Taxonomy and Evolution of *Tenthredo* (*Elinora*) Species Similar to *T. dahlii* and *T. koehleri* (*Hymenoptera: Tenthredinidae*)

**Stephan M. Blank & Andreas Taeger**

**Introduction**

*Elinora* is a lineage of *Tenthredo* which exhibits its greatest diversity in the Mediterranean Basin. *Tenthredo dominiquei* (Konow, 1894) and *T. flaveola* Gmelin, 1790 occur northwards to the coast of the Baltic Sea (Liston 1995, Blank et al. 2001). The most eastern representatives occur in Central Asia, i.e. *Tenthredo dissidua* (Konow, 1899), *Tenthredo fulveola* (Zhelochovtsev, 1961), *Tenthredo longipes* (Konow, 1886), and *Tenthredo pallidipes* (Dalla Torre, 1894) [= *Allantus pallipes* Freymuth, 1870 nec Fallén, 1808] (Zhelochovtsev 1976). The vast majority of *Elinora* species prefer steppe-like habitats and some occur even in semi-desert areas (Lacourt 1991; personal observation). As far as the larval host plants are known, these are all members of the Brassicaceae (Taeger et al. 1998, Lacourt 1999). Furthermore, the adults can frequently be found on brassicacean leaves and flowers, sometimes in large numbers. Exceptions are *Tenthredo koehleri* Klug, 1817 and *Tenthredo radoszkowskii* (André, 1881), which occur in the submontane to subalpine zone and whose adults usually visit *Geranium* flowers for feeding and resting (Lacourt 1997; present data).

Currently 52 *Tenthredo* (*Elinora*) species are regarded as valid (Taeger & Blank 2005; present work). Benson (1968) has provided the only identification keys to all species known at that time classifying them under *Cuneala* and *Elinora*. Lacourt (1991) revised and keyed the western Mediterranean species and published a number of shorter works (Lacourt 2000, 2001; for additional references see Lacourt 1999 and Taeger & Blank 2005).

The taxa revised and keyed in the present work have been treated under *Cuneala* by Benson (1968). Zhelochovtsev (1976) was the first to place *Cuneala* as a junior synonym of *Elinora*, treating the latter as a subgenus of *Tenthredo*. Lacourt (1998) has named a group comprising of *Elinora koehleri* and *Elinora radoszkowskii* as *Blankia* (= *Cuneala auct. partim*), but we regard this generic name as a junior subjective synonym of *Elinora*. Lacourt combined the other species of *Cuneala* sensu Benson with his *E. limbalis-dabliii* group (Lacourt 1997). Here we explain, why we include *Blankia* in *Elinora*. We describe three additional species from Syria and Turkey, which are similar to those species treated under *Cuneala* by Benson and under *Blankia* and the *E. limbalis-dabliii* group by Lacourt.
Material and methods

Morphological terminology generally follows Goulet (1992) and Goulet & Huber (1993). Terminology for the external genitalia is after Smith (1968: postcalcar and cyspella of the ovipositor) and Gibson (1980: valviceps of the penis valve), and that of surface microsculpture is after Harris (1979). The acronym "PD" means point distance, i.e. the relation of the distances between the margins of two points: the diameter of the points.

For light microscopic imaging stacks of digital photos were taken with the KYF-F75U camera (JVC) attached to an Olympus stereo microscope SZX12 (images of whole specimens; lighting was from cold light sources attached to ring light and to double light guides ending close to plastic plates diffusing the light) or to an Olympus compound microscope BX51 (images of ovipositors and penis valves). Focussed images were computed using the software AutoMontage 5.01.

Type labels are cited strictly verbatim, additional explanations are given in brackets. Geographical names, which are originally written in Cyrillic letters, are listed according to the Times Atlas. Distribution data listed here are primary except where stated otherwise. The distribution maps were prepared using the CFF 1.2 program by Y. Barbier & P. Rasmont (Mons / Belgium, 1996 and 1997), to which the borders of several countries were added.

The following abbreviations have been used for collections, where material studied is deposited:

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<th>Abbreviation</th>
<th>Location</th>
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</tr>
<tr>
<td>CUDB</td>
<td>Cumhuriyet University, Faculty of Science and Literature, Department of Biology, Sivas / Turkey</td>
</tr>
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<td>DEI</td>
<td>Deutsches Entomologisches Institut am Zentrum für Agrarlandschaftsforschung, Müncheberg / Germany</td>
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<td>JLC</td>
<td>J. Lacourt, Le Pâty, Igé / France</td>
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<td>MKC</td>
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<td>Museum für Naturkunde, Institut für Systematische Zoologie, Hauptabteilung Entomologie, Berlin / Germany</td>
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<td>MZLU</td>
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<td>NHM</td>
<td>Natural History Museum, London / Great Britain</td>
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<td>Staatliches Museum für Naturkunde, Stuttgart / Germany</td>
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<td>Zoologische Staatssammlung, Munich / Germany</td>
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Monophyly and ecological evolution of *Tenthredo* (*Elinora*)

Opinions upon the taxonomic treatment of *Elinora* are largely divergent. Lacourt (1988, 1997, 1998) has split the group into *Blankia*, *Elinora* and *Murciana*. Goulet (1996) considered *Elinora* and *Murciana* as junior synonyms of *Tenthredo* (*Blankia* had not yet been described at that time). Among the taxa included in *Tenthredo* s.l. (in the sense of Goulet 1996), *Elinora* can be identified by the combination of the following characters:

1. Ventral arms of propleura meeting medially;
2. Occipital carina absent on postocellar area and more or less absent along dorsal portion of gena;
3. Usually several terga with yellow distal edges, which are wider laterally and ventrally than dorso-medially, often terga 3–5 more or less red;
4. Distal edge of labrum often more or less truncated or notched;
5. Labio-maxillary complex and malar space more or less elongated;
6. Apical portion of the anterior fore tibial spurs more or less abruptly bent in axillary view.

Unequivocal morphological apomorphies, which support the monophyly of *Elinora*, are unknown. Goulet (1996) has demonstrated the characters 1–3 above to be ground plan states
of Tenthredo and accordingly plesiomorphies of Elinora. Both the shape of the labrum (character 4) and the length of the mouthparts (character 5) are liable to a wide interspecific variation (Taeger 1991). The shape of the labrum is not explicable at the moment but it occurs homoplastically in Scapteryx Stephens, 1835, a closely related lineage of Tenthredinini (Goulet 1996). In a comparative study Jervis & Vilhelmsen (2000) identified the mouthparts of Cineala as the type 1 of various types of concealed-nectar extraction apparatus occurring in sawflies. The length of the mouthparts appears to be related to adult feeding on nectar and pollen, which is concealed in more or less narrow flower corollas. We suppose that the gradual variation of the mouthpart length reflects the specific feeding preference rather than phylogenetic relationships at a higher level. The length of the malar space appears to be correlated with the length of the mouthparts. Most Elinora species have the anterior fore tibial spur clearly bent (char. 6), but also this character exhibits wide variation within Elinora. The inflection is less distinct or the spur is almost straight e.g. in Tenthredo koehleri, T. longipes, T. parvula, T. radoszkowksi and T. sabariensis. In Elinopsis, Paratenhredo, Rhogogaster and Tenthredo s.str. the spurs are mostly straight or only shallowly bent.

We score the larval oligophagy on Brassicaceae as an apomorphy of Elinora, although the larvae are known only for a few species. All of these are strictly associated with Brassicaceae as their host plants (Lorenz & Kraus 1957, Weifenbach 1985, Lacourt 1997, 1999, Taeger et al. 1998). Adults are usually swept from flowers and plants of Brassicaceae which strengthens the assumption of a general oligophagy of Elinora species (Muche 1962, Schell 1979, Saure & Blank 2006). The larva of Tenthredo koehleri has been suspected to feed on Geranium species (e.g. by Magis 1987). This might be concluded from the frequently observed visits of adults to Geranium flowers, which applies also to T. radoszkowksi (Lacourt 1997, 1999, present data). But K. Beneš has reared the larva of T. koehleri from Cardamine (Taeger et al. 1998). According to our knowledge the oligophagy of Elinora on Brassicaceae is unique among Tenthredininae. The association with Brassicaceae is a rare phenomenon among sawflies. It occurs in a large number of Athalia Leach, 1817 species but by no means all (Benson 1962). These form a distantly related lineage of Tenthredinidae (Lacourt 1999) or possibly are the basal lineage of non-blasticotomid Tenthredinoidae (Blank, unpubl. results). Also the diet of some polyphagous Tenthredininae may include Brassicaceae (e.g. Tenthredo atra Linné, 1758; Taeger et al. 1998). But for neither of the Tenthredinini lineages is a specialization on Brassicaceae as the exclusive larval diet known.

