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Review of the Northern European species of the *Odontocolon dentipes* species complex (Hymenoptera: Ichneumonidae: Xoridinae)

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The Northern European species of the *Odontocolon dentipes* species complex are revised using integrative methods combining molecular and morphological data. The revision recognizes three species of which two, *Odontocolon kodama* **sp. nov.** and *Odontocolon longitarsum* **sp. nov.** are described as new to science. To promote nomenclatorial stability, a neotype for *Odontocolon dentipes* (Gmelin, 1790) is designated. Additionally, *Odontocolon geniculatum* Kriechbaumer is reported from Sweden for the first time.

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Odontocolon dentipes (Gmelin, 1790) is one of the most widespread and common species of the genus in the Western Palearctic. As an idiobiont parasitoid it shows a great variation in size and *Odontocolon dentipes* has reputedly been reared from several different hosts, mostly consisting of cerambycids associated with conifers (Hilszczański 2003, Yu et al. 2016). During a recent revision of the Swedish species of *Odontocolon* (Johansson 2020), it was noted that some of the morphological variation within *Odontocolon dentipes* possibly could indicate the existence of cryptic species. However, the apparent lack of material and molecular support at the time of the publication made it difficult to draw any detailed conclusion from the morphologically deviating specimens (Johansson 2020, p. 29). Special effort was therefore put into finding additional material to morphologically and genetically define and delimit the potential species involved. As more material was acquired and studied more closely, it became evident that the difficulty to define the so called "northern variety", was due to the dual nature of this presumed species. Here the *Odontocolon dentipes* aggregate in Northern Europe is resolved using integrative methods in what is to be regarded as an extension of the revision recently presented by Johansson (2020). Apart from the taxonomic core of the study, the paper also presents *Odontocolon geniculatum* (Kriechbaumer, 1889) as new to Sweden.

Methods

Additional material of *Odontocolon dentipes* s. lat. was obtained from surveys of saproxylic Coleoptera, Malaise trap inventories and material collected by entomologists primarily from Sweden and Norway. The material was sorted into morphospecies based

on presumably valid characters. To support the species hypotheses generated by the morphological analysis, the CO1 barcode region was sequenced. DNA extraction was made from a single mid leg, PCR amplification and sequencing of a majority of the samples were conducted at the Canadian Centre for DNA Barcoding (CCDB) using standardized high throughput protocols (Ivanova et al. 2006). The first pass primer pair in all plates was LepF1 and Lepr1 (ATTCAACCAATCATAAAGATATTGG and TAAACTTCTGGATGTCCAAAAAATCA) and they all produced PCR products. The sequences were aligned using MUSCLE (Edgar 2004) provided through the software MEGA X (Kumar et al. 2021). The phylogeny of the barcoded specimens was then inferred by constructing a maximum likelihood (ML) phylogenetic tree (Fig. 1) using MEGA X. The analysis is based on 150 bootstrap iterations using the general time reversible model. The DNA extracts and the specimen data are stored at the CCDB. Specimen id numbers are given next to the label info for each type specimen and in Fig 1.

Morphological terminology follows Broad et al. (2018). Pictures were taken by the author with a Canon 6D with a Canon 35 mm f/2.8 macro photo lens mounted on a bellows. The photos were then stacked in Zerene stacker and postprocessed in Photoshop. Abbreviations of type depositories are given within brackets after the listed label info of each type:

MZLU = Zoologiska Museet, Lunds Universitet; Lund, Sweden

NHRS = Swedish Museum of Natural history; Stockholm, Sweden.

NTNU = Vitenskapsmuseet, Norges teknisk-naturvetenskaplige universitet; Trondheim, Norge

UPSZ = Evolutionsmuseet, Uppsala University; Uppsala, Sweden

ZSM = Zoologische Staatsammlung München; München, Germany

Results

***Odontocolon dentipes* (Gmelin, 1790)**
Figs 2C, 2F, 3B, 3F, 4A.

Ichneumon dentipes Gmelin, 1790 p.2719. Type lost. Neotype (ZSM) here designated
Odontomerus pinetorum Thomson, 1877 p.777. Lectotype female (MZLU Type no: 6350:1) in Zoologiska Museet, Lunds Universitet (MZLU), examined.
Ophion femoratum Olivier, 1811 p.508. Type lost.

Neotype
GERMANY: ♀, Bayern, Allgäu, Kempten, Kempter wald, Schornmoos, 47.74045°N, 10.50686°E, 805 m, 20 Aug.–3 Sep. 2015, D. Doczkal & J. Voith leg., Malaisefalle, dv.kewa5.09, **BC ZSM HYM 22280-H02** (ZSM).

Non type material examined
67♀♀, 39 ♂♂ Sweden; 16 ♀♀, 6 ♂♂ Germany; 1 ♀ Poland; 2♀♀ Norway.

Diagnosis
Larger specimens with a body length exceeding 12 mm are quite distinct and easily identified due to their size alone. Smaller specimens are distinguished by their generally testaceous trochanters (Fig. 3F), the narrow area superomedia (in females), the relatively stout mid and hind tarsi (Figs 2C, 2F) and the dense and distinct and dense punctures dorsally on the head (Fig. 3B) and usually also the mesosoma. A useful character in distinguishing *O. dentipes* s. lat from the two here described species is also that the propleuron is weakly crenulate centrally (Fig. 4A) while it in both of the here described species usually have more distinct sculpture (Fig. 4B).

