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**Nomenclatorial, taxonomic and faunistic notes
on genus *Pachycarus* SOLIER 1835
(Coleoptera, Carabidae, Harpalini, Ditomina)**

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Abstract

According to article 23.9.1 of ICZN 1999 the names *Pachycarus cyaneus* (DEJEAN 1830) and *P. coeruleus* (BRULLÉ 1832) are validated. Lectotypes for *Ditomus cyaneus* DEJEAN 1830 and *Ditomus coeruleus* BRULLÉ 1832 are designated. Following synonymy (senior synonym listed at first) is confirmed: *Pachycarus cyaneus* (DEJEAN 1830) = *P. atrocoeruleus* (WALTJ 1838). Following synonymies are proposed (senior synonym listed at first): *Mystropterus* CHAUDOIR 1842 (type species *Ditomus coeruleus* BRULLÉ 1832) = *Paramystropterus* SCHAUBERGER 1932 (type species *Pachycarus brevipennis* CHAUDOIR 1850) syn.nov. *P. cyaneus* (DEJEAN 1830) = *P. macedonicus* V.B. Guéorguiev & B.V. Guéorguiev 1997 syn.nov. *P. coeruleus* (BRULLÉ 1832) = *Mystropterus atrocoeruleus* ssp. *dejeani* STICHEL 1925 syn.nov. *P. brevipennis* (CHAUDOIR 1850) = *P. brevipennis* ssp. *kurdistanus* SCHAUBERGER 1932 syn.nov. An identification key for the species of *Pachycarus*, illustrations of the male genitalia including the internal sac of the median lobe and of the mentum of *P. coeruleus* (BRULLÉ) are presented, and distribution data for every species are given.

Key words: Coleoptera, Carabidae, Harpalini, Ditomina, *Pachycarus*, nomenclature, synonymy, distribution.

Zusammenfassung

Die Namen *Pachycarus cyaneus* (DEJEAN 1830) and *P. coeruleus* (BRULLÉ 1832) werden nach Artikel 23.9.1 des ICZN 1999 validisiert. Lectotypen für *Ditomus cyaneus* DEJEAN 1830 und *Ditomus coeruleus* BRULLÉ 1832 werden designiert. Folgende Synonymie wird bestätigt (älteres Synonym als erstes aufgeführt): *Pachycarus cyaneus* (DEJEAN 1830) = *P. atrocoeruleus* (WALTZ 1838). Folgende neue Synonymien werden vorgeschlagen (älteres Synonym als erstes aufgeführt): *Mystropterus* CHAUDOIR 1842 (type species *Ditomus coeruleus* BRULLÉ 1832) = *Paramystropterus* SCHAUBERGER 1932 (type species *Pachycarus brevipennis* CHAUDOIR 1850) syn.nov. *P. cyaneus* (DEJEAN 1830) = *P. macedonicus* V.B. GUÉORGUIEV & B.V. GUÉORGUIEV 1997 syn.nov. *P. coeruleus* (BRULLÉ 1832) = *Mystropterus atrocoeruleus* ssp. *dejeani* STICHEL 1925 syn.nov. *P. brevipennis* (CHAUDOIR 1850) = *P. brevipennis* ssp. *kurdistanus* SCHAUBERGER 1932 syn.nov. Ein Bestimmungsschlüssel für die Arten von *Pachycarus* wird präsentiert, die Medianlobi der Aedeagi aller Arten einschließlich der Internalsackstrukturen sowie das Mentums von *P. coeruleus* (BRULLÉ) werden abgebildet, das untersuchte Material wird zitiert und Verbreitungsangaben werden gegeben.

Introduction

In the past, the genera and species of subtribe Ditomina of tribe Harpalini are partly the source of a great confusion concerning nomenclature and taxonomy. The genus *Pachycarus* SOLIER 1835 is an excellent example for it. While working on my parts for identification keys for the Carabidae from Greece I had also to focus my attention on this genus. In connection with the Catalogue of Palaearctic Coleoptera, Volume 1 (LÖBL & SMETANA 2003) the conditions in some genera could be cleared up, and the reasons for numerous taxonomic acts were demonstrated (e.g. in genus *Dixus* BILLBERG 1820, see WRASE 2005) but due to time reasons I did not succeed in doing this also in *Pachycarus*, though knowing that the use of names is partly wrong, caused by different points of view among authors. Going through the literature on *Pachycarus* one can not overlook that there are several opinions which are contradictory, beginning with an unjustified nomenclatorial act by SCHAUM (1857) which some authors accepted but others did not. Additionally, the old literature is, if it deals with statements on the identity of types, full of assumptions or interpretations, known from hearsay, and no authors have reported the direct investigation of types.

For reaching stability of nomenclature, examination of types of the taxa involved was necessary. In the case of different usage of names for one species article 23.9.1 of the International Code of Zoological Nomenclature (ICZN 1999) was implemented for fixing the valid names. The results were compiled in this synopsis of the genus *Pachycarus* (with some newly recognized synonymies) which allows a reliable identification of the species, additionally distribution data of every species which were hitherto partly unclear are presented.

Methods

Total body length is measured from the tip of the mandibles to the apex of the right elytron as the maximum linear distance (to have similar results as the old authors), and the width of the head (HW) as the maximum linear distance across the head, including the compound eyes; the length of the pronotum (PL) from the anterior to the posterior margin along the midline; the length of the elytra (EL) from the basal margin at scutellum to the apex of the right elytron as the maximum linear distance; the width of the pronotum (PW) and elytra (EW) at their broadest point.

These measurements, made at a magnification of 7.10 or 10.00 X (body length) and 10.00 or 12.5, respectively, and using an ocular micrometer in a Leica MZ 16 stereobinocular microscope, were combined in ratios or added as follows:

BL: total body length;

PW/PL: width /length of pronotum;

PW/HW: width of pronotum /width of head;

EL/EW: length/width of elytra;

Microsculpture was examined at a magnification of 100X.

Line drawings were prepared by using an ocular grid (15 X 15 squares) attached to a Leica MZ 16 stereobinocular microscope. Dissections were made with standard techniques; genitalia were preserved in Euparal on acetate labels, and pinned beneath the specimens from which they had been removed.

Labels of type specimens were cited as originally given, and different lines are separated by a forward slash (/).

Material

The following abbreviations are used for the depositories of the examined material:

DEI.....	Deutsches Entomologisches Institut, Müncheberg, Germany (L. Zerche, M. Behne)
MNHP.....	Muséum National d'Histoire Naturelle, Paris, France (A. Taghavian, Th. Deuve)
MNHUB	Museum für Naturkunde der Humboldt-Universität, Berlin, Germany (M. Uhlig, B. Jaeger)
NMNHS.....	National Museum of Natural History, Sofia, Bulgaria (St. Beshkov, B. Guéorguiev)
NMW	Naturhistorisches Museum Wien, Vienna, Austria (H. Schönmann, E. Kirschenhofer)
cBLOCH.....	Coll. O. Blochwitz, Genthin, Germany
cBUL	Coll. P. Bulirsch, Prague, Czech Republic
cDOST	Coll. A. Dostal, Vienna, Austria
cEGG	Coll. M. Egger, Wattens, Austria
cEICH	Coll. R. Eichler, Forst, Germany

cHAJ	Coll. E. & P. Hajdaj, Ježov, Czech Republic
cHEYD	Coll. L. von Heyden (in DEI)
cKM	Coll. R. Kmeco, Litovel, Czech Republic
cLOH	Coll. R. Lohaj, Košice, Slovak Republic
cMAL.....	Coll. Z. Malinka, Opava, Czech Republic
cMÜLL	Coll. H. Müller, Zittau, Germany
cORSZ	Coll. K. Orszulik, Frýdec-Místek, Czech Republic
cŘIH.....	Coll. J. Říha, Teplice, Czech Republic
cPÜTZ	Coll. A. Pütz, Eisenhüttenstadt, Germany
cSCHN.....	Coll. P.H. Schnitter, Halle, Germany
cSKOUP	Coll. V. Skoupý, Kamenné Žehrovice, Czech Republic
cWR	Coll. D.W. Wrase, Berlin, Germany

Results

Genus *Pachycarus* SOLIER 1835

Pachycarus SOLIER 1835: 666 (type species *Pachycarus latreillei* SOLIER 1835)

Subgenus *Pachycarus* SOLIER 1835: 666 (type species *Pachycarus latreillei* SOLIER 1835)

Carterocarus TSCHITSCHÉRINE 1901: 222 (type species *Pachycarus latreillei* SOLIER 1835)

Subgenus *Mystropterus* CHAUDOIR 1842: 844 (type species *Ditomus coeruleus* BRULLÉ 1832)

Paramystropterus SCHAUBERGER 1932: 155 (type species *Pachycarus brevipennis* [CHAUDOIR 1850]) syn.nov.

Notes about synonymy

SOLIER (1835) founded his genus on a new species (*latreillei*) from West Turkey (Smyrna, today İzmir) which differed from all species of the genera running under *Aristus*, *Ditomus* and *Odoenus* at that time, by the body more convex and with humeri more rounded and reduced. He added to his new genus a second species, "*Ditomus Coeruleus*, Dupont, (Brullé, voyage. scient. de Morée. Coléopt. pag. 116 n° 109)". In 1842 CHAUDOIR described the genus *Mystropterus* basing on the latter species, underlining that it would possess a mentum tooth contrary to *Pachycarus latreillei* SOLIER.

SCHAUM (1857) united the four species known at that time in *Pachycarus* and argued that *P. latreillei* SOLIER would possibly belong to the genus *Chilotomus* CHAUDOIR 1842 which he did not know in nature (for others of his wrong conclusions see below under treatment of species). PIOCHARD (1873) grouped these species under the genus name *Pachycarus*, and (probably accepting the authority of Schaum) divided the genus into two subgenera, *Pachycarus* and *Chilotomus*, the latter with *P. chalybaeus* (FALDERMANN 1836), the only species of *Chilotomus* known at that time.

Carterocarus TSCHITSCHÉRINE 1901 with the type species *Pachycarus latreillei* SOLIER is an objective synonym of *Pachycarus* SOLIER, this fact was firstly mentioned by STICHEL (1923: 28), and cited also in later works.

While later authors (REITTER 1900, APFELBECK 1904) united the species in one genus (*Pachycarus*), separating only *Chilotomus* as distinct genus, STICHEL (1923) arranged them in three genera: *Mystropterus* CHAUDOIR including *M. atrocoeruleus* WALTZ (the true *cyaneus* DEJEAN), *M. cyaneus* DEJEAN (the true *coeruleus* BRULLÉ), *M. aculeatus* REICHE & SAULCY, and *M. brevipennis* CHAUDOIR, *Pachycarus* SOLIER with *P. latreillei* SOLIER, and *Chilotomus* with *Ch. chalybaeus* FALDERMANN. SCHAUBERGER (1932) stated firstly that the species of *Pachycarus* and *Mystropterus* agree in all essential characters and should be treated as subgenera of one genus, *Pachycarus*, and secondly, that *Chilotomus* and also *Bronslavia* SEMENOV 1891, though related to *Pachycarus*, are distinct genera.

Though APFELBECK (1904: 167), in answering the thesis of PIOCHARD (1873: 81) who separated *P. cyaneus* by having a distinct mentum tooth from *P. coeruleus* and *P. brevipennis* which would have no mentum tooth or only a weak sinuation at middle of the mentum excision, underlined that this character is very variable and not usable for separating these species, SCHAUBERGER (1932: 155) founded the subgenus *Paramystropterus* based on *Mystropterus brevipennis* CHAUDOIR. This species would have, contrary to the other species, no tooth of the mentum. Additionally, the pronotum would be distinctly narrower than the elytra and the latter much wider and shorter as in the remaining species of subgenus *Mystropterus*.

