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**Research article**

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# *Calidolipeurus*, new genus for *Lipeurus megalops* Piaget, 1880 (Phthiraptera: Ischnocera: *Oxylipeurus*-complex), with a redescription of the type species and a preliminary key to the *Oxylipeurus*-complex

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**Abstract.** The chewing louse species *Lipeurus megalops* Piaget, 1880, is redescribed and illustrated. This species has previously been placed in the genus *Oxylipeurus* Mjöberg, 1910, but marked differences in preantennal structure, male and female genitalia, abdominal chaetotaxy, and structure of abdominal plates indicate that this species is not closely related to other species in this genus. We therefore erect a new genus, *Calidolipeurus* gen. nov. for this species. *Calidolipeurus* is presently monotypic, containing only *Calidolipeurus megalops* gen. et comb. nov. We also provide a preliminary key to the *Oxylipeurus*-complex.

**Keywords.** Phthiraptera, Ischnocera, *Oxylipeurus*-complex, new genus, redescription.

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## Introduction

The first comprehensive review of the *Oxylipeurus*-complex was by Clay (1938), who considered all species to belong to the same, morphologically variable, genus, *Oxylipeurus* Mjöberg, 1910. Within this genus, she designated six species groups, based on rough similarities in morphology. The third group comprised four species parasitizing small-bodied partridges in Southeast Asia, including *Lipeurus megalops* Piaget, 1880, parasitizing the crested partridge, *Rollulus roulroul* (Scopoli, 1786). Kéler (1958) considered this group distinct from *Oxylipeurus* s. str. and proposed the subgeneric name *Megalipeurus* Kéler, 1958. Most subsequent treatments of the *Oxylipeurus*-complex have followed Clay (1938) and Hopkins & Clay (1952), and considered *Megalipeurus* and most other proposed genera in the *Oxylipeurus*-complex to be synonyms of *Oxylipeurus* (e.g., Ledger 1980; Price *et al.* 2003)

However, in recent decades, redescriptions of several species in the *Oxylipeurus*-complex have been published (Mey 1990, 2010), including that of the type species *Oxylipeurus inaequalis* (Piaget, 1880). These indicate that *Oxylipeurus* s. str. is morphologically very different from most other species in the *Oxylipeurus*-complex, and that several genera commonly synonymized with *Oxylipeurus* (e.g., Price *et al*. 2003) should be accepted as valid. Mey (2009, 2010) has recently considered the genus *Megalipeurus* as a valid genus, including the species *L. megalops*.

We agree that all of the genera considered synonyms of *Oxylipeurus* in the recent checklist of Price *et al.* (2003) should be accepted as valid, following Mey (2009, 2010) and Gustafsson *et al*. (2020). This includes the recognition of the following genera considered synonymous with *Oxylipeurus* in the checklist of Price *et al*. (2003): *Eiconolipeurus* Carriker, 1945, *Epicolinus* Carriker, 1945, *Megalipeurus* Kéler, 1958, *Reticulipeurus* Kéler, 1958 and *Talegallipeurus* Mey, 1982.

However, Mey (2009) includes the species *L. megalops* in *Megalipeurus*, following its placement in Group III by Clay (1938) and in *Megalipeurus* by Kéler (1958). *Oxylipeurus megalops* is similar to other species in *Megalipeurus* in the presence of elongated and strongly sclerotized coni and in the general shape of the female subgenital plate, but it differs from all other species in the *Oxylipeurus*-complex in many significant characters (see below). We therefore here propose a new genus, *Calidolipeurus* gen. nov. for *L. megalops*.

## Material and methods

All examined specimens are deposited at the Natural History Museum, London, United Kingdom (NHMUK). Drawings were made using a drawing tube attached to a Nikon Eclipse N*i* (Nikon Corporation, Tokyo, Japan) and edited in GIMP (www.gimp.org). Measurements (all in mm) were made from live images in NIS-Elements (Nikon Corporation, Tokyo, Japan) for the following dimensions: HL = head length (along midline); HW = head width (at temples); POW = preocular width (at preantennal nodi); PRW = prothoracic width; PTW = pterothoracic width; AW = abdominal width (at segment V); TL = total length (along midline, including stylus). Terminology of morphological and setal characters and abbreviations thereof follow Gustafsson & Bush (2017).

Abbreviations used (following Gustafsson & Bush 2017 and Gustafsson *et al*. 2020): AL = anterior lobes; *as1–2* = anterior setae 1–2; *avs3* = anterior ventral seta 3; C = conus; CL = "claspers"; CLS = clypeo-labral suture; DPS = dorsal preantennal suture; DPAS = dorsal post-antennal suture; E = eye; ES = epistomal suture; HM = hyaline margin; LAVP = lateral accessory vulval plates; *mds* = mandibular seta; *mts3* = marginal temporal seta 3; *os* = ocular seta; *pos* = preocular seta; *psps* = principal post-spiracular setae; *pst1–2* = parameral setae 1–2; *s1–7* = sensilla 1–7; SGP = subgenital plate; SMC = secondary marginal carina; *ss* = sutural setae; STY = stylus; VM = vulval margin; *vsms1–2* = ventral submarginal setae 1–2; Y = Y-shaped thickening.

## Results

### *Systematics*

Order Phthiraptera Haeckel, 1896
Suborder Ischnocera Kellogg, 1896
Family Philopteridae Burmeister, 1838
*Oxylipeurus*-complex

