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Taxonomic revision of the Afrotropical genus *Trimetopia* GUENÉE, [1858] (Lepidoptera, Geometridae, Larentiinae)

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Abstract

The Afrotropical genus *Trimetopia* GUENÉE, [1858] is revised and an overview of the historical treatment of the genus is given. *Trimetopia coerulea* stat. nov. is raised form subspecies to species rank. *Trimetopia laszloi laszloi sp. n.*, *Trimetopia laszloi ugandana ssp. n.*, *Trimetopia incognita sp. n.*, *Trimetopia hirutae sp. n.*, *Trimetopia gelbrechti sp. n.*, *Trimetopia gracilis sp. n.*, *Trimetopia ochsei sp. n.* and *Trimetopia occidentalis sp. n.* are described as new to science.

Introduction

The Larentiinae-genus Trimetopia GUENÉE, [1858] is very poorly known. This genus was originally established for the taxon aetheraria by GUENÉE in 1858 based on a single male from Abyssinia (Ethiopia). Later in 1898 the sub-species coerulea was described by WARREN based on material that originated from Lamu on the Kenya coast. Although these moths are rather attractive, no further work has been undertaken on this genus for over a hundred years.

Material and methods

For this study, material from the following collections was consulted: Zoologische Staatssammlung, Munich, Germany (including the famous CLAUDE HERBULOT Collection) (ZSM), the Natural History Museum, London, UK (BMNH), the African Natural History Research Trust, Leominster, UK (ANHRT) and the private collections of Leif AARVIK, Trondheim, Norway (PCLA), Ralf FIEBIG, Roßleben, Germany (PCRF), Michael OCHSE, Weisenheim am Berg, Germany (PCMO), Steffen SCHELLHORN, Halle/Saale, Germany (PCSS) and Dirk STADIE, Lutherstadt Eisleben, Germany (PCDS).

For better analysis and comparison of the specimens, scaled digital photographs in high definition were taken of the dorsal and ventral surfaces. Genitalia were dissected and slide-mounted for many of the specimens.

For genetic information, the Barcode of Life (BOLD) database was utilised together with additional barcodes which were generated as part of this study. Phylogenetic tree searches were performed using two main approaches, Bayesian Inference and Maximum Likelihood. The analyses were performed using jModelTest and MEGA X (Molecular Evolutionary Genetics Analysis computing platforms) (KUMAR et al. 2018). The trees resulting from the Maximum Likelihood analyses with bootstrapping (500 trees) (FELSENSTEIN 1985) and a condensed tree accepting nodes only with more than 50% likelihood were used for this study.

Results

Genus description

Morphology.

The genus *Trimetopia* GUENÉE, [1858] forms a rather compact generic unit based on external features. These medium sized Geometrid moths have quite a uniform wing and body pattern. The species show weak sexual dimorphism, although the female wingspan is usually a third larger and with more rounded

wings. The distinctive turquoise colouring of both wing upperside and body is very typical. The white wing pattern is found on the ante- and postmedian fascia of the forewing and the postmedian fascia of the hindwing upperside. In many species the veins and adjacent parts of the wing surface are densely covered in white scales. The undersides of both wings are always pearlescent without any pattern. The vertex and frons whitish, eyes rather large and dark brown. Palpi very short. Antennae in both sexes bipectinate, flagellum dorsally white or light turquoise with light brown rami. Rami twice as long as the diameter of the flagellum in males, slightly shorter in females. Proboscis reduced.

Thorax and abdomen with identical colouration to wings, abdomen with a whitish line in a dorsal view, mostly missing in pinned material through the influence of moisture. Legs pure white, tarsi of hind legs with one pair of spurs.

The male genitalia are strongly modified. Uncus short, bifid, fused with tegumen and gnathos to a broad, sclerotized plate, socii absent. Transtilla large, strongly sclerotized, covered mostly with a dense field of bristles. Saccus short and broad. Valva short, membranous, lobe like, ampulla well-developed, densely covered with short setae, sacculus short usually without processi (except in the *hirutae* clade). The aedeagus is comparably short, with fields of cornuti in the vesica.

The female genitalia are rather simplified. Ovipositor medium-long, retractable. Apophyses relatively long, eighth tergite rater elongate. Ostium rounded, anthrum present, ductus bursae very short, membranous, corpus bursae medium large, membranous, without signa.

Bionomics.

All known species of the genus *Trimetopia* occur in tropical Africa in a wide range of habitats. They have been recorded in wet, forested savannah habitats, riverine forests, forest savannah mosaics, montane swamps as well as mid altitude and montane broad-leafed rainforests. In most species only the males are readily attracted to light. The females are rare in collections. Although the early stages are poorly known, SCOBLE recorded *Vitis* and *Ampelopsis* (Vitaceae) from East Africa as host plants (SCOBLE, 1999; ROBIN-SON et al., 2019).

Species account

Trimetopia aetheraria species-group

The members of this group are widely distributed in sub-Saharan Africa from the Abyssinian Massif in the north along the great rift to the Vumba Mountains in Zimbabwe in the south. In the west, it is distributed towards the northern limits of the Congolian basin in DR Congo and Central African Republic.

The main characters of this group are the white pectination of all veins and the adjacent wing surface on upperside of the wings together with the presence of a petiolate or semi-circular hairy ampulla in male genitalia. The ampulla is situated always posterior of the valva.

The species inhabit a wide range of habitats such as broad-leaved Afromontane rainforests, Afromontane moorland as well as highland and lowland savannahs.

Trimetopia aetheraria GUENÉE, [1858] (Plate 1, Fig. 1a-f)

Trimetopia aetheraria GUENÉE, [1858], in BOISDUVAL & GUENÉE, Hist. nat. Insectes (Spec. Gén. Lépid.) 9:352; ibidem (1858), Atlas; pl. 5, fig.9 (Trimetopia), Lectotype & (MNHN), L.t.: Abyssinie [Ethiopia].

Material examined.

Ethiopia: 3d Ethiopia Oromia Harena Forest Lodge/ Katcha Camp ground, N 06°58.763, E 39°10.606, 1.-3.05.2016 2316 m LF, leg. R. Fiebig & D.Stadie, coll. PCDS; 23 Ethiopia Reg.[ion] of Sout.[hern] Nations, Sheiko Forest, road from Teppi to Mizan Teferi, 7°2'25.41``N/ 35°26'41.44``E, 1450m, 16.-19.05.2015, leg. Stadie/ Fiebig, coll. PCDS; 23 Ethiopia Reg. [ion] of Sout[hern] Nations, road Shishinda-Bonga, Stone Quarry 6 km west of Wushwush, 7°18'18.33'' N/ 36°3'27.38''E, 22.05.2015, leg. D. Stadie/ R. Fiebig, coll PCDS; 👌 Äthiopien, Ostafrikanischer Graben, Bonga-Hotel, 1700-1830m, 07°21'N, 36°07'O, 13.-20. vii. 2017, Beck R. & G. Riedel leg., coll. ZSM; & Ethiopia, Reg. Oromia, Road Bedele-Metu, 9 km NO of Yayo, 8°22'12.42''N/ 35°53'41.08''E, 1425m ü. NN, LF 13.05.2015, leg. D. Stadie/ R. & S. Fiebig, coll. PCRF; 3 🖒 Ethiopia, Oromia, Bale Mountains, Harena Forest, Bale Mountain Lodge, 2376m, N 06°42.554/ E 39°43.345, 01.-03.05.2016 LF, leg. R.& S.Fiebig /D.Stadie, coll. PCRF; 3 👌 Ethiopia, Reg.of South. Nations, Bonga Guesthouse, 7°15'4.33"N/ 36°15'15.51"E, 1750 m ü.NN, LF 12.-14.05.2016, leg. R.& S.Fiebig /D.Stadie, coll. PCRF; 1 ♀ Ethiopia, Reg. Oromia, Road Bedele-Metu, 9 km NO of Yayo, 8°22'12.42''N/ 35°53' 41.08"E, 1425m ü. NN, LF 13.05.2015, leg. D. Stadie/ R. & S. Fiebig, coll. PCRF; 🖒 Äthiopien, Ostafrikanischer Graben, Prov.[ince] South Nation, Bonga, 12km E, 2414m, 07°17.652 N, 36°2.567 O, 23.vi.2014, Beck R. & G. Riedel, coll. ZSM; & Äthiopien, Ostafrikanischer Graben, Prov. [ince] South Nations, Bonga, 10km NE, 2400m, 07°17` 37``N, 36°22'32''O, 17.viii. 2017, Beck R. & G. Riedel, coll. ZSM; 👌 Äthiopien, Ostafrikanischer Graben, Prov. [ince] South Nations, Wuschwusch, 16km W Bonga, 1910m, 07° 18'184''N, 36°03'520 21.vi.2014, Beck R. & G. Riedel, coll. ZSM.

Description.

Wingspan 23-34 mm in males (females not examined). Wings and body in dorsal view bright turquoise with a white pattern. All wings with a silky lustre, and almost opaque. The white antemedian fascia runs straight from the inner margin towards the costa up to vein R1-R2, continuing at a right or sometimes acute angle, nearly parallel to the inner margin, towards the costa. The postmedian fascia is more or less parallel to the antemedian fascia, sometimes slightly curving inwards near the inner margin, reaching the costa near the apex of fore wing. The post median of the hind wing is always well developed, curving from anal margin towards costa always parallel to termen. All veins and the adjacent area of wing upperside broadly covered with white scales. All fringes turquoise at the base, towards termen white.

Wing underside of both wings pearl white. Only the basal two thirds of the costal area of the forewing is strongly suffused with dark brown scales, otherwise without any patterning. All other external features and colouring as outlined in the genus description.

Male genitalia (Plate 4, Fig. Ia-d).

Uncus bifid, rather short, broad at base, with short, gracile, apically rounded processi, tegumen with a pair of short, semi-circular sclerotized protrusions at the base of uncus. Valva very short and narrow, membranous, apically rounded, rather tongue-shaped. Ampulla ear-like with a short and broadly rounded posterior and a longer, narrower, apically tapered anterior lobe, densely covered with short setae. Sacculus reduced to a small straight process. Sacculus short and relatively broad, without processi. Transtilla heavily sclerotized, medially with strong, long bristles. Saccus very short, broadly rounded. Aedeagus short, medially laced, apically largely dilated, dumbbell-shaped. Vesica with a row of fine and relatively long cornuti situated close to the carina and a separated elongated central field of smaller cornuti.

Female genitalia.

Not examined.

Diagnosis.

The main diagnostic features in the external morphology are the postmedian fascia of the hindwing, which always runs parallel to termen, the white pectination of all veins and the dark brown suffusion at the costal area of the forewing underside. These features are in most cases sufficient for a reliable identification. Detailed comparison between the external and internal morphology of the species are given below, under the diagnosis of each new taxa.

Genetics.

There is a 2,6% difference in the barcode between the populations east and west of the Rift Valley which may represent distinct subspecies.

Distribution.

This species appears to be endemic to the Ethiopian highlands.

Bionomics (Fig. 1).

