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REDESCRIPTION OF *EUDALACA RUFESCENS* (HAMPSON) AND *EUDALACA AMMON* (WALLENGREN) FROM AFRICA (LEPIDOPTERA: HEPIALIDAE)

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Redescription of *Eudalaca rufescens* (Hampson) and *Eudalaca ammon* (Wallengren) from Africa (Lepidoptera: Hepialidae)

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ABSTRACT

To facilitate improved taxonomic understanding of the southern African genus *Eudalaca* Viette, 1950, redescriptions are presented for *Eudalaca rufescens* (Hampson, 1910) and *E. ammon* (Wallengren, 1860). Details of wing patterns and venation, head, and genitalia are described and illustrated. A new northern record is made for *E. rufescens* in Malawi, and a new record for *E. ammon* in the Democratic Republic of the Congo. A lectotype is designated each for *Eudalaca rufescens* and *E. ammon.*

Keywords. Democratic Republic of the Congo, distribution, Malawi, morphology, southern Africa, South Africa, Lectotype.

INTRODUCTION

The genera *Eudalaca* Viette, 1950 and *Gorgopis* Hübner, [1820] are together the most speciose and poorly defined Hepialidae in Africa. Monophyly of neither genus is supported by any recognised apomorphy. Some features of genitalia in each genus suggest the possibility that some species in each genus represent a monophyletic assemblage, but whether either or both genera represent monophyletic entities is at present unknown (Grehan *et al.* 2021). The following redescriptions of *E. rufescens* (Hampson, 1910) and *E. ammon* (Wallengren, 1860) are presented as an incremental step towards clarifying the species composition and monophyly of *Eudalaca*.

MATERIAL AND METHODS

Material examined: *Eudalaca rufescens*: 1 ♂, Balgowan, Natal [KwaZulu-Natal], 9/3/56 [9 March 1956], leg. K. Pennington. Peabody Museum, Yale University, New Haven, Connecticut, USA. 1 ♀, ♂, Balgowan, Natal [KwaZulu-Natal], 9 March 1956, South Africa, leg. K. Pennington. Peabody Museum, Yale University, New Haven, Connecticut, USA.

Material examined: *Eudalaca ammon*: 2 ♂, Malawi, Chitipa District, Jembya Reserve, 18 km SSE Chismenga [Chisenga], 10-08S, 32-27 E. 1,870 m. 5-10 Dec. 1988. J. Rawlins, S. Thompson. Carnegie Museum of Natural History, Pittsburgh, USA. 1 ♂ (photo only), RDC – Haut Katanga, Kissamfu Alt. 1175 m, 10°44’08”S, 25°57’03”E, 20/XII/2023. Loc. Coll. – Leg. A. Cipolla. 1 ♂ (photo only), Caffraria [Lectotype here designated].

Morphological terminology follows Mielke *et al.* (2025). Genitalia terminology comprises tegumen (= intermediate plate), saccus (= vinculum), and fultura inferior (= juxta), fultura superior (= trulleum). Abdomen and genitalia were removed and macerated in a heated solution of 10% KOH for about 10 minutes. The abdominal integument was opened by a right lateral cut from the tergosternal bar to the genitalia, which was then removed. Dissections are preserved in alcohol or glycerol. Female description refers to differences from male.

TAXONOMIC SECTION

Eudalaca rufescens (Hampson, 1910)

(Figs. 1a-g, 2a-g, 3a-f, 4a-d, 5a-g, 6a-e, 7a-b)

Dalaca rufescens Hampson, 1910. Syntypes - 3 males, 2 females. Type locality: South Africa, Free State, Bethlehem.

Dalaca rufescens: Hampson (1910: 158), Gaede (1930: 555), Janse (1942: 27), Joubert (1975: 1, 1978: 1), Scoble (1985: 345).

Eudalaca rufescens: Viette (1950a: 145), Nielsen *et al.* (2000: 838), Vari *et al.* (2002: 7), Grehan *et al.* (2023: 114).

= *Dalaca furva* (Hampson 1910: 158; holotype male. Type locality: Transvaal), Gaede (1930: 555)

♂ **(Figs. 1a-b, e, g).** Wingspan ~ 30 mm, FW length: 14 mm, width: 7 mm; HW length: 12 mm, width: 26 mm.

Head (Figs. 2a, d-f): Covered with dense piliform scales, yellowish grey (Balgowan) to grayish brown (lectotype). Antenna with 53 annuli, pedicel barrel-shaped, distally oblique; annuli wider than long, angled distally, width decreasing towards apex. Eyes prominent, ocular scales arising from space between antenna condyle and medial edge of eye (Fig. 2a). Labium with three palpomeres, basal segment about half length and wider than second segment; distal segment shortest, Von Rath's organ present (Fig. 2f).

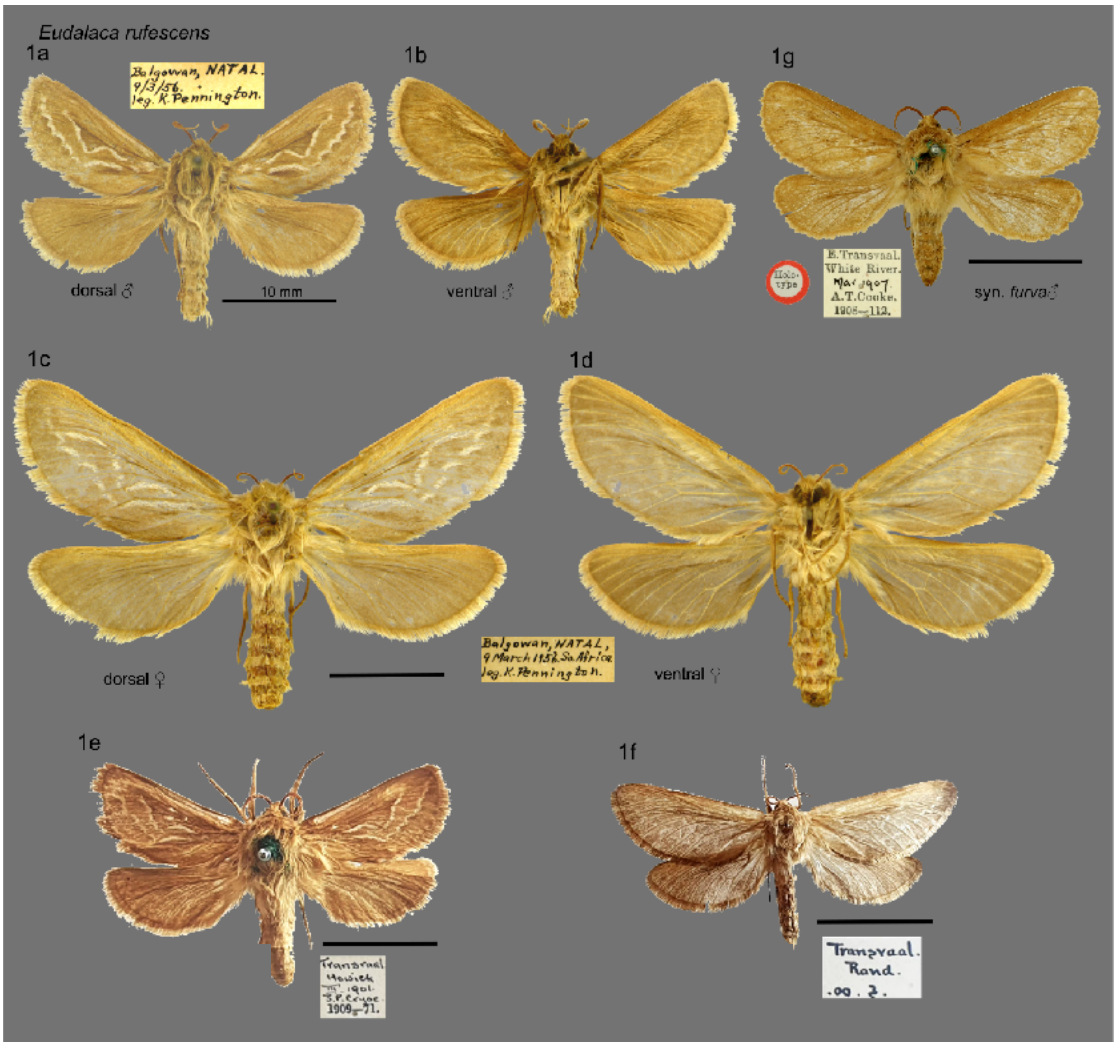

Figure 1. *Eudalaca rufescens*. Specimens examined: (a-d) Lectotype and paralectotype, Natural History Museum, United Kingdom; (e-f), male and female, (g) Holotype male of *Eudalaca furva* (=*E. rufescens*), Natural History Museum, United Kingdom. Photos: 1a-d by Vanessa Verdicea, e-g by David Lees.