***Calidolipeurus*** gen. nov.
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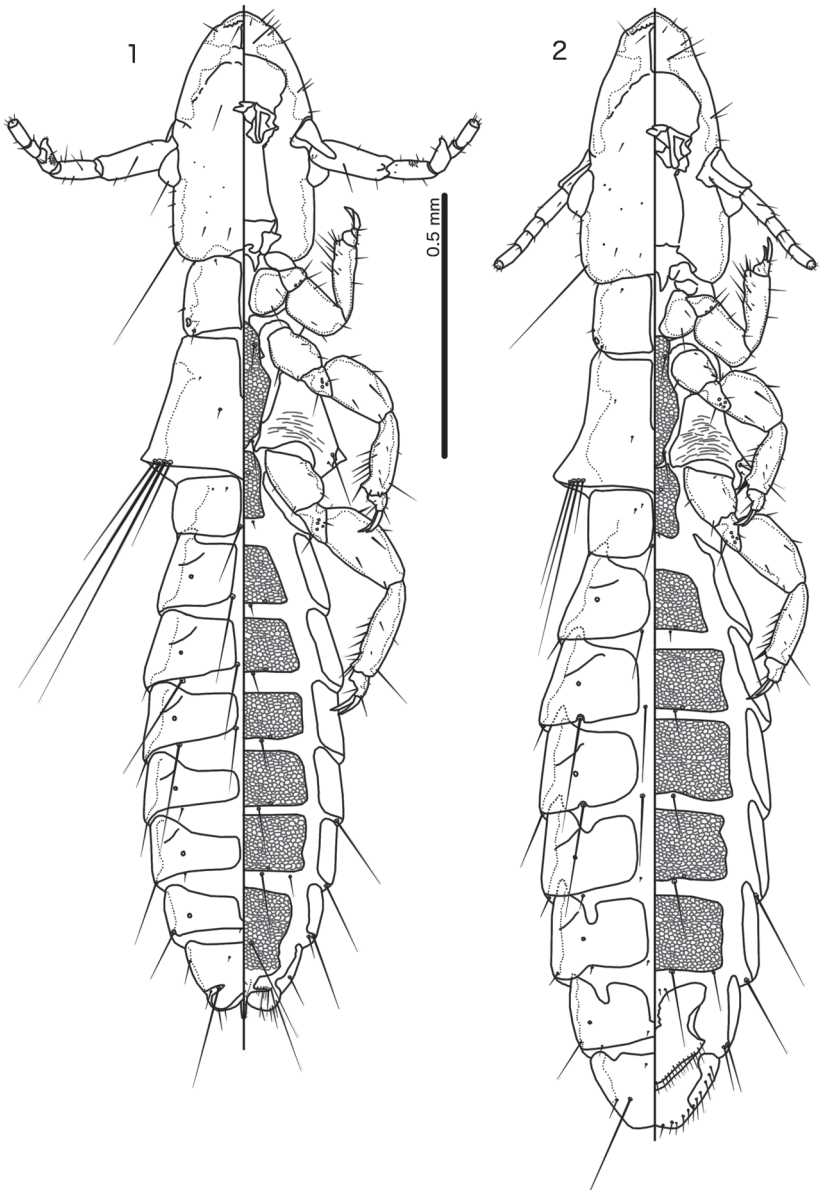
**Type species**

*Lipeurus megalops* Piaget, 1880.

**Diagnosis**

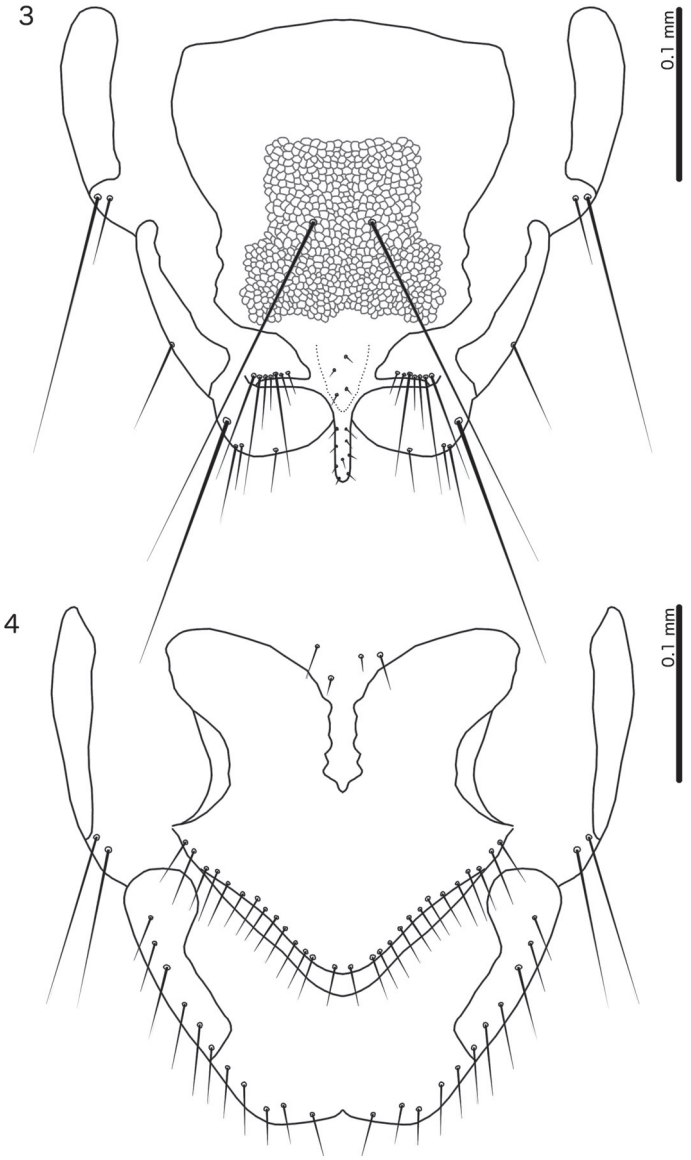
Based on morphological similarities, *Calidolipeurus* is likely most closely related to *Megalipeurus*, reflecting the close relationship between the hosts of the two louse genera (Wang *et al*. 2013). These two genera share the following characters: coni elongated in both sexes (Figs 5, 7); female subgenital plate with deep median indentation on anterior margin (Fig. 4); female vulval margin convex (Fig. 4); dorsal preantennal suture present (Fig. 5); tergopleurites II–VII medianly separated in both sexes (Figs 1–2); tergopleurites IX + X and XI fused (Figs 1–2).

*Calidolipeurus* can be separated from *Megalipeurus* by the following characters: marginal carina interrupted only near *as1* in *Megalipeurus*, but interrupted near *as1* and *as2* in *Calidolipeurus* (Fig. 5); dorsal preantennal suture transversal in *Megalipeurus*, but longitudinal in *Calidolipeurus* (Fig. 5);




**Figs 1–2.** *Calidolipeurus megalops* (Piaget, 1880) gen. et comb. nov., based on specimens on slide NHMUK010682491 (NHMUK). **1**. Habitus, ♂, dorsal and ventral views. **2**. Habitus, ♀, dorsal and ventral views.

