

**Orijinal araştırma (Original article)**

**Contribution to the taxonomy of the Genus  
*Cychrus* Fabricius, 1794 (Coleoptera: Carabidae)  
from Turkey and their relations with *Cychrus*  
species from Balkans to Caucasus<sup>1</sup>**

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**Summary**

The genus *Cychrus* Fabricius, 1794 from Turkey is examined. The study includes taxa related with Turkish *Cychrus* from Balkans to Caucasus. Rational interpretation of *Cychrus* populations is presented from the Balkans up to the Caucasus. It appears that the comments made by several entomologists confirmed that more specific groups have exchanged characters on their periphery. These exchanges have established a regular gradation or fragmented morphocline from west to east through 2 totally different species: *Cychrus aeneus* Fischer von Waldheim, 1824 and *Cychrus anatolicus* Motschulsky, 1865. The species in Turkey are an intermediate link between species of the Balkans and Caucasus. Information is shortly given on history of *Cychrus* investigations from this region. The taxonomic position and geographical distribution of species/subspecies belonging to this genus are discussed. Each taxon is characterized with description of morphological features, and photographs of habitus (male) and male genitalia.

**Key words:** Carabidae, *Cychrus* spp., taxonomy, Turkey, Balkans, Caucasus

**Anahtar sözcükler:** Carabidae, *Cychrus* spp., taxonomi, Türkiye, Balkanlar, Kafkaslar

**Introduction**

The number of *Cychrus* species belonging to the family Carabidae has been reported in the world, the Balkans and Turkey as 110, 5 and 2 respectively

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up to now. The total number of species and subspecies of genus *Cychrus* has been recorded to be 12 in Turkey so far.

The adult specimens of *Cychrus* are unmetallic black or brown; pronotum narrow, oblong; elytra oviform, very convex; labrum deeply bilobed (Lindroth, 1985). The body of *Cychrus* larvae is broad and flattened; antennae longer than head-width but cercus extremely short; mandibles with retinaculum toothed but smooth cutting edge (Luff, 1993).

Specialized snail hunters, feed as well on snails as on slugs. With their prolonged head and their slender pronotum, they are enabled to penetrate easily into snail-shells (Trautner & Geigenmüller, 1987). Fourteen European species live mostly in montane areas and in humid forests. The broad and flattened larvae are specialized on snails, too. They penetrate snail-shells with their ventral side towards the shell, such that they avoid getting their stigmata plugged with mucus. All species are wingless (Trautner & Geigenmüller, 1987). About 50 species inhabit mostly in mountain forests in Europe and East Asia, three species are distributed in northwestern North America (Hurka, 1996).

The purpose of this paper is to provide contribution to taxonomy position and geographical distribution of Turkish *Cychrus* species/subspecies, and descriptions of structural features, and photographs of habitus (male) and male genitalia for each taxon of Turkish *Cychrus* and their relations with two species from Balkans to Caucasus.

## **Material and Methods**

The previous studies were researched on *Cychrus*. The publications, short research notes, namely all studies issued on Turkish *Cychrus* were investigated in a long period of time. All these publications were brought together. Moreover, the people studying on *Cychrus* were contacted. All the studies were reviewed and evaluated, as well.

Listed are the names of coleopterologist who collected the specimens, followed by a two letter coden by which each is referred to in the Material Examined sections of this paper: Daniel Prunier (DP) and Bernard Lassalle (BL).

### **A short history of *Cychrus* investigations from Balkans to Caucasus:**

The first studies on *Cychrus* from Balkans to Caucasus were carried out by Linné, 1758; Fabricius, 1792; Fischer von Waldheim, 1824; Palliardi, 1825; Chaudoir, 1837; Géhin, 1885; Reitter, 1888; Roeschke, 1907 (namely original description of the first species). Later, from this region, important studies were carried out by Breuning, 1964; Mandl, 1977; Deuve, 2002. The first endemic species belonging to the genus *Cychrus* is *Cychrus aeneus* Fischer von Waldheim, 1824.

### **A checklist of *Cychrus* from Balkans to Caucasus:**

The checklist of *Cychrus* recorded from Balkan to Caucasus is given below. We give list of *Cychrus* species from Balkans to Caucasus so that they could compare with ones in Turkey. A total of 20 species/subspecies are included as follows:

#### **Balkans:**

- Cychrus angustatus* Hoppe & Hornschuch, 1825
- Cychrus attenuatus* Fabricius, 1792
- Cychrus caraboides* Linné, 1758
- Cychrus schmidti* Chaudoir, 1837
- Cychrus semigranosus albanicus* Hopp, 1929
- Cychrus semigranosus balcanicus* Hopffgarten, 1881
- Cychrus semigranosus dinaricus* Mandl, 1989
- Cychrus semigranosus graecus* Breuning, 1967
- Cychrus semigranosus montanus* Winkler, 1939
- Cychrus semigranosus montenegrinus* Apfelbeck, 1904
- Cychrus semigranosus rhilensis* Roeschke, 1907
- Cychrus semigranosus semigranosus* Palliardi, 1825
- Cychrus semigranosus travnikanus* Apfelbeck, 1904

