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Review of the *Eumerus barbarus* species group (Diptera: Syrphidae) from the western Mediterranean Basin

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Abstract. The species of the *Eumerus barbarus* group from the western parts of the Mediterranean Basin are revised. Two species new to science are described, i.e. *Eumerus gibbosus* **sp. n.** (from Portugal and Spain) and *Eumerus schmideggeri* **sp. n.** (from Algeria, Morocco and Tunisia). The other two species included in this group are *Eumerus barbarus* (Coquebert, 1804) and *Eumerus sulcitibius* Rondani, 1868. A neotype is designated for *E. barbarus* and we also designated a lectotype for *Eumerus iris* Loew, 1848. All species are figured, their synonyms are reviewed and an identification key is presented. *Eumerus truncatus* Rondani, 1868 is withdrawn from synonymy with *E. barbarus* and considered a *bona species*; additionally, this species is recorded from Morocco, Portugal, Spain and Tunisia for the first time. A short discussion on the value of the Mediterranean Basin as biodiversity hotspot for hoverflies is given.

Key words. *Eumerus barbarus* group, new species, description, Mediterranean Basin, hotspot, threat.

INTRODUCTION

Eumerus Meigen, 1822 is a well-defined genus restricted to the Old World, except for some Australasian species. It is one of the largest syrphid genera in the world, with over 250 described species (Pape & Thompson 2013). Some species have been introduced in other regions, notably the New World, with bulbs transported by man for commerce (Gibbson 1917; Sasscer 1919; Smit 1928; Neboiss 1957; Marinoni & Morales 2007; Speight et al. 2013). The larvae are known to feed in or on decaying roots, bulbs and fleshy matter of Liliaceae, Amerillaceae, Orobanchaceae and even in New World cacti, and some species are regarded to be pests of diverse ornamental bulbs and ginger (Collin 1920; Smit 1928; Martin 1934; Sathiamma 1979; Pérez-Banón & Marcos-García 1998; Ricarte et al. 2008).

The present study deals with the species belonging to the *E. barbarus* group as defined by Chroni et al. (2017). Chroni et al. (2017) used the name *E. sulcitibius* group for *E.* aff. *barbarus* and *E. sulcitibius* Rondani, 1868. As the name *E. barbarus* (Coquebert, 1804) is senior to *E. sulcitibius*, the correct name is *E. barabarus* species group. This grouping does not reflect a phylogenetic ranking as the taxonomy and phylogenetics of *Eumerus* still require revision (Doczkal 1996; Doczkal & Pape 2009). As the females of this group are difficult to distinguish from each other and even from other *Eumerus* species, the diagnosis for each species reviewed here is therefore only based on males. The characters used in the key to the females are often subtile and a certain identification is not always possible.

The aim of the present work is to review the species of the *Eumerus barbarus* group from the western parts of the Mediterranean Basin and to describe two species new to science, namely *Eumerus gibbosus* sp. n. (from Portugal and Spain) and *Eumerus schmideggeri* sp. n. (from Algeria, Morocco and Tunisia). Moreover, we figure all the species of the *barbarus* group, designate a neotype for *Eumerus barbarus*, a lectotype for *Eumerus iris* Loew, 1848 and provide an identification key. *Eumerus truncatus* Rondani, 1868 is withdrawn from synonymy with *Eumerus barbarus* and considered a *bona species*.

MATERIAL AND METHODS

The countries considered here as part of the western Mediterranean Basin are Algeria, France, Italy, Morocco, Portugal, Spain and Tunisia.

Male genitalia and abdomen were dissected by means of entomological pins and forceps from dry or softened specimens. Genitalia and abdomen were boiled in a 10% KOH solution. Once cleared sufficiently, genitalia and sterna IV were placed in glycerine and photographed in a Nikon SMZ dissecting microscope with a Leica MC 190

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HD mounted camera. The photographs of the male sternum IV were touched up in Adobe Photoshop©, and the photographs of the genitalia were used as a template to draw them in Adobe Illustrator©. The photos of the external structures were taken with a Canon EOS 6D mounted on a 2.5 times phototube attached to a Wild M10 stereomicroscope. The photos of the habitus and body parts were processed with Zerene Stacker version 1.04 and further edited with GNU Image Manipulation Program 2.8.16. SEM images (Fig. 9) are made with a VEGA 3xm (Tescan).

Morphological terminology follows Thompson (1999), and terms related to the male genitalia follow Doczkal (1996). The measurements were made with the use of a micrometre. The body is measured from the posterior end of the antennae to the posterior tip of the abdomen; width of head is measured at its maximum width in dorsal, respectively frontal view; the width of the face is measured just below the antennae; width of ocellar triangle is measured over the posterior ocelli in dorsal view; the length of the ocellar triangle is measured from the anterior end of the anterior ocellus to the midline posterior of the posterior ocelli; the length of the frontal triangle is measured from the anterior corner of the eye contiguity to the posterior corner of the lunule in dorsal view; the length of the vertical triangle is measured from the posterior corner of the eye contiguity to the anterior ocellus in dorsal view, the eye contiguity itself is the length in between the previous two measurements; the width of the vertex in dorsal view is measured posteriorly between the posterior corner of the eyes (a), over the posterior ocelli (b) and over the anterior ocellus (c); the length of the basoflagellomere is measured in lateral view from the most anterior part of the pedicel to the apex of basoflagellomere and the width is measured at its widest point, perpendicular to the midline; the length of the metafemur as well as the tarsomeres of the metatarsus is measured in posterior view from the base to the apex along the midline and the width is measured at its widest point, perpendicular to the midline.

In the description of type labels, the contents of each label is enclosed within double quotation (“ ”), italics denote handwriting, and the individual lines of data are separated by a forward slash (/).

DEPOSITORIES

AET private collection of Andre van Eck, Tilburg, The Netherlands
CSCA California State Collection of Arthropods, Department of Food & Agriculture, Sacramento, California, USA
CEUA Colección Entomológica de la Universidad de Alicante, Centro Iberoamericano de la Biodiversidad, Alicante, Spain
JSA private collection of Jeroen van Steenis, Amersfoort, The Netherlands
LACM Los Angeles County Museum, Los Angeles, California, USA
MNCN Museo Nacional de Ciencias Naturales, Madrid, Spain
MNHN Laboratoire d’Entomologie, Muséum national d’Histoire naturelle, Paris, France
MZUF Museo Zoologico “La Specola”, Firenze, Italy
MZW private collection of Menno van Zuijen, Wageningen, The Netherlands
NBC Natural Biodiversity Centre, Leiden, The Netherlands
NHM The Natural History Museum, London, United Kingdom
ZMHB Museum für Naturkunde, Leibniz-Institut für Evolutions- und Biodiversitätsforschung, Berlin, Germany

RESULTS

The western Mediterranean species of the *Eumerus barbarus* group

The *barbarus* group contains four *Eumerus* species in the western parts of the Mediterranean Basin: *E. barbarus*, *E. sulcitibius*, *Eumerus gibbosus* sp. n., and *Eumerus schmideggeri* sp. n. Until recently, *Eumerus truncatus* Rondani, 1868 was regarded as a synonym of *E. barbarus*. Grković et al. (2015) treated *E. truncatus* as *bona species* (from several Greek Isles), but without giving any reference to its recognition or former synonymy. We examined specimens of this species, including the type material, and concluded that *E. truncatus* is not a species of the *Eumerus barbarus* group as defined here, which can be seen from the redescription provided below.

Diagnosis of the *Eumerus barbarus* species group

As recognised here, the species of the *Eumerus barbarus* group share the following characteristics: Face with dense white pollinosity and white to light-yellow pile (Figs 4A, 4B, 4D–4I)), with mouth edge narrowly shiny black. Eyes white pilose, about 1/4–1/2 times as long as facial pile; male with rather long eye contiguity, 7–9 ommatidia long (Figs 3A, 3D, 3F, 3H). Vertex broad, ocellar triangle isosceles, located anteriorly on vertex, with widely separated posterior ocelli; anterior part and two small maculae along eye margin just posterior of posterior ocelli white pollinose (Figs 3A, 3B, 3D–I). Basoflagellomere oval with rounded apico-dorsal corner (Fig. 6). Thorax with two medial narrow white pollinose vittae on nearly entire length (Figs 1A, 1B, 1D–1I); on supra-alar region with a row of

8–12 short black setulae; shiny colour with copper to golden purple sheen. Notopleural suture absent. Abdomen black with different shiny colours (black, copper to gold) and with white pollinose lunulate maculae on terga II–IV and short black and white pile.

Males of the *barbarus* group can be distinguished with the following characteristics: Metatrochanter with low tubercle to triangular process ventro-medially (Fig. 7). Metafemur strongly incrassate (thickened) with long pile ventrally (Fig. 7), apico-posteriorly with pilose lamina of different size, with long row of black spinae along postero-ventral margin or with additionally several larger spinae ventro-medially (Figs 7, 8). Metatibia ventro-basally with spinose carina along medial surface and a well-developed lamina posteriorly (Fig. 9B); in *E. gibbosus* **sp. nov**. carina weakly developed and lamina only present at extreme apex and weakly developed. Genitalia with elongate surstylus with hook shaped apex (Fig. 11).

***Eumerus barbarus* (Coquebert, 1804)**
Figs 1A, 1B, 2A, 2B, 3A, 3B, 4A, 4B, 6A, 6B, 7A, 8A, 9A, 10A & 11A

Syrphus barbarus Coquebert, 1804: 117. Type locality: Barbaria Mus. Dom. Desfontaines [Neotype ♂, ZMHB, here designated].
Eumerus australis Meigen, 1838: 110. Type locality: Spain, Andalusia [Holotype ♀, MNHN].
Eumerus iris Loew, 1848: 118. Type locality: Italy, Sicily, Syracuse [Lectotype ♂, ZMHB, here designated].
Eumerus truquii Rondani, 1857: 95. Type locality: Italy, Piemont [Holotype ♀, MZUF].

Diagnosis. Metafemur (Figs 7A, 8A, 9A) strongly incrassate, with broad flat non pilose area ventrally with postero-ventral row of spinae covering nearly the entire length of the metafemur; metafemur apico-posteriorly with low lamina covered with dense white pile; metatibia (Figs 7A, 8A) ventro-basally along medial surface with broad carina, posteriorly with very broad lamina; sternum IV (Fig. 10A) squarish, in lateral view with characteristic postero-medial rounded extensions, in ventral view with laterally projecting rounded postero-lateral corner and deep and wide incision medially. Genitalia (Fig. 11A): surstylus with very narrow medial lobe and apical lobe elongate, gently curved margins with sharp, weakly bent apex; hypandrium with rather broad apical part and with weakly rounded and smooth ventral margin.

Redescription. MALE (Figs 1A, 2A). Body length: 6.8–8.7 mm, wing length: 4.7–6.3 mm. **Head** (Figs 3A, 4A). Face nearly parallel sided. Frons light-grey pollinose, with scattered light yellow pile. Ratio width of head : width of face 2.9–3.1 : 1. Eye contiguity relatively short, ratio frons : eye contiguity : vertical triangle is as 1.4–1.7 : 1.2–1.4 : 1. Vertical triangle grey-yellow pollinose, narrow grey-yellow pollinose along eye margin and two short oval maculae posterior of ocelli, pile golden-yellow, on ocellar triangle ranging from yellow with some black pile intermixed to entirely black pilose. Occiput predominantly grey pollinose, entirely white pilose. Ocelli isosceles with broad posterior base, length : width 1.3–1.4 : 1; posterior ocelli relatively far from eye margin, ratio width of frons : width of ocellar triangle 1.3–1.5 : 1; ratio a:b:c as 1.4–1.6 : 1.2–1.4 : 1; width of head : width of vertex is as 3.7–4.4 : 1. Antennae black to orange-yellow, scape black, pedicel from orange to black, basoflagellomere from entirely orange to yellow with apical half brown to dark-brown. Scape and pedicel with long yellow to black setae and light pile. Basoflagellomere (Fig. 6A) short rectangular, ratio length : width as 1.2–1.3 : 1 with anterior margin skewed ventrally. Arista with broad base, total length 2–3 times longer than basoflagellomere, basal 1/5 yellow to entirely black.

