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## *Vavizola hela* – new species and genus of Afrotropic Lasiocampini (Lepidoptera, Lasiocampidae)

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### Abstract

A new genus *Vavizola* **gen. n.** and a new species *Vavizola hela* **sp. n.** are described from southern Kenya and northern Tanzania. They belong to the former so-called “*Pachypasa* sensu lato” group. Morphology of the new genus is compared with 5 other genera from the group and the full-length sequences of cytochrome *c* oxidase subunit I (COI) are compared with 9 genera from the group, both confirm the description.

**Key words:** Africa, Kenya, morphology, new taxon, *Pachypasa*, phylogeny, Tanzania.

## Introduction

Six adult specimens, three males and three females, from southern Kenya and northern Tanzania, similar to the “*Pachypasa sensu lato*” group were found. The group was revised by Zolotuhin & Gurkovich (2009) and published as a well-illustrated paper. Comparison of the newly found adults with all known species has led us to the conclusion that they belong to a distinct lineage. It is described below as a new species within a new monotypic genus.

## Material and methods

Specimens from the following collections were examined:

- CGM** – collection of Günter Müller (Freising, Germany);
- CJV** – collection of Julia Volkova (Ulyanovsk, Russia);
- CMS** – collection of Manfred Ströhle (Weiden, Germany);
- CVZ** – collection of Vadim Zolotuhin (Ulyanovsk, Russia);
- MfNB** – Museum für Naturkunde (Berlin, Germany);
- MWM** – Museum Witt Munich (Munich, Germany);
- NHML** – Natural History Museum (London, UK);
- RMCA** – Royal Museum for Central Africa (Tervuren, Belgium);
- ZISP** – State Zoological Institute (Saint-Petersburg, Russia);
- ZSM** – Bavarian State Collection of Zoology (Munich, Germany).

Adults were photographed with Olympus C-750 UZ and a set of Nikon D3300 with a Nikon 40mm f/2.8G and a Nikon R1C1. Morphologic preparations were photographed using Olympus C-750 UZ and Leica MC170 HD with Leica S8APO. All images were processed in Photoshop CS6 (Adobe, 2012).

Sequences of 20 specimens from six BOLD projects were used for this study (Ratnasingham & Hebert, 2007, 2013). The samples were collected in Democratic Republic of the Congo (DRC), Ghana, Kenya, Malawi, Republic of South Africa (RSA), Tanzania, Zambia, and Zimbabwe, and stored in seven entomological collections: CGM, CJV, CMS, CVZ, MWM, RMCA, ZSM (Table 1). One leg from each individual was used for analysis. Legs were stored in tubes with 96% ethanol. The sequences were obtained at the Biodiversity Institute of Ontario, Canada. DNA isolation, PCR amplification, and DNA sequencing followed standard protocols (Hebert *et al.*, 2003; deWaard *et al.*, 2008). The sequences are released publicly in the dataset DS-VAVIZOLA ([dx.doi.org/10.5883/DS-VAVIZOLA](https://dx.doi.org/10.5883/DS-VAVIZOLA)) on BOLD.

Sequence alignment and calculation of pairwise distances were conducted using MEGA X (Kumar *et al.*, 2018). Bootstrap analysis (1000 replicates) and the neighbor-joining tree of the COI sequences (the Kimura 2-parameter was used; Kimura, 1980) were also conducted using MEGA X.

Elevation ranges were taken from Elevation Finder (Free Map Tools, <https://www.freemaptools.com/>). Distribution map was made with Google My Maps service (<https://www.google.com/maps/>).

**Table 1.** Information on the barcodes stored in the public dataset DS-VAVIZOLA and specimens used in the phylogenetic analysis.

Taxon	BOLD Sample ID	Sex	Collection data (depository)
<i>Braura</i> sp.	LBEOW1234-11	♀	Tanzania, Nguru Mts, XI.2006 (MWM/ZSM)
	LBEOW1517-11	♂	Tanzania, Manyara, Ngorongoro, Karatu, 1660 m, 27.I.2009, T. & M. Ströhle (CMS)
<i>Cheligium</i> sp.	LBEOW090-10	♂	DRC, 17 km N Kisangani, Masako Field Station, 388 m, 8.II.2008, leg. V. Zolotuhin (CVZ/CJV)
	LBEOW1325-11	♂	DRC, Bas-Congo, Luki-Mayumbe National Reserve, 250 m, 29.IX.2008, leg. J. & W. De Prins (RMCA)
<i>Cleopatrina phoea</i>	GWOSG077-10	♂	Zambia, Northern, Kundalila, 1450 m, 24.IX.2009, leg. J. Lenz (ZSM)

..continued on the next page

TABLE 1.