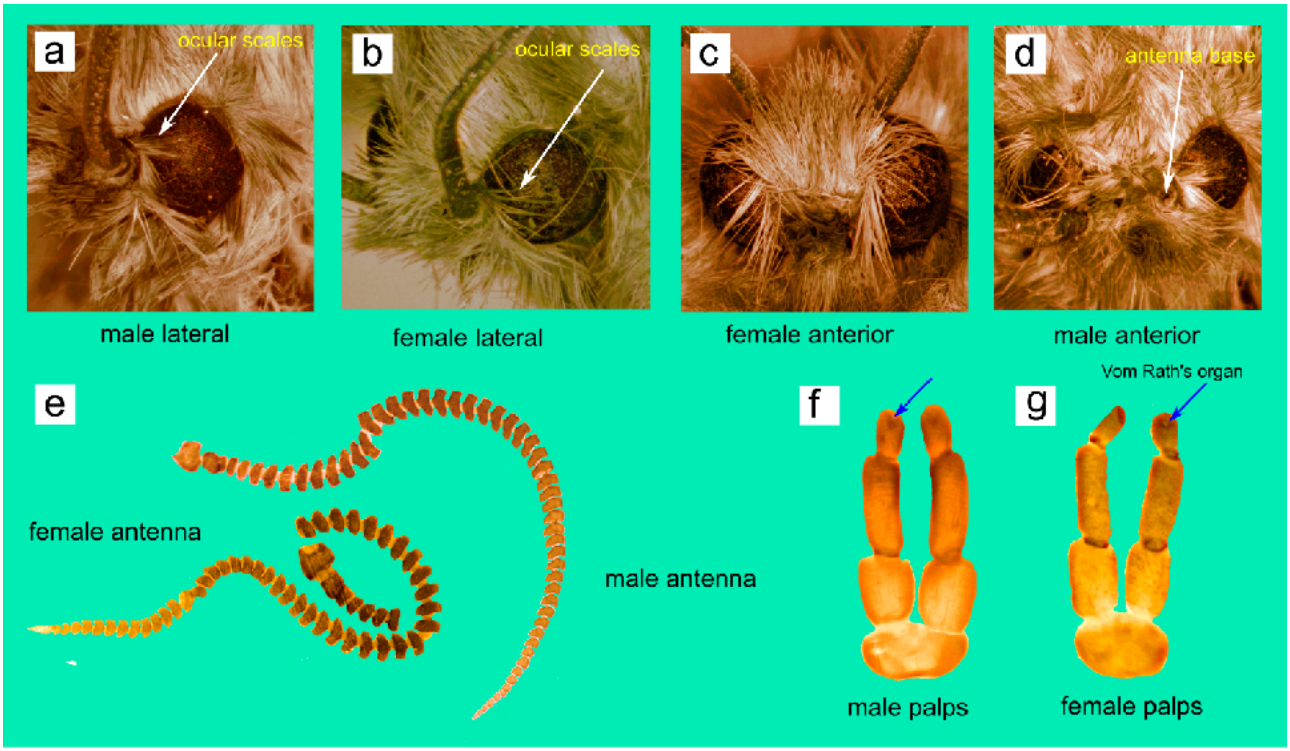

Figure 2. *Eudalaca rufescens*. Head (a-d), antenna (e), labial palps (f, g).

Thorax (Figs. 3a, c, e): Dorsally covered with dense, piliform scales, yellowish grey (Balgowan) to grayish brown (lectotype). Posterior metathoracic scales extending over anterior abdomen, including tuft of posterior scutum III scales (Fig. 4a). Wings mostly covered by lamellar scales. *Dorsal forewing* with irregular V-shaped band edged anteriorly and posteriorly with white, narrowing basally and wider distally towards apex, terminating approximately at Rs2-Rs3, darker shading anteriorly and posteriorly of white edge. Narrow white band extending between Sc and costa, widest basally and narrowing distally. Outer margin with prominent fringe of pale yellowish-brown scales, spatulate, expanding distally (Fig. 3c). *Dorsal hindwing* yellowish-brown with pale yellowish-brown fringe (Figs. 1a, 3d). *Ventral fore and hindwings* pale yellowish-brown without markings, scales along veins paler. *Wing venation* (Fig. 3a): posterior discal cell widest. Hindwing M_1 weakly connected to M_1. *Legs* (Fig. 3e): Covered with pale yellowish-brown scales, epiphysis and arolium present, lengths almost subequal, proleg: mesoleg: metaleg ratio 1: 1.2: 0.9.

Pregenital abdomen (Figs. 4a-b, 5a-f): Covered with pale yellowish grey (Balgowan) to grayish brown (lectotype) scales. Anterior segments dorsally covered with longer scales (Figs. 1a-b, 4a). Tergosternal sclerite with curved tergosternal bar, lateral and dorsal brace forming an oblique angle (Figs. 5c-d). Tergum I dorsal surface twice as wide as long, ratio 1: 2.4 (Fig. 4b). Tergum II rectangular, with robust lateral ridge; tergum III with antero-lateral projection extending down to pleura, lateral and medial apodemal attachment sites along anterior margin. Tergites IV-VIII progressively narrower posteriorly, anterior apodemal attachment sites present on segments IV-VI; tergite VIII subsquare (Fig. 5a). Sternum II twice as long as wide with antero-lateral arms laterally edged with sclerotized ridge extending posteriorly, medially concave, anterior margin with strongly sclerotized border (Fig. 5b); habitus orientation nearly vertical to axis of body (Fig. 5f). Sternites III-VI subrectangular, VII subtriangular, VIII reduced to rectangular sclerite less than ¼ width of sternum VII, posterior margin ridged (Fig. 5e).

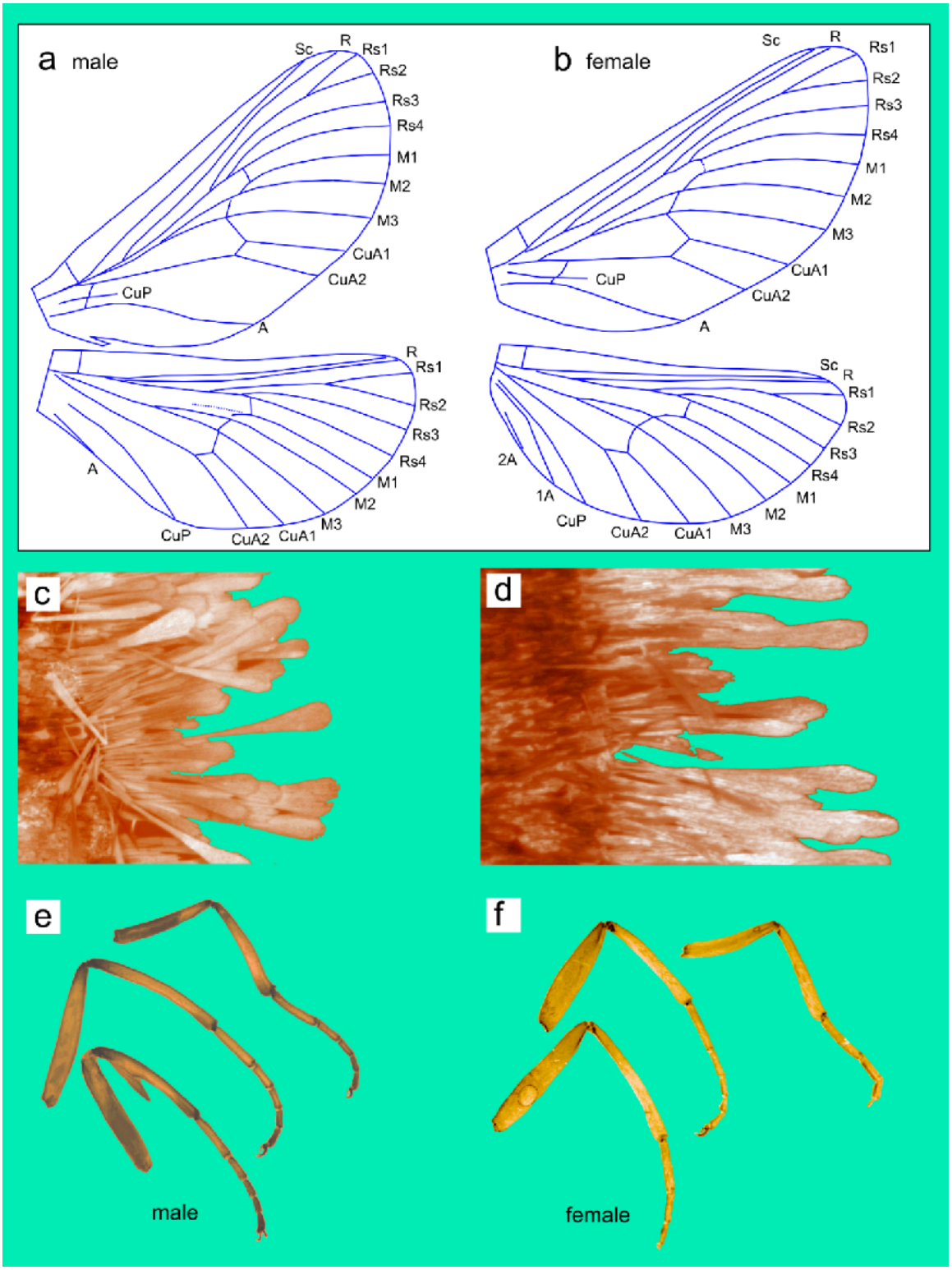

Figure 3. *Eudalaca rufescens*. Thoracic appendages. Venation (a male -b female), fringing scales of outer forewing (c - male, d - female), fore, meso, and meta legs (e-f).

Genitalia (Figs. 6a-e): Tergal lobes (tergum X) membranous, not shown. Tegumen narrow, elongate, not fused with pseudotegumen. Pseudotegumen triangular in posterior view (Fig. 6b), narrowing to postero-ventral apex forming a distal tube with pseudoteguminal arms fused and dorsal surface closed by partially transparent cuticle with irregular transverse ridges (Fig. 6d). Fultura inferior wider than long, subrectangular. Fultura superior longer than wide. Saccus broadly U-shaped anterior margin with prominent apodemal suture, posterior margin notched medially. Valva with distally expanded blade, distal edge convex with acute anterior and posterior corners.

