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Notes on *Rhithrodytes* BAMEUL, 1989, with the description of *R. minimus* nov.sp. from Algeria (Coleoptera, Dytiscidae. Hydroporini, Siettitiina)

Hans FERY

A b s t r a c t: *Rhithrodytes minimus* nov.sp. is described from Algeria. The species is the smallest of all members of the genus. In particular, it is considerably smaller than the two other North-African species *R. dorsoplagiatus* (FAIRMAIRE, 1880) and *R. numidicus* (BEDEL, 1889). So far *R. argaensis* BILTON & FERY, 1996 was treated as subspecies of *R. agnus* FOSTER, 1992. Recently published molecular data suggest that both subspecies must be treated as valid species, and thus the rank of the former is elevated to generic level. For the first time the habitus and the male genitalia of all eight members of the genus are illustrated in a single work to facilitate their identification. A syntype of *Hydroporus sexguttatus* AUBÉ, 1838 has been found in the collection of the IRSN, but it is not designated as the lectotype of the species because it is a female and because the species appears to be very variable across its distribution area and is in need of further investigations.

K e y w o r d s: Coleoptera, Dytiscidae, Hydroporinae, Siettitiina, *Rhithrodytes*, new species, syntype, new status.

Introduction

When visiting the MNHN in Paris in June 2011, among other things, I was looking for syntypes of *Rhithrodytes sexguttatus* (AUBÉ, 1838). I was not successful, but, quite by chance, I found in a drawer of the collection R. Oberthür (ex coll. Wehncke) a single very small *Rhithrodytes* BAMEUL, 1989 with labels "Algeria" and "Fairmaire" (see Figs 1-2; most probably collected in the second half of the 19th century) placed close to a series of *R. sexguttatus*. At first I assumed that it might be an extremely small *R. dorsoplagiatus* (FAIRMAIRE, 1880). But after dissecting the specimen I found distinct differences in the shape of their median lobes of aedeagi. Since there seems to be no opportunity of collecting more material in the near future, I decided to describe it as *Rhithrodytes minimus* nov.sp. although a description established on a single specimen might be regarded as somewhat "courageous".

In the course of the description of *Rhithrodytes agnus argaensis* BILTON & FERY, 1996, the authors already suspected that the two taxa might deserve specific rank because beside small external-morphological differences they found considerable differences in the shape of the male genitalia. However, the taxon was described as a subspecies because both authors could not imagine that two so similar species could occur in

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localities which are only about 10 km apart from each other. Twenty years later there is much more evidence that both taxa must indeed be treated as valid species because now results of molecular studies support this view. This is why I elevate the rank of *R. argaensis* to specific.

BAMEUL (1989: 484) gave a key to those four species which were known to him at that time. Today the genus has eight members, but I refrain from constructing a new key because all species can be easily identified by their body shape (Figs 12-19) and male genitalia (Figs 20-35) in combination with their distribution areas. These figures make it also unnecessary to provide a section Discussion with lengthy differential descriptions. I refrain also from giving a synopsis of the genus, because the respective data can be found easily in NILSSON (2016).

Material and methods

Specimens were studied with an Olympus SZX16 stereomicroscope. The illustrated aedeagi were studied in wet condition. Photos were made with a Nikon Coolpix 995 camera attached to the stereomicroscope and subsequently treated with 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), MW (maximum width) and hw (handwriting). Label texts are cited in quotation marks, additional comments are given in square brackets. Co-ordinates are given in decimal notation.

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

CHF..... coll. H. Fery, Berlin, Germany (property of the NMW)
IRSN ..... Institut Royal des Sciences Naturelles, Belgium (P. Limbourg)
MNHN ..... Muséum National d'Histoire Naturelle, Paris, France (A. Mantilleri)
NMW ..... Naturhistorisches Museum Wien, Vienna, Austria (M.A. Jäch)
ZSM ..... Zoologische Staatssammlung, München, Germany (M. Balke, L. Hendrich)

Taxonomy

The genus *Rhithrodytes* BAMEUL, 1989

The generic name *Rhithrodytes* was introduced by BAMEUL (1989) for a group of species which before were treated as members of genus *Graptodytes* SEIDLITZ, 1887. BAMEUL (1989) established the separation of the new genus based on the distinct sublateral striae of the pronotum which extend from the anterior to the posterior margin and on the symmetric and distinctly curved apex of the median lobe of aedeagus. The declivity of the prosternum between its anterior margin and the procoxae is very weak. In contrast to all other members of Siettitiina SMRŽ, 1982, species of *Rhithrodytes* have the elytral epipleuron provided with a distinct oblique carina near the shoulder (see Fig. 5, arrow "a") – similar to the epipleural carina e.g. in members of Hygrotini PORTEVIN, 1929. This

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observation was reported in FERY (2013) (cf. Figs 6 and 7 for *R. bimaculatus* and *Hygrotus impressopunctatus* (SCHALLER, 1783), respectively, which are reproductions from FERY 2013). For information about the subtribe Siettitiina see MILLER & BERGSTEN (2014) and FERY & BOUZID (2016: 451-481).

***Rhithrodytes minimus* nov.sp.**

Type locality: "Algeria"; exact locality unknown.
Type material: Holotype: ♂, "Algeria" [green label with black margin, hw Wehncke], "Fairmaire" [white label with black margin, hw Wehncke], "Museum Paris, ex Coll. R. Oberthur, ex Wehncke" [printed], "Holotype, Rhithrodytes minimus sp. n., Fery det. 2016" [red, printed] (MNHN) (see Fig. 2 for scans of the labels). Notes: The holotype lacks the entire left fore-leg, the last three tarsomeres of the right fore-leg and the tibia and tarsi of the left hind-leg. The head, the prothorax and the pterothorax are only very delicately attached to each other. The left side of the pronotum, the left elytron in its anterior half and the right elytron in its posterior half are somewhat torn. The two last abdominal ventrites have been removed (because of dissection of the aedeagus) and glued onto the card behind the specimen; same was done with the aedeagus. The holotype of the new species was found in drawer No. 11 of the water beetle part (former coll. E. Wehncke) of the coll. Oberthür in the Paris Museum (MNHN); a photo of the respective part of this drawer is given in Fig. 3. Originally, the holotype was glued onto a point (small triangular card); we have glued it onto a new bigger rectangular card.

Description: Habitus: Body elongate oval, not appearing parallel-sided, rather flat (Fig. 1); in dorsal view lateral outline with a very slight discontinuity at posterior angles of pronotum and base of elytra. Dorsal surface rather shiny due to weakly impressed reticulation and sparse punctation; with brownish to almost blackish background colour, lighter brownish pronotal sides and yellowish brown elytral pattern.

