

A review of the genus *Lanuvia* Stål, 1866 (Hemiptera: Auchenorrhyncha: Achilidae), with description of three new species and a new subgenus from the Equatorial Africa

Обзор рода *Lanuvia* Stål, 1866 (Hemiptera: Auchenorrhyncha: Achilidae) с описанием трёх новых видов и нового подрода из Экваториальной Африки

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Ключевые слова: Демократическая Республика Конго, Гана, определительный ключ, обозначение лектотипа, морфология, новый вид, новый подрод, Plectoderini, таксономия.

Abstract. Equatorial African achilid genus *Lanuvia* Stål, 1866 is reviewed. The lectotypes are designated for *Lanuvia luteovittata* Fennah, 1950 and *L. octoguttata* Fennah, 1950. Three new species, *Lanuvia nigrolutea* sp.n. from the Western Region of Ghana, *L. synavei* sp.n. from the eastern part and *L. parvimaculata* sp.n. from the southern part of the Democratic Republic of Congo are described. A key to species of the genus is provided. A new subgenus, *Lanuvia (Nulavia)* subgen.n. (type species: *Lanuvia octoguttata* Fennah, 1950) is erected. The photos of all species are provided.

Резюме. Представлен обзор экваториально-африканского рода *Lanuvia* Stål, 1866 из семейства Achilidae. Обозначены лектотипы для видов *Lanuvia luteovittata* Fennah, 1950 и *L. octoguttata* Fennah, 1950. Описаны три новых вида: *Lanuvia nigrolutea* sp.n. из Западного Региона Ганы, *L. synavei* sp.n. из восточной части и *L. parvimaculata* sp.n. из южной части Демократической Республики Конго. Дан определительный ключ к видам рода. Выделен новый подрод, *Lanuvia (Nulavia)* subgen.n. (типовой вид: *Lanuvia octoguttata* Fennah, 1950). Для всех видов даны фотографии.

Introduction

The genus *Lanuvia* was erected by Stål [1866] without type species designation. Eighty years later Fennah [1950] described two new species, *Lanuvia luteovittata* Fennah, 1950 and *L. octoguttata* Fennah, 1950, from the Cameroon and Uganda (Toro) respectively and designated *L. luteovittata* as the type species for this genus. Soon after Synave [1959] recorded *L. luteovittata* from the Democratic Republic of Congo (Kongo Central and Haut-Uélé Provinces) and listed three females from Maniema, Ituri, and Lualaba Provinces of the same country under the name *L. octoguttata*. However, our comparison of Synave's forewing drawing [Synave, 1959: Fig. 68] along with the photos made from these specimens, deposited in the Musée royal de l'Afrique

centrale in Tervuren (Belgique), with the photo of female syntype of *L. octoguttata* from the Museum of Natural History in London (the United Kingdom), revealed that H. Synave was dealing with two undescribed species of the genus *Lanuvia* differing from *L. octoguttata* by the disposition and size of forewing spots and stripes.

Below we review the genus *Lanuvia* Stål, 1866 based on the photos of syntypes of *L. luteovittata* Fennah, 1950 and *L. octoguttata* Fennah, 1950, kindly supplied by Mr. Michael Webb and Mr. Ken Merrifield (London, the United Kingdom), with designation of the lectotypes for the illustrated specimens, and describe three new species after the material collected by the second author during his field trip to southern Ghana in April-May 2022 and after Synave's specimens from the Democratic Republic of Congo pictured by Dr. Jacek Szewo (Gdansk, Poland).

Our morphological analysis of *Lanuvia* species revealed the existence of two species groups, one monotypical group with a type species of the genus, *L. luteovittata*, characterized by forewing costal margin convex to the base, and almost straight until middle of stigma and another group comprising *L. octoguttata* and three new species described below characterized by forewing costal margin slightly convex along its whole length. We suggest treating these species groups as subgenera, *Lanuvia (Lanuvia)*, with *L. luteovittata*, and *Lanuvia (Nulavia)* subgen.n. accommodating the species of the second group.