Thorax. Black bronze shiny, pollinose along lateral margin and posterior and anterior of notopleura, two medio-lateral pollinose vittae reaching to posterior 2/3–3/4 of scutum, these pollinose vittae with broad triangular anterior part. Pile light yellow. Pleurae bronze black, pilose on proepimeron, postero-dorsal margin of anterior anepisternum, entire posterior anepisternum, anterior half of anepimeron and a dorsal and ventral pile patch on katepisternum. Grey pollinose on pilose parts, others bronze black sub shiny. Metasternum pilose. Scutellum rectangular with narrow marginal rim, shiny black with bronze sheen, golden yellow pilose. **Legs**. Black and brown-yellow to orange coloured. Pro- and mesotarsus orange-yellow, connecting parts of tarsomeres black; pro- and mesotibia basal 1/2–2/3 orange-yellow and with apical black ring sometimes with brow-yellow anterior part; pro- and meso femur apical 1/10 brown-yellow. Pile all yellow with black spinae on ventral side of mesotarsus. Metaleg with coxa black and long white pile; trochanter (Fig. 7A) brown-yellow to black, short scattered mixed yellow and black pile, apicoventrally with short rounded tubercle; femur (Figs 7A, 8A, 9A) black, strongly enlarged, ratio length : width is 2.4–2.7 : 1, with broad flat non pilose area ventrally with antero-ventral row of 5–8 black spinae apically and postero-ventral row of 14–22 black spinae covering nearly the entire length of the metafemur; apico-posteriorly with densely white pilose low lamina; pile light-yellow, nearly evenly long on dorsal surface and short on ventral surface, except long on apicoventral part. Metatibia (Figs 7A, 8A) orange-yellow on basal 1/2 and apical 1/10; only slightly curved, ventro-basally along medial surface with broad carina, posteriorly with very broad lamina; tarsus orange to dark-brown. **Wing**. Entirely microtrichose to partly bare medially on alula and basally on cell bm. **Abdomen**. Shiny bronze black, white pilose, antero-medial

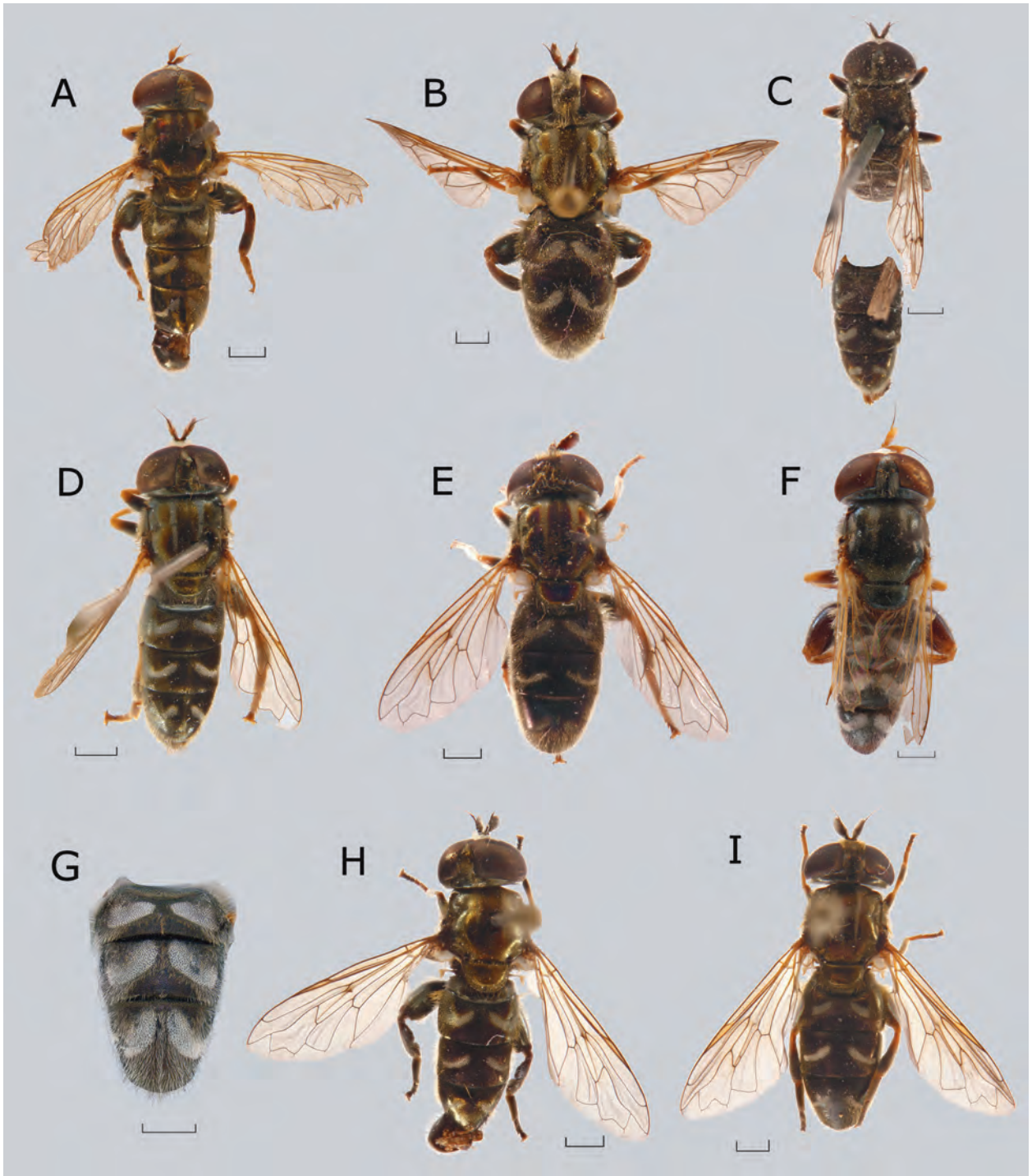

Fig. 1. Adult, dorsal view. **A.** *Eumerus barbarus* (Neotype, ♂). **B.** *Eumerus barbarus* (W. Batna, Algeria, ♀). **C.** *Eumerus truncatus* (Holotype, ♂). **D.** *Eumerus gibbosus* **sp. n.** (Albacete, Spain, Paratype, ♂). **E.** *Eumerus gibbosus* **sp. n.** (Albacete, Spain, ♀). **F.** *Eumerus schmideggeri* **sp. n.** (Gafsa, Tunisia, Paratype, ♂). **G.** *Eumerus schmideggeri* **sp. n.** (Sidi R'bat, Morocco, Paratype, ♀). **H.** *Eumerus sulcitibius* (Albacete, Spain, ♂). **I.** *Eumerus sulcitibius* (Albacete, Spain, ♀). Scale = 1 mm.

part of terga II–IV with triangular area black pilose; terga II–IV with light-grey pollinose and slightly oblique maculae, medially slightly wider; sternum IV squarish, in lateral view with characteristic postero-medial rounded extensions, in ventral view with laterally projecting rounded postero-lateral corner and deep and wide incision me-

dially; sternum VI predominantly light yellow to entirely black pilose; sternum VII from entirely black to predominantly light-yellow pilose. **Genitalia** (Fig. 11A). Surstylus with squarish basal part with scattered setae ventromedially; medial part narrowly elongate with small patch of setulae at border with apical part of surstylus; apical lobe elongate and gently curved with sharp, weakly bent apex; hypandrium with rather broad apical part and with weakly rounded and smooth ventral margin; hamus elongate to club-shaped with broad apex.

FEMALE (Figs 1B, 2B). Body length: 7.3–10.1 mm, wing length: 5.3–7.1 mm. Similar to male except for the usual sexual dimorphism. **Head** (Figs 3B, 4B). Ratio width of head : width of face 2.6–2.9 : 1. Ocelli isosceles with broad posterior base, length : width 1.2–1.4 : 1; ratio width of frons : width of ocellar triangle 1.8–2.0 : 1; width of head : width of vertex is as 3.0–3.3 : 1. Basoflagellomere (Fig. 6B) large round, orange to light-brown coloured, ratio length : width as 0.93–1.1 : 1. **Legs**. Metafemur black, strongly incrassate, ratio length : width is 2.7–2.9 : 1.

Type material examined. Neotype ♂ *Syrphus barbarus*: **Tunisia**: "N-Tunesien 27.6.1994 / Ghar el Mehl Strand / 35 km SÖ Bizerte / leg. Hauser , Tu-Gha", "*Eumerus barbarus* / (Coquebert, 1804) ♂ / det. M. Hauser 1996", "Neotype ♂ / *Syrphus barbarus* / Coquebert, 1804 / des J. van Steenis, 2016" [red label] (ZMHB).

Holotype ♀ *Eumerus australis*: **Spain**: "—-" [round silver label], "Hispania / *Eumerus* / *australis* / M." (MNHN).

Lectotype ♂ *Eumerus iris*: **Italy**: "Sicilia / 1/5 Zeller", "coll / H. Loew", "Typus"[red label], "Zool. Mus. / Berlin", "Lectotype ♂ / *Eumerus iris* / Loew, 1848 / design. J. van Steenis, 2016" [red label], (ZMHB). This specimen is here designated as lectotype to fix and ensure the universal and consistent interpretation of the name. Paralectotypes: 1 ♂, 2 ♀♀ *Eumerus iris*, with same data as the lectotype (ZMHB). These specimens are here designated as paralectotypes.

Holotype ♀ *Eumerus truquii*: **Italy**: " 141", [white oval label with red text], "Museo La Specola / coll. Rondani / HOLOTYPUS" [red label], "*Eumerus barbarus* / det. Vujić 2014", "Holotype ♀ / *Eumerus truquii* / Rondani, 1857 / det J. van Steenis, 2016" [red label] (MZUF).

Additional material examined. **Algeria**: "Algeria, 4.V.1893, A.E. Eaton", "*Eumerus* sp, nr. *barbarus* N.P. Wyatt det", 1 ♂ (NHM); "Algeria, Constantine, 2.VI.1895, B.M.1896-137, A.E. Eaton" 1 ♀ (NHM)"; "Algeria, Hippone, 8.IV.1896", 1 ♂ (NHM); "Richter / Algers", "*Eumerus ruficornis* / det v/d Wulp", "*Eumerus barbarus* / det. v. Helsdingen 1964", 1 ♂ (NBC); "20 km N de Maghnia / Bab Taza / 9 IV 1983 st 14", Algerie / Tlemcen / R. Leys & / P. v.d. Hurk", 1 ♂ (JSA), 1 ♂ (NBC), 1 ♀ (MZW); same labels except "4 km E / st 33 / 24 IV 1983", 1 ♀ (JSA); same labels except "Tlemcen / camp. municipal / 20 IV 1983 st 4.", 1 ♂ (MZW); same labels except "Mansourah / st 22 / 14 IV 1983", 1 ♂ (NBC); "Algerije / W. Tlemcen /Ain Pezza / 11-4-1981 / leg. R. Hensen", 1 ♂ (NBC); "Algerije / W. Batna / Timgad / 17-4-1981 / leg. R. Hensen", 1 ♀ (NBC); "Mascara Algeria / Dr. J. Bequart", "*Eumerus* / *barbarus* / Coq. ♀", 1 ♀ (MNHN); "Palikao / Mascara Algeria / Dr. J. Bequart", "*Eumerus* / *iris* / Lw.", 1 ♂ (MNHN); **France**: "Banyuls s Mer / France / P.O. / 21-iv-1951 v Doesburg", 1 ♂ (NBC); same label except 8-iv, 9-iv and 20-iv, 5 ♂♂, 1 ♀ (NBC); "France (Corse) / Nonad / 10-v-1963 / HJP Lambeck", 3 ♂♂, 1 ♀ (NBC); "France Corse / J.A.W. Lucas", "Vemaco / 600 m / 18-7-1967", 1 ♂ (NBC); "France Pyr. Or. / St. Cyprien / Plage / 3-VII-1956 / exc Zool Museum", 1 ♂ (NBC); "Sardegna / Teuipio P 24-9-1949 / Castellani leg", 1 ♂, 1 ♀ (NBC); **Italy**: "Sicily, above Trapani, 16.IV.1965, 200m, K.M. Guichard, B.M. 1965-273" 1 ♂ (NHM)"; "Sicily, Selinunte, 13.IV.1965, S.L., K.M. Guichard, B.M. 1965-273" 2 ♂♂ (NHM)"; "Italy / Sardinia Lode / R. Mannu / April 1989 / leg M. Hauser:, 1 ♀ (CSCA); "Ragusa / Italia 18-5-1954 / F.F. Tippmann", "*Eumerus australis* / det v Doesburg", 1 ♂; same label as previous, except "*Eumerus barbarus* / det v Doesburg", 8 ♂♂, 1 ♀ (NBC), 1 ♂ (NHM); "Italia / Sicilie / HJP Lambeck", "Adreno / Passo Zingelo / 650 m / 24-v-1966", 6 ♂♂, 1 ♀ (NBC); "Italia / Sicilia", "Mondello / 10-4-1979 / J.A.W. Lucas", 1 ♂ (NBC); same label as previous, except 11-4, 13-4 and 15-4, 8 ♂♂, 2 ♀♀ (NBC): "Italia / Sicilia / J.A.W. Lucas", "Taormina / 23-4-1976", 3 ♂♂ (NBC); "I-Sardinien Tempio 1200m / Mt. Limbara 20.7.96 / leg.: Dr. Ch.L. Neumann", 1 ♀ (CSCA); "I-Sardinien / april 1989 / Florinas, 417m / M. Hauser leg", "*Eumerus barbarus* Coqu. / det Claussen 1994", "*Eumerus barbarus* / (Coquebert, 1804) ♂ / det.: M. Hauser 1996" 1 ♂, (CSCA); **Morocco**: "Marokko / 11 km NW Tallouine / 15.III.97 30°34′N 8°00′W / leg M. Hauser", 1 ♂ (JSA); "Marokko Antiatlas / S Ait-Baha / 12.III.97 30°06′N 9°02′W / leg M. Hauser", 1 ♂ (CSCA); "Marokko Antatlas Amm- / elental 10km NE Tafraoute / 14.III.[19]97 29°48′N 8°53′W / leg M. Hauser", 2 ♂♂ (CSCA); **Portugal**: "Portugal / 24-4-1985", 2 ♀♀ (NBC); **Spain**: "Mallorca I Andraixt, 26.Mar.1977 G.E.Bohart", 2 ♂♂ (LAMC); "Espana / Mallorca / 1-24-vi-1954 / leg Klokke Moll", "*Eumerus australis* / det v Doesburg", 1 ♀ (NBC); "W. Malta / Wardijn Ridge / Rooan Baths / 20-4-1986 / J.A.W. Lucas", 7 ♂♂, 4 ♀♀ (NBC); "Calvia / Caphella / 1-5.V.1979", "Islas Baleares / Mallorca / W.H. & A.F.E. / Gravestein", 1 ♂ (NBC); "Palma", 1 ♂ (MNCN); "Alicante / Dusmet", 1 ♂ (MNCN); "Vacia Madrid / Dusmet", "MNCN / Madrid", 1 ♂ (MNCN); "Spain, Almeria Province / 800 ft. 3 km W Benhadux / 11-IV-1999 ME Irwin / 36°55.1′N 02°28.64′W / hand netted", 1 ♂ (CSCA); "El Pardo / VI-1908 / Arias", "M.N.C.N. / Madrid", "*Eumerus barbarus* / (Coquebert, 1804) / Det.: A. Ricarte, 2005", "MNCN_Ent / 142918", 1 ♂ (MNCN); "España, Ciudad

