

## The studies made on Turkish Carabinae with checklist and bibliography (Coleoptera: Carabidae)

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**Abstract:** A synthesis of the studies carried out so far on Carabinae (Coleoptera: Carabidae) of Turkey is presented. Brief information about them is included here. Additionally, a species checklist and bibliography of Turkish Carabinae are given with important data. This publication is intended to be a guide for future work on this subject.

**Key words:** Carabinae, Carabidae, Turkey

### Türkiye Carabinae (Coleoptera: Carabidae) faunası üzerine yapılan tüm çalışmalar, fauna listesi ve biyografisi

**Özet:** Türkiye Carabinae (Coleoptera: Carabidae) faunası üzerine yapılan çalışmaların bir sentezi ve bu çalışmalar hakkında kısa bilgiler sunuldu. İlaveten, Türkiye Carabinae faunasının listesi ve biyografisi önemli bilgilerle birlikte verildi. Bu yayın gelecek çalışmalar için bir rehber olacaktır.

**Anahtar sözcükler:** Carabinae, Carabidae, Türkiye

### Introduction

When studies on the species belonging to the family Carabidae are examined, it is evident that most of these studies focus on the subfamily Carabinae, and in particular on the genus *Carabus*.

For instance, we can cite some studies on the biology, morphology, taxonomy, and distribution of the species belonging to the subfamily Paussinae and Carabinae of the Italian fauna (Casale et al., 1982); or a catalogue and distribution of *Carabus* species in the

world (Deuve, 1991); or the nice Březina's catalogue (1999), who for the first time included all the type localities of species, subspecies, and synonyms; or a synthesis of the genus *Carabus* in Europe (Turin et al., 2003); or an illustrated catalogue of the genus *Carabus* in the world (Deuve, 2004).

There are more studies on Carabinae subfamily of Carabidae mainly for 2 reasons. The first reason is that these species are of great importance for biological control, and the second one is that most of

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them are big in size, attractive in shape and colour, making them easier to examine.

Most of the Carabinae species are predators. In Turkey, *Calosoma sycophanta* L. is used against *Thaumatopea pityocampa* (Denis & Schiffermüller) (Kanat, 2002).

Each study conducted on Carabinae is very important for ecological and biogeographical aspects and for biological control; therefore, any study carried out on this subject is a contribution to the knowledge regarding environment.

Most of the studies conducted on Carabidae family in Turkey are about species belonging to the Carabinae subfamily. The aim of this study is to provide general information about the studies carried out on the Carabinae subfamily in Turkey, to determine the investigations made on this subject, to present a checklist and bibliography of Turkish Carabinae, and to provide a source for the works to be conducted in the future.

## Materials and methods

All the studies on Turkish Carabinae, short notes, all the documents were compiled after a long and meticulous effort, and all the studies were reviewed and evaluated. Brief information about them is presented here. The first species that were described from Turkey, the first records of some species from Turkey, the review of some species, and all similar studies, all the studies of the researchers who study on Turkish Carabinae, namely all the studies on Turkish Carabinae have been revised and this revision has been included in the "Remarks on the studies made on Turkish Carabinae" section of this paper. Additionally, "A Species Checklist and Bibliography of Turkish Carabinae" has been prepared meticulously and it is submitted in the "A Checklist of Turkish Carabinae" and "A Bibliography of Turkish Carabinae" sections of this paper.

## Results

### Remarks on the studies made on Turkish Carabinae

In Turkey the number of species of Carabidae is reported to be about 1100 (Casale and Vigna Taglianti, 1999). However, it is estimated that this

number is as many as 1200 today. In Turkey, the recorded number of Carabinae species is 87. When the estimated new numbers of species belonging to Carabidae are taken into consideration in Turkey, species belonging to Carabinae is 7 % of them.

When the Carabidae family is examined in general in Turkey, it is seen that studies on Carabinae subfamily are more than the ones of the other subfamilies.

The species belonging to the Carabinae subfamily have been classified in different ways by different researchers.

According to a recent classification by Löbl and Smetana (2003), the species and subspecies belonging to the Carabinae subfamily from Turkey are classified in the genera *Calosoma* Weber, 1801, *Carabus* Linné, 1758, and *Cychrus* Fabricius, 1794.

Among these genera, *Carabus* has the highest number of species and subspecies. There are many studies conducted on this genus in Turkey. Many of them have been conducted by entomologists from some European countries, such as Italy, France, Austria, Germany, Hungary, Czech Republic, Great Britain, Russia, and Sweden. Some of these entomologists are Silvano Battoni, Sandro Bruschi, Achille Casale, Pierfranco Cavazzuti, Achille Costa, G. De Cristoforis, Stefano Dacatra, Alessandro Dalla Torre, Piermauro Giachino, Giorgio Jan, Paolo Mazzi, Gaetano Osculati, Beppe Osella, Maurizio Pavesi, Ivan Rapuzzi, Mario Ruspoli, Arturo Schatzmayr, Enrico Sturani (his father Mario described the larval morphology of some Anatolian species), Franco Tassi, Augusto Vigna Taglianti (Italy), Claude Auvray, Gérard Charet, Philippe Basquin, Raymond Boulben, Philippe Darge, Armand David, Charles Delagrangé, Thierry Deuve, Guy Vacher de Lapouge, Bernard Lassalle, Georges Ledoux, Jean-Philippe Legrand, Patrice Machard, Daniel Prunier (France), Carl Blumenthal, Eduard von Bodemeyer, Bodo von Bodemeyer, Carl Escherich, Henri Gadeau de Kerville, L. Ganglbauer, Friedman Göbel, Ernst Görgner, Walter Heinz, Adalbert Kindermann, Frank Kleinfeld, Max Korb, Armin Korell, Horst Korge, Theobald J. Krueper, J. Lederer, Eberhard von Oertzen, Klaus Staven (Germany), Boleslav Březina, Martin Häckel, L.Hoberlandt, Josef Mařan, V.J. Stanek, K. Taborsky (Czech Republic), Joahn Sahlberg

(Finland), Stephan von Breuning, Rudolf Kenyeri, Karl Mandl, Arnold Penther, Harald Schweiger, Leo Weirather, Emerich Zederbauer (Austria), Igor Belousov, Maximilien de Chaudoir, G. Fischer von Waldheim, C.G. Von Mannerheim, E. Ménétériés, V.I. Motschulski, Victor Shchurov, T. Tschitschrine, Alexandr Zamotajlov (Russia).

In addition, Avgin and Prunier (2007), Avgin and Emre (2008), and Avgin and Prunier (2010) carried out some studies on this subfamily in Turkey.

The first *Carabus* collected in Turkey was the bigger and one of the spectacular species of the world, and described as *scabrosus* Olivier, 1790.

Subsequently, on the first part of the 1800, the Russian G. Fischer von Waldheim, Edouard Ménétériés, Victor I. Motschulski, and Maximilien de Chaudoir explored the Caucasian region and its adjacent eastern Anatolians regions. In their expedition, the following taxa were discovered: *Cychrus aeneus* Fischer von Waldheim, 1824; *Callisthenes brevisculus orbiculatus* (1839), *Cychrus anatolicus* Motschulski, 1865; *Carabus gotschi, puschkini kolenatii* (1846), *macrogonus* (1847), *victor inconspicuus, bischoffi, nordmanni* (1848), *scabripennis, spinolae lamprus* (1850), *Carabus chalconatus chalcoclorus* (1852), *chevrolati thierki, anatolicus* (1857), *bonvouloiri* (1863), *microderus, rumelicus* (1867), *acutangulus, Cychrus armeniacus* (1879), *Calosoma sicophanta severum, eversmanni Chaudoir* (1850).

At the same time, in 1832, Italian researchers Giuseppe De Cristoforis and Giorgio Jan visited Turkey and described: *Carabus mariettii, torosus moestus, spinolae, chevrolati* and *saphyrinus* De Cristoforis and Jan, 1837, while Gaetano Osculati in the expedition of the 1841-42 discovered *Carabus maurus osculatii* and *cribratus orientalis* Osculati, 1844.

Some of the most important naturalists of the Middle Europe visited Turkey; among others: Adalbert Kindermann (1838, 1850), Theobald J. Krueper (1875), Max Korbe (1886), Eberhard von Oertzen (1887), and Carl Escherich (1896). The materials they collected were studied by leading scientists of the time, Maximilien de Chaudoir (1850), J. Walzl (1838), L. Ganglbauer (1887), Guy Vacher de

Lapouge (1914), and S. von Breuning (1928). Italian researcher Achille Costa carried out one important research in the southwestern coast of the Anatolian Peninsula.

Léon Fairmaire in 1884-1886 studied the entomological materials collected in the Amanos Mountains by abbot Armand David and Charles Delagrangé, and published *C. caramanus* (1886). On the same material S. von Breuning, in 1975, described *C. scabrosus elbursensis* (= *elbursianus* H. de Toulgoët, 1986, new name).

In the last part of the 19th century E. Reitter published the description of some new *Carabus* species: *pirithous* (1896), *gordius*, and *omphreodes* (1898).

Viktor Apfelbeck, short time later (1904), in his very important study on the "Käferfauna of the Balkan peninsula" described *C. graecus thessalonicensis* and *wiedemanni burgassiensis*.