The species has been recorded in broad-leaved montane rainforests, and forest clearings between 1,400-2,400m. Specimens have been captured from May to August, correlating with the rainy season in Ethiopia. Only males were recorded at light. Species of Vitaceae are reported to be the host plants of this species (SCOBLE, 1999; ROBINSON ET AL., 2019), but due to the restricted distribution, the findings might refer to other congeners.

Trimetopia laszloi laszloi sp. n. (Plate 1, Fig. 2a-f)

Material examined.

Holotype: ♂ Tanzanie, Morogoro Region, Kaguru Mts.[ountains], 1.870m, S 06°22.367`` E 36°55.820``, 7.XI.2013, Ph. Darge, coll. ZSM.

Paratypes: Tanzania. ♂ Tanzanie, Morogoro Region, Kaguru Mts.[ountains], forêt, alt.: 1900m, 26-IV-2005, Ph. Darge, DS 9/1018; ♂ Tanzania, Nguu Mts.[ountains], Tamota forest, 15-VIII-2004, local collector ex collection Ph. Darge, BC ZSM Lep 45602, coll. ZSM; ♂ Tanzanie, Morogoro Region, Kaguru Mts.[ountains], 1.870m, S 06°22.367 ``E 36°55.820``, 7.XI.2013, BC Eth 2221; ♂ Tanzanie, Morogoro Region, Kaguru Mts.[ountains], 1.870m, S 06°22.367 ``E 36°55.820``, 7.XI.2013, Ph. Darge, BC Eth 2223, coll. ZSM; ♂ Tanzanie, Morogoro Region, Kaguru Mts.[ountains], 1.870m, S 06°22.367 ``E 36°55.820``, 7.XI.2013, Ph. Darge, BC Eth 2223, coll. ZSM; ♂ Tanzanie, Morogoro Region, Kaguru Mts.[ountains], 1.870m, S 06°22.367 ``E 36°55.820``, 7.XI.2013, Ph. Darge, DS 68/2018, coll. ZSM; 10♂, ♀ Tanzanie, Morogoro Region, Kaguru Mts.[ountains], 1.870m, S 06°22.367 ``E 36°55.820``, 7.XI.2013, Ph. Darge, coll. ZSM; ♂ Tanzania, Morogoro Distr.[ict], Kimboza For.[est] Res.[erve], 7.IV.1992, L. Aarvik, BC Eth 2139, DS 26/2018, coll. ZSM; ♂ Tanzanie, Ruvumba Region, S.-E. Magingo, savane, 1.030m. 10°02.258' S., 035°38.945' E, 26-III-2006, Ph. Darge, DS 67/2018; ♂ Tanzanie, Ruvumba Region, S.-E. Magingo, savane, 1.030m. 10°02.258' S., 035°38.945' E, 26-III-2006, Ph. Darge, DS CZSM Lep 17282, coll. ZSM;♂ Tanzania, Iringa Region. Kipengere Mts.[ountains], Lugenge

Moorland, 2060m, 09°24.864' S, 034°34.822'E, 9-XII-2005, Ph. Darge, coll. ZSM; ♀ Tanzanie, Morogoro Region, Kaguru Mts.[ountains], 1.900m, 5-II-2005, Ph. Darge, DS13/2018, coll. ZSM; ♂ Tanzanie: Pwani Region, Mandera, 166m, 06°14.300'S., 038°23.197'E., 07-XII-2008, [legit] (Ph. Darge), DS 80/2019, coll. ZSM; ♂ Tanzania, Iringa: Udzwungwa Mang`ula, 400m, 7.III.2003, Knud Larsen leg[it], DS 82/2019, coll. ZSM; 13 ♂ Tanzania, Rukwa Region, Kalambo Falls Forest Reserve, 1557 m., 08°21.746'S.,031°12.850'E., 25-XI-2009 (Ph. Darge), coll. ZSM; 5 ♂ Tanzania, Iringa Region, Utungele, Itago Forest, 09°18.558'S.,034°39.433' E., 2048 m., 11-XII-2007, (Local collector, Ph. Darge), coll. ZSM.

Zimbabwe. & Zimbabwe, Bvumba, 23.-31.12.2006, 1.630m, S 19°06`.302`E 32°45.185`, UV, Jürgen Lenz legit, BC ZSM Lep 44339, DS 14/2018, coll. ZSM.

Malawi. ♂ Zomba Plateau, Kuchawe Inn, 1600m, 30.XI.[19]89, [legit] Ch. Herbulot, BC ZSM Lep 71979; ♂, ♀ Zomba Plateau, Kuchawe Inn, 1600m, 30.XI.[19]89, [legit] Ch. Herbulot, coll. Herbulot (ZSM).

Zambia. & 1300m, Nyangombe Falls, (Miombo/Riverine forest mosaic), 11°48'25"S, 24°32'12"E, 15-17.XI.2018, MV Light Trap, Aristophanous, M., Derozier, V., Laszlo, G., Oram, D. leg., ANHRT:2018.40, unique number: ANHRT-UK00069937, slide No.: LG5004 (coll. ANHRT).

Description.

Wingspan in males 28-31 mm, in females 31-32 mm. Apex of forewings in females less acute, wings broader, termen more rounded in both wings. Wings and body in dorsal view bright turquoise, pattern white. All wings with a silky lustre, nearly without transparency. The antemedian fascia is running mostly straight, sometimes with a slight bend at vein CuA2 from inner margin towards costa up to the cell, then in an acute angle, nearly parallel to inner margin. Towards the costa the fascia is absent or very indistinct. The postmedian fascia runs more or less parallel to the antemedian, near the costa the latter is weak or absent. The post median of the hindwing is always well developed, more or less straight, sometimes slightly curved towards the anal margin. All veins broadly covered with white scales in males. In females the pectination is rather weak. All fringes light turquoise at the base and mostly white towards the termen. Underside of wings pearlescent without pattern. All other external features and colouring as outlined in the genus description.

Male genitalia (Plate 4, Fig. IIa-b).

Uncus bifid, medium long, broad at base, medially laced, apically with a pair of short, gracile, rounded processi, tegumen with a pair of short, semi-circular sclerotized protrusions at the base of uncus. Valva very short slightly conical, membranous, apically rounded. Ampulla comma-shaped with broadly rounded base posteriorly and a gradually tapering lobe directed anteriorly, densely covered with short setae. Sacculus very short and narrow, without processi. Transtilla large, trapezoidal, apically dilated, heavily sclerotized, medially with strong, long bristles. Saccus short, V-shaped. Aedeagus short, medially slightly laced, apically dilated, sub-cylindrical. Vesica with an elongated field of fine and relatively short cornuti situated close to the carina.

Female genitalia (Plate 4, Fig. IIc).

Ovipositor medium long, basal half membraneous, retractable, papillae anales short, quadrangular with rounded edges; apophyses posteriors rather long and thin, apophyses anteriores relatively long and very thin; eighth tergite more or less trapezoidal, strongly dilated anteriorly with medially gently angled lateral margins, medially deeply incised posterior margin and evenly arcuate anterior margin; ostium bursae rounded, anthrum goblet shaped with relatively narrow, evenly arcuate lateral margins; ductus bursae very short and rather broad, corpus bursae ovoidal, without signum.

Diagnosis.

Trimetopia laszloi laszloi sp. n. is rather similar in external features to its closest relative Trimetopia aetheraria from Ethiopia. Nevertheless, the new species can be easily distinguished by the course of the postmedian fascia on the hindwing upperside, which is always rather straight in *T. laszloi laszloi and never consistently curved as in T. aetheraria.* Furthermore, the males of the latter have usually a dark brown suffusion in the costal area of the forewing underside, which is always absent in males of *T. laszloi laszloi laszloi.*

In male genitalia the uncus of the new species is considerably longer and the protrusions at the posterior margin of tegumen are remarkably bigger than those of T. *aetheraria*; the valva of the new species is conical in shape, whereas that is tongue-shaped in the related taxon. The new species differs from T. *aetheraria* also in the shape of the ampulla, which is somewhat larger, comma shaped in the former, while smaller, ear-shaped in the latter species.

The aedeagus is medially strongly laced, conspicuously dumbbell-shaped, with a central field of cornuti in *T. aetheraria*, whereas medially less concave rather sub-cylindric without central cornuti in *T. laszloi laszloi*.

Derivatio nominis.

The new species is dedicated to GYULA M. LÁSZLÓ (ANHRT), Leominster, Herefordshire, UK for his merits in investigation of Asian and African Geometridae and Nolidae.

Trimetopia laszloi ugandana ssp. n. (Plate 1, Fig. 2g-i; Plate 2, Fig. 2k-m)

Material examined.

Holotype ♂, Uganda, Mburo Lake NP, Nshara Gate, Rwakobo Rock Lodge, S 00°31.671``, E 31°00.064``, 31.03.-01.04.2013 LF, 1291m, le[git] Fiebig & Stadie, BC UG 869, coll. PCDS.

Paratypes: Uganda. Uganda, Mburo Lake NP, Nshara Gate, Rwakobo Rock Lodge, S 00°31.671'', E 31°00.064'', 31.03.-01.04.2013 LF, 1291m, leg.[git] Fiebig & Stadie, BC UG 711, DS 16/2018, coll. PCDS; 2 dynamic up and a Mburo Lake NP, Nshara Gate, Rwakobo Rock Lodge, S 00°31.671'', E 31°00.064'', 31.03.-01.04.2013 LF, 1291m, leg.[git] Fiebig & Stadie, PCDS; 9 d Uganda, Mburo Lake NP, Nshara Gate, Rwakobo Rock Lodge, S 00°31.671 . E 31°00.064``, 31.03.-01.04.2013 LF, 1291m, leg.[git] R. & S. Fiebig /Stadie, coll. PCRF; 2 🖧 Uganda western, Kibale Forest, Chimps 'Nest, N 00°23.47'' E 30°23.03'', 19.-21.03.2013 LF 1187m, leg. R. & S. Fiebig / D. Stadie, coll. PCRF; d Uganda, Border of Queen Elisabeth NP, Pumba Cottages near Kichwamba, S 0°12.345 `, E 30°06.022``, 24.03.2013 LF[Lichtfang], 1059m, leg.[git] Fiebig & Stadie, BC UG 1, DS 18/2017, coll. PCDS: 48 Uganda, Western Region, Bundibuyo Provinz, Semliki National Park, Bumaga Camp, 0°49'19.52''N 30°9'32.87''E, 688m, light attraction, January 28th, 2015, leg.[git] Michael Ochse, coll. PCMO; d Uganda, Western Region, Bushenvi Province, Queen Elisabeth Nationalpark; Maramagambo-Wald, 955m, 0°25'23.4' S 29°52'04.0' O, 29. Oktober 2015, Lichtfang, leg.[git] Michael Ochse; 🖒 Uganda, Western Region, Bushenyi Province, Queen Elisabeth Nationalpark; Maramagambo-Wald, 955m, 0°25'23.4' S 29°52'04.0' O, 26. Oktober 2015, Lichtfang, leg.[git] Michael Ochse; 👌 Uganda, Central Region, Mpigi District, Mpanga Forest, 0°12'23.19"N, 32°18'8.5"E, October 18th , 2015, leg.[git] Michael Ochse, coll. PCMO; 👌 Uganda, Western Region, Bundibuyo Provinz, Nähe Semliki Nationalpark, Sempaya-Berg Paßstraße, 0°50' 12.7''N, 30°10'8.5''O; 692m, Lichtfang, 23.Oktober 2015, leg.[git] Michael Ochse, BC UG 790, coll. PCMO; 2♂ Uganda, Kibale Forest, Chimp's nest 1207m, N 00°24.213``, E 30°23.017``, 9.-12.03.2013 LF, leg. R. Fiebig & D. Stadie, coll. PCDS.