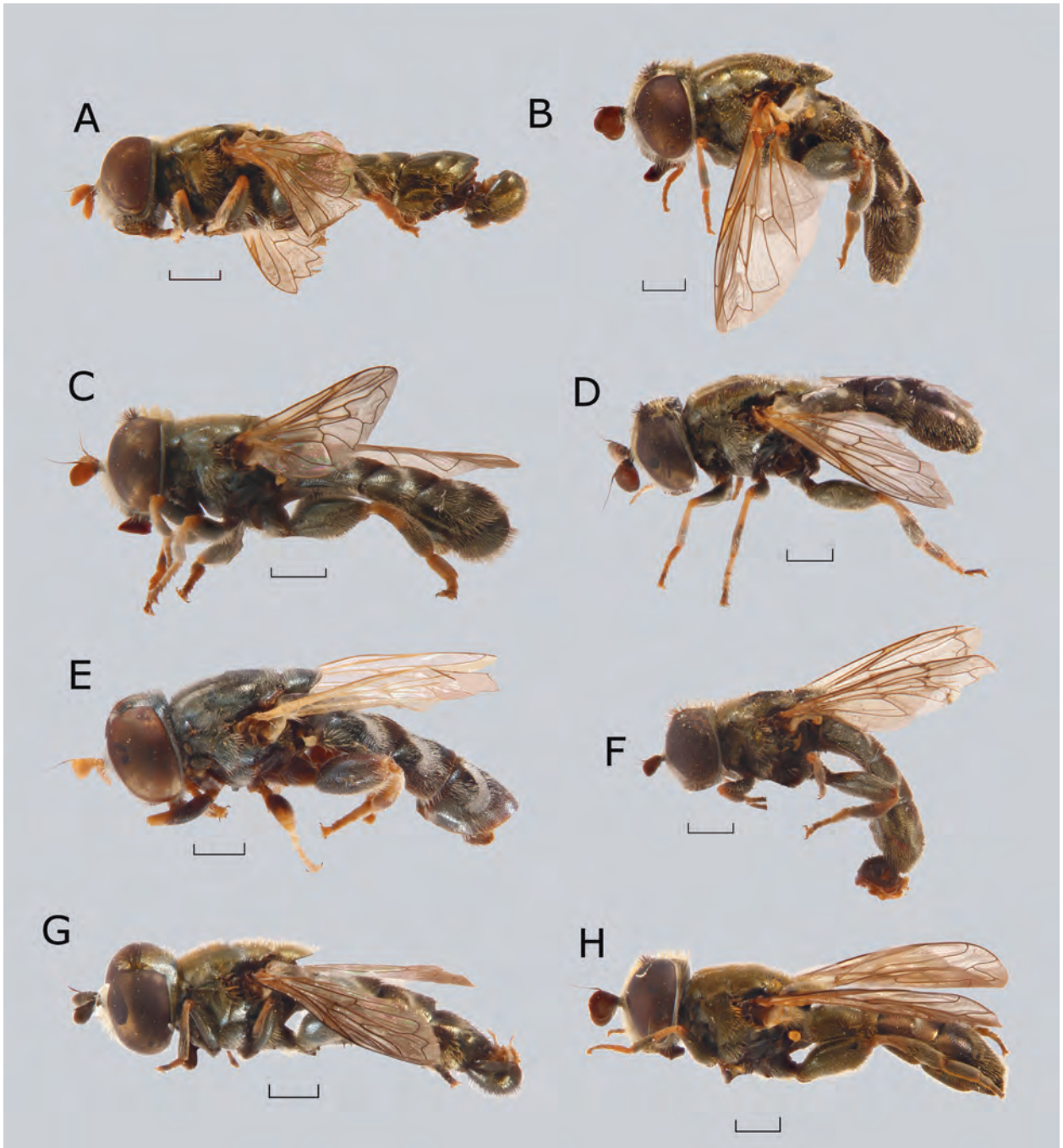

Fig. 2. Adult, lateral view. **A.** *Eumerus barbarus* (Neotype, ♂). **B.** *Eumerus barbarus* (W. Batna, Algeria, ♀). **C.** *Eumerus gibbosus* **sp. n.** (Albacete, Spain, Paratype, ♂). **D.** *Eumerus gibbosus* **sp. n.** (Albacete, Spain, ♀). **E.** *Eumerus schmideggeri* **sp. n.** (Gafsa, Tunisia, Paratype, ♂). **F.** *Eumerus truncatus* (Holotype, ♂). **G.** *Eumerus sulcitibius* (Albacete, Spain, ♂). **H.** *Eumerus sulcitibius* (Albacete, Spain, ♀). Scale = 1 mm.

Real / P.N. de Cabañeros, maR2 / 1/24-VIII-2004 / leg.: A. Ricarte 5160", "SYRPHIDAE / *Eumerus barbarus* / (Coquebert, 1804) ♀ / Det.: A. Ricarte, 2006 (GBIF)", 1 ♀ (CEUA); same label except "maR1 and 5189", 1 ♂ (CEUA); **Tunisia**: same labels as Neotype, 1 ♂, 1 ♀ (CSCA), 1 ♂ (JSA); "Tunisia S M'Saken / 5 km N Sidi Bou Goubrine / 21.V.1999 ~ 1000 m amsl / 35°36.29′N 10°36.04′E / leg. O. & M. Niehuis", 2 ♂♂, 1 ♀ (CSCA); "W Tunesia / 5 km N El Kef / Tal m. Eryngium / 22.VI.1994 leg Schmid-Egger Tu-Kef", 1 ♀ (CSCA);

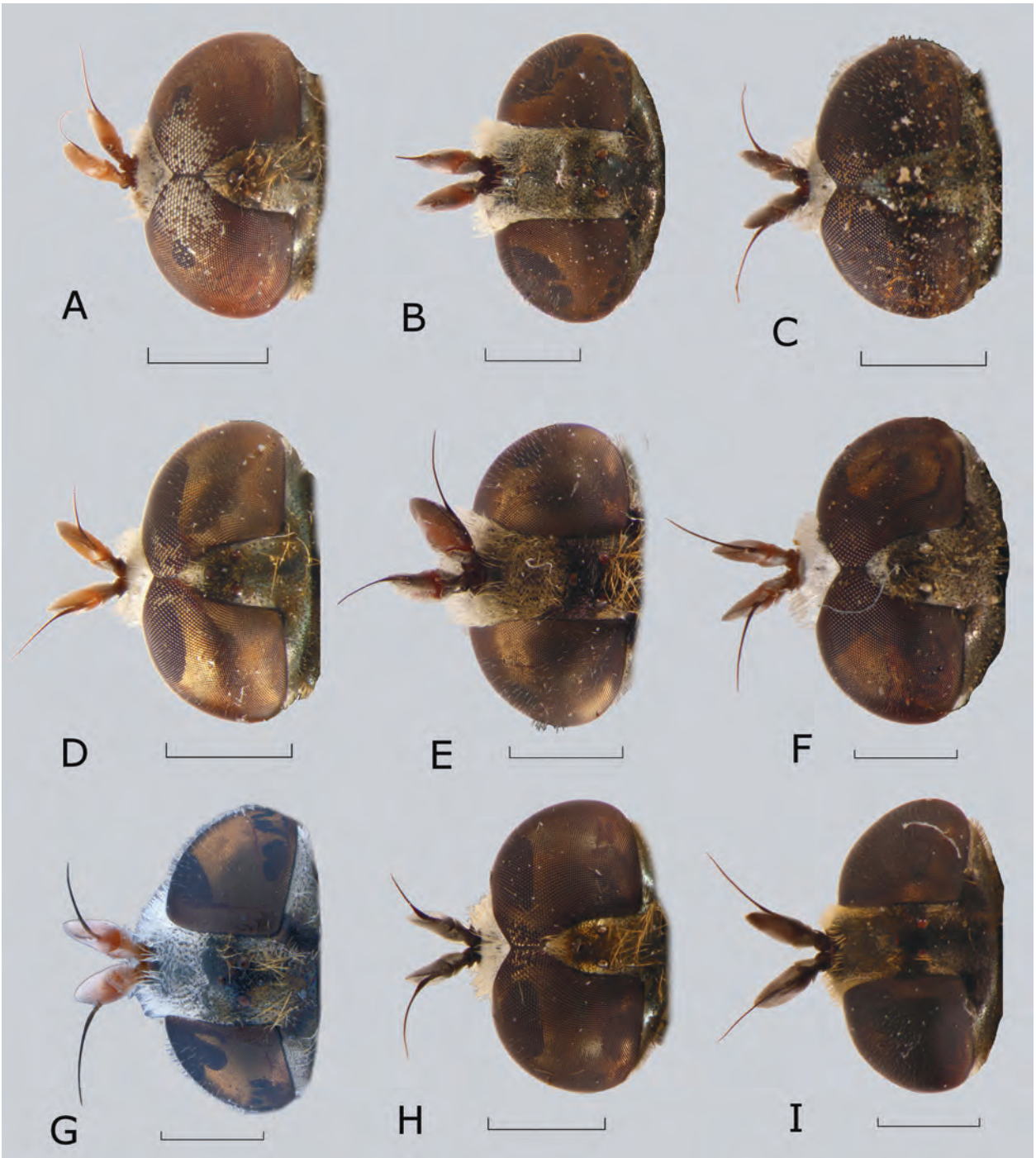

Fig. 3. Head, dorsal view. **A.** *Eumerus barbarus* (Neotype, ♂). **B.** *Eumerus barbarus* (W. Batna, Algeria, ♀). **C.** *Eumerus truncatus* (Holotype, ♂). **D.** *Eumerus gibbosus* **sp. n.** (Albacete, Spain, Paratype, ♂). **E.** *Eumerus gibbosus* **sp. n.** (Albacete, Spain, Paratype, ♀). **F.** *Eumerus schmideggeri* **sp. n.** (Gafsa, Tunisia, Paratype, ♂). **G.** *Eumerus schmideggeri* **sp. n.** (Sidi R'bat, Morocco, Paratype, ♀). **H.** *Eumerus sulcitibius* (Albacete, Spain, ♂). **I.** *Eumerus sulcitibius* (Albacete, Spain, ♀). Scale = 1 mm.

"Tunesia / Tabarka / Khatairia 15.V.1993", 1 ♂ (CSCA); "5 km E of / Tabarka 50 m / 26-IV-1980 / flower pasture", "Tunesia / E. van Nieukerken, / G. Bryan & / P. Oosterbroek", 1 ♀ (NBC); 3 additional specimens without known country: "Beicos / 1/8", 1 ♀ (MNHN); "Sa....o / Sa..d / Krausse", "*Eumerus* / *barbarus* / Coq. ♀", [handwritten, partly unreadable], 2 ♀♀ (MNHN).

Fig. 4. Head, frontal view. **A.** *Eumerus barbarus* (Neotype, m#). **B.** *Eumerus barbarus* (W. Batna, Algeria, ♀). **C.** *Eumerus truncatus* (Holotype, ♂). **D.** *Eumerus gibbosus* **sp. n.** (Albacete, Spain, Paratype, ♂). **E.** *Eumerus gibbosus* **sp. n.** (Albacete, Spain, ♀). **F.** *Eumerus schmideggeri* **sp. n.** (Saida, Algeria, Paratype, ♂). **G.** *Eumerus schmideggeri* **sp. n.** (Sidi R'bat, Morocco, Paratype, ♀). **H.** *Eumerus sulcitibius* (Albacete, Spain, ♂). **I.** *Eumerus sulcitibius* (Albacete, Spain, ♀). Scale = 1 mm.