I have checked a numerous material of *P. cyaneus* and *P. coeruleus* in respect of the construction of the mentum and can confirm the statement of Apfelbeck. I examined 46 specimens of *P. coeruleus* (BRULLÉ) and found that 31 of which (including lecto- and paralectotype) have either no mentum tooth (as in Fig. 5), or only a weakly produced round swelling at middle of the mentum excision (as in Fig. 6), and that only 15 specimens have a distinct mentum tooth (as in Fig. 7). In *P. cyaneus* (DEJEAN) the character of the mentum tooth is more stable, 78 specimens were examined, 71 of which (including the lectotype) have a distinct mentum tooth, but only 7 specimens have only a more or less weakly produced round swelling at middle of the mentum excision. Consequently due to the great variability in this character *Paramystropterus* SCHAUBERGER does not deserve generic status and is proposed as synonym of *Mystropterus* CHAUDOIR, the more so as the other characters mentioned above which would separate *P. brevipennis* in the opinion of Schauburger are also of no great importance. MÜLLER (1927: 128) in his remarks on *Pachycarus* came to the same result concerning *Paramystropterus*, expressing that this name is not supportable but did not synonymize it formally.

The male genitalia including the internal sac of the median lobe of all *Pachycarus* species are similar in their construction (see Figs 8-13), but the species *P. latreillei* SOLIER differs externally considerably in form of pronotum and elytra from the other members of *Pachycarus*. While all species except *P. latreillei* have a pronotum with the disc evenly convex, laterally almost evenly and with posterior angles widely rounded, and have elytra with distinct, though widely rounded humeri, the pronotum in *P. latreillei* is somewhat cordiform with the basal half of the disc strongly convex and basad fairly strongly declined, laterally it is always rectilinearly narrowed, and immediately anterior to the distinctly obtuse-angled posterior angles it is very weakly sinuate, and the elytra are without distinct humeri, causing an ovate shape. These differences, surely of phylogenetic importance, support the separation of the genus *Pachycarus* into two subgenera.

The species of subgenus *Pachycarus* SOLIER 1835

Pachycarus (s.str.) *latreillei* SOLIER 1835

Pachycarus latreillei SOLIER 1835: 667 (type loc.: "Smyrne" [İzmir, Turkey])

Pachycarus latreillei SOLIER: SCHAUM 1857: 130

Pachycarus (*Chilotomus*) *latreillei* SOLIER: PIOCHARD 1873: 83

Pachycarus latreillei SOLIER: REITTER 1900: 54

Pachycarus latreillei SOLIER: APFELBECK 1904: 167

Pachycarus latreillei SOLIER: STICHEL 1925: 83

Pachycarus (s.str.) *latreillei* SOLIER: CSIKI 1932: 1084

Pachycarus (s.str.) *latreillei* SOLIER: SCHAUBERGER 1932: 158

Pachycarus (s.str.) *latreillei* SOLIER: MÜLLER 1937: 128

Pachycarus (s.str.) *latreillei* SOLIER: LORENZ 1998: 363

Pachycarus (s.str.) *latreillei* SOLIER: CASALE & VIGNA TAGLIANTI 1999: 388

Pachycarus (s.str.) *latreillei* SOLIER: WRASE 2003: 367

Material examined: (14 spcms.):

Turkey: "Syria" (1♂, MNHUB). "nobilis Schfs. Asia min. (Schfs.)" (1♀, cHEYD); "Asia min. P. nobilis Schauf. Schauf." (1 spcm., DEI). - Denizli: Acipayam, 8.VI.1986, Kadlec & Vorišek leg. (1♀, cWR). Afyon-Karahissar, V 1939 (1♀, cWR). - İzmir: Odemiş, 1914, Kulzer leg. ("Oedemisch", 2 spcms., DEI). "Syria, Kisiloye ... [unreadable] Lederer" (1♂, MNHUB); "Kiasilge Aole" (1♀, MNHUB); "Kisilgye Aole Lederer" (2♀♀, cHEYD). The latter locality names, partly garbled, refer, according to FAIRMAIRE (1866) to a village south of the Boz Dağları with the former name Kisilgye Aole where Lederer in the year 1865 collected, its modern name is most likely Kızılcaova. Without doubt, two specimens (DEI) labelled with "Klein.Asien" and "P. latreillei Sol. Led." and coming from the former collection Stierlin belong to the series Lederer collected in "Kiasilge Aole" in the Boz Dağları region. The locality of a specimen labelled "Sch. Taygetos" (MNHUB) is wrong (see distribution below).

Notes about types

The species description based on two specimens. As all authors have interpreted the species of the same tenor examination of the types seemed not necessary.

Recognition

See key. For data on variation in some values see Tab. 1.

Intraspecific and geographical variability

The material is too small to make a statement concerning these items (body size varies from 16-19.7 mm).

Distribution

Described from İzmir in western Turkey, the species was further recorded from other localities in the same area: Boz Dağları (PIOCHARD 1873), and "M. Tmolos in Lidia" (MÜLLER 1937). STICHEL (1925) reported it from Syria (MÜLLER 1937 followed obviously this source), perverted through the label of specimens with "Syria...." not taking into account that collectors and authors one and a half century ago identified wide parts of Turkey with "Syria", but as shown above (under section: material examined) this

mentioned locality written in a very different and false way refers to one locality south of the Boz Dağları.

The species of subgenus *Mystropterus* CHAUDOIR 1842

Pachycarus (Mystropterus) cyaneus (DEJEAN 1830)

- Ditonus cyaneus* DEJEAN 1830: 244 (type loc.: "Troja"[Truva, W Turkey])
Ditonus atrocoeruleus WALTJ 1838: 451 (type loc.: "Balkan") syn. conf.
Pachycarus chaudiroides REICHE & SAULCY 1855: 592 (type loc.: "près d'Athènes")
Mystropterus cyaneus CHAUDOIR 1850: 445 (type loc.: "Morée")
Pachycarus coeruleus v. *lateobscurus* PIC 1903: 138 (type loc.: "Taygetos")
Pachycarus (Mystropterus) macedonicus V.B. GUÉORGUIEV & B.V. GUÉORGUIEV 1997 (type loc.: "Macédoine, montagne Galitchitsa.....parmi les lacs d'Ohrid et de Prespa") syn. nov.
Pachycarus (Mystropterus) macedonicus V.B. GUÉORGUIEV & B.V. GUÉORGUIEV: B.V. GUÉORGUIEV 2007: 97
Pachycarus atrocoeruleus WALTJ: SCHAUM 1857: 128
Pachycarus (s.str.) *cyaneus* DEJEAN: PIOCHARD 1873: 86
Pachycarus cyaneus DEJEAN: REITTER 1900: 55
Pachycarus cyaneus (OLIVIER) DEJEAN: APFELBECK 1904: 168
Pachycarus cyaneus DEJEAN: APFELBECK 1907: 32
Mystropterus atrocoeruleus ssp. *atrocoeruleus* WALTJ: STICHEL 1925: 82
Pachycarus (Mystropterus) atrocoeruleus WALTJ: SCHAUBERGER 1932: 157
Pachycarus (Mystropterus) atrocoeruleus WALTJ: Csiki 1932: 1083
Pachycarus (Mystropterus) atrocoeruleus (WALTJ) SCHAUM: MÜLLER 1937: 130
Pachycarus cyaneus DEJEAN: HIEKE 1981: 85
Pachycarus atrocoeruleus [no author]: LEGAKIS 1988: 65
Pachycarus atrocoeruleus (WALTJ): TRAUTNER & GEIGENMÜLLER 1987: 376
Pachycarus (Mystropterus) atrocoeruleus (Waltl): V.B. GUÉORGUIEV & B.V. GUÉORGUIEV 1995: 206
Pachycarus (Mystropterus) atrocoeruleus atrocoeruleus WALTJ: V.B. GUÉORGUIEV & B.V. GUÉORGUIEV 1997: 49
Pachycarus (Mystropterus) atrocoeruleus WALTJ: V.B. GUÉORGUIEV & al. 1997: 20
Pachycarus (Mystropterus) atrocoeruleus WALTJ: LORENZ 1998: 363
Pachycarus atrocoeruleus (WALTJ): WRASE 2003: 367
Pachycarus atrocoeruleus (WALTJ): SIENKIEWIECZ 2008: 367

Type material:

Ditonus cyaneus DEJEAN 1830 (MNHP)

Lectotype: ♀, labelled: "cyaneus Oliv"; "in Troja"; "D. Oliv. D. Latreille" (all handwritten by Dejean, black on yellowish labels); "ex Musæo / Chaudoir" (red printed and red framed on white label, subsequently added); "LECTOTYPE / *Ditonus* / *cyaneus* DEJEAN, 1830 / WRASE design. 2010" (black print on red label), and: "*Pachycarus* / (*Mystropterus*) / *cyaneus* (DEJEAN, 1830 / WRASE det. 2010" (black print on white label).

***Pachycarus macedonicus* V.B. GUÉORGUIEV & B.V. GUÉORGUIEV 1997 (NMNHS)**

Holotype: ♂, labelled: "Mac., Galitsica / 1000-1050 m, 18.06.1994 / leg. B. Gueorguiev" (black print on white label; Holotype ♂ / *Pachyc. macedonicus* / V. Guéorguiev / B. Guéorguiev / (written with pencil by one of the authors on red label). Paratype: ♂: with the same locality label and: "Paratype ♂ / *Pachycarus macedonicus* V. + B. Guéorg" (written with pencil by one of the authors on red label). Both specimens with: "*Pachycarus* / (*Mystropterus*) / *cyaneus* (DEJEAN, 1830 / WRASE det. 2010" (black print on white label).

Usage of the names "*cyaneus*" and *atrocoeruleus*" in the genus *Pachycarus* SOLIER 1835

Under article 23.9.1 of the International Code of Zoological Nomenclature (ICZN 1999) prevailing usage of the junior synonym must be maintained when: "the senior has not been used as valid name after 1899 and when the junior has been used for a particular taxon, as its presumed valid name, in at least 25 works, published by at least 10 authors in the immediately preceding 50 years and encompassing a span of not less than 10 years".

The name *cyaneus* in the genus *Pachycarus* has been used as valid name after 1899 four times (REITTER 1900; APFELBECK 1904; APFELBECK 1907; HIEKE 1981). The name *atrocoeruleus* was used in several works in the last 50 years (TRAUTNER & GEIGENMÜLLER 1987; LEGAKIS 1988; GUÉORGUIEV & GUÉORGUIEV 1995; GUÉORGUIEV & GUÉORGUIEV 1997; GUÉORGUIEV & al. 1997; LORENZ 1998; SFENTHOURAKIS & LEGAKIS 2001; WRASE 2003; SIENKEWIECZ 2008 but in less than 10 authors and 25 works. but as such, conditions of article 23.9.1 ICZN in both points are not met, and the name *Pachycarus cyaneus* (DEJEAN, 1830) is valid for the species with *Pachycarus atrocoeruleus* (WALTL, 1838) as its junior synonym.

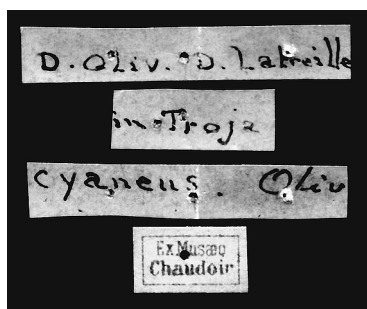


Fig. 1: Original labels of lectotype of *Ditomus cyaneus* DEJEAN.

Notes about types and synonymy

Ditomus cyaneus DEJEAN was founded on several specimens, which were "été rapporté de l'Asie mineure par feu Olivier; on le trouve aussi dans les îles et sur le continent de la Grèce". 6 to 9 lines were given as size which corresponds to 13.5 to 20.25 mm (according to VON HAYEK 1973: 11, who mentioned that nineteenth-century workers used line as an unit of measurement in a different way depending of their nationality, and that one French line would be the metric equivalent of 2.25 mm). Taking into consideration the size given in the original description and the fact that the smallest

specimen now stored under *cyaneus* in the Dejean collection measures 16 mm, it seems obvious that the series is not complete, the more as there is information that the series was composed of different species (SCHAUM 1857: 129, referring on REICHE 1855: 593), but it cannot be ascertained if from beginning, or if the series was rearranged by the later owners. For this reason I have chosen as lectotype the first specimen in the series, a pinned female, now glued to card with body size of 20.2 mm in original condition (which corresponds well with the size given in the description, after re-preparation 18.9 mm), in

good condition (with the right foreleg missing), identified by its labels (Fig. 1) with data, partly mentioned in the description, and decided not to accept the other three specimens though belonging to the same species, as syntypes. It deals with one male and two females, all labelled "ex Musæo / Chaudoir" (red printed and red framed on white label, subsequently added, the second female with label subsequently added: "atrocoeruleus / Waltl", handwritten by unknown hand).

