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Notes on *Graptodytes* SEIDLITZ, 1887, re-instatement of *G. laeticulus* (SHARP, 1882) as valid species and description of *Tassilodytes* nov.gen. from Algeria (Coleoptera, Dytiscidae, Hydroporinae, Siettitiina)

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A b s t r a c t: *Graptodytes laeticulus* (SHARP, 1882) from northern Africa was treated as a junior subjective synonym of *G. varius* (AUBÉ, 1838) since a long time ago. It is here re-instated as a valid species and the differences between the two species are illustrated and described. Both belong to a complex of species which includes also *G. ignotus* (MULSANT & REY, 1861), *G. fractus* (SHARP, 1882), and *G. kuchtae* (BREIT, 1908). Some notes on the latter species and on the var. *pauper* (O. SCHMIDT, 1903) of *G. varius* are added. Notes on *Hydroporus narentinus* ZIMMERMANN, 1915 (a junior subjective synonym of *G. bilineatus* (STURM, 1835)) and the var. *dalmatinus* ZIMMERMANN, 1932 of *G. bilineatus* are given. New Algerian records of *G. pietrii* NORMAND, 1933 are added. *Graptodytes parisii* GRIDELLI, 1939 is only known from the female holotype, which was collected 1936 in the Tassili mountain range in south-eastern Algeria. The holotype could be studied for the first time after its original description. It shows some characters which make its attribution to any of the known genera impossible – even the correct subtribe is unclear. Thus, it was necessary to introduce the new genus *Tassilodytes* nov.gen. and to give an exhaustive redescription of the species. Lectotypes are designated for *Hydroporus kuchtae* BREIT, 1908, *Hydroporus laeticulus* SHARP, 1882, and *Hydroporus narentinus* ZIMMERMANN, 1915. The genus *Graptodytes* SEIDLITZ, 1887 has still 22 members, two of them bitypic. Remarks on specific names formed from personal names are added.

K e y w o r d s: Coleoptera, Dytiscidae, Hydroporinae, *Graptodytes*, *Tassilodytes*, new genus, lectotype, re-instatement of rank.

Introduction

Recently, the junior author collected a large series of a species of *Graptodytes* SEIDLITZ, 1887 in north-eastern Algeria. The specimens were preliminarily identified as *Graptodytes varius* (AUBÉ, 1838: 637), but after comparing them with material from France, Italy, Spain and Morocco we came to the opinion that the Algerian specimens should belong to another species. The study of one syntype of *Hydroporus laeticulus* SHARP, 1882 (now in *Graptodytes*) showed that our material is identical to this taxon and, in particular, that *G. laeticulus* must be treated as a valid species and not as a junior subjective synonym of *G. varius*. In the course of these investigations we have studied also other members of a group of species which might be called the *varius*/*ignotus*-

complex and which includes, in addition to the two species mentioned above, also *Graptodytes ignotus* (MULSANT & REY, 1861), *Graptodytes fractus* (SHARP, 1882), and *Graptodytes kuchtae* (BREIT, 1908).

Additionally, we present some new Algerian records of *Graptodytes pietrii* NORMAND, 1933, and take the opportunity to give some notes on *Hydroporus narentinus* ZIMMERMANN, 1915, and *Graptodytes bilineatus* var. *dalmatinus* ZIMMERMANN, 1932, both usually treated as synonyms of *Graptodytes bilineatus* (STURM, 1835).

Graptodytes parisii GRIDELLI, 1939 is an Algerian species with a so far dubious identity. The holotype, which is a female and the only specimen ever found, was generously provided to us by F. Rigato of the Milano Museum (MCSN), and thus could be studied for the first time after GRIDELLI's original description. In particular the study of the ventral surface led to the insight that it does not belong to any known genus and that even assigning it to one of the known subtribes of Hydroporini AUBÉ, 1836 is impossible.

Material and methods

Specimens were studied with an Olympus SZX16 stereomicroscope. The illustrated genitalia were studied in wet condition. Photos were made with a Nikon Coolpix 995 camera attached to the stereomicroscope and subsequently treated using CombineZP Image Stacking software. Adobe Photoshop CS5 software was used to touch up the photos and ink drawings. The following abbreviations are used in the text: TL (total length), TL-h (total length without head), MW (maximum width), "n. comb." (new combination), "hw" (handwriting of). The abbreviation ICZN is used with two different meanings: "International Code of Zoological Nomenclature" and "International Commission on Zoological Nomenclature". Label texts are cited in quotation marks, additional comments are given in square brackets. Co-ordinates are given in decimal notation.

The holotype of *Graptodytes parisii* GRIDELLI, 1939 was treated with special care because it is the only specimen of this species ever found. This is why we had to abstain from studying characters which could be observed only if the specimen would have been considerably dissected – and possibly partly damaged. Fortunately, the female genitalia were already prepared by GRIDELLI himself.

The following codens for collections from which we have studied material are used in the text:

BMNH ..... British Museum of Natural History, London, UK (C. Taylor)
CHF..... coll. H. Fery, Berlin, Germany (property of the NMW)
CSB..... coll. S. Bouzid, Annaba, Algeria
HNHM ..... Hungarian National History Museum, Budapest, Hungary (O. Merkl)
INAT..... Institut National Agronomique de Tunisie, Tunis, Tunisia (A. Jarraya)
IRSN ..... Institut Royal des Sciences Naturelles, Belgium (P. Limbourg)
MCSN ..... Museo Civico di Storia Naturale, Milano, Italy (F. Rigato)
MNHN ..... Muséum National d'Histoire Naturelle, Paris, France (A. Mantilleri)
NMW ..... Naturhistorisches Museum Wien, Vienna, Austria (M.A. Jäch)
SDEI ..... Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany (L. Behne)
ZSM ..... Zoologische Staatssammlung, München, Germany (M. Balke, L. Hendrich)

Systematics

The genus *Graptodytes* SEIDLITZ, 1887

SEIDLITZ (1887: 59) introduced the subgenus *Graptodytes* as one of three subgenera of the genus *Hydroporus* CLAIRVILLE, 1806. His subgenus comprised all species with sublateral longitudinal impression on each side of the pronotum, except those of the genus *Oreodytes* SEIDLITZ, 1887. He divided the subgenus into three species groups: the first one comprising those species which are treated today in the genus *Stictonectes* BRINCK, 1943, the second group comprising species which are now in *Rhithrodytes* BAMEUL, 1989, and the third group comprising those which are treated today in *Graptodytes*. ZIMMERMANN (1919: 147) raised *Graptodytes* to generic rank and included, additionally to the species of SEIDLITZ's first two groups, *Siettitia balsetensis* ABEILLE DE PERRIN, 1904, *Metaporus meridionalis* (AUBÉ, 1838), and those species which are treated today in the genus *Porhydrus* GUIGNOT, 1945 (the latter two genera were introduced by GUIGNOT 1945).

Today the genus *Graptodytes* is included in the subtribe Siettitiina SMRŽ, 1982 of the tribe Hydroporini AUBÉ, 1836. Originally, SMRŽ introduced the tribe Siettitiini "... to include multiple unrelated Hydroporinae ..." (MILLER & BERGSTEN 2014: 144). These originally included genera are given in SMRŽ (1981). This classification was afterwards either overlooked, not accepted or refused (ÁDÁM 1996: 23). MILLER & BERGSTEN (2014: 144) gave SMRŽ's tribe a new status – the subtribe Siettitiina SMRŽ, 1982 (in the tribe Hydroporini). The type genus of this subtribe is *Siettitia* ABEILLE DE PERRIN, 1904. In this subtribe they included *Graptodytes* SEIDLITZ, 1887, *Metaporus* GUIGNOT, 1945, *Porhydrus* GUIGNOT, 1945, *Rhithrodytes* BAMEUL, 1989, *Stictonectes* BRINCK, 1943, and several subterranean genera, e.g. *Siettitia*. For more information on this subtribe see MILLER & BERGSTEN (2014) and PEDERZANI (1995: 64; under tribe Siettitiini SMRŽ).

Graptodytes species are characterised by the pronotal striae relatively short and reaching neither the anterior nor the posterior pronotal margins; members of this genus have the apex of the median lobe in lateral view more or less straight and in many of them asymmetric in ventral view. Species of *Porhydrus* and *Metaporus* can be separated from *Graptodytes* by the lack of the sublateral pronotal striae, and species of *Stictonectes* (which possess also the sublateral pronotal striae) can be separated from *Graptodytes* by their stellate punctation (cf. figs 2A and 4A-C in BILTON 2012) of large parts of the dorsal and ventral surfaces (present also in *Porhydrus*). Species of the genus *Rhithrodytes* can be easily distinguished from all other epigean members of the subtribe by the long sublateral stria stretched from the anterior to the posterior margin of the pronotum and by the symmetric and distinctly curved apex of the median lobe. Additionally, in contrast to all other members of Hydroporini, species of *Rhithrodytes* have the elytral epipleuron provided with a distinct oblique carina near the shoulder (see fig. 1 in FERY 2013) – similar to the epipleural carina e.g. in members of Hygrotini PORTEVIN, 1929.

Graptodytes laeticulus (SHARP, 1882) (rank re-instated)

Hydroporus laeticulus SHARP, 1882: 453; MARSEUL 1882: 75; SEIDLITZ 1887: 62; SEVERIN 1892: 473; RÉGIMBART 1895: 23.

Hydroporus varius var. *laeticulus* SHARP; BEDEL 1900: 59, 1925: 364; JACOBSON 1908: 423.

Graptodytes varius (AUBÉ, 1838); ZIMMERMANN 1920: 117 (n. comb.); RIBERA & FAILLE 2010: 4, 11, 12 (phylogeny).

Graptodytes varius ab. *laeticulus* (SHARP, 1882); ZIMMERMANN 1932: 82; GUIGNOT 1932: 400, 1947: 119, 1959: 400; NORMAND 1938: 344; KOCHER 1958: 21.

Graptodytes varius ab. *pauper* O. SCHNEIDER; NORMAND, 1933: 296 (misidentification; corrected in NORMAND 1938: 344).

Graptodytes varius form. *laeticulus* (SHARP, 1882); FRANCISCOLO 1979: 405.

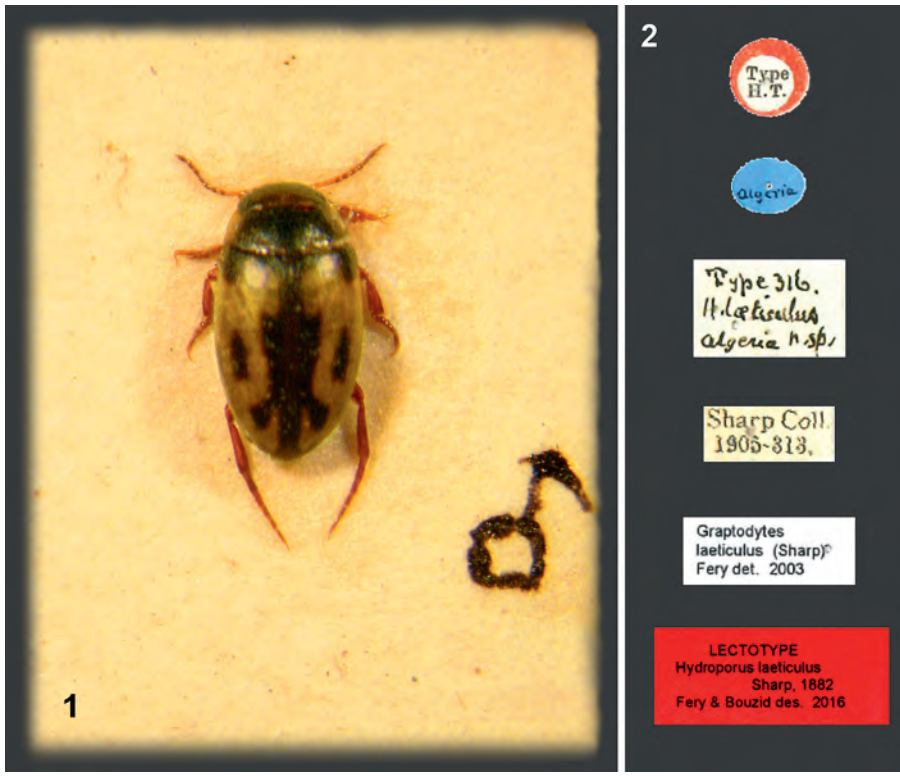
Type locality: Algeria.

Type material: Lectotype (present designation): ♂, glue card with handwritten male gender symbol (Fig. 1), "Type, H. T." [round label, red margin, printed; most probably mounted by J. Balfour-Browne], "Algeria" [hw Sharp; blue oval label], "Sharp Coll., 1905-313", "Type 316., H. læticulus, Algeria n. sp." [hw Sharp], "Lectotype, Hydroporus laeticulus Sharp, 1882, Fery & Bouzid des. 2016" [red, printed] (BMNH); scans of the labels are given in Fig. 2. Notes: SEVERIN (1892: 473) mentioned that type(s) of *G. laeticulus* exist in the IRSN and BEDEL (1925: 363) wrote that two types should be stored in this institute. We have not been able to find these "types". The records are somewhat mysterious because SHARP (1882: 454) reported only two types and one of them is stored in the BMNH.