Head: Dark brownish, but lighter and more reddish near anterior margin. Between margin and eyes with two impressions (clypeal grooves); beside inner margin of eyes with distinct line of impressed punctures. Entire surface distinctly reticulated, but reticulation weakly impressed; meshes polygonal and more or less isodiametric, near anterior margin smaller and transverse, on frons lager and not transverse; in clypeal grooves and near eyes meshes rather small. Punctation very sparse and fine behind anterior margin, becoming progressively denser and larger posteriad; on frons diameter of most punctures slightly smaller than that of meshes, distance between punctures about three diameters of meshes; punctation on frons interspersed with a few larger and some smaller punctures; on vertex punctation again sparser and finer. Setation on head absent, except very few setae in clypeal grooves and in puncture lines along inner margin of eyes. Antennomeres yellowish brown, progressively somewhat darkened distally beginning with sixth antennomere; palpomeres uniformly yellowish. First and second antennomeres (scape and pedicel, respectively) relatively long, third distinctly shorter, fourth still shorter; fifth as long as third; sixth to ninth again longer and slightly broadened (see arrow "a" in Fig. 4), elliptical in cross-section; tenth as long as ninth, but scarcely broadened; eleventh flattened and almost twice as long as tenth. Antennomeres reticulate, fifth to tenth anterodistally with two large punctures. Apex of eleventh antennomere shortly truncate and with very short bristle. Apex of last labial and maxillary palpomeres incised.

Pronotum: With very distinct sublateral stria on each side, reaching from anterior to posterior margin. Colour dark brownish as on most parts of head, interspace between stria and margin lighter brownish. Base of pronotum more less as wide as base of elytra;

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Figs 1-2: Holotype of *Rhithrodytes minimus* nov.sp.: (**1**) habitus; (**2**) labels (scale bar 2 mm).

maximum width at posterior angles; lateral margins straight in posterior half, here slightly converging anteriad; in anterior half slightly curved; posterior angles shortly truncate. Rim at sides of pronotum distinct, becoming smaller near anterior and posterior angles. Entire surface reticulated; meshes slightly larger than those on frons; on interspace between stria and margin shape of meshes more longitudinal. Behind anterior margin with a row of very coarse punctures; before posterior margin with a more irregular puncture line, here punctures sparser. Disc only with very few very small punctures, centre of disc with a small longitudinal scratch. More laterally with a few larger punctures and additionally with very small punctures in intersections of meshes. Setae not found.

E l y t r a: Dark brownish with yellowish brown pattern; pattern diffusely delimited (Fig. 1). Dark brownish parts somewhat lighter than on head and pronotum. Yellowish brown pattern consisting of broad band in anterior quarter and two spots in posterior half.

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Fig. 3: Part of drawer No. 11 of the coll. E. Wehncke (in coll. R. Oberthür, MNHN) in which the holotype of *Rhithrodytes minimus* nov.sp. was found.

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Base of elytra narrowly and suture broadly dark brownish. Along lateral elytral margin narrowly yellowish brown; epipleura of same colour. Outline of elytra in dorsal view almost straight in anterior quarter, behind evenly rounded, in posterior quarter progressively more curved. Maximum width somewhat before mid-length of elytra. Sides of elytra with distinct rim. In lateral view margin of elytra almost straight, only very weakly ascending to humeral angles in anterior quarter; angle between elytral margin and straight margin of pronotum about 170°; epipleura not visible until shoulders. Entire elytral surface reticulated, meshes isodiametric, very slightly smaller than those of pronotum; near apex still smaller. Punctation sparse, diameter of punctures more or less equalling diameter of meshes; distance between punctures about that of five meshes; in posterior quarter punctures still sparser. Very small punctures at intersections of meshes relatively numerous. Two puncture lines perceptible if observed in adequate direction, consisting of rather irregularly arranged punctures; in anterior third more distinct than posteriorly. Setation very thin, transparent and indistinct, restricted to sides and posterior third. Sutural puncture line absent.

V e n t r a l s u r f a c e: More or less entirely reddish brown; only very few parts slightly darker brownish: trochanters, large parts of prosternum including prosternal column and prosternal blade, anteromedial metaventral process, metacoxal processes, second abdominal ventrite centrally and outer margin of epipleura. Genae and gula of same colour. All parts of ventral surface more or less appearing transparent although specimen not immature.

Head behind eye with distinct crease (Fig. 4, arrow "c"); between mouthparts and eyes with one distinct and one weak wrinkle; genae reticulate, between eye and crease with relatively large transverse meshes, behind crease meshes distinctly smaller; gula anteriorly weakly reticulate, behind smooth, sublaterally with line of coarse punctures near each side.

Hypomeron (= pronotal or prothoracic epipleuron) near anterior angle distinctly flattened in a more or less triangular area (Fig. 4, arrow "b"), here with some coarse punctures and few longitudinal wrinkles. Anterior angle provided with two distinct forwards directed short bristles. Base of prosternum anterior to procoxae distinctly elevated, here strongly sculptured; prosternal column near middle of procoxae with weak protuberance. Prosternal process narrowly lanceolate, in cross-section tectiform, apex shortly rounded; sides with distinct rim, here with very few punctures and setae; process weakly inclined against prosternal column. Tip of prosternal process (blade) reaching anteromedial metaventral process.

Apex of anteromedial metaventral process narrower than mesotrochanter; tip inclined against metaventrite, most probably contacting mesosternal fork (difficult to observe without further dissection); provided with flat furrow for reception of prosternal process. Structure of mesocoxal cavities not studied. Epipleuron becoming narrower near mid-length, but not as abruptly as e.g. in species of *Graptodytes* (cf. fig. 12 in FERY & BOUZID 2016); with distinct oblique carina near shoulder (Fig. 5, arrow "a"). Metaepisternum more or less triangular in shape (Fig. 5). Ratio of width of metacoxal plate (WC) and width of metaventral wings (WV): WC/WV ca. 2.4/1 (cf. fig. 3 in PETROV et al. 2010: 43). Metacoxal lines very distinct, slightly diverging anteriad, reaching posterior margin of metaventrite; joint hind margin of metacoxal processes incised; lobes of processes rounded (Fig. 5, arrow "c"), but not as broadly as in *Graptodytes*

