

# Revision of the genus *Vadumasonium* Kammerer (Hymenoptera, Braconidae, Brachistinae)

Cornelis van Achterberg<sup>1,†</sup>, Gavin R. Broad<sup>2,‡</sup>

**1** Department of Terrestrial Zoology, Naturalis Biodiversity Center, Postbus 9517, 2300 RA Leiden, The Netherlands

**2** Department of Life Sciences, the Natural History Museum, Cromwell Road, London SW7 5BD, U.K.

† <http://zoobank.org/D6374CF4-8F07-4FA8-8C55-9335FD19CECD>

‡ <http://zoobank.org/D06689DE-526F-4CFA-8BEB-9FB38850754A>

Corresponding author: *Cornelis van Achterberg* ([Kees.vanAchterberg@naturalis.nl](mailto:Kees.vanAchterberg@naturalis.nl))

---

Academic editor: S. Schmidt | Received 23 April 2013 | Accepted 3 June 2013 | Published 1 August 2013

<http://zoobank.org/5FB0F065-7532-4D7E-B952-5F6E6A149E36>

---

**Citation:** Achterberg C van, Broad GR (2013) Revision of the genus *Vadumasonium* Kammerer (Hymenoptera, Braconidae, Brachistinae). *Journal of Hymenoptera Research* 33: 91–98. doi: 10.3897/JHR.33.5399

---

## Abstract

The genus *Vadumasonium* Kammerer, 2006 (Braconidae: Brachistinae: Diospilini), formerly known only from the Nearctic region, is revised and a second species is described from England and Germany: *V. vardyorum* sp. n. The genus is new to the Palaearctic region and we report the first host record for the genus. A key to similar genera of the Diospilini and to both species is given.

## Keywords

*Vadum*, *Vadumasonium*, biology, distribution, new species, key

## Introduction

The genus *Vadumasonium* Kammerer, 2006 (Braconidae: Brachistinae: Diospilini) hitherto comprised only the type species: *Vadumasonium volatum* (Mason, 1987), known from Missouri and Texas (U.S.A.; Yu et al. 2012). It was originally described in the genus *Vadum* Mason, 1987, but this is a junior homonym of *Vadum* Strusz, 1983, and was renamed by Kammerer (2006) as *Vadumasonium*. The second author discovered a similar species from England and Germany amongst unidentified Braconidae in the collections of the Natural History Museum (London), which is described in this

paper. The main differences between the two known species concern the length of the ovipositor sheath, the shape of the clypeus and of the first metasomal tergite.

The biology of the type species is unknown but a pair of paratypes from Germany was reared from *Ptilinus pectinicornis* (Linnaeus, 1758) (Coleoptera: Anobiidae: Ptilininae). This agrees with what is known about host relationships of Diospilini, which are koinobiont endoparasitoids of coleopterous larvae (Shaw and Huddleston 1991). The tribe Diospilini Foerster, 1862, was traditionally included in the Helconinae s.l., but recent research (Sharanowski et al. 2011) suggests placement in a separate subfamily, Brachistinae Foerster, 1862, together with the former Blacinae Foerster, 1862.

## Material and methods

For the terminology used in this paper, see van Achterberg (1988, 1993). For identification of the subfamily Helconinae s.l. and the tribe Diospilini, see van Achterberg (1993) and Sharkey (1997). For the genus *Vadumasonium* Kammerer, see Mason (1987; as *Vadum*) and Sharkey (1997; as *Vadum*). The specimens are deposited in the Natural History Museum, in London (BMNH), and in Naturalis Biodiversity Center, in Leiden (RMNH).

## Taxonomy

### Tribe Diospilini Foerster, 1862

Diospiloidae Foerster, 1862: 229.

### Genus *Vadumasonium* Kammerer, 2006

<http://species-id.net/wiki/Vadumasonium>

Figs 1–16

*Vadum* Mason, 1987: 325–327 (not Strusz 1982). Type species (by original designation): *Vadum volatum* Mason, 1987 [examined].

*Vadumasonium* Kammerer, 2006: 269 (replacement name for primary homonym).

