

Faunistic studies on the species *Pachybrachis* Chevrolat and *Cryptocephalus* Geoffroy (Coleoptera, Chrysomelidae, Cryptocephalinae) of Dedegöl Mountains (Isparta)*

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Abstract: The material of the subfamily Cryptocephalinae collected from Dedegöl Mountains (Isparta) between 1996 and 1998 consisted of 21 species belonging to the genera *Pachybrachis* and *Cryptocephalus*. A diagnostic key and distribution records for the species are presented. The species except for *Cryptocephalus bipunctatus* (L.), *C. turcicus* Suffrian, *C. connexus* Olivier, *Pachybrachis limbatus* (Menetries), *P. fimbriolatus* (Suffrian) and *P. tessellatus orientalis* Weise are new for Isparta.

Key Words: Coleoptera, Chrysomelidae, Cryptocephalinae, Fauna, Dedegöl Mountains.

Dedegöl Dağları (Isparta) *Pachybrachis* Chevrolat ve *Cryptocephalus* Geoffroy (Coleoptera, Chrysomelidae, Cryptocephalinae) Türleri Üzerine Faunistik Çalışmalar

Özet: Bu çalışmada, 1996-1998 yılları arasında Dedegöl Dağları'ndan (Isparta) toplanan Cryptocephalinae türleri belirlenmiştir. Çalışma sonucunda, Cryptocephalinae altfamilyasına ait 2 cins içinde toplam 21 tür tespit edilmiştir. Türler için teşhis anahtarları hazırlanmış ve zoocoğrafik dağılımları verilmiştir. *Cryptocephalus bipunctatus* (L.), *C. turcicus* Suffrian, *C. connexus* Olivier, *Pachybrachis limbatus* (Menetries), *P. fimbriolatus* (Suffrian) ve *P. tessellatus orientalis* Weise dışındaki türler Isparta için yenidir.

Anahtar Sözcükler: Coleoptera, Chrysomelidae, Cryptocephalinae, Fauna, Dedegöl Dağları.

Introduction

The subfamily Cryptocephalinae is characterized by their generally filiform antennae, and by three abdominal sternites in the middle which are narrowed medially, and by a deep, median depression in the last sternite of the female abdomen (1). Pronotum and elytra may be black, reddish, green or blue, or entirely yellowish.

The subfamily Cryptocephalinae is widely distributed in the world (2). It is one of the richest subfamilies according to the number of the species in the family Chrysomelidae. The subfamily Cryptocephalinae has been studied by native and foreign researchers (3-14) in Turkey. These researchers have contributed a lot to the Cryptocephalinae fauna of Turkey. In recent studies, Sassi and Kismalı (15) reported 91 species in three genera belonging to Cryptocephalinae in Turkey. In addition, Gök and Ayvaz (16) recorded for the first time one species of

the Cryptocephalinae for the Turkish fauna. It is expected that the number of species will increase in further studies. Dedegöl Mountains is a transition region between Central Anatolia and the Mediterranean region of Turkey. Consequently, the aim of this study was to determine the species existing in the area, which has different geographical locations, climatic conditions and vegetations.

Materials and Methods

Adult examples of Chryptocephalinae were collected from different habitats of Dedegöl Mountains between 1996 and 1998. The beetles were captured by sweepnet on wild plant vegetations. Collected beetles were killed by ethyl acetate in a killing bottle. Small beetles were stuck to a triangular piece of cardboard. Large beetles were

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pinned on a standard insect pin. Samples were stored and brought to the laboratory for further analysis. Specimens were prepared and labeled in the laboratory. Samples were diagnosed according to the identification key given in the literature (2, 10, 17, 18, 19, 20). The figures of body parts and aedeagus of the species were given. Beetles were deposited at the Department of Biology, Faculty of Art and Science, Süleyman Demirel University.