Brassicaceae contain secondary plant metabolites which may be sequestered by sawfly larvae feeding on them. Larvae of Athalia rosae (Linné, 1758) store glucosinolates and supposedly additional compounds of the host plant in their haemolymph. They use them as an effective deterrent against invertebrate and vertebrate predators (e.g. Müller et al. 2002, Müller & Brakefield 2003, Vlieger et al. 2004, Boevé & Müller 2005). Elinora species have not yet been studied in this respect (C. Müller and J.-L. Boevé, pers. comm.). But it appears conceivable that the adaptation to Brassicaceae is also here coupled with the sequestration of plant compounds to protect the exophytic larvae in a corresponding way.

Brassicacean species are very diverse in regions with low precipitation and may provide a significant portion of biomass there. They are particularly species rich in the Mediterranean Basin (Hammer 2000). Owing to the adaptation to and exploitation of Brassicaceae, Elinora was enabled to spread into steppes and semi-desert regions, which are otherwise inhabited only by a comparatively small number of sawflies with free feeding larvae. The possible chemical-based protection of the larvae may have given rise to the species radiation of Elinora in such regions, where ants in particular may represent highly abundant predators.

Lacourt (1997) indicated the occurrence in humid habitats of the mountainous to subalpine level as characteristic for Tenthredo koehleri and T. radoszkowksi. The present distribution data suggest that this might also apply to T. davidi, T. longipes and T. lacourtiana.

Lacourt (1988, 1997) separated Murciana for Murciana sebastiani and Blankia for Blankia koehleri and Blankia radoszkowksi by morphological and ecological autapomorphies.
For Blankia the autapomorphies concern e.g. the shape of the penis valve and the preferred habitat. The coarse clypeus surface sculpture of koehleri and radoszkowskii is also found in longipes females, which Lacourt (1999) classified as an Elinora species, and additionally in davidi and lacourtiana described below. The dorsal and apico-ventral lobes of the valviceps of the penis valve are elongated in davidi, koehleri, lacourtiana and radoszkowskii, whereas in longipes the lobes are similarly short as in most other Elinora species. Apomorphies for the remaining Elinora species have neither been reported by Lacourt, nor have any been found during the present study. Since after removing Blankia and Murciana the group comprising of the remaining Elinora species would supposedly run the risk to be paraphyletic, we keep all the included species under one genus-group name. Goulet’s (1996) phylogenetic work has demonstrated that there is no well-founded subdivision for Tenthredo s.l. at the moment. Therefore, we treat Elinora at the level of a subgroup of Tenthredo in accordance with Zhelochovtsev (1976) and Zhelochovtsev & Zinovjev (1988).

**Tenthredo (Elinora)** Benson, 1946

= Elinora Benson, 1946: 35–39; type species: Allantus dominiquet Konow, 1894, by original designation; combined as a subgenus of Tenthredo by Zhelochovtsev (1976)

= Cuneala Zingiebl, 1956: 325; type species: *Cuneala tricolor* Zingiebl, 1956 [= Tenthredo (Elinora) longipes (Konow, 1886), see Blank 1996], by monotypy; synonymy with Tenthredo (Elinora) by Zhelochovtsev (1976)


= Blankia Lacourt, 1998: 487; type species: Tenthredo (Allants) koehleri Klug, 1817, by original designation; syn. n.

Species identification

The geographical scope of the following key is Europe (excluding the Iberian Peninsula south of the Pyrenees) and Central Asia. The Pyrenees are the south-western distribution limit of *Tenthredo koehleri*. The species are roughly characterized by the combination of elongate mouthparts and generally extensive surface sculpture (e.g. clypeus surface granulate, dull; occipital carina often complete on genae and vertex except for the postocellar area; medial part of frons densely punctate and often with granulate microsculpture). These taxa have formerly been classified by Benson (1968) with *Cuneala*, or by Lacourt (1997, 1998) with the *Elinora limbalis-dablil* group and Blankia. They are possibly the most extensively sculptured *Elinora* species, although *T. krausi* has the vertex and the male of *T. davidi* the clypeus comparatively smooth. The frons is similarly sculptured e.g. in *Tenthredo algeriensis* (Maggetti, 1886) from Algeria and Tunisia and in *Tenthredo lucasis* (W. F. Kirby, 1882) from Morocco, but in these species the clypeus is at least moderately shining. A similarly extensive surface sculpture is present in the Iberian and North African *Tenthredo limbalis* Spinola, 1843. Among the excluded taxa many have the clypeus shining brightly between scattered punctures. The exclusion of other *Tenthredo (Elinora)* species in course of a number of couples 1, 8 and 12–16 is necessary, because we were unable to identify a concise combination of characters clearly defining a group including all these taxa.

1. Species from Eurasia except for south-western Europe, or clypeus black ............ 2

— Species from North Africa, Portugal and Spain, and clypeus always yellow.

other *T. (Elinora)* species

2(1) Clypeus black (Figs 1, 3) .................. 3

— Clypeus pale, sometimes base black (Figs 2, 4) .................................. 12

3(2) Female ........................................ 4

— Male ............................................. 8

4(3) Tegulae with lateral edge yellow. Labrum brown to brownish white (Fig. 3). Apex of hind tibia black. Metepisternum more or less yellow along posterior edge (sometimes completely black).

Distribution (Fig. 72): Caucasus and Transcaucasus, northern Iran, Turkmenistan (Kopet Dag). **T. longipes** (Konow, 1886)?
Figs 1–4: Face. 1, *Tenthredo koehleri* ♀; 2, *T. krausi* ♀; 3, *T. longipes* ♀; 4, *T. longipes* ♂. Scale 0.5 mm.

Figs 5–6: Pilosity of basal terga. 5, *Tenthredo koehleri* ♀; 6, *T. radoszkowskii* ♀. Scale 0.5 mm.

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— Tegulae and usually labrum black. Apex of hind tibia orange. Metepisternum completely yellow or at least with large yellow spot medially leaving narrow posterior edge brown to black………………………………………5

5(4) Terga 2–3 densely pilose lateral of the middle (setae density on dorso-lateral portion similar to that on lateral portion; Fig. 5).

Distribution (Fig. 74): Central Europe (mostly in mountainous to subalpine regions), in the South-West towards the Pyrenees, in the South-East towards the mountain ranges of southern Bulgaria.

*T. koehleri* Klug, 1817 ♀

— Terga 2–3 dorsolaterally of middle with scattered setae (setae density on dorso-lateral portion distinctly less than that on lateral portion; Fig. 6).………………………………………6
6(5) Sawteeth of ovipositor rounded (Fig. 60). Mesoscutellum black, rarely with two yellow spots medially or anterior half of mesoscutellum yellow with a medial longitudinal line brown or black. Mesepisternum black. Terga 3–5 sometimes more or less red (Fig. 37). Distribution (Fig. 74): Caucasus and Transcaucasus, central and north-eastern Turkey.

**T. radoszkowskii** (André, 1881) ♀
- Sawteeth of ovipositor flat (Figs 55, 58). Mesoscutellum yellow on anterior two thirds (Figs 19, 31). Mesepisternum with more or less long stripe posterio-medially. Terga 3–5 without red ............................ 7

7(6) Hind femur black, narrow base and apex and a dorsal line yellow (Fig. 21). Scape yellow dorsally, black ventrally, pedicel and flagellum black. Occipital carina missing on complete vertex. Prementum 1.1–1.2 × longer than flagellomere 1. Sawteeth of ovipositor with comparatively large postcalcar (Fig. 55).

Distribution (Fig. 72): South-eastern Turkey (Hakkâri Mountains).

**T. davidi** Blank & Taeger, sp. n. ♀
- Hind femur orange (Fig. 32). Scape, pedicel and narrow base of flagellomere 1 orange, otherwise flagellum black. Weak occipital carina present on vertex lateral to postocellar area. Prementum 0.8 × as long as flagellomere 1. Sawteeth of ovipositor with comparatively small postcalcar (Fig. 58).

Distribution (Fig. 72): North-eastern Turkey (Kaçkar Mountains).

**T. lacourtiana** Blank & Taeger, sp. n. ♀

8(3) Mesoscutellum black ...................... 9
- Mesoscutellum yellow.

other **T. (Elinora)** species

9(8) Hind femur yellow on outer side and black on inner side (Fig. 28, 30). Vertex without occipital carina.