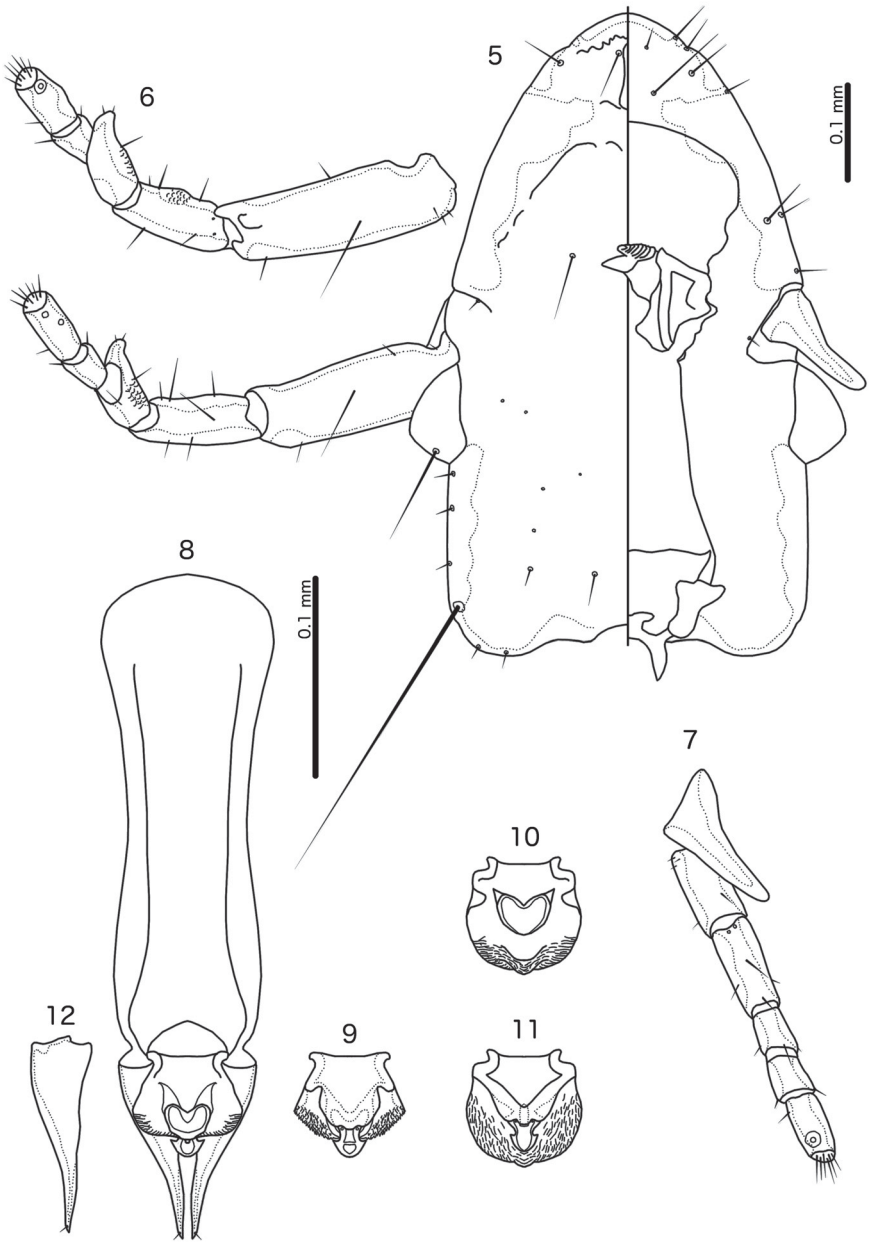
postmarginal carina extended medianly in *Calidolipeurus* (Fig. 5), but not in *Megalipeurus*; eyes gigantic in *Calidolipeurus* (Fig. 5), but not in *Megalipeurus*; preocular nodus present in *Megalipeurus* but absent in *Calidolipeurus* (Fig. 5); stylus reaches beyond distal margin of abdomen in *Calidolipeurus* (Fig. 3), but not in *Megalipeurus*; *ss* present on male abdominal segments VI–VII in *Megalipeurus*, but absent in *Calidolipeurus* (Fig. 1); *psps* present and of equal size on male tergopleurites IV–VI in *Megalipeurus*, but present on tergopleurites IV–VII in *Calidolipeurus* (Fig. 1) with those of tergopleurites VI–VII microsetae; male subgenital plate with lateral extensions following genital opening in *Calidolipeurus* (Fig. 3), but without such extensions in *Megalipeurus*; parameres very broad proximally, with overall shape roughly triangular in *Calidolipeurus* (Fig. 12), but with slender heads in *Megalipeurus*; proximal mesosome with large rounded lobes on each side in *Megalipeurus*, but without such lobes in *Calidolipeurus* (Fig. 9); gonopore with lateral hook-shaped elongations in *Calidolipeurus* (Fig. 11), but roughly rounded in *Megalipeurus*.




**Figs 3–4.** *Calidolipeurus megalops* (Piaget, 1880) gen. et comb. nov., based on specimens on slide NHMUK010682491 (NHMUK). **3**. Male subgenital plate and terminalia, ventral view. **4**. Female subgenital plate and terminalia, ventral view.

**Etymology**

*Calidolipeurus* is constructed from the Latin '*calidus*' for 'white spot in the forehead' and the genus name *Lipeurus* Nitzsch, 1818, commonly used for long and slender ischnocerans. This refers to the small, elongated dorsal preantennal suture of the type species, which appears white in many specimens in contrast to the otherwise brownish head. Gender: masculine.