Ecology
According to the records referred to by Taxapad (Yu et al. 2016) *Odontocolon dentipes* s. lat. has been reared from a number of Lepidoptera and Coleoptera hosts, though most of these can be excluded based on their incongruity with the general ecology of the genus. Hilszczański (2003) presents authenticated rearing records of *O. dentipes* s. lat. from *Anastrangalia dubia* (Scopoli, 1763) and *Arhopalus rusticus* (Linnaeus, 1758). Plausible hosts without authenticated rearings listed by literature also include *Tetropium fuscum* (Fabricius, 1787) and *Spondylis buprestoides* (Linnaeus, 1758) (Kolarov 1997, Varga 2014, Yu et al. 2016). Note

that some of these records may also refer to any of the here newly described species.

Remarks

The type of *O. dentipes* (Gmelin, 1790) is lost (Yu et al. 2016) and the original description could apply to either of the three species of the complex. To promote nomenclatorial stability given the complexity of the current situation where three taxa are involved, a neotype for *O. dentipes* needs to be designated to consolidate the name. The most probable interpretation is that the name is applicable to the largest, most widely distributed and abundant species of the genus in Europe. This argumentation in itself does not entirely clarify the identity of the specimen upon which Gmelin based his description, but provides the most likely scenario. The type locality of *O. dentipes* is Europe (Gmelin 1790 p. 2719) and a female from Germany (Bavaria), Gmelins home country, stored in ZSM is chosen as neotype. The type of *O. femoratum* Olivier is also lost and the original description

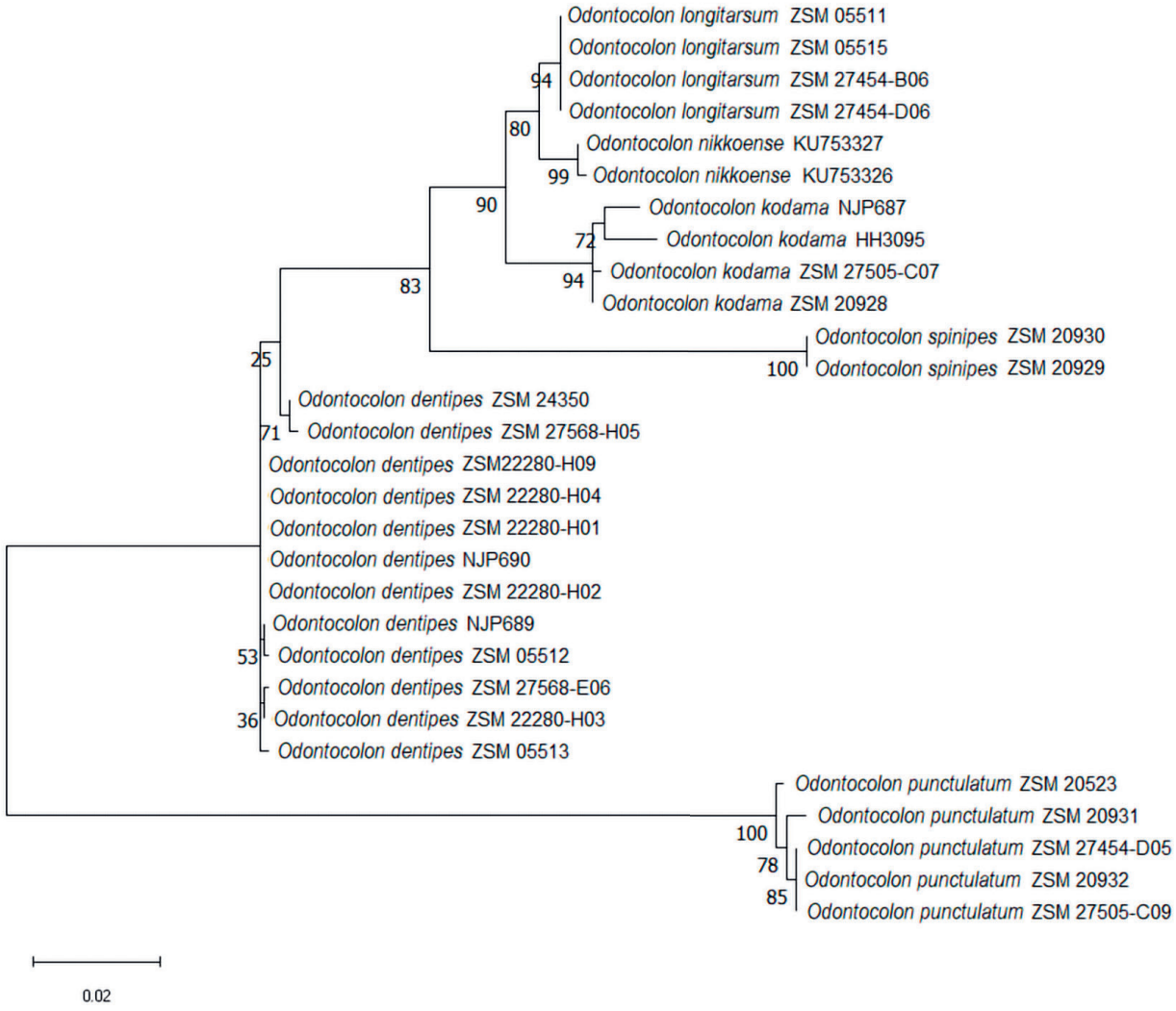

Figure 1. Evolutionary analysis of the *Odontocolon dentipes* aggregate and closely related species as obtained from cytochrome oxidase 1 (COI) sequences. Maximum likelihood tree is shown with clade support based on 150 bootstrap iterations using the General Time Reversible model and analysed with MEGA-X. The sample id:s refer to the BOLD database. Note that *Odontocolon geniculatum* (Kriechbaumer) and *O. rufiventris* (Holmgren) are missing.

