

***Dinotrema brevis* spec. nov.**
(Hymenoptera: Braconidae: Alysiinae),
a new brachypterous species from Finland

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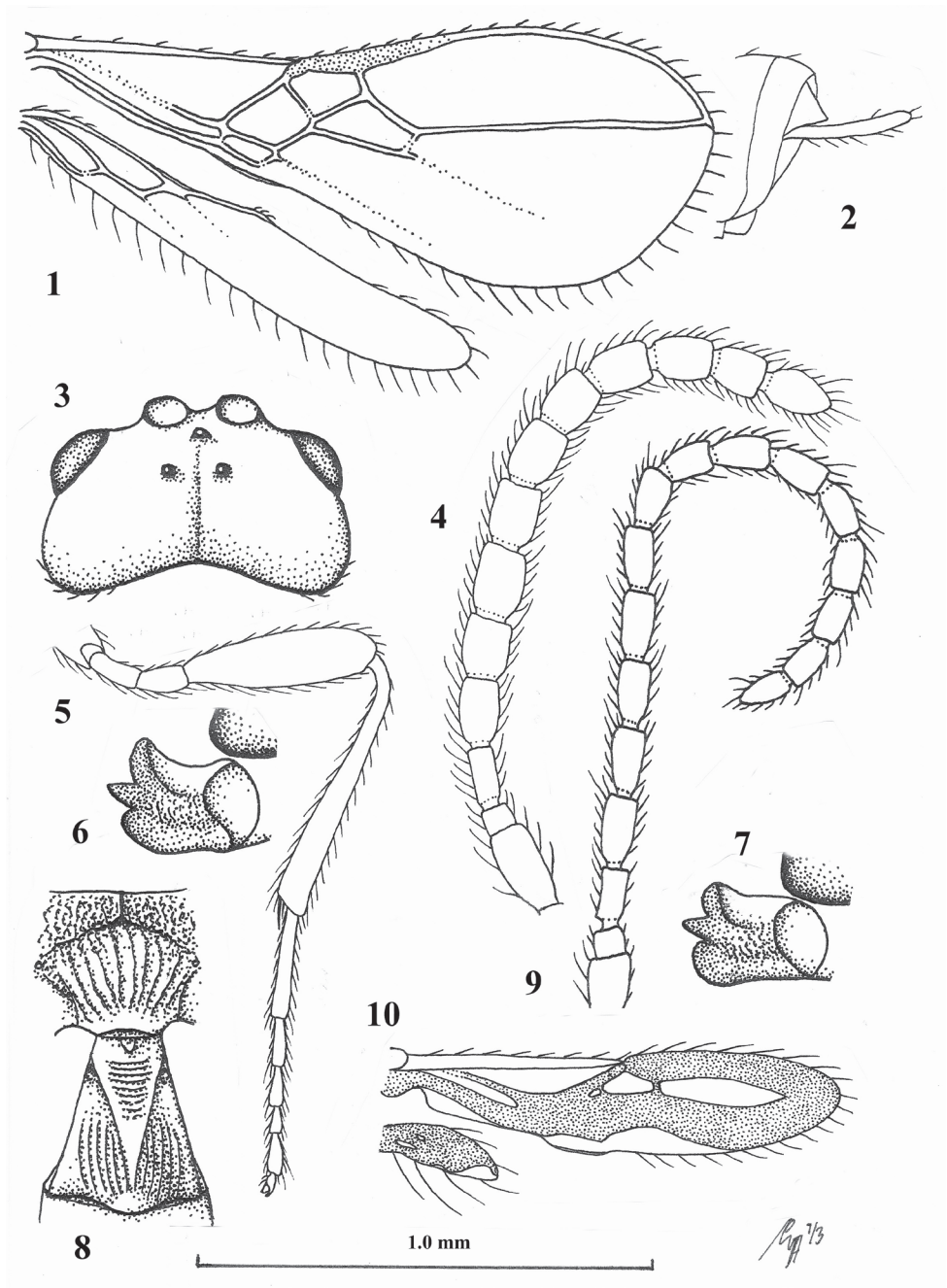
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Key words: Hymenoptera; Braconidae; Alysiinae; *Dinotrema brevis*; new species; Palaearctic; Finland. A new species of the genus *Dinotrema* Foerster, 1862, *D. brevis* spec. nov. from Finland is described. A key to the species with modified wing veins is added.