Distribution (Fig. 72): South-eastern Turkey (Hakkâri Mountains).

**T. davidi** Blank & Taeger, sp. n. ♂
- Hind femur predominantly or completely black (Figs 26, 40, 44). Vertex with a short occipital carina present close to postocellar area ............................ 10

10(9) Hind tibia bright yellow with red apex (Fig. 26), rarely apex infuscated. Terga 4–5 with usually continuous yellow bands posteriorly and sometimes terga 3 and 6 with yellow spots laterally, terga 3–5 never red (Fig. 24, 26).

Distribution (Fig. 74): Central Europe (mostly in mountainous to subalpine regions), in the South-West towards the Pyrenees, in the South-East towards the mountain ranges of southern Bulgaria. **T. koehleri** Klug, 1817 ♂
- Usually hind tibia orange or more or less black, rarely yellow with orange apex (Figs 40, 44). Either terga 3–5 more or less red and / or tergum 4 with a continuous yellow band posteriorly and tergum 5 with lateral yellow spots (Figs 38, 40, 42, 44). (Species identification ambiguous.) ...................... 11

11(10) Upper half of mesepisternum between punctures smooth or with fine microsculpture, shining.

Distribution (Fig. 72): Turkey (Artvin).

? **T. lacourtiana** Blank & Taeger, sp. n. ♀
- Upper half of mesepisternum between punctures usually wrinkled, punctures more or less obsolescent, usually dull.

Distribution (Fig. 74): Caucasus and Transcaucasus, central and north-eastern Turkey.

**T. radoszkowskii** (André, 1881) ♂

12(2) Orbits completely black (only **E. amasiensis** sometimes with a tiny brown spot on lower portion of gena) ...................... 13
- Orbits with distinct pale pattern.

other **T. (Elinora)** species

13(12) Mesepisternum completely black in anterior half ............................ 14
- Mesepisternum more or less pale in anterior half.

other **T. (Elinora)** species

14(13) Hind femora on inner side black at least in distal half, often complete inner side black except for base and apex .................. 15
— Hind femora yellow, inner side sometimes with a small spot on base or apex.

other *T. (Elinora)* species

15(14) Clypeus completely dull, with granulate microsculpture between punctures. 16
— Clypeus shining at least medially, at most with fine reticulate microsculpture between punctures.

other *T. (Elinora)* species

16(15) Vertex and upper portion of inner orbits roughly punctate, interspaces often with microsculpture and more or less dull. 17
— Vertex and upper portion of inner orbits at most with tiny, scattered punctures, interspaces smooth and shining.

other *T. (Elinora)* species

17(16) Female 18
— Male 20

18(17) Pubescence on head and mesepisternum short, about 0.5–0.75× as long as ocellar diameter, longest setae on mesepisternum about 80 μm long (Fig. 7). Tegulae predominantly yellow with a tiny black spot basally (Fig. 9).

Distribution (Fig. 72): Greece (Lesvos Island), western to central Turkey.

*T. amasiensis* (Kriechbaum, 1869) ♀

— Pubescence on head and mesepisternum about as long as ocellar diameter, longest setae on mesepisternum 170–200 μm long (Fig. 8). Tegulae black with lateral edge yellow (Fig. 10).

19(18) Terga 7 and 8 with distal yellow edges, which may be interrupted medially on tergum 7, and seldom missing on tergum 8 (Figs 27, 29). Ovipositor with 18–19 saw-teeth, sawteeth rounded (Fig. 57). Smaller species (9.5–10 mm).

Distribution (Fig. 73): North-western Syria, western and central Turkey.

*T. krausi* Blank & Tæger, sp. n. ♀

— Terga 7 and 8 black or sometimes tergum 7 yellow laterally (Figs 15, 17). Ovipositor with 21–22 sawteeth, sawteeth flat (Fig. 54). Larger species (12–13.5 mm).

Distribution (Fig. 73): South-eastern Europe.

*T. dahlit* Klug, 1817 ♀

Figs 7–10: 7, Mesepisternum *Tenthredo amasiensis* ♀; 8, mesepisternum *T. krausi* ♀; 9, colour pattern of tegulae *T. amasiensis* ♀; 10, colour pattern of tegulae *T. krausi* ♀. Scale 0.5 mm.
**Tenthredo (Elinora) amasiensis**
(Blanchbaumer, 1869)

(Figs 7, 9, 11–14, 45, 53, 61, 72)

= *Allantus xanthorius* var. *amasiensis* Blanchbaumer, 1869: 592, *♀♂*, type locality: Turkey, Amasia province, Amasia; = *Allantus dahlii* var. *amasiensis* (Blanchbaumer, 1869); = *Cuneala amasiensis* (Kriechbaumer, 1869); = *Elinora amasiensis* (Blanchbaumer, 1869)

**Diagnostic combination.** Characterized by the combination of 1, short hairs on head and mesepisternum (0.5–0.75 × as long as ocellar diameter; Fig. 7), and 2, predominantly yellow tegulae bearing a tiny black spot basally (Fig. 9).

**Type material.** *Allantus xanthorius* var. *amasiensis*. Lectotype *♀* (hereby designated): [pink:] "199.; "Mann 1860 Amasia"; [handwriting of Kriechbaumer:] "xanthorius var."; "Dahli det. Kohl"; "xanthor. var. amasiensis det. Kriechbaumer"; [red:] "Lectotypus *Allantus xanthorius* var. *amasiensis* Kriechbaumer, 1869 des. S. M. Blank 1998"; "Elinora amasiensis (Kriechbaumer)♀ det. S. M. Blank 1998". The lectotype is in perfect condition. Paralectotype 1♀ with identical collecting label. NHMW.

**Discussion.** Blanchbaumer (1869) described *Allantus xanthorius* var. *amasiensis* from a couple collected by Mann in Amasia in 1860. In the Vienna collection there are seven females and one male with such collecting labels, which have subsequently been labelled as *amasiensis*. One female, which is hereby designated as the lectotype, bears Blanchbaumer’s handwritten identification label. The only male *T. amasiensis* of the series is designated as the paralectotype. The other six females belong to *T. amasiensis* (1♀) and *T. krausi* (5♀).

**Distribution** (Fig. 72). Greece (Lesvos Island), Turkey (Amasya, Ankara, Aydin, Denizli, Kayseri, Konya, Muğla).

**Studied material.** 21♀ 11♂.

**Tenthredo (Elinora) dahlii**
Klug, 1817

(Figs 15–18, 46, 54, 62, 73)

= *Tenthredo (Allantus) dahlii* Klug, 1817: 143–144, *♀*, type locality: Hungary; = *Allantus dahlii* (Klug, 1817); = *Cuneala dahlii* (Klug, 1817); = *Elinora dahlii* (Klug, 1817); = *Elinora dahli*, misspelling; *Tenthredo dahli*, misspelling; *Tenthredo (Elinora) dahli*, misspelling

= *Tenthredo villosa* Brullé, 1832: 390–391, Tab. LII Fig. 10, *♀*, type locality: Greece, Peloponnisos, Modon plain
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Figs 11–14: *Tenthredo amasiensis*, habitus. 11, ♀ dorsally; 12, ♂ dorsally; 13, ♀ laterally; 14, ♂ laterally. Scale 1 mm. (See also Colour Plate 6).

= *Tenthredo unicincta* Brullé, 1832: 391, ♂, type locality: Greece, Pelopónnisos, Modon plain; = *Allantus unicinctus* (Brullé, 1832)
= *Allantus xanthorius* Kriechbaumer, 1869: 591–592, ♀ ♂, type locality: Romania, Tulcea [= Tultscha]
= *Macrophya hartigii* W. F. Kirby, 1882: 260, Tab. X Fig. 1, ♂, type locality: Albania; *Macrophya hartigi*, misspelling

**Diagnostic combination.** *Tenthredo dahliii* is most similar to *T. krausi* on basis of the combination of 1, comparatively long hairs of mepisternum and vertex (as long as or longer than ocellar diameter), and 2, the predominantly black tegulae bearing a narrow yellow lateral edge. *T. dahliii* females are characterized by 1, tergum 7 bearing at most yellow spots laterally and tergum 8 being black (terga 7–8 with continuous distal yellow edges in *T. krausi*), and 2, flat sawteeth of valvula 1 of the ovipositor (rounded in *T. krausi*). In males only the narrow distal edge of tergum 4 is yellow (predominantly yellow in *T. krausi*). *T. dahliii* (♀ 12.0–13.5 mm, ♂ 11.0–12.0 mm) is clearly larger than *T. krausi* (♀ 9.5–10.0 mm, ♂ 9.0–10.0 mm).