Figur 1. Evolutionär analys för *Odontocolon dentipes* aggregate och närbesläktade arter utifrån CO1 sekvenser. Maximum likelihood-träd visas med ett clade-stöd baserat på 150 bootstrap-upprepningar med hjälp av General Time Reversible model och analyserat i MEGA-X. Individkoderna refererar till BOLD databasen. Notera att *Odontocolon geniculatum* och *O. rufiventris* saknas.

could refer to any of the species of the *dentipes* species complex. It is here regarded as a synonym of *O. dentipes* based on the same presumptions as *O. dentipes* itself, e.g. being concordant with the most common and widespread species. The lectotype female of *Odontocolon pinetorum* (Thomson, 1877) in MZLU has been studied and it is conspecific with *O. dentipes* s. str. as here defined. Notably regarding *O. pinetorum*, Aubert designated the female from Västergötland as lectotype (Aubert 1966, p. 127), but the designation was first published by Townes et al. (1965, p. 119, in the text referring to the label by Aubert) who also established the synonymy with *O. dentipes* (see also Fitton 1982, p. 63).

DNA barcode
The DNA sequences of 12 specimens of *Odontocolon dentipes*, including the neotype here designated are stored in BOLD: BC ZSM HYM 24350, BC ZSM HYM 27568-H05, BC ZSM HYM 22280-H04, BC ZSM HYM 22280-H09, BC ZSM HYM 22280-H01, BC ZSM HYM 22280-H02, BC ZSM HYM 22280-H03, NJP690, BC ZSM HYM 27568-E06, BC ZSM HYM 05512, BC ZSM HYM, NJP689, BC ZSM HYM 05513.

***Odontocolon kodama* sp. nov.**
Figs 2B, 2E, 2H, 3A, 3C, 3E.

Zoobank species id: urn:lsid:zoobank.org:act:01A599BE-8107–453A-94D8-C1486A1C39C0

Holotype
SWEDEN: ♀, Västergötland, Bockagölarna, pine forest on sandy ground, 58.04778, 14.116760, sweepnet, 2 Jun. 2018, N. Johansson leg., NJP687, (NHRS).

Paratypes
SWEDEN: 1♀, Västerbotten, Fällforsån, mixed riverside forest, RT90: 7095700, 1720650, Malaise trap, 23 Jul.–14 Aug. 2021, S. Hellqvist leg., NJP875, (NHRS); 1♀, Västerbotten, Fällforsån, mixed riverside forest, RT90: 7095700, 1720650, Malaise trap, 14–24 Jul. 2021, S. Hellqvist leg. (NHRS); 1♀, Småland, Osaby, 3 Jun.–21 Jul. 2021, window trap in mixed forest, H. Lundqvist leg. (NHRS); 1♀, Dalarna, Orsa, Värmderåsen, RT90: 6803400, 501700, Window trap: (14:2), 24 Jun.–7 Aug. 2021, L-O. Wikars leg. (NHRS); 1♂ same data as preceding (11:2) (NHRS); 2♂♂ same as preceding apart from date and trap number: 9 May–24 Jun. 2021, (14:1) (NHRS); 3♂♂ same data as preceding (11:1) (NHRS); 1♀, Hamra, 15 Jul. 1927, NHRS-HEVA 000019257; 1♀, Uppland, 31 May, NHRS-HEVA 000019258; 1♀, Uppland, Uppsala, Kronåsen, 7 Aug. 1983, "253", UPSZEN161010 (UPSZ); 2♀♀, Gyll. 13:10, UPSZEN161004 & UPSZEN161003 (UPSZ); 1♀, Coll. Haeffner, UPSZEN160995 (UPSZ); 1♀, Coll. Marklin, UPSZEN160993 (UPSZ). NORWAY: 1♂, EIS 23, Ry, Vindafjord, Vikebygd, Naustikvegen, Malaise trap, May 2021, I. Thorsen leg., HH2509, (ZSM); 1♀, EIS14, Ry, Vindafjord, Opsalneset, Malaise trap, May 2019, H. Haraldseide/E. Thorsen leg., HH3095, (ZSM); 2♀♀, EIS103, NTI, Lierne, Storbakken, N64.431388, E13.896538, Malaise trap, 5 Jun.–15 Aug. 2017. O. Hansen leg. (NTNU); 1♀, EIS127, NSI, Saltdal, Junkerdal, Raubergla, N66.80112, E15.60120, Malaise trap 5, 5 Jun.–8 Jul. 2020, F. Ødegaard leg. (NTNU).

Etymology
The species epithet *kodama* refers to the strange, mythological forest creatures in the movie "Princess Mononoke" by Hayao Miyazaki. As the civilization of man destroys the forests, the kodama are driven to extinction.