	LBEOA225-11	♀	Malawi, Northern, Mzimba, Mzuzu, Nkhorongo, 1375 m, 18.XII.2008, leg. R. Murphy (CVZ/CJV)
<i>Eutricha</i> sp.	LBEOW1987-11	♂	Zimbabwe, Manicaland, Vukutu, 1900 m, 2.XII.2010, leg. P. Ustjuzhanin, V. Kovtunovich (CVZ/CJV)
	GWOUNB648-19	♂	RSA, Limpopo, Melkriver, Lapalala Wildern, 1050 m, 14.XI.2017, leg. A. Hausmann, H. Staude (ZSM)
<i>Grellada</i> sp.	LBEOW1995-11	♀	Zambia, Northern, Mutinondo Wilderness, 1406 m, 2.I.2011, leg. V. Kovtunovich, P. Ustjuzhanin (CVZ/CJV)
	LBEOW277-10	♂	Malawi, Southern, 25 km E Mangochi, Mamizimu Forest Reserve, 1040 m, 2.I.2009, leg. P. Ustjuzhanin, V. Kovtunovich (CVZ/CJV)
<i>Lasiocesa</i> sp.	GWOTB487-12	♂	Ghana, Western, Ankasa National Park, 103 m, 30.IV.2005, leg. M. Ochse (ZSM)
	LBEOW1988-11	♂	Malawi, Northern, Rumphi District, Nyika National Park, 1923 m, 23.XII.2010, leg. V. Kovtunovich, P. Ustjuzhanin (CVZ/CJV)
<i>Muzunguja rectilineata</i>	GWOSW195-11	♂	Ghana, Western, Ankasa National Park, 103 m, 28.II.2006, leg. M. Ochse (ZSM)
	LBEOW174-10	♂	DRC, Orientale, Kisangani, Masako Field Station, 388 m, 3.II.2008, leg. V. Zolotuhin (CVZ/CJV)
<i>Pachytrina</i> sp.	GWOSW193-11	♂	Ghana, Central, Kakum National Park, 30 km N Cape Coast, 198 m, 3.III.2006, leg. M. Ochse (ZSM)
	LBEOW1653-11	♂	Ghana, Eastern, Bunso Arboretum, 25.XI.2009, leg. Sz. Safian <i>et al.</i> (RMCA)
<i>Pallastica pallens</i>	GWOSG079-10	♂	Zambia, Northern, Kundalila, 1450 m, 24.IX.2009, leg. J. Lenz (ZSM)
	LBEOA116-11	♂	Malawi, Northern, Mzimba, 12 km N Mzuzu, Nkhorongo, 1408 m, 19.XII.2010, leg. V. Anikin (CVZ/CJV)
<i>Vavizola hela</i>	LBEOW1233-11	♂	Tanzania, Arusha National Park, Miriakamba Hut, 2500 m, 20.X.2004 (MWM/ZSM)
	LBEOW975-11	♀	Kenya, SW Voi, leg. Snižek (CGM)

## Systematic part

### *Vavizola* gen. n.

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(Figs 1–10, 21–22, 28, 34)

**Diagnosis.** The detailed description of morphology is provided for the new species below, since the genus is monotypic. Habitus of *Vavizola* gen. n. reminds us of some other members of “*Pachypasa sensu lato*” revised by Zolotuhin & Gurkovich (2009): 1) *Seydelora* Zolotuhin & Gurkovich, 2009; 2) *Gufria* Zolotuhin & Gurkovich, 2009; 3) *Lasiocesa* Koçak, 2013; 4) *Braura* Walker, 1865; and 5) *Eutricha* Hübner, 1814. Adults of all genera have a diagonal wing pattern, cubile in male genitalia and a corresponding antevaginal plate in female genitalia.

1) *Seydelora* includes only *Seydelora semna* (Hering, 1941) from DRC. It has very dark forewings with dark brown medial, postmedial and external fields and a complex speckled white or yellow and brown external fascia; hindwings have a well pronounced dark external field (Figs 13–14). Male adults of *Vavizola* gen. n. are overall lighter, their forewings are more elongated, medial field is more elongated towards the wing apex, postmedial fascia is developed, the medial white triangle on thorax is absent (compare Figs 5–6, 8–9 and 13); male genitalia of *Vavizola* gen. n. differ by shorter cucullus and sacculus, and smaller apodema of cubile (compare Figs 21–22 and 25). Female adults of *Vavizola* gen. n. are overall lighter, their forewings

are more elongated, forewing pattern is shifted more towards the wing apex, postmedial and external lines are doubled, medial pale speckled thoracic spot is absent (compare Figs 7, 10 and 14); female genitalia of *Vavizola* **gen. n.** differ in the shape of sterigma and presence of cup-like antrum (compare Figs 28 and 29).

2) Zolotuhin & Gurkovich (2009) considered the genus *Gufria* to be monotypic with the only member *Gufria limosa* de Villiers, 1827 distributed from Southern Europe to North Africa. We suppose that European and African populations will show a genetic divergence, sufficient to be considered a separate species, similar to experiences with *Lemonia philopalus* (Donzel, 1842) (see Prozorov *et al.*, 2022b). Here, for comparison, we take adults of *G. limosa* from Tunisia and Morocco and call them *Gufria limosa powelli* (Oberthür, 1916) – the earliest taxon from North Africa. Adults are colored in combinations of grey, creamy and brown; medial field on forewing stretches until the wing apex, postmedial field is paler than the others (Figs 17–18). Male adults of *Vavizola* **gen. n.** have more elongated forewings with medial field not reaching the wing apex, and postmedial lines (compare Figs 5–6, 8–9 and 17); male genitalia of *Vavizola* **gen. n.** differ with shorter cucullus and sacculus, shorter distal outgrowths and lack of lateral dents (compare Figs 21–22 and 23). Female adults of *Vavizola* **gen. n.** have more elongated forewings, their forewing pattern consists of more elements and both wings have dark external field (compare Figs 7, 10 and 18); antevaginal plate in female genitalia of *Vavizola* **gen. n.** is better developed and antrum is wider (compare Figs 28 and 31).