Kenya. ♂ Western Kenya, Nandi, Kakamega-Regenwald Umg. Rondo, S 0.2244, E 34.8834, 1600-1700m, 10.X.1997, legit Eitschberger, Bauer & Traub, BC ZSM 39263, coll. ZSM; ♂ Western Kenya, Nandi, Kakamega-Regenwald Umg. Rondo, S 0.2244, E 34.8834, 1600-1700m, 5.-10.V.1997, Eitschberger, Bauer et Traub, leg[it], DS 65/2019, coll. ZSM. Rwanda. ♂ Ruanda: Kisenyi, 28.IV.1057, [legit] Dr. M. Fontaine, DS 15/2018; ♂ Ruanda: Kisenyi, 19.IV.1057, [legit] Dr. M. Fontaine, DS 40/2019, coll. Herbulot/ZSM.

Burundi. ♂ Urundi, Usumbura [Bujumbura], 5.XII.1961, 990m, [legit] Dr. M. Fontaine, DS38/2019, coll. Herbulot/ZSM. **Central African Republic.** 2♂ R. C. A., Préfecture de la Lobaye, Mbata, 1-17-VIII-1969, J. Plante leg[it], collection Jacques Plante, DS 61/2019, DS 62/2019, coll. Herbulot/ZSM.

DR Congo. 2∂ Ulele [Lower Ulele]: Paulis, 19.VII-1957, [legit] Dr. M. Fontaine, DS 69/2019, coll. Herbulot/ZSM. ♀ Uvira-Sucraf, 20.III.1971, M. Isy-Schwart leg[it], DS 22/2018, coll. ZSM.

Description.

Wingspan in males 23-27 mm (female unknown). Ground colour and general pattern of both wings and body like in *T. laszloi laszloi*. Antemedian and postmedian fascia on both wings with an intensely deep turquoise shadow medially. All veins white, but with much less pectination not extending into the adjacent wing surface as in the nominate sub-species. The latter is sometimes absent in some individuals.

Male genitalia (Plate 5, Fig. IId-e).

No differences to T. laszloi laszloi.

Female genitalia (Plate 5, Fig. IIf).

No differences to T. laszloi laszloi.

Genetics.

Genetic difference between the subspecies is rather large with 4,7%. Closest relative is *Trimetopia* aetheraria.

Diagnosis.

T. laszloi ugandana ssp. n. is on average smaller in wingspan and the white scales on the veins are much more sparse compared to specimens of the nominate subspecies.

Phenology.

The records of *T. laszloi laszloi* date to the months of February, April, August, November and December. *T. laszloi ugandana* has been recorded in January, May, July, August and October. Therefore, a polyvoltine life cycle is most likely depending on local conditions.

Bionomics (Fig. 2).

T. laszloi laszloi inhabits a wide range of habitats from montane rainforests, wet savannahs and montane moorland between 1,000-2,000m to lowland savannahs. Host plant and early stages unknown.

The subspecies *T. laszloi ugandana* inhabits wet savannahs and edges of mid altitude and lowland forests between 450-1,700m. The males are readily attracted by light. The host plant and early stages are unknown.

Distribution.

T. laszloi is the most widespread species in the genus. The nominate sub-species is found from the mountains and savannahs of Tanzania, the Zomba Plateau of Malawi and Zambia south to the Vumva Mountains in Zimbabwe.

T. laszloi ugandana is distributed in the Victoria Basin Forest-Savannah Mosaic (HACKER, 2019) north and west of Lake Victoria from Kakamega Forest in western Kenya south to Rwanda and Burundi. Further vouchers are known from the northern limits of the Congolian basin from Semliki NP in western Uganda to Bas-Uele Province in DR Congo and Lobaye in the Central African Republic.



Trimetopia coerulea species-group

The members of this group are distributed in two widely separated areas. They are known from the East African Savannahs from southern Ethiopia through Kenya to Tanzania and from Northern Nigeria, Ivory Coast, Burkina Faso and Mali in the west. The species share some features in both external and internal morphology. In all species the white pectination on the veins and the adjacent wing surface is absent or strongly reduced to a fine line of white scales on the veins. The setose ampulla in male genitalia is digitiform in lateral position in the center of the valva.

All species occur in open Savannah habitats or edges of riverine forests or Savannah thickets. All species are absent from closed forests. Both sexes have been observed regularly at light. Reports on Vitaceae as host plants from East Africa refer probably to this species-group.

Trimetopia coerulea WARREN, 1898 stat. nov. (Plate 2, Fig. 3a-g)

Trimetopia aetheraria coerulea WARREN, 1898, Novit. Zool. 5: 22, L.t.: British East Africa [Kenya], Lamu.

Material examined.

Holotype ♂, British East Africa [Kenya], Lamu 18[89].

Ethiopia. \circ S.[outh] Ethiopia, Oromia, 13km S[outh] Agere Maryam, 1960m (lux), 0.5149° N, 38.2529° E, 7.XI.2010, leg.[it] de Freina, Hacker, Peks, Schreier, DS 58/2018, coll. ZSM; \Diamond Ethiopia, Oromia Gibe river valley, 20km S[outh] of Welkite/ near Natri, N 08°11.037, E 37°34.223, 15.05.2016 LF, 1580m, leg.[it] R Fiebig & D. Stadie, BC Eth 2144, coll. PCDS; \circ S.[outh] Ethiopia, Oromia, 1km W[est] vill.[age] Aluweya, 1300m (lux), 4.9636° N, 37.5489° E, 10.XI. 2010, leg.[it] de Freina, Hacker, Peks, Schreier, BC Eth 2220, coll. ZSM; \circ S.[outh] Ethiopia, Oromia, 3km NNE vill.[age] Finchawa, 1760m (lux), 5.4193° N, 38.2862° E, 8.XI.2010, leg.[it] de Freina, Hacker, Peks, Schreier, BC Eth 2222, coll. ZSM; \circ S.[outh] Ethiopia, Prov.[ince] Oromiya zw.[ischen] Deritu & Dubuluk, Umg.[ebung] Deritu, N 04°42.246, E 38°10.252, 20.IV.2010. 1590M M[ix]-Lux, leg[it] H. Sulak, BC ZSM Lep 47448, DS 17/2018, coll. ZSM; \circ S.[outh] Ethiopia, Coromia, 1km W[est] vill.[age] Aluweya, 1300m (lux), 4.9636° N, 37.5489° E, 10.XI.2010, leg.[it] de Freina, Hacker, Peks, Schreier, BC Eth 222, coll. ZSM; \circ Schreier, DS 21/2018, coll. ZSM; \circ S.[outh] Ethiopia, Oromia, 1km W[est] vill.[age] Aluweya, 1300m (lux), 4.9636° N, 37.5489° E, 10.XI.2010, leg.[it] de Freina, Hacker, Peks, Schreier, DS 21/2018, coll. ZSM; \circ S.[outh] Ethiopia, Sidoma, V. 2008, 1520m, 16km SE Yabello, leg.[it] R. Beck, G. Riedel; BC ZSM Lep 14895, ZSM G 19420, coll. ZSM; \circ S.[outh] Ethiopia, Arba Minch, Reg.[ion] Omo, Prov.[ince] Gemu Gofa, 1350-1450m, 6°0 N, 37°33'E, 14.IV.-2.V.2001, leg.[it] G. Riedel; BC ZSM Lep 13946, coll. ZSM; \circ S.[outh] Ethiopia, Gamo Gofa, nr Arba Minch, 1400m, 6°15'N, 37°30'E, 4.V.2008, [legit] S. Naumann, H. Schnitzler, coll. ZSM; $2\circ$ S.[outh] Ethiopia, Oromia, 1km W[est] vill.[age] Aluweya, 1300m (lux), 4.9636° N, 37.5489° E, 10.XI.2010, leg.[it] de Freina, Hacker, Peks, Schreier, coll. ZSM;

Kenya. \Im Kenya, Meru, Ngaya forest, 00°18'59''N/ 38°00'30,8''E, 1230m, 23-01-2010, leg[it] S. C. Collins, BC ZSM Lep 445338, DS 56/2018, coll. ZSM; \Im Kenya, Provinz Rift Valley, Umg[ebung] Evaso River, 09.V.2010 680m, Lux, leg[it] N. Pürzer & C. Ganslmeier, BC ZSM Lep 47406, DS 18/2018, coll. ZSM; 10 \Im Kenya centr[al], Mount Kenya W[est], Naro Moru River Lodge, S 0°09'14/ E 37°00'41, 1950m ü.NN, 06.-08.04.2019 LF[Lichtfang]. leg[it] Stadie, Fiebig & Schellhorn, coll. PCDS, PCRF, PCSS; \Im Kenya, Mutha, 5.-12.IV.[19]69, [legit] Watulege, coll. ZSM; 2 \Im Kenya, Mtito Andel, 10.12.[19]72, leg[it] Dr. Politzar, coll. ZSM; \Im [Kenya], Kibwezi, 20.10.[19]72, coll. ZSM; \Im Kenya, Nairobi Kabete, 6.11.[19]72, leg[it] Dr. Politzar, coll. ZSM;

Tanzania, Arumeru Distr.[ict], Usa River, 12.VIII.1991, [legit] L. Aarvik, BC Eth 2140, DS 27/2018, coll. PCLA.

Description.

Medium sized species with a wing span of 25-32 mm. Females larger than the males. Apex of forewings in females less acute, wings broader. Wings and body in dorsal view bright turquoise to greenish-turquoise, pattern white. Costa pure white. Flagellum of the antenna turquoise dorsally. All wings with a weak silky lustre, nearly without transparency. All veins in ground colour, without white pectination. The white antemedian fascia is running straight from inner margin towards costa up to the cell, then angled or sometimes curved inwards. In the costal area the fascia is often very weak or absent. The postmedian fascia runs more or less straight or slightly curved from the anal margin of the hindwing towards the costa of forewing. On forewing the latter runs parallel to the antemedian. Ante- and postmedian fascia towards medium field always with an intensely deep turquoise shadow. Wing underside pearl white towards costa of fore wing with greenish tint. All other external features and colouring like in the genus description. **Male genitalia** (Plate 5, Fig. IIIa-b).

The bifid uncus rather gracile, the tegumen with very weak sclerotized swellings (gnathos) left and right of the uncus. Gnathos and tegumen not fully merged, but connected by a weak sclerotized membrane. Valva membranous, semi-circular. Ampulla finger-shaped, comparable tall, reaching beyond the outer margin of the valva. The ampulla is densely covered with hairy seatae. Sacculus short. Transtilla strongly sclerotized, with four separated fields of tufted bristles. Saccus broad, rounded.