Diagnosis
Odontocolon kodama sp. nov. is distinguished from *Odontocolon dentipes* s. str. by the scarcer and weaker punctuation of the body and the head, the more distinctly crenulate central furrow of propleuron, the slightly more elongate tarsomeres and the mainly infuscate trochanters. It is distinguished from *O. longitarsum* sp. nov. by the shorter basal tarsomeres, the slightly weaker and scarcer punctuation of the mesosoma and head and the stouter area superomedia.

Description
Body length (5)7–11 mm. Fore wing length 5–8 mm. Head polished. Temples in ventral part with quite weak punctures with large interstices of about 4–5 times the diameter of punctures. Punctures becoming weaker and even scarcer, sometimes almost obliterated dorsally. Frons and head dorsally very

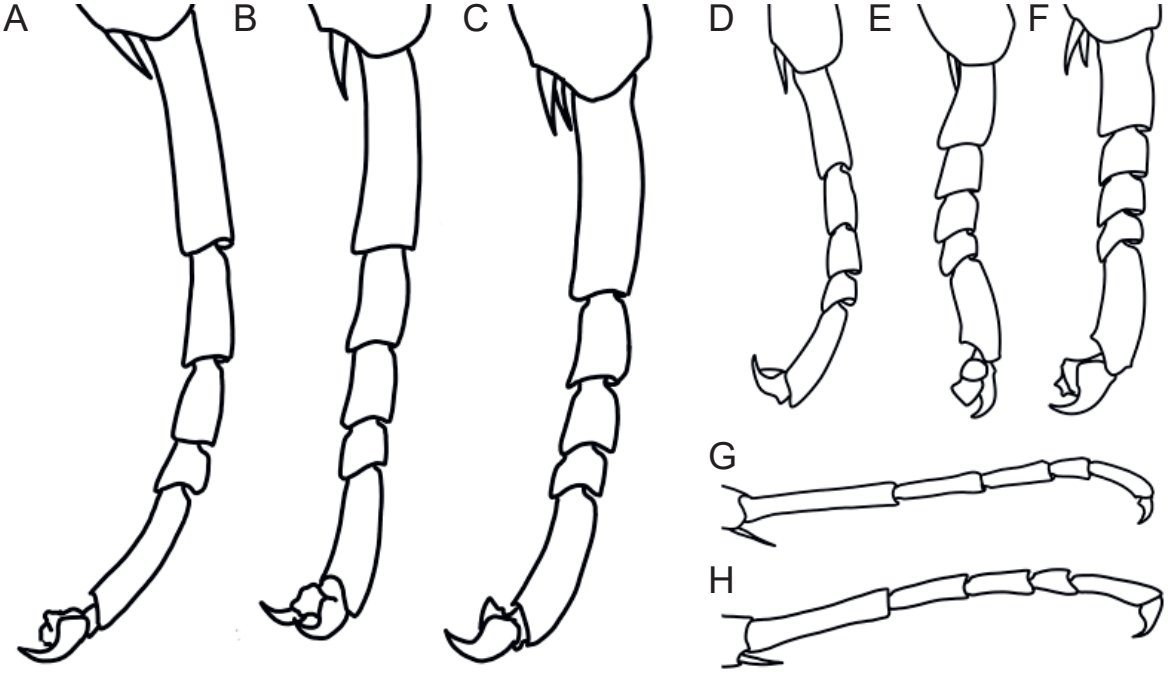

Figure 2. A–C) Hind tarsus of female; – A) *Odontocolon longitarsum* sp. nov.; – B) *O. kodama* sp. nov.; – C) *O. dentipes* (Gmelin); D–E) Mid tarsus of female; – D) *O. longitarsum* sp. nov.; – E) *O. kodama* sp. nov.; F) *O. dentipes*; G–H) Mid tarsus of male; – G) *O. longitarsum* sp. nov.; – H) *O. kodama* sp. nov.

Figur 2. A–C) Baktarser, hona; – A) *Odontocolon longitarsum* sp. nov.; – B) *O. kodama* sp. nov.; – C) *O. dentipes* (Gmelin). D–E) Mellantarser, hona; – D) *O. longitarsum* sp. nov.; – E) *O. kodama* sp. nov.; F) *O. dentipes*; G–H) Mellantarser, hane; – G) O. *longitarsum* sp. nov.; – H) *O. kodama* sp. nov.