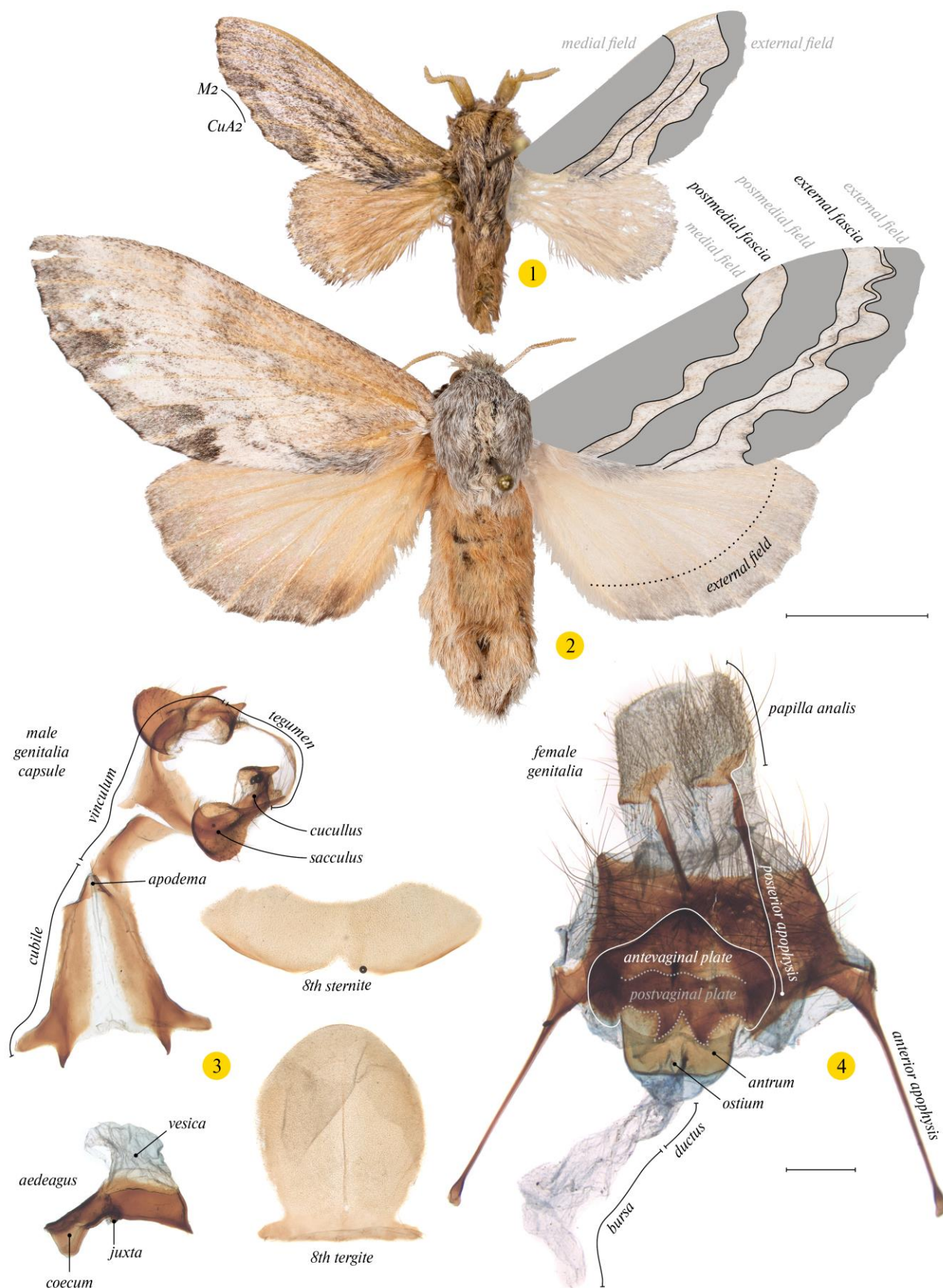
3) *Lasiocesa* includes 4 species. Here, for comparison, we take adults (Figs 15–16) and male genitalia (Fig. 26) of the type-species *Lasiocesa fulgurata* (Aurivillius, 1909) and female genitalia (Fig. 32) of *Lasiocesa lanceolata* (Hering, 1932) due to only one known bad quality slide of female genitalia of *L. fulgurata*, all from DRC. Adults are colored in combinations of brown and creamy, forewing has full set of fields and fasciae, while hindwing may be completely brown or creamy with brown external field. Wing pattern of both genera is very similar, however, *Vavizola* **gen. n.** is much paler and duller, have narrower postmedial field (compare Figs 5–10 and 15–16). Male genitalia of *Vavizola* **gen. n.** differ with shorter cucullus, larger sacculus, and lack medial ridges on processes of cubile (compare Figs 21–22 and 26). Female genitalia of *Vavizola* **gen. n.** differ with larger antevaginal plate and presence of cup-like antrum (compare Figs 28 and 32).

4) *Braura* includes 9 species. For comparison, we take the type-species *Braura ligniclusula* (Walker, 1865) from RSA. Adults have dark brown forewings with occasionally paler medial field, hind wings dark brown or creamy with darker external field. Male adults of *Vavizola* **gen. n.** are overall lighter, but head and thorax cranially are not contrasting (compare Figs 5–6, 8–9 and 11); male genitalia of *Vavizola* **gen. n.** differ with smaller cucullus and basally larger sacculus, smaller caudal processes of cubile (compare Figs 21–22 and 24). Female adults of *Vavizola* **gen. n.** are overall lighter, but head, thorax cranially, and forewing medial field are not contrasting (compare Figs 7, 10 and 12); female genitalia of *Vavizola* **gen. n.** differ in better developed antevaginal plate and presence of cup-like antrum (compare Figs 28 and 30).

5) *Eutricha* includes 5 species ranging in coloration from creamy to dark brown. Here, for comparison, we use *Eutricha capensis* (Linnaeus, 1767) from RSA, the type-species of the genus. Adults have well pronounced contrasting postmedial and external fasciae. Male adults of *Vavizola* **gen. n.** are overall lighter, their forewings are more elongated, medial field is more elongated towards the wing apex (compare Figs 5–6, 8–9 and 19); male genitalia of *Vavizola* **gen. n.** differ with smaller cucullus and sacculus, smaller apical dent of aedeagus (compare Figs 21–22 and 27). Female adults of *Vavizola* **gen. n.** are overall paler and duller with contrasting external field (compare Figs 7, 10 and 20); female genitalia of *Vavizola* **gen. n.** differ in shape of sterigma (compare Figs 28 and 33).