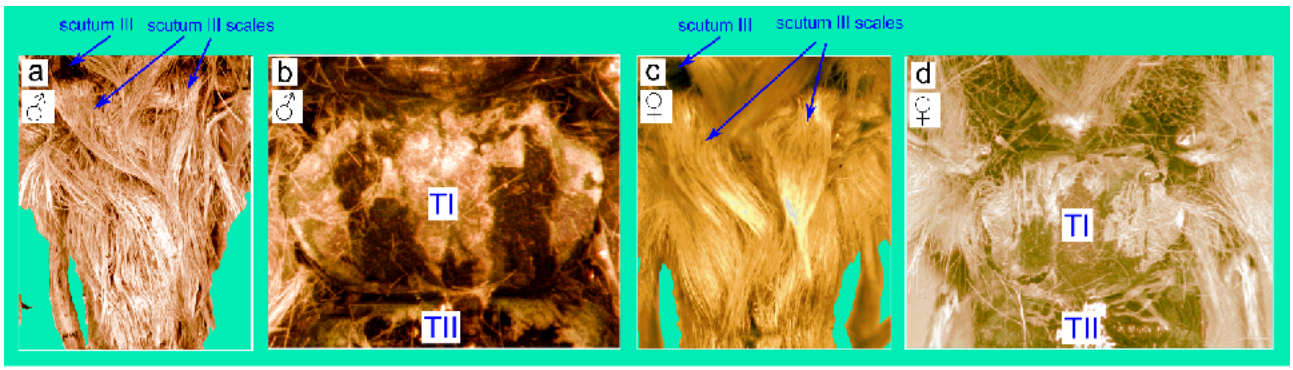

Figure 4. *Eudalaca rufescens*. Habitus dorsal anterior abdomen. Scales intact (a, c), and removed (b, d).

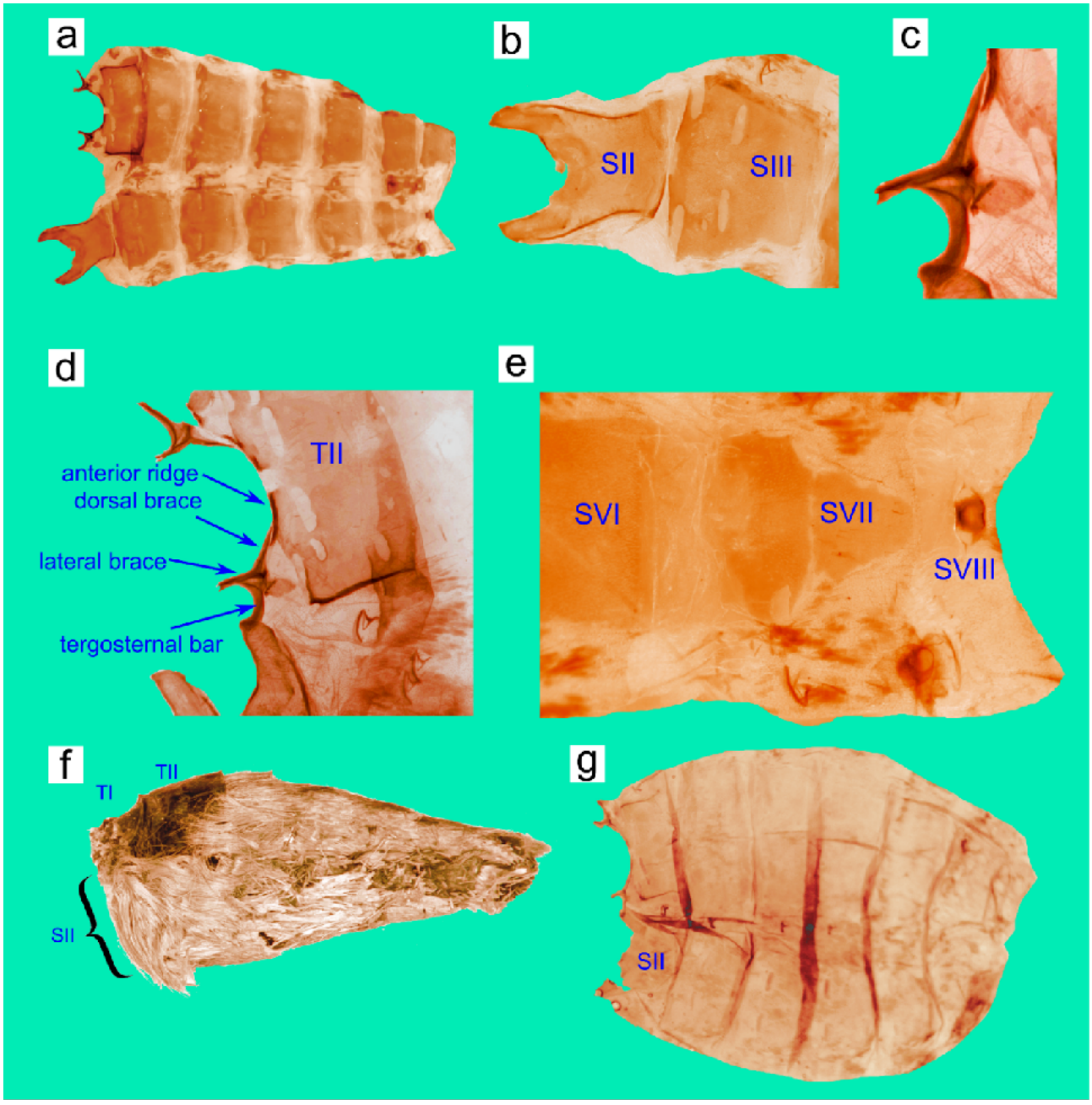

Figure 5. *Eudalaca rufescens*. (a) Male abdominal sclerites, (b) anterior sternites, (c) tergosternal sclerite (d), anterior tergum and tergosternal sclerite (e), posterior sternites, (f) habitus lateral abdomen, (g) female abdominal sclerites.

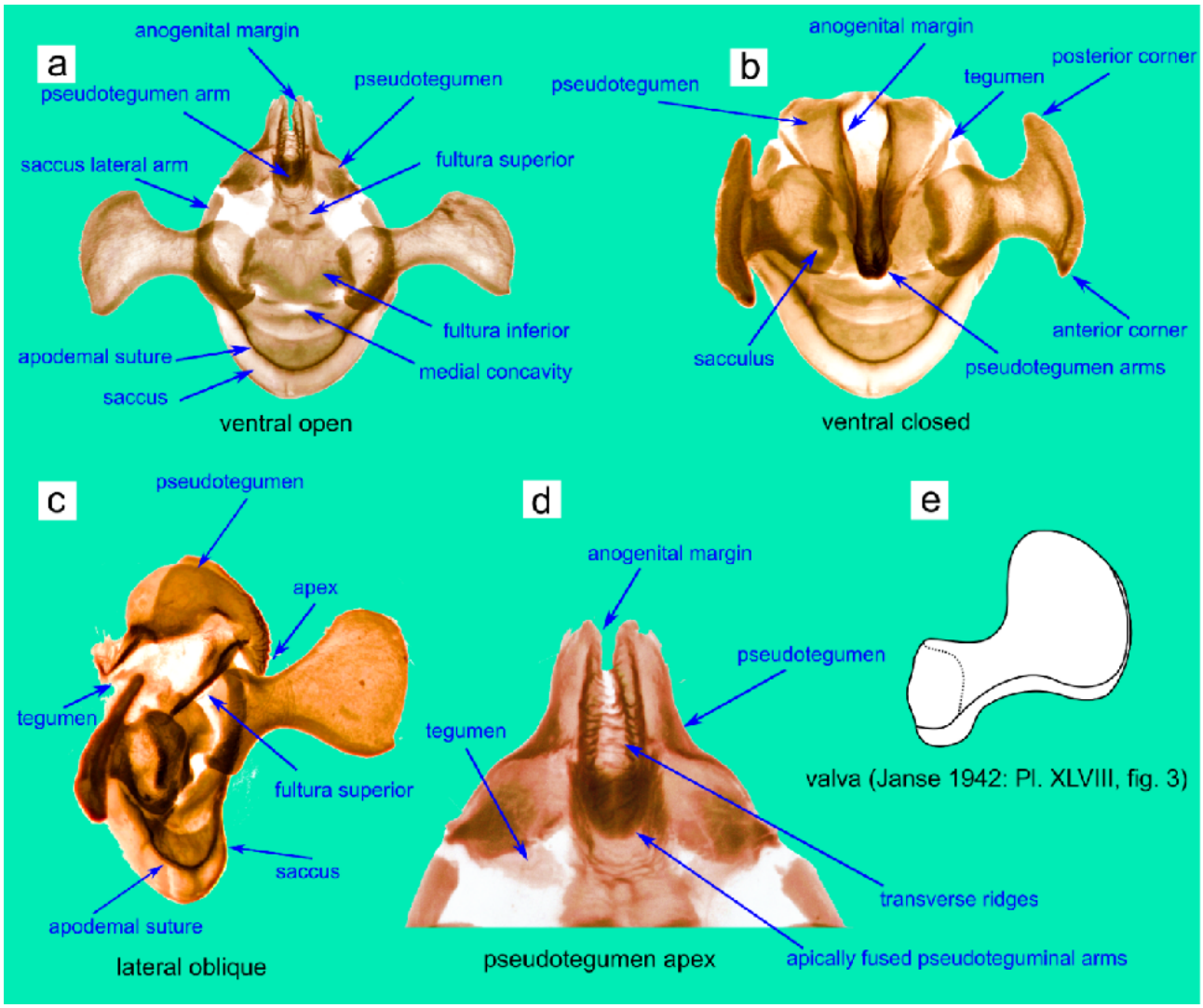

Figure 6. *Eudalaca rufescens*. (a-d) Male genitalia, and (e) diagram of valva from Janse (1942: pl. XLVIII, fig. 3).

