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Koleopterologische Rundschau	85	1–6	Wien, September 2015

A previously unrecognised species of *Agabus* LEACH, 1817 in Italy and Central Europe (Coleoptera: Dytiscidae)

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Abstract

A new species of the *Agabus uliginosus* group, *A. lotti*, is described from Italy, Austria, Czech Republic, Slovakia, and Hungary.

Key words: Coleoptera, Dytiscidae, *Agabus lotti*, new species, Italy, Central Europe.

Introduction

NILSSON & PETROV (2006) provided a detailed discussion on the identity of *Agabus uliginosus* (LINNAEUS, 1761) and described *A. uralensis* NILSSON & PETROV, 2006 bringing the number of species in the *A. uliginosus* group to six (see NILSSON 2015). *Agabus amnicola* (SAHLBERG, 1880) and *A. margaretae* LARSON, 1975 (= *margareti* LARSON, 1975, incorrect original spelling (ICZN 1999, Art. 31.1)) are East Palearctic-Nearctic in distribution whilst *A. uliginosus* occupies the western Palearctic with *A. jacobsoni* ZAITZEV, 1905, *A. uralensis*, and *A. vereschaginae* ANGUS, 1984 in the east. Until now, *A. uliginosus* found in the south-eastern corner of its range, was considered to be one species.

Material & methods

The specimens mentioned in this work are deposited in several collections which are abbreviated in the text as follows:

BMNH	Natural History Museum, London, UK
CRT	collection of Clive R. Turner, Plymouth, UK
DTB	collection of David T. Bilton, Plymouth, UK
GWW	collection of Günther Wewalka, Vienna, Austria
HFB	collection of Hans Fery, Berlin, Germany (property of NMW)
MNHN	Muséum National d'Histoire Naturelle, Paris, France
MTP	collection of Mario Toledo, Parma, Italy
NMW	Naturhistorisches Museum Wien, Vienna, Austria
PMB	collection of Paolo Mazzoldi, Brescia, Italy

The genitalia were photographed by the first author (CT) using a GX Optical trinocular microscope 7–45 × zoom with dual side lighting with the male genitalia mounted in DMHF on a glass petri dish. The use of DMHF facilitated presentation of the parameres in the same plane. The style of the descriptive notes follows NILSSON & PETROV (2006). The only available syntype (♀) of *Agabus reichei* AUBÉ, 1837 from MNHN was examined (by CT) and considered not to be the same as this new species. It conformed to its synonymy with A. *uliginosus* albeit a very rufinistic example close to the form 'oreophilus' described by QUENEY (2002). Label data are cited in quotation marks. In square brackets notes are made of teneral specimens, and of label data corrections.

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Figs. 1–2: Lateral view of aedeagus and parameres of 1) *Agabus lotti*, holotype, 2) *A. uliginosus*, Berlin Germany.

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Agabus lotti sp.n.

Holotype ♂: "ITALY, Abruzzo, L'Aquila Prov., Abruzzi National Park, leg. C.R.Turner, 26 May 2008, alt.1579m Grid 42º 23' 36" N 13º 39' 32" W, ref. IT10, Lago di Racollo, 3 ponds, all varying degrees of vegetation, Potamogeton and silty, Ranunculus and silty to grassy", red label "Holotype Agabus lotti Turner, Toledo, Mazzoldi" (NMW).

