

Notes on *Grammospila* Foerster (Hymenoptera, Braconidae, Alysiinae), with description of a new species

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Abstract

The species of the genus *Grammospila* Foerster, 1863 (Hymenoptera: Braconidae: Alysiinae) are keyed, an aberrant new species from Italy, *G. martae* **sp. n.**, is described and illustrated, and *G. ochrogaster* (Szépligeti, 1898), **stat. n.** is considered to be a valid species.

Keywords

Braconidae, Alysiinae, *Grammospila*, new species, Europe, Italy, key

Introduction

Grammospila Foerster, 1863, is a small Palearctic and Northeast Oriental genus belonging to the large subfamily Alysiinae (Hymenoptera, Braconidae), with 2,442 valid species in 107 genera up to 2015 according to Yu et al. (2016). Alysiinae are a common group of generally small (2.0–5.0 mm) parasitoid wasps, and *Grammospila* is no exception. *Grammospila* larvae are koinobiont parasitoids in larvae of mining Agromyzidae (Yu et al. 2016) and Scathophagidae (Zhu et al. 2017, this paper). The adults have been often classified among *Dapsilarthra* Foerster, 1863 (e.g., van Achterberg 1983), but recently, the group has given generic rank (van Achterberg 2014). *Grammospila* differs from *Dapsilarthra* s.s. by having the third antennal segment distinctly longer

than the fourth segment (subequal in *Dapsilarthra* s.s.), a different fore wing venation and usually a shorter first discal cell (Zhu et al. 2017). There are only five valid species recognised at the moment; four are described from Europe and one (*G. eurys* (Chen & Wu, 1994)) from Oriental China (Chen and Wu 1994, Yu et al. 2016, Zhu et al. 2017). Among the Alysiini collected in a small brook bordered by a rivulet in the Parco Naturale Alpi Marittime (NW Italy; EDIT survey) some aberrant specimens were discovered. Their generic position was uncertain considering the first subdiscal cell of the fore wing is partly open by the lack of vein CU1b (present in all other known *Grammospila* spp.) and vein 2-1A largely sclerotized (entirely sclerotized in *Grammospila* spp.; van Achterberg 1983). Nevertheless, comparison with all available material led to the conclusion that the new species fits best in *Grammospila* Foerster. For the first time a key to all currently recognised species of *Grammospila* is presented.

Material and methods

The specimens were collected in a Malaise trap and preserved in 70% alcohol during a survey of the Parco Naturale Alpi Marittime in NW Italy. For identification of the subfamily Alysiinae, see van Achterberg (1993), for identification of *Grammospila* Foerster, see van Achterberg (2014), Zhu et al. (2017) and the diagnosis in this paper, for references to the Alysiinae and *Grammospila* Foerster, see Yu et al. (2016) and for the terminology used in this paper, see van Achterberg (1988, 1993). Measurements are taken as indicated by van Achterberg (1988): for the length and the width of a body part the maximum length and width is taken, unless otherwise indicated. The length of the mesosoma is measured from the anterior border of the mesoscutum to the apex of the propodeum and of the first tergite from the posterior border of the adductor to the medio-posterior margin of the tergite. Observations and descriptions was made with an Opto-Edu A230903 stereomicroscope and a fluorescent lamp. Photographic images were made with the Keyence VHX-5000 digital microscope. The specimens are deposited in the Naturalis Biodiversity Center, Leiden, the Netherlands (RMNH).

