Review of North European species of the genus *Lathrolestes* (Hymenoptera, Ichneumonidae) with description of one new species from Öland (Sweden)

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Abstract

The genus *Lathrolestes* Förster (Hymenoptera: Ichneumonidae) from Northern Europe is reviewed. A new species, *L. oelandinus* sp. n. from Öland (Southern Sweden) is described. Illustrated diagnoses for 23 Northern European species are provided. *Lathrolestes soperi* Reschchikov, 2010 is recorded for the first time in the Palearctic region (from the UK) and *L. bipunctatus* (Bridgman, 1886), *L. citreus* (Brischke, 1878), *L. clupeatus* (Zetterstedt, 1838) are new records for Denmark, and *L. moravicus* Habermehl, 1923 is a new record for Finland, France and Russia. Additionally *L. ensator* recorded newly from Belorus, *L. erythrocephalus* from Azerbaijan, *L. macropygus* and *L. pictilis* from Austria. Trophic interactions of the genus are discussed.

Key words: Ctenopelmatinae, Perilissini, parasitoid wasps, Scandinavia, Fårö, trophic interactions, host switch, ovipositor morphology
Introduction

One of the poorly known ichneumonid subfamilies, Ctenopelmatinae (Hymenoptera, Ichneumonidae) specialized on sawflies (Hymenoptera, Symphyta) includes the genus *Lathrolestes* Förster, 1869. It is a large genus within the tribe Perilissini, with 103 previously known distinct species (Reshchikov et al. 2010, 2012, Reshchikov 2010, 2011a, 2011b, 2011c, 2012a, 2012b, 2013a, 2013b, 2015) 38 of them from the Nearctic region (including 1 introduced Palearctic species and 1 Holarctic species); 49 species from the Palearctic region, 2 from the Afrotropical (Yu et al. 2012, Reschchikov 2013b), 10 from the Neotropical (Reschchikov et al. 2012, Reschchikov 2015) and 7 from the Oriental (Reschchikov 2010a, 2011c,) regions. The extremely low number of Holarctic species or even transpalearctic species is noticeable, as well as the absence of the genus in the Australasian and Oceanic regions. Poor diversity of the genus in the tropics was believed to be associated with poor diversity of hosts (Gauld 1997). However, according to recent work, South East Asia is considered as one of the hotspots for Symphyta (Wei & Niu 2009, Smith 2011).

The genus *Lathrolestes* was established by Förster (1869) but several species were previously described in other genera: *L. luteolator* (Gravenhorst, 1829) in *Mesoleptus*, *L. orbitalis* (Gravenhorst, 1829), *L. erythrocephalus* (Gravenhorst, 1829) and one of the species with smallest body size, *L. clypeatus* (Zetterstedt, 1838).— in *Tryphon*; *L. buccinator* (Holmgren, 1857), *L. lucidulus* (Holmgren, 1857), *L. macropygus* (Holmgren, 1857) and *L. pictilis* (Holmgren, 1857) — in *Perilissus*. “Bidrag till kännedom om Skandinaviens Tryphonar” by Carl Gustaf Thomson (1883) includes description of Perilissini and seven species of *Lathrolestes*: *L. caudatus* (Thomson, 1883), *L. frontator* (Thomson, 1883), *L. luteolus* (Thomson, 1883), *L. nigrigollis* (Thomson, 1883), *L. pleuralis* (Thomson, 1883), *L. ungarlaris* (Thomson, 1883) and *L. marginatus* (Thomson, 1883) (minor synonym of *L. verticalis* (Brischke, 1871). Before this work the North European fauna contained 22 species (Reschchikov 2013a).

The scope of this paper is to show and describe Northern European diversity of the genus *Lathrolestes* belonging to one of the poorly known ichneumonid subfamilies, Ctenopelmatinae (Hymenoptera, Ichneumonidae) specialized on sawflies (Hymenoptera, Symphyta). A new species from Öland (Southern Sweden), *L. oelandinus* sp. n. is described and several new records are presented. An identification key to European species was provided in a previous paper (Reschchikov 2013a).

Material and methods

Specimens. Northern Europe is considered here as the following: UK, Fennoscandia, Baltic region and North West of Russia. Additional material from other parts of the Palearctic region was used but as this study is part of the project “Ctenopelmatinae, a poorly known group of parasitic wasps in Sweden” funded by the Swedish Taxonomy Initiative (http://www.slu.se/en/collaborative-centres-and-projects/artdatabanken/the-swedish-taxonomy-initiative) the most important source of material was the Swedish Malaise Trap Project (SMTP), a large-scale, national survey of insects (Station Linné, Öland, Sweden, http://stationlinne.se/smfp.html) (Fig. 1). The most interesting samples came from trap 22 that was set in Gamla Skogsby, Öland (just a few hundreds meters from the Station Linné) on a meadow with shrub vegetation. This trap yielded the new species *L. oelandinus* sp. n.

More than 5000 specimens of Ctenopelmatinae from the Swedish Malaise Trap Project were processed. Also material from the following collections were examined:

MZH Finnish Museum of Natural History, Helsinki, Finland;
MZLS Musée de Zoologie, Lausanne, Switzerland;
MZLU Zoologiska Museet, Lunds universitet, Lund Sweden;
NCMK Norwich Castle Museum, Norwich, UK;
HNHM Hungary, Budapest, Hungarian Natural History Museum;
NHSR Naturhistoriska Riksmuseet, Stockholm, Sweden;
NTNU Norwegian University of Technical Science and Natural History, Trondheim, Norway;
RMNH Naturalis Biodiversity Centre, Leiden, Netherlands;
RSME National Museums of Scotland, Edinburgh, United Kingdom;
SMF Natur-Museum Senckenberg, Frankfurt, Germany;
UUZM Museum of Evolution, Uppsala University, Uppsala, Sweden;
ZIN Zoological Institute, Saint Petersburg, Russia;
Additional material was collected in Sweden (Fig. 2). Sweep net, Malaise traps (Malaise, 1937; Townes, 1962) and yellow pan traps (Campbell et al. 2007, Frank & Dirrigl 2012) were used. All the material was preserved in 70% ethanol. The type specimens are databased and the data is available on www.naturarv.se and www.gbif.org.

**FIGURES 1–2.** 1, sampling by Swedish Malaise Trap Project (list of sampling sites and map are available at http://www.stationlinne.se/en/research/the-svedish-malaise-trap-project-smtp/traps/); 2, sampling by author (map is available at https://www.google.com/maps/d/edit?mid=zdSsRooS-iS4.kHQkqoUpeMBc).