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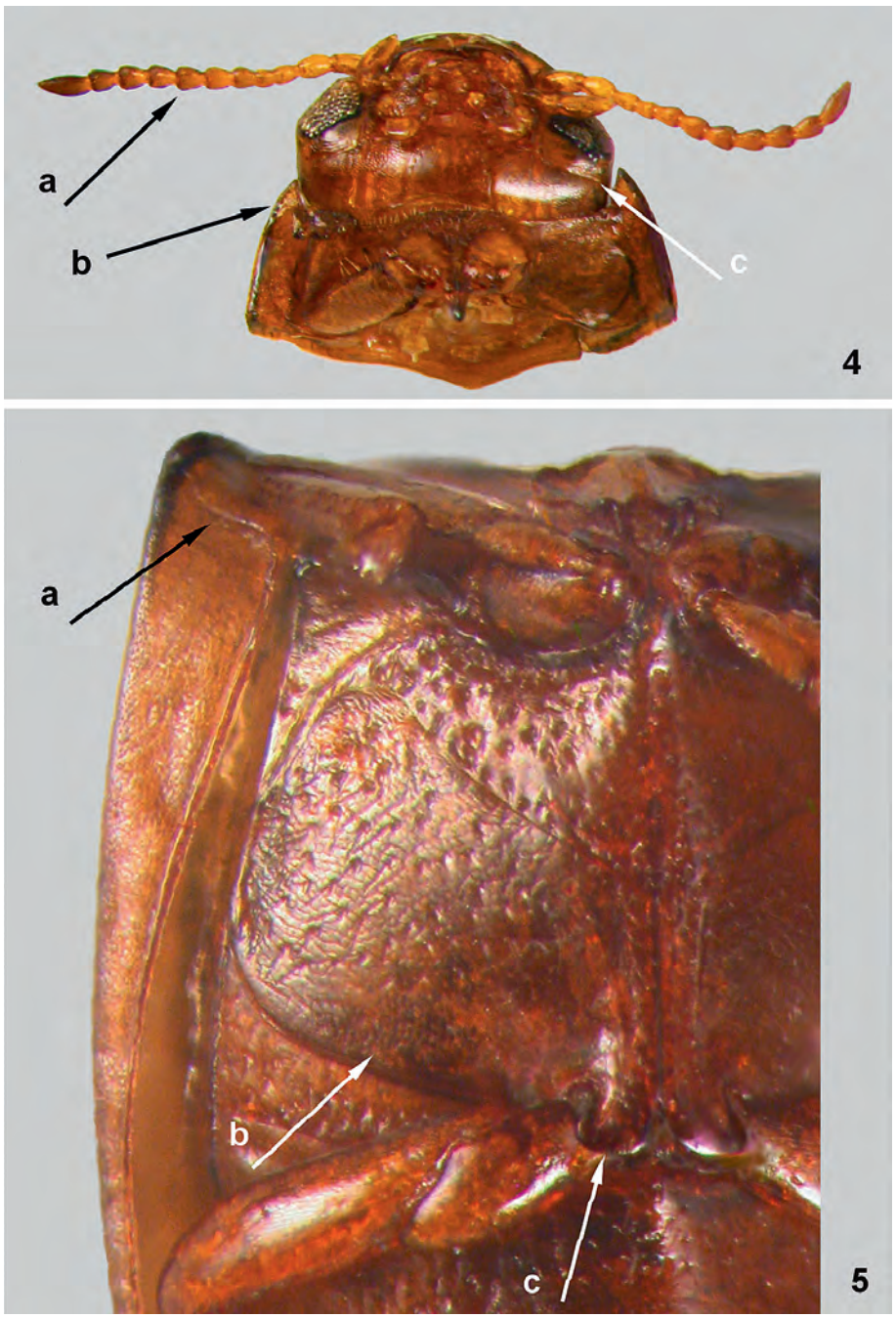

Figs 4-5: Ventral surface of *Rhithrodytes minimus* nov.sp.: (**4**) head; (**5**) part of metathorax and abdomen (significance of arrows explained in text).

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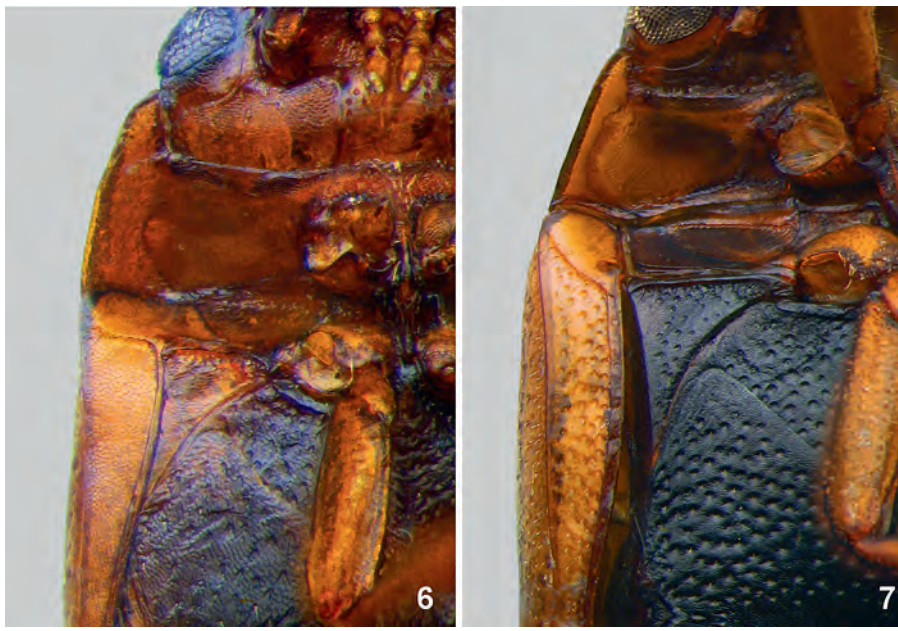

Figs 6-7: Part of ventral surface showing epipleural carina of: (**6**) *Rhithrodytes bimaculatus*; (**7**) *Hygrotus impressopunctatus* (reproductions from FERY 2013).

(cf. fig. 14 in FERY & BOUZID 2016); interlaminary bridge not concealed. Hind margin of last ventrite appearing on first glance as being evenly rounded, but left and right margins of last abdominal ventrite in fact forming a very large angle, thus apex very slightly pointed; pre-apically without impression.