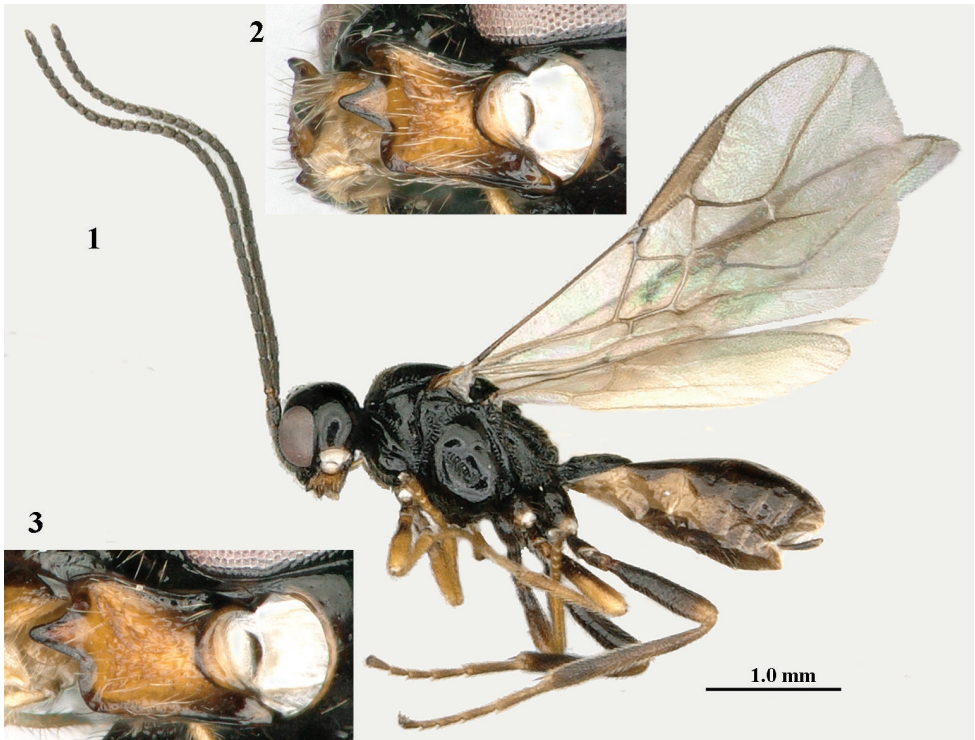
Systematics

Grammospila Foerster, 1863

Figures 1–17

Grammospila Foerster, 1863: 269. Type species (by monotypy): *Alysia isabella* Haliday, 1838 [lost?].

Paraorthostigma Königsmann, 1972: 25. Type species (by monotypy): *Paraorthostigma tirolense* Königsmann, 1972 [examined]. Synonymised with *Dapsilarthra* Foerster, 1863 by van Achterberg (1983) and with *Grammospila* Foerster, 1863 by van Achterberg (2014).



Figures 1–3. *Grammospila martae* sp. n., ♀, holotype. **1** habitus, lateral aspect **2** mandible, full view on dorsal tooth **3** mandible, full view on third tooth.

Description. Antenna with 27–41 segments, third segment 1.2–1.5 times as long as fourth segment (in Palaearctic spp.); head comparatively robust in dorsal view (Fig. 11); anterior tentorial pit large and with triangular flat area between pit and eye above curved up ventral rim (Figs 3, 10); area between mandibular base and ventro-posterior margin of eye convex or flat, without oblique depression, without malar suture; anterior tentorial pits concave, pit-shaped, and remaining removed from eyes; mandible with 3 teeth or lobes; ventral margin of mandible straight (Fig. 2); notauli absent posteriorly; mesoscutum with medio-posterior depression; length of vein 3-SR of fore wing more than 1.2 times vein 2-SR; length of vein r of fore wing 0.2–0.3 times vein 2-SR; diagonal width of first discal cell of fore wing often 1.4–1.6 times vein 1-M; vein 2-1A of fore wing sclerotized, as usually vein CU1b; vein 1-SR of fore wing distinct, resulting in a petiolate first discal cell; vein r of fore wing emitted from basal 0.3–0.5 of pterostigma; first subdiscal cell of fore wing parallel-sided or nearly so; vein m-cu of hind wing absent; pterostigma narrowly elliptical; first metasomal tergite parallel-sided behind spiracles or nearly so, with deep dorsope and laterope, its spiracles facing dorsad; apical third of ovipositor sheath evenly setose.