Additional material studied: Algeria: 1 ex., small square blue label, "Algeria, Reitter", "Grapt. varius Aubé, Coll. Reitter" (HNHM). 2 exs, "Algeria, Bou Berak" [ca. 36.88N 3.83E], "Grapt. varius var. laeticulus Shrp., Coll. Reitter" (HNHM). 1 ex., "Bou Berak, près Dellys [= Delles], Algérie", "laeticulus Sharp" [hw?], "Grapt. varius var. laeticulus Shrp., Coll. Reitter" (HNHM). 2 exs, "Constantine", " J. Sahlb.", "Grapt. varius var. laeticulus Shrp., Coll. Reitter" (HNHM). 1 ex., "Aïn Hamra [hw ?], Algerie, coll. Théry [printed]", male gender symbol, "reg." [hw Régimbart], "varius var. laeticulus shp., Regimbart det." [hw Régimbart], in coll. Guignot (MNHN) (correct locality not found because several ones exist with this or a similar name). 26 exs, "Berrouaghia" [ca. 70 km SSW Algiers, ca. 36.2N 2.9E] [printed], "Algier, Ancey" (SDEI). 1 ex., "Dra el Mizan" [possibly = Dra Lmizan, ca. 75 km ESE Algier, ca. 36.5N 3.8E], "Ancey" (SDEI). 1 ex., "Algier, 7138" (ZSM); 1 ex., "Alg Qu. Medean" [possibly = Medeah], "v. Schönfeldt" (ZSM).

The following collecting sites are all situated in NE Algeria, environs of Annaba: 16 exs, 14.7.2005, El K'haïla, Medjez Sfa (Guelma), 36.488N 7.852E, 560 m (Fig. 49); 3 exs, 22.8.2007, El M'Kaimen, Medjez Sfa (Guelma), 36.477N 7.828E, 400 m; 11 exs, 28.7.2009, Oued El Maza, Medjez Sfa (Guelma), 36.433N 7.856E, 250 m; 5 exs, 9.7.2005, Aïn El-Aoudiet, Medjez Sfa (Guelma), 36.429N 7.821E, 240 m; 12 exs, 28.3.2006, Melha Tabbet M'louka, Medjez Sfa (Guelma), 36.429N 7.844E, 360 m; 3 exs, 19.5.2005, Ghobn Chaabat Errich, Medjez Sfa (Guelma), 36.427N 7.839E, 320 m (see Fig. 42); 4 exs, 9.7.2005, idem; 1 ex., 18.5.2005, Chaabat Feid El-Bagrat, Medjez Sfa (Guelma), 36.427N 7.857E, 400 m; 1 ex., 23.7.2005, idem; 2 exs, 28.3.2006, Bir Bentaryaga, Medjez Sfa (Guelma), 36.424N 7.844E, 410 m; 12 exs, 24.8.2006, Aïn Damous, Medjez Sfa (Guelma), 36.423N 7.856E, 520 m (see Fig. 45); 1 ex., 19.5.2005, Bir Slaymate, Medjez Sfa (Guelma), 36.420N 7.857E, 480 m; 3 exs, 19.5.2005, Chaabat Settara, Medjez Sfa (Guelma), 36.419 N 7.835E, 300 m (see Fig. 46); 9 exs, 23.7.2005, Mouilha Ben Haouech, Medjez Sfa (Guelma), 36.419N 7.840E, 380 m (see Fig. 48); 1 ex., 18.5.2005, Chaabat Sangot, Medjez Sfa (Guelma), 36.419N 7.842E, 400 m (see Fig. 47); 16 exs, 23.7.2005, idem; 25 exs, 27.7.2009, idem; 1 ex., 27.7.2005, Aïn Chef, Medjez Sfa (Guelma), 36.417N 7.847E, 490 m (see Fig. 43); 8 exs, 26.11.2006, Mouilha Zizlag, Medjez Sfa (Guelma), 36.414N 7.843E, 450 m (see Fig. 44); 2 exs, 29.3.2006, Aïn Hallouf, Mechroha (Souk Ahras), 36.400N 7.860E, 850 m; all specimens Bouzid leg. (CHF, CSB).

Tunisia: 2 exs, "Tunis, Coll. O. Leonhard", "Hydr. laeticulis [misspelling] Sharp." (SDEI). 2 exs, "Tunis", "Coll. Stierlin", "H. laeticulus Licora [? almost illegible] Sharp" (SDEI). 1 ex., Teboursouk, ca. 36.4N 9.3E (CHF). 1 ex., "Tunis Mern. [?]", "Sammlung Cl. Müller" (ZSM). 2 exs, 30.10.2005, Oued Mrij, 36.75N 8.69E, 580 m; 7 exs, 28.7.2005, Oued Bransia, 36.78N 8.75E, 590 m; 1 ex., 30.11.2005, Oued Lebgaâ, 36.75N 8.70E, 560 m; all specimens Touaylia, Bejaoui & Boumaiza leg. (CHF).

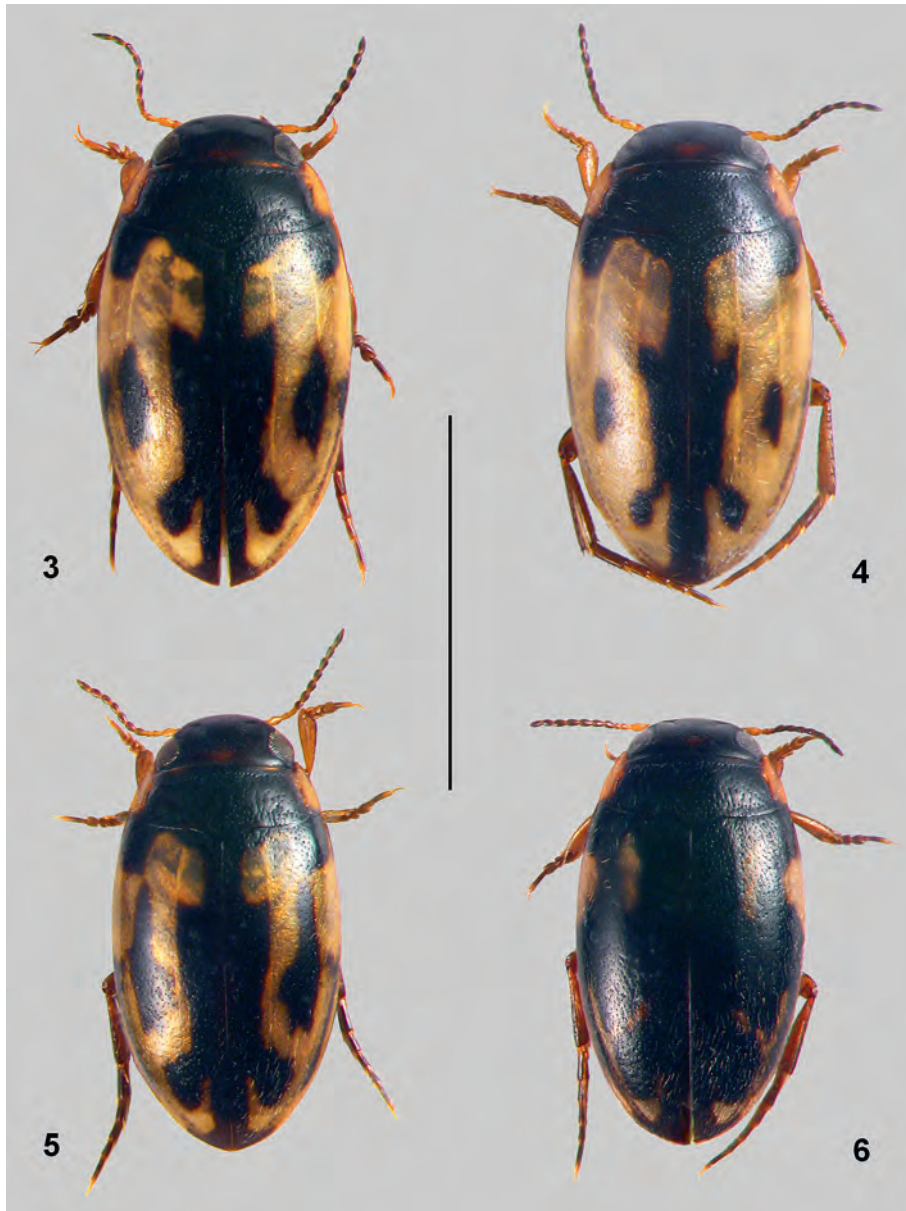


Figs 1-2: *Graptodytes laeticulus* (SHARP, 1882) (**1**) lectotype, habitus, glue-card with Sharp's male gender symbol; (**2**) lectotype labels.

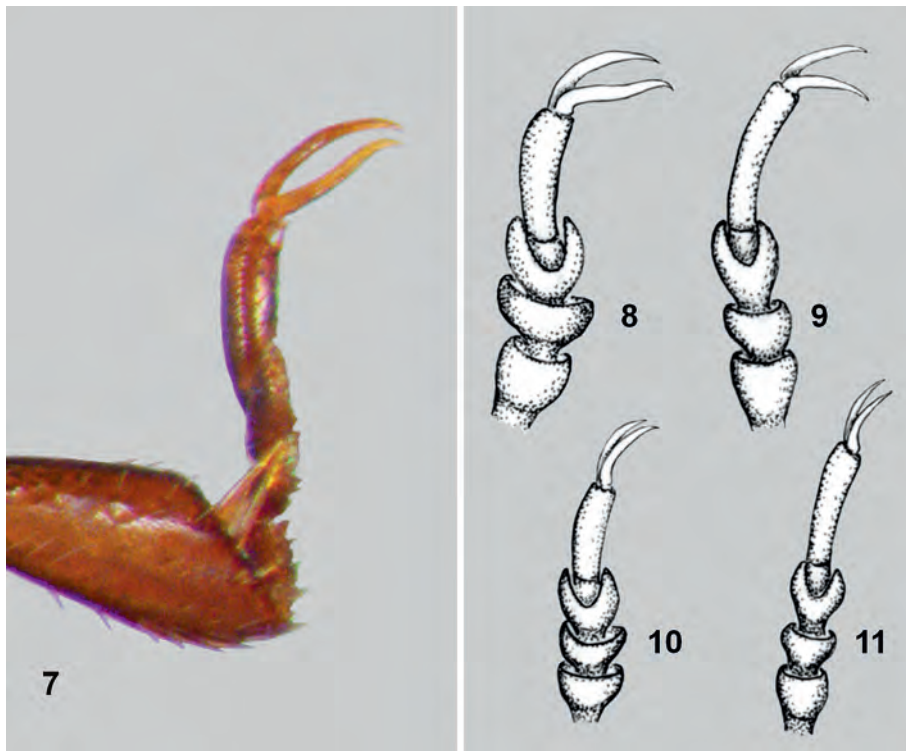
M o r o c c o: 1 ex. "Marokko" (ZSM). The exact collecting site of the single specimen of *G. laeticulus*, which – according to the label text – originates from Morocco, is unknown. All Moroccan specimens of the species complex collected by the senior author proved to belong either to *G. varius* or to *G. ignotus*. They were collected in north-western Morocco (env. Tangier, High and Middle Atlas). It might be possible that the Moroccan *G. laeticulus* was collected in the north-eastern part of Morocco, close to the Algerian border.

D o u b t f u l l o c a l i t y: 1 ex., "Algeria, El Feidja", "Grapt. varius var. laeticulus Shrp., Coll. Reitter" (HNHM). 1 ex., " El Feidja g [?]" [hw?], "Algeria, El Feidja", "Graptodytes varius var. laeticulus Shrp.", "Coll. Reitter" (HNHM). We are not sure about these label data. Usually, the name "El Feidja" is associated with a locality in Tunisia, the "El Feidja [or Feija] National Park", ca. 70 km SW Aïn Draham, ca. 36.75N 8.64E (not far from the border to Algeria and in part very close to the collecting sites of the junior author). Possibly, the country name "Algeria" was mistakenly used for "Tunisia".

W i t h o u t l o c a l i t y d a t a: 1 ex., only one label "Samml. A. Zimmermann" (ZSM); 1 aedeagus glued onto a point, label text "Penis G. laeticul." [hw Zimmermann] (ZSM). 1 ex., "laeticulus, (Desbroch. [= Desbrochers des Loges])" [hw ?], "42, Db" [small yellow label, printed] (SDEI).



Figs 3-6: Habitus of (**3**) *Graptodytes laeticulus* (SHARP, 1882), male from Aïn Damous, Algeria; (**4**) *G. laeticulus*, female from same locality; (**5**) *G. varius* (AUBÉ, 1838), male from Riunogues, southern France; (**6**) *G. varius* var. *pauper* (O. SCHMIDT, 1903), male from Zonza, Corsica, France (scale bar 2.0 mm).



Figs 7-11: Male tarsomeres and claws of (**7**) *Graptodytes laeticulus* (SHARP, 1882) (photo); (**8**) same (drawing); (**9**) same, mid-leg; (**10**) *G. varius* (AUBÉ, 1838) fore-leg; (**11**) same, mid-leg.

SHARP (1882: 453) described *G. laeticulus* as a valid species in the genus *Hydroporus*. He distinguished his new species from *G. varius* by the reduced black pattern of the elytra, the larger size and the strongly prolonged protarsal claws of the male. The status of the taxon was kept only for a short period until RÉGIMBART (1895: 23) mentioned "... me semble devoir être rapporté à cette espèce [= *varius*] comme variété, ..." (... it seems to me that it must be attributed to that species [= *varius*] as a variety ...) and afterwards it was BEDEL (1900: 59; not JACOBSON 1908: 423 as given in NILSSON 2001: 152 and 2016: 158) who treated the taxon definitely as a variety of *G. varius* for the first time.

We refrain from giving a complete redescription of the species, because the descriptive notes below together with the illustrations in Figs 3-4, 7-9, 12-16 and 19-21 are fully sufficient for reliable identification. Some remarks on important characters for identification are given, nevertheless.