scarcely punctate on a strongly polished background (Fig. 3A). Face below antennal sockets polished with scarce punctures with quite large interstices laterally, becoming denser centrally, partly merging. Malar space about 0.7 times as long as mandibular base. Temple widened behind eyes, at most about 1.3 times as long as compound eye in lateral view. Mandible bidentate, upper tooth slightly longer than lower. Antenna with 31–36 flagellomeres. First flagellomere in female about 2.5 times as long as wide, second flagellomere about 1.7 times as long as wide. First and second flagellomere about 3.0 times as long as wide in male. Sides of pronotum polished in lower part, widely crenulate centrally and polished with quite small punctures in upper part, the interstices between punctures slightly larger than the diameter of punctures. Mesosternum and lower half of mesopleuron polished with distinct punctures, the interstices between the punctures slightly larger than their diameter. Upper part of mesopleuron virtually impunctate, at most with very weak and scarce punctures anteriorly and dorsally. Mesoscutum and scutellum polished with weak irregular punctures, the interstices between punctures ranging from 3.0 to 5.0 times the diameter of punctures. Mesoscutum centrally with punctures denser, partly merging. Notauli deeply impressed, making the mesoscutum trilobed, without crenulation. Propodeum shiny, area lateralis with large irregular punctures or partly rugulose. Area superomedia in female wider than in closely related species and merged with area basalis (Fig. 3C). Area superomedia polished or with indication of transverse striae along outer margins. Inner side of hind coxae polished with scarce, weak punctures. Mid tibia of female twisted with ridge or furrow on the inner side. Hind femur about two times as long as wide with a large ventral tooth centrally. Pilosity of hind femur and hind tibia mainly consisting of very short dense adpressed setae with some scattered slightly longer setae. Hind metatarsus in female about four times as long as wide (Fig. 2B), in male five times. Mid metatarsus about 2.0 times as long as wide in female (Fig. 2E), about 5.0 times in male (Fig. 2H). First tergite about 2.0 times as long as wide in female and 4.0–4.5 in male with quite weak irregular, rugulose sculpture that becomes more rugose-punctate towards the posterior margin, the posterior 0.1 polished.

Second tergite with weak microsculpture in basal half or more, the posterior 0.3 polished. Third tergite usually with weak microsculpture in basal 0.3, sculpture becoming gradually weaker towards the hind margin. Ovipositor about as long as metasoma, mesosoma and head combined.

Colour

Body and head black, legs testaceous. All coxae and trochanters infuscate (Fig. 3E). Hind margin of the first tergite often with a wide reddish spot centrally.

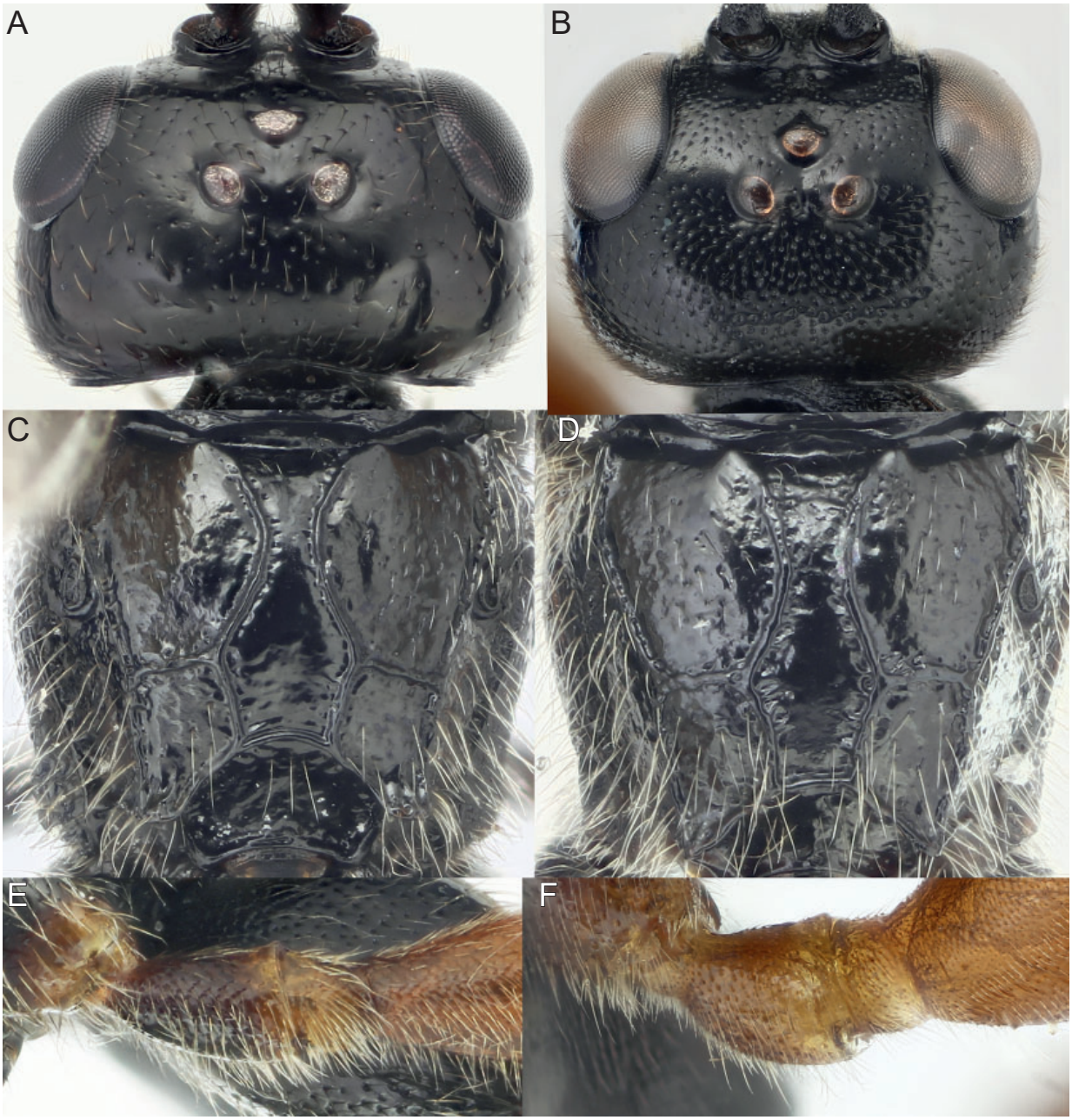

Figure 3. A–B) Head of female in dorsal view; – A) *Odontocolon kodama* sp. nov.; – B) *O. dentipes* (Gmelin); C–D) Propodeum of female in dorsal view; – C) *O. kodama* sp. nov.; D) *O. longitarsum* sp. nov.; E–F) Mid trochanter and trochantellus in anterior view; – E) *O. kodama* sp. nov., (male); –F) *O. dentipes* (female).