Remarks. This is the most widespread species and, in some places, it seems to be sympatric with the other species. The type of *Syrphus barbarus* Coquebert, 1804 was deposited in the Desfontaines collection "Mus. Dom. Desfontaines" and later placed in the MNHN, but this part of the MNHN collection is presumed to be lost (Zimsen 1964). In the material studied here several specimens of *E. barbarus* have been named either *E. iris* or *E. australis*. In order to fix the usage of the name of *Eumerus barbarus*, we designated a neotype. The locus typicus is given as "Barbaria", and according to Zimsen (1964) the specimens collected by Desfontaines originate from Algeria and Tunisia so we picked a specimen from Tunisia which agreed with the original description.

***Eumerus gibbosus* sp. n.**
Figs 1D, 1E, 2C, 2D, 3D, 3E, 4D, 4E, 6D, 6E, 7B, 8B, 10B & 11B

Diagnosis. Metafemur medio-ventrally with area of light- to dark-brown pile; apico-posterior lamina of metafemur large and densely dark brown pilose (Figs 7B, 8B); metatibia ventro-basally along medial surface with very low carina, posteriorly at extreme base with very low lamina; sternum IV (Fig. 10B) squarish, with normal postero-lateral corners and wide oval incision medially. Genitalia (Fig. 11B): surstylus with wide triangular medial part and elongate and tapering apical part with slightly rounded and sharply bent apex; hypandrium with broad apical part and several projections along ventral margin.

Fig. 5. Habitat of *Eumerus gibbosus* **sp. n.**, Albacete. **A.** Puerto de las Crucetillas. **B.** Cañada del Provencio.

Description. MALE (Figs 1D, 2C). Body length: 6.1–7.5 mm, wing length: 4.0–5.2 mm. **Head** (Figs 3D, 4D). Face nearly parallel sided. Frons light-grey pollinose, with scattered light yellow pile. Ratio width of head : width of face 3.0–3.1 : 1. Eye contiguity relatively short, ratio frons : eye contiguity: vertical triangle is as 1.4–1.5 : 1.1–1.2 : 1. Vertical triangle grey-yellow pollinose, narrow grey-yellow pollinose along eye margin and two short oval maculae posterior of ocelli, pile golden-yellow, on ocellar triangle ranging from yellow with some black pile intermixed to entirely black pilose. Occiput predominantly grey pollinose, entirely white pilose. Ocelli isosceles with broad posterior base, length : width 1.2–1.4 : 1; posterior ocelli relatively close to eye margin, ratio width of frons : width of ocellar triangle 1.2–1.3 : 1; ratio a:b:c as 1.3–1.4 : 1.2–1.3 : 1; width of head : width of vertex is as 4.1–4.5 : 1. Antennae black to orange-yellow, scape black, pedicel from orange to black, basoflagellomere from entirely orange to yellow with apical half brown to dark-brown. Scape and pedicel with long yellow to black setae and light pile. Basoflagellomere (Fig. 6D) short rectangular, ratio length : width as 1.1–1.2 : 1 with anterior margin skewed ventrally. Arista with broad base, total length 2–3 times longer than basoflagellomere, basal 1/5 yellow to entirely black. **Thorax**. Black bronze shiny, pollinose along lateral margin and posterior and anterior of notopleura, two mediolateral pollinose vittae reaching to posterior 2/3–3/4 of scutum, these pollinose vittae with broad triangular anterior part. Pile light yellow. Pleurae bronze black, pilose on proepimeron, postero-dorsal margin of anterior anepisternum, entire posterior anepisternum, anterior half of anepimeron and a dorsal and ventral pile patch on katepisternum. Grey pollinose on pilose parts, others bronze black sub-shiny. Metasternum pilose. Scutellum rectangular with narrow marginal rim, shiny black with bronze sheen, golden yellow pilose. **Legs**. Black and brown-yellow to orange coloured. Pro- and mesotarsus orange-yellow, connecting parts of tarsomeres black; pro- and mesotibia basal 1/2–2/3 orange-yellow and with apical black ring sometimes with brown-yellow anterior part; pro- and mesofemur apical 1/10 brown-yellow. Pile all yellow with black setulae on ventral side of mesotarsus. Metaleg with coxa black and long white pile; trochanter brown-yellow to black, short scattered mixed yellow and black pile, apicoventrally with short rounded tubercle (Fig. 7B); femur (Figs 7B, 8B) black, slightly enlarged, ratio length : width is 3.0–3.5 : 1, with normally curved ventral surface, with ventral surface long white pilose, medio-ventrally with patch of light- to dark brown pile, antero-ventrally with a row of 7–11 black spinae apically and postero-ventrally with a row of 9–14 black spinae along apical 1/2, apico-posterior lamina large and densely dark brown pilose; metatibia orange-yellow on basal 1/2 and apical 1/10; only slightly curved, apically with antero-medial row of black dense spicules and ventro-basally along medial surface with very weak carina, posteriorly at extreme base with very low lamina; tarsus orange to dark-brown. **Wing**. Microtrichose, except bare on very small medial part on alula and extreme base of cell bm. **Abdomen**. Shiny bronze black, white pilose, antero-medial part of terga II–IV with triangular area black pilose; terga II–IV with light-grey pollinose and slightly oblique maculae, medially slightly wider; sternum IV (Fig. 10B) squarish, with normal postero-lateral corners and wide oval incision medially; sternum VI predominantly light yellow to entirely black pilose; sternum VII from mixed black and light-yellow to predominantly light-yellow pilose. **Genitalia** (Fig. 11B). Surstylus with large squarish basal part with very scattered setae ventro-medially; medial part widely triangular with scattered setulae; apical part elongate with slightly rounded and sharply bent apex. Hypandrium with broad apical part with two squarish projections along ventral margin and with dense patch of small setulae ventro-apically; hamus short and with large round apex.

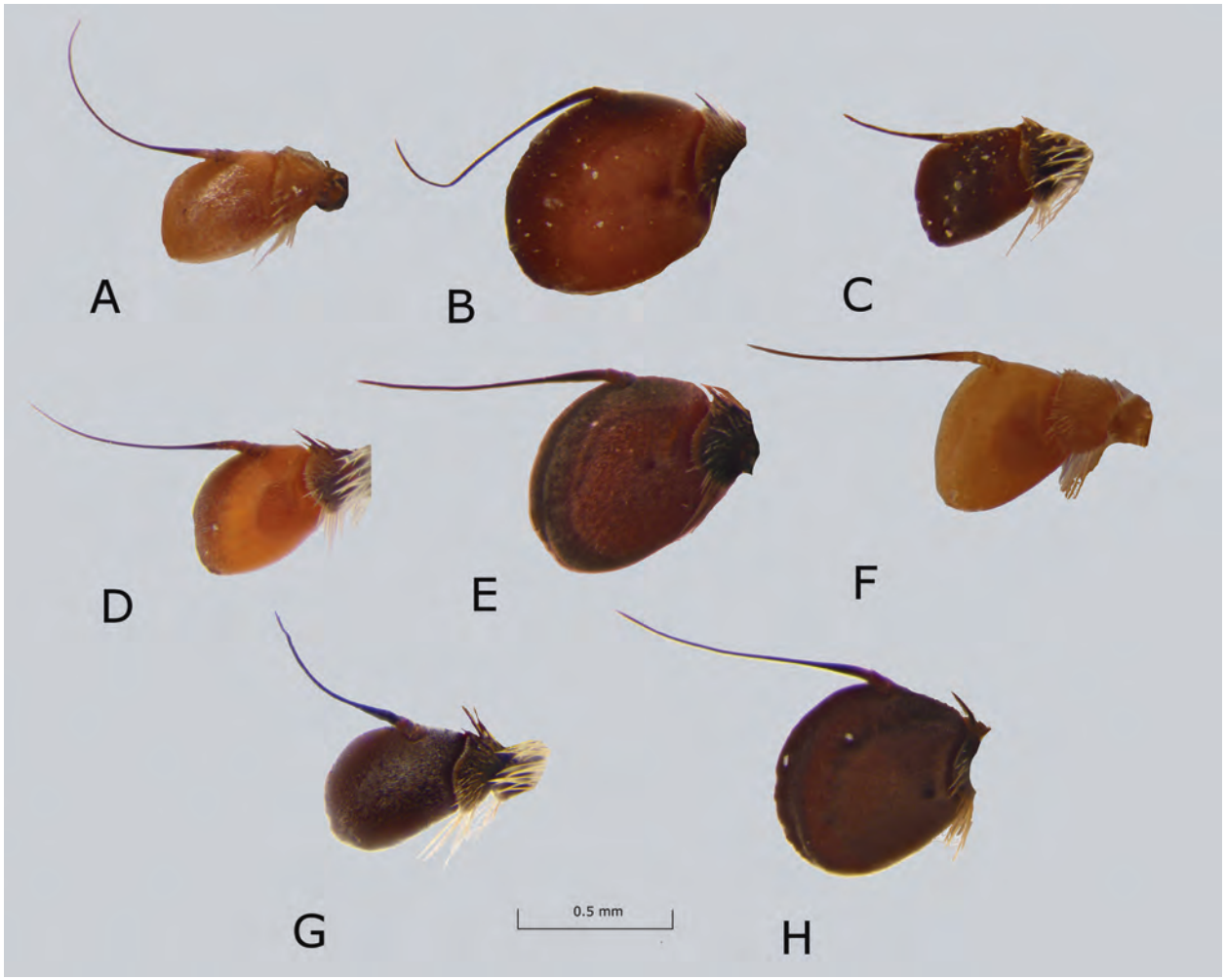

Fig. 6. Antennae, lateral view. **A.** *Eumerus barbarus* (Neotype, ♂). **B.** *Eumerus barbarus* (Tlemcen, Algeria, ♀). **C.** *Eumerus truncatus* (Holotype, ♂). **D.** *Eumerus gibbosus* **sp. n.** (Albacete, Spain, Paratype, m#). **E.** *Eumerus gibbosus* **sp. n.** (Albacete, Spain, ♀). **F.** *Eumerus schmideggeri* **sp. n.** (Gafsa, Tunisia, Paratype, m#). **G.** *Eumerus sulcitibius* (Albacete, Spain, ♂). **H.** *Eumerus sulcitibius* (Albacete, Spain, ♀). Scale = 0.5 mm.

FEMALE (Figs 1E, 2D). Body length: 7.8–8.2 mm, wing length: 5.8–6.1 mm. Similar to male except for the usual sexual dimorphism. **Head** (Figs 3E, 4E). Ratio width of head : width of face 2.7–2.8 : 1. Ocelli isosceles with broad posterior base, length : width 1.3–1.5 : 1; ratio width of frons : width of ocellar triangle 1.5–1.7 : 1; width of head : width of vertex is as 3.8–4.0 : 1. Basoflagellomere (Fig. 6E) round to slightly oval, dark orange-brown coloured with darker antero-dorsal margin, ratio length : width as 0.97–1.1 : 1. **Legs**. Metafemur black, slightly incrassate, ratio length : width is 2.6–2.9 : 1. **Abdomen**. Tergum IV without pollinose maculae.

Etymology. The characteristics which separate this species from closely related species are the two humps on the ventral margin of the hypandrium; “gibbosus”, the Latin word for humped.

Biology. The specimens from Spain were collected in a low mountainous area with open Pine (*Pinus halepensis* Miller and *P. nigra* Arnold) dominated forest with undergrowth of Mediterranean maquis with diverse yellow and white flowering Apiacaea (Fig. 5).