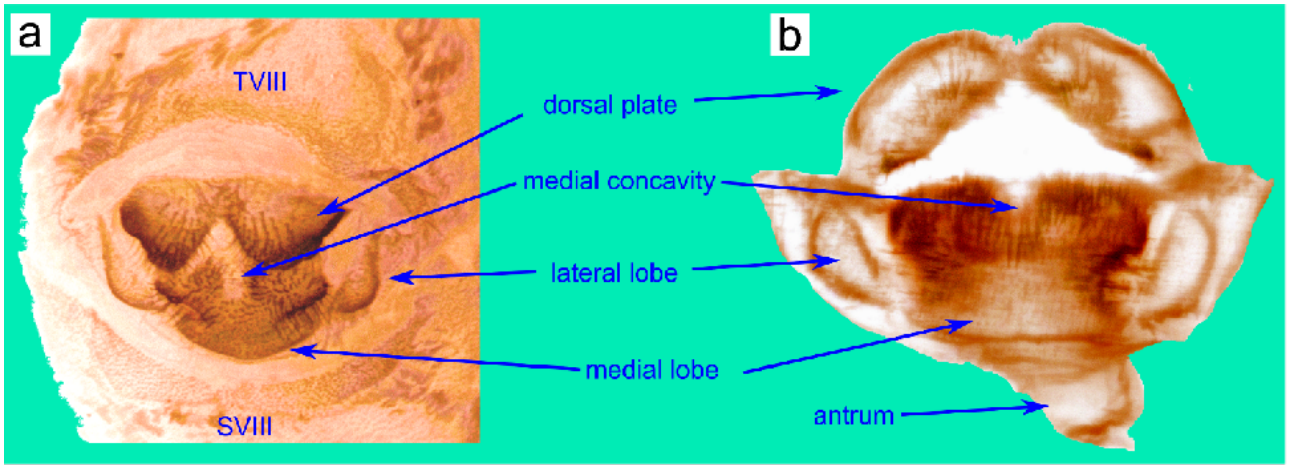

Figure 7. *Eudalaca rufescens*. Female genitalia. Posterior habitus (a), posterior dissected (b).

♀ (Figs. 1c-d, f). Wingspan ~43 mm, FW length: ~20 mm, width: 10 mm; HW length: 18 mm, width: 8 mm. Body colour as for male.

Head (Figs. 2b, c, e (down left), g): As in male other than following differences: Antenna with 50 annuli, annuli not as wide proportionally to length (Fig. 2e).

Thorax (Figs. 3b, d, f): As in male other than following differences: Foreleg without epiphysis (Fig. 3f). Tarsi missing from pro- and metalegs, relative leg lengths not measured. Two anal veins on hindwing (Fig. 3b).

Pregenital abdomen (Figs. 4c-d, 5g): As in male other than following differences: Tergum I dorsal surface wider than long, ratio 1: 1.5 (Fig. 4d). Sternum II subrectangular. Tergite and sternite sclerotization weak or absent (Fig. 5g).

Genitalia (Figs. 7a-b): Weakly sclerotized. Tergal lobes membranous. Dorsal plate (tergum IX) forming a pair of triangular lobes with numerous setae; fused across midline. Lamella antevaginalis with large, setose, medial lobe with medial concavity separating raised dorso-lateral margins, lateral lobe triangular, setose, not contacting dorsal plate. Bursa copulatrix not recovered other than junction of antrum with ductus bursa (Fig. 7b).

Habitat and biology: Joubert (1975) noted that *E. rufescens* is widespread in Natal province (now merged within Kwazulu-Natal), other than sandy coastal forests and dry northeastern Lowveld. The principal ecological factor limiting distribution is dry soil conditions affecting first instar larvae within plant detritus on the ground surface, and later instar larvae in the soil. The first five instars feed on dead, dry leaves and stalks of grass species while later instars feed on green leaves along with dead plant tissues. Adults in Natal emerge during late March and/or the beginning of April when soil temperature reaches at least 7 C at 1800 hours following a day-time high of at least 20 C, and when relative air humidity is 60% or higher by 1800 hr. Moths fly at dusk. Collection records by Janse (1942) are from the months of October, December and January-March.

Distribution: Current records indicate that the distribution of *E. rufescens* in southern Africa extends approximately between Durban in the south and Malawi to the north (Fig. 8). The small number of documented locality records are from South Africa: Free State (Bethlehem; Thabo Mofutsanyane), Gauteng (Pretoria, Randfontein [as Rand], Rietvle), KwaZulu-Natal (Balgowan, Colenso, Durban, Howick, Karkloof, Nquabeni [as Enquabeni], Sakabula Golf & Country Estate, Shafton), Limpopo (Indlovu DC), Mpumalanga (Amersfoort, Ermelo, Pilgrims Rest), North West (Potchefstroom) (Hampson 1910, Janse 1942, iNaturalist 2025).

Remarks: Taxonomic recognition of *E. rufescens* is possible because of the unique banding pattern on the forewing as shown in Fig. 1e. The original description of *E. rufescens* by Hampson (1910) included reference to three male and two female specimens. The male specimen (Fig. 1e) with the label information “Transvaal, Howick, III 1901, J.P. Cryoe, 1909-71” in the Natural History Museum (London, United Kingdom) is here **designated as the lectotype** to stabilize nomenclature. Janse (1942) placed included *Dalaca furva* Hampson, 1910 as a junior synonym of *E. rufescens*, although no explanation was given. The moth has very little indication of a forewing pattern, but examination of a photo of the primary types shows faint outlines that may correspond to an oblique forewing band (Fig. 1g). Hampson (1910) described the presence of a “faint whitish streak below base of cell; a very indistinct slightly paler oblique postmedial band faintly defined by dark lines from below costa towards apex, towards which it expands, to submedian fold, then bent upwards to the cell beyond the basal streak.” This description corresponds to the forewing pattern of the *E. rufescens* lectotype.

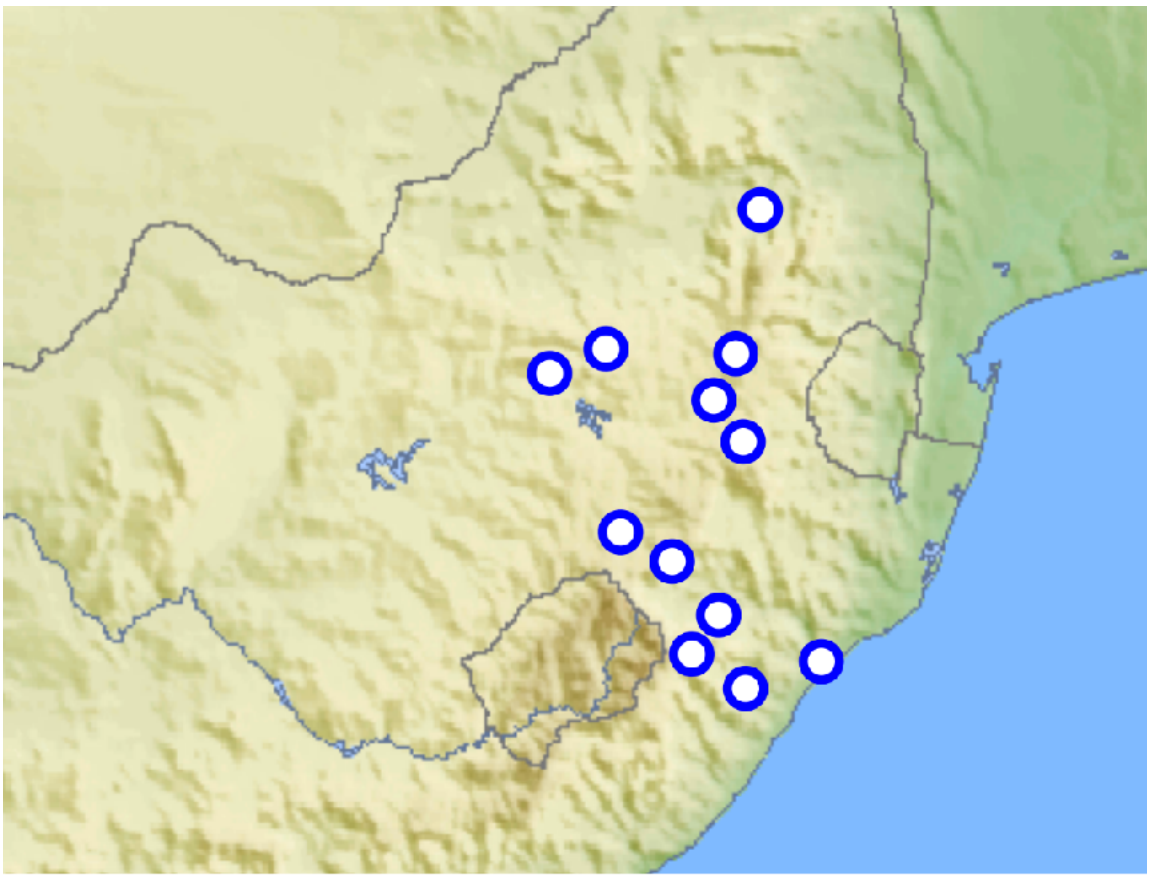

Figure 8. Distribution records of *Eudalaca rufescens* in South Africa from current study specimens, Hampson (1910), Janse (1942), and inaturalist.org photographic records.

