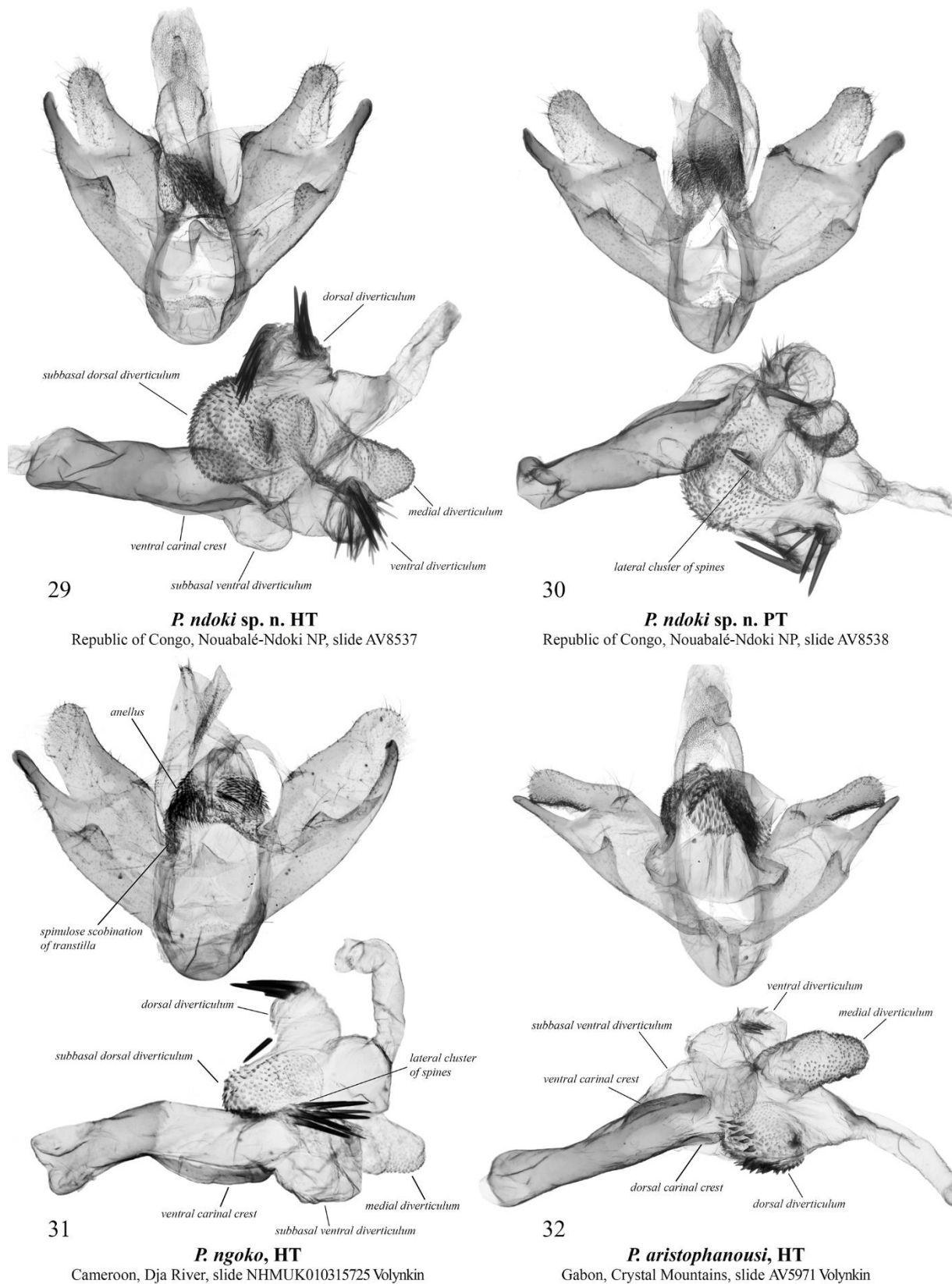
<https://zoobank.org/urn:lsid:zoobank.org:act:3AADAD94-BABA-4B6A-A7D2-92BC0491B40D>

(Figs 16–18, 29, 30, 35)

**Type material. Holotype** (Figs 16, 29): male, “Republic of Congo 372m | Nouabale-Ndoki National Park, | Mbeli camp | 02°14'23.8"N, 16°23'52.1"E | 14–20.ii.2023, actinic light trap | Bakala, N., Dérozier, V., | Kirk-Spriggs, A., László, G. leg. | ANHRT:2023.3” / “ANHRTUK | 00312053” / “Slide | AV8537♂ | A. Volynkin” (ANHRT).