Biology. Endoparasitoids of Agromyzidae and Scathophagidae larvae. *Grammospila isabella* (Haliday), has been reared from Scathophagidae (*Americina vittata* (Meigen, 1826) mining in *Paris* sp.; first record; RMNH).

Distribution. Palaearctic and NE Oriental. Seven species.

Key to species of the genus *Grammospila* Foerster

- 1 Antenna of ♀ 0.9–1.3 times as long as body and 0.9–1.1 times as long as fore wing; **if** 1.1 times fore wing then vein 1-R1 of fore wing 0.8 times as long as pterostigma; hind femur largely dark brown **2**
- Antenna of ♀ 1.4–1.9 times as long as body and 1.1–1.6 times as long as fore wing; **if** 1.1 times fore wing then vein 1-R1 of fore wing about as long as pterostigma; hind femur brownish yellow **3**
- 2 Vein CU1b of fore wing present, resulting in a closed first subdiscal cell; antenna approx. 1.3 times as long as body and 1.0–1.1 times as long as fore wing; vein r issued near basal 0.3 of pterostigma; marginal cell comparatively narrow basally; [collected at approx. 1600 m]..... ***G. tirolensis* (Königsmann, 1972)**
- Vein CU1b of fore wing absent, resulting in partly open first subdiscal cell (Figs 1, 4); antenna approx. 0.9 times as long as body or fore wing; vein r issued near basal 0.4 of pterostigma (Fig. 4); marginal cell wide basally (Fig. 4); [collected at approx. 1200 m] ***G. martae* sp. n.**
- 3 Notauli complete; body with many long setae (including mesoscutum and mesosternum); first subdiscal cell of fore wing widened distally and vein 1-CU1 widened; [third antennal segment 1.4–1.5 times as long as fourth segment; vein m-cu of fore wing antefurcal (not postfurcal as mentioned in original (Chinese) description)]; Oriental (East China, Fujian)..... ***G. eurys* (Chen & Wu, 1994)**
- Notauli largely absent on mesoscutal disc (cf. Fig. 6); body with rather sparse and medium-sized setae (including mesoscutum and mesosternum); first subdiscal cell of fore wing parallel-sided and vein 1-CU1 slender; Palearctic... **4**
- 4 Penultimate segment of antenna of ♀ 1.7–2.0 times as long as wide; base of hind coxa and second metasomal tergite dark brown or blackish..... ***G. fuscula* (Griffiths, 1968)**
- Penultimate segment of antenna of ♀ 2.5–3.2 times as long as wide; base of hind coxa and second tergite brownish yellow..... **5**
- 5 Antenna with 38–41 segments and approx. 1.6 times as long as fore wing; length of fore wing 3.0–3.5 mm; vein SR1 of fore wing about twice as long as vein 3-SR..... ***G. isabella* (Haliday, 1838)**
- Antenna with 27–33 segments and 1.3–1.4 times as long as fore wing; length of fore wing 2.0–2.5 mm; vein SR1 of fore wing approx. 2.5 times as long as vein 3-SR..... **6**
- 6 Clypeus comparatively narrow and rather convex (Figs 16, 17); metasoma darkened or dark brown apically (Fig. 15)..... ***G. rufiventris* (Nees, 1814)**
- Clypeus comparatively wide and flattened; metasoma yellow apically ***G. ochrogaster* (Szépligeti, 1898), stat. n.**