Paratypes (all specimens with red paratype label): ITALY: 5 ♂♂, 1 ♀, same locality data as holotype (CRT); 5 ♀♀: "Abruzzo L'Aquila Prov., Lago di Racollo, ref: ITA4, 42º 23' 31" N 13º 39' 41"E, alt. 1572m, leg. C.R.Turner, 12 June 2010, temporary, well vegetated pool by roadside" (CRT); 5 ♂♂, 3 ♀♀: "Abruzzo, L'Aquila Prov., Piana di Fugno, Lago di Filetto, ref: ITA1, 42º 23' 29" N 13º 33' 22"E, alt. 1505m, leg. C.R.Turner, 11 June 2010, well vegetated pond with goldfish and small muddy pools no fish" (CRT); 5 ♂♂, 3 ♀♀: "11/vi/2010 Italy Abruzzo, Campo Imperatore/Lago di Filetto, D. T. Bilton leg." (DTB); 12 ♂♂, 9 ♀♀: "Umbria, Perugia Prov., Norcia, Piano Grande di Castelluccio, alt. 1421m, 31/v/2010, M. Toledo & P. Mazzoldi leg." (MTP, PMB); 1 ♂: "Mti Sibillini, 13.6.60, Dr. Chiesa", "Agabus/uliginosus (L.)/ Fery det." (HFB); 1 ♂: "MONTI SIBILLINI Piano Grande inghiott. m. 1257 30-5-64 Pederzani" (GWW); 1 ♂: "MONTI SIBILLINI Piano Piccolo laghetto m. 1327 29-5-64 Pederzani" (GWW); 1 ♂: "MONTI SIBILLINI giugno 1960 leg. dr. A. Chiesa" (GWW). AUSTRIA: STYRIA: 1 ♂: "Styria" (NMW); LOWER AUSTRIA: 1 ♂: "Gars, Dr. Minarz N.-Ö.", "coll. Minarz", "Agabus uliginosus (L.) det. H. Shaverdo 2001" (NMW); 1 ♂: "Melk Nieder Österreich, A, 7465" (NMW); 1 ♂: "♂", "Wien Bisamberg", "coll. Wingelmüller", "uliginosus L." (NMW); 1 ♂: "♂", "Wien Bisamberg", "coll. Wingelmüller" (NMW); 1 ♂: "Wien, Nied Österr, A, 7465" (NMW); 2 ♂♂ [1 teneral]: "Wien, Nied Österr, A, 7531" (NMW); 2 ♂♂: "NÖ: Bez.Gänserndorf, ca. 1km W Marchegg, 25.VII.08, leg. M.A. Jäch", "16º 53' 44" E 48º 16' 38" N Grundwassertümpel in Wiese, close to Nature Reserve Marchauen" (NMW); 1 ♂: "5.80 NÖ Marchegg", "Agabus uliginosus (L.) det. H. Shaverdo 2001" (NMW); 1 ♂: "26.6.80 NÖ Marchegg", "Agabus uliginosus", "Agabus uliginosus (L.) det. H. Shaverdo 2001" (NMW); 1 ♂: "A.inf.: S Schwechat Moosbrunn, 2.5.1997, Brunnlust, leg. Schillhammer (#2)", "Agabus uliginosus L. det. G. Wewalka 1997" (NMW); BURGENLAND: 1 ♂ [teneral]: "Reiser 29.5.55 b.Weiden,Bgld., Kanal", "femoralis", "Agabus uliginosus (L.) det. H. Shaverdo 2005" (NMW); 1 ♂: "Neusiedlersee bei Podersdorf V.31, Ing Prock.", "A. uliginosus ♂ Det. Prock" (NMW); 1 ♂: "16.5.64, Bgld, Donnerskirchen", "leg. et det. Vogl 2034", "Sumpf-Schilf-Zone, leg. Vogel", "Agabus uliginosus (L.) det. H. Shaverdo 2001" (NMW). CZECH REPUBLIC: 1 ♂ : "♂", "Muséum Paris coll. F.Guignot", "Moravia Umg. Ostra TH. v. Wanka" (MNHN); 2 ♂♂: "Moravia, Umg. Ostra, TH.v.Wanka" (NMW). SLOVAKIA: 1 ♂: "south of Studienka, River Rudava, seasonal pools with emergents set back on banks of river, leg. C.R.Turner 5 June 2009 alt.179m, Grid 48º 30' 34" N 17º 07' 25" E, ref. SL1" (CRT); 2 ♂♂, 1 ♀: "June 2009 Slovakia, Pond @ Viškova nad Iplom [Vyškovce nad Ipl'om], D. T. Bilton leg." (DTB); 1 ♂: "1 male 8/vi/2009 Slovakia, Pond beside Rudava river, S of Studjenka[Studienka]/D. T. Bilton leg." (DTB); 3 ♂♂, 3 ♀♀: "6/vi/2009 Slovakia, Cerveňy Rybňik [Červený rybník] N of Studjenka [Studienka], D. T. Bilton leg." (DTB); 1 ♂: "Slovakia m. occ., Děvínské jazero [Devínske Jazero], 24.7.1993, J Horák leg.", "Agabus uliginosus (L.) det. H. Shaverdo 2002" (NMW); 3 ♂♂: "Slowakei, 16.5.1993, Marchauen NW, Bratislava, Devinske Jasero [Devínske Jazero], leg. Schödl" (NMW). HUNGARY: 1 ♂: "Hungary, Körös-Maros, Nemzeti Park, Szabadkígyós. 13.vi.2011, R.B.Angus", "R.B.Angus BMNH(E) 2010-22" (BMNH).

Diagnosis: This species is externally very similar to *Agabus uliginosus*, from which it differs in its laterally more convex body and the male genitalia (Figs. 1–2). Initially there appeared to be differences in the microsculpture and several other features but the level of variability in both *A. lotti* and *A. uliginosus* has eliminated a number of possible differentiators. At present the best external character should be considered the more elongate body form of *A. uliginosus* versus the laterally more expanded *A. lotti*.