**Paratypes** (21 males, 5 females, all in ANHRT). **REPUBLIC OF CONGO:** 9 males, same data as holotype, gen. prep. No.: AV8538; 2 males, 4 females, 365m, Nouabalé-Ndoki National Park, Mondika camp, 02°21'50.63"N, 16°16'25.82"E, 07–14.ii.2023, actinic, MV and LepiLED light traps, Bakala, N., Dérozier, V., Kirk-Spriggs, A., László, G. leg., gen. prep. No.: AV8539♀; 4 males, 372m, Sangha Prov., Nouabalé-Ndoki National Park, Mbeli camp (*Gilbertiodendron* forest), 02°14'23.8"N, 16°23'52.1"E, 1–10.x.2022, LepiLED, MV and actinic light traps, Dérozier, V., Fouka, B., Kirk-Spriggs, A., Takano, H. leg., gen. prep. No.: AV6950; 1 male, 1 female, 352m, Sangha Prov., Nouabalé-Ndoki National Park, Ndoki formation (secondary forest), 02°12'47.7"N, 16°23'45.8"E, 29.ix.–1.x.2022, actinic and LepiLED light traps, Dérozier, V., Fouka, B., Kirk-Spriggs, A., Takano, H. leg.; 1 male, 341m, Sangha Prov., Nouabalé-Ndoki National Park, Bomassa camp (secondary forest), 02°12'36.9"N, 16°11'30.2"E, 10–16.x.2022, LepiLED light trap, Dérozier, V., Fouka, B., Kirk-Spriggs, A., Takano, H. leg., gen. prep. No.: AV6949♂; 1 male, same locality and collectors as previous but 16–23.ix.2022, MV light trap; 1 male, 358m, Sangha Prov., Nouabalé-Ndoki National Park, Bomassa Forest (secondary forest), 02°11'58.1"N, 16°11'16.9"E, 17–22.ix.2022, actinic light trap, Dérozier, V., Fouka, B., Kirk-Spriggs, A., Takano, H. leg.; 1 male, 349m, Nouabalé-Ndoki National Park, Makao Forest, 02°36'42.5"N, 17°09'23.8"E, 15–21.v.2023, actinic light trap, Dérozier, V., Kirk-Spriggs, A., László, G., Mvouende, S. leg.; 1 male, 365m, Nouabalé-Ndoki National Park, Mondika camp, 02°21'50.63"N, 16°16'25.82"E, 27.iv.–06.v.2023, MV light trap, Dérozier, V., Kirk-Spriggs, A., László, G., Mvouende, S. leg.

**Diagnosis.** The forewing length is 8.0–9.5 mm in males and 10.0–11.0 mm in females. *Palaeogoa ndoki* **sp. n.** (Figs 16–18) is superficially similar to the Gabonese *P. aristophanousi* (Fig. 20) with its dark, greyish-brown hindwing, and identification requires the examination of the genitalia structures, which are significantly different in their valva shape, scobination of anellus, juxta width, and vesica configuration and ornamentation (Figs 29, 30, 32). The male genital capsule of the new species is most similar to the Cameroonian *P. ngoko* (Fig. 31) but in the latter the collis is less prominent, the valva apex is broader, and the juxta is longer. Compared to *P. ngoko*, the phallus of *P. ndoki* **sp. n.** is straight (it is medially downcurved in the congener) and bears a shorter and narrower ventral carinal crest. The vesica of *P. ndoki* **sp. n.** is broader than in *P. ngoko*, has broader subbasal dorsal and ventral diverticula, and an additional, ventral diverticulum bearing a cluster of spines, which is absent in the similar congener. Additionally, in the new species, the lateral cluster of spines is narrower and consists of markedly smaller spines, and the dorsal diverticulum bears two clusters of spines while there is only one cluster in *P. ngoko*. The female of the new species is very similar to the male but is larger and has



**Figures 29–32.** *Palaeogoa* spp.: male genitalia. Depositories of the specimens dissected: 29, 30 and 32 in ANHRT; 31 in NHMUK (©The Trustees of NHMUK).

a slightly more convex costal margin of the forewing. As the females of other species in the *P. peregrina* species-group are still unknown, the female genitalia of *P. ndoki* sp. n. (Fig. 35) were compared with