***Grammospila martae* sp. n.**

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Figures 1–14

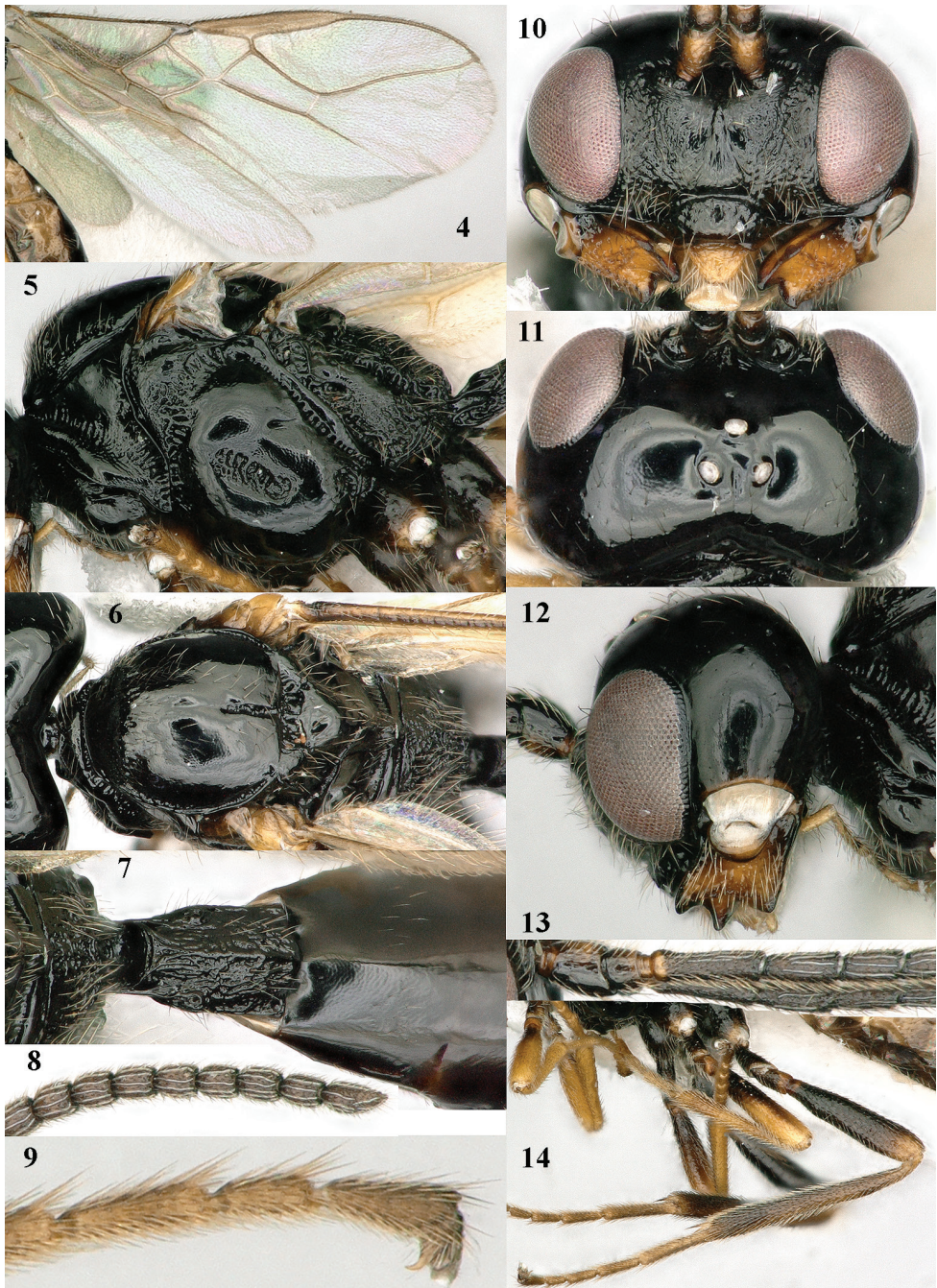
Type material. Holotype, ♀ (RMNH), “N. Italy: Cuneo, N.P. Alpi Marittime, Trinità, Ponte del Suffiet, 1192 m, Mal[aise] trap 4, near rivulet”, “edge of wet forest, N44°11'427" E07°26'864", 10-24.vi.2008, C. v. Achterberg & R. de Vries, EDIT-RMNH'08”. Paratypes: 2 ♀ (RMNH) with same data.