Result and Discussion

Key to the species of *Pachybrachis* Chevrolat, 1837

- 1- Elytra with relief2
- Elytra without relief; aedeagus as in Figures 1 b, c*P. sinuatus* (Mulsant et Rey)
- 2- Base of pronotum with two yellow spots side by side in the middle3
- Base of pronotum without spots; aedeagus as in Figures 2 b, c*P. limbatus* (Menetries)
- 3- Lateral regions of elytra and all sutures with narrow, yellow band; dorsal parts of elytra with less yellow patterns (Figure 3); pygidium black*P. fimbriolatus* (Suffrian)
- Lateral regions of elytra and sutures without band; dorsal parts of elytra with few yellow patterns (Figure 4 a); pygidium surroundings with narrow, yellow spot; aedeagus as in Figures 4 b, c*P. tessellatus orientalis* Weise

Genus: *Pachybrachis* Chevrolat, 1837

Pachybrachis sinuatus (Mulsant et Rey, 1859)

Material examined: Sütçüler, vicinity of Ayvalıpınar stream, 1200 m, 08.07.1997, 5 ♂♂, 12 ♀♀; Aksu, vicinity

of Yaka village stream, 1350 m, 13.07.1998, 10 ♂♂, 24 ♀♀.

General distribution: Germany, Hungary, North France (21), Middle Europe (18), Austria, Bosnia, Bulgaria, France, Greece, Italy, Macedonia, Poland, Turkey (22); Albania, Bulgaria, Poland, Yugoslavia (23), Asia, Europe, Bulgaria (19), Balkans, Caucasus, Central Europe, France, Italy, Moldova, Siberia, Turkey (15).

Distribution in Turkey: Ankara (6), Ankara, Konya (10), Erzurum (12), Antalya, Bolu, Erzurum (15).

Pachybrachis limbatus (Menetries, 1836)

Material examined: Aksu, vicinity of Yaka village, 1350 m, 02.05.1998, 5 ♂♂, 7 ♀♀; Aksu, Belence village, 1050 m, 23.05.1998, 4 ♀♀; Aksu, vicinity of Terziler village, 1350 m, 29.05.1998, ♀; 30.05.1998, ♀.

General distribution: Greece, Turkey (21, 24), Albania, Bosnia, Dalmatia, Greece, Italy, Syria, Turkey (22), Albania, Bulgaria, Venezuela, Yugoslavia (23), Bulgaria, Central Asia, Greece (19), Balkans, Southeast Europe, Israel, Cyprus, Syria, Turkey (20), Balkans, Israel, Syria, Rhodes, Jordan, Turkey (15).

Distribution in Turkey: Eskişehir, Mersin (4), İzmir, Mersin (25), Ankara, Bolu, Bursa, Samsun (5), İçel (7), Ankara, Bilecik, Bursa, Isparta, Konya (10), Antalya, Balıkesir, Bilecik, Çorum, Mersin, Sivas (15).

Pachybrachis fimbriolatus (Suffrian, 1848)

Material examined: Aksu, surroundings of Elecik village, 1350 m, 30.05.1998, 3 ♀♀.

General distribution: Germany, France, Northern Europe, Siberia (21), Austria, Bosnia, Bulgaria,

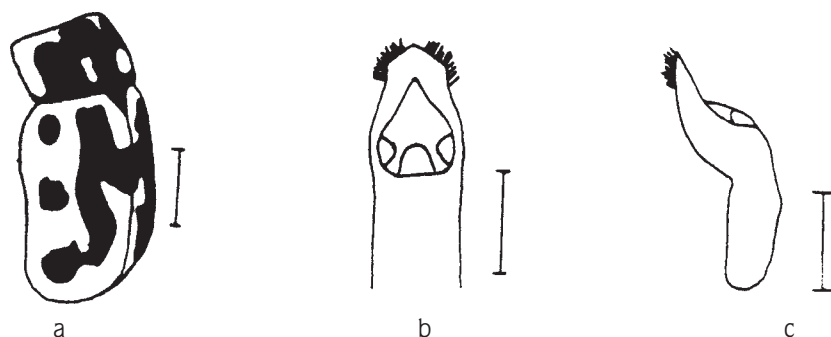


Figure 1. *Pachybrachis sinuatus* (Mulsant et Rey): a) Pronotum and elytra, laterodorsal view (Scale: 1mm); b-c: Aedeagus, b) dorsal view, c) lateral view (Scale: 0.5mm).