Material and methods

The morphological terminology follows Anufriev and Emeljanov [1988]. Photographs of *Lanuvia nigrolutea* sp.n. were taken using Canon EOS 5D Mark IV camera with the lens Canon-MP-E-65mm f/2.8 1–5x Macro

and the flash Canon Macro Twin-Lite MT-26EX-RT. Photographs of *L. synavei* sp.n. and *L. parvimaculata* sp.n. were taken using Olympus DSX1000 camera. Images were produced using Helicon Focus v. 7.6.4 and Adobe Photoshop CC 2019 software.

The type specimens of the species described below are deposited at the Zoological Institute of the Russian Academy of Sciences, Saint Petersburg, Russia (ZIN) and in the Musée royal de l'Afrique centrale, Tervuren, Belgique (MRAC). Other specimens examined are from the Museo Nacional de Ciencias Naturales, Madrid, España (MNCN) and the Natural History Museum, London, the United Kingdom (NHMUK).

Label information for the specimens from Tervuren and Madrid are quoted, with '/' indicating new line and '//' indicating next label.

Nomenclatural acts introduced in the present work are registered in ZooBank (www.zoobank.org) under urn:lsid:zoobank.org:pub:F97D3A29-C6C1-4EAB-9B2D-C756D168AC8F.

Results

Achilidae Stål, 1866

Achilinae Stål, 1866

Plectoderini Fennah, 1950

Lanuvia Stål, 1866

Type species: *Lanuvia luteovittata* Fennah, 1950, by subsequent designation by Fennah [1950].

Lanuvia Stål, 1866: 182; Fennah, 1950: 74; Synave, 1959: 27.

Diagnosis. Head wide. Coryphe transverse, without median carina; anterior margin sharp, obtusely angulate or weakly convex (almost straight). Metope wide, nearly 1.5 times as long as wide, slightly enlarged above clypeus, with median carina. Clypeus with median carina. Pronotum short, with paradiscal fields narrow behind the eyes; lateral carinae diverging posteriorly, not reaching its posterior margin. Forewing appendix shorter than sutural margin of clavus. Forewing RP fused with ScRA of stigma. ScR firstly forked basad of CuA fork. CuA₁ gradually convex distad of claval apex making narrow cubitus anterior area.

KEY TO SPECIES OF THE GENUS *LANUVIA* STÅL

1. Forewing costal margin convex at base and nearly straight medially and apically. Lateral margins of coryphe and carinae of pro- and mesonotum distinctly light (Figs 1, 3). Forewings with longitudinal narrow yellow stripes (Figs 1, 3, 4). (*Lanuvia (Lanuvia)* Stål, 1866)
..... *L. (L.) luteovittata* Fennah, 1950
- Forewing costal margin weakly convex, turned upwards. Lateral margins of coryphe and carinae of pro- and mesonotum dark. Forewings with yellow spots. (*Lanuvia (Nulavia)* subgen.n.) 2
2. Forewing clavus with two large spots, elongate anterior (stripe-shaped) and prolonged rounded posterior one (Figs 6, 7)..... *L. (N.) octoguttata* Fennah, 1950
- Forewing clavus with one elongate (stripe-shaped) spot 3
3. Elongate spot of forewing clavus running closely to anterior spot of corium laying closely to its posterior third forming together comma-shaped yellow area (Fig. 8)
..... *L. (N.) nigrolutea* sp.n.
- Spots of forewing clavus and corium are far separated each from another 4

4. Coryphe twice as wide between the eyes as long at midline, with anterior margin obtusely angulate. Corium with two equal large oval yellow spots, with fore margin of anterior spot running near to mid length of claval yellow stripe (Figs 11, 12) *L. (N.) synavei* sp.n.
- Coryphe 2.5 times as wide between the eyes as long at midline, with anterior margin widely convex. Corium with two small (posterior spot twice larger than anterior one) oval yellow spots; anterior spot is far separated from posterior ending of claval yellow stripe (Fig. 13)
..... *L. (N.) parvimaculata* sp.n.

Lanuvia (Lanuvia) Stål, 1866

Type species: *Lanuvia luteovittata* Fennah, 1950, by subsequent designation by Fennah [1950].

Diagnosis. Coryphe with obtusely angulate anterior margin. Forewing anterior margin convex basally and nearly straight medially and apically. Pro- and mesonotum with light carinae. Forewing corium with narrow yellow stripes.