Figur 3. A–B) Huvud av hona ovanifrån; – A) *Odontocolon kodama* sp. nov.; – B) *O. dentipes* (Gmelin); C–D) Propodeum hona ovanifrån; – C) *O. kodama* sp. nov.; D) *O. longitarsum* sp. nov.; E–F) Mellantrochanter och trochantelli framifrån; – E) *O. kodama* sp. nov., (hane); – F) *O. dentipes* (hona).

Ecology and distribution
The species is recorded from Sweden, Norway and (according to a matching specimen in BOLD) Russia. Most specimens were collected in areas dominated by Scots pine and in one case collected on the trunk of a dead pine infested with *Anastrangalia* Casey, 1924. The species is widespread, but quite locally occurring in Sweden and most likely also Norway.

Remarks
The barcodes displayed in BOLD for *Odontocolon kodama* sp. nov. show quite some divergence (Fig. 1). This may be caused by partly distorted DNA or incomplete sampling. In the case of a genetically slightly deviating Norwegian male paratype (HH2509) the sampling was partly incomplete (601(0n)). The specimen does not cluster with any other specimen in the BOLD database. The studied types all share the same morphological features.

DNA barcode
The DNA sequences of one male and two female types of *Odontocolon kodama* sp. nov. are stored in BOLD: NJP687, HH2509, HH3095.

***Odontocolon longitarsum* sp. nov.**
Figs 2A, 2D, 2G, 3D, 4B.

Zoobank species id: urn:lsid:zoobank.org:act:95717129–6992–4903-AA19–789F2D-DA9D4E

Holotype
GERMANY: ♀, Bayern, Transekt 3, Falle 5, (Nationalpark), 49°3’29.75N; 13°17’27.87E, 660m, 23 May–13 Jun. 2008, G. Merkel-Wallner leg., BC ZSM HYM 05511 (ZSM).

Paratypes
GERMANY: 1♂, same data and depository as the holotype, BC ZSM HYM 05515, (ZSM). RUSSIA: 1♀, Karelia, *Kp*, 61°50.28N; 37°45.12E, Chumbozere, Pine forest, Yellow pan trap, 20 Jun. 2009, A. Humala leg., BC ZSM HYM 27454-D06 (ZSM); 1♂, Murmansk Oblast, LIM, LM3, Lappland National Park, pine forest, 4 km E of farm/estate (“usadby”), 23 Jun.–28 Jul. 2014. A. Humala leg., BC ZSM HYM 27454-B06 (ZSM). SWEDEN: 1♀, Åsele Lappmark, Björnlandets NR, Häggsjöbäcken, RT90: 1607535; 7095430, lövrik svämsumpskog intill bäck (swampy forest dominated by deciduous trees along a stream), Malaise trap 24 Jul.–26 Aug. 2014 (NHRS); 1♀, Småland, Nybro, Brantehallar, clearing in mixed forest – pine dominated, Malaisetrap (M3), 5–15 Jun. 2018, O. Persson/S. Björn leg. (NHRS); 1♂, Norrbotten, Jokkmokk, Kaltisbäcken, mixed old growth forest, 66.692028, 20.384188, Malaise trap, 27 Jun.–29 Jul. 2020, M. Karström leg. (NHRS).

Etymology
The species epithet *longitarsum* is derived from latin meaning long tarsus, referring to the elongate tarsal segments of this species.

Diagnosis
Odontotocolon longitarsum sp. nov. is distinguished from *O. dentipes* s. str. by the more elongate tarsi in both male and female. Furthermore, the trochanters are usually infuscate while they are more or less testaceous in *O. dentipes*. The sculpture of the tergites is more irregular than the quite regular transverse striation found in *O. dentipes*, the head is more scarcely punctate and the central furrow of propleuron is more distinctly crenulate. *O. longitarsum* sp. nov. is distinguished from *O. kodama* sp. nov. primarily by the more elongate tarsomeres, but also by the usually slightly more distinct sculpture of the meso- and metasoma and the narrower area superomedia.