The forewing pattern of *E. rufescens* is most similar to that of *E. ammon* which shares the presence of the V-shaped band edged with white, but differs by diffuse white shading within the band, distal expansion of band width towards the wing apex, scattered dark brown spots on the forewing, and a greyish-brown ground colour (Fig. 9). The diagrammatic illustration of the valva of the male genitalia (Fig. 6e) by Janse (1942) does not show an equal expansion of the blade with rounded corners seen in the male dissected here. It is not known if this difference represents variation within the species or if the diagram is a generalized representation and may be affected by the angle of the view. The adult illustrated by Janse (1942: pl. LVIII, fig. 22) has a forewing pattern conforming to the holotype of *E. rufescens*.

Of the 27 *Eudalaca* species for which genitalia are illustrated, 21 have a distally expanded valva blade, including *E. rufescens*. Distal valva expansion may represent a derived feature within the Hepialidae, and the broad anterior and posterior expansion of the blade may represent a derived feature within *Eudalaca,* representing a monophyletic grouping within the genus (Grehan *et al.* 2023). Further detailed genital descriptions of all *Eudalaca* and *Gorgopis*, species will be necessary to generate an informative conclusion.

***Eudalaca ammon* (Wallengren, 1860)**

(Figs. 9a-d, 10a-f, 11a-e, 12a-g, 13a-f)

Hepiolus [*sic*] *ammon* Wallengren, 1860: 43. Syntype(s). Type locality: southern Africa [Caffraria]. Type depository: Naturhistoriska Riksmuseet, Stockholm, Sweden.

Dalaca ammon: Walker (1865: 593), Kirby (1892: 884), Wagner & Pfitzner (1911: 4), Gaede (1930: 555), Janse (1942: 8), Viette (1950b: 201), Pinhey (1975: 30, 1978: 1).

Eudalaca ammon: Viette (1950a: 146 [*Eudalaca* aplicable to all *Dalaca* species in Janse 1942]), Nielsen *et al.* (2000: 837), Vári *et al.* (2002: 7), Grehan *et al.* (2023: 109).

= *Dalaca fuscescens* Hampson, 1910a: 156 (Janse 1942)

= *Dalaca goniophora* Hampson, 1910a: 157 (Janse 1942)
= *Dalaca rhodesiensis* Hampson, 1910a: 157 (Meyrick 1921)
= *Dalaca rhodesiensis* ab. *hampsoni* Strand, 1916: 11
= *Dalaca fuscescens* Hampson, 1910a (Viette 1950b)
= *Eudalacina ammon* Paclt, 1953: 145 (Viette 1950b)

♂ **(Figs. 9a, b, d).** Wingspan ~ 38 mm, FW length: 18 mm, width: 8 mm; HW length: 14 mm, width: 7 mm.

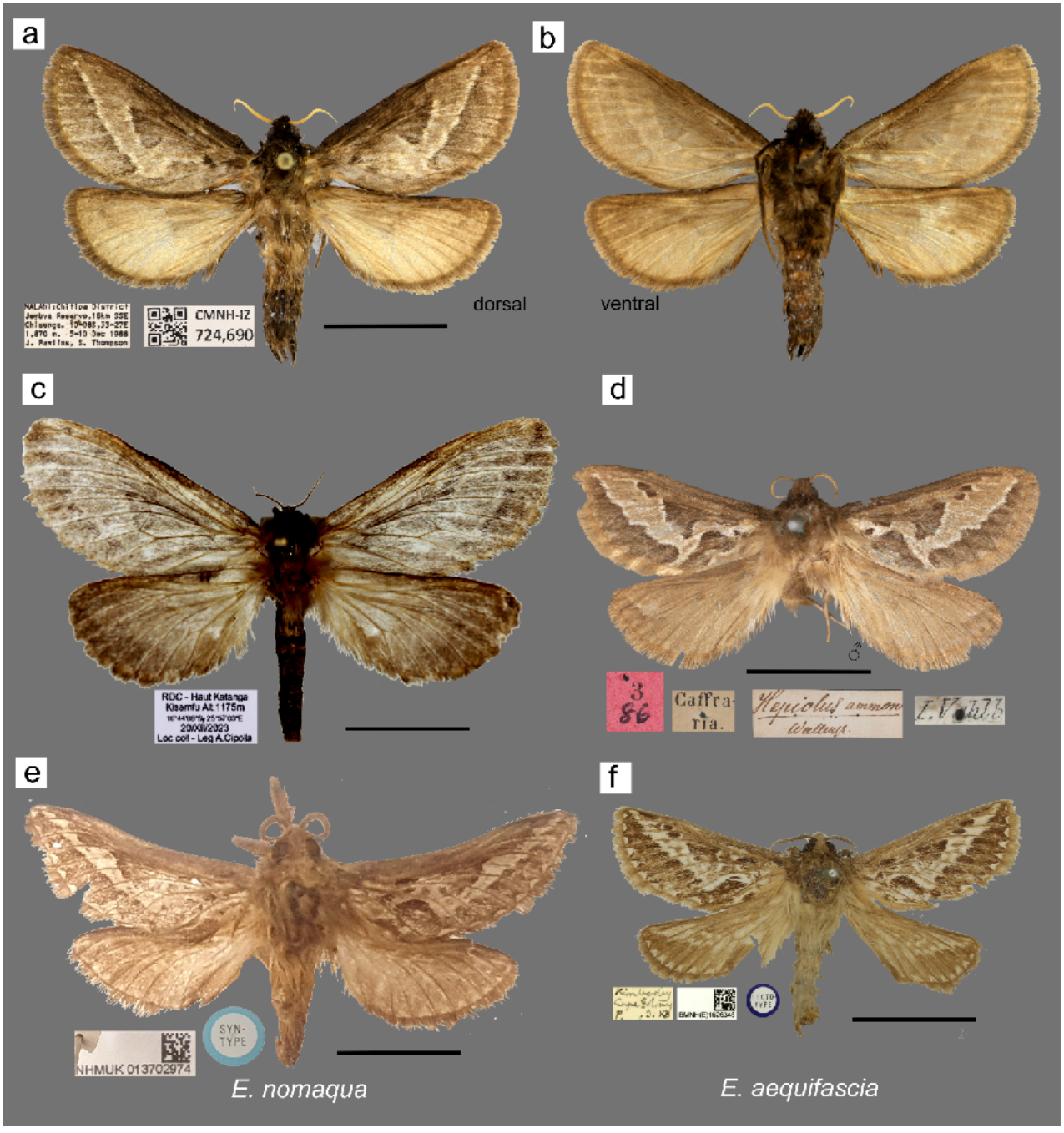

Figure 9. *Eudalaca* species. (a-d) *E. ammon*: (a-b) specimen collected by John Rawlins from Malawi, Carnegie Museum of Natural History, USA, (c) specimen collected by Alexandre Cipolla from the Democratic Republic of the Congo, (d) *E. ammon* lectotype, Naturhistoriska Riksmuseet, Stockholm, Sweden, (e) *E. nomaqua*, Natural History Museum, United Kingdom, (f) *E. aequifascia*, Natural History Museum, United Kingdom. Photos (a-b) by Vanessa Verdecia, (c) by Alexandre Cipolla, (d) by Tobias Malm, and (e-f) by David Lees.

Head (Figs. 10a-f): Covered with dense piliform scales, grayish brown, vertex broad, about 1/3 head width in dorsal view, shallow knob adjacent to each dorsal eye margin (Fig. 10b), eyes about 2/3 of head width in dorsal view. Antenna with 50 annuli, pedicel barrel-shaped, distally oblique; annuli wider than long, angled distally, width decreasing towards apex, apical segment elongate-ovoid diamond shape (Fig. 10e). Ocular scales arising from space between antenna condyle and medial edge of eye (Fig. 10d). Labium with three palpomeres, basal segment shorter and wider than second segment; distal segment shortest, Von Rath's organ present (Fig. 10f).

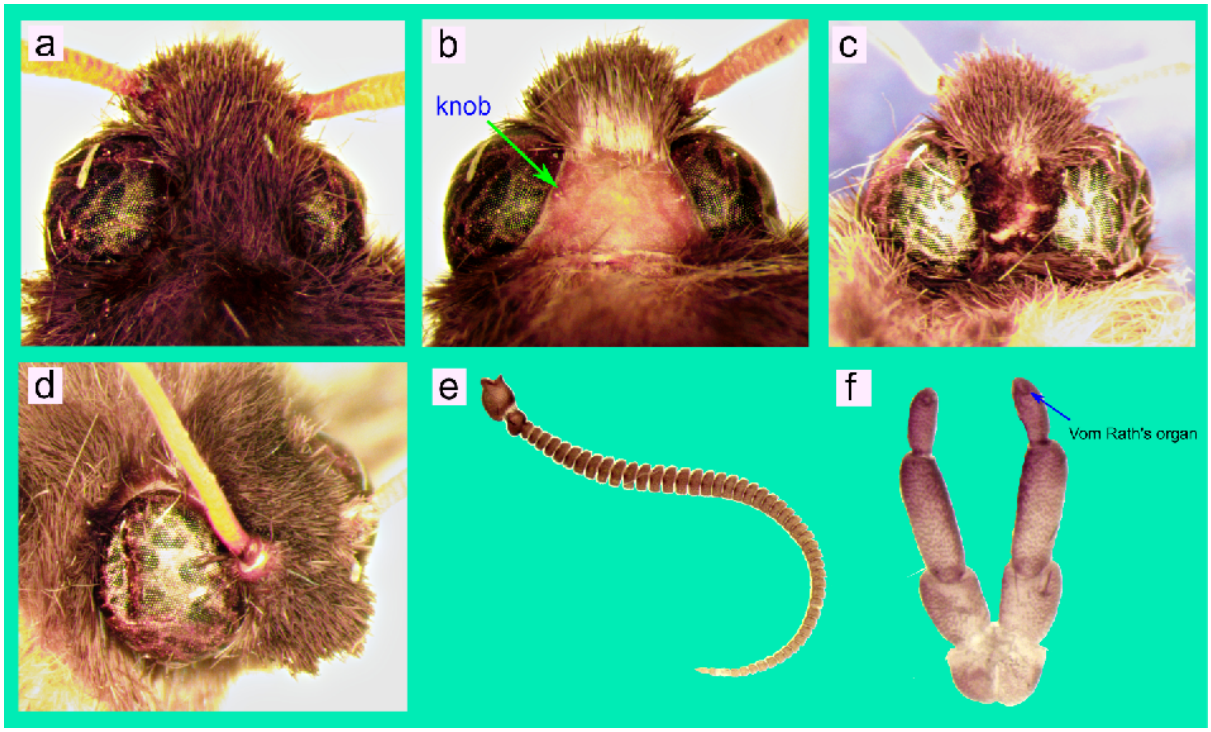

Figure 10. *Eudalaca ammon* male. (a-d) head, (e) antenna, (f) labial palps.