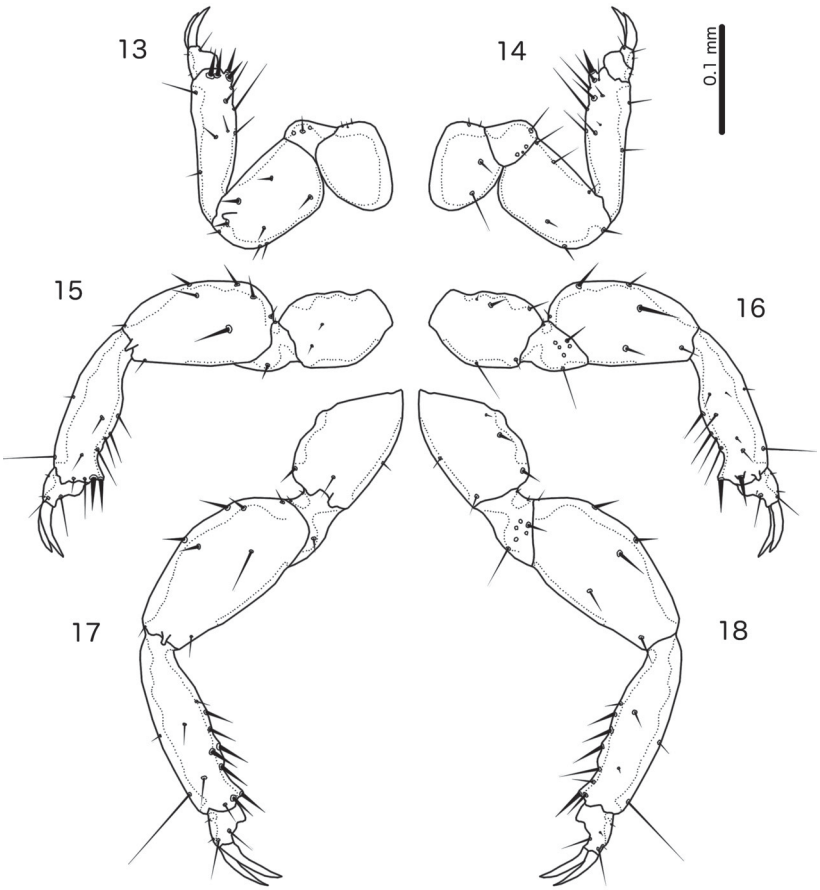

**Figs 5–12.** *Calidolipeurus megalops* (Piaget, 1880) gen. et comb. nov., based on specimens on slide NHMUK010682491 (NHMUK). **5**. Male head, dorsal and ventral views. **6**. Male antennae, ventral view. **7**. Female antenna, ventral view. **8**. Male genitalia (mesosome everted), dorsal view. **9**. Male mesosome (everted), ventral view. **10**. Male mesosome (not everted), dorsal view. **11**. Male mesosome (not everted), ventral view. **12**. Male paramere, dorsal view. Male and female antenna at same scale as male head; all genitalic elements at same scale.

**Description**

**Both sexes**

Overall body shape elongated, 'lipeuroid' (Figs 1–2). Head longer than wide (Fig. 5). Marginal carina widening considerably anteriorly, interrupted laterally near sites of *as1* and *as2*. Frons slightly protruding; marginal carina at frons with serrated posterior margin. Dorsal preantennal suture narrow, median, longitudinal. Ventral carina uninterrupted, indistinct. Head chaetotaxy as in Fig. 5; *avs3* anterior, near *vsms1–2*; *mds* not visible in all examined specimens; *s1–3*, *s5* and *s7* present; *pos* posterior to eye; *mts3* only macroseta. Coni elongated. Antennae sexually dimorphic (Figs 5–7). Eyes large. Preocular nodus absent. Marginal temporal carina slender. Dorsal postantennal suture absent.

Thoracic and abdominal segments as in Figs 1–2. Legs as in Figs 13–18; similar between sexes but some setae more slender in female than in male. Meso- and metasterna fused. Metepisterna long, with extensive striation. Tergopleurites II–VII medianly separated; tergopleurite VIII medianly continuous in posterior end; tergopleurites IX + X and XI fused. Sternites medianly continuous, reticulated in both sexes. Subgenital plates differ between sexes, formed by fusion of sternites VIII–IX.




**Figs 13–18.** *Calidolipeurus megalops* (Piaget, 1880) gen. et comb. nov., based on specimens on slide NHMUK010682494 (NHMUK). **13**. Male leg I, dorsal view. **14**. Male leg I, ventral view. **15**. Male leg II, dorsal view. **16**. Male leg II, ventral view. **17**. Male leg III, dorsal view. **18**. Male leg, III, ventral view.

**Male**

Pedicel and flagellomere I with rugose antero-dorsal surface; flagellomere with antero-dorsal claw-like elongation. Thoracic and abdominal chaetotaxy as in Fig. 1; *ss* present on segments II–V; *psps* present on segments IV–VII, those of VI–VII microsetae. Tergopleurite IX–XI with variable lateral incision reaching apertures of setae. Subgenital plate with extensive reticulation (Fig. 3), distally elongated into protruding stylus; lateral extensions on each side of base of stylus associated with anterior margin of ventral genital opening. Basal apodeme elongated, of roughly equal width, but in some specimens with concave lateral margins (Fig. 8). Mesosome largely unsclerotized, and looks different in specimens with everted or non-everted genitalia. Proximal mesosome flattened to concave, but diffuse and here illustrated approximately (Figs 8–11); on each side sinusoid thickening articulating with parameral heads. Distal mesosome roughly quadratic, with extensive folds and serrations on dorsal and ventral surfaces. Internal sclerite roughly heart-shaped (Fig. 10). Gonopore longer than wide, with lateral hook-shaped in distal end; in anterior end a dark central sclerite may be proximal part of endophallus; one small aperture on each side of presumed endophallus may be microsetae, but setae not visible in examined specimens. In everted genitalia, the gonopore extends beyond distal margin of mesosome, and rugose areas of mesosome contracted (Figs 8–9). Parameres roughly triangular (Fig. 12), median corners of heads almost touching anteriorly; median margin of anterior parameres weakly sclerotized; *pst1* not visible; *pst2* microsetae near distal end of paramere.

**Female**

Pedicel and flagellomere I without rugose areas and without claw-like elongation. Head chaetotaxy similar to male, but *s7* shorter. Thoracic and abdominal chaetotaxy as in Fig. 2; *ss* present on segments II–V; *psps* present on segments IV–VII; those on VI–VII microsetae. No lateral incision of tergopleurite IX–XI in examined specimens. Subgenital plate formed by fused sternites VIII–IX (Fig. 4); proximal margin deeply indented medianly. Vulval margin strongly convex; setae situated anterior to margin and do not form distinct sets. Subvulval sclerites absent. Lateral and posterior margins of abdominal segment IX–XI with more or less equally spaced and equal-sized setae.