Aedeagus short, concave or sub cylindric variable in shape. Vesica slender, with a field of short, straight cornuti close to the carina.

Female genitalia (Plate 5, Fig. IIIc).

Ovipositor medium long, basal half membraneous, retractable, papillae anales medium sized, quadrangular with rounded edges; apophyses posteriors rather long and thin, apophyses anteriores shorter and very thin; eighth tergite more or less trapezoidal, strongly dilated anteriorly with medially rounded lateral margins, medially deeply incised posterior margin and evenly arcuate anterior margin; ostium bursae rounded, anthrum goblet shaped with relatively narrow, evenly arcuate lateral margins; ductus bursae very short and rather broad, corpus bursae ovoidal, without signum.

Genetics.

The specimen from Kenya with remarkable distance to the South-Ethiopian populations. A bigger data set from Kenya is needed for reliable interpretation. For genetic distances to congeners see under that species. **Diagnosis**.

In *Trimetopia coerulea* the white pectination of the veins on the upperside are always absent in contrast to *T. laszloi* and *T. aetheraria*. Other typical features of *T. coerulea* is the pure white costa of the forewing and the turquoise dorsal colouring of the flagellum, which is white in the previous species. Furthermore, the differences in male genitalia between *T. coerulea* and the members of the *T. aetheraria* species-group

are large e.g. the position and shape of the ampulla. Therefore *T. coerulea* cannot be treated as a subspecies of *T. aetheraria*. In fact, *T. coerulea* represents a distinct species and together with the following species, form an independent group within the genus. For differences to other members of this group see under that species.

Phenology.

T. coerulea has been collected in January, April, May and October. A polyvoltine development is therefore most likely.

Bionomics (Fig. 3-4).

The species inhabits savannah habitats and xeric bushlands between 680-1,600m. For *T. aetheraria* species of Vitaceae (*Vitis, Ampelopsis*) were reported as host plants from British East Africa (Kenya), but *T. aetheraria* is known to be restricted to the Ethiopian highlands, therefore this data might refer to *Trimetopia coerulea*, which is the most widespread species in Kenya.

Distribution.

The species inhabits the Somalian Xeric Bushland and Shrubland Zone (ecoregion 5) sensu HACKER 2019. *T. coerulea* is widespread from southern Ethiopia, the savannahs of Kenya and northern Tanzania. The species is also found along the rift escarpments (Arba Minch) of the Ethiopian highland plateau as well as the hot and dry south-facing river valleys (Gibe river).

Trimetopia incognita sp. n. (Plate 2, Fig. 4a-b)

Material examined.

Holotype ♂, Tanzanie: Tanga region, savane de Kisangiro, 750m, 23-X-2004, S 03°36.192', E 037°32.293', [legit] Ph. Darge, BC ZSM Lep 45558, DS 55/2018, coll. ZSM;

Paratypes: Tanzania. ♂ Tanzanie: Tanga region, savane de Kisangiro, 750m, 23-X-2004, S 03°36.192', E 037°32.293', [legit] Ph. Darge, DS 19/2018, coll. ZSM; ♂, Tanzanie: Pwani Region, Mandera, 166m, 06°14.300' S, 038°23.197'E, 07-XII-2008, [legit] Ph. Darge, BC ZSM Lep 47022, coll. ZSM; ♂, Tanzania: Baobab valley, savane sèche, 560m, 07.31.356 S, 36.35.954 E, 5-XII-2002, [legit] Ph. Darge, coll. ZSM; ♂, Tanzania, Iringa, Uzzwungwa Mang`ula, 400m, 1.III.2003, Knut Larsen leg[it], coll. ZSM.

Description.

Small species, wing span 20-25mm, on average remarkably smaller than the previous species. Females unknown. Wings rather short and broad, termen rounded. Wings and body in dorsal view bright to light greenish-turquoise, pattern white sometimes rather weak. Costa pure white. Flagellum of the antenna turquoise dorsally. All wings with a weak silky lustre, nearly without transparency. All veins in ground colour, without white pectination. The white antemedian fascia is running straight from inner margin towards costa up to the cell, then angled or sometimes curved inwards. In the costal area the fascia is often very weak or absent. The postmedian fasciae runs more or less straight or slightly curved from anal margin on hindwing towards costa of forewing. On forewing the latter is running parallel to the antemedian. Ante-and postmedian fascia towards medium field with an intensely turquoise shadow. Wing underside pearl white. All other external features and colouring like in the genus description.

Male genitalia (Plate 6, Fig. IVa-d).

The bifid uncus very short, broad and stout, the tegumen with very short sclerotized swellings at both sides of the base of uncus. Gnathos and tegumen not fully merged than in members of *T. aetheraria* species-group, but connected by a weak sclerotized membrane. Valva very short, membranous, semi-circular. Ampulla digitiform, considerably short and broad, densely covered with setae. Sacculus very short. Transtilla strongly sclerotized, with four separated fields of bristle tufts. Saccus broad, rounded.

Aedeagus short, sub-cylindrical. Vesica strongly reduced, with a small field of several short, straight cornuti close to the carina.

Female genitalia.

Unknown.

Genetics.

Distance to the nearest neighbour Trimetopia coerulea is 4,1%.

Diagnosis.

Trimetopia incognita sp. n. is most similar to *T. coerulea* in external appearance, but on average smaller in size. Both species have similar wing pattern and colouration. It seems that in the new species the ground colour is more greenish-turquoise than in *T. coerulea*. However, the number of known specimens is very limited.

For a confident identification, the male genitalia needs to be studied.

T. incognita has a broader and more stout bifid uncus, compared to that of *T. coerulea*. The ampulla in the latter species is tall and narrow, right angled distally, reaching beyond the outer margin of the valva, while in *T. ingognita* the ampulla is acute angled, remarkably shorter, never reaching the outer margin of the valva.

Phenology.

T. incognita has been recorded in March, October and December.

Bionomics.

The species has been observed in lowland savannah habitats between 160-750m. Host plant unknown.

Distribution.

The species is so far known only from the lowland savannahs of Tanzania.

Trimetopia ochsei sp. n. (Plate 2, Fig. 5a-c)

Material examined.

Holotype: ♂ SW[Southwest] Mali, Ouronina, 20km NW[Northwest] Kenieroba, 26.VI.2015, 350m, 12.137° N/8.393° W, leg[it] Team G. Müller, Light trap, BC Eth 2138, DS 25/2018, coll. ZSM;

Paratypes: Mali. ♀ SW[Southwest] Mali, Ouronina, 20km NW[Northwest] Kenieroba, 26.VI.2015, 350m, 12.137° N/8.393° W, leg[it] Team G. Müller, Light trap, coll. ZSM;

Burkina Faso. ♀ Obervolta, Bobo Dioulasso, 22.8. [19]77 leg[it] Dr. Politzar, DS 6/2019, coll. ZSM;

Ivory Coast. ♀ Elfenbeinküste, Ferkessgdougou, 12.08.[19]79, DS 14/2019, coll. ZSM.

Description.

Large species with a wingspan of 31-35 mm. Wing shape rather broad, apex less acute and termen slightly rounded. Wings and body in a dorsal view pale turquoise. Pattern white, weak and indistinct. Wings with weak sheen. Costa with broad white pectination, towards apex weaker. Cell spot absent. Flagellum of the antenna dorsally white. All veins without or with strongly reduced white pectination. The antemedian fascia runs straight from inner margin towards costa up to the cell, then in an acute angle inwards. The antemedian is remarkably weaker than the postmedian fascia, towards costa more or less lapsed. The postmedian fascia of forewing runs straight and parallel to termen from inner margin towards costa. On hindwing the latter is slightly curved towards anal margin. The postmedian with a deep turquoise shadow inside. Fringes pure white. Wing underside pearl white. All other external features and colouring like in the genus description.

Male genitalia (Plate 6, Fig. Va-b).

The bifid uncus very broad and truncate with very shallow medial incision between the broad, quadrangular processi. Tegumen lacks sclerotized protrusions at the base of the uncus. Gnathos and tegumen fully merged. Valva membranous, bilobate, ear-shaped. Ampulla digitiform, densely covered with short setae. Sacculus short and rather broad. Transtilla interrupted centrally, with a row of short, straight bristles. Juxta with four separated groups of bristles. Saccus broad, rounded.

Aedeagus short and dumbbell-shaped, dilated towards carina. Vesica with a single, elongated field of short, straight cornuti.

Female genitalia (Plate 7, Fig. Vc).

Papilla analis comparable short and compact, nearly quadrangular. Apophyses posteriores longer than Apophyses anteriores, very thin. Eight tergite broad trapezoidal, strongly dilated anteriorly with medially rounded lateral margins, medially incised posterior margin and evenly arcuate anterior margin;

Genetics.

Not available.

Diagnosis.

All species of this group are difficult to distinguish based on external features. *Trimetopia ochsei* sp. n. is one of the largest within the genus. *T. coerulea* and *T. incognita* are much smaller in size. The two East African species also differ in the colour of the flagellum, which is dorsally turquoise in both species, whilst the latter is pure white in *T. ochsei*. The new species also differs in the colouration of the fringes, which are white in *T. ochsei* but turquoise in *T. coerulea* and *T. incognita*.

In the male genitalia of *T. ochsei* the bifid uncus and the tegumen are fully merged, not connected by a weak sclerotized membrane like in *T. coerulea* and *T. incognita*. Transtilla present, but interrupted in the middle, densely covered with short bristles, the latter is absent in *T. coerulea* and *T. incognita*. The juxta of the new species consists of four regular, small finger-shaped projections, which are much bigger and bent in both East African members of this group. Therefore, a determination by male genitalia is always sufficient.

For differences to *T. occidentalis* sp. n. see under the next species.

Bionomics (Fig. 5).

T. ochsei inhabits the western parts of the West Sudanian Savanna and most probably the Guinean Forest-Savanna-Mosaic (BURGESS et al., 2004), ecoregion 4b and 6g sensu HACKER, 2019. Both sexes are attracted by light, but females are more numerous. The species seems to be rare despite the large amount of moth specimenswhich were collected during a large-scale survey in southern Mali running throughout the year. Specimens have been captured only in June and August. Host plant and early stages unknown.

Distribution.

The species is known from Burkina Faso, Ivory Coast to southern Mali.

Derivatio nominis.

The species is dedicated to MICHAEL OCHSE, Weisenheim am Berg, Germany for his merits in investigation of African Arctiid and Geometrid moths.

Trimetopia occidentalis sp. n. (Plate 3, Fig. 6a-c)

Material examined.