DEJEAN mentioned in his description firstly Asia Minor as the location for his *cyaneus*, the lectotype bears the more accurate data "in Troja". This famous unoccupied archaeological site, on maps with the Turkish name Truva, lies approximately 6.5 km from the Aegean Sea and equidistant from the Dardanelles, close to the seacoast in what is now Çanakkale province in northwest Turkey, southwest of the Dardanelles under Mount Ida. I did not see more specimens from old or recent collecting from this area but have no reason to be in doubt about the correctness of this locality, the wingless species has a rather wide distribution on the Balkans including Crete and Aegean islands, surely a result of the Pleistocene variations in sea level of the Mediterranean Sea connecting the mainland with the islands. But the species reaches areas in north western Turkey, certainly the eastern limit of its distribution.

Pachycarus atrocoeruleus WALT 1838 was described from the "Balkan", based on at least two specimens, as the size was given with 8-9 lines (conforming to 17.5-19.7 mm). After HORN & al. (1990: 414) a part of the Walt's collection is now stored in the NMW, an attempt to find types resulted in the discovery of one specimen labelled with "Graecia / cyaneus / Ol." (handwritten, most probably by Walt, on white label), and "Coll. / Waltl" (printed on white label). It is unknown if Waltl labelled the specimens mentioned in his description, so there is no proof that this specimen is part of the type series. It deals with a specimen of *P. cyaneus* (DEJ.). As it is not clear if this specimen belongs to the typical series I refrain from designating it as lectotype, in either case the interpretation of *atrocoeruleus* is without ambiguity through the size given in the description which is never reached by the second blue species (*P. coeruleus* BRULLÉ) from Greece.

The description of *P. macedonicus* V.B. GUÉORGUIEV & B.V. GUÉORGUIEV 1997 based on two males from Macedonia, mentions (probably by mistake) that the paratype was collected by M. Langourov but both types have an identical locality label. The species was compared with *P. atrocoeruleus* (the true *cyaneus*) and would differ by some external differences. I could investigate both types and can state, taking into consideration the big variability of the species, that the Macedonian specimens do not differ from *P. cyaneus* from Greece in characters to be seen as specific, but are in the variability spectrum of this species, and both taxa are identical in the construction of the median lobe including its internal sac, hence *P. macedonicus* V.B. GUÉORGUIEV & B.V. GUÉORGUIEV 1997 is a synonym of *P. cyaneus* (DEJEAN 1830).

The confusion in using different names for the same species started obviously with the statement of SCHAUUM (1857: 130) who believed to find in the drawing Dejean gave for his *Ditomus cyaneus* (table "Ditomus", Fig 2, following page 244) the later described *D. coeruleus* BRULLÉ 1832 and that this fact would be decisive for the description, hence Schaum stated wrongly that *D. cyaneus* DEJ. would be a senior synonym to *D. coeruleus* BR. (This opinion seems curious, if one would see this somewhat crude figure which does not allow an unambiguous identification, and based on the blue coloured figure one could only conclude that it deals with a *Pachycarus* species).

PIOCHARD (1873), REITTER (1900), and APFELBECK (1904) did not accept Schaum's opinion and cited *P. atrocoeruleus* as junior synonym of *P. cyaneus*. It was STICHEL (1923) who picked up Schaum's ideas again and mentioned two distinct species, *P. atrocoeruleus* and *P. cyaneus* with its synonym *P. coeruleus*. Many, but not all, authors followed him (see above).

Other material examined: Beside the material mentioned above 174 specimens were investigated from:

Greece: "Turcia" (3 spcms., DEI). "Graec.", "Graecia", "Griechenld.", or "Griechenland" (5 spcms., DEI; 10 spcms., MNHUB, 1 spcm., NMW); "Graecia Kraatz" (1 spcm., cHEYD); "Bittner 94 Griechenld." (3 spcms., NMW); "Graecia Krüper" (1 spcm., NMW); "Zebe Graecia" (1 spcm., DEI). - Macedonia: Halkidiki: Kassándria, Kallitheá env., 40.25N/23.27E, fields, 5.-15.V.2000, P. Croy leg. (8 spcms., cWR); Kassándria, Néa Olynthos, 40.25N/23.27E, olive grove, 5.-15.V.2000, P. Croy leg. (2 spcms., cWR). Sithonia, VII 1976, Bilek & Kritscher leg. (1 spcm., NMW). - Kilkis: Kilkis, Metallikon, 18.VI.1989, I. Wolf leg. (1 spcm., cWR); Metallikon, 24.6.1990, N. Klingenberg (1 spcm., cWR); Metallikon, Horigi, 200 m, 19.V.1991, K. Staven leg. (1 spcm., cWR). - Pélla: Skídra env. 2.VI.1995, VI. Skoupý leg. (3 spcms., cSKOUP, cWR). - Kózani: Fárangi, 18.V.2001, J. Schneider leg. (2 spcms., cWR). - Pieriá: Pantelleimonas near Katerini, 21.VI.1996, O. Hillert leg. (1 spcm., cWR). - Pieriá/Lárisa in Thessaliá: "Olymp", 1 spcm., MNHUB). "Olympos mt.", 17.-22.V.1995, P. Krásenský leg. (1 spcm., cWR). - Serres: Áno Poróti, N Strinomonas valley, 19.V.2000, O. Hillert leg. (1 spcm., cWR). Ca. 2 km N Skepaston vill., 460 m, 40°49.3N/23°31.1E, 27.IV.2007, J. Schneider leg. (2 spcms., cHAJD). - Thessaloniki: Thessaloniki ("Salon.", 2 spcms., DEI). Vrasna, 1/2.VI.2007, T. Sitek leg. (2 spcms., cMAL). - Thessaliá: "Thessalia" (1 spcm., DEI; 1 spcm., NMW). - Larissa: Elassóna ("Elasson", 5 spcm., NMW, cWR). Ossa Mts., Spiliá vill., 1/2.VI.2007, T. Sitek leg. (1 spcm., cMAL). Farsala, 1.-10.VI.1991, R. Dydycha leg. (3 spcms., cMAL, cWR); Farsala, 1.VI.1991, Makovský leg. (1 spcm., cLOH). Olimbos, Tempe Valley env., 27.VI.-18.VII.1997, Th. Kriska leg. (6 spcms., cWR). Goni, VII 1987, W. Barries leg. (3 spcms., cDOST, cWR). - Magnissía: Pílio Mts., Chania (NE Vólos), 1400 m, 26.V.1988, I. Wolf & M. Hiermaier leg. (1 spcm., cWR). Vóries Sporádes: Skopelos ("Nördliche Sporaden Skopelos Emge", 1 spcm., MNHUB). - Trikala: Pindos Mts., Kalambaka near Trikala, 9.VI.1996, O. Hillert leg. (1 spcm., cWR); Kalambaka W-Kalambaka NW, Xirokampos E, Ion river, 299 m, 39°47'21"N/21°31'37"E, field edge/Platanus-floodplain forest, P.H. Schnitter leg. (1 spcm., cWR). Meteora, 30.VI.1988, W. Grosser leg. (1 spcm., cWR). Pindos Mts., Kria Vrisi, 4.VI.2007, T. Sitek leg. (2 spcms., cMAL). - Pelopónissus: "Taygetos" (3 spcms., MNHUB). - Argolída: Mikínes, 13.IV.1987, J. Frisch leg. ("Mykene", 1 spcm., MNHUB); Mikínes, 20.IV.2001, V. Klapka leg. (1 spcm., cBUL); Mikínes, 26.IV.2002, I. Jeniš leg. (1 spcm., cKM). Nafplio, Arahnéo Mts., 27.VIII.2005, K. Orszulik leg. (1 spcm., cWR). - Arkadiá: Route Kándia-Levidi, 6.VI.2008, M. Egger leg. (3 spcms., cSCHN, cWR). Tripolis, 3.VI.1990, M. Janata leg. (2 spcms., cMAL); Tripolis env., 5.IV.1982, Krätschmer leg. (7 spcms., NMW). Ménalo Mts., 22.V.2006, Alonistena & Řiha leg. (1 spcm., cŘIH). - Korinthía: Acrokórinthos, S Kórinthos, 17.V.1991, Steiner leg. (1 spcm., NMW). Neméa W, Stympalia Lake, 616 m, 37°51'03.8"N/22°26'47.3"E, cultivated landscape, lakeshore with reed, 29.IV.2007, Schnitter & Neumann leg. (1 spcm., cSCHN). - Kríti: "Kreta", V.1985, Dukat leg. (1 spcm., cWR). - Stereá Elláda: Attikí Pireás: "Attika" (3 spcms., DEI; 1 spcm., MNHUB); "Attica Reitter" (1 spcm., NMW); "Attika Krüper" (2 spcms., DEI; 1 spcm., cHEYD). Athína ("Athen", 2 spcms., DEI; "Athen Zebe", 2 spcms., DEI). Fokída: Delfi, 10.V.2003, A.Cedzo leg. (1 spcm., cHAJ). - Égina ("Aegina", "Collect. Plason", 1 spcm.,

- NMW). - Fthiótida: Tragana env., 21.V.1984, L. Feller leg. (3 spcsm., cWR). - Fthiótida/Viotia: "Parnass" (1 spcm., DEI; 1 spcm., cHEYD; 4 spcsm., MNHUB); "Parnass Paganetti" (6 spcsm., DEI; 4 spcsm., MNHUB); "Balkan Parnass Paganetti 03" (1 spcm., MNHUB); "Parnass", "Bittner 94 Griechenld." (1 spcm., NMW); "Graecia. Parnassos. v. Oertzen", "1882 X VI." (5 spcsm., MNHW). - Viotia: Thiva env., 27.IV.1993, Vl. Skoupý leg. (1 spcm., cSKOUP); Inoi, S Thiva, 400 m, 10.IV.1992, Krätschmer leg. (1 spcm., cWR). - Évia: "Euboea", "Bittner 94 Griechenld." (1 spcm., NMW). Kastéla, 30.V.2009, Konstantaras leg. (1 spcm., cMÜLL). Skiros: Vories Sporádes ("Nördliche Sporaden Skyros Emge", 1 spcm., MNHUB); Néa Stíra, 2.-9.VI.2007, O. Blochwitz leg. (1 spcm., cBLOCH). - Nissia Egéou: Kikládés: Andros, v. Oertzen leg. (1 spcm., MNHUB; 1 spcm., ex coll. F. Ullrich, cWR). Tinos, v. Oertzen leg. (1 spcm., MNHUB); Tinos, V 1983, Bilek & Kritscher leg. (1 spcm., NMW). - "Siderokastro", 5.-6.VI.2005, K.Pils leg. (1 spcm., cORSZ, I have been unable to locate this name geographically, as it occurs several times in Greece, one time in Macedonia, and two times on the Peloponnese).
- Greece or Republic of Macedonia: 6 spcsm. (MNHUB, with labels, according to the old collection catalogue as coming from areas from Greece to Macedonia). "Mazedonien" (2 spcsm., MNHUB). "Macedon. Doiran-See, Coll. O. Leonhard" (1 spcm., DEI).
- Republic of Macedonia: "Mazedonien, Szoor [?] 4.VI.17 Müllenhoff S.G." (1 spcm., MNHUB). - Skopje: Skopje ("Üsküb", 4.IV.1916, ex coll. Kricheldorf (1 spcm., cWR); Zeden planina at Radusha, 27.V.1980, F. Hieke leg. (1 spcm., MNHUB). - Southeastern region: "Makedonia Ohrid", 29.V.1937, W. Liebmman leg. (1 spcm., DEI). Stari Dorjan, Mt. Devgeli, 200 m, 41°10.1N/22°44.5E, 9.VI.2007, P. Kabátek leg. (1 spcm., cWR). "Macedonia or., Lake Dojran env.", 27.-30.V.1985, V. Vitner & P. Srúta leg. (1 spcm., cWR). Strumica, 17.V.1937, W. Liebmman leg. (1 spcm., DEI).
- Bulgaria: Blagoevgrad: Kresna, 4.V.1992, Mrácek leg. (1 spcm., cWR). Petrič, 25.V.2003, A.Cedzo leg. (1 spcm., cWR).
- "Montenegro, Dubrovnik, VI.87" (1 spcm., cWR). The sense of this label remains unclear, Dubrovnik is situated in Croatia, at least I could not find a Montenegrin "Dubrovnik", probably the specimen was collected on a bus trip starting in Montenegro to the close Dubrovnik. If this specimen is not mislabelled, it deals with the westernmost finding of this species.