Venter smooth in part or with weakly impressed reticulation, thus mostly distinctly shiny. Mesoepimeron and mesoepisternum shiny, very weakly reticulate; impunctate except line of coarse punctures behind anterior margin of mesoepisternum. Metaventrite centrally with three irregular puncture lines on each side; metaventral wings with line of coarse punctures behind anterior margin and another line before posterior margin and few further coarse punctures; wings laterally strongly bent backwards and here rather narrow; reticulation on metaventrite almost absent, only laterally with few very weakly impressed and incomplete meshes; metacoxal processes sublaterally with puncture line, elsewhere with few additional punctures; reticulation absent. Metacoxal plates with sparse, but large flat punctures; additionally, lateral half with numerous obliquely oriented long scratches, each arising from a large flat puncture (Fig. 5); scratches at first glance resembling long setae. (N o t e s: Possibly, each scratch serves to receive a rather long seta, these setae, however, being lost in the holotype by any kind of mechanical destruction.) Reticulation on metacoxal plates mostly distinct; before hind margin with stripe of short longitudinally oriented lines (Fig. 5, arrow "b"). First five abdominal ventrites centrally with sparse and small punctation, more laterally punctures somewhat coarser and denser. Some scratches (like on metacoxal plates) near posterior margins; last abdominal ventrite with few small punctures. Reticulation on first five abdominal ventrites centrally very weak, almost imperceptible; more laterally becoming more

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distinct; last ventrite without reticulation. Epipleura distinctly reticulate, thus surface rather matt; almost impunctate. Underside of elytra sublaterally in posterior third with distinct carina; carina progressively becoming more elevated in posterior third and then abruptly ending short before apex of elytron; without ligula. Legs without conspicuous features. Anterior and posterior claws of fore- and mid-legs short, evenly curved and similar (most probably also those of hind-legs, but only one claw of one leg present). Metafemur with about six coarse punctures, not arranged in a clear line; trochanter also with some irregularly distributed coarse punctures. Metatibia with line of five spiniferous punctures and few additional ones. Metatarsomeres impunctate, first longer than second, second and third more or less of equal length, fourth still shorter; fifth slightly shorter than first and also shorter than third and fourth together. Setation on venter very sparse, perceptible only near sides of metacoxal plates and on sides as well as near hind margin of abdominal ventrites.

G e n i t a l i a: The median lobe and the left paramere of the male holotype are given in Figs 20 and 24, respectively. The median lobe has the apex distinctly curved to the ventral side (to the left in Fig. 20), as it is typical for all members of the genus *Rhithrodytes*. According to the short TL of the species, the lobe is considerably shorter than that of all other species. The tip of the median lobe is distinctly pointed in lateral view as well as in perpendicular view onto the tip.

M e a s u r e m e n t s: Holotype: TL: ca. 2.3 mm, MW: ca. 1.2 mm; both values are somewhat inexact because of the bad state of the specimen.

D i s t r i b u t i o n: So far *R. minimus* nov.sp. is known only from "Algeria"; exact data are lacking. I assume, however, that the species occurs in the mountainous regions of northern Algeria.

E t y m o l o g y: The specific name *minimus* refers to the fact that the new species is the smallest of all members of the genus; it is an adjective in the nominative singular.

E c o l o g y: Nothing is known about the ecology of the new species and our knowledge of the ecology of the other two North-African species of the genus is also practically non-existent. However, if we consider the habitats of *R. argaensis*, *R. agnus*, and *R. bimaculatus* (DUFOUR, 1852) one might assume that the new species lives interstitially in small mountainous brooks between gravels, probably near sources. *Rhithrodytes sexguttatus* occurs in small streamlets, but can be found – at least on Corsica – in rather broad rivers as well, from high mountain passes to sea level.

Rhithrodytes sexguttatus (AUBÉ, 1838)

Hydroporus sexguttatus AUBÉ, 1838a: 632 + fig. 2 on plate 38, 1838b: 330; BERTOLINI 1872: 38; PORTA 1923: 251.

Hydroporus (*Graptodytes*) *sexguttatus* AUBÉ; SEIDLITZ 1887: 61.

Graptodytes sexguttatus (AUBÉ); ZIMMERMANN 1919: 183, 1920: 116, 1932: 86; LUIGIONI 1929: 157; GUIGNOT 1947: 117; PORTA 1949: 101; ANGELINI 1978: 49, 1984: 71; FRANCISCOLO 1979: 401; ROCCHI 1980: 123, 1989: 86, 2001: 133; BURMEISTER et al. 1988: 177.

Rhithrodytes sexguttatus (AUBÉ); BAMEUL 1989: 486; NILSSON 2001: 182, 2003: 68, 2016: 159; DETTNER 2006: 98, 2007: 132; BAMEUL & QUENEY 2014: 99; NILSSON & HÁJEK 2016: 37;

Graptodytes sexguttatus ab. *octoguttatus* ZIMMERMANN, 1919: 183 (infrasubspecific, not available)

Type locality: Sardinia, Italy.

T y p e m a t e r i a l: S y n t y p e: ♀, "3038" [printed], "Sardaigne [hw ?], Coll. Chevrolat,

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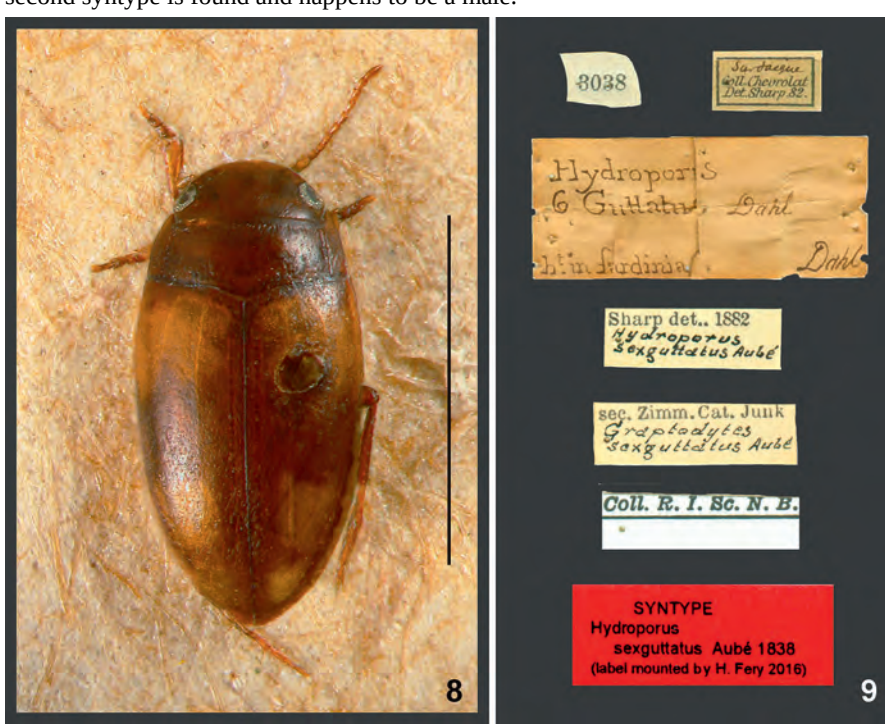
Det. Sharp. [18]82 [printed]", "Hydroporus 6 Guttatus Dahl, h^{t}. [= habitat] in Sardinia Dahl" [hw Chevrolat], "Sharp det. 1882 [printed], Hydroporus sexguttatus Aubé [hw unknown]", "sec. Zimm. Cat. Junk [printed], Graptodytes sexguttatus Aubé [hw unknown]", "Coll. R. I. Sc. N. B." [printed], "Syntype, Hydroporus sexguttatus Aubé, 1838 (label mounted by H. Fery 2016)" [red, printed] (IRSN) (scans of the labels are given in Fig. 9). Originally, this syntype must have been pinned (hole through the right elytron and body), but someone (possibly Chevrolat) has glued the specimen onto the present card.