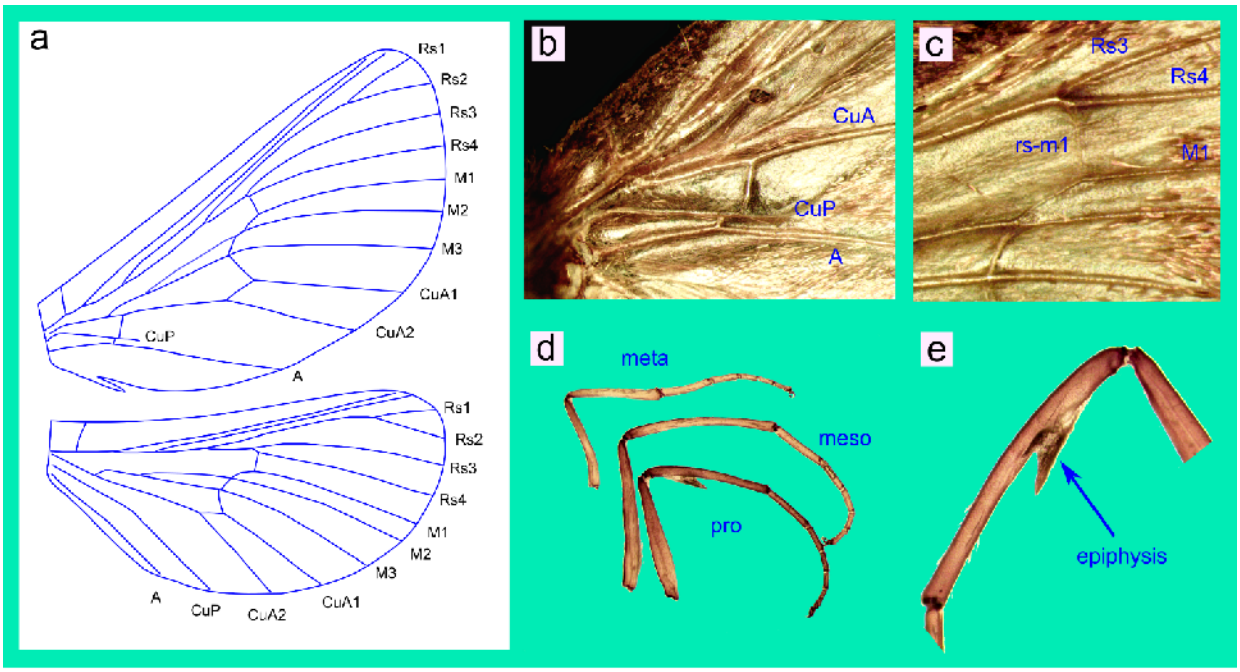

Figure 11. *Eudalaca ammon* male. Thoracic appendages. (a-c) venation, (d-e) legs.

Thorax (Figs. 9a, 11a-e, 12a): Dorsally covered with dense, piliform scales, predominantly greyish-brown with paler yellowish grey (Fig. 9a). Posterior metathoracic scales extending over anterior abdomen, obscuring posterior scutellum III (Fig. 12a). Wings mostly covered by lamellar scales. *Dorsal forewing* greyish-brown with irregular V-shaped band edged anteriorly and posteriorly with white, narrowing basally and wider distally towards diffuse apex, outer edge extending to Rs2, inner edge to Rs4. Wing base with dark brown patch. Outer margin with prominent fringe of greyish-brown scales, spatulate, expanding distally, distal margin dentate. *Dorsal hindwing* yellowish-brown with greyish-brown fringe (Figs. 9a). *Ventral fore and hindwings* anteriorly greyish brown, posteriorly pale yellowish-brown without markings, fringing scales greyish-brown with pale yellowish-brown tips. *Wing venation* (Fig. 11a): posterior discal cell widest, anterior discal cell sub-rectangular, Rs4-M_1 cross vein thin (Fig. 11b), CuP short distal to CuP-CuA crossvein (Fig. 11b?). Hindwing with single A vein. *Legs* (Fig. 11d, e): Covered with pale greyish-brown scales, epiphysis and arolium present, pro and meso legs subequal, metaleg shortest, pro-, meso-, meta- ratio 1: 1.2: 0.75. Metafemur and first tarsal segments strongly curved compared to other legs. Epiphysis elongate triangle (Fig. 11e).

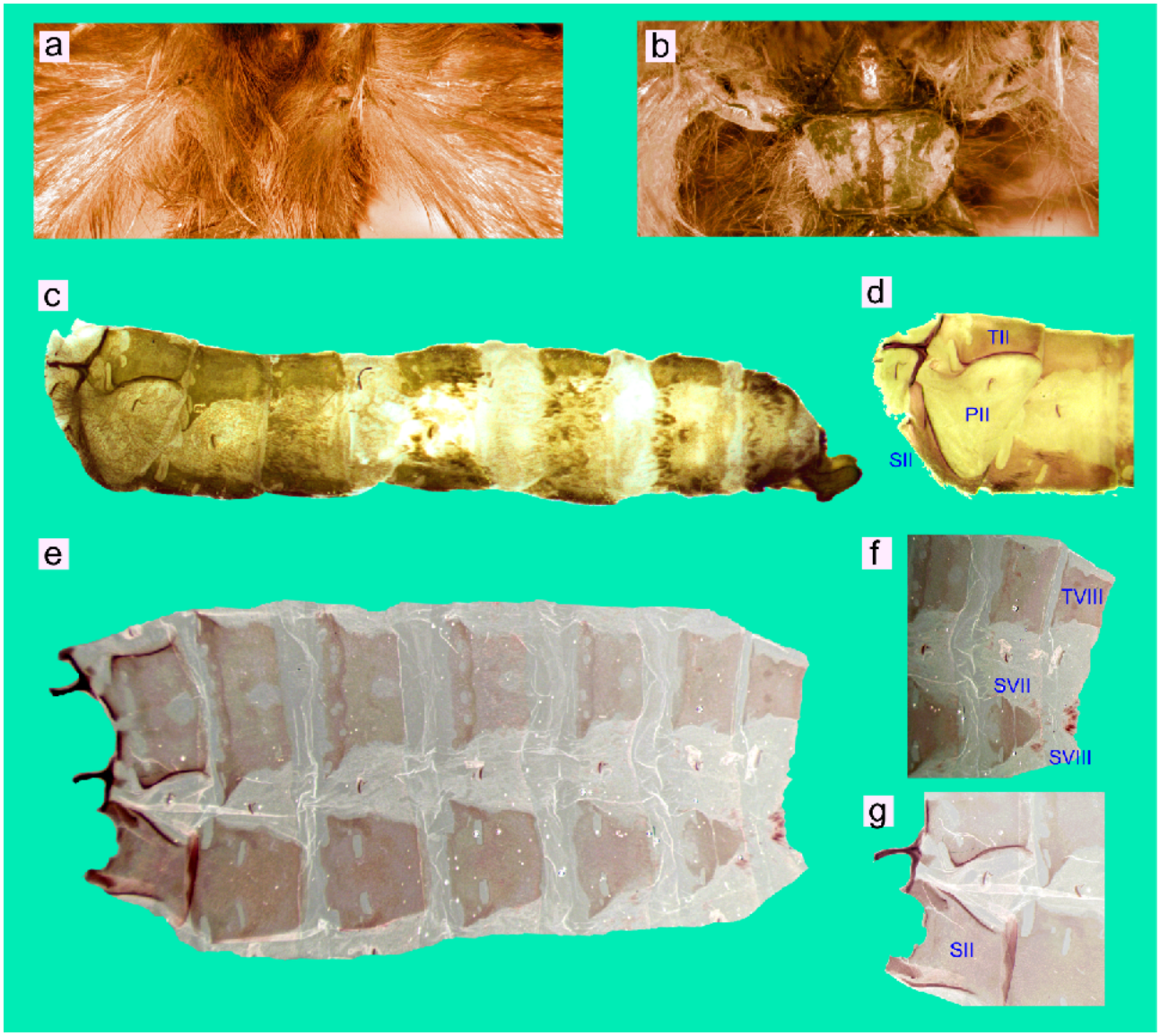

Figure 12. *Eudalaca ammon* male. Abdomen. (a) habitus dorsal anterior with scales present, (b) scales removed, (c) lateral, (d) anterior lateral, (e) sclerites, (f) posterior sclerites, (g) anterior sclerites.