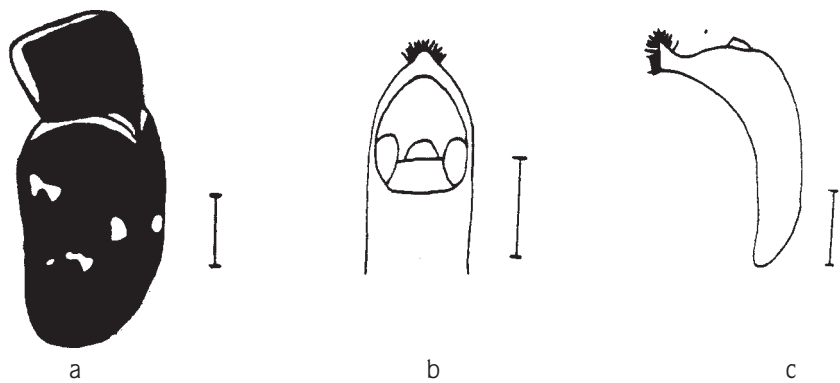


Figure 2. *Pachybrachis limbatus* (Menetries): a) Pronotum and elytra, laterodorsal view (Scale: 1mm); b-c: Aedeagus, b) dorsal view c) lateral view (Scale: 0.5mm).

Czechoslovakia, Hungary, Italy, Turkey (22), Central Europe (18), Albania, Bulgaria, Crimea, Greece, Yugoslavia (23), Europe, Siberia, Turkey (9).

Distribution in Turkey: Adana (4); Denizli (25), Ankara, Çankırı (9), Ankara, Çorum, Isparta, Kayseri, Kırşehir, Konya, Nevşehir, Niğde, Sivas (10), Gümüşhane, Erzincan, Sivas, Van (11), Bayburt, Erzurum, Iğdır, Kars (12).

General distribution: Turkey (22, 19), Caucasus, Israel, Lebanon, Syria, Turkey (15).

Distribution in Turkey: Adana (22); Ankara, Bursa (5), Amasya, Ankara, Bayburt, Gümüşhane (7), Ankara, Isparta, Kayseri, Konya, Nevşehir, Sivas, Yozgat (10), Ağrı, Bolu, Çorum, Gaziantep, Gümüşhane, Tokat (11), Erzincan, Erzurum (12), Adana, Afyon, Ağrı, Amasya, Ankara, Antalya, Bayburt, Bolu, Bursa, Çorum, Elazığ, Erzincan, Erzurum, Gaziantep, Gümüşhane, İzmir, Kahramanmaraş, Kars, Kayseri, Mardin, Mersin, Nevşehir, Sivas, Tokat, Van (15).



Figure 3. *Pachybrachis fimbriolatus* (Suffrian): Pronotum and elytra, laterodorsal view (Scale: 1mm).

***Pachybrachis tessellatus orientalis* Weise, 1894**

Material examined: Aksu, vicinity of Yaka village, 1350 m, 06.06.1998, 2 ♂♂, 4 ♀♀, 14.06.1998, 4 ♀♀, 04.07.1998, 3 ♂♂, 7 ♀♀, 13.07.1998, 6 ♂♂, 10 ♀♀.

Key to the species of *Cryptocephalus* Geoffroy, 1762

- 1- Elytral punctation completely or partly regular2
- Elytral punctation irregular12
- 2- Dorsal surface unicolor3
- Dorsal surface not unicolor7
- 3- Body with bluish-green reflection4
- Body completely black or rusty-yellowish5
- 4- Lateral margins of pronotum very narrow; anterior region of pronotum with narrow, yellow

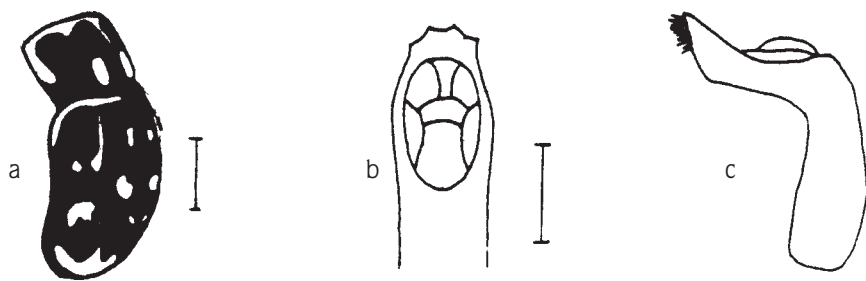


Figure 4. *Pachybrachis tessellatus orientalis* Weise: a) Pronotum and elytra, laterodorsal view (Scale: 1mm); b-c: Aedeagus, b) dorsal view c) lateral view (Scale: 0.5mm).