**Diagnosis.** Third antennal segment 0.8–0.9 times as long as fourth segment (Fig. 11); subapical antennal segments of female slender (Figs 3, 10); face short, strongly transverse (2.7–4.0 times wider than high; Fig. 5); ventral margin of clypeus medially with one small acute tooth (Fig. 5) or truncately protruding (Fig. 16); third maxillary palp segment and second labial segment distinctly widened (Fig. 13); labial palp with 4 segments; mandible with transverse basal groove (Fig. 5); medio-ventral sulcus of propleuron strongly widened anteriorly (occupying nearly entire propleuron anteri-

only) and reticulate; pronotum truncate medio-anteriorly; postpectal carina absent; hind wing with 3 distal hamuli; second submarginal cell of fore wing anteriorly narrowed and marginal cell of hind wing parallel-sided apically (Fig. 1); vein m-cu of fore wing antefurcal; first subdiscal cell of fore wing closed; vein 1-SR of fore wing absent and vein r distinctly longer than wide; vein cu-a of fore wing antefurcal, interstitial or narrowly postfurcal; vein 2A of fore wing slightly developed, short, area basal of vein largely glabrous (Fig. 8) and vein a absent (Fig. 1); tarsal claws simple (Fig. 12); first tergite parallel-sided or nearly so and dorsal carinae straight basally (Figs 4, 9); second tergite smooth or basally with some obsolescent sculpture.

**Distribution.** Holarctic (two species).

**Notes.** The genus *Vadumasonium* Kammerer belongs to a group of diospiline genera with vein 3-SR of fore wing shorter than vein 2-M (Fig. 1), resulting in an anteriorly narrowed (or trapezoidal) second submarginal cell; tarsal claws simple, without lobe or lamella (Fig. 12); dorsal carinae of first tergite strong in basal half of tergite and comparatively far from border of tergite (Figs 4, 9); hind wing with 3-5 distal hamuli; third antennal segment shorter than fourth segment (Fig. 11) or slightly longer. The genera can be separated as follows:

- 1       Medio-ventral sulcus of propleuron strongly widened anteriorly (occupying nearly entire propleuron anteriorly) and reticulate; mandible with transverse basal groove (Fig. 5); third antennal segment about 0.9 times as long as fourth segment (Fig. 11); ventral margin of clypeus with one small acute tooth (Fig. 5) or truncate protrusion (Fig. 16); third maxillary palp segment and second labial segment distinctly widened (Fig. 13); first tergite parallel-sided or nearly so (Figs 4, 9); hind wing with 3 distal hamuli; labial palp with 4 segments; subapical antennal segments of female slender (Figs 3, 10); Holarctic region ..... ***Vadumasonium* Kammerer, 2006**
- Medio-ventral sulcus of propleuron at most moderately widened, parallel (occupying at most half of propleuron anteriorly) and crenulate; mandible without transverse basal groove; third antennal segment variable, if shorter than fourth segment (*Taphaeus*) then clypeus truncate ventrally; third maxillary palp segment and second labial segment weakly widened; first tergite more or less widened apically; hind wing with 5 distal hamuli; labial palp with 3 segments; subapical antennal segments of female more or less moniliform ..... **2**
- 2       Third antennal segment slightly shorter than fourth segment; frons without median carina and slightly concave; vein r of fore wing hardly longer than wide; scutellum indistinctly micro-crenulate medio-posteriorly; first tergite contracted behind spiracles (cf. Fig. 4) and dorsal carinae curved basally; Holarctic and Australian regions ..... ***Taphaeus* Wesmael, 1835**
- Third antennal segment slightly longer than fourth segment; frons with irregular medio-longitudinal crest and distinctly concave; vein r of fore wing distinctly longer than wide; scutellum with distinctly crenulate area

medio-posteriorly; first tergite not contracted behind spiracles and dorsal carina straight basally; Palaearctic and possibly Afrotropical and Australian regions.....*Aspicolpus Wesmael, 1838*

Similar genera outside the Diospilini (*Hellenius* Tobias, 1982, in the Blacini) or the Brachistinae (*Plesiotypus* van Achterberg, 1992, in the Microtypinae) can be separated as they have vein 1-SR of the fore wing present, the ventral margin of the clypeus truncate or slightly convex and the precoxal sulcus absent or narrowly developed. In addition, *Hellenius* has the dorsal carinae of the first tergite curved basally and *Plesiotypus* has the pronotum concave medio-anteriorly and the face about 1.5 times wider than high medially.