**Figures.** Most images were acquired digitally using Canon EOS 5D digital camera and combined using Zerene®. All images were further processed using various minor adjustment levels in Adobe Photoshop® such as image cropping and rotation, adjustment of contrast and brightness levels, colour saturation, and background enhancement. Stacked images are available in colour and high resolution at http://www.morphbank.net. Several of the images were previously published (Reshchikov 2013a).

Adults of *Lathrolestes* range in body length from 3 to 15 mm, and vary widely in colour (Fig. 3). They can be recognized by the occipital carina not intercepting the hypostomal carina (Fig. 14) and can be distinguished from *Priopoda* Holmgren, 1856 (Figs. 9, 11): 1) by that the first tergite is not elongate, its length is less than twice as long as broad (Fig. 12) and 2) by the hind margin of the last visible sternite that is without notches in males (Fig. 10). There is, however, one exception, *L. fissus* Reshchikov, 2010 (Reshchikov et al. 2010) in which the last visible sternite is notched. Also, there is a defined sexual dimorphism represented by differences in colouration (Figs. 92–95). Often males have lighter colouration e.g. yellow face or lower part of mesopleuron.


*Head* of the members of the genus is orthognathous as in Ichneumonidae in general. Length of malar space is widely in use for identification of species. Some of the species have a rather elongate malar space, e.g. malar space of *Lathrolestes luteolus* Thomson 1883, or short malar space as in *Lathrolestes obliquus* Reshchikov, 2012. Another important character state is the separation of clypeus from face; almost a third of the *Lathrolestes* species
has the clypeus separated from the face by a deep groove and the rest of the species have clypeus separated from the face by a shallow impression or in rare cases may be hardly separated (Fig. 13). The face can be either flat or projecting. The occipital carina is another important character. It can be complete (Fig. 14) or interrupted in the middle (Figs. 79, 83).

**FIGURES 15–16.** Mesosoma of *Lathrolestes orbitalis*. 15, lateral view; 16, dorsal view.

*Mesosoma.* Sculpture of mesopleuron is widely used as a species-diagnostic character. The mesopleuron can be densely, sparsely, finely and roughly punctate. Propodeum has a system of carinae dividing areas (Fig. 28). A complete system includes: three pairs of longitudinal carinae (medial, lateral and pleural) and two transverse carinae (basal and apical). This system is variously developed from absent to complete. It is widely used in the
systematics of the genus. The propodeal carinae are absent in *L. verticalis* (Brischke, 1871) and *L. ensator* (Brauns, 1898) and complete in *L. luteolator* (Gravenhorst, 1829). The wings of *Lathrolestes* provide some important characters (Fig. 17). The areolet (A) can be petiolate or non-petiolate. Another important character is the position of Rs-2r relatively to the pterostigma. The following features of the legs are important character states: enlarged fifth tarsomere of *L. ungularis* (Thomson, 1883) and *L. zugophorae* Barron, 1994. The tarsal claw can be pectinate, simple, or with a basal lobe (Fig. 18–27). The members of *tripunctor* species group have elongate claw with hair-like teeth (Reshchikov, 2012a).

![FIGURE 17. Wing venation nomenclature, Lathrolestes ensator.](image)

![FIGURES 18–27. Claws. 18, L. bipunctatus; 19, L. clupeatus; 20, L. buccinator; 21, L. ensator; 22, L. luteolator; 23, L. nornae; 24, L. oelandinus; 25, L. erythrocephalus; 26, L. orbitalis; 27, L. kozlovi.](image)

The metasoma of *Lathrolestes* provides many important characters. Longitudinal dorsal and dorsomedia carinae of the first metasomal tergite are defined to different degrees in different species or may be absent. A longitudinal impression between the longitudinal dorsal carinae is also used as species-diagnostic character. The first metasomal tergite proportions vary from short to elongate, almost twice the length of the apical width. The second tergite can be almost square or elongate. Normally no important characters may be found on the tergites from the third tergite and posteriorly except for laterotergites not separated from tergites in *L. kozlovi* Reshchikov, 2012 and *L. aytmatovi* Reshchikov, 2012. The shape of the last visible sternite edge is used to differentiate males of the genera *Priopoda* and *Lathrolestes*. Males of *Priopoda* have notched edge (Fig. 11), whereas in *Lathrolestes* it is simple, except for in *L. fissus* Reshchikov, 2010.

Members of the genus have very differently shaped ovipositors. The lengths of ovipositors vary from very short in *Lathrolestes occultor* Aubert, 1984, to rather elongate in *L. ensator* (Brauns, 1898), in which it is longer than the metasoma. Several ovipositor types are distinguished during this study (Figs. 30–36).

Male genitalia are usually not used for systematics of Ichneumonidae, however they were studied and used for members of the genus *Lathrolestes*. Here several types of male genitalia are distinguished (Figs. 37–42).


**Taxonomy**

*Lathrolestes*


*Camporychus* Förster, 1869. Type-species: *Lathrolestes marginatus* Thomson;

*Culmina* Benoit, 1955. Type-species: *Culmina ruwenzorica* Benoit;

*Ecclinops* Förster, 1869. Type-species: *Tryphon orbitalis* Gravenhorst;

*Homaloma* Förster, 1869. Type-species: *Homaloma caliroae* Rohwer;

*Laphyroscopus* Förster, 1869. Type-species: *Tryphon gorskii* Zetterstedt;

*Lathrolestus* Thomson, 1883. Type-species: *Lathrolestus clypeatus* Zetterstedt

*Luphyroscopus* Thomson, 1883. Type-species: *Luphyroscopus gorskii* Ratzeburg

*Ritzemabosia* Smits van Burgst, 1912. Type-species: *Ritzemabosia meridionalis* Smits van Burgst;

*Tryphonopsis* Brauns, 1898. *Tryphonopsis ensator* Brauns

**Diagnosis.** Small to medium sized species, 4.0–7.5 mm. Occipital carina not intercepting hypostomal carina. Clypeus profile flat, its apical margin thick. Mandibles with lower tooth distinctly longer than the upper. Areolet petiolate, oblique. Second recurrent vein with a single bulla. Nervellus intercepted below or at its middle. Tarsal claws pectinate, with 1 or 3 teeth or with basal lobe. Glymmae deep. Apex of subgenital plate of male not incurved on hind margin. Tip of aedeagus somewhat decurved and swollen, its apex rounded. Ovipositor sheath 0.3 to 15 × as long as metasomal height.