- band in male; frons with yellow spots (Figure 5 a); aedeagus as in Figures 5 c, d
 *C. janthinus* Germar
- Lateral margins of pronotum broad; clypeus with yellow pattern, anterior region of pronotum without yellow band in male; aedeagus as in Figures 6 b, c *C. parvulus* Müller
- 5- Pronotum and elytra rusty yellow; head completely light yellow, legs reddish-yellow . .6
- Pronotum and elytra dull black; head black upperside of antennae, underside yellow; frons with two yellow spots side by side in the middle; tarsi completely or partly black, the other leg segments yellowish-red; aedeagus as in Figures 7 a, b *C. ocellatus* Drapiez
- 6- Fore tibia of male internally flexed with small spur apically (Figure 8 a); aedeagus as in Figures 8 b, c *C. populi* Suffrian
- Fore tibia of male normal; aedeagus as in Figures 9 b, c *C. fulvus* (Goeze)
- 7- Head and pronotum completely black8
- Some parts of the head and pronotum with yellow pattern or spots9
- 8- Elytra red, its margin and epipleura black, each elytra with two black spots; humeral spot small, the other large (Figure 10 a), elytral punctations fairly large, head with dense and short hairs; aedeagus as in Figures 10 b, c
 *C. bipunctatus* (Linnaeus)
- Elytra yellowish, suture and apical margins black, epipleura completely yellow, each with three black spots (Figure 11 a), elytral punctations small; head with dense and long hairs; aedeagus as in Figures 11 b, c *C. imperialis* Laicharting
- 9- Length more than 3.5mm; elytra black, with 2 or 4 yellow pattern10
- Length less than 3.5mm; elytra rusty yellow; suture and humeral parts with longitudinal black pattern or without pattern11
- 10- Pronotum with dense, coarse punctation; apex of elytra, epipleura and dorsal parts with large, yellow pattern (Figure 12 c); head of male with a X-shaped spot, head of female with a V-shaped spot (Figure 12 a, b); underside of forefemur with a round yellow spot, outside of tibia brownish, other segments of the leg black; aedeagus as in Figures 12 e, f
 *C. moraei* (Linnaeus)
- Pronotum without punctation; base of elytra, epipleura, middle and apical parts of elytra with yellow bands (Figure 13 a); basal band surrounds scutellum, femur and tibia of forelegs reddish yellow, all of the other leg segments black; aedeagus as in Figures 13 b, c
 *C. octocasmus* Bedel
- 11- Middle lobe of aedeagus apically pointed (Figures 14 b, c) *C. pygmaeus* Fabricius
- Middle lobe of aedeagus apically rounded (Figures 15 b, c) *C. connexus* Olivier
- 12- Dorsal parts completely covered with long white hairs; apex of elytra with a large yellow spot (Figure 16) *C. moehringi* Weise
- Dorsal parts without hairs; apex of elytra without a spot.13
- 13- Elytra entirely reddish, with black spots14
- Elytra entirely black or blackish blue, pronotum margins and epipleura of some specimens with a narrow yellow band15
- 14- Pronotum with fairly dense and rough punctation; its lateral and anterior margins with yellowish band (Figure 17 a), in some examples, anterior band reaching to pronotum disc; elytra with big, black spots; the whole margins except for epipleura with black band; aedeagus as in Figures 17 b, c *C. biledjekensis* Pic
- Pronotum with dense and thin punctation, lateral margins with yellow spots and anterior margins not spotted, lateroposterior margins of pronotum disc with two yellow spots in female (Figures 18 a, b), elytra with small, black spots; the whole margins the same color as elytra; aedeagus as in Figures 18 c, d *C. prusias* Suffrian
- 15- The whole body metallic blackish-blue; pronotum with dense punctation; the last abdomen sternite depressed in a U-shape in male; aedeagus as in Figures 19 a, b *C. concolor* Suffrian
- A large part of head, epipleura and legs yellowish; the last abdomen sternite normal in male . . .16