The expedition carried out by Eduard von Bodemeyer on the Mount Bolkar, and by Austrian Arnold Penther and Emerich Zederbauer on the Mount Erciyes, provided some important Carabidologic material. This material was studied by the top specialists of the time: L. Ganglbauer published *Carabus armeniacus korbianus, morawitzi* (1887) and *clathratus stygius* (1890). E. Bodemeyer described *C. (Procerus) sommeri sterilis* and *bulgharmaadensis* (1915). G. de Lapouge published *C. torosus bodemeyeri* (1914) and *coriaceus cerisyi bodemeyeri* (1923).

Some naturalists in the beginning of 1900 carried out entomological research. Finnish Joahn R. Sahlberg and his son, in 1904 visited the Central Anatolia, and published the result in his Catalogue of the Coleoptera of the Eastern Mediterranean region (Sahlberg, 1913).

German Bodo von Bodemeyer published the result of his journey of 1911 in Turkey (Bodemeyer, 1927). French Henry Gadeau de Kerville, in 1912 went on an important journey in the Anatolian region from İzmir to Ankara (Kerville, 1939).

At that time, G. Vacher de Lapouge was a prolific author of new taxa: *Calosoma sicophanta prasinum* and *Carabus punctatus vagepunctatus* (1907), *scabriusculus bulgarus, wiedemanni bithynus, gotschi*

*unctus* (1908), *torosus escherichi*, *torosus bodemeyeri* and *mulstantianus akbesianus* (1914), *wiedemanni anceps* and *victor transeuns* (1924).

V.J. Stanek in 1931 visited the Mount Ilgaz and discovered *C. staneki*, which was described as new species by F. Štěrba in the same year (1931).

In 1932 Joseph Mařan published a study on Carabidae from the Ilgaz massif, from which he described *Cychnus armeniacus ilgazdagghensis* among other new Carabidae species.

In 1947 the National Museum in Prague organized a very important expedition of scientific research in Turkey, which is considered as the first expedition of the modern time. The eminent entomologists taking part were: L. Hoberlandt, K. Taborsky, J. Mařan, J. Dlabola, S. Jurecek, and others of the Museum of Budapest (Hoberlandt and Taborsky, 1948; Mařan, 1950).

Other 3 important studies on the Turkish fauna followed the post-war period. At first, in 1947, Mařan examined the distribution and the geographical variation of the species *C. (Procrustes) banoni* Dejean, 1829 (*anatolicus* Chaudoir, 1857 included) in the Aegean Islands and in the southern Anatolia. In the second study, Mařan, in 1949, made an important contribution to the knowledge of the geographical distribution of the forms of *C. (Procrustes) coriaceus* Linné, 1758, present in Greece and Turkey, with the description of *cerisyi bodemeyerianus*. The zoogeographical and phylogenetic conclusions of the study are very interesting.

In the last study, dated back to 1950, he showed the results obtained during the scientific expedition to Turkey supported by the Museum of Natural Sciences of Prague in 1947. The descriptions of *C. (Lamprostus) torosus hoberlandti* and *C. (L.) hozari* were presented in a larger and well detailed, critical analysis of the species *C. (L.) torosus* Frivaldsky, 1835, and *C. (Procrustes) chevrolati* Cristofori & Jan, 1837.

Harald Schweiger (1962) identified some new species of *Carabus* Linné, 1758, and also reported some rare species from Turkey. This author (1964) taxonomically examined 8 *Carabus* species from Turkey. In another study (1964), he examined the species of *Oxycarabus* Semenov, 1898, and their zoogeographic relationships.

The most important contribution to the knowledge of the subgenus *Oxycarabus* Semenov, 1898, is the study carried out by the Austrian Karl Mandl dated back to 1971, in which he divided the subgenus into 4 species: *saphyrinus* Cristofori & Jan, 1837, *wagneri* Küster, 1846, *pirithous* Reitter, 1896, and *pseudopirithous* Mandl, 1955. In 1975 he completed a careful analysis of some species of *Sphodristocarabus* of the group *tokatensis* Roeschke, 1898, and *macrogonus* Chaudoir, 1847, but also of *blumenthaliensis* Heinz & Korge, 1967, *basilewskianus* Breuning & Ruspoli, 1970, *C. (Lamprostus) phaedimus* Schaufuss, 1882, *spinolae* Cristofori & Jan, 1837, and *bonplandi* Ménétériés, 1837. In a big study of the 1971 he revised *Sphodristocarabus* belonging to the “*macrogonus*” species group, giving a complete synthesis of the species: *resplendens* Breuning, 1934, *macrogonus* Chaudoir, 1847, *simonianus* Breuning & Ruspoli, 1970, *scovitzi* Faldermann, 1836a, and *pseudokolatensis* Heinz & Korge, 1967. In that study, a great amount of data from historical bibliographic sources and illustrations are indicated. In 1975, Mandl continued the revision of *Sphodristocarabus* analyzing the “*adamsi*” species group, distributed in the Caucasus, Transcaucasia, and North-East Turkey, and named many new taxa. In that work, the descriptions of all taxa are presented; moreover, many geographical indications are given, with a rich collection of illustrations of aedeagus drawings, pronotum shapes, and detailed distribution maps. A complete study of *Cychnus* from Anatolia was edited in 1977. In the taxonomic treatment proposed by Mandl, the genus *Cychnus* is represented in Anatolia by 3 species: *aeneus* Fischer von Waldheim, 1824, *armeniaceus* Chaudoir, 1879, and *ruspolii* Breuning, 1964. In 1980 he published, with his typical meticulousness and scrupulousness, the description of *C. (Lamprostus) hahni*, in the context of a synthesis on the *Lamprostus* of the western Anatolia. Accurate studies were conducted in 1986 attempting to define the identity of *C. (Lamprostus) bonplandi* Ménétériés, 1836, and of *C. (L.) hozari* Mařan, 1950. Finally, in 1987, Mandl performed a thorough study on the paleogeography, evolution, and the origin of some phyletic lineages of the most important *Carabus* subgenera in Turkey: *Procrustes*, *Lamprostus*, *Chaetomelas*, *Oxycarabus*, and *Megodontus*.



The most important person who characterized the carabidological research in Turkey in the post-war period was Austrian Stephan von Breuning, the author of the famous *Monographie der Gattung Carabus* (1932-1936). Since the 1960s, he published many contributions to the knowledge of the Turkish fauna. He described many new taxa, among which there were *C. (Sphodristocarabus) heinzi* and *C. (Lamprostus) giresuni* (1964). Breuning (1964) explained that the distribution of *Procrustes chevrolati* De Cristoforis & Jan, 1837 has close relationships with geological and climatic events in the area. In 1967 he published a noteworthy study on *C. (Procrustes) chevrolati*, and continued with systematic works, with the descriptions of many other *Carabus* and *Cychrus* species: *C. (Tomocarabus) maljushencoensis*, *C. (Megodontus) bonvouloiri kolatdagghensis*, *Cychrus ilgazdagghensis drannazdagghensis* (1967). In 1972 he described *C. (Sphodristocarabus) schuberti* (a name already assigned and replaced by Heinz, in 1975), and a long list of new taxa, many of which were published in the journal *Entomops*. Among them, there is one of the most beautiful gems from Turkey: *C. (Titanoechenus) osellai* (now included in *Lipaster*, and downgraded to subspecies of *gordius*), for which Ruspoli was the co-author. "Breuning and Ruspoli" were universally known in the carabidological publications of that period: they carried out long scientific expeditions together in Anatolia. Sometimes other people went with them, for instance Enrico Sturani in 1970. Their collaboration allowed the discovery of many new taxa, among which there were *C. (Tomocarabus) rumelicus zaraensis* (1970), *C. (O.) cribratus haramburae* (1974), *C. (O.) cribratus schubertianus* (1974), *C. (Lipaster) stjernvalli latisi* (1974), *C. (S.) simonianus* (1970), and others.

Carl Blumenthal was one of the most assiduous co-operators in the studies of Breuning and Battoni. He described, for instance, *C. (Lamprostus) rabaroni enricoi* Battoni & Blumenthal, 1972, *C. (L.) erenleriensis karadagghensis* Battoni & Blumenthal, 1972, *C. (Heterocarabus) mariettii sapancaensis* Blumenthal & Breuning, 1966, *C. (H.) mariettii ormanensis* Blumenthal & Breuning, 1966, *C. (Oxycarabus) pirithous sapancae* Blumenthal & Breuning, 1966, and others.

German Walter Heinz also started collecting specimen in Turkey in the 1960s, and later on published the descriptions of some new taxa. The most relevant ones were: *C. (Megodontus) bonvouloiri fortunatus*, *C. (Lamprostus) calley subnigrinus* (1970), *C. (Sphodristocarabus) scovitzii hedini*, *C. (Archicarabus) victor montanellus* (1973), *C. (Pachystus) ganyemed* (1975), *C. (Procrustes) bernauerorum* (1977), *C. (Sphodristocarabus) hedini czipkai* (1980). *C. (Sphodristocarabus) enigmaticus* was described together with its subspecies *reiseri* (1980), and represents one of the most interesting species of the Turkish fauna. The collaboration with M. Pavesi (Heinz and Pavesi, 1994) originated an interesting study on *Callisthenes* from Turkey, with the description of 2 new taxa: *Callisthenes eversmanni pesarinii*, n. ssp. and *Callisthenes peksi*, n. sp.