#### **Caucasus:**

- Cychrus belousovi* O.Berlov, 1997
- Cychrus caraboides* Linné, 1758
- Cychrus koltzei* Roeschke, 1907
- Cychrus inessae* O.Berlov, 1997 (we consider this taxon as subspecies of *Cychrus starcki*)
- Cychrus starcki* Reitter, 1888
- Cychrus volkovi* O.Berlov, 1997

#### **Turkish *Cychrus* spp.:**

Since 1824, sixteen taxa of Anatolian *Cychrus* have been described, without presuming whether their status has changed over the years.

- Cychrus aeneus* Fischer von Waldheim, 1824
- Cychrus anatolicus* Motschulsky, 1865
- Cychrus armeniacus* Chaudoir, 1879
- Cychrus frivaldszkyi* Roeschke, 1907

*Cychrus ilgazdaghensis* Mařan, 1932  
*Cychrus ponticus* Schweiger, 1962  
*Cychrus breuningi* Schweiger, 1963  
*Cychrus korgei* Breuning, 1964  
*Cychrus ruspolii* Breuning, 1964  
*Cychrus drannadaghensis* Breuning, 1967  
*Cychrus akcakocae* Breuning, 1969  
*Cychrus mesodiensis* Breuning, 1969  
*Cychrus mengenensis* Breuning, 1975  
*Cychrus baiburtensis* Breuning, 1975  
*Cychrus occidentalis* Mandl, 1977  
*Cychrus augustemarginata* Mandl, 1977

Among these 16 *Cychrus*, seven taxa were elevated to the rank of species by various authors (Stephan von Breuning, Karl Mandl and Josef Mařan) according to their personal conviction. These three authors considered the number of true species as seven that these seven species were given below and they considered others names as subspecies.

*Cychrus aeneus* Fischer von Waldheim, 1824  
*Cychrus anatolicus* Motschulsky, 1865  
*Cychrus armeniacus* Chaudoir, 1879  
*Cychrus frivaldszkyi* Roeschke, 1907  
*Cychrus ilgazdaghensis* Mařan, 1932  
*Cychrus korgei* Breuning, 1964  
*Cychrus ruspolii* Breuning, 1964

Two main authors (Stephan von Breuning and Karl Mandl) have different opinions so it was very difficult to synthesize logic.

In 2002, Thierry Deuve has reviewed all of these descriptions, by subjecting to their geographical distributions. It appeared that the 16 described taxa, two species could be real parts by characters fairly constant. We support this hypothesis being the most likely and best suited to the finding in the field (Figure 1).

- *Cychrus aeneus* Fischer von Waldheim, 1824 (to the east of Trabzon).
- *Cychrus anatolicus* Motschulsky, 1865 (to the west of Trabzon)

Some months later, also in 2003, Pierfranco Cavazzuti described a new subspecies: *Cychrus anatolicus ziyathi* Cavazzuti, 2003 from Artvin province (Turkey), included in the geographical area of *C. aeneus*.



Figure 1. The map showing distribution of *Cychrus anatolicus* Motschulsky, 1865 and *Cychrus aeneus* Fischer von Waldheim, 1824 from Turkey and their relationships with two species, *Cychrus semigranosus* Palliardi, 1825 and *Cychrus starcki* Reitter, 1888 from Balkans to Caucasus.

Variability is important for these two species undergo very different ecological conditions. They live from the sea up to 2500m. They inhabit all types of forests up to the alpine zone. The multitude of micro mountain chain forming the Pontic Mountains accentuated a process of isolation adding to environmental variations. For all *Cychrus* taxa, variability related to the ecology is the same: low altitude specimens are larger and stockier than those living in high altitude. High altitude specimens are than smaller, less convex and narrower.

It is useful today to illustrate the wealth of fauna, and to reduce the confusion that reigns in many collections.

#### **The list species/subspecies of Turkish *Cychrus*:**

The present nomenclature of the Turkish *Cychrus* follows Deuve (2002).

*Cychrus aeneus aeneus* Fischer von Waldheim, 1824

*Cychrus aeneus ayderensis* Deuve, 2002

*Cychrus aeneus baiburtensis* Breuning, 1975

*Cychrus aeneus hopaensis* Deuve, 2002

*Cychrus aeneus trabzonensis* Deuve, 2002

*Cychrus anatolicus anatolicus* Motschulsky, 1865

(=*armeniacus* Chaudoir, 1879 = *mesodiensis* Breuning, 1969)

*Cychrus anatolicus drannadaghensis* Breuning, 1967

*Cychnus anatolicus frivaldszkyi* Roeschke, 1907  
(= *ruspolii* Breuning, 1964 = *augustimarginatus* Mandl, 1977)  
*Cychnus anatolicus ilgazdaghsensis* Maran, 1932  
*Cychnus anatolicus korgei* Breuning, 1964  
*Cychnus anatolicus occidentalis* Mandl, 1977  
*Cychnus anatolicus ponticus* Schweiger, 1962  
(= *breuningi* Schweiger, 1963 = *akcakocae* Breuning, 1969 = *mengenensis* Breuning, 1975)  
*Cychnus anatolicus ziyathi* Cavazzuti, 2003

Recently, an important paper on Turkish Carabinae have been prepared by Avgın & Cavazzuti (in press). The researches on Turkish *Cychnus* was briefly presented in this paper.