Comparative diagnosis. The short vein r (much shorter than width of pterostigma), the straight ventral margin of the mandible, the large anterior tentorial pit and the smooth triangular area between pit and eye indicate that *G. martae* sp. n. belongs to *Grammospila* Foerster, despite the partially open first subdiscal cell of the fore wing. Within this genus it shares with *G. tirolensis* (Königsmann) the comparatively short antenna (shortest of all known species, only 0.9 times as long as body or fore wing). It differs from *G. tirolensis* by the shorter antenna (1.3 times as long as body and 1.0–1.1 times as long as fore wing in *G. tirolensis*) and the different wing venation, as indicated in the key.

Description. Holotype, ♀, length of body 4.1 mm; of fore wing 4.2 mm.

Head. Head transverse, its maximum width 1.9 times median length in dorsal view and temple slightly widened behind eyes (Fig. 11); antenna with 32 segments, 0.9 times as long as fore wing or body, third segment 1.4 times as long as fourth segment, length of third, fourth and penultimate segments 3.7, 2.6 and 1.5 times their width, respectively (measured in lateral view), apical segment without apical spine (Figs 8, 13); maxillary palp 0.7 times as long as height of head; labial palp segments slender; length of eye in dorsal view 0.8 times temple; temple and vertex smooth and shiny, except for some sparse punctulation, sparsely setose; stemmaticum slightly protruding, with median groove; OOL: diameter of ocellus: POL = 16:5:6; frons slightly depressed and glabrous, with shallow pit in front of anterior ocellus and behind antennal sockets crenulate, strongly shiny; face rugose and rugulose laterally, medially largely smooth and with triangular area, rather flat (Fig. 10); anterior tentorial pits large (Fig. 3); width of clypeus 2.4 times its maximum height; clypeus distinctly convex, largely smooth, truncate ventrally and hardly protruding, ventral rim depressed and thin; epistomal suture narrow and smooth (Fig. 10); malar space hardly developed; mandible 1.2 times longer medially than wide, with medium-sized ventral lamella (Figs 2, 3) and no crest connected to third tooth and baso-ventral corner depressed (Fig. 2), with two wide lobe-shaped lateral teeth, middle tooth wide triangular, upper tooth gradually widened dorsally.

Mesosoma. Mesosoma 1.4 times longer than high; pronope absent and pronotum with finely crenulated groove anteriorly (Fig. 6); propleuron evenly convex (Fig. 5); oblique groove of pronotal side finely crenulate, but posteriorly mainly granulate and near posteriorly margin rugose, remainder of pronotum smooth (Fig. 5); epicnemial area of mesopleuron distinctly crenulate or rugose (Fig. 5); precoxal sulcus remaining removed from anterior and posterior margins of mesopleuron, wide and distinctly crenulate (Fig. 5); remainder of mesopleuron shiny and with some very superficial mi-



Figures 4–14. *Grammospila martae* sp. n., ♀, holotype. **4** wings **5** mesosoma lateral aspect **6** mesosoma dorsal aspect **7** first-third metasomal tergites dorsal aspect **8** apical segments of antenna **9** outer hind claw **10** head anterior aspect **11** head dorsal aspect **12** head lateral aspect **13** basal segments of antenna **14** hind leg lateral aspect.

cro-sculpture; episternal scrobe rather small, round; pleural sulcus finely crenulate (Fig. 5); mesosternal sulcus medium-sized and crenulate; postpectal carina absent; medially metapleuron with large pit and largely smooth, remainder crenulate or rugose (Fig. 5); lateral carina of mesoscutum complete and finely crenulate; notauli absent on disc, but anteriorly shallowly crenulate; medio-posterior depression long, linear and finely crenulate (Fig. 6); mesoscutal lobes along imaginary courses of notauli sparsely setose, smooth and strongly shiny, middle lobe rather protruding antero-laterally (Fig. 6); scutellar sulcus rather deep and superficially crenulate, 0.3 times as long as scutellum; scutellum distinctly convex (protruding over level of mesoscutum), largely smooth, with superficial transverse crest and medio-posteriorly with few punctures (Fig. 6); metanotum smooth, anterior half with lamelliform median carina; dorsal surface of propodeum hardly differentiated from its posterior surface, coarsely and densely rugose, but antero-laterally sparsely so.