**Key to species of the genus *Vadumasonium* Kammerer**

- 1 Length of ovipositor sheath about 1.6 times as long as fore wing; clypeus obtusely protruding medio-ventrally (Fig. 16); mesosoma brownish-yellow (except for largely dark brown prothorax and propodeum); length of first metasomal tergite about 3.5 times its apical width (Fig. 9); face without separate triangular area medially; frons smooth; malar suture largely absent; hind coxa largely smooth dorsally; antenna with 30–34 segments; Nearctic.....  
..... *V. volatum* (Mason, 1987)
- Length of ovipositor sheath 1.2–1.3 times as long as fore wing (Figs 1, 14); clypeus with small acute tooth medio-ventrally (Fig. 5); mesosoma black or dark brown; length of first tergite about twice its apical width (Fig. 4); face with separate triangular area medially (Fig. 5); frons largely coriaceous (Figs 5, 6); malar suture present, except dorsal third (Fig. 5); hind coxa largely rugose dorsally (Fig. 7); antenna with 27–30 segments; Europe.....  
..... *V. vardyorum* sp. n.

***Vadumasonium vardyorum* sp. n.**

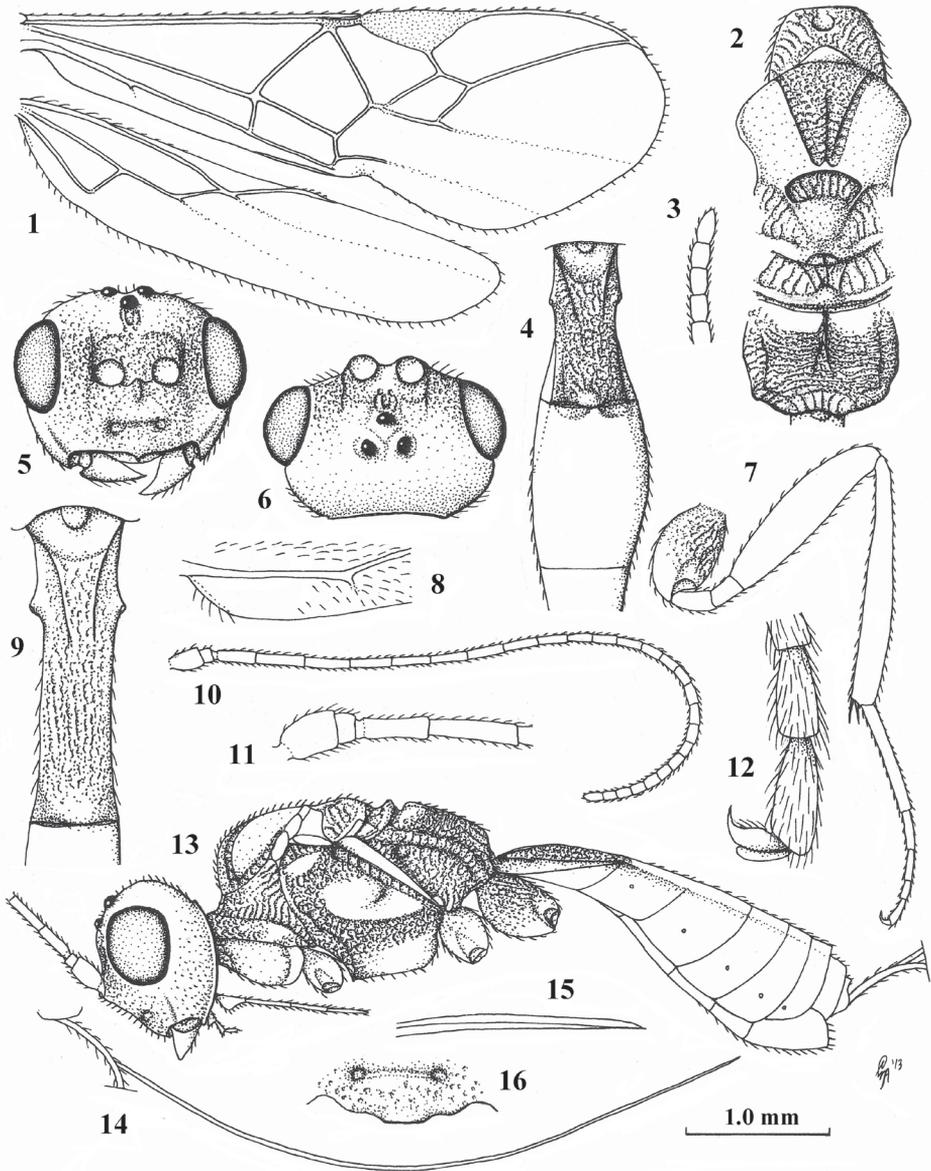
<http://zoobank.org/17104E30-0640-4364-9E5B-3A1656F1D0D8>

[http://species-id.net/wiki/Vadumasonium\\_vardyorum](http://species-id.net/wiki/Vadumasonium_vardyorum)