## Results and Discussion

### A Taxonomic review of the genus *Cychnus* Fabricius, 1794 from Turkey:

#### ***Cychnus aeneus aeneus* Fischer von Waldheim, 1824**

Material examined: Maçahel Mountain Pass 1450m, Borçka, Artvin TR, 6 specimens (Col. DP); Savsat 1600m, Artvin TR, 4 specimens (Col. BL); Otingo 1500m, Borçka, Artvin TR, 4 specimens (Col. BL); Yalnızçam 1700m, Artvin TR, 2 specimens (Col. BL). Totally 16 specimens.

Geographical distribution: Armenia, Georgia, Turkey [Artvin (Savsat)] (Deuve, 2002).

Remarks: Habitus, dorsal aspect, as in Figure 2a-b. Descriptive notes: Length 17-19 mm. Bronzed clear. Bicolor: lower body bluish black, elytra bronzed clear. Pronotum very narrow margins thin. Sculpture with strong primary rows of granules ring. Two large protuberances at 1/4 posterior elytra. Male genitalia, right lateral, as in figure 2c.

#### ***Cychnus aeneus ayderensis* Deuve, 2002**

Material examined: Ilıcaköy 1600m, Rize, TR, 3 specimens (Col. BL); Çamlık, Forest 1600m, İkizdere TR, 3 specimens (Col. BL); Çamlık 1800m, İkizdere, Rize TR, 3 specimens (Col. BL). Totally 9 specimens.

Geographical distribution: Turkey [Rize (Ayder)] (Deuve, 2002).

Remarks: Habitus, dorsal aspect, as in Figure 3a. Descriptive notes: Length 18-19 mm. Pronotum very short strongly narrowed behind. Thin margins. Elytral sculpture frequently erased.

***Cychrus aeneus baiburtensis* Breuning, 1975**

Material examined: Soğanlı Mountain Pass 2500m, Gümüşhane TR, 1 specimen (Col. BL). Totally 1 specimens.

Geographical distribution: Turkey (Mountains north of Bayburt) (Breuning, 1975).

Remarks: Habitus, dorsal aspect, as in Figure 3b. Descriptive notes: Length 17 mm. Pronotum large enough for the species. Ample margins high. Approximates *Cychrus anatolicus* Motschulsky, 1865.

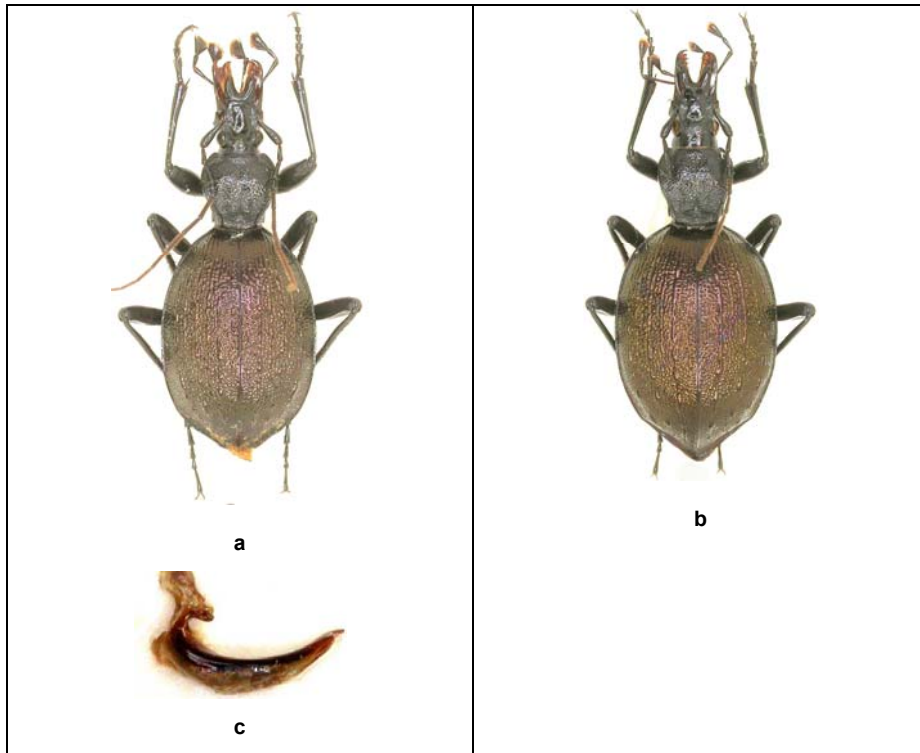


Figure 2. *Cychrus aeneus aeneus* Fischer von Waldheim, 1824: a: Habitus and dorsal view of male (from Maçahel Mountain Pass 1450 m, Artvin, Turkey), b: Female (from Savsat 1600/1800 m, Artvin, Turkey), c: Right lateral view of the aedeagus.