**Biology.** Their larvae are koinobont endoparasitoids usually on leafmining sawfly larvae of the tribe *Fenusini* (Hymenoptera, Tenthredinidae); these feed on foliage of deciduous trees or shrubs (Pschorn-Walcher & Altenhofer 1989) excluding *Metallus gei*, feeding on *Geum urbanum*. A few species are known to attack leafmining lepidopteran larvae of the family *Eriocraniidae*—*L. clypeatus* (Zetterstedt 1838) and *L. mnemonicae* (Rohwer 1914) (Rohwer 1914; Heath 1961; Carlson 1979) and leafmining beetle larvae of the family *Megalopodidae*—*L. zeugophorae* Barron, 1994. Some *Lathrolestes* species attack sawflies with a different lifestyle such as
Lathrolestes ensator, which is a parasitoid of the carpophagous, Hoplocampa testudinea (Nematinae, Hoplocampini). Lathrolestes caudatus attacks larvae of Ardis brunniventris (Blennocompinae, Blennocompini), which feeds within branches of dog rose. Lathrolestes luteolator attacks larvae of slug sawflies, Caliroa (Heterarthrinae, Caliroini) (Carl, 1976). Data on trophic interactions of the genus Lathrolestes is provided in Table 1.

**TABLE 1.** Trophic interactions of the genus Lathrolestes.

<table>
<thead>
<tr>
<th>№</th>
<th>Lathrolestes species</th>
<th>Host species</th>
<th>Host plant</th>
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<tbody>
<tr>
<td>1.</td>
<td><em>L. bipunctatus</em></td>
<td>Heterarthrinae, Fenusini: <em>Fenusa pusilla</em> (Lepetelier)</td>
<td><em>Betula pendula</em> [Lorenz &amp; Kraus, 1957]</td>
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<td></td>
<td>(Thomson, 1883)</td>
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<td>(Brischke, 1878)</td>
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<td>4.</td>
<td><em>L. clypeatus</em></td>
<td><strong>Lepidoptera, Eriocraniidae:</strong> <em>Eriocrania salopiella</em> (Stainton, 1854); <em>E. sangii</em> (Wood, 1891); <em>E. semipurpurella</em> (Stephens, 1835); <em>E. sparrmannella</em> (Bosc, 1791); <em>E. unimaculella</em> (Zetterstedt, 1839) [Heath, 1961]</td>
<td><em>Betula sp.</em> [Kutenkova, 1999]</td>
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<td></td>
<td>(Zetterstedt, 1838)</td>
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<td>(Provancher, 1882)</td>
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<td></td>
<td>(Brauns, 1898)</td>
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<td></td>
<td>(Gravenhorst, 1829)</td>
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<td></td>
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<tr>
<td>№</td>
<td>Lathrolestes species</td>
<td>Host species</td>
<td>Host plant</td>
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<td></td>
<td>Heterarthrinae, Heterarthrini: Heterarthrus vagans (Fallén, 1808) [Aubert, 2000]</td>
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<td>Sterigiphora geminate (Gmelin, 1790) [Aubert, 2000]</td>
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<td></td>
<td>Parna tenella (Klug, 1816) [Györfi, 1947]</td>
<td>Tilia cordata, T platyphylla [Liston, 1993]</td>
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<tr>
<td></td>
<td>Scolioneura betuleti (Klug, 1816) [Hedwig, 1962]</td>
<td>Betula pendula [Hedwig, 1962]</td>
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<tr>
<td></td>
<td>Blennocampinae: Periclista albida (Klug, 1814) [Aubert, 2000]</td>
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<td></td>
<td>D. griseocapitella (Walsingham, 1882) [Carlson, 1979]</td>
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......continued on the next page
<table>
<thead>
<tr>
<th>№</th>
<th>Lathrolestes species</th>
<th>Host species</th>
<th>Host plant</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.</td>
<td><em>L. soperi</em> Reshchikov, 2010</td>
<td>Heterarthriniae, Fenusini: <em>Profenusa thomsoni</em> [Reshchikov et al., 2010]</td>
<td><em>Betula pendula; B. papyrifera</em> [Reshchikov et al., 2010]</td>
</tr>
<tr>
<td>20.</td>
<td><em>L. thomsoni</em> Reshchikov, 2010</td>
<td>Heterarthriniae, Fenusini: <em>Profenusa thomsoni</em> [Reshchikov et al., 2010]</td>
<td><em>Betula pendula; B. papyrifera</em> [Reshchikov et al., 2010]</td>
</tr>
</tbody>
</table>
**Biological control.** The leaf mining sawfly *Fenusa pusilla* is a pest of birch in Northern America (Coulson 1992, Barron 1994, van Driesche *et al.* 1997). This species was brought from Europe (Friend 1933) and became an important pest (Fuester *et al.* 1984). *Lathrolestes nigricollis* has been successfully used against this species of sawfly (Raske & Jones, 1975, Guevremont & Quednau, 1977, van Driesche *et al.*, 1997, Langor *et al.*, 2000, Casagrande *et al.*, 2009). An attempt was made to use the same species of *Lathrolestes* against another invasive birch pest, *Profenusa thomsoni* (Langor *et al.*, 2000). However, during the successful biological control studies of *P. thomsoni*, two new species of the genus were discovered (Reshchikov *et al.*, 2010), *L. thomsoni* and *L. soperi* and both these species are used against *P. thomsoni* successfully (Soper *et al.* 2015).

*Lathrolestes oelandinus* sp. nov.
Figs. 24, 36, 37, 43–48.


**Diagnosis.** This species differs from other species of the genus by the following character states: 1) occipital carina complete, 2) head slightly narrowed behind eyes (Fig. 47), 3) propodeum without carinae, 4) ovipositor longer than metasoma, curved, upper valve with nodus and without subapical dorsal notch at apex; lower valve with distinct teeth at apex (Figs. 36, 43), 5) female with yellow-reddish orbits on sides from frons, maculae around clypeal fossae and temple, and reddish-brown hind margins of metasomal tergites (Fig. 43).

**FIGURES 43–44.** Habitus views of *Lathrolestes oelandinus* sp. nov.; 43, female; 44, male.

**Description.** Female (Fig. 43). Body length 3.5 mm. Antenna with 24 flagellomeres. Scape 1.75 × as long as broad.

*Head* narrowed behind eyes, matt. Maximum length of temple equal transverse eye diameter; minimum length of temple 0.7 × transverse eye diameter. Face as broad as 0.8 × eye height, rather convex, bulging (Fig. 45). Clypeus distinctly separated from face, at apex projecting anteriorly; apical margin of clypeus thick. Clypeal fovea small. Malar space 0.6 × basal mandible width. Occipital carina medially complete. Lower mandible tooth longer than upper.
Mesosoma matt, without punctures. Notaulus shallowly impressed at base. Mesopleuron impunctate, granulated. Claws pectinate (Fig. 24). R intercepting pterostigma just before its middle. Areolet not petiolate. 2m-cu with single bulla. Nervulus slightly postfurcal. Hind wing with cu-a intercepted by Cu1 below middle. Propodeal carinae absent.