Holotype & Nigeria, Samaru, 26-31.5.1970, [legit] P. H. Ward, B. M. 1970-604, NHMUK 010896858, DS 64/2018, coll. BMNH;

Paratypes: Nigeria. \bigcirc N-Nigeria, Kaduna, 28.7.[19] 70, leg[it] Dr. Politzar, DS 15/2019, coll. ZSM; $2 \bigcirc$ N-Nigeria, Kaduna, 22.6.[19] 70, leg[it] Dr. Politzar, coll. ZSM; \bigcirc N-Nigeria, Kaduna, 26.6.[19] 70, leg[it] Dr. Politzar, coll. ZSM; \bigcirc Nigeria, Samaru, 15-22.VI.1970, [legit] P. H. Ward, B. M. 1970-604, NHMUK 010896859, DS 63/2018, coll. BMNH; \bigcirc Nigeria, Samaru, 7-14.VII.1970, Mercury light trap, [legit] P. H. Ward, B. M. 1970-604, NHMUK 010896860, DS 63/2018, coll. BMNH;

Description.

Robust species with a wingspan of 33-39 mm in females. The single known male (holotype) comparably small with a wingspan of only 31mm. Wing shape broad triangular, apex and termen of fore wing rounded. Wings and body in dorsal view pale turquoise. Pattern white, weak and indistinct. Wings with weak sheen. Costa with broad white pectination, towards apex weaker. Cell spot absent. Flagellum of the antenna dorsally white. All veins with fine white pectination. On fore wing the antemedian fascia runs straight from inner margin towards costa up to the cell, then in an acute or right angle inwards towards costa. The costal half of the antemedian is often weak sometimes more or less lapsed. On hindwing the antemedian is absent. The postmedian fascia on forewing takes course rather straight and parallel to termen from inner margin towards costa of forewing. On hindwing the latter is slightly curved towards anal margin. Ante- and postmedian with a deep turquoise shadow towards medium field. Fringes pure white. Wing underside pearl white. All other external features and colouring like in the genus description.

Male genitalia (Plate 6, Fig. VIa-b).

The bifid uncus broad-based triangular with very short apical processi divided by very short and narrow medial incision. Tegumen lacks sclerotized swellings at the base of uncus. Gnathos and tegumen fully merged. Valva membranous, semi-circular. Ampulla long digitiform, reaching the outer margin of the valva. The ampulla is densely covered with short setae. Sacculus short and stump. Transtilla continuous, without setae. Juxta with two separated arms covered apically by bristles. Saccus broad, rounded.

Aedeagus short more or less cylindric, vesica without cornuti.

Female genitalia (Plate 7, Fig. VIc).

Ovipositor medium long, basal half membraneous, retractable, papillae anales short, quadrangular with rounded edges; apophyses posteriors rather long and thin, apophyses anteriores relatively long and very thin; eighth tergite trapezoidal, with posterior margin convex, evenly arcuate, and anterior margin almost straight; ostium bursae funnel-like, anthrum with relatively broad, evely arcuate lateral margins; ductus bursae very short and rather broad, sclerotized, corpus bursae elongate-ovoidal, without signum.

Genetics.

Not available.

Diagnosis.

Trimetopia occidentalis sp. n. is very similar to *T. ochsei* in external features. Both species are very robust and share the main characters in colouring and pattern. Therefore, the genitalia need to be studied for a confident identification.

The main differences in male genitalia are found in the shape of the uncus, which is broad and stump in *T. ochsei* while slightly conical in *T. occidentalis*. The ampulla in the new species is remarkably longer, reaching the outer margin of the valva, which is not the case in *T. ochsei*. In *T. ochsei* the transtilla is interrupted and covered with bristles, whereas in *T. occidentalis* that is continuous, lacking bristles. The aedeagus in the new species is short cylindric without cornuti in vesical whereas that of *T. ochsei* is dumbbell-shaped and dilated towards carina with a field of small cornuti.

The different features in internal morphology are always sufficient for a certain separation of these closely related taxa.

For differences to other members of this group see under the preceding species.

Bionomics.

The adults were recorded in the summer months from May to July. Mainly the females were attracted by light, which is unusual in this genus. *T. occidentalis* seems to be endemic to the Jos Plateau Forest Grassland (BURGESS ET AL. 2004), ecoregion 6i sensu HACKER et al. 2019.

Distribution.

The species is so far only known from the Jos Plateau Forest Grassland (Kaduna, Samaru) in northern Nigeria.



Trimetopia hirutae species-group

The members of this group sharing some features in male genitalia. The main diagnostic feature is the absence of the ampulla. Further differences to other groups are found in the shape of the transtilla, which is straight or ventrally arched with a row of straight bristles and the presence of a well-developed, triangular or spine-like saccular process.

The species of this group inhabit Afromontane rainforests between 350-2,200m in Central and East Africa.

Trimetopia hirutae sp. n. (Plate 3, Fig. 7a-f)

Material examined.

Holotype ♂ Uganda, Bwindi Forest, Cuckooland Lodge 1700m, S 01°00.083``, E 29°42.448``, 27.-30.03.2013 LF, leg[it] R. Fiebig & D. Stadie, BC UG 11, coll. PCDS;

Paratypes: Uganda: ♂ Uganda, Bwindi Forest, Cuckooland Lodge 1700m, S 01°00.083``, E 29°42.448``, 27.-30.03. 2013 LF, leg[it] R. Fiebig & D. Stadie, BC UG 187, DS 1/2017, coll. PCDS; 2♂ Uganda, Bwindi Forest, Cuckooland Lodge 1700m, S 01°00.083``, E 29°42.448``, 27.-30.03.2013 LF, leg[it] R. Fiebig & D. Stadie, coll. PCDS; 6 ♂

Uganda, Bwindi Forest, Cuckooland Lodge 1700m, S 01°00.083^{\\}, E 29°42.448^{\\}, 27.-30.03.2013 LF, leg[it] R. & S. Fiebig & D. Stadie, coll. PCRF

Rwanda: 🖒 Rwanda, Wincka, 2700m, 10.III.1974, [legit] B. Turlin, coll. Herbulot (ZSM); 🖒 Rwanda, Wincka, 2700m, 28.I.1973, [legit] B. Turlin, DS 3/2018, coll. Herbulot (ZSM);

Kenya: ♂ Kenya. Aberdare mountains, Gatamayu Forest, 00°58'10.3'`S, 36°41'40.9'`E, 2276m, 09.11.2007, Afromontane Forest, [legit] H. S. Staude, 13495 HSS_D000.DB, BC ZSM Lep 44340, coll. H. Staude (ZSM); ♂ SW[Southwest] Kenya, Central Aberdare Range, Ragia, 0,8373 N, 36,74097 E, 2.3.2012, leg[it] M. Eisenring, Eisenring Nr.66, 6.2/23.45, BC ZSM Lep 71703, DS 4/2018, coll, ZSM; ♂ Kenya, Aberdares, Gatamayo, 13.I.19[96], leg[it] Polizar, DS 5/2018, coll. Polizar (ZSM); ♂ Western Kenya, Nandi, Kakamega-Regenwald Umg. Rondo, S 0.2244, E 34.8834, 1600-1700m, 10.X.1997, legit Eitschberger, Bauer & Traub, DS 66/2019, coll. ZSM; ♂ Kenya centr[al], Mount Kenya South, Castle Forest Lodge area, S 0°22'47/ E 37°18'35, 1900-2100 m ü. NN, 11.-12.04.2019 LF, leg[it] Fiebig, Schellhorn & Stadie, coll. PCRF;

Description.

Wingspan 27-33 mm in males (female unknown). Apex of forewing pointed, termen straight. Wings and body in dorsal view bright light turquoise, wings semi-transparent. Pattern white. Wings with strong sheen. Costal border fine white. Cell spot mostly present, indistinct. Flagellum of the antenna dorsally white. All veins in ground colour, without white pectination. The white antemedian fascia runs straight from inner margin towards costa up to the cell, then curved inwards. Towards costa the fascia is often very weak or absent. The postmedian fascia takes course straight from anal margin on hind wing upperside towards costa of forewing. On forewing the latter often runs parallel to the antemedian. The medium field without intensely turquoise shadow long the fasciae. Wing underside pearl white. All other external features and colouring like in the genus description.

Male genitalia (Plate 7, Fig. VIIa-b).

The bifid uncus broad at base, triangular, with relatively long, triangular processi, divided by relatively deep and wide, U-shaped medial incision, the tegumen with short, rounded-triangular lateral protrusions at the base of uncus. Gnathos and tegumen fully merged. Valva membranous, oval. Ampulla absent. Sacculus relatively long and narrow, with a well-developed, narrow, spine-like, gradually tapering, apically narrowly rounded sclerotized distal process. Transtilla strongly sclerotized, with a long row of straight bristles. Saccus broad, rounded quadrangular.

Aedeagus short and straight, very slender, medially strongly laced, remarkably dilated towards carina. Vesica with a single extensive crest of rather long, straight cornuti situated near the carina.

Female genitalia.

Unknown.

Genetics.

The split-off in the barcode between the populations between Kenya and western Uganda needs further investigation. These populations may represent distinct sub-species.

Diagnosis.

An unmistakable species. *Trimetopia hirutae* sp. n. is unique by its wing shape and colouring, with a pointed apex in forewing in combination with a straight termen. Wings are semi-transparent. A cell spot is mostly present on forewing upperside. The veins are lacking any white pectination. Sometimes, in worn specimens a check of the genitalia might be necessary.

The male genitalia is similar to that of T. gelbrechti sp. n. For differences see under the following species. *

Phenology.

T. hirutae has been recorded in January, March and November.

Bionomics (Fig. 6-8).

The species has only been observed in Afromontane broadleaved rainforests between 1,700-2,700m. The males were attracted readily to light. Host plant unknown.

Distribution.

Species with native disjunct occurrence. *T. hirutae* is so far known from the rainforests of Mount Kenya, the Gatamayo Forest Reserve at the Aberdares and the Kakamega forest in Kenya. In the Albertine rift the species is recorded from the Bwindi Impenetrable Forest in southwestern Uganda and the Nyungwe Forest in Rwanda. A presence in the Virunga mountains is most likely.

Derivatio nominis.

The new species is dedicated to HIRUT WEDAJE ABEBE for her support and friendly attendance during the trips and her help and support at home.

Trimetopia gelbrechti sp. n. (Plate 3, Fig. 8a-c)

Material examined.