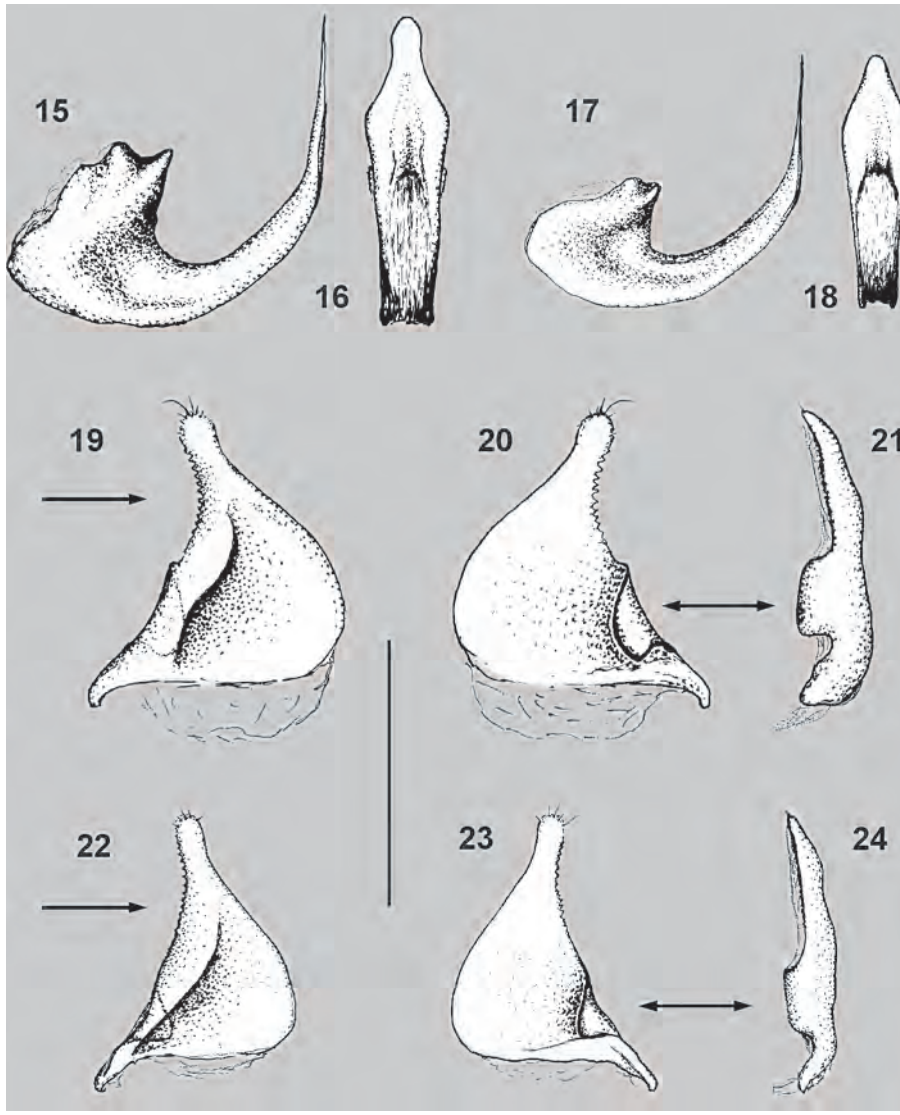
Descriptive notes

The yellow elytral marks of the species are indeed surprisingly extended (Figs 1, 3-4) and mostly enable separating the species from *G. varius* at first glance (Fig. 5; Fig. 6 shows a specimen of the var. *pauper*). For illustrating the elytral pattern of *G. varius* (Fig. 5), we have intentionally selected a male with relatively strongly developed yellow

Figs 12-14: *Graptodytes laeticulus* (SHARP, 1882), details of ventral surface (**12**) arrows pointing to abruptly narrowed epipleuron and row of ridges; (**13**) row of ridges, enlarged; (**14**) deeply incised hind margin of metacoxal processes with broadly rounded lobes.

areas (collecting data of the specimen: 16.7.1990, France, Pyrenées Orientales, Riunogues, env. Ceret, brook, Fery leg.). The elytral pattern of *G. varius* is rather variable and, usually, the yellow is less extended than in Fig. 5; in particular, we have not seen any specimen which has the yellow as strongly extended as in the *G. laeticulus* in Fig. 4.

Another feature which also has been already given by SHARP (1882) and which is very helpful for identification are the strongly prolonged protarsal claws of male *G. laeticulus* (cf. Figs 7-8). Additionally, the pro- and mesotarsomeres are somewhat more developed in *G. laeticulus* (Figs 8-9; compare with those of *G. varius*: Figs 10-11). We want to add that the metacoxal plates show near their posterior margin a series of longitudinally arranged ridges (Figs 12-13), a feature which to our knowledge has never been reported before, possibly because these ridges can be concealed by the metafemur when the ventral surface is examined. We suspect that this row has a stridulatory function. Such a row of ridges is present also in *G. varius*, in which it is, however, much less developed. The conjoint hind margin of the metacoxal processes is deeply incised centrally and each process is widely and evenly rounded (Fig. 14) as is characteristic of *Graptodytes* species. In Fig. 12 it is well recognisable that the right epipleuron is abruptly narrowed near its mid-length (at the level of the hind margin of the metacoxal plate).



Figs 15-24: **Figs 15-16, 19-21.** Aedeagus of *Graptodytes laeticulus* (SHARP, 1882) (**15**) median lobe in lateral view; (**16**) same in ventral view; (**19**) left paramere, outer surface; arrow pointing to row of teeth and direction of frontal view; (**20**) same, inner surface; (**21**) same, frontal view; arrow pointing to lobe being turned up to inner surface. Figs **17- 18, 22-24**. Aedeagus of *G. varius* (AUBÉ, 1838); text same as under *G. laeticulus* (scale bar 0.3 mm).

Graptodytes laeticulus is on average larger and more vaulted than *G. varius* although the ranges of lengths of both species overlap considerably: Lectotype: TL = 2.55 mm, TL-h = 2.35 mm, MW = 1.35 mm, TL/MW = 1.87, TL-h/MW = 1.71; other specimens at our disposal vary as follows: TL: 2.2-2.6 mm, TL-h: 2.0-2.4 mm, MW: 1.2-1.4 mm. For *G.*

varius we found: TL: 2.0-2.4 mm, TL-h: 1.85-2.15 mm, MW: 1.15-1.25 mm. GUIGNOT (1947: 119) gave for *G. varius* TL: 2.3-2.6 mm and in 1959 (p. 399) the same author gave TL: 2.3-2.5 mm. FRANCISCOLO (1979: 395) gave for *G. varius* TL: 2.3-2.7 mm. Possibly, both authors have included in their measurements also specimens from northern Africa, and thus some larger specimens of *G. laeticulus*. The latter is also somewhat more oval than *G. varius*, which can be seen when considering the ratio of total length and maximum width (e.g. TL/MW = 1.86 and TL-h/MW = 1.72 for the *laeticulus* specimen in Fig. 3 and TL/MW = 1.90 and TL-h/MW = 1.75 for the *varius* specimen in Fig. 5). However, the ranges of these ratios vary also and – like colouration and total length – can by no means be used for reliable identification of every specimen.

By contrast, the shape of the male genitalia is very helpful for distinguishing between both species:

- In *G. laeticulus* (Figs 15-16, 19-21) the outlines of the median lobe in ventral view are pre-apically slightly constricted and more apically broadened again; thus, the apex appears well separated from the rest of the lobe (Fig. 16). In *G. varius* (Figs 17-18, 22-24) the outlines are almost evenly tapering to the apex, slightly sinuate pre-apically, but without any constriction, and the apex is by no means separated from the rest of the lobe (Fig. 18).
- In *G. laeticulus* the ventral margin of the parameres (= left margin in Fig. 19) is more curved, the saw-like row (see the arrow in Fig. 19) of small teeth is more distinct (cf. Fig. 22 for *G. varius*).
- In the proximal third of the paramere there is a lobe which is strongly turned up to the inner surface (see Figs 20, 23; see also the arrows in Figs 20-21 and 23-24); this lobe is much more prominent in *G. laeticulus* than in *G. varius*; this is especially conspicuous in frontal view (Figs 21, 24).

Additionally, the male genitalia of *G. laeticulus* are distinctly and over-proportionally lager than those of the *G. varius*. The median lobes and parameres illustrated in Figs 15-24 belong to the specimens in Figs 3 and 5, respectively. Whilst the total length of the specimen of *G. laeticulus* shown in Fig. 3 is only about 8% larger than that of the specimen of *G. varius* in Fig. 5, in ventral view the length of the median lobe (Fig. 16) of the former exceeds that of the latter (Fig. 18) by about 20%.

N o t e s: Information about genetic studies can be found in RIBERA & FAILLE (2010, pp. 4, 11 and 12; under *G. varius*: HI16 from Algeria and DM38 from Tunisia) and in ABELLÁN et al. (2013, Appendix, tree of Hydroporini; under *G. laeticulus*: HI16).

E c o l o g y: The species was found by the junior author in small rest ponds of temporary streamlets (e.g. in early spring or after heavy rainfall; see Figs. 44, 48, 49: Mouilha Zizlag, Mouilha Ben Haouech and El K'haïla), as well as in streamlets which have slowly running water even in summer (e.g. Aïn Chef; see Fig. 43). In Mouilha Ben Haouech it was found together with the following other hydradephagan species: *Graptodytes flavipes* (OLIVIER, 1795), *G. fractus* (SHARP, 1882), *G. ignotus*, *Rhithrodytes numidicus* (BEDEL, 1889) and *Stictonectes samai* SCHIZZEROTTO, 1988. In El K'haïla the species co-occurred together with *Graptodytes ignotus*, *Stictonectes optatus* (SEIDLITZ, 1887) and *S. samai*. The species occurred exclusively in the pond at Mouilha Zizlag; this is a salty water, and when evaporating, the salt forms a whitish layer on the gravels ("Mouilha" is

derived from the Arabic word "melh" for salt). Other species which have been found to co-occur with *G. laeticulus* are: *Agabus* spec. (*brunneus*-complex), *A. didymus* (OLIVIER, 1795), *A. nebulosus* (FORSTER, 1771), *Bidessus goudotii* (LAPORTE, 1835), *B. minutissimus* (GERMAR, 1824), *Hydroglyphus geminus* (FABRICIUS, 1792), *Hydroporus feryi* WEWALKA, 1992, *H. pubescens* (GYLLENHAL, 1808), *H. tessellatus* (DRAPIEZ, 1819), *Hyphydrus aubei* GANGLBAUER, 1891, *Ilybius bedeli* (ZAITZEV, 1908), *Laccophilus minutus* (LINNAEUS, 1758), *Meladema coriacea* LAPORTE, 1835, *Stictonectes optatus*, *Yola bicarinata* (LATREILLE, 1804), and *Noterus laevis* STURM, 1834.

D i s t r i b u t i o n: Algeria, Tunisia and Morocco (the latter not confirmed by modern material studied). N o t e s: *Graptodytes varius* occurs in Morocco, but to our knowledge not in Algeria or Tunisia.

Graptodytes varius var. *pauper* (O. SCHNEIDER, 1903)

Hydroporus varius var. *pauper* O. SCHNEIDER, 1903:51; SAINTE-CLAIRE DEVILLE 1914: 53.
Hydroporus ignotus var. *pauper* O. SCHNEIDER; GOZIS 1914: 116.
Graptodytes varius ab. *pauper* (O. SCHNEIDER); ZIMMERMANN: 1920: 117, 1932: 82; LUIGIONI 1929: 157; GUIGNOT 1959: 400.
Graptodytes varius var. *pauper* (O. SCHNEIDER); GUIGNOT 1947: 119; ROCCHI 1989: 86.
Graptodytes varius pauper (O. SCHNEIDER); SCHAEFER 1964: 122; GIUDICELLI & TALIN 1977: 39.
Graptodytes varius (AUBÉ, 1838); FRANCISCOLO 1979: 405; BAMEUL & QUENEY 2014: 95; NILSSON 2001: 152, 2016: 158; NILSSON & HÁJEK 2016: 36.

T y p e l o c a l i t y : Corsica.

T y p e m a t e r i a l : We have not been able to trace any type material of this taxon.

In many publications not only *G. laeticulus*, but also *Graptodytes varius* var. *pauper* (O. SCHNEIDER, 1903) are treated as synonyms of *G. varius*. This is why we want to add also some notes on this taxon. First, it shall be mentioned that SCHNEIDER (1903) differentiated well between varieties (var.) and aberrations (ab.) (see e.g. l.c., p. 44, third line). Thus, according to article 45.6.4 of the ICZN (1999) his taxon must be regarded as having originally subspecific rank and, accordingly, *pauper* O. SCHNEIDER is an available name.

We have studied many specimens from Corsica and Sardinia. Most of them are indeed much darker (Fig. 6) than the continental *G. varius* (Fig. 5) and the elytral pattern often resembles that of *G. ignotus* (collecting data of the *pauper* in Fig. 6 (a male): 27.5.2012, France, Corse, ca. 6 km SSE Zonza, ca. 41.70N 9.21E, 950 m, little brook, Fery leg.). Several specimens are even slenderer than "normal" *G. varius* and in this respect also come closer to *G. ignotus*. We have also observed that in several specimens the protarsal claws are slightly longer than in continental specimens, but by far not as long as in *G. laeticulus*. The shape of the median lobe as well as that of the parameres, however, are clearly equal to those of the continental *G. varius*.

At present we come to the conclusion that all characters of the variety are in the range of variation of continental European and Moroccan *G. varius*. We want to add that *G. varius* often comes very close to *G. ignotus*. Additionally, we were surprised that in some localities *G. varius* and *G. ignotus* occur together and both species can easily be

separated, but in other localities we found not only both species, but also many specimens which show all transitional stages between them. We have no explanation for these observations and hope that future investigations will reveal a solution to this problem. Such studies must include also the two taxa *Graptodytes fractus* (SHARP, 1882) and *Graptodytes kuchtae* (BREIT, 1908).

M e a s u r e m e n t s: The range of body size of specimens from Corsica and Sardinia is the same as that of continental *G. varius*.