**DNA comparison** (Fig. 34). Two specimens of *Vavizola hela* **sp. n.** were sequenced: the holotype male from Tanzania (Fig. 5) and the paratype female from Kenya (Fig. 10). The two have a 0.8% *p*-distance which is a little higher than we expected for specimens of a single species collected so closely together. It may be explained by the 1200 meters difference in the altitude between collecting localities of the two. The new genus is compared with 18 sequences belonging to 12 biological index numbers (BINs) and 9 genera from the “*Pachypasa sensu lato*” group, missing *Seydelora*; *Pachyna* Weymer, 1892; *Beriola* Zolotuhin & Gurkovich, 2009; *Euphorea* Zolotuhin & Gurkovich, 2009; and *Sophyrta* Zolotuhin & Gurkovich, 2009 (see Table 1). We will only compare the new genus with the others without investigation of their internal concerns such as potential polyphyly of *Pachytrina* Zolotuhin & Gurkovich, 2009 or polytypy of *Muzunguja* which follow from the tree and *p*-distances. These differences require a detailed investigation.



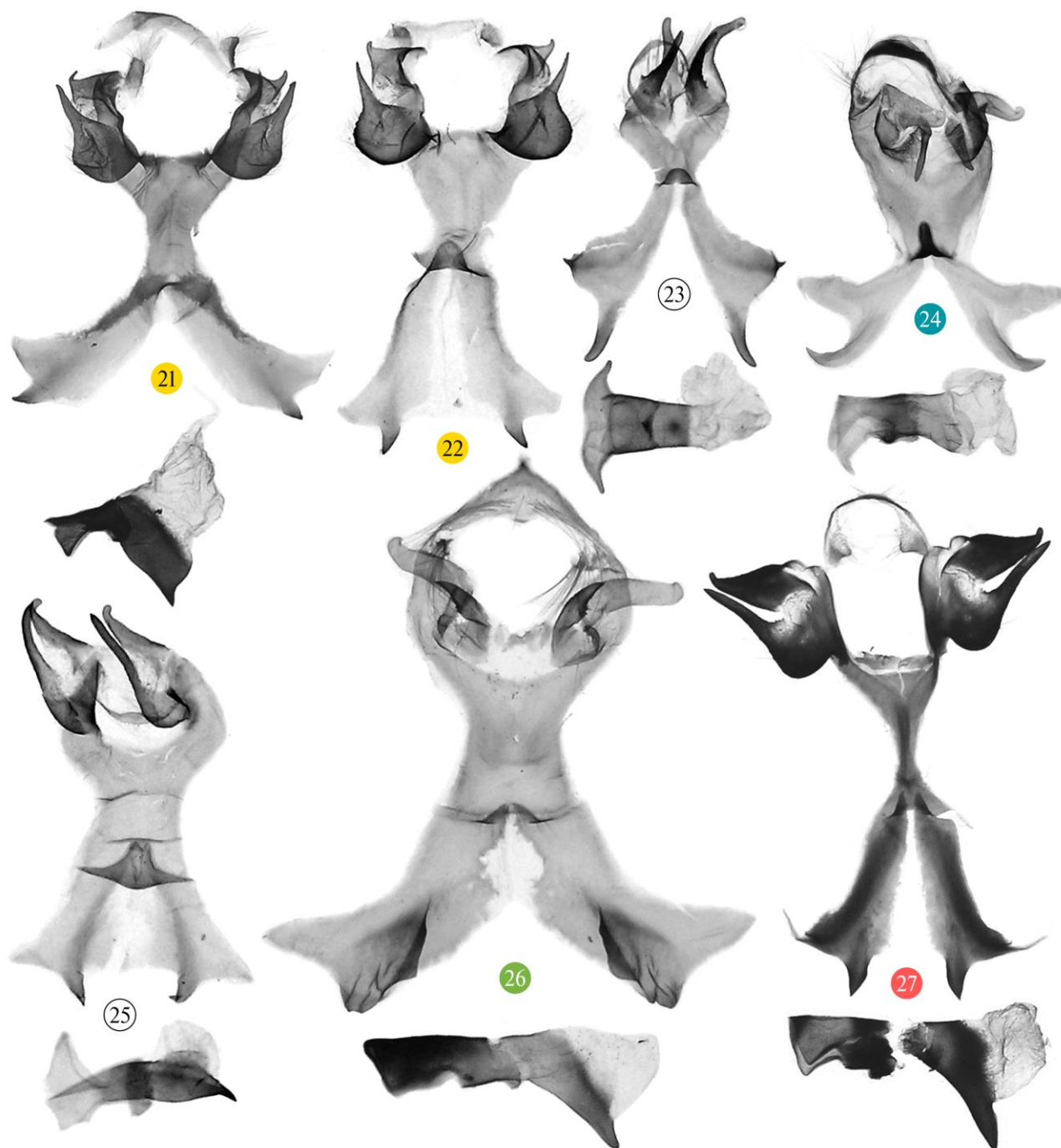


**Figures 1–4.** Nomenclature of the wing pattern and genitalia of *Vavizola hela*. 1. Holotype male, Tanzania, Arusha (MWM/ZSM). 2. Paratype female, Kenya, Kitui (CGM). 3. Paratype male, Tanzania, Arusha, slide 1267 (CGM). 4. Paratype female, Kenya, Kitui, slide 0501 (CGM). Scale bar – 1 cm for adults and 1 mm for genitalia.