AUBÉ (1838a: 634) wrote that he has studied only two specimens belonging A. Chevrolat and collected by G. Dahl in Sardinia (this is why there is no doubt about the identity of the syntype mentioned above). I was not able to locate the second syntype in the collections of the IRSN or of the MNHN. Thirteen specimens are stored in the coll. Aubé of the MNHN: nine specimens on five cards, originally two specimens on each, but one specimen lost (rests of glue are recognisable); four glue cards with only one specimen on each card; all pins without any original label and collecting data; however, all with "Museum Paris, coll. Aubé, SEF" or "Museum Paris, SEF, coll. Ch. Aubé"; two of the single specimens with additional "Graptodytes 6-guttatus Aubé" [hw Guignot]. According to the lack of any labels with informative data, none of these 13 specimens can be treated as syntype.

I refrain from designating the single syntype of the IRSN (Fig. 8) as the lectotype because it is a female. Such nomenclatorial act (typification) would not support in any way the stability of the nomenclature, but could even be counterproductive if ever the second syntype is found and happens to be a male.



Figs 8-9: Female syntype of *Hydroporus sexguttatus* AUBÉ, 1838: (**8**) habitus; (**9**) labels (scale bar 2 mm).

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Figs 10-11: "Type" of *Graptodytes sexguttatus* ab. *octoguttatus* ZIMMERMANN, 1919: (**10**) habitus; (**11**) labels (scale bar 2 mm).

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 : The ZSM houses two males which might be called "types" of *Graptodytes sexguttatus* ab. *octoguttatus* ZIMMERMANN, 1919: 183 ("type locality" Sardinia). In this aberration the basal transversal yellow band of each elytron is divided into two spots by a black longitudinal stripe, and thus both elytra together have eight yellow spots. According to article 45.6 of the ICZN (1999), this taxon has infrasubspecific rank. The labels of one of these specimens are: "Sardinien" [printed], "Type" [round light blue label, hw Zimmermann], "Samml. A. Zimmermann" [printed], "Typus" [red label, printed; unauthorised curatorial designation], male gender symbol, "Graptodytes sexguttatus ab. octoguttatus Zimmerm. [type-written], "Rhithrodytes sexguttatus (Aubé) [hw Bameul], F. Bameul det. 1988 [printed]". The second specimen has the same labels, except that the type-written label is lacking and the text of the red label is "Paratypus" (see Figs 10 and 11 for habitus and labels).

Additionally, I have studied a large amount of specimens from diverse localities in Corsica and Sardinia, mainly collected by myself. Especially specimens from Corsica vary considerably not only in body shape and elytral pattern, but also in the shape of the median lobe of aedeagus. At present I cannot judge whether this is due to intraspecific variation or whether different species/subspecies are involved. More well-founded

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statements may become possible when still further material and, in particular, molecular data of specimens from diverse localities will become available.

N o t e s: Since its description *R. sexguttatus* was dealt with in numerous publications (only a small part of which are listed above) and cited from Sardinia, Corsica, Elba, Isle of Montechristo and continental Italy (especially from Tuscany). However, there has been confusion about the identity of this species until BAMEUL (1989) published his revision of this species group and created the new genus *Rhithrodytes*. In particular, the distribution of the species is – in my opinion – not clear. Sardinia and Corsica as well as Elba seem to be correct, but I regard "Tuscany" a doubtful record. The source of this eventual misunderstanding may be BERTOLINI (1872: 38) who gave "Cors., Sard." for *R. sexguttattus* and "Cors., It. sup. [= upper Italia]" for *Rhithrodytes crux* (FABRICIUS, 1792). SEIDLITZ (1887: 61) gave "Italien, Sardinien, Corsica" for *R. sexguttatus*, but on the same page for *R. crux* "Toscana" and "Corsica". SAINTE-CLAIRE DEVILLE (1914: 53) gave for *R. sexguttatus* central Italy, Corsica and Sardinia, but doubted SEIDLITZ' record of *R. crux* from Corsica. PORTA (1923: 251) reported *R. sexguttatus* from Sardinia, Corsica and "Italia centrale". LUIGIONI (1929: 157) reported *R. sexguttatus* among others from Tuscany ("App. tosc." = Tuscany Apennines); same did PORTA (1949: 101; "Toscana"). These records were repeated by FRANCISCOLO (1979: 401), ROCCHI (1989: 86, 2001: 133), and DETTNER (2006: 98). ANGELINI (1984: 71) referred to FRANCISCOLO's records and added "Fornovolasco" (in Tuscany, 44.03N 10.36E, ca. 25 km NNW Lucca). To my knowledge, this is the only record for continental Italy with more detailed data on the collecting site. ANGELINI's record was repeated by BAMEUL (1989: 488) and by DETTNER (2006: 98). As far as I know, no further collecting of this species was ever made in Tuscany or other localities on continental Italy.

I strongly doubt all records from Tuscany, in particular, because at the time of the publication of ANGELINI's and FRANCISCOLO's works the identity of *R. sexguttatus* was disputed and in part the species was set in synonymy with *R. bimaculatus* (cf. the discussion on p. 402 of FRANCISCOLO 1979; see also GUIGNOT 1947: 118). Additionally, I have collected recently (25.6.2016) in brooks near Fornovolasco and found 36 specimens of *Rhithrodytes*, most of them at a locality (ca. 44.026N 10.358E) which is only 250 m apart from the centre of that village. All specimens turned out to be *R. crux* (FABRICIUS, 1792) and not a single *R. sexguttatus* was found.