Metasoma slightly shining, impunctate (Fig. 48). First metasomal tergite 1.1 × as long as broad apically, rather convex, without longitudinal dorsal carinae and medial impression (Fig. 48). Second metasomal tergite transverse, trapezoidal. Following tergites also transverse. Ovipositor longer than metasoma, slightly curved upwards with nodus and preapical ventral teeth (Figs. 36, 45).

Colour (Figs. 43, 45, 48). Face (except maculae under antennal sockets and around clypeal fovea), front (except orbits), temple partly and occiput completely, pronotum (except upper hind edge), mesoscutum, mesoscutellum, mesopleurae (except upper fore edge), propodeum, first metasomal tergite, hind coxae entirely and middle coxae basally black. Antennal flagellum (except basal flagellomeres ventrally), clypeus, tips of mandibles, malar space, pterostigma, basal part of metasomal tergites 2–7 dark brown. Apical part of clypeus and metasomal tergites 2–7, tarsi reddish-brown. Scape, pedicellus, basal flagellomeres ventrally, maculae under antennal sockets and around clypeal fovea, orbits on sides from frons, upper anterior and lower anterior parts of temple, legs (except basal part of middle coxae and entire hind coxae) reddish-yellow. Tegulae and closed edges of pronotum and mesopleuron whitish.

Male. Essentially as in female except as follows: first metasomal tergites 1.7 × as long as broad. Parameres broad medially (Fig. 37).

Colour (Figs. Figs. 44, 46, 47). Face, temple, mandible except its tips, scape, pedicellum, flagellomeres
ventrally, propleuron, hind part of pronotum close to tegulae and fore coxae, bands on mesoscutum in front of tegulae, top of scutellum, fore edge of mesopleuron, trochanters, fore coxa completely and middle and hind coxae apically yellow. Femora, tibiae, sternites and hind margins of metasomal tergites 2–7 laterally, parameres yellow-reddish. Tarsi reddish-brown. Occiput, pronotum, mesoscutum, mesopleuron, propodeum and first metasomal tergite black. Flagellomeres dorsally, middle and hind coxae, metasomal tergites dark brown.

Comments. Ovipositor structure similar to ovipositor of _L. ensator_, elongated and curved upwards (Fig. 35), an adaptation to hunt for larvae inside fruits. *Lathrolestes oelandinus* sp. nov. was collected in Gamla Skogsby, Öland on a meadow with shrub vegetation. It is likely this species is a parasitoid of carpophagous sawflies with small body size. The type locality has a lot of remains of human settlement from the past centuries (Rasch & Ring, 2009). I recognized different species of Rosaceae when I visited the place for collecting.

Distribution. Sweden.

Etymology. The species epithet refers to Öland.

NORTH EUROPEAN SPECIES OF _LATHROLESTES_

New records for countries marked with “*”.

**Lathrolestes bipunctatus** (Bridgman, 1886)

Figs. 18, 32, 49–51.


Diagnosis. This species differs from other species of the genus by the following character states: 1) face and clypeus separated by a distinct transverse groove, 2) complete occipital carina, 3) reddish-yellow spots at upper part of temple, 4) dark coloration of hind femur, 5) propodeum with complete carinae.

Distribution. Belarus, Denmark*, Finland, Germany, Norway, Poland, Russia (Murmansk Oblast, Sverdlovsk Oblast, Chita Oblast, Kamchatka Krai, Kunashir), Sweden (Uppland, Värmland), UK.

**Lathrolestes buccinator** (Holmgren, 1857)

Figs. 7, 13, 20, 38, 52–56.

_Perilissus buccinator_ Holmgren, 1857: 122. Holotype ♀, NHRS [examined, NHRS-HEVA00003819]. Type locality: Sweden (Småland).

_Perilissus vollenhoveni_ Gribodo, 1880: 7. Holotype ♂, Museo Civico di Storia Naturale, Genoa, Italy [not examined]. Type locality: Italy (Nicotera, Calabria).


Diagnosis. This species differs from other species of the genus by the following character states: 1) face and clypeus separated by impression, 2) face in female black, 3) head and mesopleuron matt, coarsely, densely and rather evenly punctate, 4) occipital carina complete, 5) tegulae yellow, 6) second recurrent vein intercepting areolet behind its middle, 7) propodeum with carinae complete, 8) first metasomal tergite twice as long as wide, large, very swollen.
**Figures 49–51.** *Lathrolestes bipunctatus.* 49, face; 50, propodeum; 51, habitus.

**Distribution.** Afganistan, Armenia, Azerbaijan, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxemburg, Netherlands, Poland, Romania, Russia (Buryatia, Kamchatska Krai, Khabarovsk Krai, Krasnodarsk Krai, Krasnoyarsk Krai, Leningrad, Primorsky Krai, Sakhalin, Smolensk), Slovenia, Spain, Sweden (Södermanland, Småland), Switzerland, Ukraine, UK.
Lathrolestes buccinator (Holmgren, 1857), 52) female face, 53) propodeum, 54) first metasomal tergum, 55) male face, 56) male habitus.

Lathrolestes caudatus (Thomson, 1883)
Figs. 39, 57–60.

Lathrolestes caudatus Thomson, 1883: 917. Holotype ♀, lost, Type locality: Sweden (Skåne, Fågelsång).
Lathrolestes nasoni Davis, 1897: 264. Holotype ♂, ANSP [examined]. Type locality: USA (Algonquin, Illinois).
Lathrolestes similis Davis, 1897: 265. Lectotype ♀, ANSP [examined]. Type locality: USA (Colorado).

Material. 2♀, SWEDEN, (NHRS); 1♀, SWEDEN, Södermanland, Kolmården, sydslutning, leg. R.Malaise, (NHRS); 1♀, SWEDEN, Blekinge, (NHRS); 1♀, SWEDEN, Småland, leg. C. Boheman, (NHRS); 1♂, SWEDEN, Stockholm, (NHRS); 1♀, SWEDEN, Dalarna, Malung-Sälen, Lima, leg. T. Tjeder, (NHRS); 1♀, SWEDEN, Dalarna, (NHRS); 1♀, SWEDEN, Norrbotten, (NHRS); 1♀, SWEDEN, Hälsingland, (NHRS).