Recognition

See key. Normally the puncturation of the superior surface, often used in keys, is somewhat less dense, less coarse and less rugose as in *P. coeruleus* (BR.), but occasionally specimens come in this character close to *coeruleus*, therefore often causing misidentification in the past. *P. cyaneus* (DEJ.) can be separated definitely by the lateral margin of the elytra continuing as complete, distinct, though sometimes finer basal margin to the meso-sternal peduncle (compare Figs 3, 4), by the wider head, by the elytral pubescence all about of about the same length and the male genital (see Figs 8, 9). For data on variation in some values see Tab. 1.

Intraspecific and geographical variability

All external characters have a great variability (as normal in Ditomina), this concerns especially the size, the puncturation of superior surface, the construction of the mentum and the clypeus, and the form of the pronotum, especially the construction of the anterior angles. The size can vary from 13 to 20 mm, the mentum has mostly a small acute tooth, more seldom it is only with a short projection apically rounded, the clypeus is as a rule weakly excavated but can also have an almost angulate, stronger excavation. The anterior pronotal angles are variable (weaker or more strongly protruding). The puncturation of the superior surface is coarse and dense, on the head and the pronotum sometimes

rugose, the elytral base near the suture without longitudinal rugosities, the elytral intervals are with punctures in about two to three irregular rows. A variability in geographical aspect cannot be stated.

Distribution

According to numerous authors and investigated material widely distributed in Greece (mainland, Peloponnese, Cyclades, Sporades, Crete), in Macedonia, Bulgaria, and northwest Turkey. A specimen from the historical collection of MNHUB is labelled as coming from "...Syria, Coll Schaum...." but without doubt it is a case of mislabelling. Due to the occurrence in the Macedonian parts of the Ohrid Lake and the Mount Galičica a finding in Albania seems very likely (see also B.V. GUÉORGUIEV 2007: 97).

SIENKIEWIECZ (2008: 367) recorded, referring on one specimen, *Pachycarus* (*Mystropterus*) *cyaneus* (DEJEAN) from Rupite, Mt. Kozhuh near Petrich as new for Bulgaria, without doubt he used the name in the sense of Schaum and Stichel, as he also mentioned *P. atrocoeruleus* (WALTJ.), so he was in the opinion to record the species which has the valid name *P. coeruleus* (BRULLÉ) for the first time. I was not able to check this specimen, but the author sent me kindly a more precise photograph (than the one in his publication) where I believe to realize that the lateral margin of the elytra is not terminating at the humerus about at level of the elytral stria 5 but forming a more or less complete basal margin. Taking into consideration this fact and additionally the certainty that *P. coeruleus* in his distribution toward north is already absent in northern Greece, and finally also the instance that *P. cyaneus* (DEJEAN) (under the name *P. atrocoeruleus*) was already recorded for Bulgaria from the same locality (GUÉORGUIEV & GUÉORGUIEV 1995: 206) make it very likely that this specimen belongs to the true *P. cyaneus* (DEJEAN), too.

Pachycarus (*Mystropterus*) *coeruleus* (BRULLÉ 1832)

Ditomus coeruleus BRULLÉ 1832: 116 (type loc.: "Morée"[Peloponnese])

Pachycarus cyaneus v. *limbatus* PIC 1923: 13 (type loc.: "Mont Parnasse")

Mystropterus atrocoeruleus ssp. *dejeani* STICHEL 1925: 83 (type loc.: "Brusa-Amasia" [wrong!]) syn.nov.

Pachycarus cyaneus DEJEAN: SCHAUM 1857: 129

Pachycarus (s.str.) *coeruleus* BRULLÉ: PIOCHARD 1873: 88

Pachycarus coeruleus BRULLÉ: REITTER 1900: 55

Pachycarus coeruleus BRULLÉ: APFELBECK 1904: 168

Mystropterus cyaneus DEJEAN: STICHEL 1925: 82

Pachycarus (*Mystropterus*) *cyaneus* DEJEAN: Csiki 1932: 1084

Pachycarus (*Mystropterus*) *cyaneus* DEJEAN: SCHAUBERGER 1932: 157

Pachycarus (*Mystropterus*) *cyaneus* (DEJEAN, SCHAUM): MÜLLER 1937: 129

Pachycarus cyaneus (DEJEAN): TRAUTNER & GEIGENMÜLLER 1987: 376

Pachycarus coeruleus [no author]: LEGAKIS 1988: 65

Mystropterus [sic] *coeruleus* (BRULLÉ): DVOŘÁK 1993: 179

Pachycarus (*Mystropterus*) *cyaneus* (DEJEAN): V.B. GUÉORGUIEV & B.V. GUÉORGUIEV 1997: 49

Pachycarus (*Mystropterus*) *cyaneus* (DEJEAN): LORENZ 1998: 363

Pachycarus (*Mystropterus*) *cyaneus* (DEJEAN): WRASE 2003: 367

Type material

Ditomus coeruleus BRULLÉ 1832 (MNHP)

Lectotype: ♀, labelled: "Grèce" (handwritten on white label); "coeruleus / Brullé" (handwritten on yellow label, most probably by Brullé); "ex Musæo / Mniszech" (black printed and black framed on white label, subsequently added), and: "LECTOTYPE / Ditomus / coeruleus BRULLÉ, 1832 / WRASE design. 2010" (black print on red label), and: "Pachycarus / (Mystropterus) / coeruleus (BRULLÉ, 1832) / WRASE det. 2010" (black print on white label).
Paralectotype: ♀, only labelled with: "ex Musæo / Mniszech" (black printed and black framed on white label, subsequently added), and: "PARALECTOTYPE / Ditomus / coeruleus BRULLÉ, 1832 / WRASE design. 2010" (black print on red label), and: "Pachycarus / (Mystropterus) / coeruleus (BRULLÉ, 1832) / WRASE det. 2010" (black print on white label).

Pachycarus atrocoeruleus ssp. *dejeani* STICHEL 1923 (MNHUB)

Lectotype: ♂, labelled: "3396" (black print on white label); "Asia occ. /Ban" and "cyaneus / B." (both handwritten on white label). Paralectotype: ♂, only labelled with: "3396" (handwritten on white label). Both specimens with labels subsequently added: "Hist.-Coll. (Coleoptera) / Nr. 3396 / Pachycarus cyaneus... / Brusa-Amasia / Zool. Mus. Berlin" (black print, black margined, on white label), and with labels (lectotype): "LECTOTYPE / Mystropterus atrocoeruleus ssp. dejeani STICHEL, 1923 / WRASE design. 2010", and (paralectotype): "PARALECTOTYPE / Mystropterus atrocoeruleus ssp. dejeani STICHEL, 1923 / WRASE design. 2010", and both with labels: "Pachycarus / (Mystropterus) / coeruleus (BRULLÉ, 1832) / WRASE det. 2010" (black print on white label).

Usage of the name "*coeruleus*" in genus *Pachycarus* SOLIER 1835

In compliance with the regulations of article 23.9.1. of ICZN 1999 for the case of *Ditomus cyaneus* DEJEAN and *Ditomus atrocoeruleus* WALTl the second blue species occurring in Greece has the valid name *Pachycarus coeruleus* (BRULLÉ 1832) which is consequently not a synonym of *P. cyaneus*, as some authors believed following the speculation of SCHAUM (1857). PIOCHARD (1873), REITTER (1900), APFELBECK (1904), and DVOŘÁK (1993) used the name in a correct sense as a valid one, others (see above) did not.



Fig. 2: Original labels of lectotype of *Ditomus coeruleus* BRULLÉ.

Notes about types and synonymy

BRULLÉ did not mention the number of specimens in the description but gave as size 13 mm without any range. I received four specimens from the Collection Chaudoir (MNHP) and stored under the name *coeruleus*, which have a different body size, so (as in the case of *Ditomus cyaneus*) there are doubts if this series is the original composition. The first specimen (body size 13.3 mm, close to the size the author gave) bears several labels (Fig. 2), clearly indicating that it deals with a type specimen (see above). Brullé referred in the description to Dupont (...*Ditomus cæruleus* Dupont, ined.....Communiqué par M. Dupont...). After HORN & al. (1990: 102) a part of the collection

of the brothers Dupont were sold to Mniszech in 1848. The last label at this specimen ("ex Musæo Mniszech") confirms this fact. The second specimen from the series bears only this collection label. Though not in accordance with the given size in the description (it measures 14 mm) I believe it belonging to the type series, two bits of evidence point toward this interpretation. First, it has the same type of pin, second, it has the same kind of preparation. It may be that the measurement by Brullé was only superficially made, probably in consequence of the kind of preparation which let the head deeply afflicted causing a difficult measuring. The other two specimens belonging to the same species came without doubts later into this series, they bear the only label "ex Musæo Chaudoir" and are not considered as syntypes.

STICHEL (1923) following the wrong interpretation of *Ditomus cyaneus* made by SCHAUM (1857), referred in the description of his *Pachycarus atrocoeruleus* ssp. *dejeani* wrongly to the specimens of *cyaneus* which Dejean would have received from Olivier from Asia Minor, in his opinion forming a subspecies of *P. atrocoeruleus* (WALTJ.), as types he destined specimens from "West-Kl.Asien (durch Banon B.Z.M. (Typen)". I could investigate these specimens, it deals with two specimens, according to the old collection catalogue listing the historical material including types coming from "Brusa-Amasia", one has the label "Asia occ. /Ban". Without doubts these are the specimens Stichel cited (while it is unclear, if they really come from the collector Banon) and I have designated them as lecto- and paralectotype (size 14.7 mm and 16.8 mm). Somewhat unexpected, I found that they belong to *Pachycarus coeruleus* BR. with no differences to Greek specimens, the provenance cited on the locality label must be considered as wrong as this species has never been found outside of Greece.

Other material examined: Beside the material mentioned above 157 specimens were investigated from:

Greece: "Turcia"; "coll. Germar-Schaum" (5 spcms., DEI); "Griechenland"; "coll. Kraatz" (7 spcms., DEI); "Griechenland"; "coll. Stierlin" (1 spcm., DEI); "Graecia Turk." (1 spcm., cHEYD); "Graecia"; "Heyden" (1 spcm., MNHUB); "Graecia Kraatz" (1 spcm., MNHUB); "Graecia Krüper" (1 spcm., MNHUB); "Greece" (1 spcm., cBUL); "Graecia Waltl" (2 spcms., cHEYD); "Graecia Dohrn" (1 spcm., cHEYD). - Pelopónissus: "Taygetos" (2 spcms., DEI; 8 spcms., MNHUB). - Ahaia: "Kalávrita, Morea, Holtz" (1 spcm., NMW); Aroánia Mts, SE Kalávrita, ski resort, 1500 m, 3.-7.VI.2005 and 18.VI.2005, H. Pautz leg. (2 spcms., cEICH, cWR); Aroánia Mts., ski resort env., 16.V.2007, R. Kmeco leg. (2 spcms., cKM, cWR); Aroánia Mts., N Souvardo, 1350 m, I. Wolf leg. (1 spcm., cWR). Dourdouvana Mts., 12 km E/SE Klitoría, between Louzi and Likouria, 1140 m, 15.VI.2005, H. Pautz leg. (1 spcm., cEICH). Mega Spileo, 1.V. and 3.V.1922, W. Liebmann leg. (2 spcms., DEI). Mt. Klokou Keruneias, W Fteri, northern slope, 1585 m, 38°09'04N/22°03'32E, Abies, Juniperus, snow, 28.IV.1999, L. Zerche leg. (4 spcms., DEI). Panahaiko, NW Avriokampbos, eastern slope, 1325 m, 38°11'13N/21°53'58E, thorn bushes, snow fields, 1.IV.2000, L. Zerche leg. (2 spcms., DEI). - Argolida: Mikínes, 26.IV.2002, I. Jeniš leg. (3 spcms., cKM, cWR); Mikínes, cultivated landscape, 7.X.1996, B. Büche leg. (2 spcms., MNHUB); Mikínes, 11.VII.1981, Kolibač leg. (1 spcm., cWR). "Tiryns" [N Nauplion] (1 spcm., MNHUB). - Arkadia: Route Kandila-Levidi, 6.VI.2008, M. Egger leg. (1 spcm., cSCHN). - Iliá: Agios Vlássios, Brenske leg. ("Hagios Wlassis", 1 spcm., DEI). Zaháro, 2.V.1992, A. Cedzo leg. (2 spcms., cHAJ). - Korinthia: Acrokórinthos, S Kórinthos, 16.VI.1904, ex coll. Ulrich (1 spcm., MNHUB). Kórinthos, 30.V.1992, M. Šarovec leg. (1 spcm., cWR); Kórinthos, 17.V.1994, J. Blajda leg. (1 spcm., cWR). Zemenó, S Xilókastró, 31.V.1997 and 5.VI.1997, M. Egger