**Discussion.** *Tenthredo dahliii* has been described by Klug (1817) upon a single female from Hungary bearing yellow posterior margins
on terga 1, and 4–6, and black sterna. This is the valid name for a *Tenthredo (Elinora)* species distributed from south-eastern Austria and Slovakia towards Greece and the European part of Turkey.

In later publications this species has repeatedly been reported as new under various names upon material which was collected in south-eastern Europe. Brullé (1832) described and illustrated *T. villosa* (♀) from the Pelopónnisos, which bears yellow posterior margins on terga 1, and 4–6. According to the illustration the light margin on tergum 6 is interrupted medially. *T. uncinata* Brullé, 1832 (♂) has the small posterior margin of tergum 1 and the posterior margin of tergum 4 yellow, the latter interrupted medially. According to the descriptions, illustrations and the origin of the material the current synonymies of these names can be confirmed (Lacourt 1999, 2001).

Kriechbaumer’s (1869) statement concerning the number of type specimens of *Allantus xanthorrhius* is ambiguous. He mentioned, that he had a couple of specimens from the Vienna collection on hand, but he noted three collecting localities (♂ from the Crimea, ♀ from Tultscha in Bulgaria and from Mt. Nanos). There are three specimens in the NHMW, which agree with the description, and which are hereby designated as lectotypes and paralectotypes respectively. The male from Nanos, which is little more stout, has obviously been listed as a female. *A. xanthorrhius* has been correctly identified as a synonym of *T. dahlii*. The locality “Taur” names the mountains of the Crimea (German name “Taurien”).

**Distribution** (Fig. 73). Albania, Austria, Bulgaria, Czech Republic, Greece, Hungary, Republic of Macedonia, Poland, Romania, Slovakia, Slovenia, Turkey (Edirne), Ukraine. Also reported from the European part of Russia (Zhelochovtsev & Zinovjev 1996).

**Studied material.** 81 ♀ 50♂.
Tenthredo (Elinora) davidi
Blank & Taeger, sp. n.

(Figs 19–22, 47, 55, 63, 72)

Type locality: Turkey, Hakkâri province, Sat Mountains, valley south of Gevriâ Sermendi

Diagnostic combination. Among the species with black clypeus, labrum and tegula Tenthredo davidii is characterized by the complete lack of an occipital carina on the vertex and the comparatively wide gena. The male is characterized by the hind femur being yellow on the outer and black on the inner side (Fig. 22; other species with hind femur either completely black or with scattered, irregular, pale spots).

Female Description. Color (Figs 19, 21). Head black, scape dorsally yellow, apex of mandible brown. Thorax black, posterior margin of pronotum, anterior half of mesoscutellum, a small stripe on posterior half of mesepisternum, and metepisternum yellow. Abdomen black with tergum 1 yellow except for the most anterior area close to the metapostnotum, tergum 3 with yellow posterior stripe laterally and ventrally, terga 4–7 and 9+10 with complete posterior edge yellow; tergum 8 yellow on posterior edge except for most ventral portion, sterna 3–5 with small posterior spots laterally, sternum 6 with posterior edge yellow. Legs mostly yellow with tibial apices orange. On fore leg coxa black, trochanter and trochantellus mainly black, femur black ventrally, posteriorly and at base, tarsus black towards tip. On hind leg coxa black with apical third ventrally yellow, trochanter mainly black, trochantellus yellow, femur black on inner, outer and most of ventral side, tarsus orange except for yellow base of tarsomere 1. Wings yellowish, basal half of costa yellow, subcosta yellow anteriorly and black posteriorly, basal section of anal veins yellow, pterostigma black with yellowish brown base.

Morphology. Body length 9.0 mm. Clypeus 0.60× as long as distance between lower eye margins, medially excised for 0.40 of its length, with flat and irregular wrinkles, shining, irregularly punctured (PD 0.5–2). Medial part of frons densely punctured (PD 0.5–1), interspaces mostly dull, upper inner orbits less sculp-
tured with larger punctures (mostly PD < 0.5). Premen- 
tum ca 670 μm long, 0.90 x as long as stipes, 0.80 x as long 
as flagellomere 1. Occipital carina only present on lower 
half of gena. Proportions of flagellomere length relative to 
that of flagellomere 1 as follows: 2: 0.42, 3: 0.39, 4: 
0.35, 5: 0.30, 6: 0.28, 7: 0.33. Median lobe of 
mesoscutum medially densely punctured (PD 0.5–1.5) 
with smooth and shining interspaces. Mesoscutellum densely 
point (medially PD 0.2–0.6). Mesepisternum densely covered 
with very small punctures (PD 0.5–1.5) and with few 
30–50 μm large punctures, interspaces shining. Anterior 
tibial spur of anterior legs slightly bent apically. Hypopygium 
posteriorly shallowly excised lateral of middle. Length of 
longest setae on the frons about 150 μm, on the 
mesepisternum about 570 μm. Ovipositor with 
16 flat sawteeth (Figs 47, 55).

Male Description. Color (Figs 20, 22).
Similar to female. Thorax black, metepisternum 
with a large yellow spot posteriorly. Abdomen 
black, lateral corners and very narrow poste- 
or edge of tergum 1 yellow, yellow bands on 
tergum 3 present ventrally on posterior edge, 
on tergum 4–5 present along posterior edge of 
terga and interrupted dorsally in the middle, 
tergum 9 yellow in middle. Sternum 5 with 
unpunctured and shining in the middle, 0.60 x as long as 
flagellomere 1 as follows: 2: 0.42, 3: 0.39, 4: 
0.35, 5: 0.30, 6: 0.28, 7: 0.33. Median lobe of 
mesoscutum medially densely punctured (PD 0.5–1.5) 
with smooth and shining interspaces. Mesoscutellum densely 
point (medially PD 0.2–0.6). Mesepisternum densely covered 
with very small punctures (PD 0.5–1.5) and with few 
30–50 μm large punctures, interspaces shining. Anterior 
tibial spur of anterior legs slightly bent apically. Hypopygium 
posteriorly shallowly excised lateral of middle. Length of 
longest setae on the frons about 150 μm, on the 
mesepisternum about 570 μm. Ovipositor with 
16 flat sawteeth (Figs 47, 55).

Type material. Holotype ♀: “TK [= Turkey] 
[= valley south of Gevria pass, = Gevria Sermentdi] 
3000 m [alt.] leg. S. Blank”;
“Ranunculus”;
“Cuneala confinis (Knw.) ♀ det. W. Schedl 1987”; 
[red] 
“Hokolotype ♀ Elinora davidi spec. nov. det. S. M. 
Blank 2004”; “GBIF-GISHym 4315”. DEI. Ovi- 
positor stored in a vial on the pin of the specimen. 
Paratype: Turkey: 1♂ “TK – Hakkarı, Sarıköy nördl. 
Mt. Gavaruk [= Sat Mountains, north of Mount 
Gavaruk] 3000 m [alt.] 5.8.1986 leg. S. M. Blank”; 
“Umbelliferae [= Apiaceae]”; [penis valves mounted 
on a separate glass slide by W. Schedl bearing the 
label] “Pr. Nr. 397 Cuneala confinis (Konow) 2 
Penisvalven, Türkei, Hakkarı Sarıköy, nördl. 
Blank 25.10.87 fec. W. Schedl”. DEI. 

Etymology. We dedicate this species to 
David R. Smith in deep thanks for his generous 
support of our work and of the studies of many 
other sawfly researchers.

Discussion. The single known male and 
female are assumed to belong to the same 
species upon the yellow color of the hind femur 
and the missing carina on the vertex. The 
collecting sites in the Sat Range of the Hakkari 
Mountains are only three kilometers apart.

The female is most similar to T. lacourtiana 
due to the anteriorly completely yellow scu-
tellum, but these species differ in the relative 
length of the prementum (0.90 x as long as 
atures found during these summer days in early 
August 1986 at this altitude.