Holotype ♂ Cameroon (SW[Soutwest]), Mt. Cameroon (SW[Soutwest] slope), Crater Lake, 1500m a.s.l., 4.1443907° N, 9.07178807° E, 28.11.2016 (CL6), lgt[legit] V. Maicher, J. Mertens, S. Janeček, BC UG 972, coll. ZSM;

Paratypes: Cameroon: d Cameroon (SW[Soutwest]), Mt. Cameroon (SW[Soutwest] slope), Elephant Camp, 4.145333° N, 9.087000° E, 1850m asl, 19.11.2014, lgt[legit] V. Maicher, Sz. Sáfian, S. Janeček, R. Tropek, BC ZSM Lep 93578, coll. ZSM; & Cameroon (SW[Soutwest]), Mt. Cameroon (SW[Soutwest] slope), Elephant Camp, 4.145333° N, 9.087000° E, 1850m asl, 19.11.2014, [gt[legit] V. Maicher, Sz. Sáfian, S. Janeček, R. Tropek, BC ZSM Lep 93579, coll. ZSM; 7 Cameroon (SW[Soutwest]), Mt. Cameroon (SW[Soutwest] slope), Elephant Camp, 4.145333° N, 9.087000° E, 1850m asl, 19.11.2014, lgt[legit] V. Maicher, Sz. Safian, S. Janeček, R. Tropek, BC ZSM Lep 93578, coll. ZSM; ♂ Cameroon (SW[Soutwest]), Mt. Cameroon (SW[Soutwest] slope), Elephant Camp, 4.145333° N, 9.087000° E, 1850m asl, 18.04.2017, Igt[legit] V. Maicher, P. Potocky, S. Delabye, coll. ZSM; 3 Cameroon (SW[Soutwest]), Mt. Cameroon (SW[Soutwest] slope), Elephant Camp, 4.145333° N, 9.087000° E, 1850m asl, 19.11.2014, lgt[legit] V. Maicher, Sz. Sáfian, S. Janeček, R. Tropek, BC UG 971, coll. ZSM; 23 Cameroon (SW[Soutwest]), Mt. Cameroon (SW[Soutwest] slope), Elephant Camp, 4.145333° N, 9.0B7000° E, 1850m asl, 18.04.2017, lgt[legit] V. Maicher, P. Potocky, S. Delabye, coll. ZSM; d Cameroon (SW[Soutwest]), Mt. Cameroon (SW[Soutwest] slope), Planty camp, 1100m asl, 4.1175000° N, 9.0709440° E, 13.04.2015 (PC11), , lgt[legit] V. Maicher, Sz. Sáfian, S. Janeček, R. Tropek, BC Eth 2136, DS 24/2018, coll. ZSM; Q Cameroun, Préfecture dw Kumbo, 5 km E[st] de oku, 2120m, 8 et 9.IV.1972, [legit] C. Herbulot, coll. Herbulot (ZSM); 3 Cameroun, Forêt de Bafut Nguemba, 9km S[ud] E[st] de Bamenda, 2080m, 3 au 5.IV.1973, [legit] C. Herbulot, DS 2/2018, coll. Herbulot (ZSM); d' Cameroun, Forêt de Bafut Nguemba, 9km S[ud] E[st] de Bamenda, 2080m, 3 au 5.IV.1973, [legit] C. Herbulot, DS 12/2018, coll. Herbulot (ZSM); d Cameroon (SW[Soutwest]), Mt. Cameroon (SW[Soutwest] slope), Elephant Camp, 4.145333° N, 9.087000° E, 1850m asl, 19.11.2014, lgt[legit] V. Maicher, Sz. Sáfian, S. Janeček, R. Tropek, DS 1/2018, coll. ZSM; ♂ Cameroon, Plateu de Kounden, 4km S[ud] E[st] Centre Vétérin. 1410m, 6 et 7.IV.1972, [legit] C. Herbulot, coll. Herbulot (ZSM); ♀ Cameroun, Préfecture dw Kumbo, 5 km E[st] de oku, 2120m, 8 et 9.IV.1972, [legit] C. Herbulot, DS 60/2018, coll. Herbulot (ZSM); 👌 Cameroun, Massif du Manengouba, Piste Bakwat- Mwakoumel, 1240m, 11. et 12.IV.1972, [legit] C. Herbulot, DS 61/2018, coll. Herbulot (ZSM); 18 d Cameroon (SW[Soutwest]), Mt. Cameroon (SW[Soutwest] slope), Elephant Camp, 4.145333 ° N, 9.087000° E, 1850m asl, 24.04.2017, lgt[legit] V. Maicher, P. Potocky, S. Delabye, coll. ZSM; 116 Cameroon (SW[Soutwest]), Mt. Cameroon (SW[Soutwest] slope), Crater lake, 4.1443907° N, 9.0717807° E, 1500m asl, 23.04.2017, [gt[legit] V. Maicher, P. Potocky, S. Delabye, coll. ZSM; 4 Cameroon (SW[Soutwest]), Mt. Cameroon (SW[Soutwest] slope), Elephant Camp, 4.145333 ° N, 9.087000° E, 1850m asl, 22.02.2017, lgt[legit] P. Potocky, R. Tropek, J. Mertens, S. Janeček, Sz. Sáfian, coll. ZSM; 2 & Cameroon (SW[Soutwest]), Mt. Cameroon (SW[Soutwest] slope), Elephant Camp, 4.145333 ° N, 9.087000° E, 1850m asl, 21.02.2017, lgt[legit] P. Potocky, R. Tropek, J. Mertens, S. Janeček, Sz. Sáfian, coll. ZSM; 3 Cameroon (SW[Soutwest]), Mt. Cameroon (SW[Soutwest] slope), Elephant Camp, 4.145333 ° N, 9.087000° E, 1850m asl, 20.02.2017, lgt[legit] P. Potocky, R. Tropek, J. Mertens, S. Janeček, Sz. Sáfian, coll. ZSM; 6d Cameroon (SW [Soutwest]), Mt. Cameroon (SW[Soutwest] slope), Crater lake, 4.1443907° N, 9.0717807° E, 1500m asl, 25.11.2017, (CL4) lgt[legit] V. Maicher, P. Potocky, S. Delabye, coll. ZSM; 38∂,1♀ Cameroon (SW[Soutwest]), Mt. Cameroon (SW[Soutwest] slope), Elephant Camp, 4.145333° N, 9.087000° E, 1850m asl, 18.11.2014, lgt[legit] V. Maicher, Sz. Sáfian, S. Janeček, R. Tropek, coll. ZSM; d Cameroon, Forêt de Bafut Nguemba, 8km S[ud] E[st] de Bamenda, 2000m, 4. et 5.IV.1970, [legit] C. Herbulot et C. Lemaire, coll. Herbulot (ZSM); 3 Cameroun, Massif du Manengouba, 5km N[ord] O., 1200m, 11. et 2.IV.1970, [legit] C. Herbulot et. C. Lamaire, coll. Herbulot (ZSM); 3 Cameroon, M[ount] Nouma, 1000m, 16km NW[orthwest] Yaoundé, 6.XII.1974, Ph. Darge, coll. ZSM; 👌 Cameroon, Massif du Manengouba, Versant, NE[ortheast], 2100m, 17. et 18.IV.1976, [legit] C. Herbulot, coll. Herbulot (ZSM); 3 Cameroon, Massif du Manengouba, 6km NE[ortheast] de Nkongsamba, 17. et 18.IV.1976, [legit] C. Herbulot, coll. Herbulot (ZSM);

Description.

Wingspan in males 25-29 mm, in females 35-36 mm. Apex of forewing pointed, termen straight in males. In female apex less acute, termen more rounded. Wings and body in dorsal view bright turquoise in males, paler in females. Pattern white. Wings with strong sheen. Towards costa with white suffusion. Cell spot absent. Flagellum of the antenna dorsally white. All veins with white pectination. The white antemedian fascia runs straight from inner margin towards costa up to the cell, then sharply angled inwards. The postmedian fascia on forewing runs straight and parallel to termen from inner margin towards costa of forewing. On hind wing the latter is slightly curved towards anal margin. The medium field without intensely turquoise shadow along the fasciae. Fringes pure white. Wing underside pearl white. All other external features and colouring like in the genus description.

Male genitalia (Plate 7, Fig. VIIIa-b; Plate 8, Fig. VIIIc-d).

The bifid uncus very broad and stout, with processi dilated apically, divided by a relatively deep and wide U-shaped medial incision; tegumen lacks sclerotized swellings at the base of the uncus. Gnathos and tegumen fully merged. Valva membranous, elliptical. Ampulla absent. Sacculus relatively long and narrow, with a well-developed, elongate-triangular, apically rounded sclerotized distal process. Transtilla strongly sclerotized, with a long row of straight bristles. Saccus broad, rounded.

Aedeagus short and straight, very slender, strongly dilated towards carina. Vesica with two fields of short, straight cornuti, the larger one erected close to the tip of the carina.

Female genitalia (Plate 8, Fig. VIIIe).

Ductus bursae short, dumbbell shaped, strong sclerotized. Bursa membranous, without signa.

Ovipositor relatively short, basal half membraneous, retractable, papillae anales short, quadrangular with rounded edges; apophyses posteriores medium long and thin, apophyses anteriores relatively long and very thin; eighth tergite short, more or less quadrangular, with straight posterior margin and reverse-trapezoidal anterior margin; ostium bursae very wide, broad funnel-like, anthrum large V-shaped with thick straight lateral margins; ductus bursae heavily sclerotized, short medially laced, anteriorly dilated, corpus bursae globular, without signum.

Genetics.

Genetic distance to Trimetopia hirutae is 3,6%.

Diagnosis.

Trimetopia gelbrechti sp. n. is rather similar to *T. aetheraria* and *T. laszloi* in external morphology. The new species differs mainly by the more triangular wing shape of forewing in males. The apex is more acute and the termen is always straight. The fringes are pure white in *T. gelbrechti*, without turquoise colouring basally.

The male genitalia is however quite different.

The new species is most similar in male genitalia to *T. hirutae*. The latter differs by the shape of the uncus and of the sacculus: in *T. hirutae* the uncus is sub-quadratic while in *T. gelbrechti* that is reverse-trapezoidal, apically conspicuously dilated. The saccular process is broader and less acute in *T. gelbrechti* than in *T. hirutae*. The pair of sclerotized lateral protrusions at the base of the uncus are more developed in *T. hirutae* than in the new species. Further differences are expressed by the shape of the bristle field of the transtilla: in *T. hirutae* the bristles are strongly shortened towards the centre and more equal in length in *T. gelbrechti*. For differences to *T. gracilis* sp. n. see under the description of that species.

Phenology.

The species has been recorded in April and November.

Bionomics.

T. gelbrechti inhabit broad-leaved Afromontane rainforests from 1,200-2,200m. The species seems to be frequent and was recorded in high numbers at Mount Cameroon. The males are readily attracted by light. The host plant and the early stages are unknown.

Distribution.

The species seems to be endemic to the mountainous areas of Cameroon.

Derivatio nominis.

The new species is dedicated to JÖRG GELBRECHT, Königs Wusterhausen, Germany, on the occasion of his 65th birthday and for his merits in investigation the Lepidoptera fauna of Brandenburg/ Germany and of the Geometrid fauna of the Palearctic region.

Trimetopia gracilis sp. n. (Plate 3, Fig. 9a-c)

Material examined.