leg. (6 spcsm., cEGG, cWR). Killini Mts., S Amigdalies, cultivated landscape, terraced Juglans plantation, 728 m, 37°49'55.2"N/22°19'32.8"E, 29.IV.2007, Schnitter & Neumann leg. (5 spcsm., cSCHN, cWR). Neméa W, Stympalia Lake, 616 m, 37°51'03.8"N/22°26'47.3"E, 29.IV.2007, lakeshore with reed, Schnitter & Neumann leg. (11 spcm., cSCHN, cWR); Stympalia env., 18.V.1997 and 19.V.1997, M. Egger leg. (2 spcsm., cWR). Máti, V 1989, Richter leg. (1 spcm., cWR). Kastráki, 19.V.1989, R. Sciaky leg. (1 spcm., cWR). Killini Mts., 4 km N Kastanéa, 27.IV.1983, Krätschmer leg. (1 spcm. NMW). - Lakonia: Githio, 29.-31.V.1990, Švec leg. (1 spcm., cMAL); Route Githio-Skála, 25.IV.1994, R. Kmeco leg. (3 spcsm., cWR); Githio, Vahtia, Miane, 50 m, 1.IV.1989, J. Frisch leg. (4 spcsm., MNHUB). 30 km NE Geraki, 37°02'51"N/22°41'33"E, under stone, 23.III.1997, V. Assing leg. (1 spcm., cWR). Areópoli, 2.-3.IV.1980, Vl. Lapáček leg. (1 spcm., cWR). Itilo, 10 km N Areópoli, 36°43'N/22°22'E, 317 m, 18.V.2009, V. Kozel leg. (2 spcsm., cHAJ, cWR). Krionéri, 8 km N Areópoli, Taigetos, K. Ludvig leg. (1 spcm., cWR). Monomvassia, 18.-19.V.1979, Hladilovi leg. (2 spcsm., cWR). Kótronas, 28.IV.1999, M. Liebscher leg. (1 spcm., cWR). Mani, 26.V.1984, Bilek & Kritscher leg. (1 spcm., NMW); Mani, Diroú, 150 m, 28.III.1992, J. Frisch leg. (5 spcsm., MNHUB); Exo Mani, Kastánia env., 22.V.1985, Grandner leg. (1 spcm., cWR); Exo Mani, N Areópoli, Stoupa env., 17.V.1986, Grandner leg. (1 spcm., cWR); Éxo Mani, Stoupa, 9.VI.1996 and 19.VI.1996, M. Egger leg. (2 spcsm., cEGG); Éxo Mani, Stoupa, 22.VI.1996, M. Egger leg. (1 spcm., cWR); Éxo Mani, Stoupa, Neohóri, 13.VI.1996, M. Egger leg. (1 spcm., cWR); Éxo Mani, Stoupa, Ágios Nicólaos, 15.VI.1996, M. Egger leg. (2 spcsm., cWR); Éxo Mani, Pirgos, 19.VI.1996, M. Egger leg. (1 spcm., cWR). Tripi, Spárti env., 18.-19.V.1989, J. Turna leg. (1 spcm., cWR). 8 km W Anógia, 10 km SW Spárti, 800 m, 2.VI.1994, Schulz & Vock leg. (1 spcm., cPÜTZ). - Messinia: Taigetos, Kéndro, 100 m, 23.V.1985, Grandner leg. (2 spcsm., cWR). Taigetos, Kámbos, VI 1901, Holtz leg. (1 spcm., MNHUB). Kalamáta, 31.VI.1984, Bilek & Kritscher leg. (1 spcm., NMW). Taygetos Mts., 20 km NE Kalamáta, 1300 m, 29.V.-3.VI.2009, V. Slovák leg. (1 spcm., cHAJ). - Stereà Elláda: Attiki Pireás: "Emge", "Griechenland Attika" (1 spcm., MNHUB); "Attica" (1 spcm., DEI); "Attica 15/5 70"; "coll. Kraatz" (1 spcm., DEI); "Attica Krüper" (1 spcm., cHEYD); "Attica Reitter" (1 spcm., MNHUB); Attika, 13.IV.1922 (1 spcm.); 15.IV.1922 (2 spcsm.); 17.IV.1922 (3 spcsm.), W. Liebmann leg. (DEI); "Attika, 1977, Isopp" (2 spcsm. NMW). Athína ["Athen"] (2 spcsm., MNHUB). - Évia: "Euboea" (1 spcm., DEI). Pissónas NE Halkída, 8.IV.1994, Krätschmer leg. (2 spcsm., cWR). Irfis Mt., Stení Dirfios, 10.V.1993, K. Wada leg. (1 spcm., MNHUB). Nissi Petallií, "I.[sland] Makronision", v. Oertzen leg. (both elytra of 1 spcm., MNHUB). - Fthiótida/Viotía: "Parnass" (4 spcsm., MNHUB); "Parnass Paganetti" (2 spcsm., MNHUB); "Balkan Parnass Paganetti 03" (1 spcm., MNHUB); "Graecia Parnassos. v. Oertzen." (1 spcm., MNHUB). - Viotía: Aráhova, Parnaß, 5.V.1994, Dulik & Jeniš leg. (1 spcm., MNHUB); Aráhova, Parnaß, 22.IV.1994, R. Kmeco leg. (1 spcm., cWR). N Aráhova, high plateau, 27.V-3.VI.1987, H. & L. Freude leg. (1 spcm, cPÜTZ). - Kríti: "Kandia Frivaldsky" (1 spcm., cHEYD, this locality is most probably wrong).

Recognition

See key. On average the puncturation of the superior surface, often used in keys, is somewhat denser, coarser and more rugose as in *P. cyaneus*, but there are specimens similar to *cyaneus* in this character which can give reason for confusion. But *P. coeruleus* is characterized by the lateral margin of the elytra terminating at the humerus about at level of the elytral stria 5, a complete basal margin is lacking (Fig. 3), by the elytral setae which are in the humeral, lateral, and apical area distinctly longer than on

disc, by the smaller head, and the male genital (Fig. 9), which makes a recognition easy. For data on variation in some values see Tab. 1.

Intraspecific and geographical variability

The same can be said as in *P. cyaneus* (DEJ.), all external characters are extremely variable, the size can vary from 10.2 to 18 mm, the anterior margin of the clypeus can be moderately rounded, sometimes somewhat angulately excavated, the mentum is variable, mostly only with a short, rounded projection (Fig. 6), or even the excision rectilinear basally (Fig. 5), but more seldom with a small, more or less acute tooth (Fig. 7). The puncturation of the superior surface is very coarse and dense, on head and pronotum rugose with rugosities partly confluent, the elytral base is near the suture mostly with longitudinal rugosities, the elytral intervals are with punctures in about two to three irregular rows. A variability in geographical aspect cannot be stated.

Distribution

The distribution, compared with *P. cyaneus* (DEJ.) is more restricted. According to numerous authors and investigated material distributed in Greece on southern mainland and Peloponnese. APFELBECK (1904) recorded the species also from Crete with "(Kandia)-Frivaldsky, coll. v. Heyden" (Candia is an alternative name for the island of Crete, during the Venetian and Ottoman periods), later authors obviously adopted this statement. I investigated this specimen, it is a true *P. coeruleus*, but I have doubt in the correctness of the labelling. The label "Kandia Frivaldsky" was also noted in *P. brevipennis*, in this case it is obviously wrong (see below under *P. brevipennis*), so the conclusion might stand to reason that the label in *P. coeruleus* is also incorrect, the more as there are no new findings from Crete which could corroborate the occurrence on this fairly well explored island. The species is to date not yet recorded from outside of Greece.

Pachycarus (Mystropterus) brevipennis (CHAUDOIR 1850)

Mystropterus brevipennis CHAUDOIR 1850: 444 (type loc.: "près d'Amasia")

Pachycarus (Paramystropterus) brevipennis ssp. *kurdistanus* Schaubberger 1932: 156 (type loc.: "Mardin in Kurdistan") syn. nov.

Pachycarus (s.str.) *brevipennis* CHAUDOIR: Piochard: 1873: 89

Pachycarus brevipennis CHAUDOIR: REITTER 1900: 55; part.

Pachycarus brevipennis CHAUDOIR: APFELBECK 1904: 169; part. ?

Mystropterus brevipennis CHAUDOIR: STICHEL 1925: 83; part. ?

Pachycarus (Paramystropterus) brevipennis CHAUDOIR: SCHAUBERGER 1932: 157; part. ?

Pachycarus (Paramystropterus) brevipennis CHAUDOIR: Csiki 1932: 1085; part. ?

Pachycarus (Mystropterus) brevipennis CHAUDOIR: MÜLLER 1937: 129; part. ?

Pachycarus brevipennis CHAUDOIR: TRAUTNER & GEIGENMÜLLER 1987: 376; part. ?

Pachycarus (Mystropterus) brevipennis CHAUDOIR: Lorenz 1998: 363

Pachycarus (Paramystropterus) brevipennis CHAUDOIR: CASALE & VIGNA TAGLIANTI 1999: 388

Pachycarus (Paramystropterus) brevipennis (CHAUDOIR): Wrase 2003: 367

Material examined: (82 spcms.):

Turkey: "Asia minor" (1 spcm., MNHUB); "brevipennis Chaud. Anatolia coll Thieme" (5 spcms., MNHUB); "Anatolia" (1 spcm., DEI). "Syria. V.M. Duchon" (4 spcms., MNHUB). - Amasya: "chalybaeus Fald. Amasia Kind"; "3396"; "Hist.-Coll. (Coleoptera) / Nr. 3396 / Pachycarus cyaneus... / Brusa-Amasia / Zool. Mus. Berlin" (1 spcm., MNHUB); "Brusa/.nonreadable": "Hist.-Coll. (Coleoptera) / Nr. 3396 / Pachycarus cyaneus... / Brusa-Amasia / Zool. Mus. Berlin" (1 spcm., MNHUB, a further spcm. only with "3396" and the label subsequently added). "3400"; "Ditomus brevipennis Chaud. Amasia, Mniszech"; "Hist.-Coll. (Coleoptera) / Nr. 3400 / Pachycarus brevipennis / Chaud. /Amasia, Mnisz. / Zool. Mus. Berlin" (1 spcm., MNHUB, 3 further spcms. with only the last two labels); "Ditomus chalibaeus"; "brevipennis Chaud. Amasia Kind." (1 spcm., DEI); "Amasia Kindrm" (4 spcms., cHEYD); "Amasia" (12 spcms., DEI); "Amasia", ex coll. F. Ulrich (2 spcms., MNHUB). - Aksaray: ca 10 km E Aksaray, 1200 m, 4.IV.1980, W. Heinz leg. (4 spcms., cWR). - Bilecik: Bilecik, 28.III.1993, Ströhle leg. (1 spcm., cWR). - Corum: Yazılıkaya, ca 1200 m, 16.IV.1974, W. Heinz leg. (1 spcm., cWR). Sungurlu, Boğazkale, Hattuşaş, S Sungurlu, 1200 m, 23.IV.1992, K. Staven leg. (9 spcms., cPÜTZ, cWR). Ca 18 km W Alaca, ca 1100 m, 13.IV.1988, W. Heinz leg. (3 spcms., cWR). - Elaziğ: 15 km E Ak del Maden, 7.IV.1993, Ströhle leg. (1 spcm., cMÜLL). - Eskişehir: "Eski Chehir" (5 spcms., MNHUB); "Klein-Asien, Eskischehir v. Bodemeyer" (1 spcm., MNHUB). Hekimdağ env., 24.IV.1996, S. Kadlec leg. (1 spcm., cWR). - İstanbul: İstanbul ("Constantinop. Frivaldsky" (1 spcm., cHEYD). - Karaman: Sertavul pass, pass summit, ca 1600 m, 21.IV.1981, W. Heinz leg. (1 spcm., cWR). - Kayseri?/Adana?: "Syria Hadjin" (an Armenian town, destroyed 1920, today Siambeyli; 2 spcms., DEI). - Mardin: "Mardin Taurus" (4 spcms., MNHUB). - Malatya: "Malatia Mesopotam. Staudgr. 85" (2 spcms., DEI). - Nevşehir: pass Ürgüp/Aksalur, S Ürgüp, 1480 m, 8.V.1993, K. Staven leg. (1 spcm., cWR). - Sivas: Sivas, 20.V.1959, ex coll. Jeanne (1 spcm., cWR). - Yosgat: Bazıamaç env., SW Zile, 5.V.1996, S. Kadlec leg. (1 spcm., cWR). - Niğde: Ulukışla, 1914, Kulzer leg. ("Ulu Kischla Klzr. 1914", 2 spcms., DEI).