The summits of the Hakkari Mountains 
reach 3,000 m altitude everywhere and more 
than 4,000 m in the center of the Cilo Range. 
Precipitation and glaciation is more exten- 
sive and the snow line lower than might be 
expected for a mountain range of that altitude,
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Figs 23–26: *Tenthredo koehleri*, habitus. 23, ♀ dorsally; 24, ♂ dorsally; 25, ♀ laterally; 26, ♂ laterally. Scale 1 mm. (See also Colour Plate 7).

geographical latitude and geographical position relative to the Central Asian arid areas (Bobek 1938, 1940). Several insect and plant groups have been found to be particularly species rich here and to have produced a large number of forms endemic to this region (Hesselbarth et al. (1995) for butterflies of Tragacanth steppes of the Irano-Anatolian Refuge; Blank & Kraus (1994) for bee taxa described by K. Warncke). The outstanding climate and geography of the range may have been driving forces for this diversification. Only few details are known for the sawfly fauna of the Hakkâri Mountains.

**Ecology.** The adults were swept from the flowers of a buttercup (*Ranunculus* spec.) and of an umbellifer (*Apiaceae*) at 3,000 m altitude.

**Distribution** (Fig. 72). Turkey (Hakkâri).

**Studied material.** 1 ♀ 1 ♂.

*Tenthredo (Elinora) koehleri* Klug, 1817

(Figs 1, 5, 23–26, 48, 56, 64, 74)

= *Tenthredo* (*Allantus*) *koehleri* Klug, 1817: 143, ♀ ♂, type locality: Poland, Silesia; = *Allantus koehleri* (Klug, 1817); = *Blankia koehleri* (Klug, 1817); = *Cuneala koehleri* (Klug, 1817); = *Elinora koehleri* (Klug, 1817); = *Tenthredo koehleri* (Klug, 1817); = *Allantus kohleri*, misspelling; = *Tenthredo kohleri*, misspelling

= *Allantus koehleri* forma *scutellaris* Gregor, 1941: 201, ♀, type locality: Czech Republic, Hodslavice, primary homonym of *Allantus scutellaris* Konow, 1898

= *Allantus koehleri* var. *biinterruptus* Pic, 1925: 14, ♂, type locality: France, Royat, infrasubspecific name; = *Allantus koehleri* var. *biinterruptus*, misspelling

= *Allantus koehleri* var. *multiinterruptus* Pic, 1925: 14, ♀, type locality: France, Royat, infrasubspecific name; = *Allantus koehleri* var. *multiinterruptus*, misspelling
The difference in setae density also occurs in yellow with red apex (yellow with black apex in orange in T. davidi, with black labrum, clypeus and tegulae females less setous medially than on the lateral portion). Terga 2—3 are medially densely pubescent tergum 1 and metapostnotum (setae ca. 100 μm continuously pilose along the edge between T. koehleri as did Benson (1968). Females are considered two separate species var. multiplicatus Pic, 1925). The collection catalogue Klug, 1817 des. S. M. Blank 2005”; “GBIF-koehlerii Klug”]; [red:] “Type”; “13988”; “Schlesien Klug”; [cabinet label:] “Köhleri Kl. Siles. [= Silesia] M.KL [= Museum Klug]”; [red:] “Lectotype ϕ Tenthredo (Allantus) koehleri Klug, 1817 des. S. M. Blank 2005”; “GBIF-GISHym 2654”. In perfect condition. MNB. Paralectotypes: 2ϕ 1σ, MNB. The collection catalogue mentions the following data regarding the number 13993: “Allantus Koehleri var. subinterruptus, type locality: France, Royat, infrasubspecific name; Allantus koehleri var. multiplicatus Pic, 1925: 14, ϕ, type locality: France, Royat, infrasubspecific name

Diagnostic combination. Among the species with black labrum, clypeus and tegulae females differ in 1, the densely pilose terga 2—3 (Fig. 5; scattered medially in T. davidi, T. lacourtiana and T. radoszkowskii), and 2, the hind femur being black with a narrow yellow apex (Fig. 25; with a yellow dorsal line in T. davidi, orange in T. lacourtiana, similar or red in T. radoszkowskii).

Males are characterized by 1, the apical band of tergum 5 being usually continuous (Fig. 24; interrupted in T. davidi, T. lacourtiana and T. radoszkowskii), and 2, the hind tibia being yellow with red apex (yellow with black apex in T. davidi, similar in T. lacourtiana, completely orange, more or less infuscated or rarely similar in T. radoszkowskii).


Discussion. Zhelochovtsev (1941) and Zhelochovtsev & Zinovjev (1988) classified koehleri and radoszkowskii as geographical forms of Tenthredo koehleri. Upon morphological differences we regard them as two separate species as did Benson (1968). T. koehleri females are continuously pilose along the edge between tergum 1 and metapostnotum (setae ca. 100 μm long). Terga 2—3 are medially densely pubescent (Fig. 5). T. radoszkowskii females have few, ca. 50 μm long setae on tergum 1 and terga 2—3 are almost glabrous in the middle (Fig. 6; clearly less setous medially than on the lateral portion). The difference in setae density also occurs in males but is much less evident. The shape of the valviceps of T. koehleri (Fig. 64) is within the range of variability of that of T. radoszkowskii (Figs 68–71; see also Lacourt 1997: Figs 1–2). T. koehleri is comparatively uniform in coloration, size and surface sculpture (Figs 23–26), whereas T. radoszkowskii is highly variable (Figs 37–44; see also Taeger 1988 and below).

Klug (1817) described Tenthredo (Allantus) koehleri upon an unknown number of males and females from Silesia. A male is selected as the lectotype from 2ϕ and 2σ syntypes preserved at the MNB.

Çalmaşur & Özbek (2004) presented Cuneala koehleri as an alleged new species for the Turkish fauna. Records are from the provinces Artvin, Erzurum and Rize. The authors reported most specimens having been collected together with C. confinis (a junior synonym of T. radoszkowskii) or close to collecting sites of the latter. From the extensive north-eastern Turkish material of T. radoszkowskii, which has been checked during the present study, we conclude that T. koehleri is absent from the Asian part of Turkey. Çalmaşur & Özbek (2004) most likely misidentified black and yellow T. radoszkowskii as C. koehleri.

Distribution (Fig. 74). Austria, Bulgaria, Czech Republic, France, Germany, Hungary, Italy, Luxembourg, Poland, Romania, Slovakia, Slovenia, Switzerland. Additionally reported from Andorra, Albania, Belgium, Republic of Macedonia, Netherlands, European part of Russia, Ukraine and modern Yugoslavia (Taeger & Blank 2006).

Studied material. 316 ϕ 241 σ.

Tenthredo (Elinora) krausi
Blank & Taeger, sp. n.

(Figs 2, 8, 10, 27–30, 49, 57, 65, 73)

Type locality: Turkey, Konya province, Konya WSW 30 km, Kızılören Dağı, hill 2–5 km SE Sefaköy = Elinora krausi Blank & Taeger, in litt.: Lacourt (1999)

Diagnostic combination. Among the species with yellow clypeus and comparatively long hairs of vertex and mesepisternum (as long as or longer than ocellar diameter), T. krausi females are characterized by 1. the yellow distal edge of terga 7–8 (tergum 7 with lateral spots

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Figs 27–30: Tenthredo krausi, habitus. 27, ♀ dorsally (holotype); 28, ♂ dorsally; 29, ♀ laterally (holotype); 30, ♂ laterally. Scale 1 mm. (See also Colour Plate 8).

and tergum 8 black in *T. dahlii*), and 2, the rounded sawteeth of valvula 1 of the ovipositor (flat in *T. dahlii*). Males differ in the predominantly yellow tergum 4 (with narrow distal edge yellow in *T. dahlii*). *T. krausi* (♀ 9.5–10 mm, ♂ 9–10 mm) is conspicuously smaller than *T. dahlii* (♀ 12–13.5 mm, ♂ 11–12 mm).

**Female Description. Color** (Figs 27, 29). Head black, clypeus, labrum, broad base of mandibles, medial segments of the labial and maxillary palps, and a small spot at the apex of the scape yellow. Thorax black, posterior margin of pronotum, lateral margins of tegulae, and posterior margins of metepisterna yellow. Tergum 1 yellow except for the most anterior area close to the metapostnotum, terga 2–3(−4) with yellow spots on posterior margins, terga (4–)5–7 with posterior margins completely and terga 8–9 medially yellow. The yellow stripes of terga 4–7 are broader laterally than medially. Preapical sterna with tiny yellow spots laterally on the posterior margins. Legs yellow, coxae basally, tibiae and tarsomeres apically black, anterior and middle femora black posteriorly, posterior femora largely black on preapical portion. Wings yellowish, costa yellow, subcosta yellow anteriorly and black posteriorly, anal veins yellow, pterostigma yellow antero-basally and black posterio-apically.