Composition. Only type species.

Distribution. Cameroon, the Democratic Republic of Congo.

Lanuvia (Lanuvia) luteovittata Fennah, 1950

Figs 1–5.

Lanuvia luteovittata Fennah, 1950: 75, Fig. 47; Synave, 1959: 30, Figs 61–66.

Material. Cameroon: Lectotype, ♀ — «Cameroons / Escalera / 1903–355» (NHMUK); 4♀♀ — «Kamerun. / L. Conradt. 1899. / Lab. ent. Escalera» // «MNCN-Ent / 356308-311» (MNCN and ZIN).

Supplementary description. Metope brown to dark brown, with black lower part above clypeus. Postclypeus black frontally, with brown median carina (Figs 2, 5). Preocular fields and genae light brown. Pedicel light brown. Coryphe, pro- and mesonotum dark brown to black, with yellow lateral stripes (Figs 1, 3). Paranotal lobes dark brown, with light band in front of pedicel and light lower margins. Forewings dark brown apically to black on clavus and main part of corium, with yellow stripes and yellow anterior margin apically (Figs 1, 3, 4). Hind wings from light brown in apical half to black in basal half. Coxae and trochanters dark brown. Femorae dark brown, with yellow apices. Tibiae light brown yellowish, with two dark brown bands. First and second tarsomeres light brown yellowish. Third tarsomeres dark brown.

Total length (with forewings) 8.1–8.3 mm. **Body length** 5.0 mm.



Figs 1–2. External appearance of *Lanuvia (Lanuvia) luteovittata* Fennah, 1950, ♀, lectotype (dissected). 1 — dorsal view; 2 — frontal view.

Рис. 1–2. Внешний вид самки *Lanuvia (Lanuvia) luteovittata* Феннах, 1950, лектотип (препарирован). 1 — сверху; 2 — спереди.

Notes. The species was described after two females [Fennah, 1950], deposited in NHMUK. Here we designate the lectotype for one of these females (Figs 1, 2).

Lanuvia (Nulavia)

Emeljanov et Gnezdilov **subgen.n.**

Type species: *Lanuvia octoguttata* Fennah, 1950, designated here.

Diagnosis. Coryphe with weakly convex (nearly straight) or obtusely angulate anterior margin. Forewing anterior margin weakly convex, turned upwards. Pro- and mesonotum with dark carinae. Forewing corium with large yellow spots.

Composition. Four species, namely: *Lanuvia octoguttata* Fennah, 1950, *L. nigrolutea* sp.n., *L. synavei* sp.n. and *L. parvimaculata* sp.n.

Distribution. Ghana, the Democratic Republic of Congo, and Uganda.

Lanuvia (Nulavia) octoguttata Fennah, 1950

Figs 6, 7.

Lanuvia octoguttata Fennah, 1950: 76, Fig. 48.

Material. Uganda: Lectotype, ♀ — «Uganda Prot. / Mpanga Forest, / Toro. 4,800 ft. / 13–23 Nov. 1911. / S.A. Neave.» // «1912-193» // «*Lanuvia / octoguttata / Fenn.*» // «Type» // «NHMUK 013590018 (NHMUK)».

Notes. The species was described after two females from Uganda [Fennah, 1950], deposited in NHMUK. Here we designate the lectotype for the female labeled as given above (Figs 6, 7).

Lanuvia (Nulavia) nigrolutea

Emeljanov et Gnezdilov **sp.n.**

Figs. 8, 9.

Urn:lsid:zoobank.org:act:00C3E3E5-C528-4A6C-A0A3-13CCC6135833.

Material. Ghana, Western Region: Holotype, ♀, Subiriso Forest Reserve, 3.V.2022, V.M. Gnezdilov leg. (ZIN).

Diagnosis. Generally black, with six large yellow spots on forewings.

Description. Structure. General structure as given for the genus. Forewing appendices slightly tucked into the body along the nodal line at rest. Legs comparatively short. Hind femora nearly as long as fore and middle ones. Hind tibiae 0.4 longer than hind femora.