Not exactly to locate: "Kl. Asien Süd-Taurus 1000 m W. Siche" (1 spcm., MNHUB).

Wrong localities: "Caucasus" (1 spcm., DEI). "Graecia", "coll. Stierlin" (1 spcm., DEI); "Graecia" (1 spcm., DEI); "hirtus Strm. Graecia", "coll. Kraatz" (1 spcm., DEI). "Candia Frivaldsky", "brevipennis Apfelbeck vid." (Crete, 1 spcm., cHEYD).

Notes about types and synonymy

Chaudoir in his description mentioned a new *Pachycarus* species "que j'ai reçue de M. Kindermann qui l'a trouvée près d'Amasia en Anatolie". The passage ".... Long. 6 '". L'exemplaire que j'ai sous les yeux..." indicate that the description based only on one specimen (6 lines corresponds to 13.5 mm). Some time ago I had the occasion to investigate the type, stored in the Collection Chaudoir (MNHP) and compared it with two specimens coming from my collection, one from Sungurlu, the second from Bazıamaç (mentioned above), unfortunately I did not make any further notice on labelling of the type. In the Museum Berlin are several specimens housed (see above), one with the label "chalybaeus Fald. Amasia Kind", which most likely originate from the rate of yield, which Kindermann, a well known insect dealer, made and afterwards sold to entomologists of his time, amongst others also to Chaudoir. The same can also be said on specimens in DEI, one of which is labelled with "Ditomus chalibaeus" and "brevipennis Chaud. Amasia Kind.", and with the label subsequently added, most probably by G. Kraatz: "Amasia", others only with the latter label. Most probably these specimens come from the same series as the specimen Chaudoir investigated and

described as a new species. Also for that reason the interpretation of this species is beyond doubt.

Schauberger described *Pachycarus brevipennis* ssp. *kurdistanus* from one male from Mardin in eastern Turkey, it would differ from the typical form by wider elytra with more blunt apex, with disc flatter but more convex apically, by the pronotum laterally toward the more obtuse-angled posterior angles only weakly rounded, and by coarser puncturation of the superior surface. After having seen a larger number of specimens of *P. brevipennis* CHD. from all of its whole distribution area I had to state a great variability of characters, which is not geographically fixed, hence *kurdistanus* belongs as a junior synonym to *brevipennis*.

Recognition

See key. For data on variation in some values see Tab. 1.

Intraspecific and geographical variability

As in the preceeding species all external characters are very variable, the size can vary from 11.9 to 14.4 mm. The superior surface is blackish, rarely with a weak bluish hue, sometimes pronotal and elytral lateral gutter weakly violet. The anterior margin of the clypeus is very moderately rounded, sometimes also somewhat angulately excavated. The puncturation of the superior surface can vary in strength, density, and rugosity. The species is very similar to the later described *P. artipunctatus* DVOŘÁK, but as a rule, with somewhat coarser but less dense puncturation, shorter elytra, darker coloration and, at the average, larger size and a different construction of the median lobe (see key and Fig. 12). A variability in geographical aspect cannot be stated.

Distribution

Mentioned by authors from wide areas in Asia Minor, but also recorded from "Konstantinopel", "Obersyrien" and from "Mesopotamia (Malatia)", and furthermore from Crete and Rhodes. In many cases there is a reasonable suspicion that some distributional data some authors gave, refer on *P. artipunctatus* (DVOŘÁK 1993), a species very similar to *P. brevipennis* and described much later.

After the material investigated distributed from northwestern Turkey, namely from the mountainous regions of Istanbul, Bursa and Eskişehir, from Amasya, Nevşehir, southwards to Karaman and eastwards to regions of the Van Lake. The eastern limit of the distribution, indicated by abovementioned historical geographical names, is unsure, areas in "Obersyrien" belong partly today to Turkish territory, though an occurrence in the north western part of Syria cannot be excluded, though specimens labelled as coming from "Syria" I consider as originating from Turkey.

APFELBECK (1904) recorded the species also from "Mesopotamia (Malatia)", without doubt it refers to the town or province of Malatya in eastern Turkey. The name Mesopotamia, a toponym for the area of the Tigris-Euphrates river system, largely corresponding to modern-day Iraq, as well as some parts of north eastern Syria, south eastern Turkey, and south western Iran, was used in the older research in a wider sense than today and denoted the whole flat steppe land between the Arab desert and the eastern peripheral regions of the Zagros and Taurus mountains.

I could investigate the specimen APFELBECK (1904) mentioned from Crete with "(Kandia)-Frivaldsky, coll. v. Heyden" (Candia is an alternative name for the island of Crete, during the Venetian and Ottoman periods), it deals with a true *P. brevipennis* but taking into account the distribution of this species an occurrence on Crete seems not plausible, the record without doubt is caused by a mislabelling (what I could state several times concerning old, historical material), the more as Crete is a fairly well explored island and *P. brevipennis* is not represented in new collections from there, this is also true for Greece in general, from that reason I consider the labelling of historical specimens as coming from Greece wrong. I could also check the specimen APFELBECK (1904) recorded from "Konstantinopel-Frivaldsky, coll. v. Heyden". It is a *P. brevipennis* proving the occurrence in the extreme north west of the Asian part of Turkey, Taking into consideration all investigated material, I tend to disbelieve (like also PIOCHARD 1873) in an occurrence in the European part.

I was unable to study material from Rhodes, cited by MÜLLER 1937 who has seen a specimen in the Museum Turin, but in this case, if this specimen is not mislabelled, I assume that this record refers to the later described *P. artipunctatus* (DVOŘÁK 1993), a species very similar to *P. brevipennis*, due to its distribution area in south western Turkey (see also below the remarks on a finding of both elytra of a specimen of *P. artipunctatus* on the Greek island Híos). According to the material studied both species do not occur sympatricly.

***Pachycarus (Mystropterus) artipunctatus* (DVOŘÁK 1993)**

Mystropterus [sic] *artipunctatus* DVOŘÁK 1993: 179 (type loc.: Turkey, Barladağı, ca. 1400 m)

Pachycarus brevipennis CHAUDOIR: REITTER 1900: 55; part. ?

Pachycarus brevipennis CHAUDOIR: APFELBECK 1904: 169; part. ?

Mystropterus brevipennis CHAUDOIR: STICHEL 1925: 83; part. ?

Pachycarus (Paramystropterus) brevipennis CHAUDOIR: SCHAUBERGER 1932: 157; part. ?

Pachycarus (Paramystropterus) brevipennis CHAUDOIR: Csiki 1932: 1085; part. ?

Pachycarus (Mystropterus) brevipennis CHAUDOIR: MÜLLER 1937: 129; part. ?

Pachycarus brevipennis CHAUDOIR: TRAUTNER & GEIGENMÜLLER 1987: 376; part. ?

Pachycarus (Mystropterus) artipunctatus (DVOŘÁK): LORENZ 1998: 363

Pachycarus (Paramystropterus) artipunctatus DVOŘÁK: CASALE & VIGNA TAGLIANTI 1999: 388

Pachycarus (Paramystropterus) artipunctatus (DVOŘÁK): WRASE 2003: 367

Type material (cWR)

Paratype: ♂, labelled: "TR-Barla Dağı / 29.4.1992 / lgt. Janata M." (black print on white label); "PARATYPUS" (black print on red label); "*Mystropterus* / *artipunctatus* sp.n. / det. M. Dvořák 92" (black print on white label).

Additional material examined: (44 spcms.)

Turkey: Antalya: Termessos, ca 700 m, 1.IV.1988, W. Heinz leg. (4 spcms., cWR); Gülden Dağ, Termessos, 14./15.IV.1984, I. Wolf leg. (6 spcms., cWR). N Altınyaka, 1100 m, 24.V.1991, M. Jäch leg. (2 spcms., same data but St. Schödl leg., 5 spcms., cWR). Route Kemer-Altınyaka, 5.-7.V.1997, M. Egger leg. (1 spcm., cWR). Saklıkent env., ca 25 km W Antalya, 1500-1800 m, 7.V.1992, U. Heinig leg. (10 spcms., cWR); Saklıkent, Bey Dağları, 1400 m, 1.VI.1993, C. Jeanne leg. (1 spcm., cWR); Saklıkent, Bey Dağları, 1650-1900 m, 17.VI.1994, A. Pütz leg. (4 spcms., cPÜTZ, cWR). Avlanbeli Geç., 25 km S Elmalı, 1100 m, 16.VI.2003, 3632N/2958E, E. & P. Hajdaj leg. (2 spcms., cWR). Karaovabeli Geçidi, 35 km N Kas, 1300-1500 m, cedar forest, 23.V.1993, leg. Schulz (1 spcm., cPÜTZ). Side, N Gesir, 12.V.1987, R. Wiedenfalk leg. (2 spcms, cPÜTZ, cWR). - Isparta: Eğirdir env., 1000 m, 29.III.1878, W. Heinz leg. (1 spcm., cWR). Barla Dağı, Barla env., 20.-21.V.1998, Vl. Kubík leg. (1 spcm., cWR). - İzmir: "Smyrna Frivald." (1 spcm., DEI); Bozdağköy, 8.IV.1988, D. Bernhauer leg. (1 spcm., cWR).

The locality of one specimen with the label "Elmalı Cilicia Rolle" (cHEYD) without doubt refers not to the city or cities Elmalı (which can be found many more than a dozen in Turkish maps) in Cilicia, which was in antiquity a commonly used name of the south coastal region of Asia Minor south of the central Anatolian plateau but to the city in the province of Antalya, wherefrom the species is documented by new findings.

Greece: Nissia Egéou: Híos: Volissós, v. Oertzen leg. ("Chios", both elytra of 1 spcm., MNHUB).

Notes about types

DVOŘÁK (1993) based the description of his species on a larger series (46 specimens) from the Barladağı and the Bey Dağları in southwestern Turkey. He compared his species with *P. coeruleus* (BRULLÉ) and *P. brevipennis* (CHAUDOIR) and stated numerous differences, which I can confirm, with one exception: DVOŘÁK described the males as blue and the females as black. This statement is not correct, also females can have a blue metallic reflection, surely the colour is depending from the age with fresh specimens with more distinct, brighter lustre, while older ones become darker and dull (an observation every entomologist have surely already made).

Recognition

See key. The species is very similar to *P. brevipennis* (CHAUDOIR), but at the average somewhat smaller, mostly with a little more distinct metallic lustre. The punctuation of the superior surface is as a rule somewhat finer and denser, the elytra are at the average longer, and the median lobe is different (compare Figs 11 and 12). For data on variation in some values see Tab. 1.