Graptodytes kuchtae (BREIT, 1908)

Hydroporus (*Graptodytes*) *kuchtae* BREIT, 1908: 59.
Hydroporus kuchtae BREIT; BREIT 1909: 76; TENENBAUM 1915: 35; FUENTE 1921: 74.
Graptodytes kuchtae (BREIT); ZIMMERMANN 1919: 182 (n. comb.), 1920: 113; GUIGNOT 1933: 901; FOSTER 1994: [2]; RIBERA & FAILLE 2010: 4, 11, 12 (phylogeny); NILSSON 2016: 158; NILSSON & HÁJEK 2016: 36.
Graptodytes ignotus ab. *kuchtae* (BREIT); ZIMMERMANN 1932: 83.
Graptodytes ignotus form. *kuchtai* (BREIT); BURMEISTER, 1939: 229 (incorrect subsequent spelling).
Graptodytes ignotus kuchtai GUIGNOT 1959: 401 (objective junior synonym of *kuchtae* BREIT).
Graptodytes kuchtai (BREIT); NILSSON & FERY 2006: 58; FERY & FRESNEDA 2007: 132.
Graptodytes fractus (SHARP, 1882); RICO et al. 1990: 88; NILSSON 2001: 151, 2003: 59.

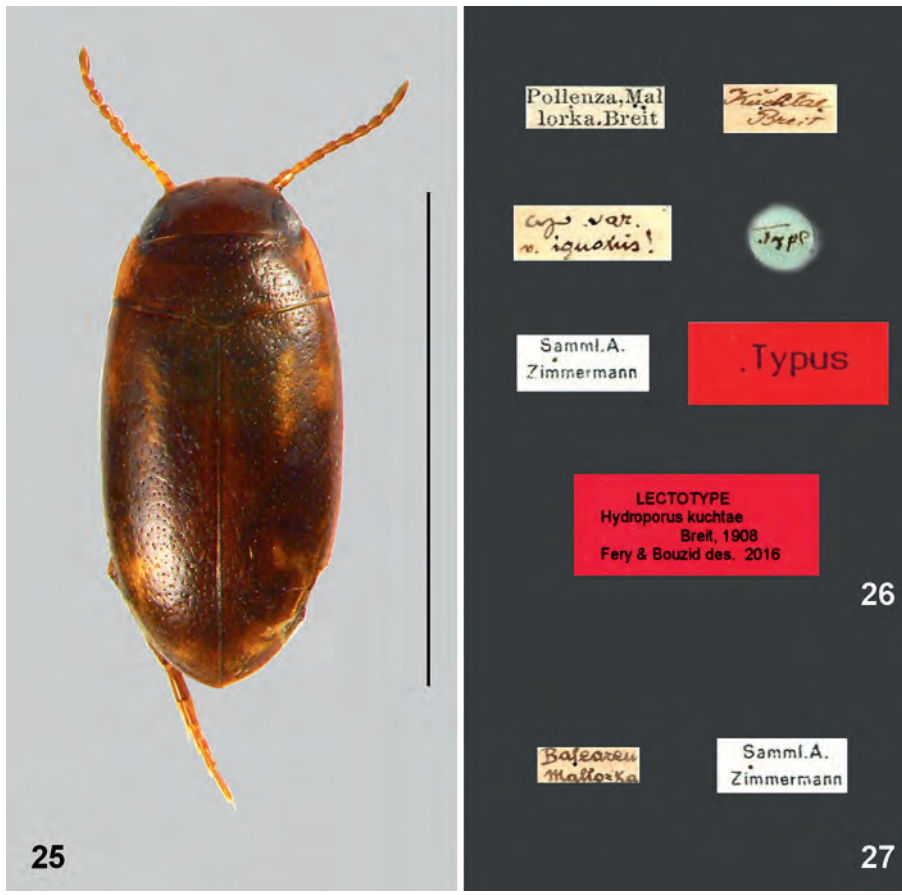
T y p e l o c a l i t y: Spain, Balearic Islands, Mallorca, Pollenza (Majorca Pollença).

T y p e m a t e r i a l: Lectotype (present designation): ♂, "Pollenza, Mallorka, Breit" [printed], "Kuchtae, Breit" [hw Breit], "[two or three illegible letters] var. v. [= "var. von" = "var. of"] ignotus!" [hw Zimmermann], "Type" [round light blue label, hw Zimmermann], "Samml. A. Zimmermann" [printed], "Typus" [red label, printed; unauthorised curatorial designation], "Lectotype, Hydroporus kuchtae Breit, 1908, Fery & Bouzid des. 2016" [red, printed] (ZSM); scans of the labels are given in Fig. 26. N o t e s: The lectotype was originally glued onto a point (small triangular card); we have glued it onto a new bigger rectangular card. BREIT (1908: 60) reported several specimens, but we have not been able to find other syntypes.

A d d i t i o n a l m a t e r i a l s t u d i e d: 1♂, 1♀, "Balearen, Mallorka" [hw Zimmermann], "Samml. A. Zimmermann" [printed]; each specimen also originally glued onto a point (ZSM; see Fig. 27 for scans of labels). 1 ex., "Mallorca 7.5.[19]78, Puig Major 700 m, leg. Malicki (Mal. 3.)", "Graptodytes fractus kuchtae Breit, det. G. Wewalka [19]85" (CHF). 9 exs, "2/4.1.1990 E [= Spain], Mallorca nr. Lluc, on C710, pools with Schoenoplectus, G. Foster leg.", "Graptodytes fractus kuchtae Breit, Fery det." (CHF).

BREIT (1908) compared his new species with *G. fractus* (in the genus *Hydroporus*, subgenus *Graptodytes*) and pointed especially to the darker colouration and the flatter and more parallel body shape. We can confirm his description and want to add that the dark areas of the elytra are dark brownish and not black (Fig. 25). While in *G. fractus* the yellowish parts are only very diffusely delimited, the border between the dark brownish and the yellowish parts are rather well marked in *G. kuchtae*. The lengths of the specimens which have been studied are more or less equal to that of the lectotype. The median lobe and the parameres are similar to those of *G. varius*; in particular, the species bears also the saw-like row of small teeth on the ventral surface of the parameres (as do also *G. fractus* and *G. ignotus*).

Additionally we want to point to the trees in RIBERA & FAILLE (2010, figs 12 and 13) which show that *G. varius*, *G. laeticulus*, *G. kuchtae*, *G. ignotus* and *G. fractus* are five closely related species which are in strong need of further investigations. As a first step, we decided to designate the lectotype of *Hydroporus kuchtae* BREIT, 1908. The habitus



Figs 25-27: *Graptodytes kuchtae* (BREIT, 1908) (**25**) lectotype, habitus (scale bar 2.0 mm); (**26**) lectotype labels; (**27**) labels of one of other two specimen in ZSM.

of this lectotype and scans of the respective labels are given in Figs 25-26. It has a total length of 2.1 mm and a maximum width of 1.0 mm. The specimen is slightly damaged in the sub-apical region of the right elytron, it lacks all legs except the right fore- and the left hind-leg.

D i s t r i b u t i o n: The species is only known from the Balearic Islands.

N o m e n c l a t u r a l n o t e s: BREIT (1908: 60) dedicated the new species to his friend Gustav Kuchta together with whom he collected several specimens in Majorca. Since Kuchta was a man, it might have been the reason for some entomologists to use the spelling "*kuchtai*" instead of "*kuchtae*" (originally "*Kuchtae*"). BURMEISTER (1939: 229) was the first who used the spelling "*kuchtai*" instead of "*kuchtae*", but gave neither a justification nor an explanation for this nomenclatural act. Thus, his "*kuchtai*" might be inferred as subsequent incorrect spelling (see article 33.3 of the ICZN, 1999) and not as an (unjustified) emendation. On the other hand, BURMEISTER called the taxon "eine sehr

flache Form" (= a very flat form) of *G. ignotus*. Since in his work he differentiated well between "subspecies" (under the term "Rasse" = race), aberrations and forms, his treatment must not be accepted as giving the name subspecific rank, but only as giving it infrasubspecific rank (see second part of article 45.6.4 of the ICZN, 1999). Anyway, BURMEISTER's name is an unavailable name (article 19.1 of the ICZN, 1999). GUIGNOT (1959: 401; footnote) used also the spelling "*kuchtai*" and added "n. emend." (thus, this was no lapsus!). Although without giving any justification, the name "*kuchtai*" must be accepted as an emendation. However, since this emendation is unjustified, it cannot be accepted as a valid name. Nevertheless, according to article 33.2.3 of the ICZN (1999) the name is an available name with the author GUIGNOT and the date 1959, and it is a junior objective synonym of *kuchtae* BREIT, 1908. Because in that footnote GUIGNOT treated *G. kuchtai* as a variation ("var.") of *Graptodytes ignotus*, the name *kuchtai* has subspecific rank according to article 45.6.4 of the ICZN (1999). Additionally, in the same footnote the author gave *Graptodytes ignotus* var. *fallaciosus* GUIGNOT, 1932 as a junior synonym of *kuchtai*. This variation was described by GUIGNOT (1932: 402) from south-western France as a more brownish variation of *G. ignotus* with a flatter and more parallel habitus resembling that of *G. fractus*. As the distribution area for both taxa, GUIGNOT gave the Balearic Islands and southern France. It is likely that GUIGNOT did never study the real *G. kuchtae*, which occurs only on the Balearics.

Miscellaneous notes on other *Graptodytes* species

Hydroporus narentinus ZIMMERMANN, 1915

Hydroporus narentinus ZIMMERMANN, 1915: 220.

Graptodytes bilineatus var. *narentinus* (ZIMMERMANN); ZIMMERMANN 1919: 182, 1920: 110; LUIGIONI 1929:157; FRANCISCOLO 1979: 411.

Graptodytes bilineatus narentinus (ZIMMERMANN); J.[G.] MÜLLER 1926: 290; DEPOLI 1930: 83.

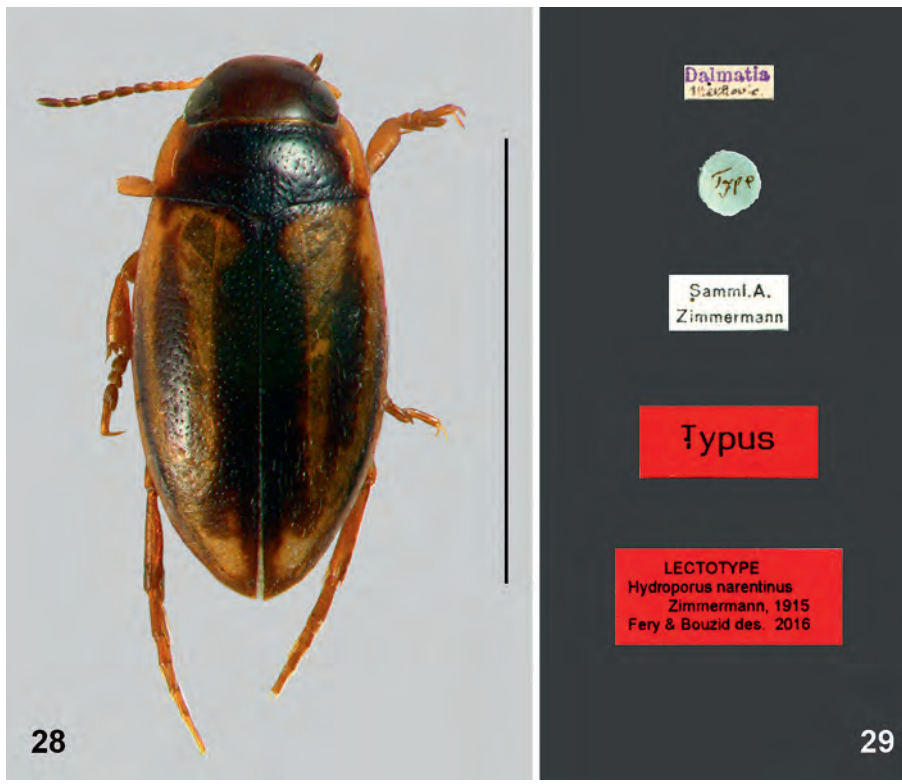
Graptodytes bilineatus var. *dalmatinus* ZIMMERMANN, 1932: 81 (lapsus for *narentinus*).

Graptodytes bilineatus (STURM, 1835); GUÉORGUIEV 1971: 13; NILSSON 2001: 151, 2016: 157; NILSSON & FERY 2006: 65 (sub *dalmatinus*).

T y p e l o c a l i t y: Croatia, Metcovic, ca. 60 km NW Dubrovnik.

T y p e m a t e r i a l: Lectotype (present designation): ♂, "Dalmatia [printed], Metkovic [hw Zimmermann]", "Type" [round light blue label, hw Zimmermann], "Samml. A. Zimmermann" [printed], "Typus" [red label, printed; unauthorised curatorial designation], "Lectotype, Hydroporus narentinus Zimmermann, 1915, Fery & Bouzid des. 2016" [red, printed] (ZSM); scans of the labels are given in Fig. 29. 1♀, same labels as the lectotype, but "Paratypus" [red label, printed; unauthorised curatorial designation] and "Paralectotype, Hydroporus narentinus Zimmermann, 1915, Fery & Bouzid 2016" [red, printed] (ZSM). 1 ex., same labels as the female paralectotype; the abdomen and most appendages are missing (ZSM). The lectotype and the two paralectotypes were originally glued onto points (small triangular cards); we have glued them onto new bigger rectangular cards to protect them against further mechanical damage. Next by these three specimens we have found a single aedeagus which was glued onto a point mounted at a separate pin. This pin had labels "Penis, G. narentinus" [hw Zimmermann] and "Samml. A. Zimmermann" [printed]. We are convinced that this aedeagus belongs to the paralectotype without abdomen and have glued the aedeagus onto the new rectangular card behind that specimen and mounted the two labels at the same pin below the other four labels. The apices of the median lobe and of both parameres are strongly damaged.

The habitus of the lectotype is given in Fig. 28. It has a total length of 2.5 mm and a maximum width of 1.2 mm; nine right antennomeres, all tarsomeres of the left fore-leg and the fifth tarsomere of the right hind-leg are missing; the apex of the median lobe is slightly and the right paramere strongly damaged.



Figs 28-29: *Graptodytes narentinus* (ZIMMERMANN, 1915) (**28**) lectotype, habitus (scale bar 2.0 mm); (**29**) lectotype labels.