***Cychrus aeneus hopaensis* Deuve, 2002**

Material examined: Cankurtaran Mountain Pass 800m, Hopa, Artvin TR, 4 specimens (Col. DP); Damar 1000m, Borçka, Artvin TR, 2 specimens (Col. DP); Hopa to Borçka at 14 km, 550m, Artvin TR, 1 specimen (Col. DP) Artvin 1600/1800m TR, 8 specimens; Kafkasor village 1700m, Artvin TR, 5 specimens (Col. BL). Totally 20 specimens.

Geographical distribution: Turkey [Artvin (Borçka, Hopa)] (Deuve, 2002).

Remarks: Habitus, dorsal aspect, as in figure 3c. Descriptive notes: Length 20 mm. Pronotum expanded toward the front, elytra very convex and rounded. Sculpture links strong and well marked. Reddish bronze coloration.

***Cychrus aeneus trabzonensis* Deuve, 2002**

Material examined: Kalecik, East of Trabzon TR, 3 specimens (Col. DP); Maçka, towards Sumela 850m, TR, 1 specimen (Col. DP). Totally 4 specimens.

Geographical distribution: Turkey (Trabzon) (Deuve, 2002).

Remarks: Habitus, dorsal aspect, as in Figure 4a. Descriptive notes: Length 20-21mm. Pronotum margin thin, expanded at the front. Elytrale sutural line convex. Entirely dark brownish color. Sculpture with raspy rows of granules.

***Cychrus anatolicus anatolicus* Motschulsky, 1865**

(= *armeniacus* Chaudoir, 1879 = *mesodiensis* Breuning, 1969).

Material examined: Gürgentepe TR 1 specimen; Mesudiye 1500m (Col. BL), Ordu TR 3 specimens; Gölköy 1900m, Ordu TR 2 specimens; Koyuluhisar, 1600m (Col. BL), Sivas TR 1 specimen (Col. BL). Totally 7 specimens.

Geographical distribution: Turkey (South of Ordu) (Motschulsky, 1865).

Remarks: Habitus, dorsal aspect, as in Figure 4b. Descriptive notes: Length 19-21 mm. Black bronze, convex, pronotum narrower at the base. Margin less ample.

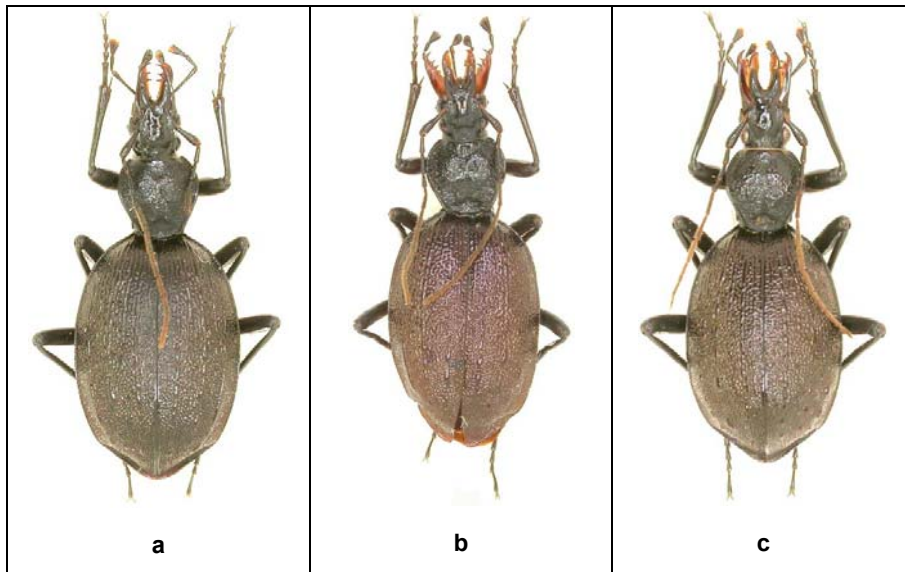


Figure 3. a: *Cychrus aeneus ayderensis* Deuve, 2002 (female from Çamlık, İkizdere, Rize, Turkey), b: *Cychrus aeneus baiburtensis* Breuning, 1975 (female from Soğanlı 2500m, Gümüşhane, Turkey), c: *Cychrus aeneus hopaensis* Deuve, 2002 (female from Hopa to Borçka 550m, Artvin, Turkey).