Coloration. Generally black, with large bright yellow spots on forewings (Fig. 8). Head with carinae dark brown. Metope with red brown upper part (Fig. 9). The area around scapus, ocellus, and vedge-shaped area near to paranotal lobe and fore coxae brown reddish. Lower margins of paranotal lobes yellow. Mesonotum with brown yellowish lateral carinae. Paradiscal fields of mesonotum and tegulae black. Second axillary sclerite light in its posterior part near to clavus. Clavus with large elongate yellow or yellow greenish spot occupying 2/3 of its length. Hind marginal part of clavus black. Elongate spot of clavus running closely to anterior spot of corium laying closely to its posterior third — these two spots are separated only by linear dark claval suture forming together comma-shaped yellow area. Anterior spot of corium covering radial and medial areas, small part of cubital area and anteriorly small part of costal area. Posterior spot of corium shortly separated from anterior one running distally until the nodal line covering radial and medial areas and reaching CuA area on vein furcation point. Antero-distal angle of costal area yellow. Forewing appendix with apices of veins yellow. Fore and middle legs brown, except tibiae light in its middle parts. Hind femora brown. Hind tibiae light



Figs 3–5. External appearance of *Lanuvia (Lanuvia) luteovittata* Fennah, 1950, ♀, Cameroon. 3 — dorsal view; 4 — lateral view; 5 — frontal view. Scale bar: 1 mm.

Рис. 3–5. Внешний вид самки *Lanuvia (Lanuvia) luteovittata* Fennah, 1950, Камерун. 3 — сверху; 4 — сбоку; 5 — спереди. Масштаб: 1 мм.

brown, with dark apices. Abdominal sternites dark brown, with light hind margins.

Total length (with forewings) 6.4 mm. **Body length** 4.3 mm.

Etymology. The species is named after bright and contrast black and yellow coloration.

Comparison. New species is very similar to *L. octoguttata* Fennah, but differs in number, shape and length of forewing spots (Figs 6–8). Forewing costal area in basal part of corium of both species with peculiar curve making the room for a hind knee (femora-tibia connection of hind legs) during jumping. This curve is separated from the costal area by the groove. Fennah figured this curve for *L. octoguttata* [Fennah, 1950:



Figs 6–7. External appearance of *Lanuvia (Nulavia) octoguttata* Fennah, 1950, ♀, lectotype. 6 — dorsal view; 7 — lateral view. Scale bar: 1 mm.

Рис. 6–7. Внешний вид самки *Lanuvia (Nulavia) octoguttata* Fennah, 1950, лектотип. 6 — сверху; 7 — сбоку. Масштаб: 1 мм.



Figs 8–9. External appearance of *Lanuvia (Nulavia) nigrolutea* Emeljanov et Gnezdilov sp.n., holotype. 8 — dorsal view; 9 — frontal view. Scale bar: 1 mm.

Рис. 8–9. Внешний вид самки *Lanuvia (Nulavia) nigrolutea* Emeljanov et Gnezdilov sp.n., голотип. 8 — сверху; 9 — спереди. Масштаб: 1 мм.

Fig. 48d], but did not describe it in the text. According to Fennah's drawing for *L. luteovittata* [Fennah, 1950: Fig. 47d] this species has another contour of the costal margin (typical shape) without such a curve.

Notes. The species was collected under the rainforest canopy by sweeping low trees and shrubs (Fig. 10).

Lanuvia (Nulavia) synavei
Emeljanov et Gnezdilov sp.n.

Figs 11, 12.

Urn:lsid:zoobank.org:act:1CA8FBD6-8931-42B9-BCC2-D58264A09136.

Lanuvia octoguttata Synave, 1959: 30, Figs 62–72 (misidentification).

Material. The Democratic Republic of Congo: Holotype, ♀, «Musée du Congo [print] / Masua (Lubutu) [hand written] / 9–IX–1929 [hand written] / A. Collart [print]» (MRAC). Paratype: ♀, «Coll. Mus. Congo / Kib. - Ituri: Irumu / 18/XII–1952 / P. Basilewsky [print] // desid. [red, print] // B.I.Sc.N.B. / I.G. 21.544 [print]» (MRAC).