Description: Length: 6.52–7.60 mm, width: 3.62–4.37 mm. Body broadly oval with dorsal surface strongly convex: lateral outline continuous. Head black; areas anterior to eyes and two posteromedial spots rufous. Antennae and palpi pale testaceus progressively darkening apically; antennomeres 4–10 infuscated distally with antennomere 11 brown in distal half. Pronotum black; lateral margin clearly rufotestaceus when viewed from above. Elytron piceous, occasionally brown; lateral margins faintly rufotestaceus becoming less so posteriorly. Ventral surface black; hypomeron and epipleuron rufotestaceus; metacoxae posteriomedially and posterior margins of abdominal sterna rufous. Legs rufous. Clypeus with anterior bead medially more or less fragmented. Dorsal body surface shiny, with a slight metallic sheen. Dorsal reticulation normally very finely impressed; meshes of unequal size and shape; frequently with

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micropunctures at intersections. Elytron with linear series of punctures evident. Broad pronotum with lateral bead evident. Prosternal process narrowly pointed; strongly convex, subcarinate, setose; lateral bead well defined. Metaventral "wing" rather broad. Longer metatibial spur with weak longitudinal striation. Male with raised ridge sublaterally between sterna 2 and 3. Male pro- and mesotarsomeres 1–3 strongly dilated; anterior protarsal claw with strong medial expansion. Male tarsomeres 1–4 with ventral setal fringe.

Penis in lateral view basally sinuate expanding medially, followed by a sinuate contraction toward the narrowing apex; the external margin progresses evenly in a gradual inward curve until the three quarters to the apex where a straight section completes the apex. Paramere widest below vertical midpoint and narrowing apically, basally striate from middle, with dense setal fringe extending from just above the base. Endophallus with a variably angled and positioned anteriorly sinuate progression (Fig. 1).

Similar to *A. uralensis* this species exhibits the differentiated basal apodeme of the penis where it is enlarged in mature specimens and underdeveloped in teneral examples as described by NILSSON & PETROV (2006). Here the position and progression to the apical angle of the endophallus also appears to express a variation with maturity.

Distribution: Italy, Austria, Czech Republic, Slovakia, Hungary.

Agabus lotti and *A. uliginosus* both occur in Slovakia although to date there is no evidence of them being found together within any given location. The currently somewhat disjunct range of *A. lotti* provides an indication of its area of existence and suggests an overlap with *A. uliginosus* in its northern areas of occurrence. Small numbers of *A. uliginosus* from France, Sweden, Poland, Germany and Belarus have been examined without encountering *A. lotti*.

Ecology: In the Apennine region of Italy at the type locality (Fig. 3) the beetle was found to occupy the stable organic margins of seasonal pools where a dense grass and herb layer grew from richly organic fine sediment. At the nearby Lago di Filetto the beetles were found in the *Glyceria* filled margins of small, richly organic fine sedimented pools next to the main pond. No individuals were forthcoming from the main pond which contained goldfish. In a similar context this species was collected in Piano Grande di Castelluccio (Fig. 4), 55 km northwest of the type locality, in almost circular seasonal pools, filled with grass and *Ranunculus* sp. (Fig. 4), in association with a rather rich water beetle fauna. In the adjacent permanent ditch no specimens of *A. lotti* were found despite the otherwise rich water beetle fauna. In Italy the beetle appears to be only found above 1000 m altitude.

In Slovakia the habitat comprised of lowland well vegetated pools again with richly organic fine sediment as substrate. In Austria this species was found in the lowland in at least four provinces, from May to July.

In 2010 at Piano Grande di Castelluccio both adult and teneral specimens were encountered together with few 3rd instar larvae. At Lago di Filetto all examples encountered were teneral, although this was not the case at the nearby site of Lago di Racollo supporting the notion that this species emerges in the late spring (May and June) with some variation between sites. In 2009 both Piano Grande di Castelluccio and Lago di Racollo were visited in July (MT & PM) but this species was not encountered indicating that it may only be present as an adult for a short period.

In Slovakia the beetle occurred in the seasonal pools of lowland mires of river floodplains in June.

Etymology: Named in recognition of the late Dr. Derek Lott.

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Figs. 3–4: Habitats of *Agabus lotti*, 3) type locality, Lago di Racollo, Italy, with Clive Turner, 4) Piano Grande di Castelluccio, Italy (inset: close up).

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Acknowledgements

Thanks must be extended to Anders N. Nilsson for the examination of the material, confirmation that it is not a described species of *Agabus* and assistance in resolving this issue. Thanks are also due to Garth Foster (Aquatic Coleoptera Conservation Trust), David Bilton (Plymouth University) and Maxwell V.L. Barclay (BMNH), for their critical comment, guidance, assistance and encouragement. Thanks are also due to Antoine Mantilleri (MNHN) for provision of type material and other specimens for examination. Manfred A. Jäch and Helena Shaverdo (NMW) along with Robert Angus (BMNH) as well as Hans Fery (Berlin) and Günther Wewalka (Wien) must be also thanked for their assistance in obtaining material. Anonymous reviewers must be thanked for their useful comments on the manuscript.

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Zeitschrift/Journal: Koleopterologische Rundschau

Jahr/Year: 2015

Band/Volume: 85_2015

Autor(en)/Author(s): Turner C. R., Toledo Mario A., Mazzoldi Paolo

Artikel/Article: A previously unrecognised species of Agabus LEACH, 1817 in Italy and Central Europe (Coleoptera: Dytiscidae) 1-6