Since 1989 Heinz, together with Klaus Staven, has published articles on the systematics of the Anatolian fauna. From their collaborations, a lot of excellent studies were derived, rich in biogeographic annotations, containing the descriptions of many new taxa: *C. (Lipaster) stjernvalli tenebrius* (1989), *C. (L.) gordius planostriatus* (1995) and a well-argued study on the subgenus *Lipaster* (1989). Papers on *C. (Sphodristocarabus) rotundicollis aequicostalis* and *C. (S.) tokatensis kirikensis* (1995) followed. In 2000 they published an important study on the distribution and nomenclature of *Chaetomelas*, a subgenus widely spread in Asia Minor and in the eastern Mediterranean region, and in the same year they wrote, in collaboration with B. Lassalle, a development upon the identity of *C. (Lipaster) gordius*.

Armin Korell (1987, 1990) published some studies on *C. (Sphodristocarabus) tokatensis*, and on the same species in Hatay (2001), from which he already described *Procerus syriacus daphnensis* (1985) and *P. syriacus limitaneus* (1988). In 1998 he published a complete study on *C. (Pachystus) trojanus*, a very interesting species spread in the Aegean islands, and in 1999, together with Ernst Görgner, he produced an interesting study on *C. (Procrustes) impressus* Klug, 1832, of the province of Hatay, in which 2 new subspecies, *halfeticus* Korell and *palmyrus* Görgner, were described.

Achille Casale (1973) described *C. (Sphodristocarabus) resplendens cavazzutianus*, and discussed some groups of *Sphodristocarabus* species, giving photographs and drawings of their genitalia.

Pierfranco Cavazzuti, together with Casale, visited Anatolia several times between 1973 and 1991. They described a new subspecies of *Carabus* from Turkey in 1976: *C. (Sphodristocarabus) resplendens lilianae*, an interesting taxon with lively variable colors. In 1984 Cavazzuti published the descriptions of *C. (Sphodristocarabus) simonae*, *C. (S.) tokatensis kosensis*, and *C. (Tribax) curlettii*, a macrocephalous species rated among the most rare and mysterious from Anatolia. Its distribution is point form, localized in the area of Sarıkamış. *C. (Sphodristocarabus) georgia*, another very rare and enigmatic species, coming from the surroundings of Tunceli, was described in 1984. In the following years this author continued the analysis of the Turkish fauna publishing the description of many new taxa, as *C. (Sphodristocarabus) macrogonus azaleae*, *C. (S.) armeniacus sarikamisensis* and *C. (Megodontus) bonvouloiri casalei*, all in the same year (1986) in which *Procerus scabrosus ispiratus* and *P. s. callipygius* were described, as well. *Procerus scabrosus munzurensis* (1987), a rare endemic from the Munzur massif, was described in collaboration with Lassalle. In the same year (1987) he published a study on the *Lamprostus* from the northern forests in which some new subspecies were described; among them the most important is *C. nordmanni triumphans* with a very variable chromatic range, coming from inviolate forests at low altitude of the Pontic Alps, near Tonya, from where also the earthworm *Eophyla cavazzutii* Omodeo, 1988 comes, one of the biggest Lumbricidae (Oligochaeta) of the Mediterranean basin, which is almost surely a common prey of *Lamprostus*.

In 1989, Cavazzuti presented a monographic paper on *Procerus* Dejean, 1821, treated as a distinct genus. In this work many notes on systematics, biology, habitat, ecology, and distributions were given on all species. This monograph treated all *Procerus* species from Anatolia and included descriptions of new subspecies from this region.

Later, Cavazzuti continued his investigations of the Turkish fauna with a work on *C. (Sphodristocarabus)* species from the medium Valley of the Çoruh River, in

which the diagnosis of *C. (Sphodristocarabus) coruhnehriensis*, a new species, and *C. (S.) enigmaticus exiliatus* (1990) are given. *C. (Sphodristocarabus) giachinoi*, *C. (S.) karasudominus*, and *C. (S.) resplendens diogenei* were published in 1991. *C. (Tomocarabus) acutangulus mackaensis* (1991) was described by Cavazzuti, together with Korell; with him he also described *C. (Tribax) merdeniki* (1992), a species with completely unknown habits, which only recently (2008) has been found again by Ivan Rapuzzi. In 1992 he published also a work with the description of 2 new species: *C. (Pachystus) mazzii* from South Anatolia, and *C. (Sphodristocarabus) pavesii*, an interesting species coming, probably, from the mountains located at the east of İzmir, but never found again. In some following studies he gave again descriptions of new *Carabus* from Turkey, among which *C. (Lamprostus) pseudorobustus pseudocolossus*, *C. (L.) nordmanni exsultans* (1993), and *C. (Ischnocarabus) rubizzaniorum* (1994). Moreover, in collaboration with Rapuzzi (1998), he described *C. (Pachystus) pisidicus samai*, a new subspecies from south Turkey, an unexpected discovery in a region very far away from the type locality of the species. In 1999 he described *C. (Lamprostus) spinolae leonidas*, a new unrecognized subspecies of *C. spinolae* that, because of its isolated geographical localization among the southern populations of *C. (L.) torosus*, raises many questions on the dynamics of the original population and on the systematic position of the 2 species. There followed the description of *Cychnus anatolicus ziyathi* (2003), a unique taxon of *Cychnus anatolicus* present in northeastern Anatolia, isolated among numerous populations of *C. aeneus*. In 2004, in cooperation with Myska, he produced a study on some new subspecies of *Procerus*, from the Azerbaijan and the southern Armenia, and one from the Kahramanmaraş zone, in southern Turkey: *C. (P.) scabrosus kahramanicus*.

A more detailed study on Turkish Carabinae was prepared by Cavazzuti (2006). The distribution in Turkey, short definitions, and biologies of the species belonging to this subfamily were reported in this paper.

In addition to these studies, some other studies were also published.

Vigna Taglianti and Bruschi (1976) defined *Carabus* (*Sphodristocarabus*) *keltepenensis* as a new species for Turkey (in the mountains near Sapanca lake). They also discussed the systematic relations between the species of *Sphodristocarabus* Géhin, and prepared a new identification key.

Casale and Vigna Taglianti (1999) discussed the origin and biogeography of carabids of the Anatolian fauna, presented a short history of its discovery, and gave a checklist of Anatolian Carabidae, with species and subspecies of Carabinae included.

Silvano Battoni published 2 reports on his trips to the Balkans and Anatolia (1973, 1978), and described some taxa: *C. (Procrustes) coriaceus mehmeti*, *C. (Sphodristocarabus) resplendens zanderi*, and *C. (Lamprostus) rabaroni enricoi* (1973) in collaboration with Blumenthal, while he described by himself the taxon *C. (Oreocarabus) staneki yaraligozi* (1982).

Ivan Rapuzzi described (1990) *C. (Ischnocarabus) tenuitarsis prasinosomatus*, a nice subspecies from the surroundings of Çankırı. Later on, he published some studies on *Carabus* from the province of Hatay, in which he described *C. (Lamprostus) hemprichi propheta* (1995), *C. (Procrustes) impressus simulacrum*, and *C. (Chaetomelas) morawitzii discipulus* (1997). In 2000, together with Frank Kleinfeld he described *C. (Tomocarabus) scabripennis martaiellus*, from Abant lake, and together with the same author he published in 2004 a very complete and detailed study on the *Carabus* and *Procerus* from the Near East, including Hatay, in which they gave all the distribution localities, the maps of all taxa in those regions and a rich iconographic documentation.

Georges Ledoux published in 1972 the description of *C. (Cytilocarabus) mahouxi* followed by the description of *C. (Sphodristocarabus) resplendens rizensis*, 1975.

Thierry Deuve produced a great number of studies on Carabids, some of which concern the study of the Turkish fauna. His first publication, together with Simard, in 1977 was the description of *C. (Trachycarabus) ponticola*. He then described *C. (Tomocarabus) simardianus* (1990), from specimens found in the Roeschke collection, about which there are still some doubts. In the same year he published an excellent paper on the new subgenus *Apoplesius*,

localized in the southeastern part of Anatolia, with peculiar characteristics and, together with *Relictocarabus* from the high Moroccan Atlas, representing the remains of a relictual population of the Mediterranean Basin. There followed the description of *C. (Apoplesius) legrandi* (1991), expanding to the Kars region, the range of the subgenus. In the following studies he described: *C. (Sphodristocarabus) scovitzi sarigoelensis* and *C. (Lamprostus) spinolae ladikensis*; he did the latter together with Charet. In 1993 he proposed the division of *C. (Cytilocarabus) cribratus* in 3 different species: *cribratus* Quensel, 1806, *porrectangulus* Géhin, 1885, and *staneki* Sterba, 1931, based on important differences in the morphology of the aedeagus. Then, he described *C. (Cytilocarabus) mahouxi ciloensis* (1994), *C. (Heterocarabus) mariettii hroni* (1997) and *C. (Sphodristocarabus) biroi iorbi* (1998) with Charet. In 2001 he published an interesting systematic study on the *Lamprostus* of the *robustus-nordmanni-torosus* species group, with a great revision of its nomenclature, and later (2002) published a study on the Carabini and Cychrini of the Caucasian and Ponto-Caucasian regions, in which he described some new subspecies of *Cychnus aeneus* of the eastern Pontic Alps. Later, Deuve gave some systematic studies with the descriptions of *C. (Ischnocarabus) tenuitarsis balgoezensis* (2004) and *C. (Sphodristocarabus) biroi leonardoi* (2005) from the surroundings of Sinop. More recently (2009), Deuve treated the distribution of *C. (Minocarabus) maurus* in Anatolia and Cyprus, and described *C. (M.) maurus smyrnensis* from İzmir.