Type material. HOLOTYPE ♂: **Spain**: “Spain Albaceta / [leg] J. van Steenis & M.P. van Zuijen”, “Sierra de Alcaraz, 1400 m [a.s.l.] / Puerto de las Crucetillas / [road] C 415 km 190, open pine forest / 38°31′N 2°26′W / on *Thapsia villosa* / 21-VI-2003” (NBC). **Paratypes**: **Spain**: with same data as Holotype, 1 ♂, 1 ♀ (CSCA), 1 ♂, 1 ♀ (JSA); with same data except “Sierra de Alcaraz, 1000 m [a.s.l.] / river valley, meadow marsh / Cañada del Provencio / 38°31′N 2°20′W / on *Thapsia villosa* / 22-VI-2003”, 2 ♂♂ (JSA); “Spain (E) Albacete, Riopar / Puerto

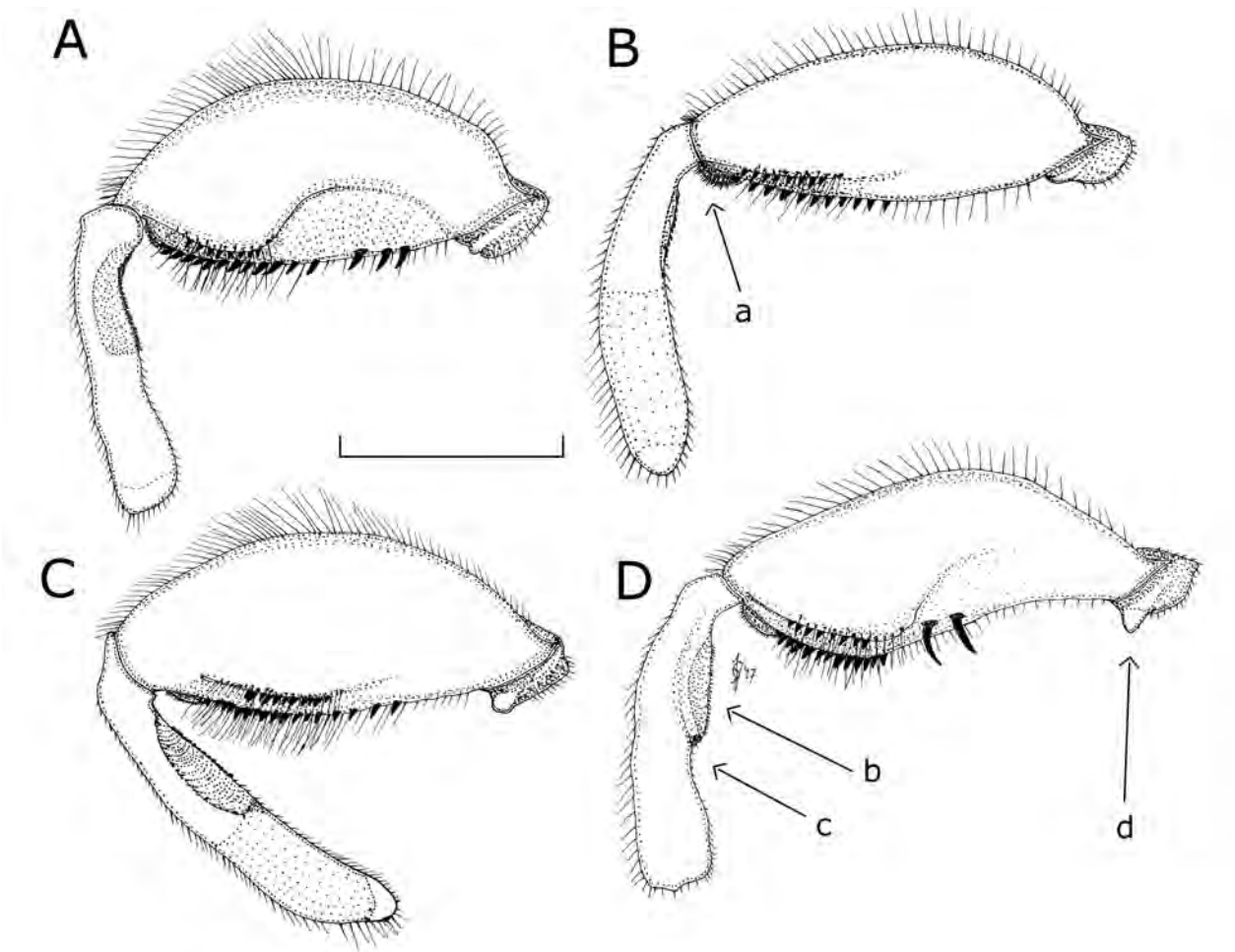

Fig. 7. Right metaleg (without tarsi) of ♂, anterior view. **A.** *Eumerus barbarus* (Sicily, Italy). **B.** *Eumerus gibbosus* **sp. n.** (Albacete, Spain, Paratype). **C.** *Eumerus schmideggeri* **sp. n.** (Saida, Algeria, Paratype). **D.** *Eumerus sulcitibius* (Albacete, Spain). Scale = 1 mm. a = apico-posterior lamina of metafemur, b = posterior lamina of metatibia, c = ventro-medial excavation of metatibia, d = process of metatrochanter.

de las Crucetillas road / C415 km 190, 1400 m [a.s.l.] / 38°31′NB 2°26′ WL / [leg] MP van Zuijen, J van Steenis / 21-6-2003 / dry pine forest, [on] yellow Apiaceae", 1 ♂ (MZW); "Spain(E) Albacete, Riopar, Cañada / de Provencio, 1000 m [a.s.l.] / 38°31′NB 2°20′ WL / [leg] MP van Zuijen, J van Steenis / 22-6-2003 / stream, open forest [on] yellow Apiaceae", 1 ♂ (JSA), 2 ♂♂ (MZW); **Portugal**: "PORTUGAL mal.trap / Mertola, west of town / dry rainwater brooklet / UTM: 29S 6171-4166 / 21-23.v.2004 [leg] A v. Eck", 1 ♂ (AET).

Eumerus schmideggeri sp. n.

Figs 1F, 1G, 2E 3F, 3G, 4F, 4G, 6F, 7C, 8C, 10C & 11C

Diagnosis. Pollinosity on ocellar triangle with two large oval maculae along eye margin (Fig. 3F); metafemur (Figs 7C, 8C) apico-posteriorly with hardly visible and scattered white pilose lamina; metatibia ventro-basally along medial surface with rather broad carina, posteriorly with rather broad lamina; pollinose maculae on terga very wide (Figs 1F, G); sternum IV (Fig. 10C) trapezoid, posterior margin concave with triangular posterolateral corners, narrow but deep medial incision. Genitalia (Fig. 11C): surstylus with small squarish medial part and straight apical part with rounded and slightly bent apex; hypandrium with narrow and straight apical part.

Description. MALE (Figs 1F, 2E). Body length: 8.4–9.3 mm, wing length: 5.5–6.3 mm. **Head**. Face nearly parallel sided. Frons light-grey pollinose, with scattered light yellow pile. Ratio width of head : width of face 2.8–3.0 : 1. Eye contiguity relatively short, ratio frons : eye contiguity : vertical triangle is as 1.4–1.6 : 1.2–1.3 : 1. Vertical triangle grey-yellow pollinose, broadly grey-yellow pollinose along eye margin and two broad squarish mac-

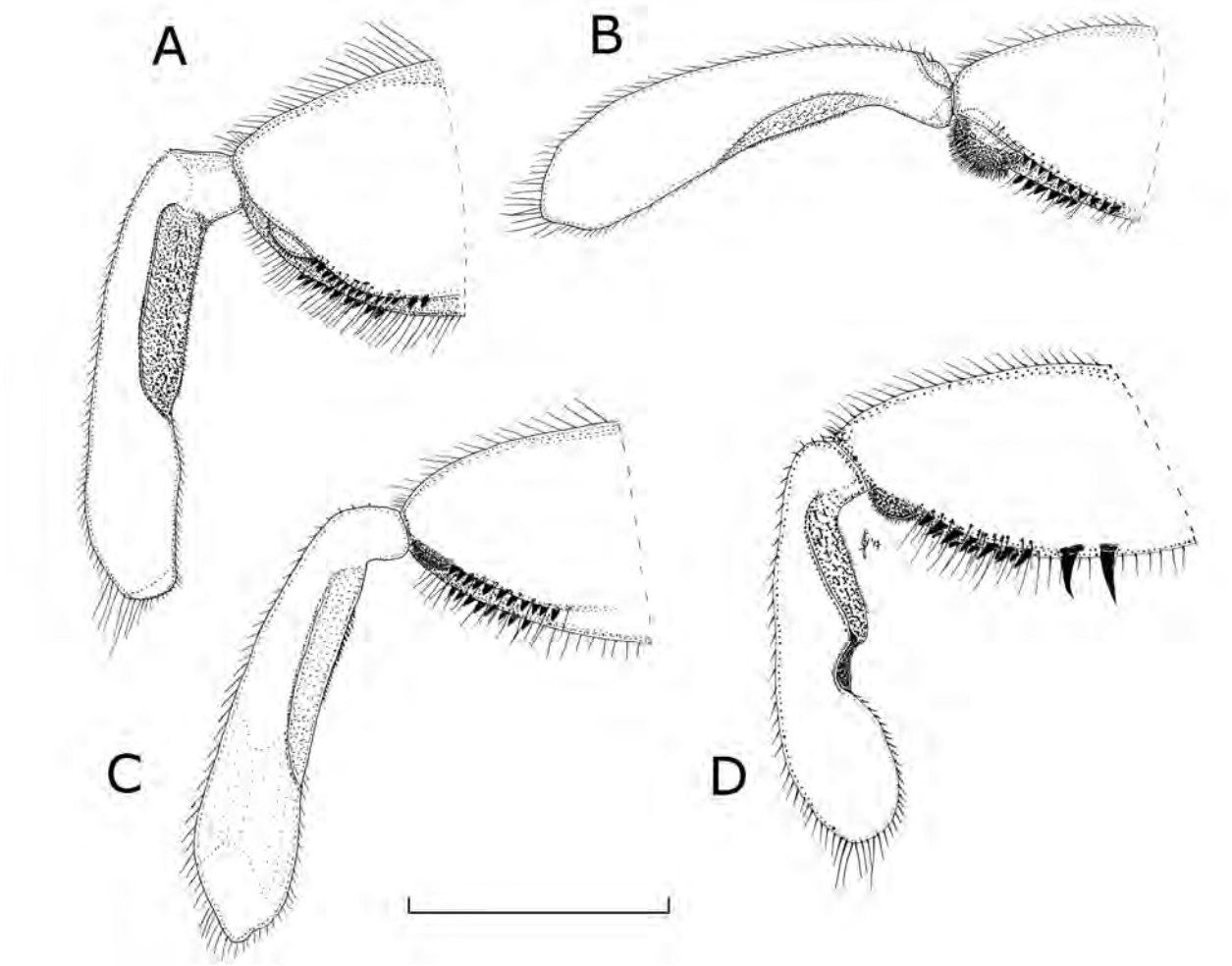

Fig. 8. Detail of left metaleg in ♂, posterior view. **A.** *Eumerus barbarus* (Corse, France). **B.** *Eumerus gibbosus* **sp. n.** (Holotype). **C.** *Eumerus schmideggeri* **sp. n.** (Saida, Algeria, Paratype). **D.** *Eumerus sulcitibius* (Albacete, Spain). Scale = 1 mm.

ulae posterior of ocelli, pile golden-yellow, on ocellar triangle entirely black pilose. Occiput predominantly grey pollinose, entirely white pilose. Ocelli isosceles with broad posterior base, length : width 1.2–1.3 : 1; posterior ocelli relatively far from eye margin, ratio width of frons : width of ocellar triangle 1.4–1.5 : 1; ratio a:b:c as 1.3–1.4 : 1.2–1.3 : 1; width of head : width of vertex is as 4.3–4.5 : 1. Antennae black to orange-yellow, scape black, pedicel from orange to black, basoflagellomere from entirely orange to yellow with apical half brown to dark-brown. Scape and pedicel with long yellow to black setae and light pile. Basoflagellomere (Fig. 6F) trapezoid, ratio length : width as 1.0–1.1 : 1 with anterior margin skewed ventrally. Arista with broad base, total length 2–3 times longer than basoflagellomere, basal 1/5 yellow to entirely black. **Thorax**. Black bronze shiny, pollinose along lateral margin and posterior and anterior of notopleura, two mediolateral pollinose vittae reaching to posterior 2/3–3/4 of scutum, these pollinose vittae with broad triangular anterior part. Pile light yellow. Pleurae bronze black, pilose on proepimeron, postero-dorsal margin of anterior anepisternum, entire posterior anepisternum, anterior half of anepimeron and a dorsal and ventral pile patch on katepisternum. Grey pollinose on pilose parts, others bronze black sub shiny. Metasternum pilose. Scutellum rectangular with narrow marginal rim, shiny black with bronze sheen, golden yellow pilose. **Legs**. Black and brown-yellow to orange coloured. Pro- and mesotarsus orange-yellow, connecting parts of tarsomeres black; pro- and meso tibia basal 1/2–2/3 orange-yellow and with apical black ring, sometimes with brow-yellow anterior part; apical 1/10 of pro- and meso femur brown-yellow. Pile all yellow with black setulae on ventral side of mesotarsus. Metaleg with coxa black and long white pile; trochanter brown-yellow to black, with short scattered mixed yellow and black pile, apicoventrally with short rounded tubercle (Fig. 7C); femur (Figs 7C, 8C) black, slightly enlarged, ratio length : width is 2.8–3.1 : 1, with normally curved ventral surface,