Description
Body length 7.5–12 mm. Fore wing length 5–9.5 mm. Head polished, lower part of temples with quite scarce punctures, their interstices about two times the diameter of punctures. Punctures becoming weaker and scarcer dorsally. Frons and head dorsally with very small and scarce, but distinct punctures on a strongly polished background (as in Fig. 3A). Face below antennal sockets polished with larger and denser punctures that sometimes merge centrally. Malar space about 0.7 times as long as mandibular base. Temple widened behind eyes, at most about 1.3–1.5 times as long as compound eye in lateral view. Mandible bidentate, upper tooth slightly longer than lower. Antenna with (28) 32–39 flagellomeres. First flagellomere in female about 3.0 times as long as wide, second flagellomere about 2.5 times as long as wide. First and second

Illustrated key to the Odontocolon dentipes species complex.
Odontocolon dentipes s. lat. can be determined using the key in Johansson (2020). Note that *Odontocolon*, as many idiobiont parasitoids, varies greatly in size, probably depending on the host used. The infuscation of the hind femur mentioned in Johansson (2020) occur in smaller specimens, especially males, of all the species presented here and cannot be used for diagnostics.

1. Trochanters mainly testaceous, concolorous with trochantelli (very rarely with most of the trochanter infuscate) (Fig. 3F); mid and hind metatarsus stouter (Figs 2C, 2F); propleuron weakly crenulate centrally, with a single more strongly defined carina in the anterior part (Fig. 4A); area superomedia narrow (as in Fig. 3D); head dorsally (Fig. 3B) and inner side of hind coxae densely punctate. Small to large species (body length 7–17 mm).....***O. dentipes*** (Gmelin, 1790)
– Trochanters mainly infuscate (most evident in the mid leg), contrasting with the testaceous trochantelli (Fig. 3E); mid and hind metatarsus in female longer (Figs 2A–B, 2D–E); propleuron usually more strongly crenulate centrally (Fig. 4B); area superomedia frequently wider in female (Fig. 3C); head more scarcely punctate dorsally (Fig. 3A). Small or midsized species (body length 6–12 mm).....2
2. Mid and hind metatarsus elongate (Figs 2A, 2D, 2G); area superomedia in female stouter (Fig. 3C); inner side of hind coxae with distinct quite deep punctures.....***O. longitarsum*** sp. nov.
– Mid and hind metatarsus stouter (Figs 2B, 2E 2H); area superomedia in female narrower (Fig. 3D); inner side of hind coxae with weaker, scarcer punctures.....***O. kodama*** sp. nov.

flagellomere about 3.5 times as long as wide in male. Sides of pronotum (propleuron) polished in lower part, with distinct crenulation centrally and punctate in upper part (Fig. 4B). Mesosternum and mesopleuron polished with weak, scarce punctures, the interstices between the punctures about 3.0 to 5.0 times the diameter of punctures. Speculum large and polished. Upper part of mesopleuron in anterior part with distinct punctures. Mesoscutum and scutellum polished with irregular punctures, the interstices between punctures ranging from 2.0–5.0 times the diameter of punctures. Mesoscutum centrally with punctures denser, forming irregular longitudinal striae. Notauli deeply impressed making the mesoscutum trilobed, with weak crenulation in posterior part. Propodeum weakly polished, area lateralis with large irregular punctures or partly rugulose, area superomedia in female relatively elongated and narrow (Fig. 3D), merged with area basalis. Area superomedia irregularly rugulose or with indication of coarse transverse striae. Hind coxae on inner side with dense, distinct punctures. Mid tibia of female twisted with ridge or furrow on the inner side. Hind femur about two times as long as wide with large ventral tooth centrally. Pilosity of hind femur and hind tibia mainly consisting of very short dense, adpressed setae with some scattered slightly longer setae. Hind metatarsus in female very slender about 5.0 times as long as wide (Fig. 2A), in male 6.0 times as long as wide. Mid metatarsus also slender, about 2.5 times as long as wide in female (Fig. 2D), 6.0 times in male (Fig. 2G). First tergite in female about 3.0 times as long as wide, in male 4.0 times with quite weak rugulose sculpture, the posterior 0.1 polished. Second tergite slightly longer than posteriorly wide or square in female, about 1.6 times as long as wide in male, rugulose over almost the entire surface, the posterior 0.1 polished with small and scarce punctures. Third tergite usually weakly transversely aciculate at least in basal 0.5, sculpture becoming gradually scarcer towards the hind margin. Ovipositor about as long as metasoma, mesosoma and head combined.

Colour
Body and head black, legs testacous. All coxae and trochanters infuscate. Hind margins of tergites sometimes paler reddish.

Ecology and distribution
The species is recorded from Sweden, Germany, Finland (see below) and Russia. Most specimens were collected in areas dominated by Scots pine. It appears to be quite rarely collected and all records come from pristine coniferous forests.

Remarks
The DNA records in BOLD show that the species is closely related to the Eastern Palaearctic