Bernard Lassalle discovered one of the most interesting and peculiar species from Turkey, described as *C. (Tribax) deuvei* (1986), that Deuve in 1990 attributed to the new subgenus *Apoplesius*, created by himself. Some years later he published the descriptions of some new taxa of *Carabus*: *C. (Sphodristocarabus) rotundicollis aabadensis* and *C. (Heterocarabus) mariettii mouthiezi* (1990). In 1991 he collaborated with Machard, and described many new taxa, almost all coming from the eastern Pontic Alps and belonging to the subgenera *Tribax*, *Megodontus* and *Sphodristocarabus*, but also *C. (Lipaster) osellai bontempsii*, *C. (L.) osellai lasoeli*, and *Callisthenes adehinotus*. Later, he gave the descriptions of *C. (Oreocarabus) cribratus echarouxi* and *C. (O.)*



*cribratus bilmenekus* (1996), *C. (Chaetomelas) morawitzi tainei* and *C. (Oxycarabus) saphyrinus yenicensis* (1998). In 2004 he reported the findings of the type locality of *C. (Lipaster) gordius*, providing a map of the distribution of *Lipaster* in Turkey and the description of *C. (L.) stjernvalli ilgarensis*.

Patrice Machard published in 1977 a short synthesis on *Lamprostus* from Turkey, where he described: *C. (L.) rabaroni drouxi* and *C. (L.) calley martinae*. In 1979 he published a taxonomic revision of the Turkish taxa of the subgenera *Oxycarabus*, *Lipaster*, *Archicarabus* and *Tribax*, and later on he described some new taxa belonging to the subgenera *Lamprostus*, *Procrustes*, *Sphodristocarabus* and *Tribax*. In cooperation with Auvray (1990) he reported the presence in Turkey, in the region of Kars, of *C. (Procrustes) clypeatus abchasicus*, a species new for the Turkish fauna, previously known only in the Caucasus. In 1994 he published a study on some new *Carabus* from north eastern Anatolia: *C. (Lamprostus) nordmanni subrobustus*, *C. (Archicarabus) gotschi pseudorugosus*, and *C. (A.) victor subminimus* (1995).

Claude Auvray published a pair of studies with Machard (1990, 1994), already cited, and in 2005 a revision of the subgenus *Tomocarabus* in Turkey.

Belousov and Zamotajlov published the astonishing discovery of the subgenus *Cechenochilus* in Turkey in 1999, with the description of the new species *lazorum*. The subgenus, spread in the Caucasian region, was reported for the first time in Turkey, on the Kaçkar massif, where many previous investigations were already carried out by several entomologists. This important discovery allows the possibility of finding other taxa of the same subgenus on the higher massifs of the eastern Pontic Alps.

Finally, concerning the representatives of the genus *Calosoma* (in the widest sense) in Turkey, at least the classic monograph by Jeannel (1940), and the revision by Obydov (2002) of the subgenus *Callisthenes* (treated as distinct genus), have to be cited.

In addition to all these studies, many short papers and notes on Turkish Carabinae were issued by several entomologists in different journals.

Many more important studies should be conducted on this subfamily in addition to the ones already made in Turkey. These studies should:

1. Help to make an identification key for the Carabinae found in Turkey,
2. Provide more detailed studies on the ecology of Carabinae species,
3. Investigate Carabinae species for their functions as predator or prey.

#### A Checklist of Turkish Carabinae

The checklist of the Carabinae recorded from Turkey is given below.

A total of 365 species and subspecies are included, distributed in 3 genera and 25 subgenera as follows:

##### Tribe CARABINI Latreille, 1802

GENUS **CARABUS** Linné, 1758: 413

Div. **SPINULATI** Ishikawa, 1973: 46

Subdiv. **LEPIDOSPINULATI** Imura, Kim, Su & Osawa 1998: 20

Subgen. **LIMNOCARABUS** Géhin, 1876: 15

**clatratus** Linné, 1761: 218

ssp **stygius** Ganglbauer, 1890: 117

Div. **DIGITULATI** Deuve, 1991a: 25

Subgen. **CARABUS** Linné, 1758: 413

**granulatus** Linné, 1758: 413

ssp **aetolicus** Schaum, 1857: 122

Div. **LIPASTROMORPHI** Deuve, 1991a: 41

Subgen. **TRACHYCARABUS** Géhin, 1876: 33

**scabriusculus** Olivier, 1795: 47

ssp **bulgarus** Lapouge 1908: 37

= **interruptus** Born 1902: 156

**bosphoranus** Fischer von Waldheim, 1823: 34

= **laceratus** Csiki 1927: 273

ssp **tscherkessicus** Heinz & Korge, 1964: 236

= **sibiricus** Mandl, 1955: 246

Subgen. **MIMOCARABUS** Gehin 1876: 36

**maurus** Adams 1817: 281

ssp **maurus** Adams, 1817: 281

= **discoides** Reitter, 1880: 457

= **gemellus** Fischer von Waldheim, 1844: 14

ssp **hochhuthi** Chaudoir, 1846: 103



- = *maurulus* Mandl, 1955: 247
- ssp *alagoensis* Kraatz, 1897a: 336
- ssp *osculatii* Osculati, 1844: 72
- ssp *geminatulus* Reitter, 1896: 147
- ssp *paphius* Redtenbacher, 1843: 981
- ssp *smyrnensis* Deuve, 2009: 216
- pumilio* Kuster, 1846: (Cah. n. 23)
- ssp *pumilio* Kuster, 1846: (Cah. n. 23)
- = *araratensis* Kraatz, 1896: 336
- Subgen. **LIPASTER** Motschoulsky, 1866: 296
- = *Lamprocarabus* Thomson, 1875: 639
- = *Titanocechenus* Breuning & Ruspoli, 1970: 215
- gordius* Reitter 1898: 360
- ssp *gordius* Reitter, 1898: 360
- ssp *bontempsii* Lassalle, 1992b: 310
- ssp *osellai* Breuning & Ruspoli, 1970: 87
- = *lasoeli* Lassalle, 1992b: 311
- = *pseudolangneri* Machard, 1979: 290
- ssp *planostriatus* Heinz & Staven, 1995: 15
- stjernvalli* Mannerheim, 1830: 55
- ssp *stjernvalli* Mannerheim, 1830: 55
- = *boschniaki* Faldermann, 1836a: 24
- = *raddeanus* Schaufuss, 1882a: 526
- = *metzleri* Mandl, 1955: 268
- ssp *posofensis* Auvray, 1994: 137
- = *purpureoviolaceus* Machard, 1979: 290
- = *ilgarensis* Lassalle, 2004: 158
- ssp *latisi* Breuning & Ruspoli, 1974: 238
- = *langneri* Breuning & Ruspoli, 1976: 222
- ssp *tenebrius* Heinz & Staven, 1989: 49
- Div. **ARCHICARABOMORPHI** Deuve, 1991a: 59
- Subgen. **ARCHICARABUS** Seidlitz, 1887: 6
- = *Deuteroctarabus* Reitter, 1896: 141
- montivagus* Palliardi, 1825: 31
- ssp *bulgaricus* Csiki, 1927: 280
- = *ponticus* Apfelbeck, 1904: 38
- wiedemanni* Ménétries, 1836: 149
- ssp *burgassiensis* Apfelbeck, 1904: 39
- = *vaitoiani* Strasser, 1900: 148
- ssp *wiedemanni* Ménétries, 1836: 149
- ssp *bythinus* Lapouge, 1908: 19
- = *cekirgensis* Schweiger, 1964b: 160
- = *nilufer* Schweiger, 1964b: 160
- = *goekdagensis* Mandl, 1955: 252
- ssp *besucheti* Schweiger, 1964b: 161
- ssp *akcakocaensis* Blumenthal & Breuning, 1967: 56
- ssp *winklerianus* Breuning, 1932: 119
- ssp *mengenicola* Schweiger, 1969: 157
- ssp *mussardianus* Breuning, 1964b: 213
- = *zindangensis* Lassalle, 2003: 437
- ssp *paphlagoniensis* Breuning, 1954: 134
- = *patruelis* Schweiger, 1964a: 144
- ssp *anceps* Lapouge, 1924: 181
- victor* Fischer von Waldheim, 1836: 350
- = *falsarius* Reitter, 1896: 142
- = *motschoulskyi* Kolenati, 1845: 31
- = *nanus* Kraatz, 1897b: 379
- = *dissolutus* Csiki, 1927: 282
- = *obtritatus* Lapouge, 1924: 181
- ssp *transeuns* Lapouge, 1924: 181
- = *akkusanus* Breuning, 1964b: 213
- = *pseudotransenus* Machard, 1979: 291
- = *inconspicuus* Chaudoir, 1848b: 449
- ssp *loebli* Schweiger, 1969: 159
- = *torulensis* Lassalle, 2003: 434
- ssp *subminimus* Machard, 1995: 274
- ssp *cordithorax* Blumenthal & Breuning, 1967: 56
- = *hortulanus* Darge, 1994: 15
- ssp *borckanus* Cavazzuti, 2003: 10
- ssp *montanellus* Heinz & Korge, 1967: 91
- gotschi* Chaudoir, 1846: 77
- ssp *inonunus* Cavazzuti, 2003: 13