Wings. Fore wing: Pterostigma elongate elliptical (Fig. 4); vein r issued from basal 0.4 of pterostigma and its length 0.5 times width of pterostigma; r:2-SR:3-SR:SR1 = 5:20:37:80; r-m vertical and unsclerotized, half as long as 2-SR; SR1 slightly sinuate; M+CU1 largely sclerotized; cu-a vertical; 1-CU1:2-CU1 = 5:21; CU1b absent, resulting in an open subdiscal cell but 2-1A sclerotized and 3-CU1 medium-sized (Fig. 1); m-cu antefurcal. Hind wing: M+CU:1-M:1r-m = 40:18:28; 1r-m curved; m-cu and most of SR1 absent (Fig. 4).

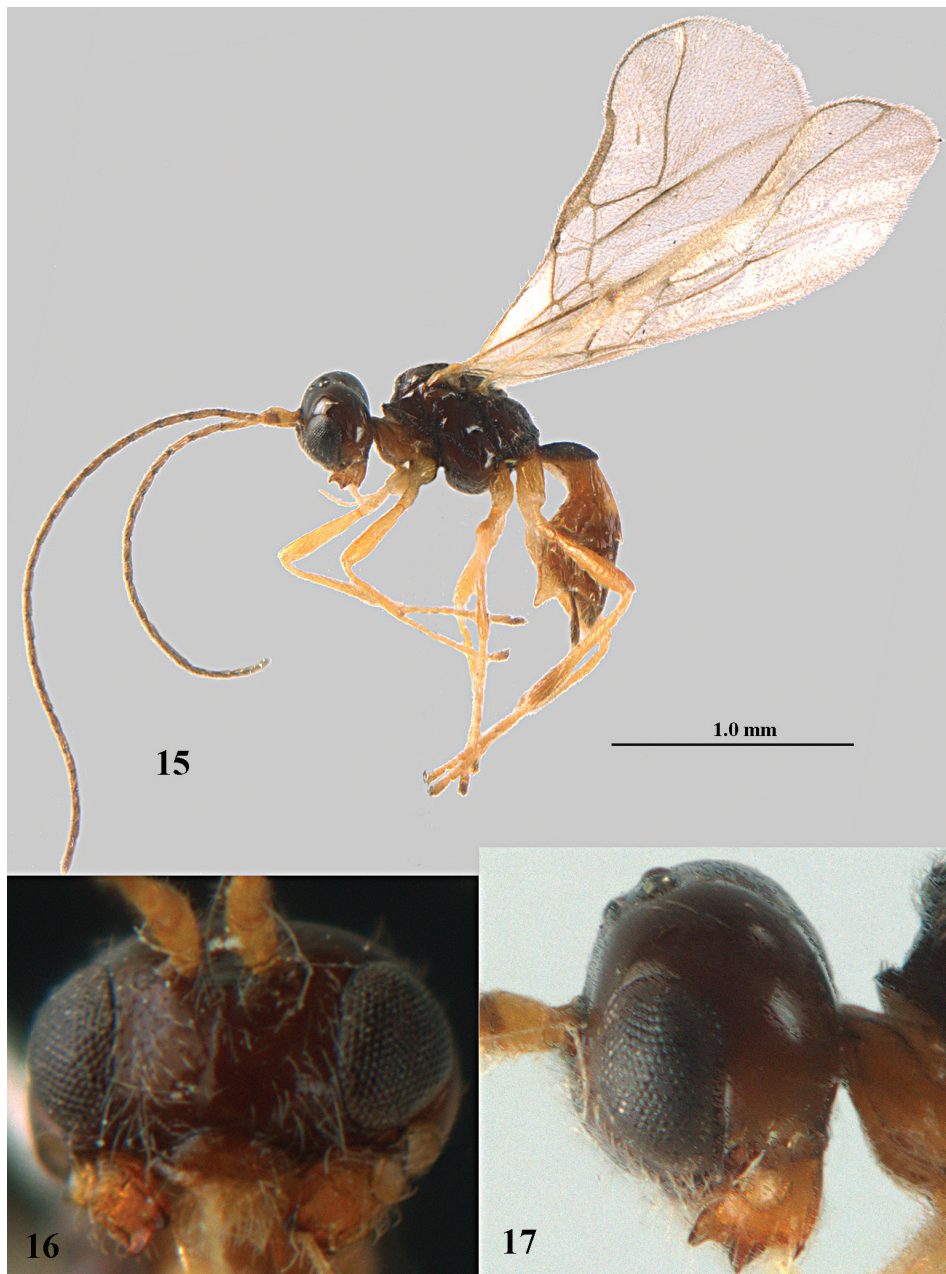
Legs. Hind coxa smooth; tarsal claws medium-sized (Fig. 14); length of femur, tibia and basitarsus of hind leg 4.3, 10.0 and 6.0 times their width, respectively.