Diagnosis. This species differs from other species of the genus by the following character states: 1) face not strongly convex, 2) occipital carina incomplete, 3) claws pectinate, 4) metasoma mostly black, 5) ovipositor elongate and slightly up-curved, tip of its upper valve with nodus, 6) parameres elongate but wide.

Distribution. Belgium, Canada (Alberta, British Columbia, Ontario, Saskatchewan), Finland, France, Germany, Latvia, Netherlands, Russia (Buryatia, Kamchatka, Khabarovsky Kray, Sakhalin), USA (Arizona, California, Colorado, Illinois, Minnesota, Montana).

Lathrolestes citreus (Brischke, 1878)
Fig. 40.

Perilissus citreus Brischke, 1878: 75–76. Type lost. Type locality: Poland.

Material: 2♂, DENMARK, Sjælland, Korsør, ZMUC.

Distribution. Bulgaria, Denmark*, Finland, Germany, Latvia, Moldova, Poland, Russia (Bryansk Oblast), Switzerland.
Comments. The type specimen was lost. The status of this taxon is not clear. Material from the ZMUC determined by Habermehl is similar to *L. saliceti*. The specimen from the NHRS (NHRS-HEVA000002033) was misidentified, http://www.gbif.org/occurrence/787271937 and belongs to *L. pleuralis*. However *L. saliceti* is known only by males (Figs. 106, 107) which are morphologically rather similar to *L. lucidulus* (Fig. 70), but the latter species has a petiolate areolet (Fig. 73).

**FIGURES 57–60. Lathrolestes caudatus** (Thomson, 1883). 57, female face; 58, male face; 59, propodeum; 60, habitus.

*Lathrolestes clypeatus* (Zetterstedt, 1838)

Figs. 19, 21, 31, 61, 62.

*Tryphon clypeatus* Zetterstedt, 1838: 399. Holotype ♀, MZLU [examined]. Type locality: Sweden (Lapland).

*Lathrolestes eriocraniae* Seyrig, 1928: 201. Holotype ♀, MNHN [not examined]. Type locality: France.


**Diagnosis.** This species differs from other species of the genus by the following character states: 1) clypeus strongly projecting anteriorly, 2) clypeus separated from face by a distinct transverse groove, 3) occipital carina complete, 4) apical lateral fields of propodeum absent, 5) ovipositor up-curved.

**Distribution.** Denmark*, Finland, France, Germany, Ireland, Lithuania, Netherlands, Norway, Poland, Russia (Arkhangelskaya Oblast, Khabarovsky Kray, Leningradskaya Oblast), Sweden, UK.

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*Lathrolestes ensator* (Brauns, 1898)

Figs. 17, 35, 63–66.

Tryphonopsis ensator Brauns, 1898: 63. Holotype ♀, ZMHU [examined]. Type locality: Germany (Teschendorf, Mecklenburg-Vorpommern).

Lathrolestes dilatatus Nordenström, 1905: 207. Holotype ♀, MZLU [examined]. Type locality: Sweden (Halland).

Diagnosis. This species differs from other species of the genus by the following character states: 1) clypeus distinctly separate from face, 2) malar space as long as basal mandibular width, 3) head broad behind eyes, 4) occipital carina complete, 5) propodeum without carinae, 6) ovipositor longer than metasoma, curved upwards, upper valve with nodus and without subapical dorsal notch at apex, lower valve with distinct teeth at apex.

Distribution. Austria, Belgium, Bulgaria, Belarus*, Canada (introduced in Quebec), Czech Republic, Germany, Iran, Netherlands, Serbia, Sweden, Switzerland, UK.

FIGURES 63–66. Lathrolestes ensator (Brauns, 1898). 63, male habitus laterally; 64, female habitus dorsally; 64, female face; 65, male face; 66, male face.

Lathrolestes erythrocephalus (Gravenhorst, 1829)
Figs. 25, 67–69.

Tryphon erythrocephalus Gravenhorst, 1829: 220. Holotype ♀, lost, Type locality: Germany
Perilissus subcinctus horvathi Kiss, 1926: 266. Holotype ♀, HNHM [examined]. Type locality: Hungary (Pápa, Veszprém).

Material. 3♀, DENMARK, ZMUC; 1♀, SWEDEN, Skåne, NHRS; 4♂, 4♀, SWEDEN, Småland, NHRS; 1♂,
SWEDEN, Jönköping, Nobynäs, NHRS; 4♂, SWEDEN, Öland, NHRS; 1♂, SWEDEN, Gotland, NHRS; 1♀, SWEDEN, Västergötland, NHRS; 1♀, 2♂, SWEDEN, Bohuslän, NHRS; 2♂, SWEDEN, Stockholm, NHRS; 2♂, SWEDEN, Stockholm, NHRS; 2♂, SWEDEN, Uppland, NHRS;


**FIGURES 67–69.** *Lathrolestes erythrocephalus* (Gravenhorst, 1829). 67, face; 68, propodeum; 69, habitus.
**Diagnosis.** This species differs from other species of the genus by the following character states: 1) face and clypeus separated by impression, 2) occipital carina complete, 3) head mostly orange, 4) head is large, very, 5) tegulae brownish, 6) second recurrent vein intercepting areolet at its middle, 7) head and mesopleuron matt, coarsely, densely and rather evenly punctate, 8) propodeum with carinae complete.

**Distribution.** Austria, Azerbaijan*, Belarus, Belgium, Bulgaria, Czech Republic, Denmark, Finland, France, Germany, Hungary, Italy, Kazakhstan, Kyrgyzstan, Latvia, Netherlands, Poland, Romania, Russia (Kursk Oblast, Ryazan Oblast, Yaroslavl Oblast), Serbia, Sweden, Switzerland, Ukraine, UK.

**FIGURES 71–73.** *Lathrolestes lucidulus* (Holmgren, 1857). 70, male face; 71, female face; 72, propodeum; 73, female habitus laterally.
**Lathrolestes laevipleuris** Reshchikov, 2013

Fig. 5.

*Lathrolestes laevipleuris* Reshchikov, 2013: 70. Holotype ♂, MZH [examined]. Type locality: Finland (Åland archipelago, Kökar).

**Diagnosis.** This species differs from other species of the genus by the following character states: 1) face and clypeus separated by impression, 2) occipital carina complete, 3) polished and weakly punctate mesopleuron, 4) basal parts of longitudinal propodeal carinae obliterated, 5) area superomedia narrow, 6) body brownish, face entirely brownish, legs yellowish.