**Morphology.** Body length 9.5–11 mm. Clypeus granulate, irregularly punctured (PD 0.5–2). Medial part of frons densely punctured (PD 0.5–1), interspaces dull with granulate microsculpture, upper inner orbits smooth with smaller punctures (mostly PD > 1). Occipital carina present on genae and vertex, often indistinct on upper genae. Stipes 880–930 μm long, 0.90–0.95 as long as flagellomere 1. Proportions of flagellomere length relative to that of flagellomere 1 as follows: 2: 0.45, 3: 0.37, 4: 0.29, 5: 0.28, 6: 0.24, 7: 0.25. Median lobe of mesoscutum medially punctured (PD 1–2.5) with smooth and shining interspaces. Mesoscutellum densely punctate (medially PD 0.2–0.6).
Mesepisternum densely punctured with shining interspaces (PD 0.5—1.5). Anterior tibial spur of anterior legs distinctly bent apically. Hypopygium posteriorly almost straight. Length of longest setae on the frons about 200 μm, on the mesepisternum about 170 μm. Ovipositor with 18—19 rounded sawteeth (Figs 49, 57).

**Male Description**. **Color** (Figs 28, 30).

Head, thorax, legs and wings similar to female besides the following pattern: scape completely black, yellow margins of pronotum, tegulae and metepisterna smaller. Tergum 1 with small posterior margin yellow, terga 2—3 and 5—6 variably yellow on posterior margin (mostly interrupted medially), tergum 4 dorsally predominantly yellow apart from a small black anterior margin, ventrally predominantly black anteriorly. Visible sternum 3 mostly predominantly yellow, other sterna variably yellow on posterior portion, last sternum yellow apically.

**Morphology**. Body length 9.5—10 mm. Stipes 820—920 μm long, 0.91—0.94 as long as flagellomere 1. Surface sculpturing similar to female. Length of longest setae on the frons about 250 μm, on the mesepisternum about 170 μm. Penis valve see Fig. 65.

**Variability**. In females the yellow posterior margin of tergum 4 is usually interrupted medially, but continuous in few specimens. One male has almost completely dark sterna with superficial yellow pattern on the visible sterna 2—4 posteriorly and on 2 medially. There is no superficial yellow pattern on the visible sterna 3—4 posteriorly and on 2 medially), tergum 4 dorsally predominantly black anteriorly. Visible sternum 3 mostly predominantly yellow, other sterna variably yellow on posterior portion, last sternum yellow apically.


**Etymology**. This pretty species is dedicated to our friend and colleague Dr. Manfred Kraus (Nürnberg). His systematic study on the sawfly larvae, Lorenz & Kraus (1957), is still today one of the major standard works in the research of sawflies.

**Discussion**. *Tenthredo krausi* is morphologically very similar to *T. dahlii*. The distribution ranges of these species of seem to abut along the border of Europe and Asia Minor and supposedly these are vicariant species (Fig. 73). The most north-western and western records of *T. krausi* are from Bursa and Ephesus in the Asian part of Turkey. The closest records of *T. dahlii* are from the European part of Turkey (Edirne [= Adrianopol], 6.1894, leg. Flach, 1♂, DEI) and from south-eastern Bulgaria (Kharmanli [= Harmanlı], 09.05.1985, leg. J. Kadlec, 1♀, MKC). Schell (2005) mentioned *E. dahlii* for the Greek island Chios, which is situated only few kilometers West of the Turkish mainland near İzmir. But this is a type error for Athens airport (W. Schell, pers. comm. 2005).

*T. amasiensis* occurs sympatrically with *T. krausi* in Turkey (Konya WSW 30 km, Hill
2–5 km Sefaköy, Kızıloren Dağı, 1450 m alt., 23.05.1998, leg. S. M. Blank, 6♀ 4♂, SMBC; Fig. 72). Adults of both species have been collected even from flowers of the same plant.

**Host plant.** The adults from İncesu and Sefaköy were swept from the yellow flowers of a Brassicaceae species on road sides. Supposedly the larvae are also associated with Brassicaceae as is usual for *Elinora* species.

**Distribution** (Fig. 73). Syria, Turkey (Amasya, Ankara, Bursa, Isparta, Izmir, Kayseri, Konya, Nevşehir, Niğde, Şanlı Urfa)

**Studied material.** 43♀ 42♂.

*Tenthredo (Elinora) lacourtiana* Blank & Taeger, sp. n.

(Figs 31, 32, 50, 58, 67, 72)

Type locality: Turkey, Artvin, Kaçkar Mountains, Sarıgöl

**Diagnostic combination.** Among the species with black clypeus, labrum and tegula, the female of *T. lacourtiana* shares the largely yellow scutellum with *T. davidi*. Yellow spots on the mesoscutellum occur rarely in *T. radoszkowskii*, whose sawteeth are more lobular and the cypselleae shorter. In *T. lacourtiana* the occipital carina on the vertex is weak but present (absent in *T. davidi*). Scape, pedicel and the narrow base of flagellomere 1 are orange (Figs 31, 32; only scape dorsally yellow in *T. davidi*). The prementum of *T. lacourtiana* (1.15 × as long as stipes) is longer than in *T. davidi* (0.90), and the sawteeth of the ovipositor bear a comparatively small postcalcar (Fig. 58).

**Female Description. Color** (Figs 31, 32).

Head black, scape, pedicel, narrow base of flagellomere 1, outer portion of mandible except for tip (and except for a medial infuscation in holotype) orange. Thorax black, posterior margin of pronotum, anterior two thirds of mesoscutellum, a stripe on posterior half of mesepisternum, and metepisternum yellow. Abdomen black with tergum 1 yellow except for the most anterior area close to the metapostnotum, tergum 3 with yellow posterior stripe laterally and ventrally, terga 4–7 with complete posterior edge yellow, tergum 8 yellow on posterior edge except for most ventral portion, tergum 9+10 with more or less interrupted posterior yellow band, sternums without yellow. Coxae black, posterior coxa with tiny diffuse pale spot medially before the tip, trochanters orange anteriorly, more or less black posteriorly, femora orange, fore femur predominantly yellow anteriorly and black posteriorly (holotype) or orange anteriorly and diffusely infuscated posteriorly (paratype), fore and middle femora narrowly yellow at apex, tibiae yellow with distal quarter or third orange, tarsi orange, fore tarsus slightly infuscated towards tip. Wings slightly yellowish, costa, subcosta yellow and anal veins yellow, costa and subcosta infuscated before pterostigma, pterostigma brown with largely orange base.

**Morphology.** Body length 10.5–11.0 mm. Clypeus ca 0.60 × as long as distance between lower eye margins, medially excised for 0.35 of its length, with flat and irregular wrinkles, shining, irregularly punctured (PD 0–2). Medial part of frons densely punctured (PD 0–1), interspaces moderately shining, upper inner orbits similarly sculptured as surface of
frontal crests. Occipital carina present on lower half of gena and ventral lateral to postocular area. Premomentum 1.020–1.080 μm long, ca 1.15× longer than stipes, 1.10–1.20× longer than flagellomere 1. Proportions of flagellomere length relative to that of flagellomere 1 as follows (holotype / paratype): 2: 0.44 / 0.45, 3: 0.43 / 0.41, 4: 0.36 / 0.34, 5: 0.33 / 0.29, 6: 0.28 / 0.28, 7: 0.28 / 0.27. Median lobe of mesocutum medially densely punctured (PD 0.5–2) with smooth and shining interspaces. Mesocutellum densely punctate (medially PD 0.2–1.5), posterior third more or less striulate between punctures. Mesepisternum densely covered with ca 25 μm large punctures (PD 0.5–1.5) and with few 50–70 μm large punctures, interspaces shining. Anterior tibial spur of anterior legs slightly bent apically. Hypopygium posteriorly shallowly excised lateral of middle. Length of longest setae on the frons about 190 μm, on the mesepisternum about 125 μm. Ovipositor with 17 flat sawteeth (Figs 50, 58).

**Male** (identification ambiguous). Head black, scape more or less yellow dorsally. Thorax and abdomen black with yellow pattern: very narrow posterior edge of tergum 1, small posterior-lateral spots on tergum 3, continuous or medially interrupted posterior band on tergum 4, small posterior-lateral spots or medially interrupted posterior band on tergum 5, narrow posterior edges of medial sterna, large medial spot at distal edge of hypopygium. Coxae and trochanters black. On fore leg femur, tibia and tarsus anteriorly mainly yellow, posteriorly mainly black. Middle femur black, anterior side in distal half or completely yellow. Hind femur black, apex yellow, basis and ventral side more or less yellow or brown. On middle and hind legs femora and tibiae yellow with orange apex, tarsi orange. Wings similar to female.