Rhithrodytes argaensis BILTON & FERY, 1996 (new status)

Rhithrodytes agnus argaensis BILTON & FERY, 1996: 919; RIBERA et al. 1999: 60; RIBERA 2003: 477; FERY & FRESNEDA 2007: 138; ABELLÁN et al. 2013: 123 and Appendices (phylogeny).

Type locality: "Portugal, Minho, NE Viana do Castelo, Serra de Arga, stream at 700 m".

For the description of *R. argaensis* and comparison with *Rhithrodytes agnus* FOSTER, 1992 see BILTON & FERY (1996). The holotype is stored in the NMW. The habitus of this species is given in Fig. 16, the male genitalia in Figs 29 and 33; see Figs 15, 28 and 32 for *R. agnus*.

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So far this taxon was treated as a subspecies of *R. agnus*. Because the type localities of the two subspecies are only about 10 km away from each other, the authors of the original description hesitated to assign specific rank to *R. argaensis*. On the other hand, they found that the two taxa are obviously incapable of dispersal by flight (BILTON & FERY 1996: 924). This is why the authors suspected that both subspecies might be given specific rank following (future) genetic investigations and wrote "... but it would appear that these represent taxa on their way to speciation." (BILTON & FERY 1996: 928).

Recently, such genetic investigations have been presented by ABELLÁN et al. (2013, appendices) and Ignacio Ribera (Barcelona, Spain) communicated privately that if both subspecies have "... enough morphological differences they can be upgraded to species... genetically they are very close, but well separated." In particular, the differences in the male genitalia are very distinct (see Figs 28 and 29), and thus the rank of *argaensis* is here elevated from subspecific to specific.

The data of the specimens used for the genetic studies in ABELLÁN et al. (2013) are: "28.5.2006 (P) Viana do Castelo, ca. 6 km N Ponte de Lima, W Labruja, rest ponds of brook under bridge, UTM ca. NG 324311, H. Fery; COI: HF931143; 16S: HF931362" and "9/v/2005 Serra de Arga, pools on summit, D.T. Bilton; COI: HF931183, 16S: HF931405".

Notes on other species of the genus

Species of *Rhithrodytes* are often relatively difficult to collect and mostly badly represented in museum's collections. There are also only very few publications which deal more intensively with all members of the genus as these were known at the respective time: SEIDLITZ (1887), ZIMMERMANN (1932), BEDEL (1925), BAMEUL (1989) and BILTON & FERY (1996). A key to species is given in BAMEUL (1989), but it lacks *R. dorsoplagiatus* and the species described after 1989. Nevertheless, it seems unnecessary to give a new key because habitus, total length, shape of male genitalia and distributional data are fully sufficient for a reliable identification.

The habitus of the eight species are illustrated in Figs 12-19. In the first row all three North-African species are figured to demonstrate the enormous difference in size of *R. minimus* nov.sp. with respect to the two others. In the second row are displayed the two Portuguese species which are the only ones with a TL approaching that of the new species, but otherwise they are very different. The third row comprises the three remaining species. The male genitalia of all members of *Rhithrodytes* are illustrated in Figs 20-35.

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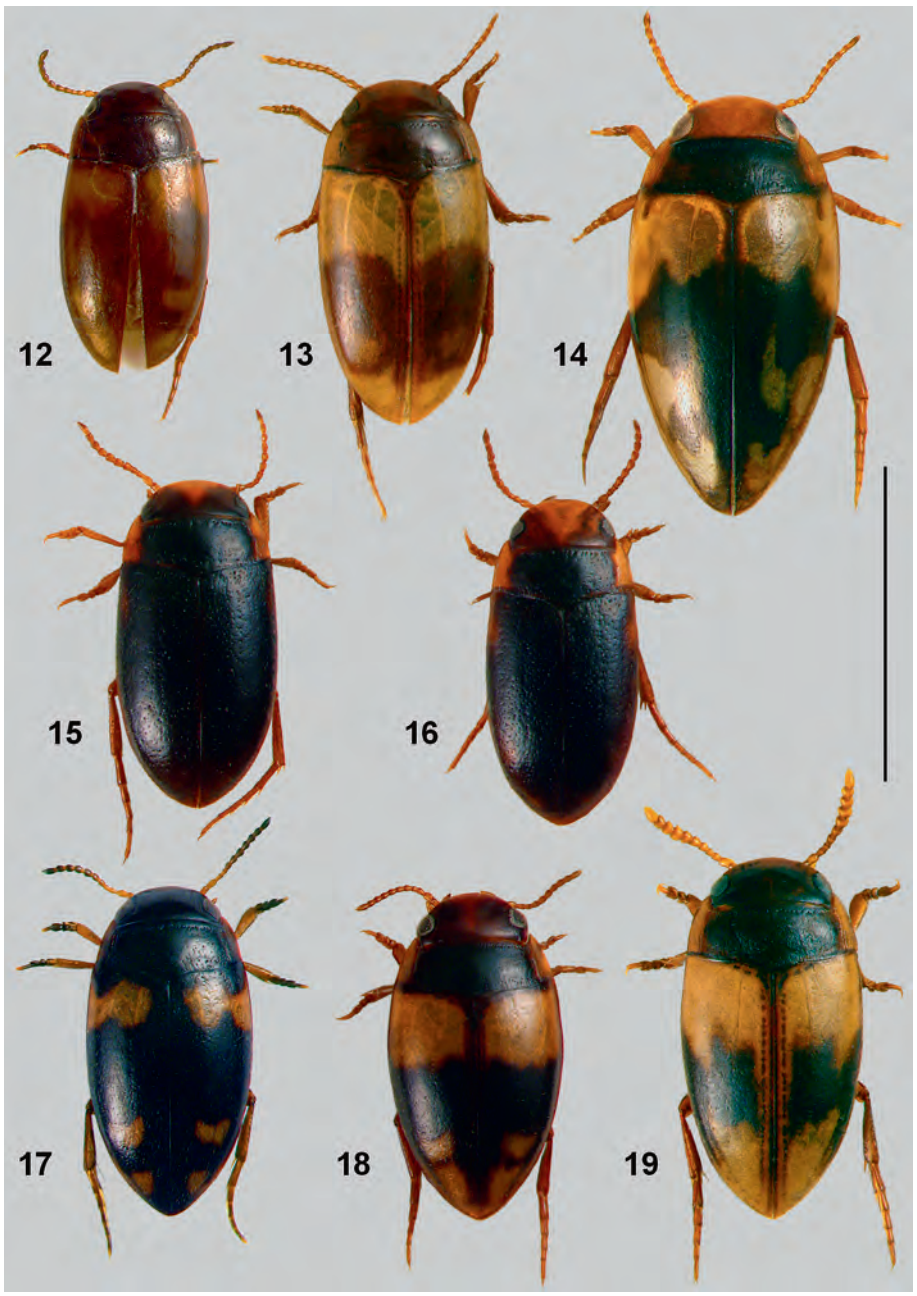

Figs 12-19: Habitus of: (**12**) *Rhithrodytes minimus* nov.sp.; (**13**) *R. dorsoplagiatus*; (**14**) *R. numidicus*; (**15**) *R. argaensis*; (**16**) *R. agnus*; (**17**) *R. sexguttatus*; (**18**) *R. crux*; (**19**) *R. bimaculatus* (scale bar 2.5 mm).