**Host distribution**

Only known from the type host of the type species, *Rollulus roulroul* (Scopoli, 1786) (Galliformes: Phasianidae).

**Geographical range**

Indo-Malayan region, both mainland and the Indonesian archipelago.

***Calidolipeurus megalops*** (Piaget, 1880) gen. et comb. nov.
Figs 1–18

*Lipeurus megalops* Piaget, 1880: 675.

*Esthiopterum megalops* – Harrison 1916: 138.
*Oxylipeurus megalops* – Clay 1938: 166.
*Oxylipeurus* (*Megalipeurus*) *megalops* – Kéler 1958: 327 [inferred].
*Megalipeurus megalops* – Mey 2009: 162 [inferred].

**Type host**

*Rollulus roulroul* (Scopoli, 1786) – crested partridge (Phasianidae).

**Type locality**

Madagascar [= in error]. Known from Southeast Asia (Thailand, peninsular Malaysia, Borneo).

**Material examined**

**Non-type material**

BORNEO • 4 ♂♂, 9 ♀♀; R. Meinertzhagen, 10905; NHMUK-010682491; NHMUK • 6 ♂♂, 10 ♀♀; R. Meinertzhagen, 10891; NHMUK-010682483; NHMUK • 2 ♂♂, 1 ♀♀; Jan. 1901; R. Meinertzhagen, 3655; NHMUK-010682490; NHMUK.

MALAYSIA • 1 ♂, 1 ♀; Terengganu [as Trengganu]; 140 ft a.s.l.; 102°0′ E, 5°28′ N; 26 Feb. 1974; Gn. Lawit Expedition, Brit. Mus. 1974-2; NHMUK-010682494; NHMUK.

THAILAND • 1 ♂♂, 4 ♀♀; 1939; R. Meinertzhagen, 17661; NHMUK-010682866; NHMUK.

**Description**

See genus description.

**Male**

Lobes of genital opening with 3–5 mesosetae and 1–3 short setae on each side. Stylus with 12–16 microsetae ventrally or laterally (some situated near base of stylus). Measurements (n = 14, except TL where n = 13): TL = 1.84–2.01 (1.93); HL = 0.44–0.50 (0.47); POW = 0.25–0.28 (0.27); HW = 0.26–0.29 (0.28); PRW = 0.21–0.24 (0.22); PTW = 0.35–0.41 (0.38); AW = 0.34–0.41 (0.37).

**Female**

Proximal margin of subgenital plate typically with two setae on each side, but placement asymmetrical and 1–3 setae may be present on each side; lateral setae about twice as long as median setae. Vulval margin with 10–15 slender setae on each side (Fig. 4). Measurements (n = 25, except AW where n = 24): TL = 2.11–2.31 (2.21); HL = 0.49–0.53 (0.51); POW = 0.25–0.29 (0.27); HW = 0.28–0.32 (0.30); PRW = 0.22–0.24 (0.23); PTW = 0.37–0.43 (0.40); AW = 0.40–0.46 (0.43).

**Remarks**

Piaget (1880) gives as type locality Madagascar, which is well outside the range of the host species (Madge & McGowan 2002). Clay (1938) examined Piaget's types, which she found to be identical to material from Borneo. Piaget's type locality designation is therefore here considered erroneous.

We have seen photos of the lectotype and paralectotype (at NHMUK), but not examined these specimens in person. The photo of the female lectotype does not differ from the non-type specimens we have examined.

## *Preliminary key to the genera of the* Oxylipeurus*-complex*

Characters taken primarily from Clay (1938), Clay & Meinertzhagen (1941), Carriker (1945, 1967), Emerson & Ward (1958), Kéler (1958), Elbel & Price (1970), Mey (1982, 1990, 2006, 2010), Gustafsson *et al*. (2020), and examinations of specimens. Additional groups deserving recognition at the genus level may exist, and many species of the complex are in need of further study and redescription. The genus *Labicotes* Kéler, 1939, may also belong to this complex, based on similarities in male and female terminalia, male genitalia, and temporal chaetotaxy between this genus and *Chelopistes*. This needs to be confirmed by additional studies of species of *Labicotes*, and the genus is not included here.

1. Broad-headed, with width of head similar to, or wider than, length of head (Figs 19–20); temples with elongated "horns" (Fig. 19) or with prominent lateral bulges (Fig. 20) ..... 2
– Slender-headed, with head clearly longer than wide (Fig. 5); temples generally rounded, never with prominent bulging ..... 3

2. Temporal setae *mts1–2* macrosetae (Fig. 20) ..... ***Trichodomedea*** Carriker, 1946
– Temporal setae *mts1–2* microsetae (Fig. 19) ..... ***Chelopistes*** Kéler, 1939

3. Dorsal preantennal suture present (Figs 5, 21) ..... 4
– Dorsal preantennal suture absent or if present only visible around aperture of *ads* and not extending medianly (Fig. 22) ..... 10

4. Dorsal preantennal suture as median, elongated oval, not expanded laterally (Fig. 5); female terminalia with marginal mesosetae distributed more or less equally around distal margin (Fig. 4); eye very large and preocular nodus absent (Fig. 5) ..... ***Calidolipeurus*** gen. nov.
– Dorsal preantennal suture transversal, normally reaching apertures of *ads* (Fig. 21); female terminalia with marginal setae gathered in the same area (Fig. 23); eye not very large (Fig. 21), and preocular nodus present ..... 5

5. Clypeo-labral suture present (Fig. 24); stylus expanded distally, with small "hooks" on lateral margins (Fig. 25) ..... ***Gallancyra*** Gustafsson & Zou, 2020
– Clypeo-labral suture absent (Fig. 5); stylus differing in shape, but never with lateral 'hooks' ..... 6

6. Dorsal preantennal suture with postero-lateral elongations ("epistomal suture" sensu Kéler 1958) extending towards preantennal nodi (Fig. 26); hyaline margin present (Fig. 26) ..... ***Splendoroffula*** Clay & Meinertzhagen, 1941
– Dorsal preantennal suture without such extensions (Fig. 21); hyaline margin absent (Fig. 21) ..... 7