**Distribution.** Finland.

**Lathrolestes lucidulus** (Holmgren, 1857)

70–73.


**Diagnosis.** This species differs from other species of the genus by the following character states: 1) face strongly convex, 2) clypeus strongly projecting, concave, 3) occipital carina incomplete dorsally, 4) epomiae present, 5) claws not pectinate 6) metasomal tergites with very narrow yellow margin, 7) hypopigium trangle, black, with hind margin more or less broadly yellow, 8) ovipositor very short, 9) parameres narrow.

**Distribution.** Finland, Germany, Poland, Russia (Chita Oblast, Khabarovsky Kray, Ussuriysky Kray), Sweden, Turkey.

**Comments.** This species is described by females only as diagnosing males is difficult. Examined material suggests that the proposed males of this species are similar to *L. saliceti* (Fig. 106, 107), but the latter has a rhombic and open areolet. In females *L. lucidulus* is rather similar with *L. occultor* Aubert, 1991 described from France. But *L. occultor* has no defined yellow stripes on hind margin of tergites and last sternite (photo of type specimen of *L. occultor* Aubert, 1991 can be accessed from https://drive.google.com/folderview?id=0BxXMktnC3Ub2SWlHVQ0U&usp=sharing).

**Lathrolestes luteolator** (Gravenhorst, 1829)

Figs. 22, 28, 29, 30, 74–77.


FIGURES 74–75. *Lathrolestes luteolator* (Gravenhorst, 1829), 74, female habitus; 75, male habitus.
**FIGURES 76, 77. Lathrolestes luteolator** (Gravenhorst, 1829). 76, female face; 77, male face.


**Diagnosis.** This species differs from other species of the genus by the following character states: 1) face and clypeus separated by impression, 2) head narrowed behind eyes, 3) occipital carina complete, 4) shiny smooth surface of mesopleuron and deep distinct punctures, 5) hind tibia reddish-yellow with dark apex, 6) propodeum with carinae complete.

**Distribution.** Belgium, Czech Republic, Denmark, Finland, France, Germany, Hungary, Italy, Netherlands, Norway, Poland, Russia (St Petersburg), Serbia, Sweden, Switzerland, Ukraine, UK.
**Lathrolestes luteolus (Thomson, 1883)**
Figs. 33, 78–81.

*Lathrolestus luteolus* Thomson, 1883: 917. Holotype ♂, MZLU [examined]. Type locality: Sweden (Lund, Skåne).

**Material.** 1♂, NETHERLANDS, Haarlem, Bolwerk, 11.vi.1878, leg. C. Ritsema; 2♀, SWEDEN, Gotlands kommun, Fårö, near Fårö kyrka, 57.915668,19.131789 = 57°54'55.27"N 19° 7'57.58"E, 16m., 5.vi.2013, sweep netting, *Ulmus*, leg. Alexey Reshchikov, NHRS.

**Additional material.** 1♀, FRANCE, leg. Hinz, ZSM.

**Diagnosis.** This species differs from other species of the genus by the following character states: 1) malar space as long as width of base of mandibles, 2) occipital carina incomplete dorsally, 3) body mostly pale yellow except black first metasomal tergite, 4) mostly yellow colouration.

**Distribution.** Czech Republic, France, Moldova, Netherlands, Poland, Sweden.

**FIGURES 78–81. Lathrolestes luteolus** (Thomson, 1883), 78, face; 79, head dorsally; 80, propodeum; 81, habitus.
FIGURES 82–86. Lathrolestes macropygus (Holmgren, 1857). 82, female face; 83, head dorsally; 84, propodeum; 85, female habitus; 86, male habitus.
Lathrolestes macropygus (Holmgren, 1857)
Figs. 82–86.

Perilissus macropygus Holmgren, 1857: 126. Lectotype ♂, NHRS [examined, NHRS-HEV00000189]. Type locality: Sweden (Småland, Öddev, Oppland).


Diagnosis. This species differs from other species of the genus by the following character states: 1) clypeus projecting distinctly anteriorly, but not strongly, and not incurved, 2) head narrowed behind eyes, 3) occipital carina incomplete dorsally, 4) areolet petiolate, 5) carinae of propodeum absent, 6) third metasomal tergite reddish-yellow at base and at apex, 7) ovipositor slightly up-curved or straight and stout, 8) parameres elongate and wider apically.

Distribution. Austria*, Belgium, Finland, France, Germany, Hungary, Ireland, Netherlands, Norway, Poland, Russia (Chita Oblast, Kunashir, Leningrad Oblast, Primorsky Krai, Yakutia), Sweden, Ukraine, UK.

Lathrolestes moravicus (Habermehl, 1923)
Figs. 87–91.

Perilissus moravicus Habermehl, 1923: 379. Holotype ♀, SMF [examined]. Type locality: Germany (Weiskirchen, Mähren).


Diagnosis. This species differs from other species of the genus by the following character states: 1) middle of face in male yellow, 2) face and clypeus separated by impression, 3) occipital carina complete, 4) mesopleuron sparsely and distinctly punctuate, and matt, 5) area superomedia elongate, narrowed anteriorly, separate from area basalis, area apicalis short.

Distribution. Czech Republic, Finland*, France*, Russia* (St Petersburg), UK.

Lathrolestes nigricollis (Thomson, 1883)
Figs. 92–95.

Perilissus nigricollis Thomson, 1883: 915–916. Holotype ♂, MZLU [examined]. Type locality: Sweden (Skåne).

Perilissus minutus Bridgman, 1887: 370. Holotype ♀, NCMK [examined]. Type locality: UK (Shiere)

FIGURES 87–91. Lathrolestes moravicus (Habermehl, 1923). 87, female face; 88, male face; 89, propodeum; 90, male habitus; 91, female habitus.
FIGURES 92–95. *Lathrolestes nigricollis* (Thomson, 1883), 92, female face; 93, male face; 94, female habitus laterally; 95, male habitus dorsally.

Additional material.

**Diagnosis.** This species differs from other species of the genus by the following character states: 1) clypeus separated from face by a distinct transverse groove, 2) occipital carina complete, 3) tarsus mostly dark, apical tarsal segments slightly enlarged, 4) apical lateral fields of propodeum absent, 5) last visible metasomal tergite not modified, 6) ovipositor straight.

**Distribution.** Austria, Finland, France, Germany, Ireland, Netherlands, Norway, Russia (Kuril islands, Saint Petersburg), Sweden, Switzerland, UK

**Lathrolestes nornae** Reshchikov, 2013

Figs. 6, 23.