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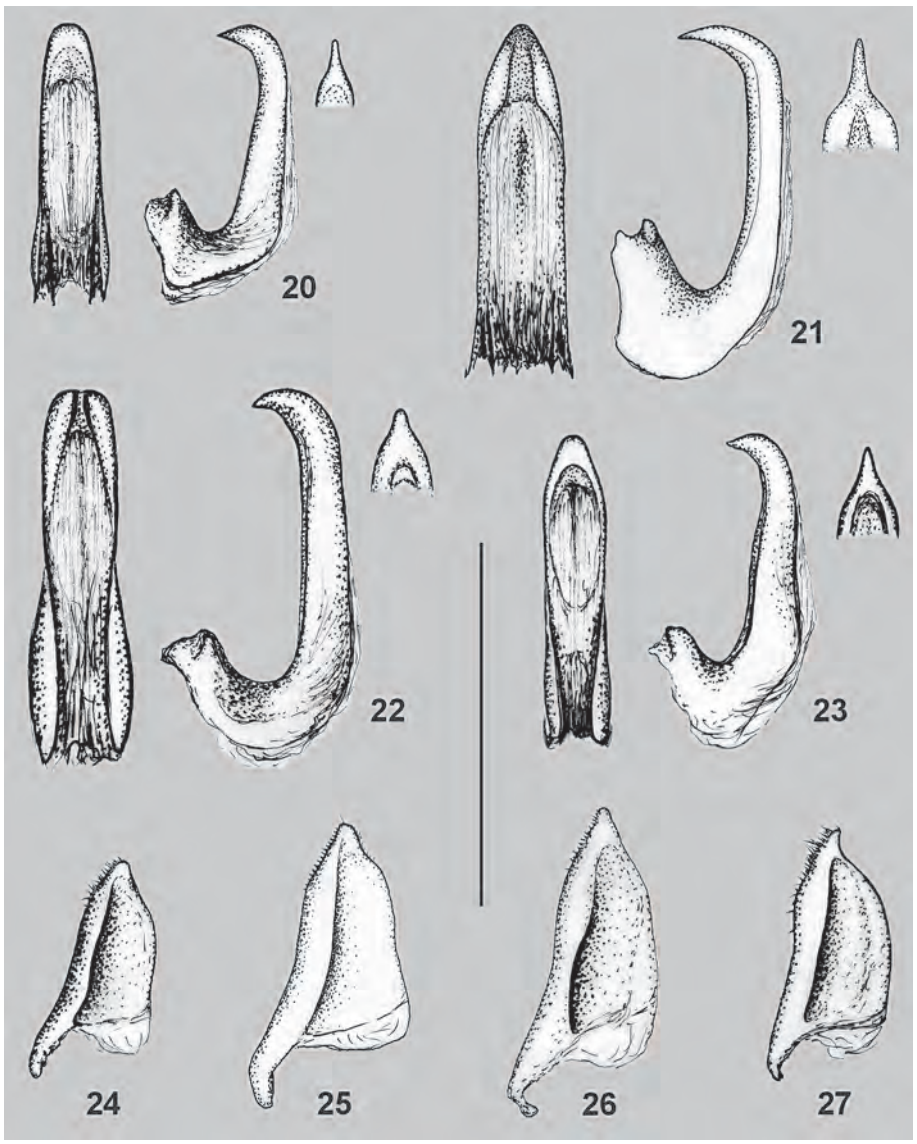

Figs 20-27: Male genitalia of: (**20, 24**) *Rhithrodytes minimus* nov.sp.; (**21, 25**) *R. dorsoplagiatus*; (**22, 26**) *R. numidicus*; (**23, 27**) *R. sexguttatus*: Median lobe in ventral and lateral view and perpendicular view onto tip (**20-23**), left paramere (**24-27**).

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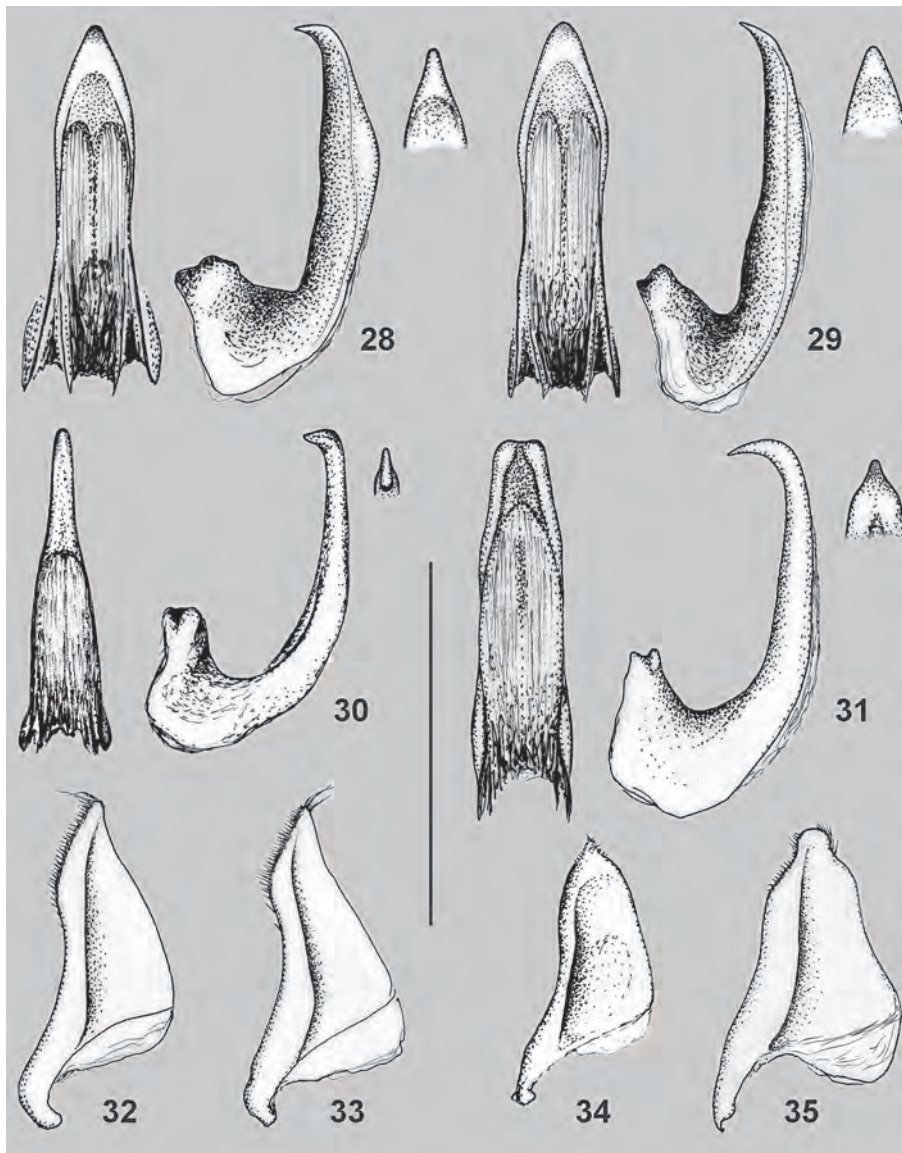