- ssp **ilgazicus** Breuning & Ruspoli, 1970: 85  
 ssp **regismontium** Schweiger, 1964a: 143  
 = *subnivalis* Schweiger, 1964a: 144  
 ssp **congruus** Motschoulsky, 1865: 288  
 = *turcicus* Motschoulsky, 1865: 288  
 = *ottomanus* Reitter, 1896: 142  
 = *koyulicus* Lassalle, 2003: 438  
 = *kochisarensis* Lassalle, 2003: 440  
 ssp **diversus** Schweiger, 1969: 158  
 ssp **pseudogotschi** Breuning, 1926: 75  
 ssp **nicolae** Auvray, 1995: 274  
 ssp **naumanni** Breuning, 1971: 33  
 ssp **horioni** Korge, 1968: 37  
 ssp **goeksunensis** Breuning, 1966: 24  
 ssp **unctus** Lapouge, 1908: 21  
 = *bulghardaghensis* Breuning, 1926: 78  
 = *demelti* Heinz, 1977b: 12  
 = *eregliensis* Breuning, 1974b: 167  
 ssp **alayliensis** Cavazzuti, 2006: 53  
 ssp **caramanus** Fairmaire, 1886: xxi  
 = *mollis* Lapouge, 1924: 183  
 = *depressipennis* Mandl, 1955: 262  
 ssp **pseudorugosus** Machard, 1994: 141  
 Subgen. **ISCHNOCARABUS** Kraatz, 1877b: 78  
**cychropalpus** Peyron, 1858: 356  
 = *cychropalpulus* Mandl, 1955: 268  
**tenuitarsis** Kraatz, 1877b: 78  
 ssp **tenuitarsis** Kraatz, 1877b: 78  
 = *cottarellii* Breuning & Ruspoli, 1970: 96  
 ssp **balgoezensis** Deuve & Charet, 2004: 36  
 ssp **ankarensis** Breuning, 1961: 113  
 = *cankiriensis* Breuning, 1962: 37  
 ssp **prasinosomatus** Rapuzzi, 1991: 36  
 ssp **auvrayi** Charet, 1992b: 21  
 ssp **rubizzaniorum** Cavazzuti, 1994: 579  
 Div. **METACARABI** Bengtsson, 1927: 83  
 Subdiv. **MULTISTRIATI** Reitter, 1896: 55  
 Latipalpi Reitter, 1896: 55  
 Subgen. **TOMOCARABUS** Reitter, 1896: 135  
**decolor** Fischer von Waldheim, 1823: 72  
 ssp **decolor** Fischer von Waldheim, 1823: 72  
 = *biseriatus* Chaudoir, 1846: 87  
**convexus** Fabricius, 1775: 238  
 ssp **gracilior** Géhin, 1885: 49  
 ssp **salax** Motschoulsky, 1865: 286  
 ssp **immodicus** Cavazzuti, 2006: 64  
 ssp **rhinopterus** Hampe, 1852: 309  
 ssp **sultandaghensis** Breuning, 1966: 24  
 ssp **acutangulus** Chaudoir, 1879: 109  
 ssp **mackaensis** Cavazzuti & Korell, 1991: 99  
 ssp **erzeliki** Schweiger, 1962a: 120  
 = *abantayaginiensis* Schweiger, 1962a: 121  
**scabripennis** Chaudoir, 1850b: 156  
 ssp **scabripennis** Chaudoir, 1850b: 156  
 ssp **ponticola** Deuve & Simard, 1977: 1  
 = *reticulatus* Hampe, 1852: 308  
 ssp **reductus** Roeschke, 1896: 345  
 = *nocturnus* Schweiger, 1969: 160  
 ssp **subreductus** Breuning, 1977: 48  
 ssp **martaiellus** Rapuzzi & Kleinfeld, 2000: 359  
 ssp **kocaelicus** Cavazzuti, 2006: 71  
 ssp **microderus** Chaudoir, 1867: 259  
 = *finikensis* Lassalle, 1993: 304  
 ssp **gautieri** Géhin, 1885: 91  
 = *ledereri* Gautier, 1868: 322  
**simardianus** Deuve, 1990a: 14  
**rumelicus** Chaudoir, 1867: 259  
 ssp **rumelicus** Chaudoir, 1867: 259  
 = *guelekensis* Breuning, 1964b: 214  
 ssp **zaraensis** Breuning & Ruspoli, 1970: 85  
 ssp **cappadociae** Breuning, 1932: 132

- ssp *kurdistanicus* Eidam, 1931: 78  
 = *kurdistanicola* Deuve, 1990a: 15  
 ssp *syriensis* Breuning, 1943: 14  
*Oreocaraboides* Deuve, 1997b: 3  
 Subgen. **PACHYSTUS** Motschoulsky, 1865: 294  
 = *Melancarabus*, Thomson, 1875: 640  
*irmasanus* Heinz & Korge, 1967: 92  
 ssp *irmasanus* Heinz & Korge, 1967: 92  
 = *felix* Heinz & Korge, 1967: 92  
 ssp *mazzii* Cavazzuti, 1992: 115  
*morio* Mannerheim, 1830: 58  
 ssp *morio* Mannerheim, 1830: 58  
 = *olivieri* Castelnau, 1835: 89  
 = *carceli* Gory, 1833: 211  
 = *acuminatus* Ménétries, 1838: 10  
 = *aethiops* Cristoforis & Jan, 1837: 181  
 ssp *thessalonicensis* Apfelbeck, 1904: 24  
 = *cavernicola* Kraatz, 1880: 157  
 ssp *muglanus* Cavazzuti, 2006: 86  
 ssp *ganymed* Heinz, 1975a: 145  
*pisidicus* Peyron, 1855: 669  
 ssp *pisidicus* Peyron, 1855: 669  
 ssp *samai* Cavazzuti & Rapuzzi, 1998: 398  
*tamsi* Ménétries, 1832: 109  
 Subgen. **CYTILOCARABUS** Reitter, 1896: 193  
*cribratus* Quensel, 1806: 171  
 ssp *cribratus* Quensel, 1806: 171  
 ssp *orientalis* Osculati, 1844: 72  
 ssp *schubertianus* Breuning & Ruspoli, 1974: 229  
 ssp *negreianus* Deuve, 1993b: 17  
 ssp *pulumuricus* Cavazzuti, 1994: 580  
 ssp *haramburae* Breuning & Ruspoli, 1974: 230  
 ssp *bilmenekus* Lassalle, 1996: 51  
 ssp *maironei* Cavazzuti, 1994: 581  
 ssp *echaroux* Lassalle, 1996: 51  
*porrectangulus* Gehin, 1885: 5  
 ssp *porrectangulus* Gehin, 1885: 5  
 ssp *ispiriacus* Deuve, 1993a: 7  
 ssp *farineli* Machard, 1975a: 52  
 ssp *tazieffi* Breuning & Ruspoli, 1974: 89  
 = *arpaalaniensis* Machard, 1985: 27  
*staneki* Sterba, 1931: 118  
 ssp *staneki* Sterba, 1931: 118  
 = *kreissli* Schweiger, 1964a: 145  
 ssp *graziolii* Cavazzuti, 1987: 502  
 ssp *yaraligozi* Battoni, 1982: 64  
*mahouxi* Ledoux, 1972: 87  
 ssp *mahouxi* Ledoux, 1972: 87  
 ssp *ciloensis* Deuve, 1994a: 17  
 Subgen. **PACHYCARABUS** Géhin, 1876: 31  
 = *Caucasocarabus* Lapouge, 1930: 241  
*roseri* Faldermann, 1836a: 22  
 ssp *roseri* Faldermann, 1836a: 22  
 = *sphodrinus* Fischer von Waldheim, 1844: 20  
 ssp *ciftekopruleriensis* Machard, 1975b: 142  
 ssp *soganliensis* Heinz & Korge, 1964: 230  
 Div. **ARCIFERA** Imura, 1996: 7  
 Subgen. **HETEROCARABUS** Morawitz, 1886: 49  
*akensis* Haury, 1889: 106  
 ssp *akensis* Haury, 1889: 106  
 ssp *akensiculus* Cavazzuti, 2006: 108  
 ssp *sapancaensis* Blumenthal & Breuning, 1967: 56  
*mariettii* Cristoforis & Jan, 1837: 5  
 ssp *mariettii* Cristoforis & Jan, 1837: 5  
 ssp *charetianus* Auvray, 1992: 20  
 ssp *ormanensis* Blumenthal & Breuning, 1967, 57  
 ssp *ativsengueni* Schweiger, 1962a: 122  
 = *pseudomarietti* Schweiger, 1964b: 161  
 = *petrovitzi* Mandl, 1964: 2  
 ssp *necopinatus* Basquin & Darge, 1987a: 406  
*bischoffi* Chaudoir, 1848b: 450  
 ssp *bischoffi* Chaudoir, 1848b: 450