**Material.** 1♀, SWEDEN, Torne lappmark, Vassijaure, 1918, leg. R.Malaise

**Diagnosis.** This species differs from other species of the genus by the following character states: 1) clypeus projecting distinctly anteriorly, but not strongly, and not incurved, 2) head narrowed behind eyes, 3) occipital carina incomplete dorsally, 4) areolet petiolate, 5) tarsal claws pectinate, teeth as long as apical tooth, 6) hind femur black, 7) carinae of propodeum absent, 8) metasomal tergites black, 9) parameres elongate and wider apically.

**Distribution.** Norway, Russia (Yakutia Republic, Yamalo-Nenets Autonomous Okrug), Sweden*

**Lathrolestes orbitalis** (Gravenhorst, 1829)

Figs. 14–16, 26, 34, 96–100.

*Tryphon orbitalis* Gravenhorst, 1829: 2554. Type lost. Type locality: Poland (Wrocław).

*Perilissus bucculentus* Holmgren, 1857: 123. Lectotype ♀, NHRS [examined, NHRS-HEVA00003820]. Type locality: Sweden (Småland).
FIGURES 96–100. *Lathrolestes orbitalis* (Gravenhorst, 1829). 96, male face; 97, female face; 98, propodeum; 99, male habitus; 100, female habitus.


**Diagnosis.** This species differs from other species of the genus by the following character states: 1) face entirely yellow in both sexes, 2) face and Clypeus separated by impression, 3) occipital carina complete, 4) area super-omedia elongate, narrow and fused with area basalis, area apicalis short.

**Distribution.** Austria, Belarus, Belgium, Bulgaria, Czech Republic, Denmark, Finland, France, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Norway, Poland, Russia (Dagestan, Irkutsk Oblast, Khabarovsky Kray, Krasnoyarsky Kray, Leningrad Oblast, Moscow Oblast, Pskov Oblast, Primorsky Kray, Sakha Yakutia, Sverdlovsk Oblast, Tomsk Oblast, Yaroslavl Oblast), Sweden, Switzerland, Ukraine, UK.

**Lathrolestes pictilis** (Holmgren, 1857)
Figs. 101–103.

*Perilissus pictilis* Holmgren, 1857: 125. Lectotype ♀, NHRS [examined, NHRS-HEVA00003818]. Type locality: Sweden (Småland).


FIGURES 101–103. Lathrolestes pictilis (Holmgren, 1857). 101, face; 102, propodeum; 103, habitus.

Diagnosis. This species differs from other species of the genus by the following character states: 1) orbits entirely yellow, 2) face and clypeus separated by a distinct transverse groove, 3) occipital carina complete, 4) hind femur yellow-reddish, 5) propodeum with complete carinae.

Distribution. Austria*, Belarus, Belgium, Czech Republic, Denmark*, Finland, France, Germany, Hungary, Latvia, Lithuania, Netherlands, Norway, Poland, Russia (Buryatia, Chita Oblast, Khabarovsky Kray, Primorsky Kray, Sakha Yakutiya), Sweden, Switzerland, Ukraine, UK.

*Lathrolestes pleuralis* (Thomson, 1883)
Figs. 104–105.


Diagnosis. This species differs from other species of the genus by the following character states: 1) clypeus projecting distinctly anteriorly, but not strongly, and not incurved, 2) head narrowed behind eyes, 3) occipital carina incomplete dorsally, 4) areolet petiolar, 5) tarsal claws pectinate, teeth shorter than apical tooth, 6) hind femur yellowish, 7) carinae of propodeum absent, 8) parameres elongate and wider apically.

Distribution. Denmark*, Finland, Germany, Latvia, Norway, Russia (Chita Oblast, Kamchatka, Khabarovsky Kray, Primorsky Kray, Sakha Yakutia), Sweden, UK.

*Lathrolestes saliceti* (Roman, 1909)
Figs. 106–107.

*Lathrolestus saliceti* Roman, 1909: 104. Lectotype ♂, NHRS [examined, NHRS-HEV A000001981]. Type locality: Sweden (Sarek, Lapland).

Material. 1♂, RUSSIA, Murmansk Oblast, Pasvik NR, mt Kalkupya, birch forest, Malaise trap, 30.vii.–11.x.2007, leg. A. Humala, ZIN; 1♂, SWEDEN, Torne lappmark, Vassijaure, 1918, leg. R. Malaise, NHRS-HEV A000001982, NHRS.

Diagnosis. This species differs from other species of the genus by the following character states: 1) occipital carina incomplete dorsally, 2) areolet rhombic and open, 3) area petiolaris present, 4) parameres broad apically.

Distribution. Norway, Russia, Sweden.

Comments. Only males are known of this species. It is similar with *L. lucidulus*, but it has open areolet.

*Lathrolestes soperi* Reshchikov, 2010


Diagnosis. This species differs from other species of the genus by the following character states: 1) face and clypeus separated by transverse distinct groove, 2) occipital carina complete dorsally, 3) tarsal claws pectinate with three teeth, 4) area basalis and area superomedia present, costula absent, 5) 2nd metasomal tergum reddish.

Comments. This is first record of the species from Palaearctic.

Distribution. USA (Alaska), UK*.
NORTH EUROPEAN LATHROLESTES, SP.N. FROM SWEDEN

Lathrolestes tripuncctor (Thunberg, 1824)
Figs. 4, 110–116.

Perilissus (Polyoncus) grandiceps Thomson, 1883: 913. Holotype ♂, MZLU [examined]. Type locality: Sweden (Arrie, Skåne).
Perilissus longicornis Brischke, 1871: 72. Type lost. Type locality: Poland.
Perilissus luteocephalus Giraud, 1872: 397–399. Lectotype ♀, MNHN [examined]. Type locality: France (Grenoble, Rhône-Alpes).
Perilissus singularis Vollenhoven, 1878: 45. Lectotype ♂, RMNH [examined]. Type locality: Netherlands.

Material. 8♀, 1♂, DENMARK, Strandmølle, ZMUC; 1♀, RUSSIA, Pskov Oblast, Chudskoe Lake, vii.2003, leg. A.Reshchikov, ZIN; 1♀, SWEDEN, Kimstad, NHRS; 1♂, SWEDEN, NHRS.