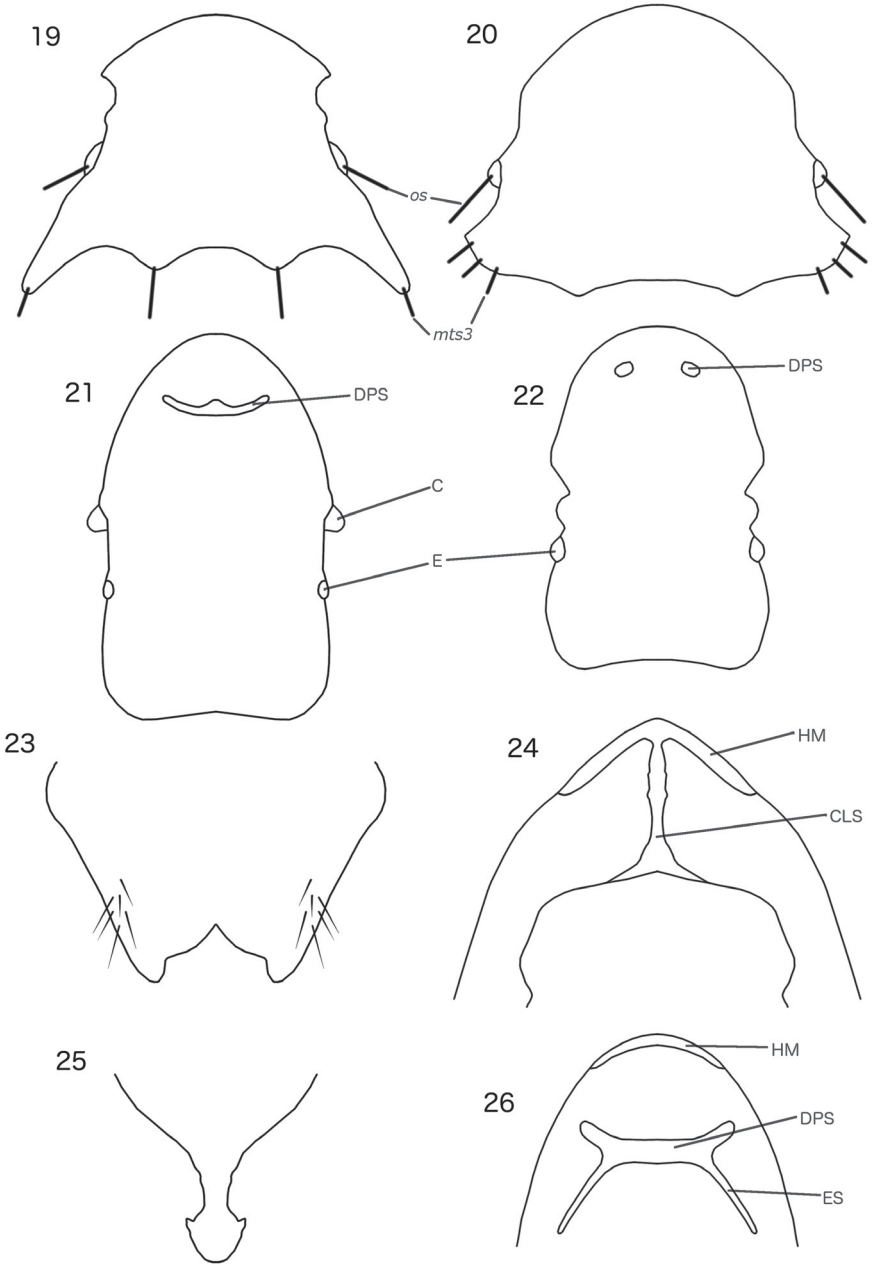
7. Dorsal postantennal suture present (Fig. 27); male genitalia asymmetrical, with mesosome much reduced (Fig. 28) ..... ***Oxylipeurus*** Mjöberg, 1910
– Dorsal postantennal suture absent (Fig. 21); male genitalia symmetrical, with prominent mesosome (variable, but similar to Figs 8–11) ..... 8

8. Coni elongated (similar to Fig. 5); male mesosome with prominent V- or Y-shaped thickening in distal half (Fig. 29); proximal margin of mesosome with rounded lateral lobes (Fig. 29); frons convergent to median point in most species (similar to Fig. 27) ..... ***Megalipeurus*** Kéler, 1958.
– Coni short (Fig. 21); male mesosome without thickening in distal half; proximal margin variable, but never with rounded lateral lobes; frons rounded ..... 9