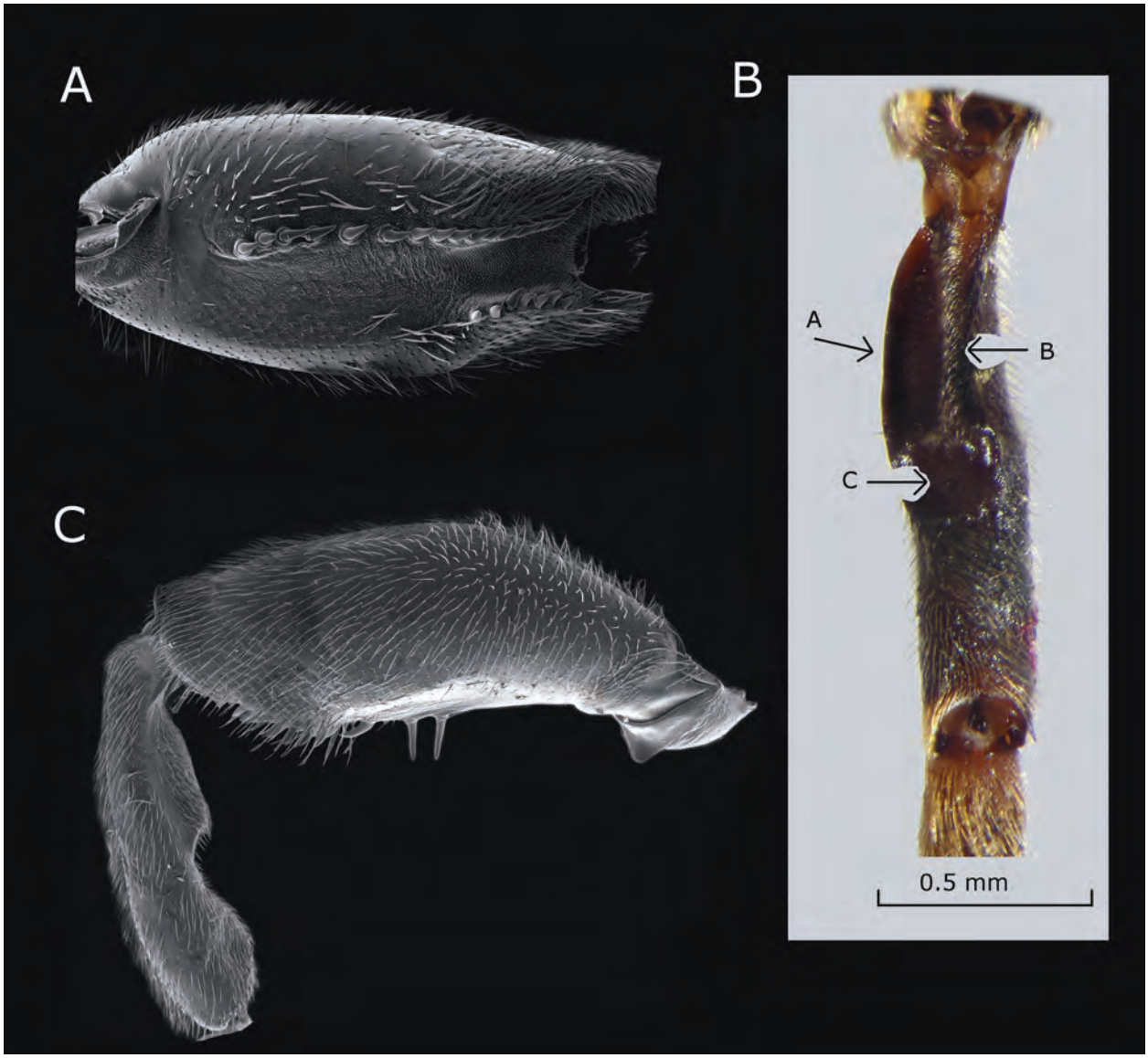

Fig. 9. Details of right metaleg of ♂. A, B SEM pictures; C Stack photo. **A.** Metafemur ventral view, *Eumerus barbarus* (Corse, France). **B.** Tibia ventral view, *Eumerus sulcitibius* (Albacete, Spain). **C.** Femur and tibia, anterior view, *Eumerus sulcitibius* (Saida, Algeria). A = posterior lamina of metatibia, B = medial carina of metatibia, C = ventro-medial excavation of metatibia.

covered with long white pile, antero-ventrally with a row of 8–10 black spinae apically and postero-ventrally with a row of 12–16 black spinae on apical 2/3, apico-posterior lamina large and densely dark brown pilose; metatibia orange-yellow on basal 1/2 and apical 1/10; only slightly curved, apically with antero-medial row of black dense spicules and posterior ventro-basally along medial surface with narrow carina; tarsus orange to dark-brown. **Wing**. Microtrichose except bare on medial part of alula and basally on cell bm and br. **Abdomen**. Shiny bronze black, white pilose, antero-medial part of terga II–IV with triangular area black to white pilose; terga II–IV with broad light-grey pollinose and slightly oblique maculae, medially slightly wider; sternum IV (Fig. 10C) trapezoid, posterior margin concave with triangular posterolateral corners, narrow but deep medial incision; sternum VI predominantly light yellow pilose; sternum VII predominantly light-yellow pilose. **Genitalia** (Fig. 11C). Surstylus with large rectangular basal part with large dorso-medial patch of setae; medial part squarish with baso-dorsal patch of setulae; apical part elongate with slightly rounded and slightly bent apex. Hypandrium with narrow and smooth apical part; hamus short and with small round apex.

FEMALE (Fig. 1G). Body length: 7.0–9.5 mm, wing length: 4.8–6.2 mm. Similar to male except for the usual sexual dimorphism. **Head** (Figs 3G, 4G). Ratio width of

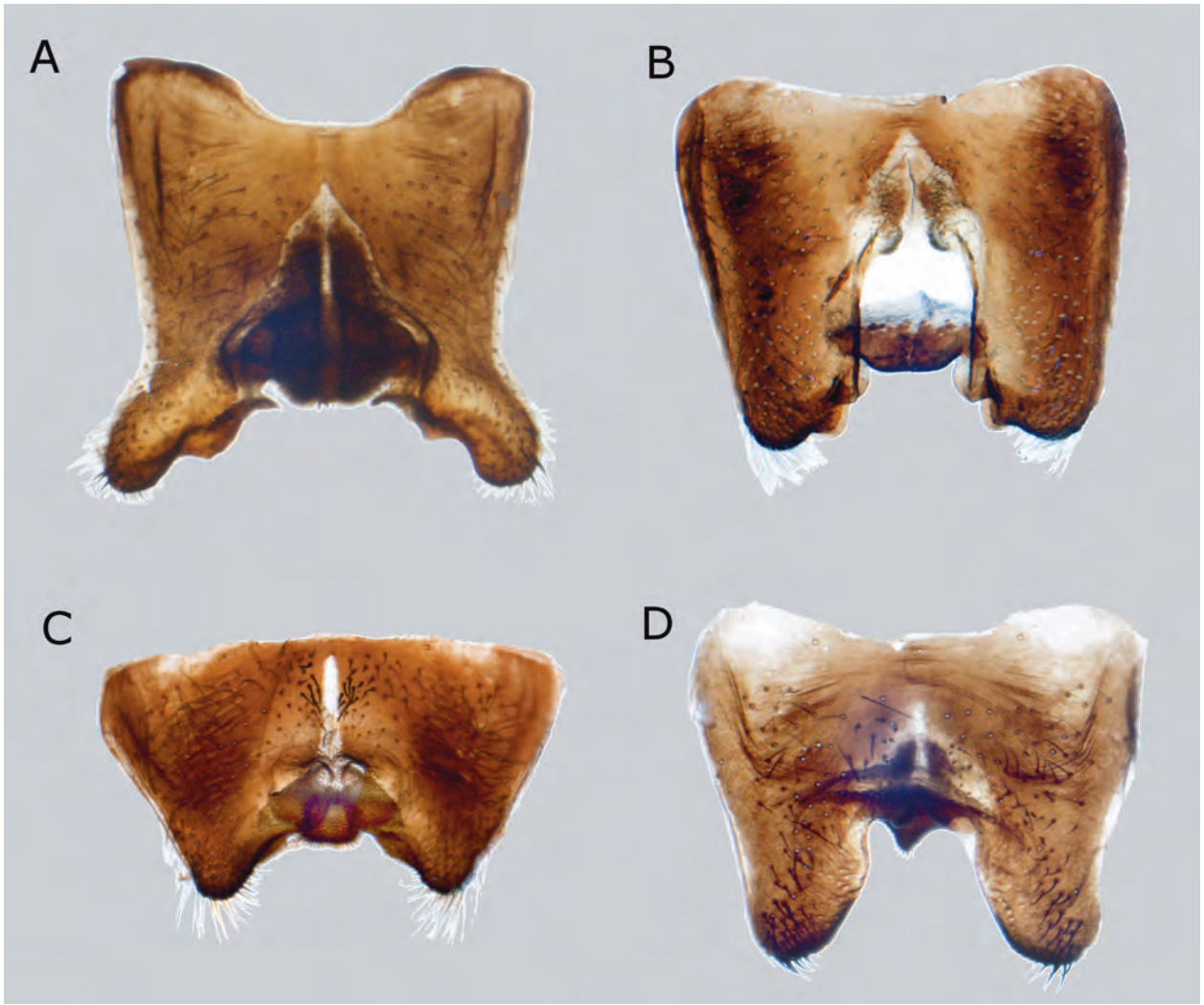

Fig. 10. Sternum IV ♂, ventral view. **A.** *Eumerus barbarus* (Bizerte, Tunisia). **B.** *Eumerus gibbosus* **sp. n.** (Holotype). **C.** *Eumerus schmideggeri* **sp. n.** (Holotype). **D.** *Eumerus sulcitibius* (Capri, Italy).

head: width of face 2.7 : 1. Ocelli isosceles with broad posterior base, width : length 1.3 : 1; ratio width of frons : width of ocellar triangle 1.9 : 1; width of head: width of vertex is as 3.5 : 1. Basoflagellomere oval with ventral part longer than dorsal, bright orange coloured with anterior 2/3 orange-brown, ratio length : width as 1.1 : 1. **Legs**. Metafemur black, slightly incrassate, ratio length : width is 2.9 : 1. **Abdomen**. Pollinose maculae oval-shaped, thick, occupying about 1/3 of length of tergum.

Etymology. Named after Christian Schmid-Egger, long-time friend, exceptional hymenopterist and avid insect collector, including the Holotype of this species.

Type material. HOLOTYPE ♂: **Morocco**: "Morocco, 37 km S Agadir / Sidi R'bat, 30.084 N 9.664 W / 30 m NN leg. Schmid-Egger / 17.06.2014 ma17" (ZMHB). **Paratypes**: **Morocco**: with same labels as holotype, 1 ♂ (JSA), 2 ♀♀ (CSCA); **Tunisia**: "Tunesien 21.6.2194 / Gafsa, Oasegarten / leg. Hauser, Tu-Gaf", 1 ♂ (CSCA); **Algeria**: "Dayet el Kerch / st 5. / 5 IV 1983", "Algerie / Saida / R. Leys & / P. v.d. Hurk", 1 ♂ (NBC); same labels except "5 km SE de Sfissifa / st. 8. / 6 IV 1983", 2 ♂♂ (JSA, MZW).

Eumerus sulcitibius Rondani, 1868

Figs 1H, 1I, 2G, 2H, 3H, 3I, 4H, 4I, 6G, 6H, 7D, 8D, 9B, C, 10D & 11D

Eumerus sulcitibius Rondani, 1868: 24. Type locality: Italy, Parma [Syntype ♂ MZUF, not studied].

Diagnosis. Metatrochanter ventrally with rather long and triangular process (Fig. 7D); metafemur (Figs 7D, 8D, 9C) ventro-medially with 2–3 large black spinae, clearly dif-