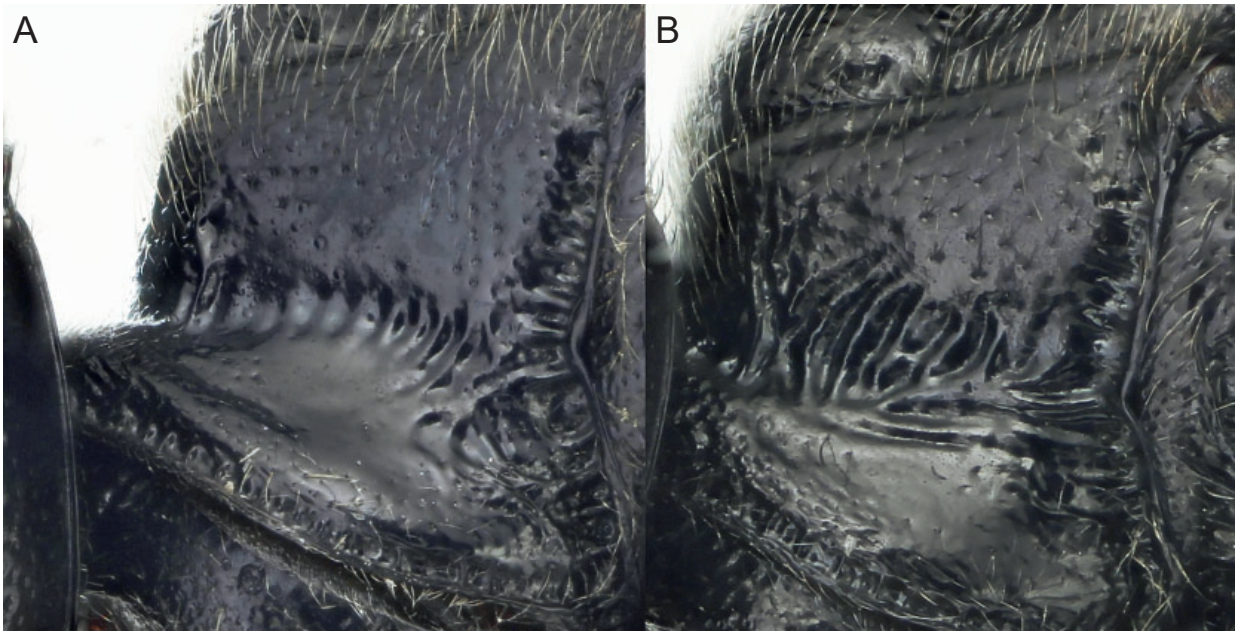

Figure 4. A–B) Typical sculpture of propleuron of female in lateral view; – A) *Odontocolon dentipes* (Gmelin, 1790); – B) *O. longitarsum* sp. nov.

Figur 4. A–B) Typisk struktur på propleuron, hona från sidan; – A) *Odontocolon dentipes* (Gmelin, 1790); – B) *O. longitarsum* sp. nov.

Odontocolon nikkoense Ashmead, 1906 (Ashmead 1906, Uchida 1928). I have repeatedly, but unfortunately unsuccessfully, tried to get access to the type stored in the Smithsonian institute, USA. However, the molecular differences displayed by the CO1 sequences in BOLD confirms the separation between the two species. Notably there is also an additional matching barcode in BOLD which comes from a specimen collected in Finland.

DNA barcode
The DNA sequences of two male and two female types are stored in BOLD: BC ZSM HYM 05511, BC ZSM HYM 27454-D06, BC ZSM HYM 05515, BC ZSM HYM 27454-B06

***Odontocolon geniculatum* Kriechbaumer, 1889. New species for Sweden.**

Odontomerus geniculatus Kriechbaumer, 1889 p.73.

SWEDEN: 1♂, Skåne [Scania], Hörby kommun, Hemmeneköp 8171, 3.5 km S. Önneköp, "Sweeping at sun exposed oak forest margins with logs and dead wood.", 10 Jun. 2021, M. Sörensson leg., (det. N. Johansson 2021).

Remarks
Odontocolon geniculatum was deleted from the Swedish checklist by Johansson (2020) based on misidentified material of *O. dentipes*. The author also highlighted the possibility that the species could occur in Sweden and that it should be sought after on spruce logs in the southern part of the country. The male here reported was collected at Linderödsåsen, one of the most southerly of the areas with extensive spruce forests/plantations in Southern Sweden. The specimen was most likely sweepnetted at, or around, some large, shaded spruce logs with *Fomitopsis pinicola* (Sw.) P. Karst. along a margin of a mixed forest (M. Sörensson pers. comm.). The specimen is stored in the private collection of Mikael Sörensson.

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at ZSM kindly lended their barcoded material of the *O. dentipes* s. lat. and gave access to unpublished barcodes. Mikael Sörensson kindly allowed for the publication of *Odontocolon geniculatum* and provided information of the locality and translated some Russian labels. Alexander Berg made the line drawings. Lars-Ove Wikars lended specimens for study and added types. Rune Bygebjerg and Christoffer Fägerström at MZLU assisted with the study of the *Odontocolon* in the Thomson collection. Hege Vårdal of NHRS and Hans Mejlon UPSZ assisted with their collections. Mattias Forshage and Bengt-Åke Bengtsson provided valuable feedback on the treatment of the neotypification of *O. dentipes*. Reviewers Jacek Hilszczański and Jonathan Vogel gave suggestions that greatly improved the quality of the manuscript.

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Sammanfattning

De nordeuropeiska arterna inom *Odontocolon dentipes*-aggregatet revideras med hjälp av integrativa metoder. Revisionen behandlar tre arter, varav två, *Odontocolon kodama* **sp. nov.** och *Odontocolon longitarsum* **sp. nov.**, beskrivs som nya för vetenskapen. En neotyp för *Odontocolon dentipes* (Gmelin, 1790) designeras för att konsolidera namnet i förhållande till de här nybeskrivna arterna. Studien är att betrakta som en förlängning av den av författaren nyligen genomförda revisionen av släktet och presenterar förutom det rent taxonomiska bidraget också *Odontocolon geniculatum* som ny för Sverige genom en hane insamlad i Skåne.