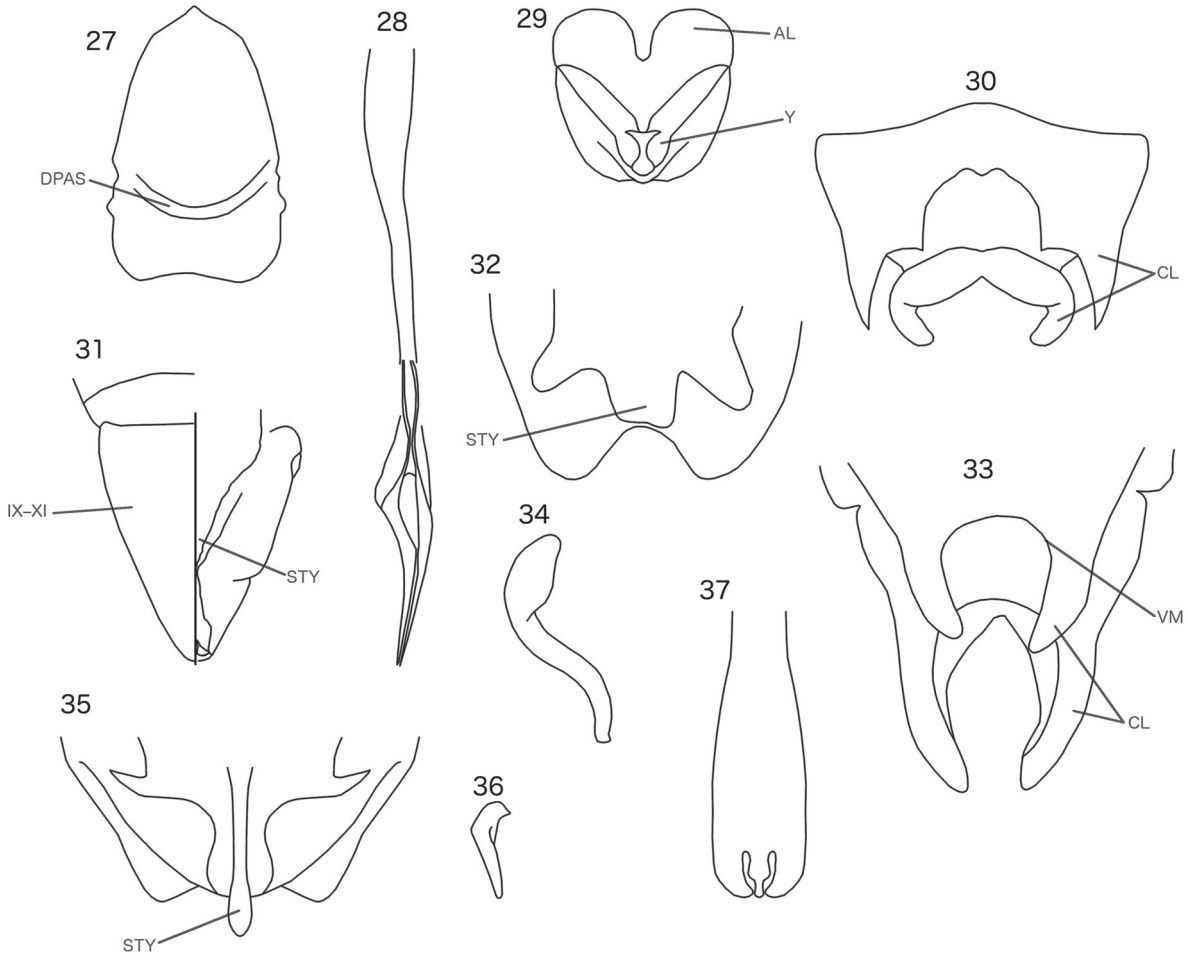
9. Male abdominal segments IX and IX+X with prominent postero-lateral extensions ("claspers" sensu Carriker 1945) (Fig. 30) ..... ***Eiconolipeurus*** Carriker, 1945
– Male abdomen without such structures ..... ***Reticulipeurus*** Kéler, 1958

10. Frons convergent to median point (Fig. 27) ..... 11
– Frons rounded (Fig. 21) ..... 12

11. Male tergopleurites II–VII medianly continuous with no median indentations of anterior margin; male abdominal segments IX+X and XI fused into roughly triangular cone (Fig. 31); stylus elongated and slender, in the shape of a posterior extension of the male subgenital plate (Fig. 31); female terminalia without "claspers", vulval margin more or less straight ..... ***Afrilipeurus*** Mey, 2010
– Male tergopleurites II–VII either divided medianly, or with median indentation of anterior margin; male tergopleurites IX+X and XI separate, posterior margin concave (similar to Fig. 1); stylus short and blunt (Fig. 32); female terminalia with "claspers", vulval margin deeply concave (Fig. 33) ..... ***Talegallipeurus*** Mey, 1982




**Figs 19–26. 19**. Outline of head and temporal macrosetae (cut off distally) of male *Chelopistes meleagridis* (Linnaeus, 1758), redrawn from Kéler (1939). **20**. Outline of head and temporal macrosetae (cut off distally) of female *Trichodomedea setosus* Carriker, 1946, redrawn from original description. **21**. Outline of head and dorsal preantennal suture of male *Reticulipeurus mesopelios* (Nitzsch, 1866), redrawn from Gustafsson *et al*. (2020). **22**. Outline of head and dorsal preantennal suture of male *Cataphractomimus junae* Gustafsson *et al*., 2020, redrawn from original description. **23**. Female terminalia of *Reticulipeurus mesopelios* (Nitzsch, 1866), redrawn from Gustafsson *et al*. (2020); vulval margin, lateral macrosetae, and subvulval plates not illustrated. **24**. Ventral view of preantennal area in *Gallancyra dentata* (Sugimoto, 1934) (redrawn from Gustafsson & Zou 2020a). **25**. Outline of stylus in *Gallancyra dentata* (Sugimoto, 1934) (redrawn from Gustafsson & Zou 2020a). **26**. Outline of preantennal area and dorsal preantennal suture of *Splendoroffula ampullaceal* Kéler, 1955, redrawn from Kéler (1958). Antennae not included in any illustration. Abbreviations used: C = conus; CLS = clypeo-labral suture; DPS = dorsal preantennal suture; E = eye; ES = epistomal suture; HM = hyaline margin; *mts3* = marginal temporal seta 3; *os* = ocular seta. Illustrations are not to scale.