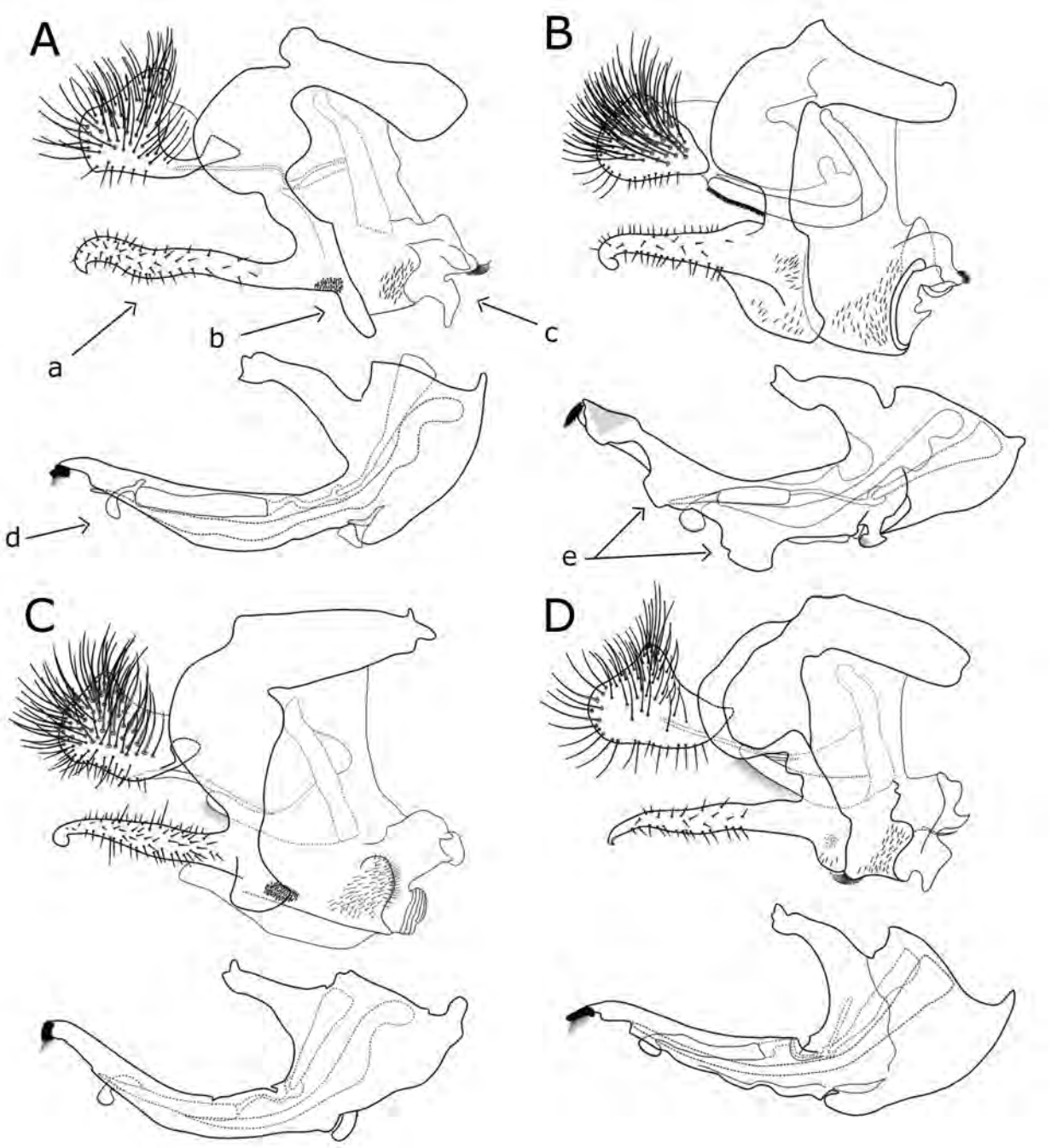

Fig. 11. Genitalia ♂, lateral view. **A.** *Eumerus barbarus* (Bizerte, Tunisia). **B.** *Eumerus gibbosus* **sp. n.** (Holotype). **C.** *Eumerus schmideggeri* **sp. n.** (Holotype). **D.** *Eumerus sulcitibius* (Capri, Italy). a = apex of surstylus, b = medial part of surstylus, c = basal part of surstylus, d = hamus, e = ventral surface of hypandrium (here with two "humps").

ferentiated from apico-ventral spinae; metafemur with narrow, light-brown pilose, apico-posterior lamina; metatibia ventro-medially with narrow but deep sulcus, metatibia (Fig. 9B) ventro-basally along medial surface with rather broad carina, ending medially in a deep excavation, posteriorly with broad lamina; sternum IV (Fig. 10D) rectangular with large broadly rounded postero-lateral corner and broad but not deep medial incision. Genitalia (Fig. 11D): surstylus with rectangular medial part; apical part elongate with slightly curved margins and with sharp, very weakly bent apex; hypandrium with rather narrow and slightly wavy apico-ventral margin.

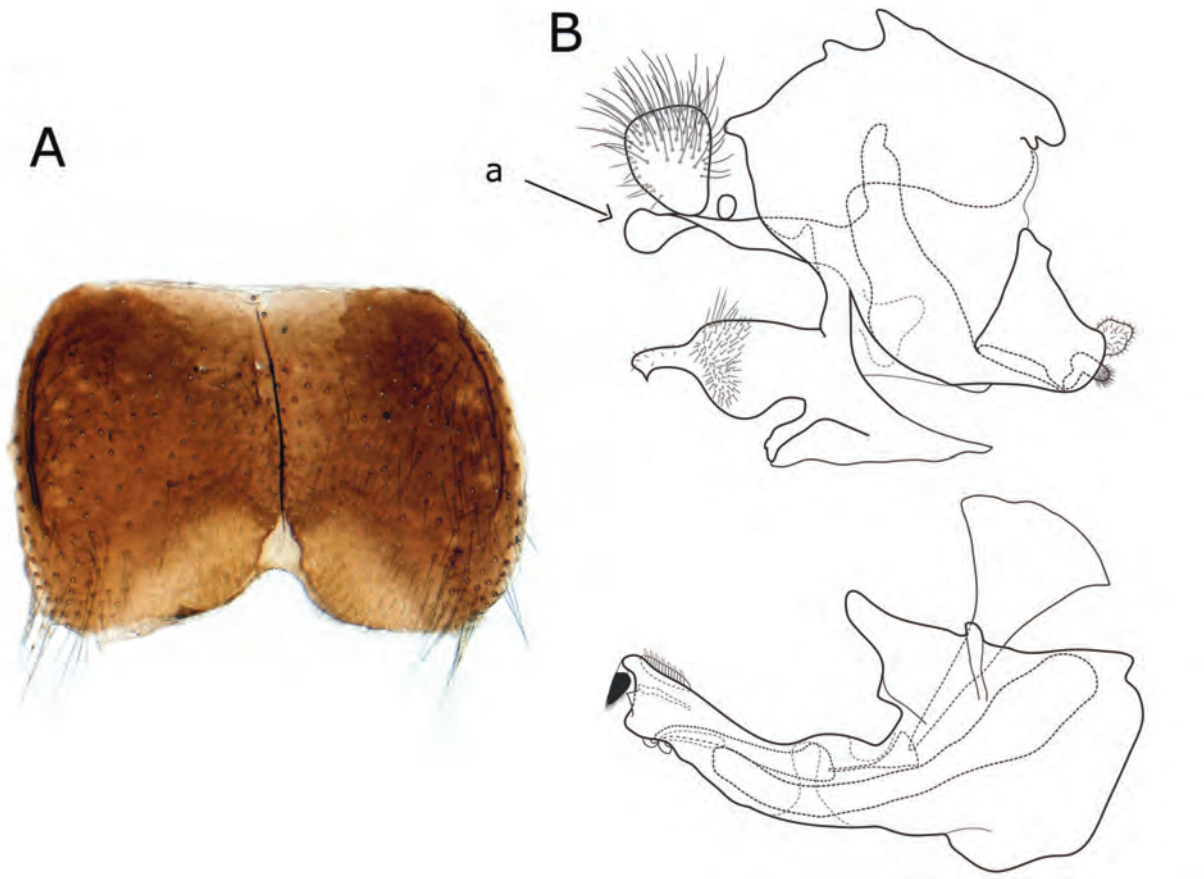

Fig. 12. *Eumerus truncatus* Rondani, ♂. **A.** sternum IV, ventral view (Ait-Baha, Morocco). **B**. Genitalia, lateral view (Ait-Baha, Morocco). **a** = teaspoon shaped appendix.

Redescription. MALE (Figs 1H, 2H). Body length: 7.2–8.5 mm, wing length: 5.9–7.0 mm. **Head** (Figs 3H, 4H). Face slightly triangular widening dorsally. Frons light-grey pollinose, with scattered light yellow pile. Ratio width of head : width of face 3.1–3.4 : 1; eye contiguity relatively long, ratio frons: eye contiguity : vertical triangle 1.3–1.6 : 1.4–1.6 : 1. Vertical triangle grey-yellow pollinose, narrow grey-yellow pollinose along eye margin and two short oval maculae posterior of ocelli, pile golden-yellow, on ocellar triangle ranging from yellow with some black pile intermixed to entirely black pilose. Occiput predominantly grey pollinose, entirely white pilose. Ocelli isosceles with broad base, ratio length : width 1.1–1.3 : 1; posterior ocelli relatively close to eye margin, ratio width of frons : width of ocellar triangle 1.2–1.4 : 1; ratio a:b:c as 1.2–1.4 : 1.2–1.3 : 1; width of head: width of vertex as 4.7–5.2 : 1. Antennae black to basally orange-yellow, scape and pedicel black, basoflagellomere from partly orange basally to entirely black. Scape and pedicel with long yellow to black setae and light pile. Basoflagellomere (Fig. 6G) rectangular, ratio length : width as 1.3–1.4 : 1. **Thorax**. Black bronze shiny, pollinose along lateral margin and posterior and anterior of notopleura, two mediolateral pollinose vittae reaching to posterior 2/3–3/4 of scutum, these pollinose vittae with broad triangular anterior part. Pile light yellow, posterior intermixed with longer black hairs. Pleurae bronze black, pilose on proepimeron, postero-dorsal margin of anterior anepisternum, entire posterior anepisternum, anterior half of anepimeron and a dorsal and ventral pile patch on katepisternum. Grey pollinose on pilose parts, others bronze black sub shiny. Metasternum pilose. Scutellum rectangular with narrow marginal rim, shiny black with bronze sheen, golden yellow pilose. **Legs**. Black and brown-yellow to orange coloured. Pro- and mesotarsus orange-yellow darkened ventraly, connecting parts of tarsomeres black; pro- and mesotibia basal 1/2–2/3 orange-yellow and with apical black ring sometimes with brow-yellow anterior part; pro- and mesofemur apical 1/10 brown-yellow. Pile all yellow with black setulae on ventral side of mesotarsus. Metaleg with coxa black and long white pile; trochanter brown-yellow to black, short scattered mixed yellow and black pile, ventrally with rather long and triangular process (Figs 7D, 9C); metafemur (Figs 7D, 8D, 9C) slightly less incrassate

compared with *E. barbarus*, length : width 2.9–3.3 : 1, medio-ventrally with 2–3 long and strong spinae clearly differentiated from apico-ventral rows of spinae, apico-ventrally with long white pile, antero-ventrally with a row of 8–11 black spinae apically and postero-ventrally with a row of 8–10 black spinae on apical 1/3, metatibia strongly curved, ventro-basally along medial surface with rather broad carina, ending medially in a deep excavation, posteriorly with broad lamina. **Wing**. Microtrichose, partly bare on cell bm and cup. **Abdomen**. Shiny bronze black, white pilose, antero-medial part of terga II–IV with triangular area black pilose; terga II–IV with light-grey pollinose and slightly oblique maculae, medially slightly wider; tergum IV predominantly black pilose, except lateral margin light yellow pilose; sternum IV (Fig. 10D) rectangular with large broadly rounded postero-lateral corner and broad but not deep medial incision; sternum VI predominantly light yellow to entirely black pilose; sternum VII from entirely white to mixed white and black pilose. **Genitalia** (Fig. 11D). Surstylus with small rectangular basal part with very scattered setae dorso-medially; medial part rectangular with a small patch of setulae medially; apical part elongate with slightly curved margins and with sharp but weakly bent apex. Hypandrium with rather narrow apical part with slightly wavy ventral margin; hamus long and with rounded apex.

FEMALE (Figs 1I, 2I). Body length: 7.5–9.2 mm, wing length: 5.9–6.8 mm. Similar to male except for the usual sexual dimorphism. **Head** (Figs 3I, 4I). Ratio width of head : width of face 3.0–3.3 : 1. Ocelli isosceles with broad posterior base, length : width 1.2–1.4 : 1; ratio width of frons width of ocellar triangle 1.7–1.9 : 1; width of head : width of vertex is as 3.8–4.1 : 1. Basoflagellomere (Fig. 6H) round, black to basally dark-orange coloured, ratio length : width as 0.95–1.0 : 1. **Legs**. Metafemur black, slightly incrassate, ratio length : width is 2.8–3.3 : 1.

Material studied. France: "France (Corse) / Asco (600-900) / 6-VII-1961 / HJP Lambeck", 1 ♂ (NBC); **Italy**: "Italy / Capri, Mt Solaro / 275-589m 25.VI.1992 / leg. P.W. Lohr", 1 ♂ (CSCA); "Italia / Sicilia / J.A.W. Lucas", "Taormina / 23-4-1976", 4 ♂♂, 1 ♀ (NBC); **Portugal**: "Portugal 260 m / Porto de Mos Alvados / UTM 29S0519-4377 / 12.IV.2007 leg A. van Eck", 1 ♂ (CSCA); **Spain**: "Espana / Avila / V.S. v.d. Goot / J.A.W. Lucas", "Sierra de Gredos / Navarredonda / de Gredos 1600 m / 9-7-1972", 4 ♂♂, 5 ♀♀ (NBC); "Spain, Albaceta / J. van Steenis & / M.P. van Zuijen", "Sierra de Alcaraz, 1200 m / Puerto de las Crucetillas / C 415 km 186 slope near / Populus plantation and small / stream 38°21′ N 2°24′ W / on *Thapsia villosa* 21-VI-2003", 2 ♂♂, 2 ♀♀ (JSA); "Spain (E) Albacete, Riopar / Puerto de las Crucetillas road / C415 km 190, 1400 m [a.s.l.] / 38°31′ NB 2°26′ WL / [leg] MP van Zuijen, J van Steenis / 21-6-2003 / dry pine forest, [on] yellow Apiaceae", 1 ♂ (MZW); "Spain, Albaceta / J. van Steenis & / M.P. van Zuijen", "Sierra de Alcaraz / Batan del Puerto 1200 m / meadow in open Pine forest / 38°34′ N 2°21′ W / on *Thapsia villosa* / 21-VI-2003", 1 ♂, 2 ♀♀ (JSA), 1 ♀ (MZW).