Fig. 10. Type locality of *Lanuvia (Nulavia) nigrolutea* Emeljanov et Gnezdilov sp.n., Ghana, Western Region, Subiriso Forest Reserve. Photo by V.M. Gnezdilov.

Рис. 10. Типовое место *Lanuvia (Nulavia) nigrolutea* Emeljanov et Gnezdilov sp.n., Гана, Западный Регион, лесной заповедник Субирисо. Фото В.М. Гнездилова.

Diagnosis. Coryphe with anterior margin obtusely angulate. Spots of forewing clavus and corium are far separated each from another. Corium with two equal large yellow spots, with fore margin of anterior spot of corium running near to mid length of claval stripe.

Description. Structure. General structure as given for the genus. Coryphe twice as wide between the eyes as long at midline (Figs 11, 12).

Coloration. Generally brown to dark brown. Head, pronotum, and tegulae light brown. Mesonotum dark brown, with light brown anterior corners. Forewings brown, with light brown stripe along the costal margin. Corium with two equal large oval light yellow spots (Figs 11, 12). Clavus with wide light yellow stripe (or elongate spot) on Pcu occupying $\frac{3}{4}$ of vein length. Fore margin of anterior spot of corium running near to mid length of claval stripe; posterior spot of corium exceeding apex of clavus on half of its length. Abdominal tergites and genital block dark brown.

Total length (with forewings) 7.2–7.4 mm. **Body length** 5.0 mm.

Etymology. The species is named after well known Belgian hemipterologist, Henri Synave (1921–1981), who specialized on African Auchenorrhyncha.

Comparison. New species is closely related to *L. parvimaculata* sp.n., but clearly differs by larger yellow spots of forewing corium.

Notes. The species was misidentified by Synave [1959] as *L. octoguttata*. The type specimens are from the neighboring provinces Maniema (Lubutu) and Ituri (Irumu) in eastern part of the Democratic Republic of Congo.

Lanuvia (Nulavia) parvimaculata
Emeljanov et Gnezdilov sp.n.

Fig. 13.

Urn:lsid:zoobank.org:act:A28EA7B6-529A-474A-9AC5-65168AFBF0C5.

Lanuvia octoguttata Synave, 1959: 30 (misidentification).

Material. The Democratic Republic of Congo: Holotype, ♀, «Coll. Mus. Congo / Kivu: Kapanga / 1952 / Froidebise» [print] (MRAC).

Diagnosis. Coryphe with anterior margin widely convex. Spots of forewing clavus and corium are far separated



Figs 11–13. Dorsal view of *Lanuvia (Nulavia)* species. 11 — *L. (N.) synavei* Emeljanov et Gnezdilov sp.n., holotype; 12 — *L. (N.) synavei* Emeljanov et Gnezdilov sp.n., paratype; 13 — *L. (N.) parvimaculata* Emeljanov et Gnezdilov sp.n., holotype. Scale bar: 1 mm.

Рис. 11–13. Виды рода *Lanuvia (Nulavia)* сверху. 11 — *L. (N.) synavei* Emeljanov et Gnezdilov sp.n., голотип; 12 — *L. (N.) synavei* Emeljanov et Gnezdilov sp.n., паратип; 13 — *L. (N.) parvimaculata* Emeljanov et Gnezdilov sp.n., голотип. Масштаб: 1 мм.

each from another. Corium with two small oval yellow spots (posterior spot twice larger than anterior one); anterior spot is far separated from posterior ending of claval yellow stripe (Fig. 13).

Description. Structure. General structure as given for the genus. Coryphe 2.5 times as wide between the eyes as long at midline.

Coloration. Generally brown to dark brown. Head, pronotum and mesonotum, and tegulae light brown. Forewings brown, with light brown stripe along the costal margin. Corium with two small oval yellow spots, posterior one twice larger than anterior; anterior spot is far separated from posterior ending of claval yellow stripe. Clavus with wide light yellow stripe (or elongate spot) on Pcu occupying 2/3 of vein length.

Total length (with forewings) 7.0 mm.

Etymology. The species is named after small yellow spots of forewing corium.

Notes. The species was misidentified by Synave [1959] as *L. octoguttata*. The holotype is from Lualaba Province of the southern Democratic Republic of Congo.

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