Introduction

The second author collected in May 2013 near his home in Kalpalinna (southern Finland) a long series of a peculiar species of the genus *Dinotrema* Foerster, 1862 (Braconidae Nees, 1812: Alysiinae Leach, 1815) with brachypterous males and macropterous females. As far we know of brachypterous species of *Dinotrema* and related genera one of the sexes has normal wings (in most cases the female), but of *D. crassiceps* (Fischer, 1958) both sexes are brachypterous. The collecting site is an almost barren sunny and open slope (used for skiing) with very short vegetation in May. The species proved to be new for science, is closely related to *Dinotrema crassiceps* (Fischer, 1958) comb. nov. and is described below. The latter was described as type species of the genus *Pterusa* Fischer, 1958 (Fischer, 1958; van Achterberg, 1988a) without knowing the opposite sex. After examination of the long series of the new species it is obvious that the genus *Pterusa* Fischer cannot be retained as valid genus and most likely the unknown female is a normally winged *Dinotrema* species without submalar groove. The differences between *Pterusa* and the group of *Dinotrema* species without oblique submalar groove are obviously sex-related and connected to brachyptery. Therefore, *Pterusa* Fischer, 1958, is synonymized with *Dinotrema* Foerster, 1862, syn. nov.

The genus *Dinotrema* Foerster is distributed worldwide with about 360 described species (Yu et al., 2012), but this is less than 30% of the total number of species, considering the new species present in existing collections. As far as known all species are solitary koinobiont endoparasitoids of larvae of Phoridae. For the recognition of the subfamily Alysiinae, see van Achterberg (1990, 1993, 1997); for a key to the genera of the subfamily Alysiinae, see Fischer (1971, 1976a) and van Achterberg, 1988a. Terminology used in this paper follows van Achterberg (1988b).



Figs 1-10, *Dinotrema brevis* spec. nov., ♀, holotype, but 9, 10 of ♂, paratype. 1, 10, wings; 2, ovipositor sheath, lateral aspect; 3, head, dorsal aspect; 4, 9, antenna; 5, hind leg, lateral aspect; 6, mandible, full sight on first tooth; 7, mandible, full sight on third tooth; 8, propodeum and first metasomal tergite, dorsal aspect. 1: 1.0 × scale-line; 2, 4, 10: 1.6 ×; 3, 6, 7, 9: 1.5 ×; 5: 1.1 ×.

Dinotrema Foerster, 1862
(figs 1-10)

- Dinotrema* Foerster, 1862: 268; van Achterberg & Bin, 1981: 104; van Achterberg, 1988a: 19-21. Type species: *Dinotrema erythropha* Foerster, 1862 (by monotypy; lectotype examined).
- Aspilota* auct. p.p.; Fischer, 1972: 327-329 (sections A & C); Shenefelt, 1974: 966; Fischer, 1976b: 345, 346 (sections A & C).
- Spanomeris* Foerster, 1862: 268. Type species: *Spanomeris pulla* Foerster, 1862 (original designation; holotype examined).
- Coloboma* Foerster, 1862: 268. Type species: *Coloboma nigrina* Foerster, 1862 (by original designation; type probably lost). Synonymised by van Achterberg (1988).
- Prosapha* Foerster, 1862: 266. Type species: *Alysia speculum* Haliday, 1838 (by original designation; lectotype examined). Synonymised by van Achterberg (1988).
- Synaldis* Foerster, 1862: 273. Type species: *Bassus concolor* Nees, 1814 (by original designation; type series lost). Synonymised by van Achterberg (1988).
- Scotioneurus* Provancher, 1886: 156. Type species: *Scotioneurus stenostigma* Provancher, 1886 (designated by Gahan, 1913). Synonymised by Gahan, 1913.
- Pterusa* Fischer, 1958: 14; Shenefelt, 1974: 1108; van Achterberg, 1988a: 51. Type species: *Pterusa crassiceps* Fischer, 1958 (by monotypy; holotype examined). **Syn. nov.**
- Synaldotrema* Belokobylskij & Tobias, 2002: 1. Type species: *D. speciosum* Belokobylskij & Tobias, 2002 (by original designation). N.B. Differs only by having the hypopygium of the female is strongly retracted up to below the fourth tergite.