Diagnosis. This species differs from other species of the genus by the following character states: 1) face in female yellow, 2) face and clypeus separated by impression, 3) occipital carina complete, 4) head and mesopleuron matt, coarsely, densely and rather evenly punctate, 5) tegulae yellow, 6) second recurrent vein intercepting areolet behind its middle, 7) propodeum with carinae complete, 8) first metasomal tergite 1.6 × as long as wide.

Distribution. Czech Republic, Denmark*, Finland, France, Germany, Italy, Lithuania, Netherlands, Poland, Russia (Pskov Oblast), Sweden, Switzerland.


Lathrolestes ungularis (Thomson, 1883)
Figs. 117–119.

Lathrolestus ungularis Thomson, 1883: 918. Holotype ♂, MZLU [examined]. Type locality: Sweden (Pålsjö, Skåne).
Lathrolestes citrofrontalis Schmiedeknecht, 1912: type lost. Type locality: Germany.


Diagnosis. This species differs from other species of the genus by the following character states: 1) face and clypeus separated by a distinct transverse groove, 2) maculae on face and behind eyes, 3) occipital carina complete, 4) mesopleuron and metasoma shagreened, matt, 5) fifth article of tarsus dark and enlarged, 6) teeth of claws not slanted, 7) only one transverse propodeal carina present (basal transverse carina of propodeum evenly arched, area supeomedia absent, apical area open anteriorly), 8) propodeum with rough sculpture, 9) last visible tergite of metasoma modified in projection, 10) ovipositor straight.

Distribution. Austria, Azerbaijan, Germany, Moldova, Netherlands, Poland, Sweden, Turkey, Ukraine, UK.

Lathrolestes verticalis (Brischke, 1871)
Figs. 41, 120–123.

Perilissus verticalis Brischke, 1871: 71. Type lost. Type locality: Poland.
Perilissus abdominatus Brischke, 1878: 74. Type lost. Type locality: Poland.
Lathrolestus marginatus Thomson, 1883: 917. Holotype ♂, MZLU [examined]. Type locality: Sweden (Skåne, Lund).


Diagnosis. This species differs from other species of the genus by the following character states: 1) head narrowed behind eyes, 2) yellow spots on orbits near antennal sockets and on top of eyes, 3) rounded apical margin of clypeus, 3) occipital carina complete, 4) open areolet, 5) propodeum with only area petiolaris obliterated anteriorly, 6) ovipositor as long as first metasomal tergite, without nodus, with subapical dorsal notch and lower valve without teeth at apex.

Distribution. Austria, Czech Republic, Denmark*, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Norway, Poland, Russia (Saint Petersburg), Sweden, Switzerland, Ukraine, UK.

Discussion. As a result of this study, 24 Northern European species are recorded of which 23 are known from Sweden including L. oelandinus sp. n. described here and collected by the SMTP just few hundred meters from the Station Linné and the rare L. luteolus (Thomson, 1883) collected on Fårö on Ulmus. The first finding shows the poor state of the knowledge for the group. L. citreus (Brischke, 1878), L. bipunctatus (Bridgman, 1886), L. clypeatus (Zetterstedt, 1838), and L. pleuralis (Thomson, 1883) were recorded for the first time in Denmark, and L. moravicus Habermehl, 1923 in Finland, France and North Western Russia. During this study L. soperi Reshchikov, 2010 is recorded for the first time in the Palaearctic region (from the UK). Previously only L. caudatus (Thomson, 1883) was considered to be distributed in both Nearctic and Palaearctic regions (Reschchikov et al., 2010) apart from L. nigricollis (Thomson, 1883), which is introduced in North America (Langor et al. 2002). L. nornae Reschchikov, 2013 is recorded for the first time in Sweden.
Data on trophic interactions of the genus *Lathrolestes* are gathered in Table 1 and shows a high level of specialization to hosts with a variety of lifestyles. The members of *Lathrolestes* are mostly known to be koinobont endoparasitoids, usually on leafmining sawfly larvae of the tribe Fenusini (Hymenoptera, Tenthredinidae). However *L. clypeatus* (Zetterstedt 1838) and *L. mnemonicae* (Rohwer 1914) attack leafmining lepidopteran larvae of the family Eriocroniidae (Rohwer 1914; Heath 1961; Carlson 1979) and *L. zeugophorae* Barron, 1994 attacks leafmining beetle larvae of the family Megalopodidae. These hosts have a similar leafmining lifestyle and are associated with deciduous trees. Such a transition into other groups of hosts with similar lifestyle also occurs in the subfamily Tryphoninae (Hymenoptera, Ichneumonidae). Several species of the genus *Grypocentrus*, attacking mainly leafmining sawflies, were also reared from Eriocroniidae (Heath, 1961; Jordan, 1998). In the genus *Lathrolestes* such a host switch probably took place twice: in European *L. clypeatus*, and in American *L. mnemoniacae*. *Lathrolestes ensator* is parasitoid of the carpophagous *Hoplocampa testudinea* (Nematinae, Hoplocampini) feeding on apples. The ovipositor of this species of *Lathrolestes* is elongate and curved upwards.
FIGURES 120–123. Lathrolestes verticalis (Brischke, 1871), 120, female face; 121, male face; 122, female habitus; 123, male habitus.
It is likely that this is an adaptation to hunt for larvae inside fruits. Similar structure of the ovipositor occurs in *L. oelandinus* sp. n. Based on this feature as well as the type locality with its anthropogenic influences may indicate a similar lifestyle as parasitoid of carpophagous insects for *L. oelandinus* sp. n. Another example of specialization and modification of the ovipositor can be observed in *L. caudatus*, attacking larvae of *Ardis bruniventris* (Blennocontinae, Blennocompini), which feeds within branches of dog rose. The ovipositor of this wasp is elongate and has a nodus at its apex instead of notch. This feature is unusual for entoparasitoids and the modification of the ovipositor is considered here as an adaptation for species with larvae living inside hard substrate as fruits and branches. Another species, *Lathrolestes lutetolator* attacks larvae of slug sawflies, *Caliroa* (Heterarthrinae, Caliroini) (Carl, 1976). Attacking these sawflies requires narrow specialization since larvae of slug sawflies have specific defensive strategies which includes having a cover of mucus (Boevé & Müller 2005). The ovipositor of this species of *Lathrolestes* is stout at base and has a shallow notch (Fig. 30). This structure of the ovipositor probably is an adaptation to pierce the mucus cover of the sawfly larva. Most of the *Caliroa* parasitoids have similar ovipositor with a shallow notch (Kasparyan 1973, 1990), including *Hodostates* Förster, 1869 which differs from other Pionini in having slender needle-like ovipositors lacking a notch (Cameron & Wharton 2011).

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