***Cychrus anatolicus drannadaghensis* Breuning, 1967**

Material examined: Zindan mountain 1300m, Sinop TR 1 specimen (Col. BL); Dranaz mountain 1500m, Sinop TR, 2 specimens (Col. BL). Totally 3 specimens.

Geographical distribution: Turkey [Sinop (Dranaz Mountains)] (Breuning, 1967).

Remarks: Habitus, dorsal aspect, as in Figure 4c. Descriptive notes: Length 19-22mm. Black, bronze. Great subspecies with pronotum expanded towards the front margin line. Elytral sculpture links primary rough and confused.

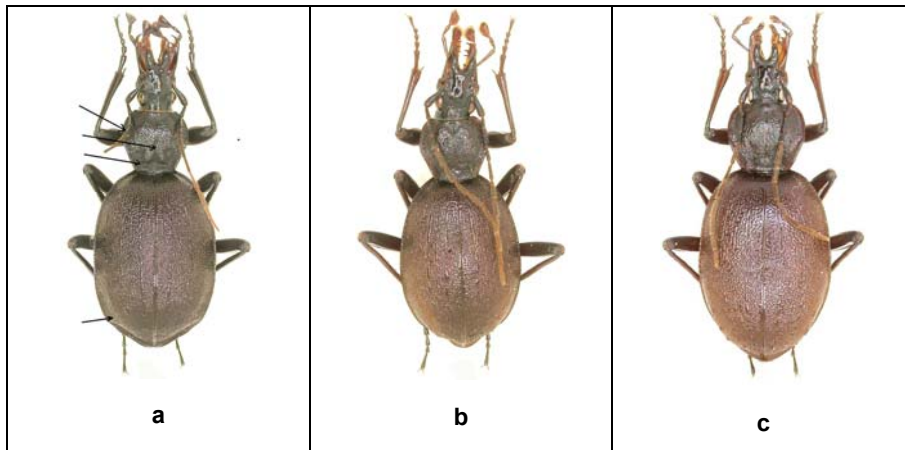


Figure 4. a: *Cychrus aeneus trabzonensis* Deuve, 2002 (male from Kalecik 1600m, east Trabzon, Turkey), b: *Cychrus anatolicus anatolicus* Motschulsky, 1865 (male from Mesudiye 1500m, Ordu, Turkey), c: *Cychrus anatolicus drannadaghensis* Breuning, 1967 (female from Drannaz mountain 1500m, Sinop, Turkey).

***Cychrus anatolicus frivaldszkyi* Roeschke, 1907**

(= *ruspolii* Breuning, 1964 = *augustimarginatus* Mandl, 1977).

Material examined: Çayırkent, Samsun TR, 1 specimen (Col. DP); Refahiye 1100m, Ordu TR, 2 specimens (Col. DP). Totally 3 specimens.

Geographical distribution: Turkey [Samsun (Akkuş)] (Roeschke, 1907).

Remarks: Habitus, dorsal aspect, as in Figure 5a. Descriptive notes: Length 21-22mm. Black bronze, convex, pronotum small, subcircular, much narrowed in front than behind. Sculpture strong and links well marked. Very close to the ssp. *anatolicus*.

***Cychrus anatolicus ilgazdaghensis* Maran, 1932**

Material examined: Ilgaz mountain 1700m, Kastamonu TR, 1 specimen (Col. BL); Ayli mountain 1350m, Kastamonu TR, 4 specimens (Col. BL). Totally 5 specimens.

Geographical distribution: Turkey (Ilgaz massif) (Deuve, 2002).

Remarks: Habitus, dorsal aspect, as in Figure 5b. Descriptive notes: Length 19mm. Black, pronotum broad, square, parallel-sided, general form short. Sculpture small, slight. Elytra slightly swollen on the sides.

***Cychnus anatolicus korgei* Breuning, 1964**

Material examined: Yavuz Kemal 1000m, Giresun TR, 8 specimens (Col. DP); Kumbet, Giresun TR, 2 specimens (Col. DP); Tamdere, Giresun TR, 4 specimens (Col. DP). Totally 14 specimens.

Geographical distribution: Turkey (Giresun) (Breuning, 1964).

Remarks: Habitus, dorsal aspect, as in Figure 5ca. Descriptive notes: Length 17-20mm. Black, bronze, pronotum circular, small, narrowed in front and back, narrow margins. Elytra strongly convex and swollen. Sculpture strong primary links purposes. Male genitalia, right lateral, as in figure 5cb.

***Cychnus anatolicus occidentalis* Mandl, 1977**

Material examined: Alem mountain 300m, Istanbul TR, 3 specimens (Col. DP); Yenice 800m, Zonguldak TR, 1 specimen (Col. BL). Totally 4 specimens.

Geographical distribution: Turkey (Istanbul) (Mandl, 1977).