Note. As indicated by van Achterberg (1988a), both species included in the genus *Pterusa* Fischer, 1958, are closely related. With the discovery of *Dinotrema brevis* spec. nov. it is obvious that it is impossible to separate *Pterusa* from *Dinotrema* if the aberrant venation of the males is considered to be restricted to the males only. Therefore, we synonymise here the genus *Pterusa* Fischer with *Dinotrema* Foerster, 1862 (**syn. nov.**) and the species previously placed in *Pterusa* belong to a group without an oblique submalar groove.

Key to European *Dinotrema* Foerster and related species with modified veins

1. Vein SR1 of fore wing absent or nearly so; antenna with 23-26 segments (females; males unknown); third antennal segment 1.5-1.7 times as long as fourth segment; marginal cell of fore wing about as long as first discal cell; [veins of fore wing at most moderately widened] *Panerema inops* Foerster, 1862
- Vein SR1 of fore wing present (figs 1, 10); antenna with 11-21 segments (both sexes); third antennal segment about as long as fourth segment (figs 4, 9); marginal cell of fore wing much longer than first discal cell (figs 1, 10); *Dinotrema* Foerster 2
2. Brachypterous, fore wing not surpassing apex of metasoma; marginal cell of fore wing 0.3-0.4 times as long as fore wing; vein 1-R1 (= metacarp) of fore wing strongly widened and often without second submarginal cell (fig. 10); [first metasomal tergite 1.0-1.3 times as long as its apical width; head distinctly widened behind eyes in dorsal view (fig. 3); oblique submalar groove absent; = *Pterusa* Fischer, 1958] 3
- Macropterous, fore wing far surpassing apex of metasoma; marginal cell of fore wing 0.5-0.6 times as long as fore wing; vein 1-R1 of fore wing not or weakly widened and second submarginal cell present (fig. 1) 5