- ssp **balboi** Cavazzuti, 2005: 114
- ssp **mouthiezi** Lassalle, 1991: 324
- ssp **ornatus** Heinz, 1976: 66
- ssp **muchei** Breuning, 1961: 115
- ssp **stephaniruspolii** Breuning, 1966: 24
- = **inclarus** Darge, 1994: 15
- ssp **terahci** Charet, 1994: 55
- ssp **delmastroi** Cavazzuti, 2003: 13
- ssp **inexpectatus** Basquin & Darge, 1987a: 406
- ssp **hroni** Deuve, 1997a: 214
- Div. **NEOCARABI** Bengtsson, 1927: 83
- Subgen. **SPHODRISTOCARABUS** Géhin, 1885: 27
- = **Sphodristus** Thomson, 1875: 640
- pavesii** Cavazzuti, 1992: 118
- macrogonus** Chaudoir, 1847: 8
- ssp **macrogonus** Chaudoir, 1847: 8
- = **theophilei** Deyrolle, 1869: 6
- ssp **keltepenis** Vigna Taglianti & Bruschi, 1976: 209
- = **kolatensis** Lapouge, 1925: 162
- ssp **schweigerinae** Schweiger, 1962a: 124
- = **pseudoschweigerinae** Schweiger, 1964a: 140
- = **goettingi** Schweiger, 1964a: 139
- ssp **drannazdaghensis** Breuning, 1964b: 214
- = **clientulus** Schweiger, 1969: 162
- = **mollioni** Breuning, 1976: 229
- ssp **diogenei** Cavazzuti, 1991b: 198
- ssp **resplendens** Breuning, 1932: 135
- = **zanderi** Battoni & Blumenthal, 1972: 52
- = **eiselti** Mandl, 1975a: 67
- = **Cavazzutianus** Casale, 1973: 133
- = **chambruni** Breuning & Ruspoli, 1970: 92
- ssp **akkusensis** Breuning, 1964a: 106
- = **daumani** Breuning, 1976: 232
- = **guergentepeensis** Blumenthal, 1975: 59
- = **ingloriosus** Breuning & Ruspoli, 1970: 93
- ssp **lilianae** Cavazzuti & Casale, 1976: 181
- ssp **simonianus** Breuning & Ruspoli, 1970: 91
- = **pseudosimonianus** Mandl, 1975a: 70
- ssp **koselerensis** Lassalle & Machard, 1991: 66
- ssp **azaleae** Cavazzuti, 1986a: 3
- ssp **giresunensis** Deuve, 1992a: 55
- ssp **lemeslei** Machard, 1995: 273
- ssp **rizensis** Ledoux, 1975: 28
- = **michaelae** Darge, 1994: 14
- ssp **pseudokolatensis** Heinz & Korge, 1967: 97
- giachinoi** Cavazzuti, 1991b: 192
- biroi** Csiki, 1927: 75
- = **biroi** Csiki, 1927: 75
- = **kindermanni** Chaudoir, 1850b: 155
- ssp **iorbi** Deuve & Charet, 1999: 174.
- ssp **leonardoi** Deuve, 2005: 267
- heinzi** Breuning, 1964b: 215
- ssp **heinzi** Breuning, 1964b: 215
- ssp **mateuellus** Deuve, 2003: 264
- = **matteui** Breuning & Ruspoli, 1970: 93
- gilnickii** Deyrolle, 1869: 6
- ssp **hasandaghensis** Darge & Basquin, 1990: 5
- ssp **gilnickii** Deyrolle, 1869: 6
- = **acutus** Lapouge, 1904: 16
- = **giulielli** Thomson, 1875: 686
- = **viridifossulatipennis** Breuning, 1964b: 214
- = **brignolii** Breuning & Ruspoli, 1970: 94
- = **ovoides** Machard, 1994: 142
- = **pseudoelongatus** Machard, 1994: 142
- = **yakalamakus** Lassalle, 1992b: 309
- ssp **lavezorum** Darge, 1994: 14
- ssp **brunneicupreus** Deuve, 1993b: 20
- coruhnehriensis** Cavazzuti, 1991a: 106
- enigmaticus** Heinz, 1980: 80
- ssp **enigmaticus** Heinz, 1980: 80
- ssp **reiseri** Heinz, 1980: 82
- ssp **citamagineus** Lassalle & Charet, 1992a: 106



- ssp *bechteli* Charet, 1996: 42
- ssp *exiliatus* Cavazzuti, 1991a: 108
- scovitzi* Faldermann, 1836a: 20
- ssp *scovitzi* Faldermann, 1836a: 20
- ssp *otigoensis* Deuve, 1993b: 23
- ssp *czipkai* Heinz, 1980: 79
- ssp *bouilloni* Breuning & Ruspoli, 1976: 238
- ssp *hedini* Heinz, 1973: 26
- ssp *sarigoelensis* Deuve & Charet, 1992b: 184
- armeniacus* Mannerheim, 1830: 59
- ssp *armeniacus* Mannerheim, 1830: 59
- = *subincatenatus* Kraatz, 1878: 108
- = *mutabilis* Géhin, 1885: 29
- = *fulminans* Kraatz, 1878: 108
- = *incatenatus* Mannerheim, 1830: 60
- ssp *korbianus* Ganglbauer, 1887b: 136
- ssp *pseudoarmeniacus* Breuning, 1932: 136
- = *arsiyandagensis* Machard, 1985: 30
- = *robichei* Auvray, 1994: 144
- ssp *sarikamisensis* Cavazzuti, 1986a: 4
- ssp *rotundithorax* Deuve, 2003: 265
- = *rotundicollis* Mandl, 1955: 261
- ssp *basilewskianus* Breuning & Ruspoli, 1970: 90
- ssp *aabadensis* Lassalle, 1990b: 324
- ssp *blumenthaliensis* Heinz & Korge, 1967: 98
- ssp *alagoenoides* Mandl, 1955: 261
- tokatensis* Roeschke, 1898: 162
- ssp *tokatensis* Roeschke, 1898: 162
- = *almushensis* Mandl, 1975a: 62
- ssp *kosensis* Cavazzuti, 1984b: 135
- ssp *kirikensis* Staven, 1995a: 5
- ssp *simonae* Cavazzuti, 1984b: 132
- ssp *karasudominus* Cavazzuti, 1991b: 195
- kurdicus* Heinz, 1975b: 196
- ssp *kurdicus* Heinz, 1975b: 196
- = *schuberti* Breuning, 1972: 143
- = *basquini* Darge, 1990b: 32
- ssp *machardianus* Machard, 1986: 208
- ssp *kurdaorum* Lassalle, 1992b: 308
- georgia* Cavazzuti, 1984a: 496
- = *hardei* Heinz, 1990a: 162
- Subgen. *CECHENOCHILUS* Motschoulsky, 1850: 74
- = *Cechenus* Fischer von Waldheim, 1822: 110
- lazorum* Belousov & Zamotajlov, 1999: 67
- Subgen. *APOPLESIUS* Deuve, 1990b: 25
- deuvei* Lassalle, 1986: 36
- ssp *deuvei* Lassalle, 1986: 36
- ssp *hajdaji* Hackel, 2007: 5
- pseudodepressus* Machard, 1988: 33
- legrandi* Deuve, 1991b: 20
- omphreodes* Reitter, 1897: 337
- Subgen. *TRIBAX* Fischer von Waldheim, 1817: 463
- = *Microtribax* Gottwald, 1982: 211
- = *Platychrus* Kolenati, 1845: 25
- = *Plectes* Fischer von Waldheim, 1823: 52
- puschkini* Adams, 1817: 292
- ssp *kolenatii* Chaudoir, 1846: 97
- ssp *kintrishensis* Gottwald, 1980: 42
- ssp *ishikawaianus* Breuning & Ruspoli, 1970: 94
- = *kabacaensis* Machard, 1991: 21
- ssp *zyzyus* Lassalle, 1992b: 306
- ssp *pseudoponticus* Lassalle & Machard, 1991: 59
- = *ispirensis* Lassalle & Machard, 1991: 60
- = *uskutdagensis* Lassalle & Machard, 1991: 60
- ssp *strobinoicus* Breuning & Ruspoli, 1976: 224
- ssp *zeytinlikensis* Charet, 1996: 41
- ssp *ayrdensis* Blumenthal & Breuning, 1966: 57
- ssp *ponticus* Deyrolle, 1869: 6
- ssp *praenuntius* Heinz & Korge, 1967: 100
- ssp *mescitliensis* Staven, 1998: 408
- merdeniki* Cavazzuti & Korell, 1992: 61
- = *koropeckyi* Deuve & Macek, 1992: 1