Holotype ♂ Cameroon (SW[Soutwest]), Mt. Cameroon (SW[Soutwest] slope), Drinking Gari camp, 4.101447° N, 9.06 1000° E, 650m asl, 29.11.2014, lgt[legit] V. Maicher, Sz. Sáfian, S. Janeček, R. Tropek, BC ZSM Lep 93577, coll. ZSM; Paratypes: Cameroon. ♂ Cameroon (SW[Soutwest]), Mt. Cameroon (SW[Soutwest] slope), Bamboo camp, 350m asl, 4.0879152° N, 9.050144° E, 12.02.2016 (BC18), lgt[legit] V. Maicher, Sz. Sáfian, S. Janeček, R. Tropek, BC Eth 2137, DS 23/2018, coll. ZSM; ♂ Cameroon (SW[Soutwest]), Mt. Cameroon (SW[Soutwest] slope), Drinking Gari camp, 4.1014470° N, 9.0610000° E, 650m asl, 04.02.2016 (DG15), lgt[legit] V. Maicher, Sz. Sáfian, S. Janeček, R. Tropek, BC Eth 2137, DS 23/2018, coll. ZSM; ♂ Cameroon (SW[Soutwest]), Mt. Cameroon (SW[Soutwest] slope), Drinking Gari camp, 4.1014470° N, 9.0610000° E, 650m asl, 04.02.2016 (DG15), lgt[legit] V. Maicher, Sz. Sáfian, S. Janeček, R. Tropek, coll. ZSM;

Description.

Wingspan in male 24-27 mm (female unknown). Apex of forewing pointed, termen slightly rounded. Wings and body in dorsal view pale turquoise. Pattern white, weak and indistinct. Wings with weak sheen. Costa fine white. Cell spot absent. Flagellum of the antenna dorsally white. All veins without white pectination. The antemedian fascia is running oblique from inner margin towards costa up to the cell, then curved inwards. In the upper half the latter is nearly lapsed. The postmedian fascia on forewing runs rather straight and parallel to termen from inner margin towards costa of forewing. On hindwing the latter is slightly curved towards anal margin. The triangular medium field without intensely turquoise shadow along the fasciae. Fringes pure white. Wing underside pearl white. All other external features and colouring like in the genus description.

Male genitalia (Plate 8, Fig. IXa-b).

The bifid uncus broad and stout, with a pair of broad, apically dilated, broadly rounded, rather thumbshaped processi, divided by deep and wide U-shaped medial incision; tegumen with well-developed, triangular sclerotized protrusions at the base of the uncus. Gnathos and tegumen fully merged. Valva membranous, rather short, nearly circular. Ampulla absent. Sacculus relatively long and narrow, with a well-developed, narrow gradually tapered, apically rounded sclerotized distal process. Transtilla strongly sclerotized, its anterior margin angled medially, with two separated extensive fields of straight bristles. Saccus broad, rounded-quadrangular.

Aedeagus conspicuously short and cylindric, largely widened towards carina. Vesica relatively long and thin, with a single, elongated crest of short, straight cornuti along the carina and an additional connecting field of longer cornuti medially.

Female genitalia.

Unknown.

Genetics.

Genetic distance to the closest relative Trimetopia gelbrechti is 5,7%.

Diagnosis.

Perhaps the smallest species of this group (limited material was available to examine). The pale turquoise ground colour, the indistinct pattern and the triangular medium field on forewing are unique among all other congeners. Therefore, in most cases a determination only by external features is sufficient.

The closest relative is *T. gelbrechti*, which occurs sympatrically with *T. gracilis* sp. n. on Mount Cameroon. Although they are rather different in external morphology, they are quite similar in male genitalia. The main differences are expressed by the presence of sclerotized protrusions near the base of uncus in *T. gracilis*, while those characters are absent in *T. gelbrechti*. Furthermore, the spine-like saccular process in *T. gracilis* is considerably narrower than in *T. gelbrechti* which is rather triangular in the latter species. In addition, the transtilla of the new species is strongly angled anterio-medially with well-separated setose areas, while that is rather straight, with continuous elongated field of bristles in *T. gelbrechti*.

Phenology.

The species has only been recorded in February and November.

Bionomics.

T. gracilis inhabits broad-leaved rainforests at the foot hills of Mount Cameroon from 350-650m. The species seems to be rare at the localities of occurrence. The males are attracted to light. The host plant and the early stages are unknown.

Distribution.

The species seems to be endemic to Mount Cameroon.



Discussion

The present study has generated a great deal of information about this poorly-known genus. Ten species belonging to three distinct clades are recognised in this previously monotypic genus.

Most of the taxa are strictly allopatric in their distribution. This phenomenon is not uncommon within the African moth fauna and is most probably the result of the cyclic expansion and regression of both open and forested habitats during the climate oscillations of the Quaternary (HAMILTON, 1976; HAMILTON & TAYLOR, 1989; PLANA, 2004, MURIENNE, 2017).

This distribution pattern is present in all *Trimetopia*, except one species-pair, which occurs at Mount Cameroon sympatrically. *Trimetopia gracilis* was recorded there only at lower altitudes between 350-650m, whereas *Trimetopia gelbrechti* was recorded rather common from 1,200 up to 2,200m. Mount Cameroon is situated in one of the areas, which are regarded as rainforest refuges during Quaternary Period (HAMILTON & TAYLOR, 1991). In consideration of this widely accepted hypothesis, the stable conditions in climate and vegetation during the last 3-4 million years can be assumed. Therefore, speciation by specialisation into different ecological niches in this case is more likely.

The barcode-trees support the hypothesis that the *T. aetheraria* and the *T. coerulea* species-groups are regarded as monophyletic clades. All nodes inside these groups are rather well supported. The relationships between the members of the *T. hirutae* species-group are more complicated. Although they form a rather compact morphologic unit, the trees does not support a monophyletic origin. Nevertheless the basal nodes are supported by a low plausibility. Therefore a monophyletic origin of this group is not to exclude with certainty. A detailed comprehensive analysis of some nuclear genes in the future could solve this problem, but this was beyond the scope of this work.



0.050

Tree 1: Taxon Id-tree generated by using HKY+G-Modell, bootstrapping (500 trees) in Mega X.



Tree 2: Condensed tree (calculation as in Tree 1): accepting nodes only with more than 50% likelihood.

Plate 1 (page 94)

Trimetopia aetheraria GUENÉE, [1858]

- 1a ♂ Ethiopia, Oromia Harena Forest Lodge/ Katcha Camp ground, N 06°58.763, E 39°10.606, 1.-3.05.2016 2316 m LF[Lichtfang], leg[it] R. Fiebig & D.Stadie, coll. PCDS
- 1b ♂ Ethiopia, Reg.[ion] of Sout[hern] Nations, Bonga Guesthouse, 7°15′4.33″N/ 36°15′15.51″E, 1750 m ü.NN, LF[Lichtfang] 12.-14.05.2016, leg[it] R. & S. Fiebig /D.Stadie, coll. PCRF
- 1c ♂ Äthiopien, Ostafrikanischer Graben, Bonga-Hotel, 1700-1830m, 07°21`N, 36°07`O, 13.-20. vii. 2017, Beck R. & G. Riedel leg., coll. ZSM
- 1d ♂ Ethiopia, Reg.[ion] of Sout[hern] Nations, road Shishinda-Bonga, Stone Quarry 6 km west of Wushwush, 7°18`18.33``N/ 36°3`27.38`` E, 22.05.2015, leg[it] D. Stadie/ R. Fiebig, coll. PCDS
- 1e undersite of 1d
- 1f ♂ Ethiopia, Reg[ion] of Sout[hern] Nations, Bonga Guesthouse, 7°15'4.33"N/ 36°15'15.51"E, 1750 m ü.NN, LF[Lichtfang] 12.-14.05.2016, leg. [it] R. & S. Fiebig /D.Stadie, coll. PCRF

Trimetopia laszloi laszloi STADIE & FIEBIG sp. n.

- 2a HT ♂ Tanzanie, Morogoro Region, Kaguru M[ountains], 1.870m, S 06°22.367'' E 36°55.820'', 7.XI.2013, Ph. Darge, coll. ZSM
- 2b PT ♂ Zimbabwe, Bvumba, 23.-31.12.2006, 1.630m, S 19°06`.302`E 32°45.185`, UV, Jürgen Lenz legit, BC ZSM Lep 44339, DS 14/2018, coll. ZSM
- **2c** PT ♀ Zomba Plateau, Kuchawe Inn, 1600m, 30.XI.[19]89, [legit] Ch. Herbulot, coll. Herbulot (ZSM);
- 2d PT ♂ Tanzanie, Morogoro Region, Kaguru M[ountains], 1.870m, S 06°22.367`` E 36°55.820``, 7.XI.2013, Ph. Darge, coll. ZSM
- **2e PT**, undersite of 2d
- 2f PT ♂ Tanzanie, Morogoro Region, Kaguru M[ountains], 1.870m, S 06°22.367`` E 36°55.820``, 7.XI.2013, Ph. Darge, DS 68/2018, coll. ZSM

Trimetopia laszloi ugandana STADIE & FIEBIG ssp. n.

- 2g HT ♂, Uganda, Mburo Lake NP, Nshara Gate, Rwakobo Rock Lodge, S 00°31.671``, E 31°00.064``, 31.03.-01.04.2013 LF, 1291m, leg[it]Fiebig & Stadie, BC UG 869, coll. PCDS
- **2h HT**, undersite of 2g
- 2i PT ♂ Uganda, Border of Queen Elisabeth NP, Pumba Cottages near Kichwamba, S 0°12.345^{\cold{t}}, E 30°06.022^{\cold{t}}, 24.03.2013 LF[Lichtfang], 1059m, leg[it] Fiebig & Stadie, BC UG 1, DS 18/2017, coll. PCDS



Plate 1. Legend see page 93. Scale bar 1,0 cm.



Plate 2. Legend see page 96. Scale bar 1,0 cm.

Plate 2 (page 95)

Trimetopia laszloi ugandana STADIE & FIEBIG ssp. n.

- 2k PT ♂, Uganda, Mburo Lake NP, Nshara Gate, Rwakobo Rock Lodge, S 00°31.671``, E 31°00.064``, 31.03.-01.04.2013 LF[Lichtfang], 1291m, leg[it] R. & S. Fiebig / Stadie, coll. PCRF
- 21 PT ♂ Uganda western, Kibale Forest, Chimps `Nest, N 00°23.47`` E 30°23.03``, 19.-21.03.2013 LF[Lichtfang], 1187m, leg[it] R. & S. Fiebig / D. Stadie, coll. PCRF
- 2m PT ♂, Uganda, Mburo Lake NP, Nshara Gate, Rwakobo Rock Lodge, S 00°31.671``, E 31°00.064``, 31.03.-01.04.2013 LF[Lichtfang], 1291m, leg[it] R. & S. Fiebig / Stadie, coll. PCRF

Trimetopia coerulea WARREN, 1898 stat. nov.