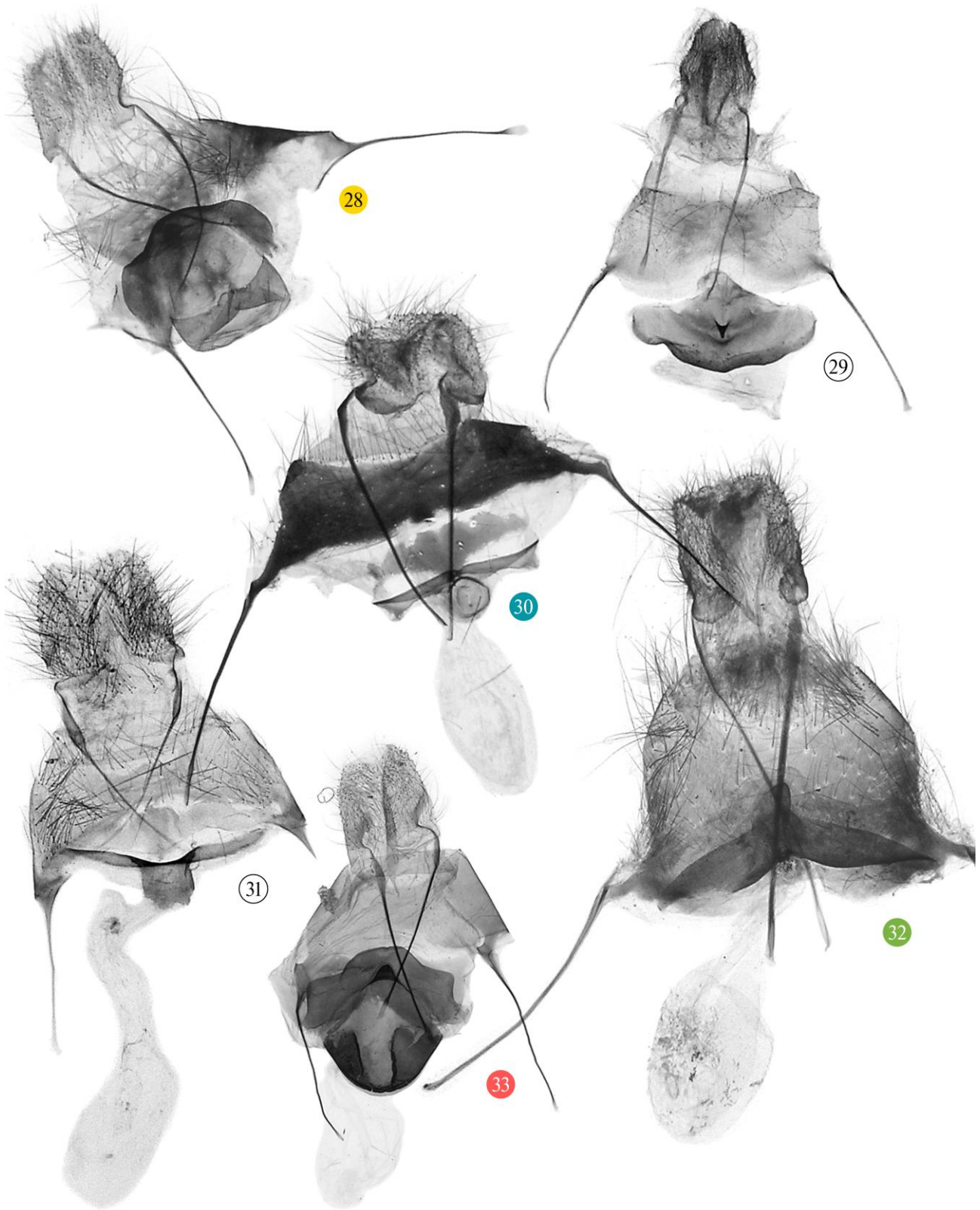
**Figures 5–20.** Adults of Lasiocampini. 5–10. *Vavizola hela*. 5. Holotype male, Tanzania, Arusha, slide 17.446, LBEO1233-11 (MWM/ZSM). 6. Paratype male, Tanzania, Arusha, slide 1267 (CGM). 7. Paratype female, Kenya, Kitui, slide 0501 (CGM). 8. Paratype male, Kenya, Lamu, slide 20.690 (CGM). 9. Paratype male, Kenya, Taita-Taveta (ZISP). 10. Paratype female, Taita-Taveta, slide 17.447, LBEO1233-11 (CGM). 11–12. *Braura ligniclus*. 11. Male, RSA, Transvaal, slide 2006-08 (MfNB). 12. Female, RSA, KwaZulu-Natal, slide 2006-24 (MfNB). 13–14. *Seydelora semna*. 13. Male, DRC, Katanga (RMCA). 14. Female, DRC, Haut-Lomani, slide 1448 (NHML). 15–16. *Lasiocesa fulgurata*, male and female, DRC, Haut-Uele (RMCA). 17–18. *Gufria limosa powelli*, male and female, Tunisia, Nabeul (MWM/ZSM). 19–20. *Eutricha capensis*. 19. Male, RSA, Western Cape, slide 2006-12 (MfNB). 20. Female, RSA, Western Cape (NHML). Scale bar – 1 cm.



**Figures 21–27.** Male genitalia. 21–22. *Vavizola hela*. 21. Holotype, Kenya, Lamu, slide 20.690 (CGM). 22. Paratype, Tanzania, Arusha, slide 17.446, LBEO1233-11 (MWM/ZSM). 23. *Gufria limosa powelli*, Morocco, Tangier-Tétouan-Al Hoceima, slide 10.633 (MWM/ZSM). 24. *Braura ligniclusa*, RSA, Transvaal, slide 2006-08 (MfNB). 25. *Seydelora semna*, holotype, DRC, Haut-Katanga (RMCA). 26. *Lasiocesa fulgurata*, DRC, Haut-Uele, slide 2006-59 (RMCA). 27. *Eutricha morosa*, RSA, Western Cape, slide 2006-12 (MfNB).