3. Marginal cell of fore wing 0.4-0.7 times as wide as widened vein SR1 (fig. 10); penultimate antennal segment of ♂ about 1.7 times as long as wide (fig. 9); antenna with 15-18 segments (fig. 9; only males) *D. brevis* spec. nov.
- Marginal cell of fore wing 2.7-3.7 times wider than vein SR1 and cell short; penultimate antennal segment of ♂ about 2.3 times as long as wide; antenna with 16-21 segments (both sexes) 4
4. Marginal cell of fore wing about 3.7 times wider than vein SR1 and comparatively long; first metasomal tergite striate; third lobe of mandible as long as middle tooth; antenna with about 21 segments (male; female unknown)
..... *D. nevae* (Tobias, 1986) comb. nov.
- Marginal cell of fore wing about 2.7 times wider than vein SR1 and comparatively short (fig. 85 in van Achterberg, 1988a); first tergite largely smooth, partly finely rugulose; third lobe of mandible distinctly shorter than middle tooth (figs. 84, 86); antenna with 16-20 segments (both sexes) *D. crassiceps* (Fischer, 1958) comb. nov.
5. Veins of fore wing about as twice as wide as normal; antenna of ♂ with about 13 segments (female unknown) *D. insigne* (Stelfox & Graham, 1950)
- Veins of fore wing narrow (fig. 1); number of antennal segments variable 6
6. Medio-posterior depression of mesoscutum absent **and** ovipositor sheath 0.4-1.0 times as long as first tergite (fig. 2); antenna of ♀ with 11-15 segments (♂: 15-20); propodeum rugose or incompletely areolate; [eye small; dorsope deep] 7
- Medio-posterior depression of mesoscutum present **or** ovipositor sheath at least nearly as long as first tergite; antenna segments and sculpture of propodeum variable other *Dinotrema* spp.
7. Antenna of ♀ with 14-15 segments (♂: 19-20) and fourth segment slightly wider than third segment; vein 2-SR about 2.5 times as long as 3-SR; antenna of ♀ about 0.8 times as long as body; antenna basally and legs yellowish brown; head parallel-sided behind eyes in dorsal view; first metasomal tergite pale brown, hardly widened apically and 1.7-2.5 times as long as wide apically; propodeum largely smooth and its spiracles enlarged; precoxal sulcus absent anteriorly; [♂ macropterous]
..... *D. brevis* spec. nov.
- Antenna of ♀ with 11-13 segments and fourth segment distinctly wider than third segment (fig. 4); vein SR1 4.6-4.8 times as long as 3-SR (fig. 1); antenna of ♀ 0.6-0.7 times (♂: 0.9 times) as long as body; antenna and legs (except tarsi) largely dark brown basally; head widened behind eyes in dorsal view (fig. 3); first tergite dark brown, distinctly widened apically and 1.0-1.3 times as long as wide apically (fig. 8); propodeum entirely finely rugose and its spiracles small (fig. 8); precoxal sulcus present anteriorly and finely crenulate; [♂ brachypterous] *D. brevis* spec. nov.

Dinotrema brevis spec. nov.
(figs 1-10)

Material. — Holotype, ♀ (FMNH), “Finland: 6760:3369 EH, Janakkala, Kalpalinna, Turistirinne, 16.v.2013, V. Vikberg”. Paratypes (12 ♀ + 14 ♂); 12 ♀ + 9 ♂ (FMNH, RMNH): topotypic and collected 15-25.v.2013; 1 ♂ (FMNH), Finland, 6840:3511 Sa, Mikkeli Rantakylä, Sokkalantie, 17.v.2010, V. Vikberg; 1 ♂ (FMNH), Finland, 6835:3503, Mikkeli Otava, 21.v.2012, V. Vikberg; 3 ♂ (FMNH) 6837:3514, Mikkeli Tuukkala, 18.v.2014, M. Koponen. Mikkeli Tuukkala is a dry open field for more than a century and was used by the Russian and Finnish armies.

Diagnosis.— The new species belongs to a small group of species of which the female is macropterous (with vein 2-SR of fore wing sclerotized) and the male is brachypterous. The apex of the fore wing of the male reaches up to the first metasomal tergite or to the base of the second tergite and the veins are strongly widened enclosing a narrow elliptical marginal cell (0.4-0.7 times wider than the widened vein SR1; fig. 9). The new species is most similar to *Dinotrema crassiceps* (Fischer, 1958) considering the combination of low number of antennal segments (♀ with 11-13 segments, of ♂ with 15-18 segments), the absence of the second submarginal cell of the fore wing of the male (as a result of the reduction of the wings), the absence of the medio-posterior depression of the mesoscutum, the ovipositor sheath half as long as hind tibia and as long as first tergite (fig. 2) and the robust first tergite. Males of *D. brevis* differ as follows: marginal cell of fore wing narrow elliptical (moderately wide in *D. crassiceps*), first tergite longitudinally striate and basally transversely striate (largely smooth, but rarely also so in *D. brevis*), scutellar sulcus moderately wide (wider), antenna of ♀ with 11-13 segments (about 20), penultimate segment of antenna of ♂ about 1.7 times as long as wide (about 2.3 times) and females with normally developed wings (brachypterous).

Holotype, ♀, length of body 1.5 mm, of fore wing 1.5 mm and fore wing far surpassing apex of metasoma.