Intraspecific and geographical variability

The same can be said concerning these items as in the previous species. Body size varies from 9.5 to 12.5.

Distribution

According to examined material distributed from mountainous areas in south western Turkey from regions around İzmir and Isparta to Antalya. The distribution to the north and the east must be indicated by further material from outside of this region to show, if

this species lives sympatricly with *P. brevipennis* (CHAUDOIR) or not. I did not see material of the zone between Eğirdir and the regions towards north around Eskişehir where *P. brevipennis* occurs, and likewise from regions between Antalya and the Taurus towards Karaman wherefrom (Sertavul pass) I saw *brevipennis*, too.

Interestingly, the relicts of one specimen, presented by both elytra, found on the Greek island Hios, which is separated from Turkey by the Hios Strait and only seven kilometres off the Asia Minor coast directly adverse to the distribution area in south western Turkey evoke the question if this specimen is a member of an autochthon population which would mean that the species belongs to the Greek fauna, too, or this specimen (or its relicts) came to this island in a passive way, transported by water, wind, or other events.

***Pachycarus (Mystropterus) aculeatus* REICHE & SAULCY 1855**

Pachycarus aculeatus REICHE & SAULCY 1855: 590 (type loc.: "Syra" [Síros, Cyclades, Greece])

Pachycarus aculeatus REICHE: SCHAUM 1857: 128

Pachycarus (s.str.) *aculeatus* REICHE & SAULCY: PIOCHARD 1873: 83

Pachycarus aculeatus REICHE: REITTER 1900: 54

Pachycarus aculeatus REICHE & SAULCY: APFELBECK 1904: 168

Mystropterus aculeatus REICHE: STICHEL 1925: 82

Pachycarus (Mystropterus) aculeatus REICHE: SCHAUBERGER 1932: 157

Pachycarus (Mystropterus) aculeatus REICHE: CSIKI 1932: 1083

Pachycarus (Mystropterus) aculeatus REICHE & SAULCY: MÜLLER 1937: 129

Pachycarus (Mystropterus) aculeatus REICHE: LORENZ 1998: 363

Pachycarus (Mystropterus) aculeatus REICHE & SAULCY: Wrase 2003: 367

Material examined (26 spems.):

Greece: Nissia Egéou: Kiklades: Síros: "Graecia Kraatz" (1 spcm., MNHUB); "coll. Forster - v. Halfen" (1 spcm., MNHUB); "Graecia" (3 spems., DEI); "Griechenland" (1 spcm., DEI); "Griechenland Coll. Leonhard" (1 spcm., DEI); "Syra" (6 spems., DEI; 6 spems., MNHUB); "Syra Erber" (4 spems., CHEYD; 1 spcm., MNHUB); "Syra Schatzmayr" (1 spcm., DEI).

1 specimen (DEI) with a wrong locality, labelled "Kephallonia Stenz" (see distribution).

Notes about types

The species description based at least on two specimens, as the authors mentioned specimens of both sexes. As all authors have interpreted the species which is easily to recognize, of the same tenor, investigation of the types seemed not necessary.

Recognition

See key. For data on variation in some values see Tab. 1.

Intraspecific and geographical variability

As an inhabitant of a small island surely geographical variability cannot be stated, for judging the intraspecific variability the material is too small, at least the few investigated specimens show a very little variability in characters except the body size which varies from 16 to 23 mm.

Distribution

Endemic to the Cyclades island Síros.

Key to species of *Pachycarus* SOLIER 1835

- 1 Pronotum somewhat cordiform, basal half of pronotal disc strongly convex, basad fairly strong declined, laterally always rectilinearly narrowed, and very weakly sinuate shortly anterior to distinctly obtuse-angled posterior angles. Elytra oval, without distinct humeri (sg. *Pachycarus*).
 Body black with a very weak bluish hue. Clypeus at anterior margin weakly excavate. Mentum without tooth, only with a roundly protruding swelling of about one tenth of length of lateral lobes. Lateral margin of elytra continuing as complete, distinct, though finer basal margin to meso-sternal peduncle. Punctuation of upper surface coarse and dense, on head and pronotum partly rugose, elytral intervals with punctures in about two to three irregular rows. Pubescence on head and pronotum very short, hardly visible, on elytra short with somewhat longer setae in apical part. Median lobe of aedeagus Fig. 13. 16-19.7 mm. W Turkey..... *P. (s.str.) latreillei* SOLIER 1835
- Pronotum with disc evenly convex, laterally almost evenly and posterior angles widely rounded. Elytra less ovate with humeri distinct, though widely rounded (sg. *Mystropterus* CHAUDOIR 1842)..... 2
- 2 Posterior trochanters long and apically strongly acuminate. Pronotum longer, ratio PW/PL 1.20-1.28. Lateral gutter toward posterior angles wider and there margin distinctly reflexed.
 Body black. Clypeus at anterior margin almost rectilinear. Mentum with distinct tooth apically somewhat blunt (as in Fig. 7). Lateral margin of elytra terminating at humerus about at level of stria 5, a complete basal margin missing. Punctuation of upper surface coarse, on head and pronotum rugose, rugosities partly confluent, elytral intervals with punctures in about two to three irregular rows. Pubescence of superior surface very short, hardly visible. Median lobe of aedeagus Fig. 10. 16-23 mm. Endemic to the Greek Cyclade isle Siros *P. (Mystropterus) aculeatus* REICHE & SAULCY 1855
- Posterior trochanters short and apically blunt. Pronotum shorter, ratio PW/PL as a rule more than 1.28. Lateral gutter equally formed on its whole length, margin at posterior angles not distinctly reflexed 3
- 3 Lateral margin of elytra terminating at humerus about at level of elytral stria 5, a complete basal margin lacking (Fig. 3). Elytral setae in humeral, lateral, and apical area distinctly longer than on disc.
 Superior surface with blue or at least blackish-blue shine. Head relatively small, ratio PW/HW 1.42-1.57. Clypeus at anterior margin moderately roundly excavated. Mentum mostly only with a short, rounded projection (Fig. 6.), or even the excision rectilinear basally (Fig. 5), more seldom with a small, more or less acute tooth (Fig. 7). Punctuation of upper surface coarse and dense, on head and pronotum rugose, rugosities partly confluent, elytral base near suture mostly with longitudinal rugosities, elytral intervals with punctures in about two to three irregular rows. Median lobe of aedeagus Fig. 9. 10.2-18 mm. S Greek mainland, Peloponnese, ?Crete.....
 *P. (Mystropterus) coeruleus* (BRULLÉ 1832)
- Lateral margin of elytra continuing as complete, distinct, though sometimes finer basal margin to meso-sternal peduncle (Fig. 4). Elytral pubescence all about of about the same length..... 4
- 4 Large species (13-20 mm) from the Balkans and from areas close to coast of NW Turkey.

- Superior surface with blue or at least blackish-blue shine. Head relatively wide, ratio PW/HW 1.35-1.47. Clypeus at anterior margin weakly roundly excavated. Mentum variable, mostly with a small acute tooth (as in Fig. 7), more seldom only with a short rounded projection. Punctuation of superior surface coarse and dense, on head and pronotum sometimes rugose, elytral base near suture without longitudinal rugosities, elytral intervals with punctures in about two to three irregular rows (as a rule punctuation of upper surface somewhat less dense, less coarse and less rugose as in *P. coeruleus*). Median lobe of aedeagus Fig. 8. Greece (mainland, Peloponnese, Cyclades, Sporades, Crete), ?Montenegro, Makedonia, Bulgaria, NW Turkey
.....*P. (Mystropterus) cyaneus* (DEJEAN 1829)
- Species with at the average smaller body size (9.5-14.4 mm) from SW to E Turkey (and probably to Syria) 5
- 5 At the average smaller species (9.5-12.5 mm) from SW Turkey. Elytra at the average narrower, ratio EL/EW 1.36-1.44. Superior surface blackish with faint bluish shine, sometimes elytral lateral gutter faint violet. Median lobe (Fig. 11) apically almost evenly narrowed with apical lamella acuminate, somewhat shifted to the left (dorsal view).
Clypeus at anterior margin very weakly roundly, sometimes somewhat angulately excavated. Mentum without tooth (as in Fig. 5), sometimes with a weakly protruding roundly projection. Punctuation of upper surface coarse and dense, sometimes rugose, elytral intervals with punctures in about three to four irregular rows, striae hardly visible
.....*P. (Mystropterus) artipunctatus* (DVOŘÁK 1993)
- At the average larger species (11.9-14.4 mm) from C and S Turkey to W Turkey (and probably Syria). Elytra at the average wider, ratio EL/EW 1.28-1.38. Superior surface blackish, rarely with a faint bluish hue, sometimes pronotal and elytral lateral gutter faint violet. Median lobe (Fig. 12) apically with a weak contraction, apical lamella somewhat set off, apically somewhat rounded and somewhat shifted to the left.
Clypeus at anterior margin very weakly roundly, sometimes somewhat angulately excavated. Mentum without tooth (as in Fig. 5), sometimes with a weakly protruding roundly projection. Punctuation of upper surface as a rule somewhat coarser but less dense as in *P. artipunctatus*, sometimes rugose, elytral intervals with punctures in about two to three irregular rows, striae hardly visible
.....*P. (Mystropterus) brevipennis* (CHAUDOIR 1850)

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References

- APFELBECK V. (1904): Die Käferfauna der Balkanhalbinsel, mit Berücksichtigung Klein-Asiens und der Insel Kreta. Erster Band. Familienreihe Caraboidea. – Berlin: R. Friedländer und Sohn, ix + 422 pp.
- APFELBECK V. (1907): Bericht über die im Jahre 1906 durchgeführte zoologische Reise nach Ost-Albanien in das Gebiet des Schar Dagh. – Jahresbericht des Naturwissenschaftlichen Orientvereins **12**: 31-36.
- BRULLÉ A. (1832): Des Animaux Articulés. Pp. 1-29, 64-395. – In: Expédition scientifique de Morée. Section des sciences physiques (sous la direction de M. Bory de Saint-Vincent). Tome III. Partie I. Zoologie. Deuxième Section. Paris: F.G. Levrault, 400 pp.
- CASALE A. & A. VIGNA TAGLIANTI (1999): Caraboid beetles (excl. Cicindelidae) of Anatolia, and their biogeographical significance (Coleoptera, Caraboidea). – Biogeographia **20**: 277-406.
- CHAUDOIR M. DE (1842): Description de quelques genres nouveaux de la Famille des Carabiques. – Bulletin de la Société Impériale des Naturalistes de Moscou **15**: 832-857.
- CHAUDOIR M. DE (1850): Mémoire sur la famille des carabiques. 2e partie (continuation). – Bulletin de la Société Impériale des Naturalistes de Moscou **23** (2): 349-460.
- CSIKI E. (1932): Carabidae: Harpalinae VI (Pars 121). Pp. 1023-1278. – In: JUNK W. & S. SCHENKLING (eds), Coleopterorum catalogus. Volumen III. Carabidae III. Berlin: W. Junk, 1933 pp.
- DEJEAN P.F.M.A. (1830): [new taxa]. – In: DEJEAN P.F.M.A. & J.B.A. BOISDUVAL, Iconographie et histoire naturelle des coléoptères d'Europe. Tome premier. Livraisons 4-12. Paris: Méquignon-Marvis, 113-400, pl. 16-60.
- DVOŘÁK M. (1993): Zur Kenntnis der Gattung *Carterus* und ihrer Verwandten (Coleoptera, Carabidae, Ditomini). – Časopis Slezského Muzea Opava A (**42**): 179-185.
- FAIRMAIRE L. (1866): Notice sur les coléoptères récoltés par M. J. Lédérer sur le Bosz-Dagh (Asie Mineure). – Annales de la Société Entomologique de France (**4**) **6**: 249-280.
- GUÉORGUIEV B.V. (2007): Annotated Catalogue of the Carabid Beetles of Albania (Coleoptera: Carabidae). – Sofia-Moscow: Pensoft Publishers, 243 pp.
- GUÉORGUIEV V.B. & B.V. GUÉORGUIEV (1995): Catalogue of the ground-beetles of Bulgaria (Coleoptera: Carabidae). – Sofia - Moscow: Pensoft Publishers, 279 pp.
- GUÉORGUIEV V.B., SAKALIAN V.P. & B.V. GUÉORGUIEV (1997). Biogeography of the endemic Balkan ground-beetles (Coleoptera: Carabidae) in Bulgaria. – Sofia-Moscow: Pensoft Publishers., 73 pp.
- GUÉORGUIEV V.B. & GUÉORGUIEV B.V. (1997): *Pachycarus (Mystropterus) macedonicus* sp. n. de Macédoine et notes sur les espèces balkaniques (Coleoptera, Carabidae, Harpalini). – Acta Zoologica Bulgarica **49**: 48-51.
- HAYEK C.F.M. VON (1973): A reclassification of the subfamily Agrypinae (Coleoptera: Elateridae). – Bulletin of the British Museum (Natural History), Entomology. Supplement **30**: 1-309+17 figures.
- HIEKE F. 1981: Die Carabidae einer Sammelreise nach Mazedonien (Insecta: Coleoptera). – Acta Musei Macedonici Scientiarum Naturalium **16** (3): 71-101.