We can see that intergeneric *p*-distance lays between 4.7 and 12% (Fig. 34), where the lowest is between *Pallastica* Zolotuhin & Gurkovich, 2009 and *Cleopatrina* Zolotuhin & Gurkovich, 2009, and the highest is between *Muzunguja* and *Lasiocesa*. The nearest neighbor of *Vavizola* **gen. n.** (BOLD:AAV0301) found on BOLD is *Eutricha morosa* (Walker, 1865) from Malawi (BOLD:ABZ6351) at 5.92%. We selected two other *Eutricha* species which are not much farther: 6.4 and 7.4%. Other sequences, except *Pachytrina* sp. at 6.1% (Fig. 34, 10), are farther than any *Eutricha*.





**Figures 28–33.** Female genitalia. 28. *Vavizola hela*, paratype, Kenya, Taita-Taveta, slide 17.447 (CGM). 29. *Seydelora semna*, DRC, Haut-Lomani, slide 1448 (NHML). 30. *Braura ligniclusa*, RSA, KwaZulu-Natal, slide 2006-24 (MfNB). 31. *Gufria limosa powelli*, Morocco, Tangier-Tétouan-Al Hoceima, slide 11.544 (MWM/ZSM). 32. *Lasiocesa lanceolata*, Angola, Ituri, slide 2006-53 (RMCA). 33. *Eutricha capensis*, RSA, Western Cape, slide 2006-47 (MfNB).



**Etymology.** Name of the new genus is devoted to Prof. Dr. Vadim Viktorovich Zolotuhin (1967–2021), Russian entomologist specialized on the Old World Lasiocampidae. It is formed by a combination of the first letters of his name by analogy with *Tarsozeuzera vavizola* Yakovlev, 2006 (Cossidae).

***Vavizola hela* sp. n.**

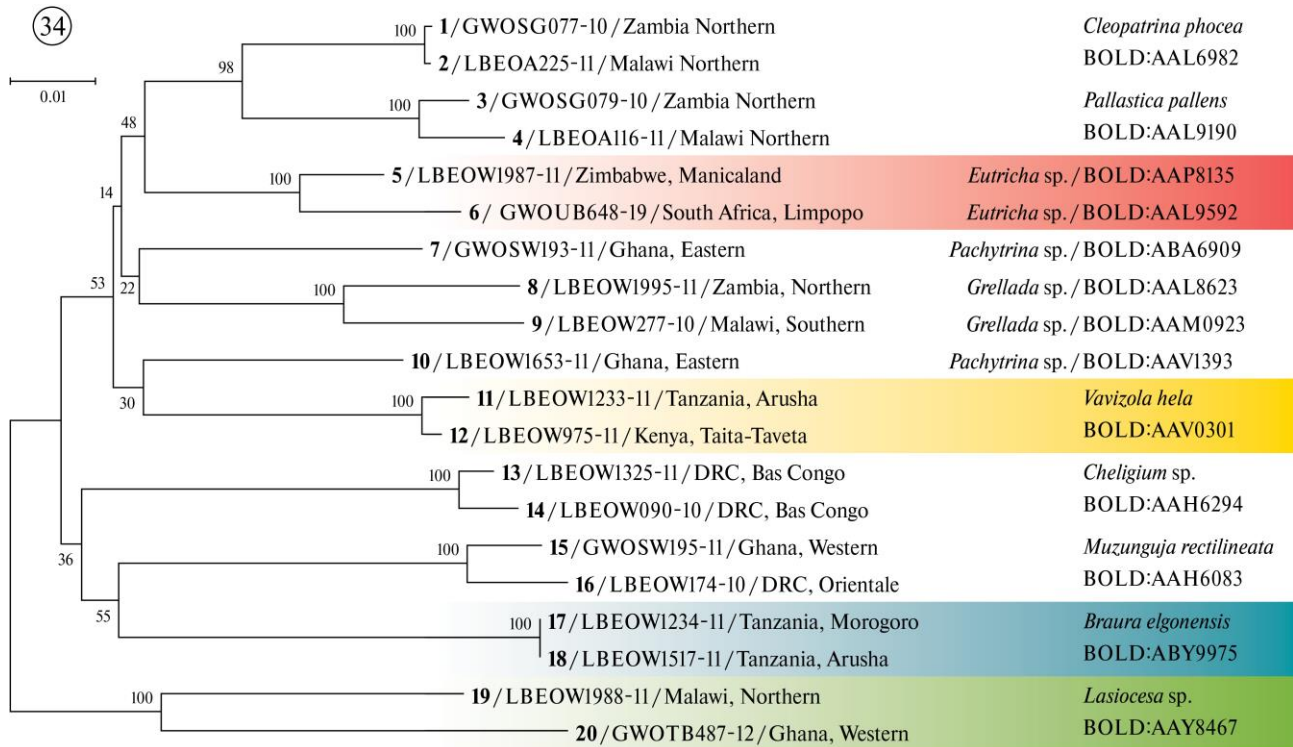
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(Figs 1–10, 21–22, 28, 34)

**Holotype:** ♂, Tanzania, Arusha National Park, Miriakamba Hut, -3.2294225707906707, 36.79956440000001, 2500 m, 20.X.2004, slide 17.446, LBEOW1233-11 (MWM/ZSM). **Paratypes** (2♂, 3♀). **Tanzania:** ♂, like holotype, slide 1267 (CGM). **Kenya:** ♂, Taita-Taveta, Voi, 19.XII.1911, leg. Svatosh (ZISP); ♀, Taita-Taveta, SW of Voi, 8–12.XII.2009, leg. Snižek, slide 17.447, LBEOW975-11 (CGM); ♂, Lamu, E of Garsen, W of Witu, 28.IV.2011, leg. Snižek, slide 20.690 (CGM); ♀, Kitui, 202 km E Thika, Sosoma, 4.XII.2010, leg. Snižek, slide 0501 (CGM); ♀, Kitui, E of Mwingi, W of Enguni, 1.XII.2010, leg. Snižek (CGM).