*curlettii* Cavazzuti, 1984b: 138

Subgen. **LAMPROSTUS** Motschoulsky, 1865: 297

= *Chaetogaster* Lapoue, 1930: 197

= *Chaetoprostus* Reitter, 1896: 66

= *Pseudoprocrustes* Morawitz, 1886: 8

**torosus** Frivaldsky, 1835: 252

ssp **torosus** Frivaldsky, 1835: 252

ssp **escherichi** Lapoue, 1914: 35

ssp **xanthicus** Darge, 1992: 155

ssp **cankirianus** Blumenthal & Breuning, 1966: 57

= *basquinianus* Darge, 1992: 156

= *crudus* Darge, 1992: 157

= *reynieri* Charet, 1992b: 21

ssp **bodemeyeri** Lapoue, 1914: 35

ssp **jani** Géhin, 1885: 8

= *moestus* Cristoforis & Jan, 1837: 1

= *mundus* Lapoue, 1914: 38

= *hoberlandti* Mañan, 1952: 5

= *vignatagliantii* Breuning & Ruspoli, 1977: 68

ssp **gajaci** Breuning & Ruspoli, 1979: 281

= *hahni* Mandl, 1980: 152

ssp **procrustoides** Géhin, 1885: 7

**spinolae** Cristoforis & Jan, 1837: 5

ssp **leonidas** Cavazzuti, 1999: 406

ssp **pseudeschrichi** Breuning, 1962: 37

ssp **spinolae** Cristoforis & Jan, 1837: 5

= *bonplandi* Ménétries, 1836: 149

= *obesus* Lapoue, 1909: 117

= *phaedimus* Schaufuss, 1882a: 520

ssp **mercatii** Breuning & Ruspoli, 1970: 99

ssp **rouziei** Breuning & Ruspoli, 1970: 97

ssp **pseudoducalis** Schweiger, 1964a: 146

ssp **usurpator** Cavazzuti, 1987: 495

ssp **sinopensis** Breuning, 1961: 113

ssp **coeruleoviolaceus** Breuning & Ruspoli, 1970: 99

ssp **lohsei** Heinz & Blumenthal, 1978: 14

ssp **vexator** Schweiger, 1969: 164

ssp **salignus** Schweiger, 1969: 165

ssp **ladikensis** Deuve & Charet, 1992: 125

ssp **lamprus** Chaudoir, 1850b: 154

ssp **dominici** Thomé, 1987: 23

ssp **rigouti** Basquin & Darge, 1986a: 21

ssp **nordmanni** Chaudoir, 1848b: 446

= *enricoi* Battoni & Blumenthal, 1972: 52

= *productus* Hampe, 1852: 309

ssp **rabaroni** Breuning, 1964a: 107

ssp **sturanicus** Breuning & Ruspoli, 1979: 281

ssp **giresuni** Breuning, 1964a: 107

ssp **paululus** Heinz & Korge, 1964: 233

**erenleriensis** Schweiger, 1962a: 127

ssp **ahmetustaensis** Cavazzuti, 1987: 492

ssp **bithynicus** Heinz & Korge, 1967: 102

ssp **erenleriensis** Schweiger, 1962a: 127

= *kaynasliensis* Machard, 1975b: 142

ssp **karadagensis** Battoni & Blumenthal, 1972: 51

ssp **fortepunctatus** Battoni & Blumenthal, 1973: 105

= *rotundicollis* Blumenthal & Breuning, 1966: 57

ssp **pseudotorosus** Schweiger, 1969: 163

ssp **hamus** Basquin & Legrand, 1991: 68

**robustus** Deyrolle, 1869: 6

ssp **robustus** Deyrolle, 1869: 6

= *perfectus* Schaufuss, 1882a: 517

= *callipeplus* Schaufuss, 1882a: 517

= *semirugosus* Schaufuss, 1882a: 517

= *sexpunctatus* Schaufuss, 1882a: 517

= *trapesunticus* Eichler, 1924: 61

= *triumphator* Schaufuss, 1882a: 517

= *colossus* Bleuse, 1896: 19

ssp **pseudorobustus** Heinz & Blumenthal, 1977: 219

= *extremus* Schaufuss, 1882a: 517

ssp **yavuzkemalensis** Deuve & Remond, 2001: 37

ssp **egribelensis** Deuve & Remond, 2001: 38

- ssp **drouxi** Machard, 1977: 174
- ssp **pseudocolossus** Cavazzuti, 1993: 135
- ssp **triumphans** Cavazzuti, 1987: 498
- ssp **exsultans** Cavazzuti, 1993: 137
- ssp **ducalis** Schauffuss, 1882a: 514
- = *singanensis* Breuning, 1932: 160
- = *subrobustus* Machard, 1994: 140
- ssp **kaptanpasa** Cavazzuti, 2001: 396
- ssp **athleta** Semenov, 1897: 193
- chalconatus** Mannerheim, 1830: 57
- ssp **chalconatus** Mannerheim, 1830: 57
- = *luxuriosus* Motschoulsky, 1844: 10
- = *hozari* Mařan, 1952: 6
- = *hisarensis* Darge, 1990d: 285
- = *koyunensis* Darge, 1990a: 57
- = *maguini* Auvray, 1994: 138
- ssp **chalcochlorus** Chaudoir, 1852: 97
- = *tschimenensis* Breuning, 1964b: 215
- ssp **subnigritulus** Heinz, 1990b: 349
- calleyi** Fischer von Waldheim, 1824: 96
- ssp **machardiellus** Deuve, 1991a: 138
- = *kurdistanicus* Machard, 1986: 205
- ssp **chaudoiriellus** Deuve, 1995: 74
- ssp **martinae** Machard, 1977: 175
- = *catakensis* Machard, 1985: 28
- ssp **subnigrinus** Heinz, 1970: 372
- ssp **claudauvrayi** Cavazzuti, 2001: 395
- propheta** Rapuzzi, 1995: 473
- mulsantianus** Morawitz, 1886: 7
- ssp **mulsantianus** Morawitz, 1886: 7
- = *asperatus* Mulsant & Wachanru, 1853: 124
- = *kotschy* Ganglbauer, 1887a: 2
- = *adpersarius* Lapouge, 1907a: 148
- ssp **nurdagensis** Blumenthal, 1967: 122
- ssp **antakyae** Korell, 1985: 141
- ssp **akbesianus** Lapouge, 1914: 45
- ssp **aleppensis** Lapouge, 1914: 43
- ssp **bernhauerorum** Heinz, 1977a: 35
- punctatus** Castelnau, 1834: 89
- ssp **punctatus** Castelnau, 1834: 89
- ssp **vagepunctatus** Lapouge, 1907a: 148
- Subgen. **PROCRUSTES** Bonelli, 1809: 39
- = *Macrogenus* Motschoulsky, 1845: 346
- = *Procrusticus* White, 1845: 111
- = *Procrustocarabus* Géhin, 1885: 4
- = *Pseudoprocrustes* Morawitz, 1886: 8
- = *Sphodristus* Motschoulsky, 1866: 295
- payafa** White, 1845: 111
- ssp **payafa** White, 1845: 111
- ssp **pseudoacuticollis** Catloř & Moravec, 1999: 110
- ssp **acuticollis** Motschoulsky, 1858: 187
- ssp **drouxianus** Machard, 1986: 206
- clypeatus** Adams, 1817: 299
- ssp **kurnakovi** Kryzhanovskij, 1968: 174
- = *abchasicus* Motschoulsky, 1850: 88
- = *fischeri* Faldermann, 1836a: 14
- = *rectoimpressus* Motschoulsky, 1850: 88
- chevrolati** Cristoforis & Jan, 1837: 2
- ssp **internatus** Heinz & Korge, 1964: 235
- = *cifcandaghensis* Blumenthal & Breuning, 1966: 59
- = *salignicola* Schweiger, 1969: 166
- ssp **ilgazdagensis** Schweiger, 1964a: 147
- = *ilgazdaghensis* Heinz & Korge, 1964: 234
- = *golkoyensis* Schweiger, 1964b: 162
- = *dadayanus* Schweiger, 1964a: 142
- = *esmeraldae* Breuning & Ruspoli, 1977: 69
- = *portei* Breuning & Ruspoli, 1977: 70
- = *rodriguezi* Breuning & Ruspoli, 1977: 69
- ssp **chevrolati** Cristoforis & Jan, 1837: 2
- = *assimilis* Cristoforis & Jan, 1837: 3
- = *persimilis* Csiki, 1927: 39
- ssp **thierki** Chaudoir, 1857a: 81

- = *wiedemanni* Cristoforis & Jan, 1837: 3
- = *surejae* Csiki, 1927: 39
- ssp *korbi* Breuning, 1928: 1
- = *chauveloti* Breuning & Ruspoli, 1977: 70
- ssp *vanensis* Machard, 1985: 30
- coriaceus* Linné, 1758: 413
- ssp *kindermanni* Walzl, 1838: 452
- = *olympicus* Géhin, 1885: 3
- = *brussensis* Ganglbauer, 1888: 395
- = *caraboides* Ganglbauer, 1888: 394
- = *pseudofurax* Mařan, 1952: 6
- = *mehmeti* Battoni & Blumenthal, 1972: 51
- ssp *cerisyi* Dejean, 1826: 30
- = *melancholicus* Gistel, 1857: 37
- = *minor* Gautier, 1866b: 288
- = *bodemeyeri* Lapouge, 1923: 158
- = *bodemeyerianus* Mařan, 1952: 6
- ssp *mopsucrenae* Peyron, 1858: 357
- ssp *ressli* Mandl, 1961: 30
- = *montisgavurensis* Mandl, 1975a: 78
- anatolicus* Chaudoir, 1857a: 81
- ssp *anatolicus* Chaudoir, 1857a: 81
- = *cypricus* Roeschke, 1915: 294
- ssp *lycicus* Breuning, 1932: 163
- = *gueneyensis* Catloř & Moravec, 1999: 112
- ssp *resslianus* Mandl, 1963: 48
- impressus* Klug, 1834: 71
- ssp *impressus* Klug, 1834: 71
- ssp *simulacrum* Rapuzzi, 1997: 564
- = *halfeticus* Korell, 1999: 242
- Subgen. **CHAETOMELAS** Thomson, 1875: 635
- morawitzi* Ganglbauer, 1887a: 2
- ssp *morawitzi* Ganglbauer, 1887a: 2
- = *tainei* Lassalle, 1998: 91
- ssp *montesamanus* Mandl, 1967: 385
- ssp *discipulus* Rapuzzi, 1997: 565
- Subgen. **OXYCARABUS** Semenov, 1898a: 507
- pirithous* Reitter, 1896: 66
- ssp *pirithous* Reitter, 1896: 66
- ssp *pseudopirithous* Mandl, 1955: 269
- ssp *kenyeryi* Schweiger, 1962a: 124
- ssp *sapancae* Blumenthal & Breuning, 1967: 58
- ssp *yenicensis* Lassalle, 1998: 91
- ssp *saphyrinus* Cristoforis & Jan, 1837: 4
- ssp *notabilis* Roeschke, 1898: 163
- ssp *akdagicola* Mandl, 1973: 80
- ssp *pseudosaphyrinus* Schweiger, 1965: 121
- = *kainashensis* Schweiger, 1965: 124
- = *boluensis* Schweiger, 1965: 127
- = *ilgazdagicus* Blumenthal & Breuning, 1967: 57
- = *mengenensis* Blumenthal & Breuning, 1967: 58
- = *korgei* Heinz & Korge, 1964: 232
- ssp *rabaronianus* Breuning, 1964b: 216
- ssp *besanconi* Breuning & Ruspoli, 1970: 99
- ssp *ruspolii* Breuning, 1964b: 216
- ssp *juengeri* Breuning & Ruspoli, 1970: 101
- ssp *saphyrinus* Cristoforis & Jan, 1837: 4
- = *wagneri* Kuster, 1846: (cah. 6, n. 12)
- = *artusi* Schweiger, 1965: 128
- = *pseudowagneri* Mandl, 1973: 78
- Subgen. **MEGODONTUS** Solier, 1848: 58
- = *Aulacocarabus* Géhin, 1876: 24
- = *Nabicarabus* Kwon & Lee, 1984: 102
- = *Pachycranion* Solier, 1848: 58
- = *Proteocarabus* Géhin, 1876: 5
- = *Pseudocoptolabrus* Reitter, 1896: 95
- septemcarinatus* Motschoulsky, 1840: 181
- = *trigintiduosulcatus* Lapouge, 1898: 60
- bonvouloiri* Chaudoir, 1863b: 447
- ssp *gracilicollis* Breuning, 1964a: 107
- ssp *bonvouloiri* Chaudoir, 1863b: 447
- = *clandestinus* Schaufuss, 1882b: 558