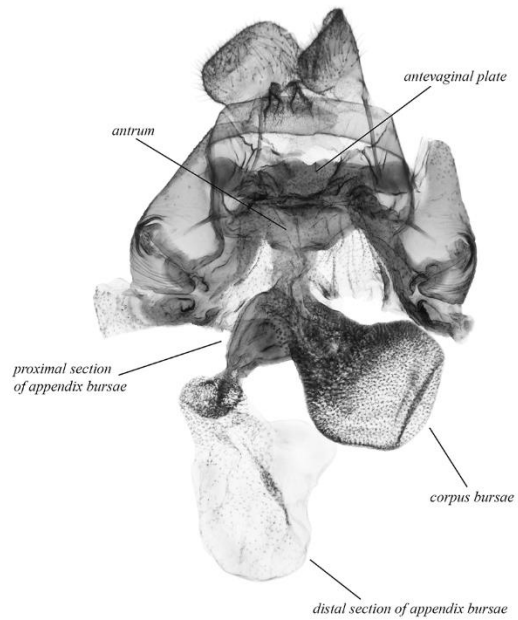
the *P. takanoi* species-group (Figs 33, 34) instead, and *P. ndoki* **sp. n.** is distinguished from the latter in the lack of the antevaginal plate, the funnel-shaped and weakly gelatinous antrum (it is sclerotised in *P. asafis* and absent in *P. takanoi*), the broader corpus bursae, the considerably broader and longer proximal section of the appendix bursae bearing a large sclerotised plate laterally, and the markedly broader distal section of the appendix bursae. Additionally, the 7<sup>th</sup> abdominal sternum of *P. ndoki* **sp. n.** is weakly sclerotised whereas it bears lateral sclerotisations in the *P. takanoi* species-group.



33

*P. takanoi*

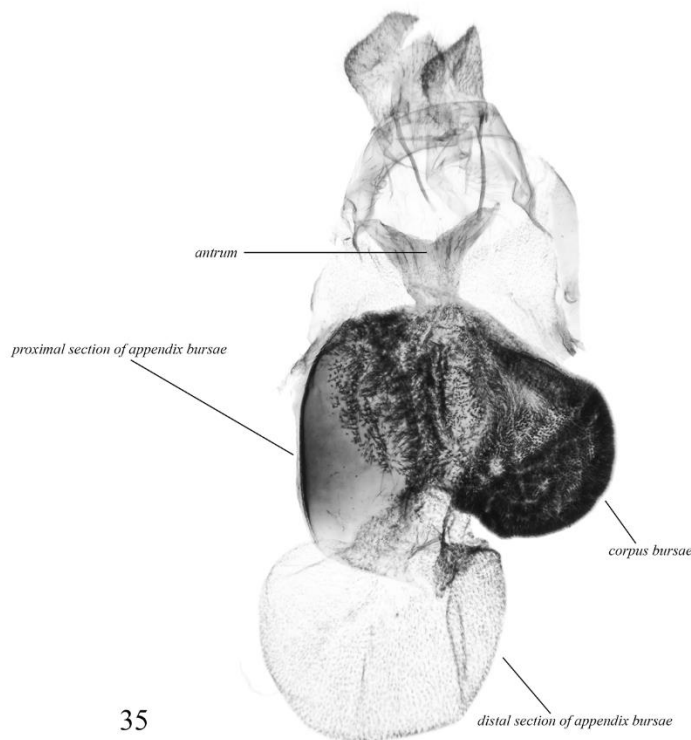
Republic of Congo, Nouabalé-Ndoki NP, slide AV8534



34

*P. asafis*

Republic of Congo, Nouabalé-Ndoki NP, slide AV8532



35

*P. ndoki* **sp. n.**, PT

Republic of Congo, Nouabalé-Ndoki NP, slide AV8539

Figures 33–35. *Palaeugoa* spp.: female genitalia. The specimens dissected are deposited in ANHRT.

**Distribution.** Currently only known from northeastern Republic of Congo.

**Etymology.** The new species is named after the type locality, Nouabalé-Ndoki National Park, Republic of Congo. The name is a noun in the nominative singular in apposition.

## Acknowledgements

In the Republic of Congo, the cooperative partner of ANHRT, the Wildlife Conservation Society (WCS) Congo and their employees authorised research in Nouabalé-Ndoki National Park and provided diverse administrative and technical support during the expeditions. The author expresses his gratitude to the following WCS staff: Morgane Cournarie (Program coordinator), Vittoria Estienne (Director of Research and Biomonitoring), Ben Evans (Park Director), Richard Malonga (Director), Onesi Samba (Research Assistant) and Yako Valentin (Administrative Manager). Joseph Goma-Tchimbakala (General Director of IRSEN, Institut National de Recherche en Sciences Exactes et Naturelles), Jean Bosco Nganongo (Directeur de la DFAP Direction de la Faune et des aires protégées) and the Ministère de la recherche and scientifique are acknowledged for the seamless collaboration in issuing the necessary research (permit Nos: 051/MESRSIT/IRSEN/DG/DS, 0107/ACFAP/DG/DTS) and export permits. The valuable assistance of Victor Mamonekene (Hydrobiologist, Ichthyologist, IRSEN and Marien Ngouabi University) is also highly appreciated.

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