**Description. Male** (Figs 1, 5–6, 8–9). Flagellum covered with creamy and brown scales, rami brown. Head and thorax speckled creamy and brown; thorax dorsally has longitudinal dark stripes. Abdomen brown or reddish brown. *Forewing.* Forewing length: 19–23 mm; wingspan: 38–45 mm. Elongated, apex blunt, outer margin with indentation on veins and concavity between  $M_2$  and  $CuA_1$ . Background color speckled creamy with brown scales. Pattern diagonal (Fig. 1), consist of more or less pronounced discal stroke, speckled medial field, postmedial fascia with dark edges vanishing towards apex, postmedial field and external fascia practically merged into speckled field with dark lines vanishing towards apex as well, and dark external field. Cilia creamy on vines and dark brown between them. *Hindwing.* Somewhat ovaloid with some indentation on veins. Background color brown or dark brown with dark external field. Cilia speckled creamy and brown, darker between veins. *Genitalia* (Figs 3, 21–22). Tegumen a narrow band bearing a pair of socia laterally. Socii papilla-shaped, covered with chaetae. Vinculum ventrally elongated, distally bears cubile. Cubile clearly divided medially into a pair of somewhat triangle processes with caudal dent. Cucullus tubercle-like with papilla-shaped medial extension. Sacculus about twice bigger than cucullus, tubercle-like with elongated finger-like apically pointed extension loosely covered with chaetae. Juxta a tiny medial extension of aedeagus. Aedeagus c-shaped with ventral apical spur. Vesica short, wrinkled, caudally narrows. Eight sternite a c-shaped band, posterior margin with medial concavity. Eight tergite somewhat oval widened posteriorly. **Female** (Figs 2, 7, 10). Reminds male in pattern but paler, larger in size, antenna pectination much shorter. Head and thorax speckled creamy with brown scales. Thorax medially paler with two longitudinal dark stripes. Abdomen brown or orangish with creamy speckles. *Forewing.* Forewing length: 33–35 mm; wingspan: 67–68 mm. Elongated, apex blunt, outer margin with indentation on veins. Background color speckled creamy with brown scales. Pattern diagonal (Fig. 2), consist of speckled medial field, wavy postmedial fascia with faded dark edges, pale postmedial field, wavy external fascia with faded dark edges, and dark external field. Cilia creamy on vines and dark brown between them. *Hindwing.* Somewhat ovaloid with some indentation on veins. Background color creamy with dark speckled external field. Cilia speckled creamy and brown, darker between veins. *Genitalia* (Figs 4, 28). Papillae anales oval, densely covered with chaetae. Posterior and anterior apophyses about the same length. Antevaginal plate somewhat pentagonal with round corners, bends outwards with help of male cubile; together with postvaginal plate forms cup-like antrum. Ostium wrinkled, amorphous. Ductus bursae short. Corpus bursae wrinkled.

**Variability. Male.** One paratype male (Fig. 8) looks distinct compared to the others (Figs 5–6, 9). It was collected in the lowlands, in April. The other adults were collected from altitudes above 500 meters in October and December. It has no significant difference in genitalia and originates near the others, so we consider it within the same species. Overall, male may have more (Fig. 8) or less pronounced and contrasting pattern (Figs 5–6, 9). Dark stroke in forewing medial field may present (Fig. 8) or absent (Figs 5–6, 9). Hindwing may have dark blurred medial fascia (Fig. 8). Cubile may be more sclerotized basally (Fig. 21). **Female.** Females have stable wing patterns, only the abdomen may get more or less orangish. Antevaginal plate with more (Fig. 4) or less (Fig. 28) protruded medial extension.