**Morphology.** Body length 9.0–10.0 mm. Premomentum 850–920 μm long, ca 1.10× as long as stipes, 0.90–1.00× as long as flagellomere 1. Clypeus 0.60–0.65× as long as distance between lower eye margins, medially excised for 0.35–0.40 of its length, with flat and irregular wrinkles, shining, irregularly punctured (PD 0–2). Longest setae on frons ca 200 μm, on mesepisternum ca 130 μm long. Hypopygium truncate distally. Penis valve similar to that of *T. radoszkowskii* (Fig. 67).

**Variability.** The coloration of the legs varies in both sexes. The amount of yellow pattern on the terga of the males is variable.


**Etymology.** Etymology. This species is dedicated to our friend and colleague Dr. Jean Lacourt (Igé). His extensive studies on *Elinora* and his catalog of the West Palaearctic Tenthredinidae are particularly important and useful contributions to the knowledge of sawflies. The species name is to be treated as an adjective.

**Discussion.** In Sarigöl on the same day two female *Tenthredo radoszkowskii* were caught together with *T. lacourtiana*, one with red on the abdomen and one without. Also four males were found there, one with red on the abdomen (= *T. radoszkowskii*) and three without (here identified as *T. lacourtiana*). The latter three males have lateral yellow marks on tergum 3 and lateral yellow marks or more or less continuous bands on terga 4–5. Unambiguous *T. radoszkowskii* (abdomen pardy red) notably differ from these males in the sculpture of the upper half of the mesepisternum. In *T. radoszkowskii* the mesepisternum usually is densely, irregularly wrinkled, and the punctures may hardly be perceptible between the rough surface sculpture. In the present three males it is polished between the punctures or bears very fine microsculpture. Since the females of *T. lacourtiana* have a similar surface sculpture, the three males are assumed to belong here. But due to the great variability observed in *T. radoszkowskii* the identification remains quite doubtful and the inclusion of these three males in the identification key and in the description above remains provisional.

**Ecology.** *Tenthredo lacourtiana* was found to occur sympotically together with *T. radoszkowskii* at 3,000 m altitude.

**Distribution** (Fig. 72). Turkey (Artvin).

**Studied material.** 2♀ 3♂.
Tenthredo (Elinora) longipes (Konow, 1886)

(Figs 3, 4, 33–36, 51, 59, 66, 72)

= Allantus longipes Konow, 1886: 20–21, ♀ ♂, type locality: Russia, Dagestan, Derbent; = Cuneala longipes (Konow, 1886); Elinora longipes (Konow, 1886)

= Allantus schestoperovi Ushinskij, 1936: 110–111, ♀ ♂, type locality: Turkmenia, Kopet Dagh, Arpak-lenskoje Ushtshelje, syn. n.; = Tenthredo (Elinora) longipes ssp. schestoperovi (Ushinskij, 1936); = Allantus schestoperovi, misspelling; Tenthredo schestoperovi, misspelling; Tenthredo (Elinora) schestoperovi, misspelling

= Cuneala tricolor Zingiebl, 1956: 322–325, ♂, type locality: Iran, Racht [= Rescht], Ţaher Gūrāb [= Tahergourab]; secondary homonym of Allantus tricolor Kriechbaumer, 1869 [= Elinora corynetes (W. F. Kirby, 1882)]

Diagnostic combination. The Tenthredo longipes female is characterized among species with black clypeus by 1, the pale lateral edge of the tegula (black in T. davidi, T. koehleri, T. lacourtiana and T. radoszkowskii), and 2, the brown to white labrum (Fig. 3; black in T. davidi, T. koehleri, T. lacourtiana and T. radoszkowskii). The base of the clypeus being extensively black distinguishes the male from other species with pale clypeus (Fig. 4; base yellow in other species).

plastic slide on the pin, but the genitalia preparations formerly embedded on it are missing. DEI.

Allantus shestoperovi. Types not studied.

Cuneala tricolor. SMNS. See Blank (1996; specimen now additionally labelled with "GBIF-GISHym 2101").

Discussion. Tenthredo longipes is the valid name for a species, which is known from the eastern part of the Caucasus and Transcaucasus mountains, from northern Iran (close to Racht), and from Turkmenistan (Kopet Dag). Allantus longipes was described upon an unknown number of males and females. The only specimen of the DEI collection, which is labelled as collected in "Derbent", is hereby designated as the lectotype. Schidl never published the lectotype designation which is indicated by the labelling. An additional female without a collecting label is not taken into consideration as syntype. The lectotype agrees well with the original description. Females have terga 4–6 with yellow posterior margins and terga 3 and 7 with small yellow posterior stripes laterally. In males terga 3 and 4 bear very small posterior margins, the basal three sternae are largely pale medially at their base.

Allantus shestoperovi is a pale form of T. longipes. According to Ushinskij's original description, females have the dorsal part of terga 3–4 completely yellow or red, terga 5–7 and 9 with yellow posterior margins, and the ventral parts of terga 5–7 with confluent triangular pale spots. Males have terga 3–4 and the basal three sternae whish yellow, the basal sternum bearing two lateral black spots. Ushinskij (1936) described A. shestoperovi from 4 ♀ and 2 ♂ collected in Turkmenistan (Kopet Dag, Arpaklenskoe uschchel'e, 5.–7.5.1933). Zhelochovtsev (1976) added a single female (Kopet Dag, Kara-Kala, uschch. [= uschchel'e, gorge] Ay-Dere, 26.5.1936, A. Ushinskij) and classed it as Tenthredo (Elinora) longipes ssp. shestoperovi (Ushinskij, 1936). The red color pattern of terga 3–4 in A. shestoperovi is similar to Zirngiebl's type specimen of C. tricolor from northern Iran and a further female from Talysh mountains on the border of Iran and Azerbaijan ("Transkauk. Talysh 1886"; DEI). The distribution areas of the pale and the dark form overlap at least in the West of the Transcaucasus range. As no geographical separation is apparent, these two forms are treated as synonyms.

Distribution (Fig. 72). Azerbaijan, Iran (Gilan), Russia (Daghestan). Reported from Turkmenia (Kopet Dag) by Ushinskij (1936) and Zhelochovtsev (1976).

Studied material. 5 ♀ 1 ♂.

Tenthredo (Elinora) radoszkowskii
(Ed. André, 1881)

(Figs 6, 37–44, 52, 60, 68–71, 74)

= Macrophyra radoszkowskii Ed. André, 1881a: 365 and Catalogue 44*, 9, type locality: Caucasus, incorrect original spelling: = Macrophyra radoszkowskii Ed. André, 1881b: 591, correction of spelling (Art. 32.5.1.1., ICZN 1999); = Blankia radoszkowskii (Ed. André, 1881); = Cuneala radoszkowskii (Ed. André, 1881); = Elinora radoszkowskii (Ed. André, 1881); = Elinora koehleri radoszkowskii (Ed. André, 1881); = Tenthredo (Cuneala) radoszkowskii (Ed. André, 1881); = Allantus radoszkowskii, misspellings: = Allantus koehleri radoszkowskii, misspelling: = Cuneala radoszkowskii, misspelling = Allantus atratus Ed. André, 1883: 206, σ, type locality: Russia, ?Sarepta (most likely from Caucasus); = Tenthredo atrata (Ed. André, 1883)

= Allantus confinis Konow, 1886: 21, 9 σ, type locality: Azerbaydzhan, Shakh Dag: = Cuneala confinis (Konow, 1886); = Tenthredo confinis (Konow, 1886)

= Allantus parviceps Konow, 1898: 329, 9 σ, type locality: Georgia, Lomis-Alevskiy Khrebet [= Lomis mta]; = Elinora parviceps (Konow, 1898); = Allantus parvicea, misspelling = Cuneala koehleri: Çalmaşur & Özbel (2004), misidentification