16- Pronotum convex, lateral margins of pronotum partly visible from above, anterior and lateral margins with narrow, yellow band in male, lateral yellow prolongation not reaching posterior (Figure 20 a); pronotum completely black in female; head generally yellow; aedeagus as in Figures 20 b, c *C. flavipes* Fabricius

- Pronotum slightly convex, lateral margins of pronotum completely visible from above, anterior and lateral margins with yellow band (Figure 21 a), lateral yellow band reaching posterior in male; head black; clypeus and frons with yellow pattern between eyes; aedeagus as in Figures 21 b, c *C. turcicus* Suffrian

Genus: *Cryptocephalus* Geoffroy

Cryptocephalus janthinus Germar, 1824

Material examined: Aksu, vicinity of Yaka village stream, 1330 m, 24.08.1997, 11 ♂♂, 14 ♀♀, 25.07.1998, 5 ♂♂, 8 ♀♀, 03.08.1998, ♂, 2 ♀♀.

General distribution: South Europe, Siberia (21, 24), South and Middle Europe (18), West Kazakhstan, Caucasus, Central and South Europe, European parts of Russia, Siberia (2), Central Europe, Central Asia (19), Azerbaijan (26), Armenia, Georgia, Caucasus (20), Caucasus, Central Asia, Europe, Iran, Siberia, Ukraine, Turkey (15).

Distribution in Turkey: İçel (7), Çanakkale, Eskişehir (11), Mersin, Kırklareli (15).

Cryptocephalus parvulus Müller, 1776

Material examined: Sütçüler, vicinity of Sipahiler village stream, 1200 m, 07.06.1998, 12 ♂♂, 10 ♀♀, 13.06.1998, 5 ♂♂, 9 ♀♀.

General distribution: Europe, Japan, Siberia (21), Europe (18), Poland, Venezuela (23), Europe, Kazakhstan, Siberia, European parts of Russia (2), Europe, Caucasus, Central Europe (19), Azerbaijan (26), Central Asia, Europe, Iran, Siberia, Turkey (15).

Distribution in Turkey: Samsun (7), Bursa (6), Burdur, Bursa, Konya, Samsun (15).

Cryptocephalus (Burlinius) ocellatus Drapiez, 1819

Material examined: Yenişarbademli, vicinity of Pınargözü stream, 1200 m, 06.06.1998, 10 ♂♂, 21 ♀♀, 04.07.1998, 2 ♂♂, 2 ♀♀.

General distribution: South and Middle Europe (21, 24, 18), Albania, Azerbaijan, Bulgaria, Armenia, Caucasus, Crimea, Poland, Venezuela, Greece, Yugoslavia (23), Kazakhstan, all Europe except Northern Europe, European parts of Russia (2), Europe, Caucasus, Kazakhstan, Turkey (19), Caucasus, Central Asia, Europe, Iran, Ukraine, Siberia, Turkey (15).



Figure 5. *Cryptocephalus janthinus* Germar: a) Head in male (Scale: 0.5mm); b) Pronotum in male, laterodorsal view (Scale: 1mm); c-d: Aedeagus, c) dorsal view d) lateral view (Scale: 0.5mm).

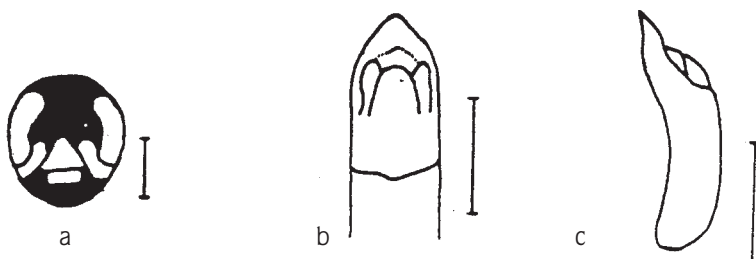


Figure 6. *Cryptocephalus parvulus* Müller: a) Head in male (Scale: 0.5mm); b-c: Aedeagus, b) dorsal view c) lateral view (Scale: 0.5mm).