Genus	Country	No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
<i>Cleopatrina</i>	N Zambia	1		0.2	4.7	4.7	5.5	6.7	7.1	7.6	7.4	6.8	7.0	6.8	8.4	8.4	9.1	10.0	8.8	8.8	9.6	10.3
<i>Cleopatrina</i>	N Malawi	2	0.2		4.9	4.9	5.3	6.5	7.0	7.4	7.4	7.0	7.0	6.8	8.2	8.5	9.3	10.2	8.7	8.7	9.7	10.2
<i>Pallastica</i>	N Zambia	3	4.7	4.9		1.5	6.1	7.1	6.7	8.1	8.7	7.1	7.8	7.6	8.8	8.5	10.2	9.6	9.0	9.0	10.0	10.3
<i>Pallastica</i>	N Malawi	4	4.7	4.9	1.5		6.7	7.8	7.3	8.4	8.5	7.6	8.2	7.8	9.3	9.0	10.3	10.0	9.7	9.7	9.9	10.8
<i>Eutricha</i>	Zimbabwe	5	5.5	5.3	6.1	6.7		2.7	5.8	7.4	7.1	6.4	6.5	6.4	8.4	9.0	9.6	9.6	8.7	8.7	9.0	9.7
<i>Eutricha</i>	South Africa	6	6.7	6.5	7.1	7.8	2.7		6.8	8.4	8.2	6.7	7.6	7.4	8.8	9.3	10.2	10.2	9.1	9.1	9.4	10.6
<i>Pachytrina</i>	E Ghana	7	7.1	7.0	6.7	7.3	5.8	6.8		7.0	7.4	5.8	7.4	7.1	9.3	9.6	9.7	10.0	9.0	9.0	9.4	10.2
<i>Grellada</i>	N Zambia	8	7.6	7.4	8.1	8.4	7.4	8.4	7.0		4.0	8.2	8.7	8.4	9.3	9.6	9.7	9.9	9.3	9.3	9.7	10.9
<i>Grellada</i>	S Malawi	9	7.4	7.4	8.7	8.5	7.1	8.2	7.4	4.0		7.1	8.2	7.9	9.6	9.9	9.9	9.9	10.3	10.3	10.2	10.9
<i>Pachytrina</i>	E Ghana	10	6.8	7.0	7.1	7.6	6.4	6.7	5.8	8.2	7.1		6.4	6.1	8.7	9.0	8.8	8.8	8.8	8.8	9.3	10.8
<i>Vavizola</i>	Tanzania	11	7.0	7.0	7.8	8.2	6.5	7.6	7.4	8.7	8.2	6.4		0.8	8.2	8.5	8.2	8.8	10.2	10.2	9.6	10.8
<i>Vavizola</i>	Kenya	12	6.8	6.8	7.6	7.8	6.4	7.4	7.1	8.4	7.9	6.1	0.8		8.2	8.5	8.1	8.7	9.7	9.7	9.1	10.2
<i>Cheligium</i>	DRC	13	8.4	8.2	8.8	9.3	8.4	8.8	9.3	9.3	9.6	8.7	8.2	8.2		1.1	9.7	9.7	9.3	9.3	10.0	10.6
<i>Cheligium</i>	DRC	14	8.4	8.5	8.5	9.0	9.0	9.3	9.6	9.6	9.9	9.0	8.5	8.5	1.1		9.6	9.6	9.6	9.6	10.5	11.4
<i>Muzunguja</i>	W Ghana	15	9.1	9.3	10.2	10.3	9.6	10.2	9.7	9.7	9.9	8.8	8.2	8.1	9.7	9.6		2.0	9.1	9.1	9.9	11.1
<i>Muzunguja</i>	DRC	16	10.0	10.2	9.6	10.0	9.6	10.2	10.0	9.9	9.9	8.8	8.8	8.7	9.7	9.6	2.0		9.3	9.3	10.5	12.0
<i>Braura</i>	Tanzania	17	8.8	8.7	9.0	9.7	8.7	9.1	9.0	9.3	10.3	8.8	10.2	9.7	9.3	9.6	9.1	9.3		0.0	10.3	11.7
<i>Braura</i>	Tanzania	18	8.8	8.7	9.0	9.7	8.7	9.1	9.0	9.3	10.3	8.8	10.2	9.7	9.3	9.6	9.1	9.3	0.0		10.3	11.7
<i>Lasiocesa</i>	N Malawi	19	9.6	9.7	10.0	9.9	9.0	9.4	9.4	9.7	10.2	9.3	9.6	9.1	10.0	10.5	9.9	10.5	10.3	10.3		7.6
<i>Lasiocesa</i>	W Ghana	20	10.3	10.2	10.3	10.8	9.7	10.6	10.2	10.9	10.9	10.8	10.8	10.2	10.6	11.4	11.1	12.0	11.7	11.7	7.6	

**Figure 34.** NJ tree (Kimura-2 parameter model, built with MEGA X) based on sequence variation at COI (658 bp) and pairwise distances (%) between the sequences of some genera from the former “*Pachypasa sensu lato*” group (Lasiocampini).

**Etymology.** The species is named in honor of Dr. Hela Gayatri. She has a motto: “To live in sync with nature with deep appreciation of even the smallest part of it.” In addition to being an ardent lover of nature, she is also a distinguished scientist and a successful inventor and entrepreneur. She has a master’s degree in

organic chemistry, a doctorate in chemistry and has international research experience with the Medical Research Council (UK), École Normale Supérieure (France), Texas Medical Center (USA) and National Tsing Hua University (Taiwan). Dr. Hela Gayatri also has expertise in synthetic chemistry, nanotechnology and other leading technologies. She is a serial entrepreneur and graduated from Goldman Sachs 10K (Cohort 2) initiative at NSRCEL, IIM, Bangalore and is an alumni of Goldman Sachs 10K Women Entrepreneur program, reimagining business at ISB, India.

**Distribution.** Southern Kenya and north-eastern Tanzania (for details visit [https://bit.ly/Vavizola\\_hela](https://bit.ly/Vavizola_hela)).

**Biology.** Adults were collected in April, October, and December from lowlands up to 2,500 meters a.s.l. Preimaginal stages are unknown.

## Conclusion

Zolotuhin and Gurkovich (2009) have done a great job in compiling type specimens and original descriptions of what they called “*Pachypasa sensu lato*” and analyzing a great number of non-type specimens from 24 collections around the world. They ended up with descriptions of 12 new genera and 28 new species. The revision was done prior to accessible genetic analysis and based on comparison of habitus, genitalia and distribution of species. The paper was under preparation for more than five years and being somehow unfinished, according to numerous remarks in the text, was anyway published to be later used as a base for updates and new findings. Thus, numerous uncertainties and mistakes were left in the revision.

Here, we compared sequences of 10 genera related to the former “*Pachypasa sensu lato*” group. The intergeneric *p*-distance varies widely from 4.7% between *Pallastica* and *Cleopatrina* up to 12% between *Muzunguja* and *Lasiocesa*, while interspecific distance can be up to 7.6% within *Lasiocesa* (Fig. 34). The new genus, *Vavizola* **gen. n.**, differs from any other belonging to the *Pachypasa* group. It may only resemble some particularly worn specimens of *Braura*, otherwise easily distinguished by habitus and no genitalia study is required for the identification. Pairwise distance between *Vavizola* **gen. n.** and 9 other genera of *Pachypasa* group ranges from 6.1 up to 10.8%. It includes the only species, *Vavizola hela* **sp. n.**, but hopefully more will be found in the future similarly to *Typhonoya* Prozorov, 2011 (see Prozorov *et al.*, 2021).

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