Remarks: Habitus, dorsal aspect, as in Figure 6aa. Descriptive notes: Length 20-21 mm. Black, convex, pronotum very wide margins increased. Elytrale sculpture with rows of granules little marked. Male genitalia, right lateral, as in figure 6ab.

***Cychnus anatolicus ponticus* Schweiger, 1962**

(= *breuningi* Schweiger, 1963 = *akcakocae* Breuning, 1969= *mengenensis* Breuning, 1975).

Material examined: Keltepe 1500m, İzmit TR, 4 specimens (Col. BL); Yedigöller 1600m, Bolu TR, 1 specimen (Col. BL); Dorukhan Mountain Pass, Mengen TR, 1 specimen (Col. BL). Totally 6 specimens.

Geographical distribution: Western part of the Pontic chain (Deuve, 2002).

Remarks: Habitus, dorsal aspect, as in Figure 6ca. Descriptive notes: Length 19mm. Black, bronze, pronotum fairly large and shrunk back. Margins slightly raised. Elytra with convex primary rows of granules visible but small.

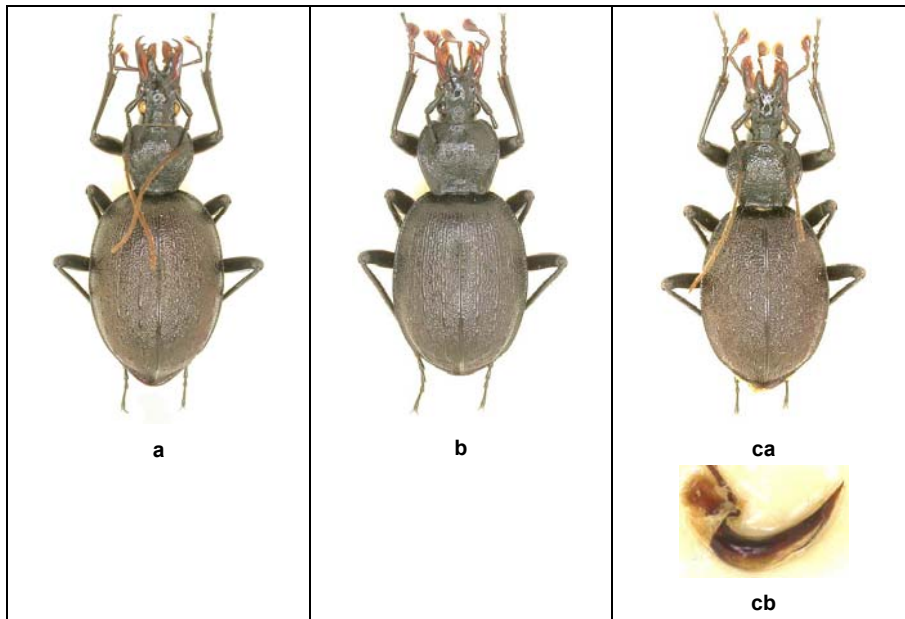


Figure 5. a: *Cychrus anatolicus frivaldszkyi* Roeschke, 1907 (female from Refahiye 1100m, Ordu, Turkey), b: *Cychrus anatolicus ilgazdaghensis* Maran, 1932 (male from Ilgaz mountain 1700m, Kastamonu, Turkey), ca: *Cychrus anatolicus korgei* Breuning, 1964 (male from Yavuzkema1, Giresun, Turkey), cb: *Cychrus anatolicus korgei* Breuning, 1964, right lateral view of the aedeagus.