Figs 1–8, 10–15

**Type material.** Holotype, ♀ (BMNH), “England: Hants., Romsey, Awbridge, 1–14.viii.1981, C. & M. Vardy”, “Malaise trap at 5 m in dead *Larix*”, “*Aspigonus* sp., det. T. Huddleston, 1982”. Paratypes (2 ♀ + 1 ♂): 1 ♀ (RMNH), “England: Hants., New Forest, Minstead, 5.viii.[19]63. In cage with *Apatele alni*, L.W. Siggs”, “*Aspidogonus* sp., R.D. Eady det. 1967”; 1 ♀ + 1 ♂ (BMNH), “D. [= Germany], [near] Freiburg, Bechtaler Wald [= a strictly protected forest reserve near Weisweil in Baden-Württemberg], 1996”, “ex *Ptilinus pecticornis*”, “Hedqvist coll. BMNH(E) 2011-27”.

**Diagnosis.** Clypeus with small acute tooth medio-ventrally (Fig. 5); face 4.0 times wider than high medially and with separate triangular area medially (Fig. 5);



**Figures 1–16.** *Vadumasonium vadyorum* sp. n., ♀, holotype, but 9 and 16 of holotype of *V. volatum* (Mason), ♀. **1** wings **2** mesosoma dorsal **3** apex of antenna **4** first-third metasomal tergites dorsal **5** head frontal **6** head dorsal **7** hind leg lateral **8** detail of fore wing postero-basally **9** first tergite dorsal **10** antenna **11** base of antenna **12** inner hind claw **13** habitus lateral **14** ovipositor **15** apex of ovipositor lateral **16** clypeus frontal. **1, 7, 10, 13, 14:** scale-line (= 1.0×); **2, 4–7:** 1.7×; **3:** 2.5×; **8, 9, 16:** 2.0×; **11, 12, 15:** 5.0×.

frons largely coriaceous (Figs 5, 6); malar suture present, except dorsal third (Fig. 5); hind coxa largely rugose dorsally (Fig. 7); mesosoma black or dark brown; length of first tergite about twice its apical width (Fig. 4); length of ovipositor sheath

1.2–1.3 times as long as fore wing (Figs 1, 14); length of fore wing 3.6–4.2 mm; antenna with 27–30 segments.

**Description.** Holotype, ♀, length of body 5.0 mm, of fore wing 4.2 mm.

**Head.** Antenna with 28 segments and 1.1 times as long as fore wing (Fig. 10); third segment 0.9 times as long as fourth segment, length of third, fourth and penultimate segments 3.6, 4.0 and 1.3 times their width, respectively; length of maxillary palp nearly equal to height of head; third segment of maxillary palp distinctly widened medially; second segment of labial palp wide, triangular with fourth segment inserted at lower corner (Fig. 13); occipital carina complete but medio-dorsally weakly developed; hypostomal carina narrow; length of eye in dorsal view 1.5 times temple (Fig. 6); frons moderately depressed and coriaceous medially, without median carina or groove and laterally slightly convex and punctate; face 4.0 times wider than high, slightly convex and punctate laterally and medially with triangular flat area (Fig. 5); clypeus convex and sparsely but distinctly punctate, its ventral margin thick and medio-ventrally with small tooth (Fig. 5); malar suture present, except dorsal 0.3 of malar space, malar space 1.2 times as long as basal width of mandible (Fig. 13); mandible with deep transverse groove basally (Fig. 5), ventral tooth about as wide as longer dorsal tooth.

**Mesosoma.** Length of mesosoma 1.5 times its height; dorsal pronope wide and moderately impressed, with pronotum truncate anteriorly (Fig. 2); antescutal depression absent, but with triangular flat area; pronotal sides largely punctate-rugose and medially crenulate; epicnemial area and complete precoxal sulcus widely reticulate-rugose and rest of mesopleuron (except dorsally) largely smooth; pleural sulcus crenulate; mesosternal sulcus wide and coarsely crenulate; notauli complete, crenulate and posteriorly wide (Fig. 2); middle lobe of mesoscutum densely punctate and posteriorly rugose, with a median carina, both lateral lobes largely smooth (Fig. 2); scutellar sulcus deep, wide and with irregular carinae; scutellum punctate and convex medially, with paired depressions medio-posteriorly (Fig. 2); surface of propodeum densely and coarsely rugose but anteriorly smooth, median carina short, posterior face hardly separated from dorsal face, lateral tubercles indistinct and areola absent.