ZIMMERMANN (1919: 182) himself stated that *narentinus* should be treated only as a variety of *G. bilineatus*. Except J.[G.] MÜLLER (1926) and DEPOLI (1930) this taxon was and is still treated as a variety or as a junior subjective synonym of *G. bilineatus*. We are not fully convinced that *narentinus* is conspecific with *G. bilineatus*. The lectotype (Fig. 28) and the two paralectotypes are unusually small and slender (compared with central European *G. bilineatus*). More topotypical material should be collected and eventually sequenced for molecular studies. At present, we refrain from changing the status of this taxon as a junior subjective synonym of *G. bilineatus*. However, we designate the lectotype as a first step of future studies of a possible complex of species around *G. bilineatus*, which probably comprises also *Graptodytes snizeki* HENDRICH, 1993. We want to mention also specimens from north-eastern Turkey (near Tortum, Erzurum province; preliminarily determined as *G. bilineatus*; in CHF) which are also unusually

small and slender and, additionally, have the yellow pattern strongly reduced. Another specimen from Pester, Serbia, has a similar habitus, but the dorsal surface is almost totally black (CHF).

Graptodytes dalmatinus ZIMMERMANN, 1932 is another taxon which is usually treated as a junior subjective synonym of *G. bilineatus*. Strange enough, no syntypes could be found in the ZSM. A careful comparison of the descriptions of *H. dalmatinus* and *G. narentinus* shows that the text of both is identical in part. Additionally, the description of *dalmatinus* includes no hint on the collecting site and that it is a new taxon. This is why we are convinced that the name *dalmatinus* is nothing else than a lapsus, an incorrect subsequent spelling of *narentinus*. Thus, according to article 33.3 of the ICZN (1999) *dalmatinus* "is not an available name and ... it does not enter into homonymy and cannot be used as a substitute name ..."

Graptodytes pietrii NORMAND, 1933

Graptodytes pietrii NORMAND, 1933:297; GUIGNOT. 1959: 406; GSCHWENDTNER 1939: 36; FERY 1988: 161, 1995: 38, RIBERA & FAILLE 2010: 11.

T y p e l o c a l i t y: Le Kef, Tunisia.

Type material: The lectotype was designated by FERY (1995: 38) and is kept in the MNHN. Some paralectotypes are stored also in the MNHN and several further ones in the INAT (see FERY 1995: 38).

Graptodytes pietrii was recorded by FERY (1988) also from Sicily (Italy). Seven years later, however, the Sicilian specimens were attributed to the new species *Graptodytes siculus* FERY, 1995. Both species belong together with *Graptodytes castilianus* FERY, 1995, and *Graptodytes aequalis* (ZIMMERMANN, 1918) to the *aequalis*-group of species as given in RIBERA & FAILLE (2010: 11).

As far as we know, GUIGNOT (1959: 406) was the only author who recorded this species from Algeria (Edough, near Annaba). We can state that this species is rather abundant in north-eastern A l g e r i a and give the following modern records (all environs of Annaba): 23 exs, 29.6.2009, nr Ben-Azzouz (Skikda), Garaet Chichaya, 36.886N 7.300E, 10 m; 1 ex., 4.7.2009, nr Ben-Azzouz (Skikda), Garaet Zaouia, 36.869N 7.380E, 2 m; 2 exs, 7.7.2009, nr El-Kala (El-Tarf), 36.882N 8.343E, Marécage Mellah, 1 m; 1 ex., 17.6.2007, Mellah, El Kala (El Tarf) 36.868N 8.342E, spring, 3 m; 9 exs, 14.3.2007, Réserve Brabtia, El Kala (El Tarf) 36.849N 8.326E, pond, 20 m; 1 ex., 26.5.2005, Oued El-Hout, El Kala (El Tarf), 36.836N 8.439E, 20 m; 2 exs, 15.6.2006 Gauthier, El Kala (El Tarf) 36.836N 8.439E, temporary pool, 30 m; 3 exs, 11.4.2006, Raml-Souk, El Tarf, 36.793N 8.520E, streamlet, 110 m; 2 exs, 8.6.2006, idem; 16 exs, 8.6.2006, Raml-Souk, El Tarf, 36.792N 8.522E, well, 100 m; 1 ex., 16.3.2006, Mare El Feid, Ben M'Hidi (El Tarf), 36.733N 8.029E, 10 m; 1 ex., 23.6.2007, Djebel Ghorra, Bougous (El Tarf) 36.605N 8.366E, pond, 790 m; 1 ex., 29.4.2006, Ghobn Kef-Kourrath, Medjez Sfa (Guelma), 36.437N 7.854E, 530 m; 1 ex., 28.3.2006, Ghobn Chaabat Errich, Medjez Sfa (Guelma), 36.427N 7.839E, 320 m; all specimens Bouzid leg. (CHF, CSB).

Some records from northern T u n i s i a shall be added: 3 exs, 9.4.1992, near Le Kef, Fery leg. (CHF). 2 exs, 27.4.2006, Oued Lebna, 36.94N 10.89E, 7 m; 3 exs, 23.10.2005, idem; 2 exs, 25.7.2005, idem; 1 ex., 29.11.2005, SSW Tabarka, Oued Amor amont [amont = upstream], 36.92N 8.74E, 12 m; 2 exs, 30.8.2005, Oued Bouterfes, 36.95N 8.91E, 100 m; all specimens Touaylia, Bejaoui & Boumaiza leg. (CHF).

Tassilodytes nov. gen.

T y p e s p e c i e s: *Hydroporus parisii* GRIDELLI, 1939, by monotypy.

Already GUIGNOT (1959: 408) called *Graptodytes parisii* an "énigmatique" species and wrote that it is difficult to assign to it any unquestionable systematic position. Although only a single female of GRIDELLI's species is known, we come to the same conclusion and are even unable to assign to it any of the known subtribes. The species belongs, however, no doubt to the tribe Hydroporini of the subfamily Hydroporinae. These difficulties make it necessary to give an exhaustive description and to illustrate as many characters as possible.

Diagnosis

According to the key to genera in PEDERZANI (1995) the species clearly belongs to the subfamily Hydroporinae because of the concealed scutellum and the pseudotetramerous pro- and mesotarsi. His key leads to the Australian *Antiporus* SHARP, 1882, *Tiporus* WATTS, 1985, and especially *Megaporus* BRINCK, 1943. We have checked these very unlikely possibilities by studying specimens of all three genera in our collections, but are sure that none of them applies to the species. We can add that none of the works dealing with African genera (e.g. GUIGNOT 1959, OMER-COOPER 1965) was of any help identifying the genus of this species.

Furthermore, the following characters show that the new genus belongs to the tribe Hydroporini:

- epipleuron without oblique humeral carina (Figs 31, 35);
- metafemur separated from outer margin of metacoxal process by anterior part of metatrochanter (Fig. 36) (not separated in *Laccornis* GOZIS, 1925; cf. figs 33, 35 in NILSSON & HOLMEN 1995).
- metatarsal claws equal in length and shape.

On the one hand the short but distinct sublateral longitudinal stria on each side of the pronotum (Fig. 30) refers to the subtribe Siettitiina; however, on the other hand, the species shows two features the combination of which definitely excludes it from this subtribe:

- hind margin of metacoxal processes only slightly incised, more laterally slightly sinuate, almost straight (Fig. 36);
- epipleuron becoming evenly narrower posteriad and not abruptly narrowed near midlength (Figs 31, 35).

Other features exclude the species from any genus which might be considered a possible choice. These features are here shortly listed, but again given in detail in the description of the species: (1) upper surface not matt, but moderately shiny, (2) punctation on entire surface normal, not stellate, (3) elytra with dots, not vittate, (4) anteromedial metaventral process truncate (Fig. 39), without groove for reception of prosternal process, (5) interlaminary bridge of metacoxae concealed and (6) sixth abdominal ventrite without apical impression.

According to all these observations, we see no other possibility than to introduce a new genus which we attribute preliminarily to none of the known subtribes of Hydroporini,

but group it together with *Siamoporus* SPANGLER, 1996 in NILSSON's (2016: 166) "subtribe unknown".

E t y m o l o g y: The name *Tassilodytes* relates to the geographically isolated wonderful Tassili mountain range in south-eastern Algeria combined with *dytes*, which is latinised from the Greek δύτης (diver). The gender of the generic name is masculine.

***Tassilodytes parisii* (GRIDELLI, 1939) (nov.comb.)**

Graptodytes parisii GRIDELLI, 1939: 408; GUIGNOT 1959: 408; FRANCISCOLO 1983: 645; FERY 1995: 33; RIBERA & FAILLE 2010: 11.

T y p e l o c a l i t y: Algeria, Tassili, Tin el Fokki (ca. 24.76N 9.91E).

T y p e m a t e r i a l: Holotype: ♀, "Tassili, Tin El Fokki, Ottobre 1936, G. Scortecci" [printed], "Holotypus" [red, printed], "Graptodytes Parisii n. sp. [most probably hw Gridelli], DET. E GRIDELLI 1939 [printed]", "Tassilodytes gen. n. parisii (Gridelli, 1939), Fery & Bouzid det. 2016" [printed] (MCSN); scans of the labels are given in Fig. 32.

This is one of those extremely rare species which are known only from a single specimen. We know also of only four publications (except the original description) in which the name of this species is mentioned, but the species is here not treated in detail because none of the authors of these publications has seen the holotype. Nobody except GRIDELLI himself seems ever to have studied the holotype and the species has never been found again; in particular, the male of this species is unknown. The senior author had the opportunity to study the holotype for a while, and thus we can provide a thorough redescription and add several new features to GRIDELLI's original description from the year 1939.

Redescription

H a b i t u s: Body shape more or less oval (Figs 30, 31); outline with very indistinct discontinuity at bases of pronotum and elytra. Upper surface longitudinally as well as transversely more or less evenly vaulted. Dorsal surface weakly shiny, not matt; predominantly black, with four reddish brown spots on each elytron.

H e a d dark brown, centrally on clypeus, frons and vertex with diffusely delimited more reddish brown areas. Anterior margin almost evenly rounded, only very slightly truncate, without rim. Anteromedially between eyes with two rather large clypeal grooves. Entire surface more or less evenly reticulate with fine polygonal meshes, but in anterior part of clypeus meshes slightly smaller. Punctation sparse and normal (i.e. not stellate; same on pronotum, elytra and ventral surface), on clypeus punctures smaller, on frons somewhat denser; diameter about that of meshes; vertex with very sparse punctation; clypeal grooves with denser coarser punctures; head along inner margin of eyes with line of rather coarse punctures; setae on entire surface absent. Many intersections of meshes with very small puncture (same on pronotum and elytra).

P r o n o t u m black, near anterior angles diffusely delimited brownish; sides weakly curved posteriorly, in anterior third almost straight; greatest width of pronotum near posterior angles; margin with narrow blackish bead, in anterior fourth slightly thinner. Sublateral stria on each side perceptible, but short and not deeply impressed; more or less only indicated by three or four impressed punctures; else pronotum without depressions, evenly vaulted. Angle between sides and base of pronotum slightly less than 90°; angles

shortly rounded. Posterior margin sublaterally sinuate, thus posterior angles appearing very slightly deflected backwards; posterior margin centrally expanded backwards; scutellum concealed. Reticulation with meshes slightly larger than on head, near anterior margin somewhat transverse, otherwise more regularly polygonal (isodiametric); punctation denser and coarser than on head; near anterior and posterior margin still coarser and denser, but not forming distinct puncture lines; small area on disc with very few punctures, except one very coarse puncture centrally. Setae sparse and indistinct, present only right and left of disc.

Figs 30-32: *Tassilodytes parisii* (GRIDELLI, 1939) (**30**) holotype, dorsal surface; (**31**) same, ventral surface; (**32**) holotype labels (scale bar 4.0 mm).

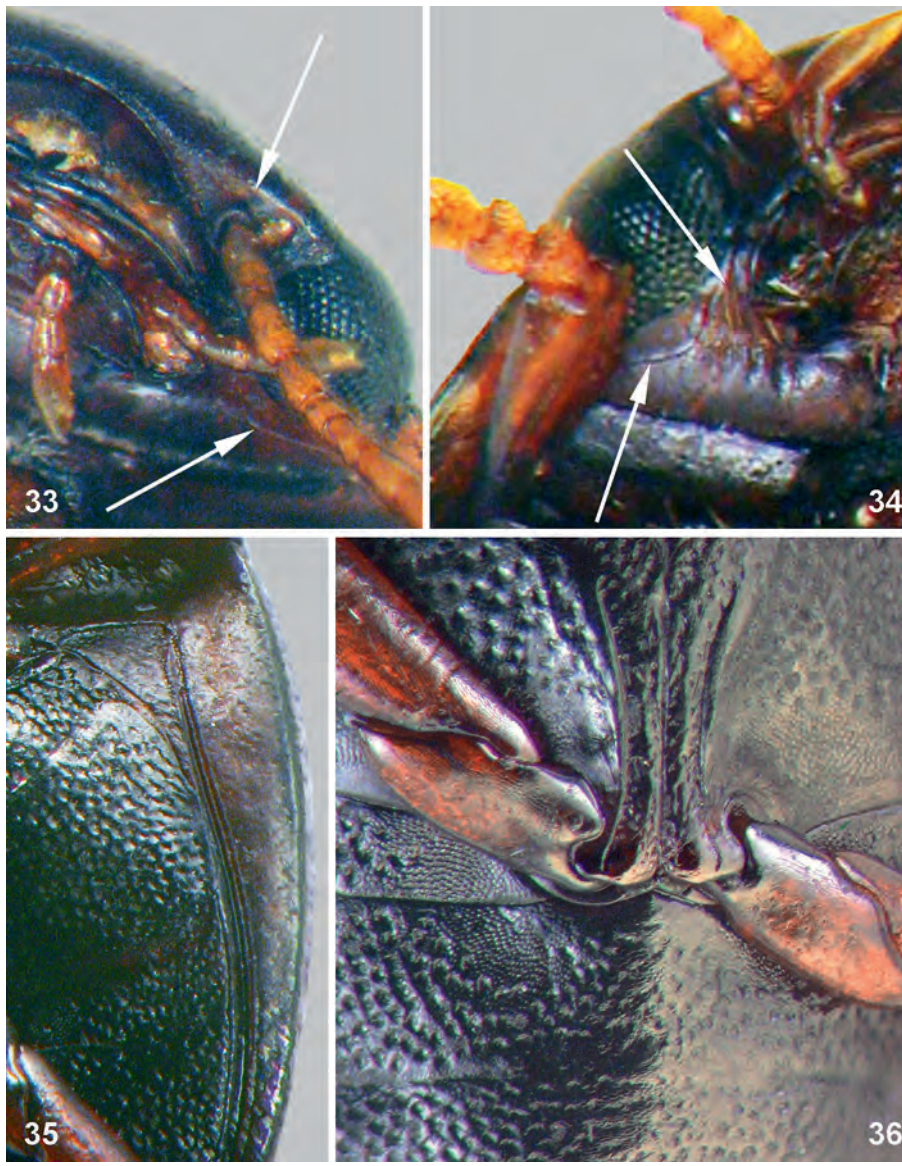
E l y t r a black, each elytron with four distinct lighter reddish brown longitudinal spots (Fig. 30); in posterior third with stripe of similar colour along margin; small area on apex also brownish. Sides of elytra almost evenly rounded, maximum width before middle of elytral length; apically conjointly rounded, not pointed; surface more or less evenly convex; reticulation and punctation similar to that on pronotum; sutural puncture line very distinct; base of elytra near suture with some coarser and strongly impressed punctures. One discal puncture line weakly indicated by denser punctation; second more lateral puncture line almost imperceptible; further lines absent. Setae more distinct than on pronotum, present on outer third and posterior fourth of elytra.