Pregenital abdomen (Figs. 12a-g): Covered anteriorly with greyish-brown and pale yellowish grey scales. Anterior segments dorsally covered with longer pilose scales (Figs. 9a, 12a). Tergosternal sclerite with nearly straight tergosternal bar, lateral and dorsal brace forming an oblique angle, lateral brace subequal in length to tergosternal bar (Fig. 12d). Tergum I dorsal surface almost twice as wide as long, ratio 1: 1.7 (Fig. 12b). Tergum II rectangular, with robust, slightly convex lateral ridge, not fused medially; tergum III with antero-lateral projection extending down to pleura, lateral and medial apodemal attachment sites along anterior margin. Tergites IV-VI subequal, sequentially slightly narrower posteriorly, anterior apodemal attachment sites; tergite VIII sub-rectangular, slightly longer than wide (Fig. 12e). Sternum II 2x long as wide with antero-lateral arms strongly sclerotized and laterally edged with sclerotized ridge extending posteriorly, shallow concave, anterior margin strongly sclerotized each side of median (Fig. 13b); habitus orientation nearly vertical to axis of body (Fig. 12c). Sternites III-VI sub-rectangular, narrower posteriorly; sternum VII subtriangular, VIII unsclerotized, marked by patch of robust scales.

Genitalia (Figs. 13 a-f): Tergal lobes (tergum X) membranous. Tegumen subtriangular, narrow, not fused with pseudotegumen. Pseudotegumen triangular in posterior view (Fig. 13b), narrowing to postero-ventral apex, arms not fused (Figs. 13a-d). Fultura inferior wider than long, subrectangular. Fultura superior comprising a pair of triangular plates, narrowing towards pseudotegumen apex. Saccus broadly U-shaped anterior margin with prominent apodemal suture with anterior margin forming shallow point. Valva with distally expanded blade, posterior distal edge convex, antero-distal spur edged posteriorly with shallow convex distal margin.

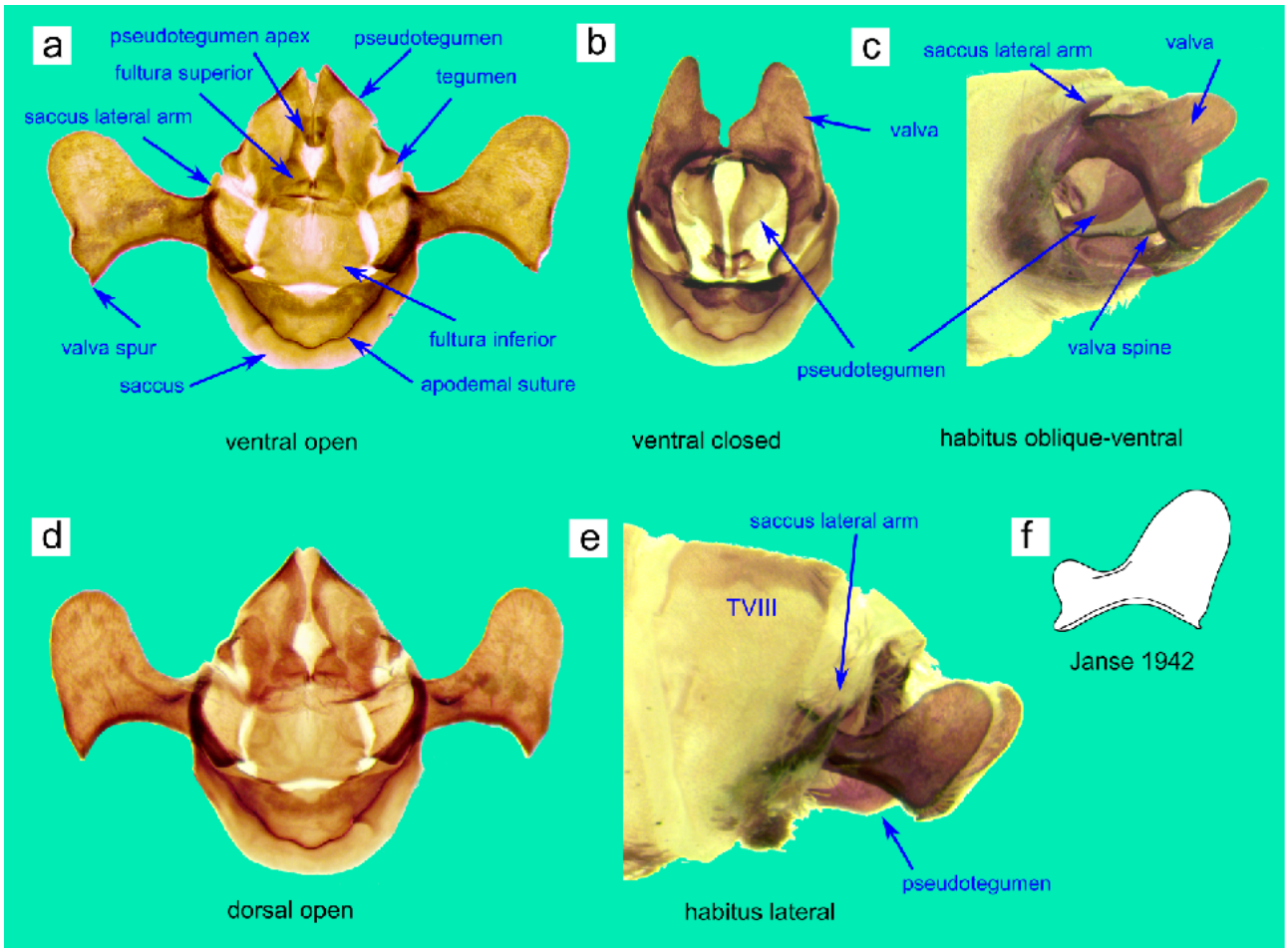

Figure 13. *Eudalaca ammon*. (a-f) male genitalia, (f) diagram of valva (from Janse 1942).

Habitat and biology: Larvae burrow into the ground beneath the ground cover of 'turf' [surface grass/herbs and humus] to a depth of about 15 cm. Tunnel entrance covered by a mat of silk webbing (Taylor 1963).

Distribution: The distribution of *E. ammon* is widespread from the Cape of South Africa to at Haut Kantanga (Democratic Republic of the Congo), and Malawi in the northwest, and northern Namibia in the northeast (Fig. 14). The Jembya sample represents the first documented locality record for Malawi, although Pinhey (1975) made a general reference to *E. ammon* being present in the country. In addition to the locality records presented in Fig. 14, Pinhey (1975) included Mozambique, Zambia, and Tanzania within the species range. The Jembya Forest Reserve specimens examined here were collected and currently exist as a small forest remnant (Fig.15) with an area of about 150 Km^2 (BIOPAMA 2025).

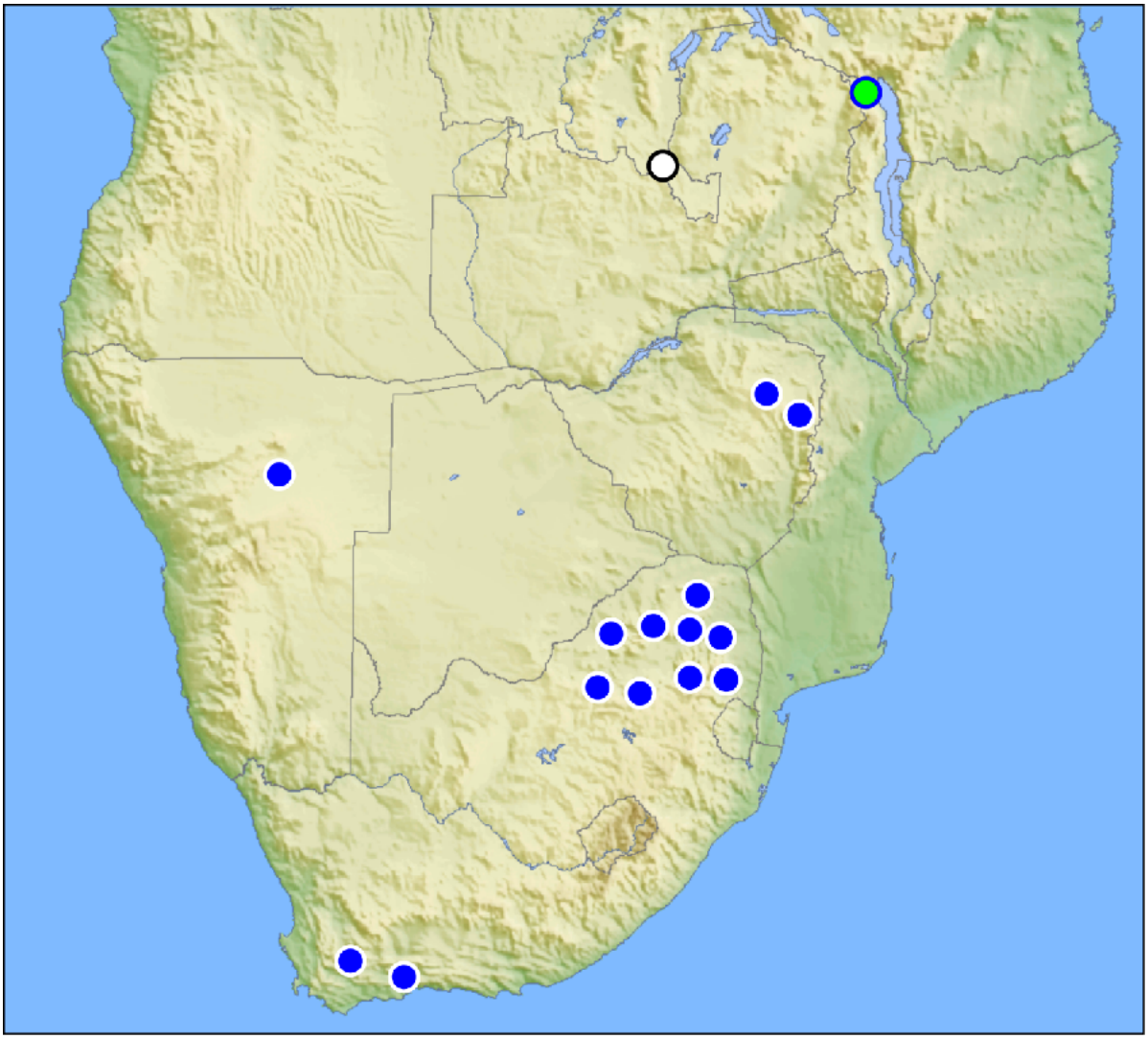

Figure 14. Distribution locality records of *Eudalaca ammon* in southern Africa. Green circle – current study, white circle – Alexandre Cipolla specimen, blue circles – inaturalist.org, Hampson (1910), Janse (1942).