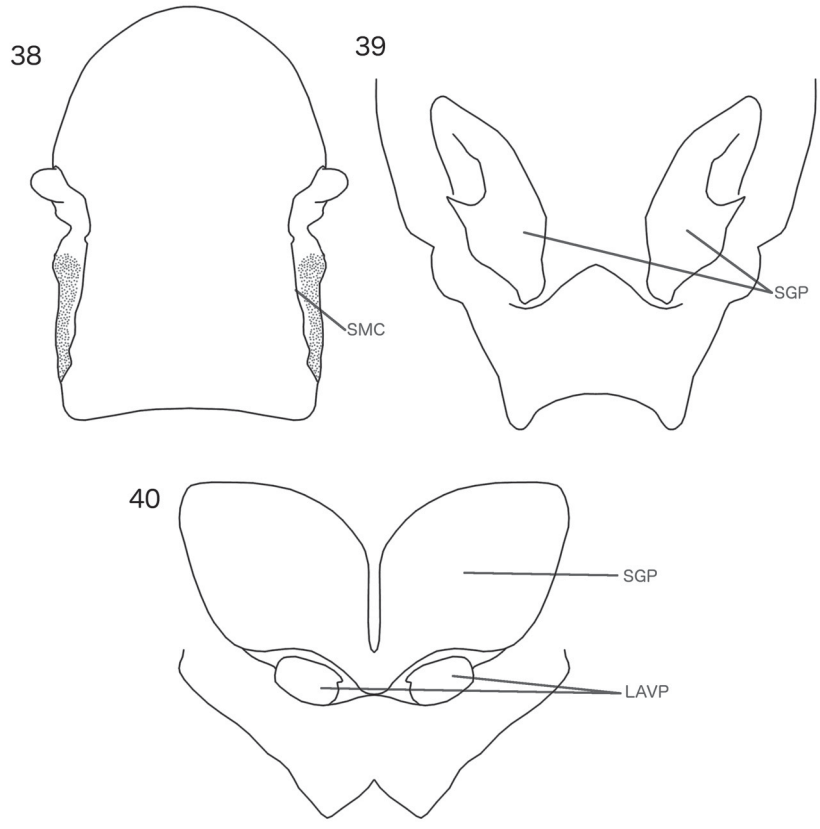



**Figs 27–37. 27**. Outline of head and dorsal post-antennal suture of *Oxylipeurus inaequalis* (Piaget, 1880), redrawn from Mey (1990); original drawing asymmetrical. **28**. Male genitalia of *Oxylipeurus inaequalis* (Piaget, 1880), redrawn from Mey (1990); some details left out for clarity. **29**. Ventral view of mesosome of *Megalipeurus sinensis* Gustafsson *et al*., 2020, redrawn from original description. **30**. Dorsal view of male terminalia of *Eiconolipeurus melanotis* Carriker, 1945, redrawn from original description; setae not illustrated. **31**. Dorsal and ventral views of male terminalia of *Afrilipeurus vincentei* Kéler, 1953, redrawn from Mey (2010); seta not illustrated. **32**. Ventral view of male terminalia and stylus of *Talegallipeurus tenuis* Mey, 1982, redrawn from original description; setae not illustrated; original illustration asymmetrical (Mey 1982). **33**. Ventral view of female terminalia and vulval margin of *Talegallipeurus tenuis* Mey, 1982, redrawn from original description; setae not illustrated. **34**. Outline of male paramere of *Sinolipeurus tetraophasis* (Clay, 1938), redrawn and simplified from Gustafsson *et al.* (2020). **35**. Outline of male terminalia and stylus of *Sinolipeurus tetraophasis* (Clay, 1938), redrawn and simplified from Gustafsson *et al.* (2020). **36**. Outline of male paramere of *Reticulipeurus ithaginis* (Clay, 1938), redrawn and simplified from Gustafsson *et al.* (2020). **37**. Distal section of male genitalia of *Epicolinus clavatus* (McGregor, 1917), redrawn from Carriker (1945). Abbreviations used: AL = anterior lobes; CL = "claspers"; DPAS = dorsal post-antennal suture; IX–XI = tergopleurites IX–XI; STY = stylus; VM = vulval margin; Y = Y-shaped thickening. Antennae not included in any illustration. Illustrations are not to scale.

12. Male parameres strongly S-curved (Fig. 34); stylus arising centrally on abdominal segment IX+X (Fig. 35) ..... ***Sinolipeurus*** Gustafsson *et al*., 2020
– Male parameres not S-curved (Fig. 36); stylus varying in shape, but always arising terminally or subterminally on subgenital plate (similar to Fig. 3) ..... 13

13. Male genitalia simple, with parameres fused to basal apodeme and mesosome much reduced (Fig. 37) ..... ***Epicolinus*** Carriker, 1945
– Male genitalia with parameres articulating with basal apodeme, and mesosome not reduced (similar in structure but not shape to Fig. 8) ..... 14

14. Lateral margins of postantennal head with secondary, ventral carina between antennal socket and site of *mts2* or *mts3* (Fig. 38); area between margin of head and secondary carina, densely reticulated, including ventral surface of eye (Fig. 38); male parameres with *pst1–2* situated close together apically; male gonoporal complex does not reach distal margin of mesosome; female subgenital plate divided medianly (Fig. 39)..... ***Valimia*** Gustafsson & Zou, 2020
– Lateral margins of postantennal head without secondary carina and without extensive ventral reticulation (similar to Fig. 5); male parameres with *pst1–2* separated, and only *pst2* apical; male gonoporal complex reached to or beyond distal margin of mesosome; female subgenital plate medianly continuous (Fig. 40)..... ***Cataphractomimus*** Gustafsson *et al*., 2020




**Figs 38–40. 38**. Outline of male head of *Valimia polytrapezius* (Burmeister, 1838), with post-antennal ventral carina and densely reticulated area marked with grey dots; other characters omitted. **39**. Outline of ventral view of female terminalia of *"Oxylipeurus polytrapezius*" (Burmeister, 1838). Setae not illustrated. (38–39 redrawn from Gustafsson & Zou 2020b) **40**. Outline of ventral view of female terminalia of *Cataphractomimus impervius* Gustafsson *et al*., 2020, redrawn and simplified from the original description. Antennae not included in any illustration. Abbreviations used: LAVP = lateral accessory vulval plates; SGP = subgenital plate; SMC = secondary marginal carina. Illustrations are not to scale.

## Discussion

Clay (1938) included illustrations of only a few species of *Oxylipeurus* and most of these illustrations are partial. As Clay (1938) is the only comprehensive revision of the genus, particularly for the Old World species, the systematics of this group has been confused, and most recent authors have adopted an overly conservative approach (e.g., Price *et al*. 2003). The complex includes a large number of morphologically homogeneous groups, some of which Clay (1938) considered species groups. Most of these species groups are distinct enough to warrant recognition at the genus level and a thorough revision of the complex is needed. Within this complex, the following genera should be recognized as valid: *Afrilipeurus* Mey, 2010; *Calidolipeurus* gen. nov.; *Cataphractomimus* Gustafsson *et al.*, 2020; *Chelopistes* Kéler, 1939; *Eiconolipeurus* Carriker, 1945; *Epicolinus* Carriker, 1945; *Gallancyra* Gustafsson & Zou, 2020; *Megalipeurus* Kéler, 1958; *Oxylipeurus* Mjöberg, 1910; *Reticulipeurus* Kéler, 1958; *Sinolipeurus* Gustafsson *et al.*, 2020; *Splendoroffula* Clay & Meinertzhagen, 1941; *Talegallipeurus* Mey, 1982; *Trichodomedea* Carriker, 1946 and *Valimia* Gustafsson & Zou, 2020. Additional morphologically distinct groups exist within this complex, which represent undescribed genera.

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