Head.— Antenna with 13 segments and 0.7 times as long as body, length of third segment 0.9 times fourth segment, length of third, fourth and penultimate segments 2.0, 1.8 and 1.4 times their width, respectively (fig. 4); head in dorsal view widened behind eyes (fig. 3); length of eye in dorsal view 0.6 times temple (fig. 3); maximum diameter of anterior tentorial pits about half distance between eye and pit; length of malar space 0.05 times basal width of mandible; oblique submalar groove absent; medial length of mandible 0.8 times its maximum width, first and third teeth lobe-shaped and large, somewhat shorter than acute middle tooth (fig. 7), and first tooth distinctly protruding dorsally (fig. 6); palpi short, about as long as width of mandible.

Mesosoma.— Length of mesosoma 1.3 times its height; precoxal sulcus in anterior half of mesopleuron only, with several short crenulae; pleural sulcus narrowly crenulate; medio-posterior depression of mesoscutum absent (but slightly developed longitudinal impression present in some paratypes); surface of propodeum finely reticulate-rugose, with short medial carina anteriorly, and no distinct medial area, and its spiracle small (fig. 8).

Wings.— Fore wing (fig. 1): 1-SR short and widened; pterostigma narrow elliptical; marginal cell up to apex of wing; m-cu just postfurcal; r somewhat widened; r:3-SR:SR1 = 4:9:49; 2-SR:3-SR:r-m = 9:9:3; CU1b distinctly longer than 3-CU1. Hind wing: M+CU:1-M = 11:6.

Legs.— Length of femur, tibia and basitarsus of hind leg 3.6, 7.8 and 7.0 times their width, respectively (fig. 5).

Metasoma.— Length of first tergite 1.1 times its apical width, its surface shiny and longitudinally striate but basally transversely striate (fig. 8), widened posteriorly and evenly convex medially, dorsal carinae nearly complete and dorsope medium-sized, medio-posteriorly with smooth convexity (fig. 8); ovipositor sheath 0.15 times as long as fore wing, as long as first tergite and half as long as apical height of metasoma (fig. 2) or length of hind tibia.

Colour.— Black or blackish brown; mandible, palpi, base of fore and middle tibia, tarsi (except telotarsus) and hind tibia (except apically), yellowish brown; antenna, remainder of legs, tegulae and first tergite dark brown; pterostigma (but apically yellowish) and wing veins brown.

Variation.— Body black or more or less dark brown; length of eye in dorsal view 0.4-0.6 times as long as temple; first tergite pale brown, brown or dark brown. Male: brachypterous (fig. 10), with fore wing reaching up to middle or end of first metasomal tergite, rarely somewhat surpassing apex of first tergite; head distinctly widened behind eyes; medio-posterior depression of mesoscutum absent or as narrow, shallow and finely crenulate linear depression submedially on mesoscutum; 1.1-1.3 times as long as wide apically and distinctly widened posteriorly. Fore wing (fig. 10): marginal cell narrower than vein SR1, narrow parallel-sided to moderately elliptical; pterostigma and 1-R1 equally widened; r-m, 2-M, and CU1b absent; 2-SR and SR1 strongly widened; parastigma hardly differentiated (fig. 10). Hind wing: largely sclerotized, except postero-apically; veins largely indiscernible (fig. 10), and cells absent, only basal cell slightly indicated; antenna with 15 (1), 16 (3), 17 (3) or 18 (2) segments (fig. 9); length of body 1.0-1.5 mm, of fore wing 0.4-0.6 mm; three basal antennal segments brown or largely dark brown and rest of antenna dark brown. Female: antenna with 11 (3), 12 (6) or 13 (3) segments (fig. 4); first metasomal tergite 1.0-1.2 times as long as wide apically and distinctly widened posteriorly length of body 1.0-1.5 mm, of fore wing 1.1-1.5 mm.

Distribution.— Finland.

Etymology.— Named after the short wings of the male and the short second submarginal cell of the female; “brevis” is Latin for “short”.

Acknowledgements and abbreviations

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