Figs 28-35: Male genitalia of: (**28, 32**) *Rhithrodytes agnus*; (**29, 33**) *R. argaensis*; (**30, 34**) *R. crux*; (**31, 35**) *R. bimaculatus*: Median lobe in ventral and lateral view and perpendicular view onto tip (**28-31**), left paramere (**32-35**).

In Table 1 the distribution and size ranges of all members of the genus are given. It is noteworthy that *R. crux* in France does not only occur in the "départements" Alpes-Maritimes, Alpes-de-Haute-Provence and Var (BAMEUL 1989: 489), but also in Haute-

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Savoie and Isère which are situated much farther north: Savoie: Les Marches, SSE Chambéry, 14.7.1975, Fery leg. (see BAMEUL & QUENEY 2014: 99); Isère: La Morte, ca. 17 km SSE Grenoble, brook "Le Guériment", 14. 8 2011 (unpublished record, privately communicated by the collector M. Manuel). CARRON (2005: 103) recorded the species also from Switzerland (Ticino and Vaud). It is also noteworthy that in August 2013 M. Manuel found *R. bimaculatus* again at its type locality (Eaux Bonnes, French Pyrenees) – after more than a century of unsuccessful search (unpublished record, privately communicated by M. Manuel).

Table 1. Distribution and range of total length in *Rhithrodytes* species; order of species as in Figs 12-19.

species	distribution	total length (TL)
R. minimus nov.sp.	"Algeria"	ca. 2.3 mm
R. dorsoplagiatus	N Algeria	2.7-2.85 mm
R. numidicus	N Algeria, N Tunisia	3.1-3.3 mm
R. argaensis	N Portugal	2.45-2.7 mm
R. agnus	N Portugal	2.35-2.7 mm
R. sexguttatus	France (Corsica), Italy (Sardinia)	2.55-2.6 mm
R. crux	SE France, NW Italy, S + W Switzerland	2.55-2.6 mm
R. bimaculatus	France (Pyrenees), N Spain	2.85-2.9 mm

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Zusammenfassung

Es wird eine neue Art der Gattung *Rhithrodytes* BAMEUL, 1989 aus Algerien beschrieben. *Rhithrodytes minimus* nov.sp. ist die kleinste Art der Gattung und insbesondere deutlich kleiner als die beiden anderen nordafrikanischen Arten *R. dorsoplagiatus* (FAIRMAIRE, 1880) und *R. numidicus* (BEDEL, 1889). Weiterhin wird der Rang des *R. argaensis* BILTON & FERY, 1996, der bisher als Unterart des *R. agnus* FOSTER, 1992 geführt wurde, von subspezifisch zu spezifisch erhöht. Deutliche Unterschiede in den männlichen Genitalien beider Arten waren schon bei der Beschreibung des *R. argaensis* bekannt. Außerdem konnte festgestellt werden, dass beide Taxa flugunfähig sind. Seinerzeit standen jedoch noch keine molekularer Daten zur Verfügung und die Autoren nahmen deshalb davon Abstand zwei so nahe beheimatete Taxa (Entfernung zwischen den Fundorten nur etwa 10 km!) als verschiedenen validen Arten zu behandeln. In der Zwischenzeit sind jedoch entsprechende molekulare Daten verfügbar (ABELLÁN et al. 2013) und diese lassen eine solche Vorgehensweise sehr wohl als begründet erscheinen.

Rhithrodytes sexguttatus (AUBÉ, 1838) wird bisher als eine für Sardinien, Korsika, die Inseln Elba

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und Montechristo sowie die Toskana endemisch Art betrachtet. Meldungen vom italienischen Festland sind allerdings als zweifelhaft einzustufen. Die Meldungen von der Insel Elba (ROCCHI 1980; diese von DETTNER 2006 und 2007 zitiert aber nicht durch eigene Aufsammlungen bestätigt) und eines einzelnen weiblichen Exemplars von der Insel Montechristo (FRANCISCOLO 1975: 10) bedürfen der Überprüfung. Es kann nicht ausgeschlossen werden, dass *R. sexguttatus* mit *R. crux* verwechselt wurde, da bis zum Erscheinen von BAMEUL's Arbeit im Jahre 1989 die Identität des *G. sexguttatus* unklar war und dieser zum Teil sogar als identisch mit *R. bimaculatus* (DUFOUR, 1852) angesehen wurde. Die Art variiert in ihrem Verbreitungsgebiet recht stark und deshalb wäre es wünschenswert einen Lectotypus festzulegen. Darauf wird jedoch bewusst verzichtet, da lediglich ein weiblicher Syntypus im IRSN aufgefunden werden konnte, obwohl entsprechend der Originalbeschreibung an sich zwei Syntypen vorhanden sein sollten.

Der Habitus und die männlichen Genitale sämtlicher Arten der Gattung werden in den Abb. 12-19 respektive Abb. 20-35 dargestellt. Auf die Wiedergabe eines Bestimmungsschlüssels kann verzichtet werden, da nach heutigem Kenntnisstand Habitus, männliche Genitale sowie Verbreitung völlig ausreichend für eine sichere Identifikation der Arten sind.

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