Metasoma. Length of first metasomal tergite 1.6 times its apical width, irregularly rugose, convex medially, subparallel-sided behind spiracles and dorsal carinae united subbasally in a strong median carina (Fig. 7), medio-posteriorly strongly convex and distinctly above level of second tergite in lateral view (Fig. 1); spiracles of first tergite facing dorsally; dorsope and laterope large; second suture only laterally present (Fig. 7); second and third tergites flat, with band of setae and smooth; ovipositor sheath with long setae apically, glabrous submedially, setose part of sheath 0.05 times as long as fore wing (total: 0.07 times) and 0.2 times as long as hind tibia (Fig. 1).

Colour. Black; tegula brown; labrum, humeral plate, fore femur (except basally), tibia and tarsus, apical half of middle femur, tibia and tarsus, and apex of hind femur brownish yellow; remainder of legs dark brown or brown (Figs 1, 14); palpi pale yellowish or whitish; mandible (except dark brown margin) orange brown; metasoma dark brown, but first tergite black and metasoma ventro-basally pale yellowish; wing membrane subhyaline; pterostigma and veins brown.

Male. Unknown.

Variation. Length of body 3.5–4.1 mm; of fore wing 3.7–4.2 mm, antenna of ♀ with 31(1) or 32(2) segments, third segment 1.4–1.5 times as long as fourth segment; precoxal sulcus up to base of middle coxa and finely crenulate or posteriorly absent; length of first metasomal tergite 1.5–1.7 times its apical width; setose part of sheath 0.05–0.06 times as long as fore wing.



Figures 15–17. *Grammospila rufiventris* (Nees), ♀, Netherlands (Waarder). **15** habitus, lateral aspect **16** head, anterior aspect **17** head, lateral aspect.

Distribution. Italy (CN).

Etymology. Named after Marta Di Biaggi (Parchi Alpi Marittime e Marguareis, Valdieri) for her help and kindness during the EDIT fieldwork in the Parco Naturale Alpi Marittime.

***Grammospila ochrogaster* (Szépligeti, 1898), stat. n.**

Phaenocarpa ochrogaster Szépligeti, 1898: 393–394, 406; Papp 1968: 572 (as synonym of *Dapsilarthra rufiventris* (Nees, 1812)); Shenefelt 1974: 1012 (as valid sp.); van Achterberg 1983: 11 (as synonym of *Dapsilarthra rufiventris* (Nees, 1812)); Papp 2004: 166 (id.; lectotype designation).

Notes. The lectotype from Hungary (Budapest, Diósárok) listed by Papp (2004) and housed in the Hungarian Natural History Museum (Budapest) has been examined and directly compared with Hungarian specimens of *G. rufiventris* (Nees). Traditionally, it is considered to be a junior synonym of *Dapsilarthra* (now *Grammospila*) *rufiventris* (Nees, 1812). However, the difference in colour of the metasoma (the apex is yellow, a condition absent in *G. rufiventris* as examined so far) is accompanied by a small but probably important difference in the shape of the clypeus (it is somewhat wider than in *G. rufiventris* and flattened). Further research is needed to corroborate its independent status and to record the distribution.

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