V e n t r a l s u r f a c e: Head and prothorax dark brown, metathorax predominantly black. Genae and gula of same colour; epipleura dark brown; mesoepimeron and mesoepisternum, metaepisternum and narrow distal part of metaventral wing (curved strongly backwards) (Fig. 35) even darker brown; metacoxal processes in posterior third, hind margin of metacoxal plates (Fig. 36) and of abdominal ventrites 3-6 shining through brownish (Fig. 31); mouthparts, including maxillary and labial palps, as well as antennae and legs more or less uniformly reddish-yellowish brown. First and second antennomeres rather long, third and fourth distinctly shorter; fifth to tenth somewhat longer than fourth, eleventh almost twice as long as tenth. Antennomeres reticulate and impunctate, but fifth to eleventh antennomere anterodistally with two large (sensorial?) punctures, each provided with a very short bristle; apex of lasts antennomere shortly truncate and tip also provided with a short bristle.

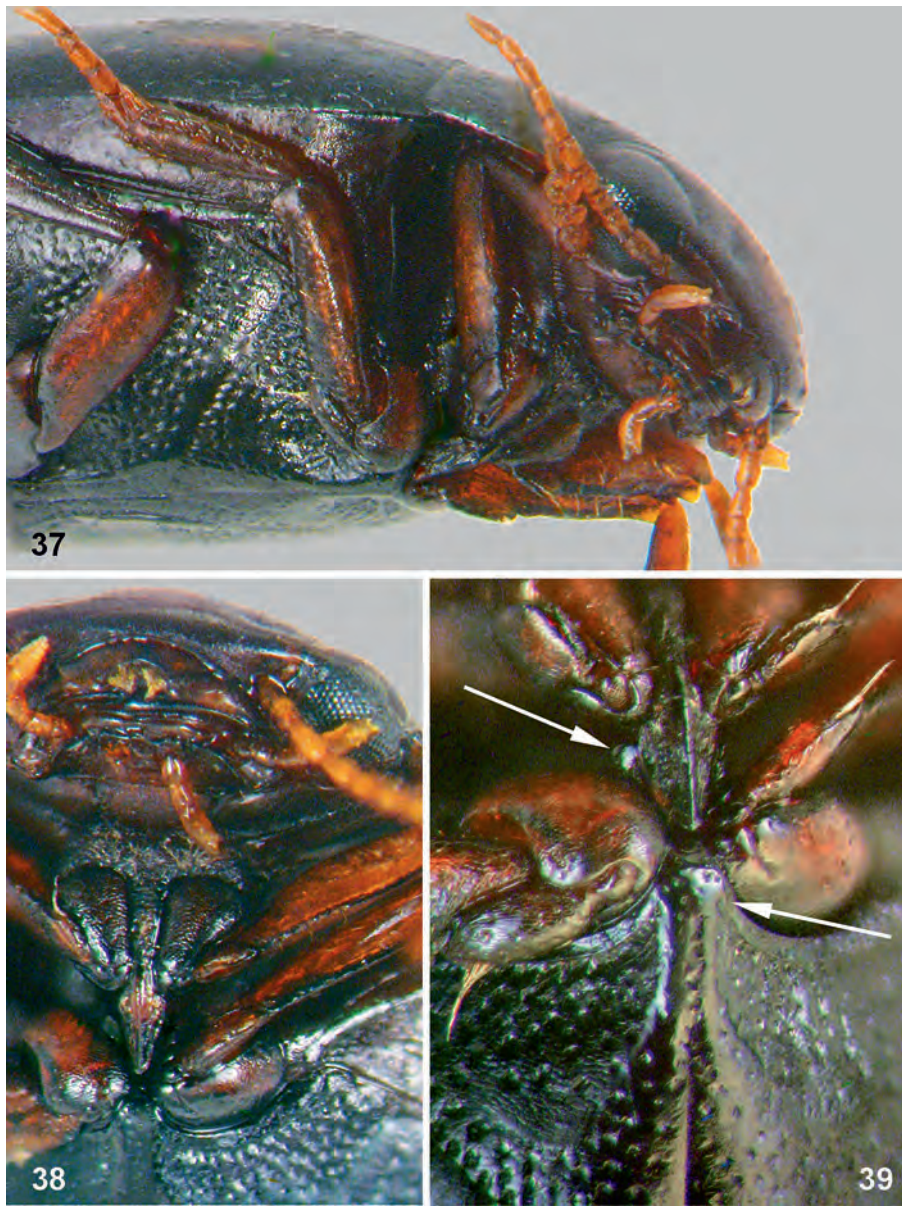
Head behind eye with distinct crease (Figs 33, 34); between mouthparts and eyes with a few wrinkles (Fig. 34); genae and gula reticulate, gula laterally with some coarse punctures. Apex of last labial and maxillary palpomeres deeply incised (Figs 33, 37-38); antennal cavity as in Fig. 33.

Base of prosternum anterior to procoxae distinctly elevated, with deeply impressed very coarse punctures, thus surface strongly sculptured; prosternal column (= part of prosternum between procoxae, ascending to prosternal process; sometimes called also "file") near middle of procoxae with indistinct protuberance, before with four or five weak transverse ridges. Prosternal process (= part behind procoxae = "the blade") narrowly lanceolate, apex pointed (Figs 38-39); process more or less tectiform in cross-section; sides narrowly bordered and here with a few coarse punctures and some distinct setae. Declivity of prosternum (column between procoxae) distinct, in lateral view forming an angle of about 40° with surface of metaventrite (Fig. 37); prosternal process weakly inclined. Tip of prosternal process not reaching onto anteromedial metaventral process, and even not contacting its surface (Figs 37-39); however, this situation most probably due to preparation and such contact present if prosternum made more inclined to ventral surface. Anterior angle of hypomeron (pronotal epipleuron) with a flat and more or less triangular area, provided with some small punctures and longitudinal wrinkles.

Anteromedial metaventral process rather narrow, slightly broader than mesotrochanter; tip truncate and short before apex slightly broadened (Fig. 39); without furrow for reception of prosternal process, however, very shallow impression visible if adequately illuminated. N o t e s: We could not study the structure of the mesocoxal cavities, but we assume that these are not closed because the anteromedial metaventral process is relatively narrow. We want to add that these cavities are not closed in species of *Graptodytes* and *Stictonectes*.



Figs 33-36: *Tassilodytes parisii* (GRIDELLI, 1939), holotype (**33**) ventral side of head; arrows pointing to cavity of left antenna and crease behind left eye; (**34**) idem, arrows pointing to wrinkles between right eye and mouthparts and crease behind right eye; (**35**) left metaepisternum and left epipleuron; (**36**) metacoxal processes.



Figs 37-39: *Tassilodytes parisii* (GRIDELLI, 1939), holotype (**37**) lateral view, showing almost straight elytral margin near shoulder; (**38**) ventral view, showing vaulted prosternum before procoxae, prosternal column (between procoxae) and prosternal process; (**39**) ventral view, arrows pointing on anteromedial metaventral process and small visible part of right side of "mesosternal fork" serving to receive prosternal process (see SHARP 1882: 224).

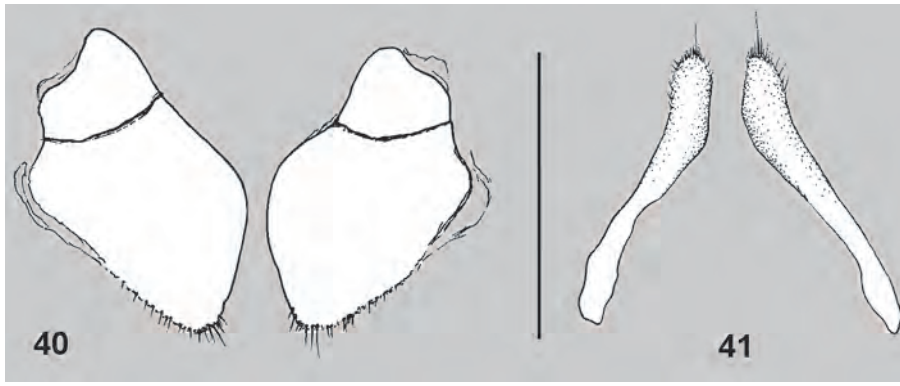
Epipleura without oblique subhumeral carina, becoming evenly narrower posteriad and not abruptly narrowed near mid-length (Figs 31, 35). Metaepisternum almost triangular in shape (Fig. 35). Ratio of width of metacoxal plate (= WC) to width of lateral lobe of metaventrite (= WV): WC/WV ca. 3/1 (cf. fig. 3 in PETROV et al. 2010: 43). Metacoxal lines diverging anteriad, not reaching posterior margin of metaventrite; joint hind margin of metacoxal processes only weakly incised (Fig. 36), here shortly rounded and more laterally slightly sinuate, almost straight; interlaminary bridge concealed. Abdominal ventrites simple; hind margin of last ventrite evenly rounded, without apical impression, and thus different from that of *Graptodytes* species.

Legs without conspicuous features. Anterior and posterior claws of all legs similar, evenly curved, not prolonged. Metafemur separated from metacoxal process by part of metatrochanter (Fig. 36), along midline with about 10 setiferous punctures, else with very few additional setiferous punctures; anterior surface of metatibia with line of about 11 spiniferous punctures; else reticulate, but not punctate. Metatarsi not punctate; metatarsomere 2-5 more or less of equal length, first tarsomere shorter than second and third together. Natatorial setae present on meso- and metatibiae and on first four metatarsomeres.

Almost entire venter – including elytral epipleura – reticulate, but somewhat shiny, not appearing matt; only metaventrite along midline and metacoxal processes without reticulation. Mesoepimeron and mesoepisternum distinctly reticulate; not punctate except narrow strip behind anterior margin of mesoepisternum, here punctures rather coarse and dense. Meshes of reticulation on metaventrite and metacoxal plates rather small, polygonal, mostly weakly impressed; in posterior third of metacoxal plates meshes more distinct and surface inside meshes convex, thus surface here appearing somewhat roughly sculptured; on last four abdominal ventrites meshes elongate and transversely arranged. Metaventrite except along midline and in small areas left and right of midline rather densely punctate; similar punctation in anterior two thirds of metacoxal plates and entire abdomen; punctures rather coarse, diameter about that of three or four meshes, distance between punctures equalling their diameter; first to fifth abdominal ventrites centrally with punctures somewhat smaller and sparser; each metacoxal process with two slightly irregular lines of relatively small punctures (Fig. 36). Epipleura with sparse small punctures and few indistinct setae. Metaventrite and metacoxal plates and processes without setae; posterior half of third to fifth and entire sixth abdominal ventrites with indistinct and sparse setae. Third to fifth abdominal ventrite centrally provided with tuft of rather long setae (cf. exhaustive description in GRIDELLI 1939: 408 and fig. 1 on p. 409). (N o t e s: Such tufts of long setae are known from many other Dytiscidae). Margin of elytra in lateral view straight before humeral angle, not at all ascending; slightly inclined against margin of pronotum; slight step present because pronotum reaching over elytra (Fig. 37). Epipleuron visible until humeral angle (Fig. 37).

G e n i t a l i a: The gonocoxosterna and gonocoxae of the female holotype are given in Figs 40 and 41, respectively. Their shapes are similar to those of other Hydroporini species, and thus a close relationship to *Stictonectes* can be excluded also in this respect. In species of the latter genus the gonocoxae and gonocoxosterna are very slender as illustrated e.g. in FRESNEDA & FERY (1990: 80-81, figs 6-7) and FRANCISCOLO (1979: 429, figs 1203-1207).

M e a s u r e m e n t s: TL: 3.9 mm, TL-h: 3.55 mm, MW: 2.1 mm.



Figs 40-41: *Tassilodytes parisii* (GRIDELLI, 1939), holotype (**40**) gonocoxosterna; (**41**) gonocoxae (scale bar 0.4 mm).

N o t e s: The left fore-leg and left hind-leg of the holotype lack the last four tarsomeres. In the section "Material and methods" we mentioned that we abstained from studying features which need dissection, and thus might cause considerable damage. This is why we did not study details like the carina on the ventral surface of the elytra (and the eventual presence of a ligula). We refrained also from dismantling a mid-leg including its coxa for studying the mesocoxal cavity. We have also not studied the metathoracic wings, the flight muscles and the metathoracic furca to check whether the species might be capable of flight.