- = *nobilis* Schaufuss, 1882b: 558
- = *foveicollis* Schaufuss, 1882b: 558
- = *pastillatus* Lapouge, 1902: 310
- = *kolatdaghensis* Breuning, 1967: 24
- ssp *kaschkarensis* Blumenthal & Breuning, 1967: 59
- = *soganlidaghensis* Lassalle & Machard, 1991: 64
- ssp *fortunatus* Heinz, 1970: 370
- ssp *casalei* Cavazzuti, 1986a: 6
- Subgen. **PROCERUS** Dejean, 1826: 22
- scabrosus** Olivier, 1790: 17
- ssp **scabrosus** Olivier, 1795: 17
- = *olivieri* Dejean, 1826: 24
- = *aegyptiacus* Motschoulsky, 1844: 8
- = *bosphoranus* Motschoulsky, 1844: 4
- = *cribratus* Motschoulsky, 1850: 87
- ssp **propinquus** Csiki, 1927: 36
- = *dejeani* Géhin, 1885: 1
- = *angusticollis* Haller, 1885: 200
- = *giganteus* E. Bodemeyer, 1915a: 439
- ssp **mentor** Blumenthal & Breuning, 1967: 58
- ssp **schuberti** Breuning, 1968: 51
- ssp **culminicola** Cavazzuti, 1989: 109
- ssp **kahramanicus** Cavazzuti & Myska, 2004: 165
- sommeri** Mannerheim, 1844: 868
- ssp **sommeri** Mannerheim, 1844: 868
- = *breviusculus* Kraatz, 1876: 133
- = *uludagensis* Schweiger, 1964a: 140
- = *basoghui* Schweiger, 1964b: 163
- ssp **sterilis** Bodemeyer E., 1915a: 439
- ssp **dardanellicus** Kraatz Koschlau, 1886: 421
- ssp **estegeicus** Cavazzuti, 1989: 79
- ssp **buerschianus** Breuning, 1928b: 109
- ssp **callipygius** Cavazzuti, 1986b: 149
- ssp **cerkes** Basquin & Darge, 1986b: 20
- ssp **amasicus** Csiki, 1927: 36
- = *modestus* Kraatz, 1876: 133
- ssp **munzurensis** Cavazzuti & Lassalle, 1987: 71
- ssp **montisabanti** Schweiger, 1962a: 126
- caucasicus** Adams, 1817: 282
- ssp **armenius** Zaitzev, 1930: 261
- ssp **audouini** Brullé, 1835: 116
- ssp **colchicus** Motschoulsky, 1844: 7
- = *shawsheticus* Zaitzev, 1930: 261
- ssp **ispiratus** Cavazzuti, 1986b: 146
- bulgharmaadensis** Bodemeyer E., 1915b: 571
- ssp **toulgoetianus** Deuve, 2002b: 281
- = *transversalis* Csiki, 1927: 37
- = *laticollis* Kraatz, 1876: 127
- ssp **bulgharmaadensis** Bodemeyer E., 1915b: 571
- ssp **akbesiensis** Toulgoët, 1986b: 499
- = *akbesianus* Breuning, 1975b: 132
- ssp **weidneri** Lassalle, 1990a: 2
- syriacus** Kollar 1843: 980
- ssp **muruvvetae** Avgin & Prunier, 2007: 83
- ssp **syriacus** Kollar, 1843: 980
- = *daphnensis* Korell, 1985: 140
- ssp **limitaneus** Korell, 1988b: 176
- Gen. **CALOSOMA** Weber, 1801: 20
- Subgen. **CALOSOMA** Weber, 1801: 20
- sycophanta** Linné, 1758: 414
- ssp **sycophanta** Linné, 1758: 414
- = *nigrocyaneum* Letzner, 1850: 95
- = *marginatum* Letzner, 1850: 95
- = *azureum* Letzner, 1850: 95
- = *purpureoaureum* Letzner, 1850: 95
- = *cupreum* Letzner, 1850: 95
- = *smaragdinum* Rossi, 1882: 204
- ssp **prasinum** Lapouge, 1907b: 124
- ssp **severum** Chaudoir, 1850c: 422
- = *rapax* Motschoulsky, 1865: 309
- inquisitor** Linné, 1758: 414
- ssp **cupreum** Dejean, 1826: 196

= *clathratum* Kolenati, 1845: 33  
 = *viridescens* Reitter, 1896: 46  
 Subgen. **CAMPALITA** Motschoulsky, 1865: 304  
*maderae* Fabricius, 1775: 237  
*europunctatum* Herbst, 1782: 131  
*olivieri* Dejean, 1831: 559  
*denticolle* Gebler, 1833: 274  
 Subgen. **CALLISTHENES** Fischer von Waldheim, 1821: pl.7  
*breviusculus* Mannerheim, 1830: 61  
 = *orbiculatus* Motschulsky, 1839: 88  
 = *araraticus* Chaudoir, 1846: 104  
 = *tamerlanum* Zaitzev, 1918: 261  
*eversmanni* Chaudoir, 1850b: 157  
 ssp *eversmanni* Chaudoir, 1850b: 157  
 ssp *persicus* Géhin, 1885: 68  
 ssp *adehinotus* Lassalle, 1992b: 305  
 ssp *pesarinii* Heinz & Pavesi, 1994: 5  
*peksi* Heinz & Pavesi, 1994: 6  
 Tribe **CYCHRINI** Laporte, 1834  
 Gen. **CYCHRUS** Fabricius, 1794: 440  
*anatolicus* Motschulsky, 1865: 310  
 ssp *anatolicus* Motschulsky, 1865: 310  
 = *medodjiensis* Breuning, 1969: 36  
 ssp *armeniacus* Chaudoir, 1879: 109  
 ssp *occidentalis* Mandl, 1977: 83  
 = *armeniacus* Roeschke, 1907: 253  
 ssp *drannazdagensis* Breuning, 1967: 24  
 ssp *frivaldszkyi* Roeschke, 1907: 250  
 ssp *ilgazdagensis* Mařan, 1932: 30  
 = *angustemarginatus* Mandl, 1977: 89  
 = *ruspolii* Breuning, 1964b: 217  
 ssp *korgei* Breuning, 1964b: 217  
 ssp *ponticus* Schweiger, 1962a: 119  
 = *breuningi* Schweiger, 1964a: 141  
 = *akcakocae* Breuning, 1969: 36

= *mengenensis* Breuning, 1975a: 48  
 ssp *ziyathi* Cavazzuti, 2003: 14  
*aeneus* Fischer von Waldheim, 1824: 43  
 ssp *aeneus* Fischer von Waldheim, 1824: 43  
 = *granulatus* Motschulsky, 1850: 91  
 = *signatus* Faldermann, 1836a: 13  
 ssp *ayderensis* Deuve, 2002a: 122  
 ssp *baiburtensis* Breuning, 1975a: 48  
 ssp *hopaensis* Deuve, 2002a: 122  
 ssp *trabzonensis* Deuve, 2002a: 120

## Discussion

Many researchers from different countries of the world came to Turkey and collected samples of Carabinae for many years up to the present and they conducted many research studies, such as the description of the new species that belong to this subfamily, their variety, distribution, and review. Furthermore, some researchers from Turkey have made some important investigations on this subfamily. Combining all these studies and submitting them in one single source will surely be very essential for further studies to be performed in the future. All the studies on Carabinae from Turkey are submitted in this publication from the first described species *Carabus scabrosus* Olivier, 1790 to the last described subspecies *Carabus (mimocarabus) maurus smyrnensis* Deuve, 2009.

Because the checklist and bibliography of this subfamily provide a basis for other studies, submission of these in one single study is of great importance for further studies. For example, the studies of Casale et al. (1982), Deuve (1991), Brezina (1999), Turin et al. (2003), Deuve (2004) are very significant studies that we always utilize regarding Carabinae. Like these papers, this study will certainly act as a basis for future studies in Turkey.

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