**Wings.** Fore wing (Fig. 1): pterostigma triangular; first discal cell narrowly truncate anteriorly; 1-R1 ending before wing apex and 1.3 times as long as pterostigma; r:3-SR:SR1 = 9:13:74; 2-SR:3-SR:r-m = 28:13:22; 2-M nearly twice as long as 3-SR; r slender; 1-M and SR1 straight; cu-a interstitial; first subdiscal cell closed, CU1b short; M+CU1 sclerotized. Hind wing: M+CU:1-M = 24:15; cu-a straight.

**Legs.** Hind coxa densely rugose dorsally (Figs 7, 13); length of femur, tibia and basitarsus of hind leg 4.2, 8.7 and 8.4 times as long as wide, respectively; hind femur largely smooth; hind tibia slightly narrowed apically (Fig. 7); hind tibial spurs slender, apically acute and both 0.3 times as long as basitarsus.

**Metasoma.** First tergite 2.1 times as long as its apical width, surface largely rugose with straight dorsal carinae on basal 0.3 of tergite (Fig. 4); second suture absent; second and following tergites smooth; length of setose part of ovipositor sheath 1.18

times fore wing; upper valve of ovipositor depressed apically, without apical notch or nodus (Fig. 15); hypopygium truncate apically.

**Colour.** Black; antenna, clypeus, hind leg (but trochanter and trochantellus yellow), metasoma (but baso-ventrally yellowish-brown), pterostigma, parastigma and ovipositor sheath dark brown; remainder of legs (but middle coxa largely dark brown) and mandible brownish-yellow; veins brown; palpi, trochanters and trochantelli pale yellow; wing membrane slightly infuscate but somewhat darker near vein r of fore wing.

**Male.** The males do not differ from the females except for the sexual differences and a slightly higher number of antennal segments.

**Variation.** Length of body 5.0–5.3 mm, fore wing 3.6–4.2 mm; antenna of female with 27 (1) or 28 (1) segments and of male 30 (1); first tergite 1.9–2.2 times as long as its apical width; ovipositor sheath 1.18–1.31 times as long as fore wing; vein cu-a of fore wing interstitial or narrowly postfurcal; frons with or without an irregular median carina; second tergite smooth or with some obsolescent sculpture basally.

**Biology.** Reared from *Ptilinus pectinicornis* (Linnaeus, 1758) (Coleoptera: Anobiidae: Ptilininae).

**Distribution.** England, Germany.

**Etymology.** Named after Colin and Martha Vardy, for collecting the holotype and for their hospitality during visits by the senior author.

## Acknowledgements

We thank Dr Henri Goulet and Mrs Caroline Boudreault (CNC, Ottawa) for the loan of the holotype of *Vadum volatum*.

## References

- Achterberg C van (1988) Revision of the subfamily Blacinae Foerster (Hymenoptera, Braconidae). *Zoologische Verhandelingen Leiden* 249: 1–324.
- Achterberg C van (1993) Illustrated key to the subfamilies of the Braconidae (Hymenoptera: Ichneumonoidea). *Zoologische Verhandelingen Leiden* 283: 1–189.
- Foerster A (1862) Synopsis der Familien und Gattungen der Braconiden. *Verhandlungen des Naturhistorischen Vereins der Preussischen Rheinlande und Westfalens* 19: 225–288.
- Kammerer CF (2006) Notes on some preoccupied names in Arthropoda. *Acta Zootaxonomica Sinica* 31(2): 269–271.
- Mason WRM (1987) *Vadum*, a new genus of Nearctic Braconidae (Hymenoptera). *Proceedings of the Entomological Society of Washington* 89(2): 325–328.
- Sharanowski BJ, Dowling APG, Sharkey MJ (2011) Molecular phylogenetics of Braconidae (Hymenoptera: Ichneumonoidea), based on multiple nuclear genes, and implications for classification. *Systematic Entomology* 36: 549–572. doi: 10.1111/j.1365-3113.2011.00580.x

- Sharkey MJ (1997) Subfamily Helconinae. In: Wharton RA, Marsh PM, Sharkey MJ (Eds). Manual of the New World genera of the family Braconidae (Hymenoptera). Special Publications of the International Society of Hymenopterists 1: 260–272.
- Shaw MR, Huddleston T (1991) Classification and biology of braconid wasps (Hymenoptera: Braconidae). Handbooks for the Identification of British Insects 7(11): 1–126.
- Yu DSK, Achterberg C van, Horstmann K (2012) Taxapad 2012, Ichneumonoidea 2011. Ottawa, Ontario, Canada. Database on flash-drive. [www.taxapad.com](http://www.taxapad.com)