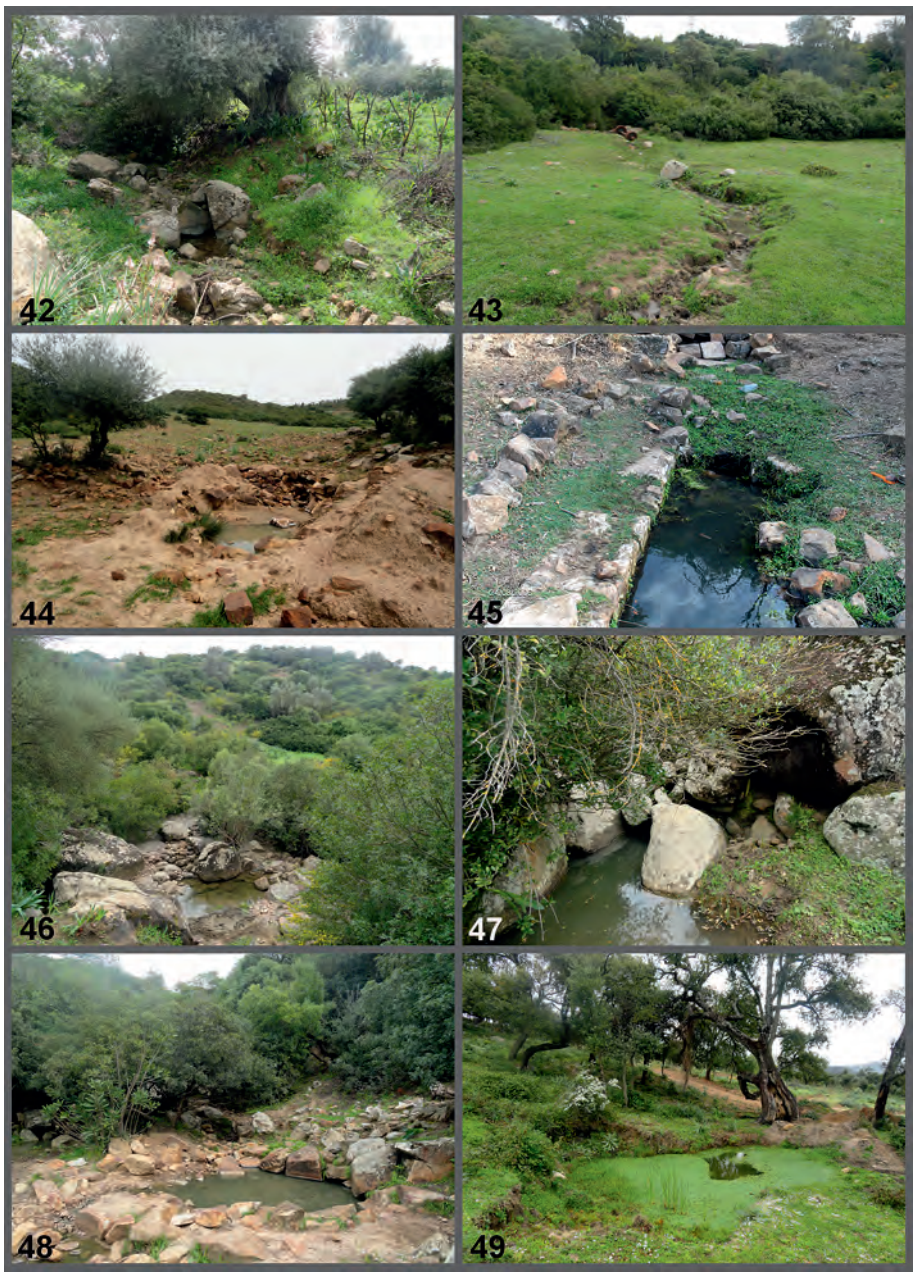
E t y m o l o g y: GRIDELLI (1939: 411) dedicated his new species to his friend Bruno Parisi, at that time the director of the MCSN. It is a noun in the genitive case.

D i s t r i b u t i o n: Known only from the type locality.

Notes on names formed from personal names

The dispute about how to spell the specific name of *G. kuchtae* (see above) shall be taken as an opportunity for adding some general remarks on names formed from personal names. In particular, this seems to be necessary because some kind of confusion seems still to exist among zoologists and only recently TURNER et al. (2015: 1) used such an unjustifiably emended name.

The Code (ICZN 1999) is not unambiguous in the question. On the one hand in article 31.1.2 it is stated: "a species-group name, if a noun in the genitive case ... formed directly from a modern personal name, is to be formed by adding to the stem of that name *-i* if the personal name is that of a man, ... *-ae* if of a woman ...". On the other hand in article 32.2 is given: "the original spelling of a name is the 'correct original spelling', unless it is demonstrably incorrect as provided in Article 32.5." And in article 32.5 – "Spellings that must be corrected (incorrect original spellings)" – is stated: "If there is in the original publication itself, without recourse to any external source of information, clear evidence of an inadvertent error, such as a lapsus calami or a copyist's or printer's



Figs 42-49: Collecting sites: (**42**) Chaabat Errich; (**43**) Aïn Chef; (**44**) Mouilha Zizlag; (**45**) Aïn Damous; (**46**) Chaabat Settara; (**47**) Chaabat Sangot; (**48**) Mouilha Ben Haouech; (**49**) El K'haïla; all localities situated in Medjez Sfa region (Guelma province).

error, it must be corrected. Incorrect transliteration or latinization, or use of an inappropriate connecting vowel, are not to be considered inadvertent errors."

Is the use of an incorrect ending an "incorrect transliteration or latinization"? DUBOIS (2007) discussed the problems in much detail. As a (strongly shortened) conclusion, it can be said that it is impossible to determine whether a personal name has been correctly transliterated or latinised by its author, and thus the original spelling of a name formed from a personal name must not be emended.

One might also argue that the Code gives in article 31.1.2 a few rules how such names must be formed and that these rules must be followed. But what to do if an author does not follow these rules? The only article in the Code which applies to cases where it is mandatory to change the suffix of a specific name is article 34. Here it is stated, that "the ending of a Latin or latinised adjectival or participial species-group name must agree in gender with the generic name with which it is at any time combined". Thus, we can conclude that once such an apparently "incorrectly formed name" (which is no adjectival or participial species-group name) is published, it must NOT be emended. No article of the Code allows the change of such a name, even if the respective author did not follow the rules of article 31.1.2.

It may be helpful to have a look into the previous edition of the Code (ICZN 1985). Here we have article 32 (c) which is more or less identical to article 32.5.1 of the 1999 edition. However, in the 1985 edition (on p. 69) an Example is given which deals almost exactly with our case (ending *-i* although name formed from two persons), and here this is called an incorrect original spelling that **must be corrected** (to *-orum*). This example and the respective claim are not anymore included in the 1999 edition of the Code. This is a strong proof that such apparently original incorrect spellings must NOT be corrected since 1999.

One might have some sympathy for the rule in the 1985 version of the Code. However, we should prefer the new one because, after reduction to its main content,

- it is very simple: "the original spelling is the correct one!" – that's all! (with the exception of the mandatory changes given in article 34 which are, however, very simple and easily to understand) and
- it avoids cases of doubts where it is not clear whether the name was dedicated to a man or a woman or a family or whatever.

For those colleagues who are still not persuaded that the arguments given above are correct, we want to add that the senior author in 2009 made an inquiry to the Secretary of the ICZN considering such apparently "incorrect" names: the reply was short and simple – emendations of such names are unjustified! As a consequence of this reply NILSSON in the 2010 online-version of the World Catalogue changed the suffixes of several names which he had unjustifiably emended some time before (in the 2007 and 2008 online-versions) (see also NILSSON 2016: 11). Since the issuing of the 2010 online-version of the World Catalogue, no further unjustified emendation of such specific names have appeared (among hydradephagan names). However, TURNER et al. (2015: 1) expressly used the name *Agabus margaretae* (with author LARSON, year 1975 and comment "incorrect original spelling (ICZN 1999, Art. 31.1)"), instead of the correct original *Agabus margareti* LARSON, 1975. Seemingly, TURNER et al. (2015) had no knowledge of the unjustified emendation *Agabus margaretae* LARSON, ALARIE & ROUGHLEY, 2000. Thus,

their nomenclatural act is another unjustified emendation with the authors TURNER, TOLEDO & MAZZOLDI and the year 2015.

Subsequently, in October 2015 the senior author sent another inquiry to the Secretary of the ICZN. The reply was: "Certainly your original interpretation, which I agreed with in 2009, is still correct and there have not been any changes to the way the Code handles incorrectly formed names with respect to gender or number of people to whom genitive-ending names are dedicated."

Acknowledgements

We thank all colleagues and curators mentioned in the section 'Material and methods' for the loan of material. Special thanks are due to Fabrizio Rigato (MCSN) who kindly let us study the holotype of *Tassilodytes parisii*, the only specimen of this species known to science. Katja Neven (ZSM) and Ignacio Ribera (Barcelona, Spain) gave some very helpful hints. We also thank Pyotr Petrov (Moscow, Russia) for improving the English of an earlier version of this work.

Zusammenfassung

Es werden mehrere Taxa aus der Gattung *Graptodytes* SEIDLITZ, 1887 behandelt. Anlass dazu war einerseits das Auffinden umfangreichen Materials von *G. laeticulus* (SHARP, 1882) im Nordosten Algeriens und andererseits die Möglichkeit den Holotypus des *G. parisii* GRIDELLI, 1939 erstmalig seit seiner Originalbeschreibung ausführlich zu untersuchen.

Schon kurz nach seiner Beschreibung wurde *G. laeticulus* als jüngeres subjektives Synonym des *G. varius* (AUBÉ, 1838) angesehen und dieser Status bis heute beibehalten. Sowohl extern-morphologische Merkmale als auch die Form der Aedeagus zeigen jedoch, dass das Taxon seinen ursprünglichen Status als valide Art zurück erhalten muss. Im Rahmen der Untersuchungen der beiden genannten Arten wurden auch andere Vertreter der Gattung studiert. Dazu gehören *G. ignotus* (MULSANT & REY, 1861), *G. fractus* (SHARP, 1882), *G. kuchtae* (BREIT, 1908), *G. pietrii* NORMAND, 1933 und die var. *pauper* (O. SCHMIDT, 1903) des *G. varius*.

Die Taxa *Hydroporus narentinus* ZIMMERMANN, 1915 und die var. *dalmatinus* ZIMMERMANN, 1932 des *Graptodytes bilineatus* (STURM, 1835) werden gewöhnlich als jüngere subjektive Synonyme des letzteren angesehen. Es wird kurz darauf eingegangen, dass *G. bilineatus* in seinem Verbreitungsgebiet erheblich variiert und weitere Untersuchungen umfangreichen Materials notwendig sind um den Status der Art zu klären. Weiterhin wird der Name *dalmatinus* als unkorrekte nachträgliche Schreibweise von *narentinus* angesehen (lapsus calami).

Graptodytes parisii ist in nur einem weiblichen Exemplar, dem Holotypus, bekannt. Diese enigmatische Art aus dem Tassili-Gebirge im Südosten Algeriens weist eine Kombination mehrerer Merkmale auf, die eine Zuordnung zu keiner der bekannten Gattungen der Unterfamilie Hydroporinae zulässt. Die Zugehörigkeit zum Tribus Hydroporini scheint klar zu sein, aber schon die Zuordnung zu einem Subtribus ist unmöglich, obwohl auf Grund des sublateralen Halsschild-Strichels der Subtribus Siettitiina SMRŽ, 1982 naheliegend wäre. Aus diesen Gründen wird die Gattung *Tassilodytes* nov.gen. eingeführt und die Art ausführlich neu beschrieben und illustriert.

Lectotypen werden für die folgenden nominellen Taxa designiert: *Hydroporus kuchtae* BREIT, 1908, *Hydroporus laeticulus* SHARP, 1882, und *Hydroporus narentinus* ZIMMERMANN, 1915. Die Gattung *Graptodytes* hat nach wie vor 22 Arten, zwei davon mit jeweils zwei Unterarten. Abschließend werden noch einige nomenklatorische Anmerkungen zu von Personennamen abgeleiteten Artnamen gemacht.

References

ABELLÁN P., SÁNCHEZ-FERNÁNDEZ D., PICAZO F., MILLÁN A., LOBO J.M. & I. RIBERA (2013): Preserving the evolutionary history of freshwater biota in Iberian National Parks. — Biological Conservation **62**: 116-126.

ÁDÁM L. (1996): A check-list of the Hungarian caraboid beetles (Coleoptera). — Folia Entomologica Hungarica. Rovartani Közlemények (Series Nova) **57**: 5-64.

AUBÉ C. (1838): Hydrocanthares et gyriniens. — In: DEJEAN P.F.M.A., Species général des coléoptères de la collection de M. le Comte Dejean. Vol. **6**. — Paris: Méquignon Père et Fils, xvi + 804 pp.

BAMEUL F. (1989): Description de *Rhithrodytes*, nouveau genre d'Hydroporinae d'Europe et d'Afrique du nord: analyse phylogénétique et biogéographie (Coleoptera: Dytiscidae). — Annales de la Société Entomologique de France (N.S.) **25** (4): 481-503.

BAMEUL F. & P. QUENEY (2014): Gyrinidae, Haliplidae, Noteridae, Paelobiidae, Dytiscidae, pp. 81-102. — In: TRONQUET M. (ed.), Catalogue des coléoptères de France. — Perpignan: Association Roussillonnaise d'Entomologie, 1052 pp. [Dytiscidae on pp.: 84-102]

BEDEL L. (1885-1925): Catalogue raisonné des coléoptères du nord de l'Afrique (Maroc, Algérie, Tunisie et Tripolitaine) avec notes sur la faune des Îles Canaries et de Madère, première partie. — Paris: Société Entomologique de France, 402 pp. [pp. 321-402 in 1925]

BEDEL L. (1900): Exploration scientifique de la Tunisie. Catalogue raisonné des coléoptères de Tunisie. — Paris: Imprimérie Nationale, xiv + 130 pp.