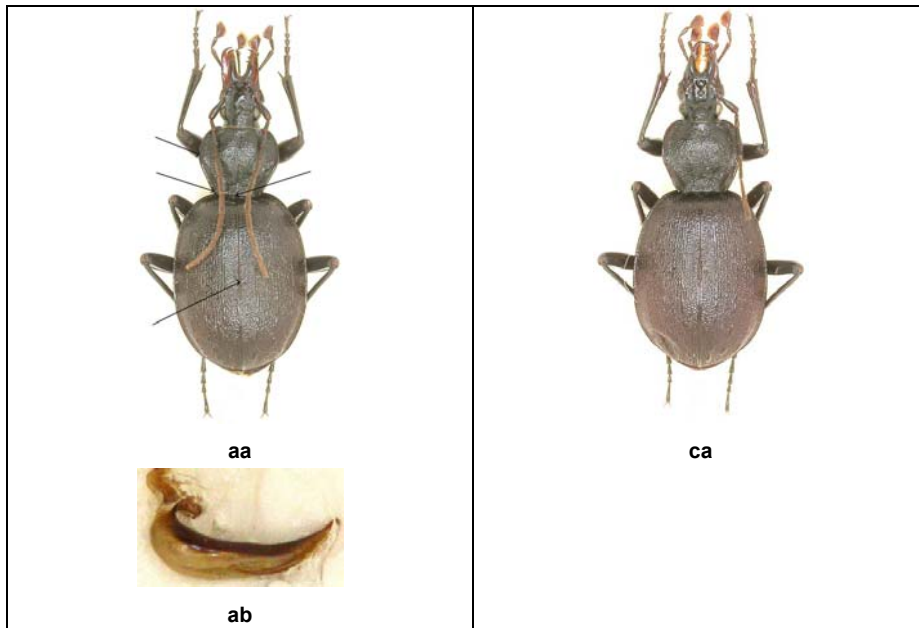


Figure 6. aa: *Cychrus anatolicus occidentalis* Mandl, 1977 (male from Alem mountain 300m, Istanbul, Turkey), ab: *Cychrus anatolicus occidentalis* Mandl, 1977, right lateral view of the aedeagus, ca: *Cychrus anatolicus ponticus* Schweiger, 1962 (male from Dorukhan 700m, Mengen, Zonguldak, Turkey).

### ***Cychnus anatolicus ziyathi* Cavazzuti, 2003**

Type locality: Artvin province, Borçka, 300m.

Geographical distribution: Only the typical locality is known, included in the area of *Cychnus aeneus* (Cavazzuti, 2003).

Remarks: This subspecies was described by Cavazzuti (2003). We do not have this subspecies. He collected this subspecies in Artvin province, Borçka, 300m.

The *Cychnus anatolicus ziyathi* Cavazzuti, 2003 has not been harvested since 1981. Only a single specimen is known while the region is particularly prospected.

### **Comparison between species:**

#### ***Cychnus semigranosus* Palliardi, 1825**

Habitus, dorsal aspect, as in Figure 7aa. Descriptive notes: Length 16-22mm. Lateral edges of pronotum rounded, convex posterior edge without lobes highlights. Elytra convex, granules confused little primary rings aligned. Male genitalia, right lateral, as in figure 7ab. Aedeagus little curved at the apex.

Balkan species were not collected in Turkey.

#### ***Cychnus anatolicus* Motschulsky, 1865**

Length 17-21mm. Pronotum extended to the front, raised margins, visible lobes and right posterior edge. Elytra less convex primary rings aligned. Aedeagus more curved.

*Cychnus anatolicus* Motschulsky, 1865 is replaced to the west by *Cychnus semigranosus* Palliardi, 1825 occupying the Balkans. Their resemblance is striking but *C. semigranosus* has erased lobes of pronotum and distinctly pronounced convexity of the elytra. *C. anatolicus* at the base of pronotum right lobes with a little marked and elytra less convex. In the absence of data on *C. anatolicus* and transitional areas of *C. semigranosus* can be considered as two separate but related species. Researches in the European (Edirne) part of Turkey have not objectified presence of *Cychnus*.

Towards the east, *Cychnus anatolicus* is replaced by *Cychnus aeneus* around Trabzon.

*C. anatolicus korgei* is the last representative of *C. anatolicus* prior to *C. aeneus*. Pronotal margin is less elevated and the elytral rows of granules are more prominent, pointing neighborhood with *aeneus*.

*C. aeneus trabzonensis* is the first representative of the species that we encountered after *C. anatolicus* and perceived the influence of *C. anatolicus* nearby. The pronotum is wider and it tends to disappear bicolor.

Characters related to *C. aeneus*: pronotum small but expanded to the front, cordate, basal dimples pronounced median furrow visible, elytra with a quadrangular pronounced angle to the apex.