- HORN W., KAHLE I., FRIESE G. & R. GAEDIKE (1990): *Collectiones entomologicae*. Ein Kompendium über den Verbleib entomologischer Sammlungen der Welt bis 1960. Teil I: A-K: 220 pp. Teil II: L-Z, pp. 221-573. Aus dem Institut für Pflanzenschutzforschung Kleinmachnow - Bereich Eberswalde, Abteilung Taxonomie der Insekten - der Akademie der Landwirtschaftswissenschaften der DDR. – Berlin: Akademie der Landwirtschaftswissenschaften der Deutschen Demokratischen Republik.
- ICZN (1999): *International Code of Zoological Nomenclature*. Fourth edition. – International Trust for Zoological Nomenclature. London: xxix + 306 pp.
- LEGAKIS A. (1988). The Zoological Museum of the University of Athens 3. The collection of Coleoptera from Greece, part I. – *Biologia gallo-hellenica* **14** (1): 59-95.
- LÖBL I. & A. SMETANA (eds): *Catalogue of Palaearctic Coleoptera*, Vol. 1. – Stenstrup: Apollo Books, 819 pp.
- LORENZ W. (1998): *Nomina Carabidarum* - a directory of the scientific names of ground beetles (Insecta, Coleoptera "Geodephaga": Trachypachidae and Carabidae incl. Paussinae, Cicindelinae, Rhysodinae). – Tutzing: W. Lorenz, iv + 937 pp.
- MÜLLER J. [G.] (1937): Note su alcuni carabidi della Balcania e della regione mediterranea. – *Atti del Museo Civico di Storia Naturale di Trieste* **13**: 119-134.
- PIC M. (1903): Coléoptères européens et "Clytus" Syrien nouveaux. – *L'Échange, Revue Linnéenne* **19**: 138-139.
- PIC M. (1923): Mutations, synonymies, nouveautés. – *L'Échange, Revue Linnéenne* **39**: 13-14.
- PIOCHARD DE LA BRÛLERIE C.J. (1873): *Monographie des Ditomides, tribu des carabiques*. – *L'Abeille, Journal d'Entomologie* **15**: i-viii, 1-100.
- REICHE L. & F. SAULCY (1855): *Espèces nouvelles ou peu connues de coléoptères, recueillies par M. F. de Saulcy, membre de l'Institut, dans son voyage en Orient, et décrites par M.M. L. Reiche et Félix de Saulcy*. – *Annales de la Société Entomologique de France* (3) **3**: 561-645 + 1 pl.
- REITTER E. (1900): *Bestimmungs-Tabellen der europäischen Coleopteren*. XLI. Heft. Enthaltend Carabidae. Abtheilung: Harpalini und Licinini. – *Verhandlungen des Naturforschenden Vereines in Brünn* **38** [1899]: 33-155.
- SCHAUBERGER E. (1932): *Zur Kenntnis der paläarktischen Harpalinen* (VIII. Beitrag). – *Coleopterologisches Centralblatt* **5** [1930-1932]: 153-192.
- SCHAUM H.R. (1857): *Beitrag zur Käferfauna Griechenlands*. Erstes Stück: Cicindelidae, Carabici, Dytiscidae, Gyrinidae. – *Berliner Entomologische Zeitschrift* **1**: 116-158.
- SFENTHOURAKIS S. & LEGAKIS A. (2001): Hotspots of endemic terrestrial invertebrates in southern Greece. – *Biodiversity and Conservation* **10**: 1387-1417.
- SIENKIEWIECZ P. (2008): *Pachycarus (Mysteropterus) cyaneus* (DEJEAN 1825) - species of ground beetles (Coleoptera, Carabidae) new for Bulgaria's fauna. – *Polish Journal of Entomology* **77**: 63-66.
- SOLIER A.J.J. (1835): *Observations sur le genre Ditomus*. – *Annales de la Société Entomologique de France* **3** [1834]: 659-671 + 2 pl.
- STICHEL W. (1923): *Zur Phylogenesis eines geologischen jungen Formenkreises der Käfer, der Ditominen (Carab. Harpal.)*. – *Zeitschrift für Wissenschaftliche Insektenbiologie* **18**: 41-50, 81-100, 145-162, 209-242.
- TRAUTNER J. & K. GEIGENMÜLLER (1987): *Sandlaufkäfer. Laufkäfer. Illustrierter Schlüssel zu den Cicindeliden und Carabiden Europas*. – Aichtal: Verlag Josef Margraf, 488 pp.

- TSCHITSCHÉRINE T. (1901): Genera des Harpalini des région Paléarctique et Paléanarctique. – Horae Societatis Entomologicae Rossicae **35**: 217-251.
- WALTJ. (1838): Beiträge zur Kenntniss der Coleopteren der Türkei. – Isis (Dresden) **6**: 449-472.
- WRASE D.W. (2003): Ditomina, pp. 363-367. – In: LÖBL I. & A. SMETANA (eds), Catalogue of Palaearctic Coleoptera, Vol. 1. Stenstrup: Apollo Books, 819 pp.
- WRASE D.W. (2005): Nomenclatorial, taxonomic and faunistic notes on some Palaearctic genera and species of ground-beetles (Coleoptera, Carabidae: Apotomini, Chlaeniini, Cyclosomini, Harpalini, Lebiini, Licinini, Platynini, Siagonini, Sphodrini). – Linzer biologische Beiträge **37** (1): 815-874.

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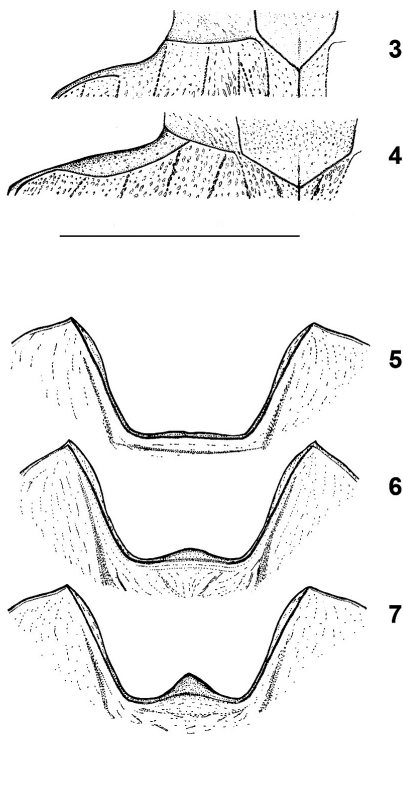
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Table 1: Data on variation in some values among *Pachycarus* species

taxon	sex	n	PW/PL	Ø	PW/HW	Ø	EL/EW	Ø
<i>latreillei</i>	♂	5	1.49-1.59	1.54	1.23-1.28	1.25	1.37-1.46	1.41
<i>latreillei</i>	♀	5	1.47-1.60	1.52	1.25-1.30	1.27	1.37-1.46	1.40
<i>cyaneus</i>	♂	5	1.32-1.38	1.36	1.35-1.47	1.41	1.37-1.44	1.41
<i>cyaneus</i>	♀	5	1.38-1.47	1.41	1.35-1.40	1.37	1.34-1.46	1.42
<i>coeruleus</i>	♂	5	1.33-1.38	1.35	1.47-1.57	1.52	1.41-1.51	1.46
<i>coeruleus</i>	♀	5	1.26-1.34	1.30	1.42-1.50	1.46	1.42-1.49	1.45
<i>brevipennis</i>	♂	5	1.41-1.50	1.45	1.34-1.42	1.38	1.28-1.36	1.32
<i>brevipennis</i>	♀	5	1.37-1.51	1.45	1.32-1.38	1.36	1.32-1.38	1.33
<i>artipunctatus</i>	♂	5	1.41-1.54	1.46	1.34-1.41	1.39	1.39-1.44	1.41
<i>artipunctatus</i>	♀	5	1.39-1.49	1.42	1.33-1.40	1.36	1.36-1.43	1.40
<i>aculeatus</i>	♂	5	1.20-1.27	1.24	1.38-1.46	1.42	1.38-1.44	1.42
<i>aculeatus</i>	♀	5	1.22-1.28	1.25	1.33-1.46	1.38	1.37-1.46	1.41

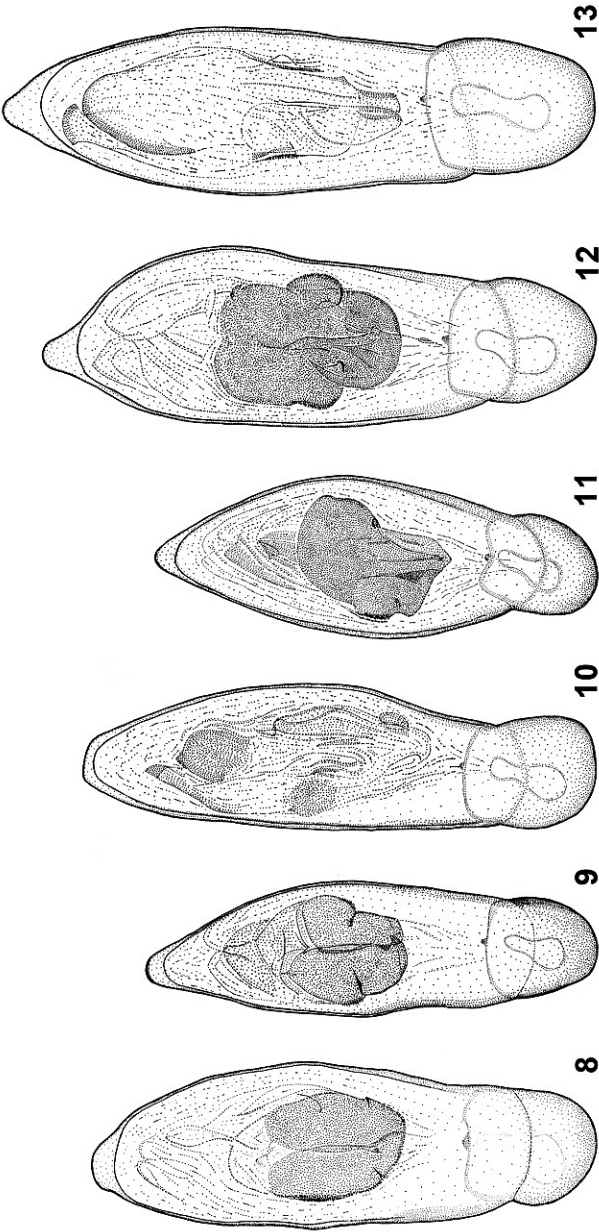


Figs 3-7: *Pachycarus*. 3, 4: left humerus. (3) *P. coeruleus* (BR.); (4) *P. cyaneus* (DEJ.). 5-7: *P. coeruleus* (BR.), variability in mentum excision. Scale bar 2 mm (3, 4), 0.5 mm (5-7).

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Figs 8-13: *Pachycarus*, median lobe of aedeagus, dorsal view. (8) *P. cyaneus* (DEL.); (9) *P. coeruleus* (BR.); (10) *P. aculeatus* (REICHE & SAULCY); (11) *P. arripunctatus* (DVOR.); (12) *P. brevipennis* (CHD.); (13) *P. latreillei* SOL. Scale bar 1.5 mm.

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