BILTON D.T. (2012): *Stictonectes rebeccae* sp.n. from the Iberian Peninsula, with notes on its phylogenetic position (Coleoptera, Dytiscidae). — Zootaxa **3188**: 42-54.

BREIT J. (1908): Eine koleopterologische Sammelreise auf Mallorka (Balearen). — Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien **58**: 52-67.

BREIT J. (1909): Eine koleopterologische Sammelreise auf Mallorka (Balearen). — Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien **59**: 72-94.

BURMEISTER F. (1939): Biologie, Ökologie und Verbreitung der europäischen Käfer auf systematischer Grundlage. I. Band: Adephaga. I. Familiengruppe: Caraboidea. — Goecke Verlag, Krefeld: 307 pp.

DEPOLI G. (1930): I coleotteri della Liburnia. Parte I: Adephaga - Palpicornia. — Fiume. Rivista della Societa di Studi Fiumani **7** (1929): 73-150.

DUBOIS A. (2007): Genitives of species and subspecies nomina derived from personal names should not be emended. — Zootaxa **1550**: 49-68.

FERY H. (1988): Erstnachweis von *Graptodytes pietrii* NORMAND für die italienische Fauna (Coleoptera, Dytiscidae). — Entomologica Basiliensia **12**: 159-164.

FERY H. (1995): Notizen zur *a*[*e*]*qualis*-Gruppe und weiteren Arten der Gattung *Graptodytes* SEIDLITZ 1887 (Coleoptera: Dytiscidae). — Entomologische Zeitschrift **105** (3): 33-51.

FERY H. (2013): *Rhithrodytes* – are we all blind? — Latissimus **34**: 13-15.

FERY H. & J. FRESNEDA (2007): Los "Hydradephaga" (Coleoptera: Dytiscidae, Gyrinidae, Haliplidae, Noteridae, Paelobiidae) de la Península Ibérica e Islas Baleares de las colecciones J. Fresneda y H. Fery. — Boletín de la Sociedad Entomológica Aragonesa **41**: 119-171.

FOSTER G.N. (1994): Balearic checklist of aquatic Coleoptera. — Privately published, 11 pp. [unpaginated]

FRANCISCOLO M.E. (1979): Coleoptera, Haliplidae, Hygrobiidae, Gyrinidae, Dytiscidae. — Fauna d'Italia **14**: 1-804.

FRANCISCOLO M.E. (1983): Perche' la Sardegna non ha endemiti tra i coleotteri adefagi acquaioli? [In: Il popolamento animale e vegetale della Sardegna] — Lavori della Societá Italiana di Biogeografia (nuova serie) **8** (1980): 641-660.

FRESNEDA J. & H. FERY (1990): *Stictonectes occidentalis* n.sp. vom Südwesten der iberischen Halbinsel (Coleoptera: Dytiscidae). — Entomologische Zeitschrift **100** (5): 73-83.

FUENTE J.M. DE LA (1921): Catálogo sistemático-geográfico de los coleópteros observados en la península ibérica, Pirineos propriamente dichos y Baleares. — Boletín de la Sociedad Entomológica de España **4** (5-6): 74-89.

GRIDELLI E. (1939): Coleotteri del Fezzan e dei Tassili d'Aggèr (Missione Scortecci 1936). — Atti della Società Italiana di Scienze Naturali **78**: 385-456.

GIUDICELLI J. & J. TALIN (1977): Recherches sur les peuplements de coléoptères d'eau courante en Corse. — Ecologia Mediterranea **3**: 33-54.

GOZIS M. DES (1914): Tableaux de détermination des dytiscides, notérides, hyphydrides, hygrobiides et haliplides de la Faune Franco-Rhénane (part). — Miscellanea Entomologica **22** (1): 113-128.

GSCHWENDTNER L. (1939): Monographie der paläarktischen Dytiscidae. X. Ergänzungen und Register. — Koleopterologische Rundschau **25**: 23-69.

GUÉORGUIEV V.B. (1971): Coleoptera hydrocanthares et Palpicornia. — Catalogus Faunae Jugoslaviae **3** (6): 1-45.

GUIGNOT F. (1931-1933): Les hydrocanthares de France. — Toulouse: Les Frères Douladoure, xv + 1057 pp. [pp. 1-188: 1931, pp. 189-786: 1932, 787-1057: 1933]

GUIGNOT F. (1945): Dix-neuvième note sur les hydrocanthares. — Bulletin de la Société d'Étude des Sciences Naturelles de Vaucluse **14** (3-4) (1943): 5-9.

GUIGNOT F. (1947): Coléoptères hydrocanthares. — Faune de France **48**: 1-287.

GUIGNOT F. (1959): Revision des hydrocanthares d'Afrique (Coleoptera Dytiscoidea). Deuxième partie. — Annales du Musée Royal du Congo Belge, Tervuren (Belgique), Série 8vo, Sciences Zoologiques **78**: 321-648.

ICZN (1985): International Code of Zoological Nomenclature, adopted by the XX. General Assembly of the International Union of Biological Sciences. — Huddersfield, England: Charlesworth & Co., 338 pp.

ICZN (1999): International code of zoological nomenclature. Fourth edition. — London: The International Trust for Zoological Nomenclature, 306 pp.

JACOBSON G.G. (1905-1915): The beetles of Russia, West Europe and adjacent countries. 11 fascs. — Petersburg: A.F. Devrien, 1024 pp. [in Russian; No. 6, pp. 401-480 from 1908]

KOCHER L. (1958): Catalogue commenté des coléoptères du Maroc Fascicule II, Hydrocanthares, Palpicornes, Brachélytres. — Travaux de l'Institut Scientifique Chérifien (Société des Sciences Naturelles et Physiques du Maroc); Série Zoologique **14**: 1-244.

LARSON D.J. (1975): The predaceous water beetles (Coleoptera: Dytiscidae) of Alberta: systematics, natural history and distribution. — Quaestiones Entomologicae **11**: 245-498.

LARSON D.J., ALARIE Y. & R.E. ROUGHLEY (2000): Predaceous diving beetles (Coleoptera: Dytiscidae) of the Nearctic Region, with emphasis on the fauna of Canada and Alaska. — Ottawa: NRC Research Press, 982 pp.

LUIGIONI P. (1929): I coleotteri d'Italia, catalogo sinonimico – topografico – bibliografico. — Memorie della Pontificia Accademia delle Scienze Nuovi Lincei (2) **13**: 1-1160.

MARSEUL S.A. DE (1882): Nouveau répertoire contenant les descriptions des espèces de coléoptères de l'ancien-monde publiées isolément ou en langues étrangères, en dehors des monographies ou traités spéciaux et de l'Abeille. — L'Abeille **20**: 1-196.

MILLER K.B. & J. BERGSTEN (2014): The phylogeny and classification of predaceous diving beetles, pp. 49-172. — In: YEE D.A. (ed.), Ecology, systematics, and the natural history of predaceous diving beetles (Coleoptera: Dytiscidae). — Dordrecht, Heidelberg, New York, London: Springer.

MÜLLER J.[G.] (1926): I coleotteri della Venezia Giulia. Vol. 1. Adephaga. — Studi Entomologici **1** (2): 1-306.

MULSANT E. & C. REY (1861): Description de quelques coléoptères nouveaux ou peu connus. — Annales de la Société Linnéenne de Lyon (NS) **7** (1860): 300-345.

NILSSON A.N. (2001): World catalogue of insects. Vol. 3. Dytiscidae Coleoptera. — Stenstrup: Apollo Books, 395 pp.

NILSSON A.N. (2003): Family Dytiscidae, pp. 35-78. — In: LÖBL I. & A. SMETANA (eds), Catalogue of Palaearctic Coleoptera, 1. Archostemata – Myxophaga – Adephaga. — Stenstrup: Apollo Books, 819 pp.

NILSSON A.N. (2016): A world catalogue of the family Dytiscidae, or the diving beetles (Coleoptera, Adephaga). Internet version 1.I.2016. Available from the URL http://www.norrent.se/images/stories/upload/Skorvnopparn/Worldcatalogues/wcd_2016a.pdf (last access April 2016).

NILSSON A.N. & H. FERY (2006): World catalogue of Dytiscidae – corrections and additions, 3 (Coleoptera: Dytiscidae). — Koleopterologische Rundschau **76**: 55-74.

NILSSON A.N. & J. HÁJEK (2016): Catalogue of Palearctic Dytiscidae (Coleoptera). Internet version 2016-01-01. Available from the URL: http://www.waterbeetles.eu (last access April 2016).

NILSSON A.N. & M. HOLMEN (1995): The aquatic Adephaga (Coleoptera) of Fennoscandia and Denmark. II. Dytiscidae. — Fauna Entomologica Scandinavica **32**: 1-192.

NORMAND H. (1933): Contribution au catalogue des coléoptères de la Tunisie. Fascicule 2(1). — Bulletin de la Société d'Histoire Naturelle de l'Afrique du Nord **24** (8): 295-307.

NORMAND H. (1938): Contribution au catalogue des coléoptères de la Tunisie (13e fascicule) (1). — Bulletin de la Société d'Histoire Naturelle de l'Afrique du Nord **29** (5): 337-371.

OMER-COOPER J. (1965): Chapter 2. Coleoptera: Dytiscidae. A review of the Dytiscidae of Southern Africa being the results of the Lund University Expedition 1950-1951, with which are incorporated all other records known to the author. — South African Animal Life **11**: 59-214.

PEDERZANI F. (1995): Keys to the identification of the genera and subgenera of adult Dytiscidae (sensu lato) of the world (Coleoptera Dytiscidae). — Atti dell'Accademia Roveretana degli Agiati, a. **244**, ser. VII, vol. IV, B (1994): 5-83.

PETROV P.N., SHAPOVALOV M.I. & H. FERY (2010): A new species of *Ilybius* ERICHSON, 1832 (Coleoptera: Dytiscidae) from the North Caucasus. — Russian Entomological Journal **19** (1): 41-45.

RÉGIMBART M. (1895): Revision des Dytiscidae et Gyrinidae d'Afrique et Madagascar et îles voisines. — Mémoires de la Société Entomologiques de Belgique **4**: 1-244.

RIBERA I. & A. FAILLE (2010): A new microphthalmic stygobitic *Graptodytes* SEIDLITZ from Morocco, with a molecular phylogeny of the genus (Coleoptera, Dytiscidae). — Zootaxa **2641**: 1-14.

RICO E., PEREZ L. & C. MONTES (1990): Lista faunistica y bibliografica de los Hydradephaga (Coleoptera: Haliplidae, Hygrobiidae, Gyrini dae, Noteridae, Dytiscidae) de la Peninsula Iberica e Islas Baleares. — Asociacion Española de Limnologia, Listas de la Flora y Fauna de las Aguas Continentales de la Peninsula Iberica **7**: 1-216.

ROCCHI S. (1989): Contributo alla conoscenza degli idroadefagi della Corsica (XIV nota sui coleotteri idroadefagi). — Atti Museo Civico Storia Naturale Grosseto **9/10** (1986): 81-93.

SAINTE-CLAIRE DEVILLE J. (1914): Catalogue critique des coléoptères de la Corse. — Caen, 573 pp.

SCHAEFER L. (1964): Dix voyages entomologiques en Corse. — Annales de la Société Horticulture et Histoire Naturelle de Herault **104**: 119-134.

SCHNEIDER O. (1903): Über Melanismus korsischer Käfer. — Isis in Dresden **1902**: 43-60.

SEIDLITZ G. (1887): Bestimmungs-Tabelle der Dytiscidae und Gyrinidae des europäischen Faunengebietes. — Verhandlungen des Naturforschenden Vereines in Brünn **25** (1886): 3-136.

SEVERIN G. (1892): Les collections d'articulés du Musée Royal d'Histoire Naturelle de Belgique. — Annales de la Société Entomologique de Belgique **36**: 469-478.

SHARP D. (1882): On aquatic carnivorous Coleoptera or Dytiscidae. — The Scientific Transactions of the Royal Dublin Society (2) **2**: 179-1003 + pls 7-18.

SMRŽ J. (1981): Respiration – a new function of some hydroporine elytra (Coleoptera, Dytiscidae, Hydroporinae). — Acta Entomologica Bohemoslovaca **78**: 209-215.

SMRŽ J. (1982): Comparative anatomy of proventriculus and intraelytral structure of the suborder Adephaga (Coleoptera) — Acta Universitatis Carolinae – Biologica 1980: 213-296.

TENENBAUM S. (1915): Faune coléoptérologique des îles Baléares. — Warszaw: Gebertnera and Wolffa, 150 pp. [in Polish]

TURNER C.R., TOLEDO M. & P. MAZZOLDI (2015): A previously unrecognised species of *Agabus* LEACH, 1817 in Italy and Central Europe (Coleoptera: Dytiscidae). — Koleopterologische Rundschau **85**: 1-6.

ZIMMERMANN A. (1915): Beiträge zur Kenntnis der Europäischen Dytiscidenfauna. — Entomologische Blätter **11**: 218-225.

ZIMMERMANN A. (1919): Die Schwimmkäfer des Deutschen Entomologischen Museums in Berlin-Dahlem. — Archiv für Naturgeschichte **83** A (12) (1917): 68-249.

ZIMMERMANN A. (1920): Dytiscidae, Haliplidae, Hygrobiidae, Amphizoidae. — In: SCHENKLING S. (ed.), Coleopterorum Catalogus, Vol. 4, pars 71. — Berlin: W. Junk, 326 pp.

ZIMMERMANN A. (1932): Monographie der paläarktischen Dytisciden. III. Hydroporinae (3. Teil). — Koleopterologische Rundschau **18**: 69-111.

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