Diagnostic combination. Tenthredo radoszkowskii shares the black clypeus, labrum and tegulae with T. davidi, T. koehleri and T. lacourtiana. The vertex lateral to the postocellar area bears at least a weak occipital carina (absent in T. davidi). The female is characterized by the combination of 1, scattered setae in the middle of tergum 2–3 (Fig. 5; setae continuously present in T. koehleri); 2, rounded sawteeth of valvula 1 of the ovipositor (Fig. 60; flat in T. davidi and T. lacourtiana). Most females have a black scutellum, but rarely specimens with two separate yellow spots occur (mesoscutellum yellow on anterior two thirds in T. davidi and T. lacourtiana). The male has 1, terga 3–5 red, and 1 or 2, tergum 4 with a more or less continuous distal yellow edge and tergum 5 with yellow distal spots laterally (Figs 38, 40, 42, 44). The
Figs 37–44: *Tenthredo radoszkowskii*, habitus. 37–40 form with red markings. 37, ♀ dorsally; 38, ♂ dorsally; 39, ♀ laterally; 40, ♂ laterally. 41–44 form without red markings. 41, ♀ dorsally; 42, ♂ dorsally; 43, ♀ laterally; 44, ♂ laterally. Scale 1 mm. (See also Colour Plate 9).
Figs 53–60: Tenthredo (Elinora) spp., teeth of the saw (in parentheses number counted from the apex). 53, T. amasiensis (10–12); 54, T. dahlii (9–11); 55, T. davidii (7–9, arrow indicates postcalcar); 56, T. koehleri (8–10); 57, T. krausii (8–10); 58, T. lacourtiana (8–10, arrow indicates postcalcar); 59, T. longipes (ca 8–10); 60, T. radoszkowskii (7–9).
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Figs 72–74: Distribution records from material checked in the present study and from Ushinskij (1936; Allantus shetoperovii [= Tenthredo longipes] from Turkmenia, Kopet Dagh, Arpaklenskoje Ushthelje) and Kirby (1882; Macrophya hartigii [= T. dahliii] from Albania); 72, Tenthredo amasiensis, T. davidi, T. lacourtiana and T. longipes; 73, T. dahliii and T. krausi; 74, T. koehlerii and T. radoszkowski.
differentiation of male *T. radoszkowskii* and *T. lacourtiana* is ambiguous.

**Type material.** *Allantus atratus*. Type $\delta$: [round, golden label, " = type specimen]; "Sarepta"; "*Allantus atratus* André"; [Cyrillic letters]: “K. Jakovleva”. ZIF *Macrophya radoszkowskii*, *Allantus confinis*, *A. parviceps*: see Taeger (1988).

**Discussion.** *Tenthredo radoszkowskii* is a frequently collected sawfly species in the Caucasus range and neighbouring high mountain ranges. The species is confusingly variable throughout its distribution area. Most females can be associated with two forms: form 1 has the hind femora red and only yellow pattern on the medial terga (Figs 41, 43); form 2 has the hind femora black, the medial terga bear yellow and often red pattern (Figs 37, 39). Two forms can also be distinguished among males with respect to the abdominal coloration: form 1 with yellow stripes on terga 4–5 (Figs 42, 44); form 2 with terga 3–5 red and sometimes with yellow stripes on terga 4–5 (Figs 38, 40). Males and females of these forms have often been collected on the same site. On particular collecting sites one of the forms is usually dominant among long series of specimens. Form 1 is much more abundant in the Caucasus and form 2 in the north-eastern Turkish mountains. Really intermediate forms (femora red with extensive black pattern, abdomen only with yellow pattern) are rare. A series of such intermediate, locally quite constantly colored specimens is from northern Caucasus (Russia, Kuban region, Kisha; DEI and ZSM). Due to the variability of the color pattern and the syntopic occurrence of the forms we regard them as conspecific.

Females with the most extensive yellow color pattern may have two yellow spots on the anterior portion of the mesoscutellum (Azerbaijan, Aras Valley, Ordubad, 1♀, DEI; Russia, Respublika Karachay-Cherkessia, Kuban Mountains, Kisha, 22.5.1914, leg. Prager, 2♀, DEI; Turkey, Rize S, 1200 m altitude, 30.7.1983, leg. K. Warncke, 1♀, MKC). The single female from Rize was collected together with 16♀ and 7♂, which all have a black mesoscutellum. In the specimens from Kisha and Rize the yellow spots are widely separate. In the female from Ordubad they cover almost the complete anterior half of the mesoscutellum and abut medi- ally along a narrow brown line. The yellow spots were found to occur in females with and without red on the abdomen.

The placement of *Allantus atratus*, *A. confinis* and *A. parviceps* as synonyms of *Tenthredo radoszkowskii* was reconsidered by Taeger (1988, 1991a). The type of *A. atratus* represents a dark male of *T. radoszkowskii*. The type locality "Sarepta" near Volgograd is doubtful, because it is far from the known distribution range of the species. The type material was collected and sent to André by A. Becker (see André 1883). Alexander Becker dealt with insects in Sarepta, which he had collected in steppes of Kyrgyzstan, Caucasus, Daghestan and on other sites (Horn et al. 1990). It seems likely that this specimen has been labelled wrongly.

*Tenthredo davidi* and *Tenthredo lacourtiana* are described as new species in course of the present work, because the nominal taxa associated with the most similar species, *T. radoszkowskii*, cannot be referred to the present taxa. The lectotype of *Macrophya radoszkowskii* has the mesepisternum and the mesoscutellum black (André 1881a: "Thorax noir"; examination and redescriptions of lectotype by Taeger 1988). The type specimen of *Allantus atratus* was studied by Taeger already long before our discovery of *T. lacourtiana*, and we do not have it on hand at present. André’s (1883) description refers to a black male with dull thorax and anteriorly yellow fore femur and tibia, which does not match the more extensively pale and largely shining males here associated with *T. lacourtiana* and *T. davidi*. The lectotype females of *Allantus confinis* and *A. parviceps* disagree with *T. davidi* and *T. lacourtiana* among other characters in the black mesepisternum and mesoscutellum and the lobular sawteeth.

**Distribution** (Fig. 74). Armenia, Azerbaijan, Georgia, Russia (Daghestan, Krasnodarskiy Kray, Respublika Kabardino-Balkaria, Respublika Karachay-Cherkessia, Stavropol’skiy Kray), Turkey (Artvin, Erzurum, Erzurum and Rize, Gümüşhane, Kars, Kastamonu, Rize, Trabzon). Benson (1968) listed records from Iran and from additional, more western provinces of Turkey.

**Studied material.** 100♀ 51♂.
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**Abstract**

**Taxonomy and Evolution of *Tenthredo (Elinora)* Species Similar to *T. dahliii* and *T. koehlerii* (Hymenoptera: Tenthredinidae).** Although *Elinora* Benson, 1946, a lineage of *Tenthredo* Linné, 1758, is taxonomically well defined, the known morphological characters do not unequivocally support the monophyly of such a taxon. They turned out as plesiomorphies, underly considerable interspecific variability, or occur homoplastically in *Sciapteryx* Stephens, 1835, a closely related lineage of Tenthredinini. The adaptation of *Elinora* larvae to Brassicaceae as their host plants is regarded as the only unequivocal apomorphy for this group. *Blankia* Lacourt, 1997, which has been split off from *Elinora* on basis of autapomorphies, is considered as a new synonym of *Tenthredo* Linné, 1758, due to the lack of apomorphies of the remaining *Tenthredo (Elinora)* species. The species, which are similar to *T. dahliii* Klug, 1817 and *T. koehlerii* Klug, 1817, are revised and keyed. *T. davidii* sp. n., *T. krausii* sp. n. and *T. lacourtiana* sp. n. are described from Turkey and Syria. *Allantus* shestoperovii Ushinskij, 1936 is regarded as a new synonym of *T. longipes* (Konow, 1886). Lectotypes are designated for *Allantus sibiricus* Kriechbaum, 1869, *A. saxthorius* var. amasiensis Kriechbaum, 1869, and *Tenthredo (Allantus) koehlerii* Klug, 1817.

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**Zusammenfassung**

Figs 11–18: 11–14, *Tenthredo amasiensis*, habitus. 11, ♀ dorsally; 12, ♂ dorsally; 13, ♀ laterally; 14, ♂ laterally; 15–18, *Tenthredo dahlii*, habitus. 15, ♀ dorsally; 16, ♂ dorsally; 17, ♀ laterally; 18, ♂ laterally. Scale 1 mm.

Scale 1 mm.
Figs 37–44: *Tenthredo radoszkowskii*, habitus. 37–40 form with red markings. 37, ♀ dorsally; 38, ♂ dorsally; 39, ♀ laterally; 40, ♂ laterally. 41–44 form without red markings. 41, ♀ dorsally; 42, ♂ dorsally; 43, ♀ laterally; 44, ♂ laterally. Scale 1 mm.