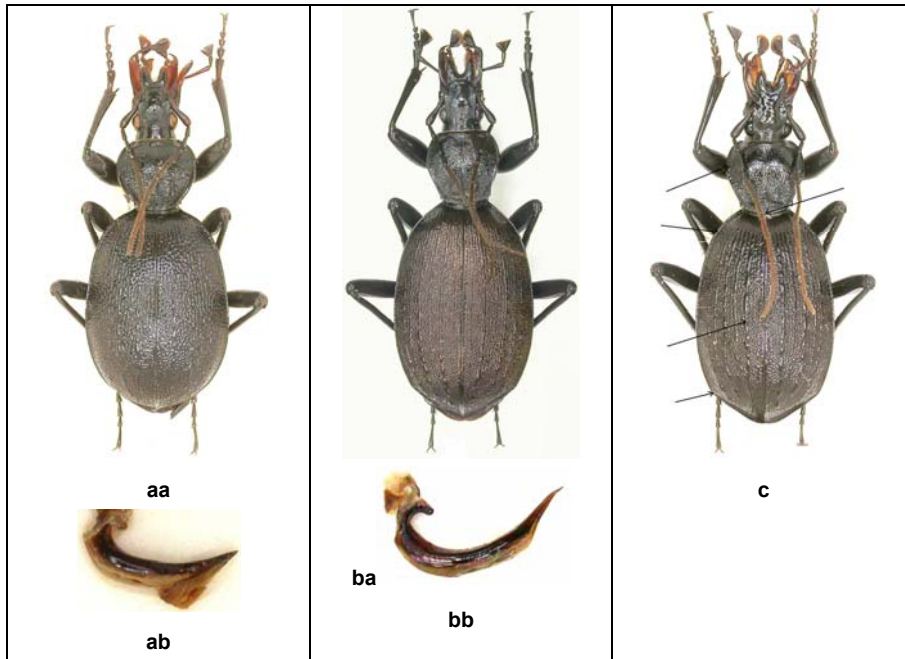


Figure 7. aa: *Cychrus semigranosus* Palliardi, 1825 (male from Lithoro 1000m, Mt Olympus Greece), ab: *Cychrus semigranosus* Palliardi, 1825, right lateral view of the aedeagus, ba: *Cychrus starcki inessae* Berlov, 1997 (male from Muhazstate 70 m, NE Kobuleti, Batoumi, Adjarie, Georgie), bb: *Cychrus starcki inessae* Berlov, 1997, right lateral view of the aedeagus, c. *Cychrus starcki starcki* Reitter, 1888 (male from Gagry area 1800m, Mt Arabika, Abkhazia).

### ***Cychrus aeneus aeneus* Fischer von Waldheim, 1824**

Length 18-21mm. Pronotum very small margins slightly raised, posterior edge convex dimples marked basal. Aedeagus of *C. anatolicus* Motschulsky, 1865 is small but the apex is curved towards the outside. Bicolor is chest / elytra pronounced. Towards the east, this case is performed in Armenia.

### ***Cychrus starcki inessae* Berlov, 1997**

Habitus, dorsal aspect, as in Figure 7ba. Descriptive notes: Length 22-24 mm. Shape nearby *C. aeneus* Ficher von Waldheim, 1824 margins of pronotum narrow. Elytra less convex and falling sharply towards the apex, parallel-sided, sculpture properly aligned. Aedeagus large, curved towards the outside. *Cychrus starcki inessae* Berlov, 1997 adopt similarities with *C. aeneus* reflecting a probable genetic exchange with *C. aeneus*: pronotum narrow bicoloris present but weak, sculpture. Male genitalia, right lateral, as in Figure 7bb.

### ***Cychrus starcki starcki* Reitter, 1888**

Habitus, dorsal aspect, as in Figure 7c. Descriptive notes: Length 19-22 mm. Pronotum cordate, base convex, lobes absent. Elytra with drooping shoulders, high sculpture, pronounced apical angle, plate elytral suture falling sharply to the apex.

Considering all *Cychrus* from Balkans until Caucasus there is extremity between these two whole progressive ranges which translates those primitive cores and exchanged characters with the marginal populations. It's a fragmented morphocline associated to the expansion of isolated groups of populations which meet by exchanging characters thanks to an extended but partial fertility. If we consider both extremes, it is not very thinkable that there are transitional steps.

But we note the presence of *C. anatolicus ziyathi* Cavazzuti, 2003 (presence not confirmed since 1981) near Artvin as a very isolated population of *C. anatolicus* Motschulsky, 1865 within the geographical area of *C. aeneus* Fischer von Waldheim. The model presented is consistent and built on several observations. And however the realities of the ground are edifying demonstration. It is however necessary to interpret the observations of ground well not to lead to wrong conclusions.

## **Özet**

### **Türkiye'den *Cychrus* Fabricius, 1794 (Coleoptera: Carabidae) taksonomisine katkı ve Balkan'lardan Kafkas'lara *Cychrus* türleriyle ilişkileri**

Türkiye'den *Cychrus* Fabricius, 1794 cinsi incelenmiştir. Çalışmaya Balkan'lardan Kafkas'lara Türkiye'deki *Cychrus* türleriyle ilişkide olan *Cychrus*'larda dahil edilmiş ve Balkan'lardan Kafkas'lara *Cychrus* türlerinin populasyonun rasyonel yorumları sunulmuştur. Daha çok spesifik grupların çevreleriyle değişmiş olan karakterleri birkaç entomolog tarafından yapılan yorumlarla onaylandığı görülmüştür. Bu değişiklikler batıdan doğuya toplam 2 farklı türle bir düzgün değişim veya parçalanmış morfoloji kurmuştur. Bu türler *Cychrus aeneus* Fischer von Waldheim, 1824 ve *Cychrus anatolicus* Motschulsky, 1865'dur. Türkiye'deki türler Balkanlar ve Kafkaslar'daki türlerle orta derecede bağlantıdadır. Bu bölgeden *Cychrus* türlerine ait araştırmaların tarihi hakkında kısa bilgi verilmiştir. Bu cinse ait olan tür, alttürlerin coğrafik dağılımı ve taksonomik pozisyonu tartışılmıştır. Her bir takson morfolojik özelliklerin tanımıyla ve ergin erkek birey fotoğrafları, erkek genital organa ait aedeagus fotoğraflarıyla karakterize edilmiştir.

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## A Bibliography of *Cychrus* from Balkans to Caucasus

The publications on *Cychrus* from Balkans to Caucasus from the first one to the last are given in the following list.

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