Identification key to the species of the *Eumerus barbarus* group from western Mediterranean Basin

1. Males: eyes holoptic, genital capsule clearly developed (Figs 1A, 2C, 2G, 3A) …… 2
– Females: eyes dichoptic, genital capsule absent (Figs 1B, 2B, 3B) …… 5
2. Metafemur medio-ventrally with 2–3 long black spinae, clearly differentiated from the much shorter apico-posterior row of 8–10 spinae (Figs 7D, 8D, 9C), on apico-posterior corner with densely white pilose, narrow lamina (Fig. 8D); metatibia ventro-basally along medial surface with rather broad carina, ending medially in a deep excavation and posteriorly with broad lamina (Figs 7D, 8D, 9B, 9C); metatrochanter ventrally with rather long and triangular process (Figs 7D, 9)…… ***Eumerus sulcitibius*** Rondani, 1868
– Metafemur medio-ventrally without long black spinae, only with a row of rather short and stout black spinae (Figs 7A–C, 9A), with differently shaped and pilose apico-posterior lamina (Figs 8A–C); metatibia ventro-basally along medial surface with weak to broad carina, medial carina ending apically in at most a weak excavation (Figs 7A–C, 8A–C); metatrochanter ventrally with low tubercle or with short rounded process (Figs 7A–C) …… 3
3. Metafemur strongly incrassate, medio-ventrally with a broad and flattened scarcely pilose area, and apically with 5–8 black spinae antero-ventrally and a row of 14–22 black spinae postero-ventrally along nearly the entire length of the metafemur (Figs 7A, 9A); metafemur at apico-posterior corner with densely white pilose, narrow lamina (Fig. 8A); metatibia ventro-basally along medial surface with broad carina, posteriorly with very wide lamina (Figs 7A, 8A); sternum IV as in Fig. 10A, with two rounded projections postero-medially .. …… ***Eumerus barbarus*** (Coquebert, 1804)
– Metafemur slightly to clearly less incrassate, more evenly curved and almost entirely pilose, on apical part with 7–11 black spinae antero-ventrally and a row of 9–16 black spinae postero-ventrally along apical 1/2–2/3 (Figs 7B, 7C); metafemur at apico-posterior corner with densely brown pilose and wide lamina (Fig. 8B) or with scarcely pilose, hardly visible lamina (Fig. 8C); metatibia ventro-basally along medial surface with very narrow to at most rather broad carina, posteriorly with at most rather wide lamina (Figs 7B, 7C, 8B, 8C); sternum IV as in Figs 10B–C, postero-medial surface smooth .. …… 4

4. Metafemur medio-ventrally with an area with brownish pile; metafemur at apico-posterior corner with densely brown pilose, wide lamina (Fig. 8B); metatibia ventro-basally along medial surface with narrow carina, posteriorly with very narrow lamina confined to the most basal part (Figs 7B, 8B); terga with restricted pollinosity (Fig. 1D); sternum IV as in Fig. 10B …… …….. ***Eumerus gibbosus* sp. n.**
– Metafemur medio-ventrally with only light-yellow pilosity; metafemur at apico-posterior corner with scarcely pilose, hardly visible lamina (Fig. 8C); metatibia ventro-basally along medial surface with rather broad carina, posteriorly with rather broad lamina (Figs 7C, 8C); terga with extensive pollinosity (Fig. 1F); sternum IV as in Fig. 10C …… ***Eumerus schmideggeri* sp. n.**
5. Oblique maculae on terga narrow (Figs 1B, 1E, 1I) .. 6
– Oblique maculae on terga broad (Fig. 1G) …….. ……***Eumerus schmideggeri* sp. n.**
6. Metafemur postero-ventrally with a row of 4–10 evenly spaced spinae (similar to Figs 7A–C); basoflagellomere large, more oval about as wide as long (Figs 6B, 6E) …… 7
– Metafemur medio-ventrally with 1–2 spinae, differentiated from the other postero-ventral row of spinae (similar to Figs 7D, 8D); basoflagellomere large and round, almost wider than long (Fig. 6H) …… …… ***Eumerus sulcitibius*** Rondani, 1868
7. Metafemur slightly incrassate (as in Fig. 3B); basoflagellomere large, oval (Fig. 6E); terga III and IV with pollinose maculae reduced, more or less straight (Fig. 1E) …… ***Eumerus gibbosus* sp. n.**
– Metafemur strongly incrassate (as in Fig. 3A); basoflagellomere large, rounded (Fig. 6B); pollinose maculae on tergum III and IV large and strongly oblique (Fig. 1B) …… ***Eumerus barbarus*** (Coquebert, 1804)

Excluded species from the *E. barbarus* group

***Eumerus truncatus* Rondani, 1868 stat. n.**
Figs 1C, 2F, 3C, 4C, 6C, 12A–B

Eumerus truncatus Rondani, 1868: 575. Type locality: Italy, Sicily, Nebrodes [Holotype ♂, MZUF].

Diagnosis. Differing from the species of the *E. barbarus* group and *E. strigatus* by the following characters: squarish basoflagellomere (Fig. 6C) (in *E. strigatus* similar, in *E. barbarus* group more oval with rounded apico-dorsal corner), very slightly pollinose vertex (Figs 1C, 3C, 4C) (in *E. strigatus* similar, in *E. barbarus* group with dense pollinosity on apical corner and posterolateral from posterior ocelli); ocellar triangle with narrow base (Fig. 3C) (in *E. strigatus* slightly wider, in *E. barbarus* group with very wide base); mesonotum with hardly visible pollinosity, at most very narrow vittae mediolateral reaching to over 2/3 of scutum (Fig. 1C) (in *E. strigatus* and *E. barbarus* group with clear and wide medio-lateral pollinose vittae); metafemur apico-posterior normal, without lamina or pile fringe like in *E. strigatus* (in *E. barbarus* group with pile fringe and sometimes even with carina); water drop shaped to short straight pollinose maculae on tergum IV (Fig. 1C) (in *E. strigatus* and *E. sulcitibius* with nearly straight oblique vittae and in the other three species of the *E. barbarus* group with elongate lunulate maculae).

Redescription. MALE (Figs 1C, 2F). Body length: 6.6–6.9 mm, wing length: 4.5–5.1 mm. **Head** (Figs 3C, 4C). White pilose face and frons; mixed black and light-brown pile on vertex, with very scattered pollinosity in anterior corner; eyes white pilose; ratio width of head : width of face 3.1–3.3 : 1. Eye contiguity relatively long, ratio frons: eye contiguity : vertical triangle is as 1.1–1.3 : 1.1–1.2 : 1; ocelli isosceles with narrow posterior base, length : width 0.84–0.92 : 1; posterior ocelli far from eye margin, ratio width of frons : width of ocellar triangle 1.5–1.7 : 1; ratio a:b:c as 1.2–1.3 : 1.2–1.3 : 1; width of head : width of vertical triangle is as 4.0–4.6 : 1; basoflagellomere (Fig. 6C) dark-brown to orange squarish, ratio length : width as 1.1–1.3 : 1. **Thorax**. Shiny bronze with white pile. **Legs**. Colour predominantly black, only some tarsomeres and apex and bases of tibiae brown-yellow; metafemur slightly incrassate with white pile ventrally, the pile length about 2/3 of the width of femur and with normal vestiture of short black spinae apically, ratio length : width is 3.2–3.4 : 1. **Abdomen**. Abdomen shiny bronze with pairs of lunulate pollinose maculae on terga II and III and water drop shaped pollinose maculae on tergum IV, pile predominantly white; sternum IV (Fig. 12A) with straight posterior margin, medially with rather deep and broad notch; sternum VII mixed light-brown to black pilose. **Genitalia** (Fig. 12B). With characteristic teaspoon shaped appendix between cerci and surstylus; apical part of surstylus with large almost squarish base and suddenly narrowed, ventrally sharp tipped apex.

Material studied. Holotype ♂ *Eumerus truncatus*: “Maiorni“, “147” [white oval label with red text], “Museo La Specola / coll. Rondani / HOLOTYPUS” [red label], “*Eumerus truncatus* / bona sp. / [det] Vujić 2014”, “Holotype ♂ / *Eumerus truncatus* / Rondani, 1869 / det J. van Steenis, 2016” [red label] (MZLS).

Additional material. **Morocco**: “Marokko / Antiatlas / S. Ait-Baha / 12.III.1997 / 30°00′ N 9°02′ W / leg. M. Hauser”, 3 ♂♂ (CSCA); “Marokko / 11km NW Taliouine / 15.III.1997 / 30°34′ N 8°00′ W / leg. M. Hauser”, 1 ♂ (CSCA); “Morocco 25km NE Tizinit / Massa Riv. 29.890N 9.595W 30m NN / leg. Schmid-Egger / 16.VI.2014 mal15 GS”, 2 ♂♂ (CSCA); “Morocco 20km E Tizinit / Assaka 29.960N 9.530W 190m NN / leg.

Schmid-Egger 16.VI.2014 mal16", 1 ♂ (CSCA); **Portugal**: "Portugal mal. trap Mertola / west of town / dry rainwater brooklet / UTM 29S6171-4166 / 21-23.I.2004 / leg A.v. Eck", 1 ♂ (AET); **Spain**: "Madrid / Arias Encobet", 1 ♂ (MNCN); "Belin chón (Cuenca) / 8-VII-1925 / J.M. Dusmet", 1 ♂ (MNCN); "Rio Peyales / Arena de San Pedro / 15.V-4.VI.1976 / 550 m Station 7", "España Avila / Sierra de Gredos / P. Oosterbroek & / E. Boersma", 1 ♂ (JSA); **Tunisia**: "Tunesia N Kasserine / 24.V.1999 1000 m asl / 35°25.14′ N 08°44.74′ E / leg. O. & M. Niehuis", 1 ♂ (CSCA); "Tunisia S M'Saken / 5 km N Sidi Bou Goubrine / 21.V.1999 ~ 1000 m amsl / 35°36.29′ N 10°36.04′ E / leg. O. & M. Niehuis", 1 ♂ (CSCA); "Tunesia S M'Saken / "Tunesie / J.A.W. Lucas", "Takrouana / 15-4-1977", 1 ♂ (NBC).

Remarks. In the synonymy of *E. barbarus*, *Eumerus truncatus* was mentioned (Pape & Thompson 2013). The latter is, however, a *bona species* clearly differentiated by the characters given in the above description. Grković et al. (2015) cited this species from eastern Mediterranean Basin (Crete, Lesvos and Naxos islands). The species is recorded from Morocco, Portugal, Spain and Tunisia for the first time.

DISCUSSION

The Mediterranean Basin is considered a biodiversity hotspot and ranked 15th out of the 25 world hotspots (Médail & Quézel 1999; Myers et al. 2000; Médail & Myers 2004) and, as such, in need for global conservation priorities (Sloan et al. 2014).

The family of Syrphidae has a high species diversity in the Mediterranean Basin (e.g. Kassebeer 2000, 2001; Vujić et al. 1999, 2001; Radenković et al. 2011; van Steenis & van Steenis 2014; Pérez-Bañón et al. 2016) but not many studies have included Syrphidae in analysis of biodiversity richness (Petanidou et al. 2013). The genera *Merodon* Meigen, 1803 and *Eumerus*, both dependent on bulbous plants in the larval and sometimes also adult stage and with often very specialized life cycle (Ricarte et al. 2008; Rotheray & Gilbert 2011), are key genera for species diversity in the Mediterranean Basin. The genus *Merodon* is well studied with many supposed Mediterranean endemics (Hurkmans 1993; Marcos-García et al. 2007; Vujić et al. 2007; Radenković et al. 2011; Popović et al 2015; Šašić et al. 2016). The genus *Eumerus* is less well studied and, besides the two newly described species in this paper, several studies indicate that there are many more new *Eumerus* species to be expected in the Mediterranean Basin (Grković et al. 2015; Chroni et al. 2017; Grković et al. 2017).

The Mediterranean Basin has many immediate and long-term threats that put in risk its biodiversity, such as increasing tourism and growth of population (Hoekstra et al. 2005; Cuttelod et al. 2008; Riservato et al. 2009). Restrictions in water, land and energy resources, and development of coastal tourism and urbanisation pose risks of further habitat degradation (Underwood et al. 2009). The predicted climate change will cause warmer summers and less precipitation during spring, autumn and summer (Lionello 2012) causing a general drying and possible desertification of the land. The warming of the Mediterranean Basin will be more than the world average making the global warming an even higher threat to this region. The decrease in precipitation combined with the increased demands of water for tourism, agriculture and the growing population lead to an even more rapid loss of natural water and drying of natural habitats, with an increasing risk for forest fires. All these factors influence the extant flora, with the bulbous plants as most valuable community of the Mediterranean Basin (Silva et al. 2008; Buerki et al. 2012; Mendoza-Fernández et al. 2015), and, consequently, all the species within the specialized genus *Eumerus* are highly threatened too. We believe that the description of these new species adds to the need for protective measurements and reappraisal of local refuges (Médail & Diadema 2009; De la Montaña et al. 2011; Vujić et al. 2016).

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