- 3a HT &, British East Africa [Kenya], Lamu 18[89]; coll. BMNH
- 3b ♂ S.[outh] Ethiopia, Oromia, 3km NNE vill[age] Finchawa, 1760m (lux), 5.4193° N, 38.2862° E, 8.XI.2010, leg[it] de Freina, Hacker, Peks, Schreier, BC Eth 2222, coll. ZSM
- 3c ♀ Ethiopia, Oromia Gibe river valley, 20km S[outh] of Welkite/ near Natri, N 08°11.037, E 37°34.223, 15.05.2016 LF, 1580m, leg[it] R Fiebig & D. Stadie, BC Eth 2144, coll. PCDS
- 3d ♂ S.[outh] Ethiopia, Oromia, 1km W[est] vill[age] Aluweya, 1300m (lux), 4.9636° N, 37.5489° E, 10.XI.2010, leg[it] de Freina, Hacker, Peks, Schreier, BC Eth 2220, coll. ZSM
- 3e undersite of 3d
- 3f ♂ Kenya centr[al], Mount Kenya W[est], Naro Moru River Lodge, S 0°09`14/ E 37°00`41, 1950m ü.NN, 06.-08.04.2019 LF[Lichtfang], leg[it] Stadie, Fiebig & Schellhorn, coll. PCDS
- 3g ♂ Kenya centr[al], Mount Kenya W[est], Naro Moru River Lodge, S 0°09`14/ E 37°00`41, 1950m ü.NN, 06.-08.04.2019 LF[Lichtfang], leg[it] Stadie, Fiebig & Schellhorn, coll. PCRF
- Trimetopia incognita STADIE & FIEBIG sp. n.
- **4a** HT ♂, Tanzanie: Tanga region, savane de Kisangiro, 750m, 23-X-2004, S 03°36.192', E 037°32.293', [legit] Ph. Darge, BC ZSM Lep 45558, DS 55/2018, coll. ZSM
- **4b PT** ♂ Tanzanie: Tanga region, savane de Kisangiro, 750m, 23-X-2004, S 03°36.192`, E 037°32.293`, [legit] Ph. Darge, DS 19/2018, coll. ZSM

Trimetopia ochsei STADIE & FIEBIG sp. n.

- 5a HT ♂ SW[Southwest] Mali, Ouronina, 20km NW[Northwest] Kenieroba, 26.VI.2015, 350m, 12.137° N/8.393° W, leg[it] Team G. Müller, Light trap, BC Eth 2138, DS 25/2018, coll. ZSM
- 5b PT, undersite of 5c
- 5c PT ♀ SW[Southwest] Mali, Ouronina, 20km NW[Northwest] Kenieroba, 26.VI.2015, 350m, 12.137° N/8.393° W, leg[it] Team G. Müller, Light trap, coll. ZSM

Plate 3 (page 97)

Trimetopia occidentalis STADIE & FIEBIG sp. n.

- 6a HT ♂ Nigeria, Samaru, 26-31.5.1970, [legit] P. H. Ward, B. M. 1970-604, NHMUK 010896858, DS 64/2018, coll. BMNH
- 6b PT, undersite of 6c
- 6c PT \bigcirc Nigeria, Samaru, 7-14. VII.1970, Mercury light trap, [legit] P. H. Ward, B. M. 1970-604, NHMUK 010896860, DS 63/2018, coll. BMNH

Trimetopia hirutae STADIE & FIEBIG sp. n.

- 7a HT ♂ Uganda, Bwindi Forest, Cuckooland Lodge 1700m, S 01°00.083``, E 29°42.448``, 27.-30.03.2013 LF, leg[it] R. Fiebig & D. Stadie, BC UG 11, coll. PCDS
- 7b HT, undersite from 7a
- 7c PT 🖧 Rwanda, Wincka, 2700m, 10.III.1974, [legit] B. Turlin, coll. Herbulot (ZSM)
- 7d PT ♂ Uganda, Bwindi Forest, Cuckooland Lodge 1700m, S 01°00.083``, E 29°42.448``, 27.-30.03.2013 LF, leg[it] R. & S. Fiebig / Stadie, coll. PCRF
- 7e PT ♂ Uganda, Bwindi Forest, Cuckooland Lodge 1700m, S 01°00.083``, E 29°42.448``, 27.-30.03.2013 LF, leg[it] R. & S. Fiebig / Stadie, coll. PCRF
- 7f PT ♂ Kenya centr[al], Mount Kenya South, Castle Forest Lodge area, S 0°22'47/ E 37°18'35, 1900-2100 m ü. NN, 11.-12.04.2019 LF, leg[it] Fiebig, Schellhorn & Stadie, coll. PCRF

Trimetopia gelbrechti STADIE & FIEBIG sp. n.

- 8a HT ♂ Cameroon (SW[Soutwest]), Mt. Cameroon (SW[Soutwest] slope), Crater Lake, 1500m a.s.l., 4.1443907° N, 9.07178807° E, 28.11.2016 (CL6), lgt[legit] V. Maicher, J. Mertens, S. Janeček, BC UG 972, coll. ZSM
- **8b HT**, undersite of 8a
- 8c PT & Cameroon (SW[Soutwest]), Mt. Cameroon (SW[Soutwest] slope), Elephant Camp, 4.145333° N, 9.087000° E, 1850m asl, 19.11.2014, lgt[legit] V. Maicher, Sz. Sáfian, S. Janeček, R. Tropek, BC UG 971, coll. ZSM
 Trimetoria generilis STADE & EFERC SP. P.
- Trimetopia gracilis STADIE & FIEBIG sp. n.
- 9a HT ♂ Cameroon (SW[Soutwest]), Mt. Cameroon (SW[Soutwest] slope), Drinking Gari camp, 4.101447° N, 9.061000° E, 650m asl, 29.11.2014, lgt[legit] V. Maicher, Sz. Sáfian, S. Janeček, R. Tropek, BC ZSM Lep 93577, coll. ZSM
- **9b HT**, undersite of 9a
- 9c PT ♂ Cameroon (SW[Soutwest]), Mt. Cameroon (SW[Soutwest] slope), Drinking Gari camp, 4.1014470° N, 9.0610000° E, 650m asl, 04.02.2016 (DG15), lgt[legit] V. Maicher, Sz. Sáfian, S. Janeček, R. Tropek, coll. ZSM.



Plate 3. Legend see page 96. Scale bar 1,0 cm.



Plate 4. I: *Trimetopia aetheraria* Guenée, [1858], Genitalia a-b: A Äthiopien, Ostafrikanischer Graben, Prov.[ince] South Nations, Bonga, 10km NE, 2400m; Genitalia: c-d: A Ethiopia, Oromia, Bale Mountains, Harena Forest, Bale Mountain Lodge, 2376m; II *Trimetopia laszloi laszloi sp. n.*, Genitalia a-b: A Tanzanie, Morogoro Region, Kaguru Mts.[ountains], 1.870m; Genitalia c: A Tanzanie, Morogoro Region, Kaguru Mts.[ountains], 1.870m.

Trimetopia laszloi ugandana ssp.n.



Plate 5. II: *Trimetopia laszloi ugandana* ssp. n., Genitalia d-e: ♂ Uganda, Mburo Lake NP, Nshara Gate, Rwakobo Rock Lodge, 1291m; Genitalia f: ♀ Rep.Dem.Congo, Uvira-Sucraf; III *Trimetopia coerulea* WARREN, 1898 stat. nov., Genitalia a-b: ♂ S.[outh] Ethiopia, Oromia, 13km S[outh] Agere Maryam, 1960m; Genitalia c: ♀ Kenya, Provinz Rift Valley, Umg[ebung] Evaso River, 680m.



Plate 6. IV: *Trimetopia incognita* sp. n., Genitalia a-b: ♂ Tanzanie: Tanga region, savane de Kisangiro, 750m; Genitalia c-d: ♂, Tanzanie: Tanga region, savane de Kisangiro, 750m; V: *Trimetopia ochsei* sp. n., Genitalia a-b: ♂ SW[Southwest] Mali, Ouronina, 20km NW[Northwest] Kenieroba, 350m; VI: *Trimetopia occidentalis* sp. n., Genitalia a-b: ♂ Nigeria, Samaru.



Plate 7. V: *Trimetopia ochsei* sp. n., Genitalia c: \bigcirc Elfenbeinküste, Ferkessgdougou; VI: *Trimetopia occidentalis* sp. n., Genitalia c: \bigcirc N-Nigeria, Kaduna; VII: *Trimetopia hirutae* sp. n., Genitalia a-b: \bigcirc Uganda, Bwindi Forest, Cuckooland Lodge 1700m; VIII: *Trimetopia gelbrechti* sp. n., Genitalia a-b: \bigcirc Cameroon, Forêt de Bafut Nguemba, 8km S[ud] E[st] de Bamenda, 2080m.



Plate 8. VII: *Trimetopia hirutae* sp. n., Genitalia c-d: ♂ SW[Southwest] Kenya, Central Aberdare Range, Ragia; VIII: *Trimetopia gelbrechti* sp. n., Genitalia c-d: ♂ Cameroon (SW[Soutwest]), Mt. Cameroon (SW[Soutwest] slope), Planty camp, 1100m; Genitalia e: ♀ Cameroun, Préfecture dw Kumbo, 5 km E[st] de oku, 2120m; IX: *Trimetopia gracilis* sp. n., Genitalia a-b: ♂ Cameroon (SW[Southwest]), Mt. Cameroon, Bamboo camp, 350m.



Fig.1 Ethiopia: Abyssinian Plateau (Harena Forest): Afromontane rainforest at former Katcha Campground at 2,300m. The locality is characterized by the occurrence of the first *Hagenia abyssinica*-trees and bamboo thickets along a creek. These species indicate the upper Afromontane Zone. A place where *Trimetopia aetheraria* is rather abundant. (© R. Fiebig)



Fig.2 Uganda: Mburo NP: Wet Savannah at Nshara Gate, 1300m, type locality of Trimetopia laszloi ugandana. (© R. Fiebig)



Fig.3 Kenya: Western escarpment of Mount Kenya: Riverine thicket along the Naro Moru river at the sclerophyllous forest zone in the rain shadow of Mount Kenya. Clearings harbours xerophyllous vegetation e.g. *Aloe*, various *Lamiaceae* and some lianas like members of *Curcubitacae* and *Vitaceae*. A place of local occurrence of *Trimetopia coerulea*. (© Ph. Stadie)



Fig.4 Kenya: Naro Moru river, a Vitis- or Ampelopsis-species at Naro Moru River Lodge. This species is most probably the host plant of Trimetopia coerulea, which was observed rather local there. (© D. Stadie)



Fig.6 Uganda: Albertine Rift, rich Afromontane broad-leaved rainforest at Bwindi Impenetrable NP at 1700m. The forest is one of the hot spots of diversity and harbours more than 200 tree species. The Cuckooland lodge is type locality of *Trimetopia hirutae*. (© R. Fiebig)



Fig.7 Uganda: Albertine Rift, Bwindi Impenetrable NP at 1700m (© R. Fiebig)



Fig.8 Kenya: Broad-leaved Afromontane Rainforest at Mount Kenya: Steep gorge with magnificent vegetation including fern trees and lianas near the Castle Forest Lodge at 2100m. *Trimetopia hirutae* was recorded there too. (© R. Fiebig)

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Zusammenfassung

Es wird eine historische Übersicht über den Wissenstand zur Gattung *Trimetiopa* GUENÉE, [1858] gegeben. *Trimetopia coerulea* stat. nov. wird vom Rang einer Unterart zur Art erhoben. *Trimetopia laszloi laszloi laszloi ugandana*, *Trimetopia incognita*, *Trimetopia hirutae*, *Trimetopia gelbrechti*, *Trimetopia gracilis*, *Trimetopia ochsei* und *Trimetopia occidentalis* werden als neu für die Wissenschaft beschrieben.

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