Remarks: In the absence of a published illustration, earlier literature records of *E. ammon* are presumably based on the written description by Wallengren (1860). Illustrations by Gaede (1930: p. 555 pl. 80e), Janse (1942: LVIII, fig. 1), and Pinhey (1975: pl. 3, fig. 3) conform to the lectotype (Fig. 9d). A diagrammatic illustration of the valva for *E. ammon* (Fig. 12f) by Janse (1942) shows the same shape as found in our dissection, including the pointed antero-distal spur.

Figure 15. Jembya Forest Reserve collecting locality of *Eudalaca ammon* specimen from Malawi examined in this study.

The species *Hepiolus ammon* Wallengren, 1860 was described for an unspecified number of moths collected from 'Caffraria orientali'. The specimen was not illustrated, but briefly described as:

> "*Antennae flavescentes; alae anticae supra fuscae, fascia transversa testacea albo-marginata, obliqua, postice interrupta et versus basin directa, ibique nigro-unipunctata; posticae fuscobrunneae. Long. al. exp. 30 mill. Hab. in Caffraria orientali. Mus. Holm. Antennae maris filiformes."* [Antennae yellow; forewing above the dark transverse reddish [yellowish] brown fascia (band), white-margined, oblique, interrupted posteriorly and directed towards the base [of the wing] there also punctured by a black spot; hindwing dark brown. Wing expanse 30 mm. Location, in Caffraria orientali (Eastern Cape, South Africa). Mus. Holm. (Swedish Museum of Natural History, Stockholm). Male antennae filiform.]

Since the original description, specimens attributed to this species have been redescribed and illustrated by Gaede (1930: pl. 80e), Janse (1942: pl. LVIII, fig. 1), and Pinhey (1975: pl. 3, fig. 3). These records conform to the description by Wallengren (1860). After examining a series of specimens, Janse (1942: 9) noted:

> "This species is widely distributed over South Africa and very variable in forewing markings; in some specimens the facia (-fascia?) almost disappears, as in Hampson's *rhodesiensis*, and then the ground-colour is usually darker and has often a bronzy sheen; in some specimens a pale spur is formed from the angle of the fascia towards tornus, and in some a semilunar mark of a pale colour may be more or less developed beyond middle at inner margin. All sorts of gradations may be found if a large series is studied and none of these varieties can be attributed to a particular locality. A study of the genitalia proves that all these varieties belong to one species."

The forewing pattern of *Eudalaca ammon* is most like that of *E. rufescens* (Hampson, 1910) which shares the presence of the V-shaped band edged with white but differs by lacking the

diffuse white shading within the band. Two other species that show superficial similarity to *E. ammon* are *E. nomaqua* (Walker, 1856) (Fig. 9e) and *E. aequifascia* (Gaede, 1930) (Fig. 9f) that share with *E. ammon* the presence of an irregular white V-shaped band on the forewing, but in these species the band narrows distally and extends to the wing apex.

The type locality "Caffraria" on the label has been assumed to refer to the region that now corresponds to Eastern Cape province (Grehan *et al.* 2023). However, the location of the type at the Swedish Museum of Natural History makes it almost certain that the specimen was collected by J.A. Wahlberg, who collected extensively in southern Africa, but not in the Eastern Cape region (Irish 2024). The type locality, therefore, remains indeterminate. The original description of *E. ammon* did not specify the number of specimens involved. The male specimen (Fig. 9d) with the label information "Caffraria", red label 3/86, species label *Hepiolus ammon* Wallengr., and white label 'L. Vohlb" in the Naturhistoriska Riksmuseet, Stockholm, Sweden, is **here designated as the lectotype** to stabilize nomenclature.

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REFERENCES

BIOPAMA. 2025. *Biodiversity and Protected Areas Management Reference Information System*. https://rris.biopama.org/pa/33311 (Last accessed 23 November 2025).

Gaede, M. 1930. 24. Familie: Hepialidae. In: Seitz, A. (ed.), *Die Gross-Schmetterlinge der Erde, 14. Band. Die Afrikanischen Spinner und Schwärmer,* 553–559. A. Kernen, Stuttgart.

Grehan, J.R., Mielke, C.G.C., Ignatyev, N. & De Groof., B. 2021. New species of *Eudalaca* Viette, 1950 ghost moth from Karkloof Nature Reserve, South Africa (Lepidoptera: Hepialidae). *ZooNova* 11: 1–9.

Grehan, J.R., Mielke, C.G.C., Turner, J.R.G. & Nielsen, J.E. 2023. A revised world catalogue of Ghost Moths (Lepidoptera: Hepialidae) with taxonomic and biological annotations. *ZooNova*, 28: 1–337.

Hampson, G.F. 1910. Descriptions of new African moths. *Annals and Magazine of Natural History* 6: 145–160. https://doi.org/10.1080/00222931008692834.

iNaturalist. 2025. https://www.inaturalist.org. (Last accessed 18 November 2025)

Irish, J. 2024. Clarifying elusive, obscure, or misleading historical Namibian biodiversity collecting localities. *Namibia Wissenschaftliche Gesellschaft Journal*, 71: 59–99.

Janse, A.J.T. 1942. *The moths of South Africa 4(1) Jugatae*. E.P. et Commercial Print, Durban. 78 pp.

Joubert, P.C. 1975. The "ghost moth" (*Dalaca rufescens* Hampson) in Natal (Lepidoptera: Hepialidae). *Technical Communication Department of Agricultural Technical Services Republic of South Africa* 130: 1–21.

Joubert, P.C. 1978. The post-embryonic development and structure of the internal reproductive organs of *Dalaca rufescens* Hampson (Lepidoptera, Hepialidae). *Phytophylactica*, 10: 1–6.

Kirby, W.F. 1892. *A synonymic catalogue of Lepidoptera Heterocera, 1. Sphinges and Bombyces*. Gurney & Jackson, London. 951 pp. https://doi.org/10.5962/bhl.title.9152.

Meyrick, E. 1921. Descriptions of South African micro-Lepidoptera. *Annals of the Transvaal Museum*, 8: 7–47.

Mielke, C.G.C., Grehan, J.R. & Koike, R.M. 2025. Review of the genus *Cibyra* Walker (Lepidoptera: Hepialoidea: Hepialidae) with descriptions of twenty-four new species from Brazil and Argentina. *Zootaxa*, 5709: 1–74. https://doi.org/10.11646/zootaxa.5709.1.1.

Nielsen, E.S., Robinson, G.S. & Wagner, D. L. 2000. Ghost-moths of the world: a global inventory and bibliography of the Exoporia (Mnesarchaeoidea and Hepialoidea) (Lepidoptera). *Journal of Natural History*, 34: 823–878. https://doi.org/10.1080/002229300299282.

Paclt, J. 1953. Genera of the Hepialidae (Insecta, Lepidoptera). *Journal of the Asiatic Society*, 19: 141–148.

Pinhey, E.C.G. 1975. *Moths of southern Africa: descriptions and colour illustrations of 1183 species*. Tafelberg, Cape Town. 273 pp. 32 pl.

Scoble, M.J. 1985. Primitive Lepidoptera. In: Scholtz, C.H. and Holm E. (eds.), *Insects of southern Africa*: 344–348. Butterworths, Durban.

Strand, E. 1916. Neue Nebenformen exotischer Heterocera. *Archiv für Naturgeschichte*, 82A (3): 7–11.

Taylor, J.S. 1963. Notes on some South African Hepialidae. *Entomologist's Record and Journal of Variation*, 75: 185–187.

Vári, L., Kroon, D.M. & Krüger, M. 2002. *Classification and checklist of the species of Lepidoptera recorded in southern Africa.* Simple Solutions, Chatswood. 384 pp.

Viette, P. 1950a. Contribution à l'étude des Hepialidae (19e note). *Entomologisk Tidskrift*, 71: 144–146.

Viette, P. 1950b. Contribution à l'étude des Hepialidae (Dixième [10th] note). Hepialidae du Congo belge et du Territoire du Tanganyika. *Revue de zoologie et de botanique africaines,* 52: 201–206.

Wagner, W. & Pfitzner, R. 1911. Hepialidae. In: Aurivillius, C. & Wagner, H. (eds.), *Lepidopterorum Catalogus*, 4: 1–26. W. Junk, Berlin. https://doi.org/10.5962/bhl.title.166235.

Walker, F. 1865. Supplement 2. *List of the specimens of lepidopterous insects in the collection of the British Museum*, 32: 322–706.

Wallengren, H.D.J. 1860. Lepidopterologische Mittheilungen. *Wiener Entomologische Monatschrift*, 4: 33–46.

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