Distribution in Turkey: Mersin (4), Rize (7), Ankara, Çorum, Kayseri, Konya, Nevşehir, Niğde, Sivas (10), Ankara, Artvin, Bilecik, Bolu, Eskişehir, Erzurum, Gümüşhane, Kastamonu, Rize, Samsun, Sivas (11), Artvin, Erzincan, Erzurum, Ordu (12), Adıyaman, Amasya, Ankara, Artvin, Balıkesir, Bilecik, Bolu, Bursa, Çanakkale, Çorum, Diyarbakır, Erzincan, Erzurum, Eskişehir, Gümüşhane, Hakkari, İstanbul, Kars, Kastamonu, Kütahya, Mardin, Mersin, Ordu, Rize, Samsun, Sivas (15).

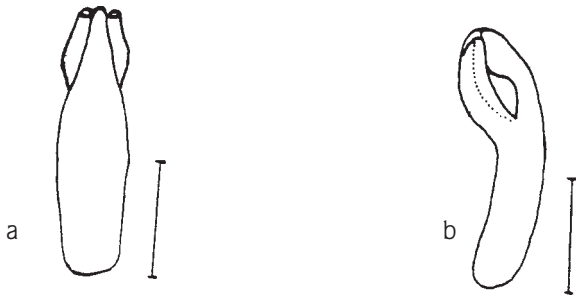


Figure 7. *Cryptocephalus (Burlinius) ocellatus* Drapiez: a-b: Aedeagus, a) dorsal view b) lateral view (Scale: 0.5mm).

***Cryptocephalus (Burlinius) populi* Suffrian, 1848**

Material examined: Aksu, Koçular village, 1300 m, 24.08.1997, ♂, 2 ♀♀, Aksu, Yaka village, 1325 m, 02.05.1998, ♂, ♀.

General distribution: Germany, Spain (24), Central and South Europe (18), Caucasus, Kazakhstan, South and Central Europe, European parts of Russia (2), Bulgaria, Caucasus, Kazakhstan, Central Europe (19), Central Europe, Poland (20).

Distribution in Turkey: Isparta (16).

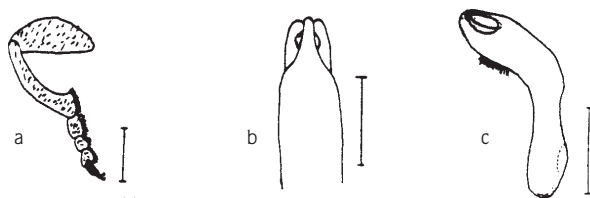


Figure 8. *Cryptocephalus (Burlinius) populi* Suffrian: a) Forefemur in male (Scale: 0.5mm); b-c: Aedeagus, b) dorsal view c) lateral view (Scale: 0.5mm).

***Cryptocephalus (Burlinius) fulvus* (Goeze, 1777)**

Material examined: Aksu, Anamas plateau, 1450 m, 18.06.1996, 20 ♂♂, 23 ♀♀, 11.07.1998, 18 ♂♂, 31 ♀♀.

General distribution: Europe, West Siberia (24), Middle Europe (18), Albania, Bulgaria, Poland, Venezuela, Yugoslavia (23), Europe, Bulgaria, Turkey (19), Caucasus, Europe, Jordan, Israel, Northern Africa, Saudi Arabia, Ukraine, Turkey (15).

Distribution in Turkey: İzmir, Mersin (6), Gümüşhane, Erzincan, Erzurum (12), Ankara, Antalya, İzmir, Manisa, Mersin, Muğla (15).

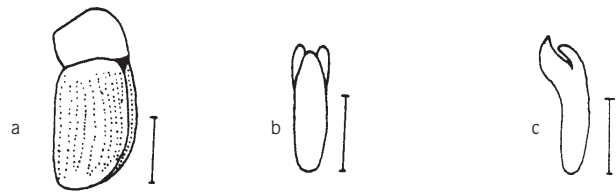


Figure 9. *Cryptocephalus (Burlinius) fulvus* (Goeze): a) Pronotum and elytra, laterodorsal view (Scale: 1mm); b-c: Aedeagus, b) dorsal view c) lateral view (Scale: 0.5mm).

***Cryptocephalus bipunctatus* (Linnaeus, 1758)**

Material examined: Between Yenişarbademli and Yaka village, 1550 m, 14.06.1997, 2 ♂♂, 7 ♀♀, 19.07.1997, 2 ♂♂, 4 ♀♀, 23.05.1998, 2 ♂♂, ♀, Sütçüler, vicinity of Sipahiler village stream, 1200 m, 06.06.1998, ♀, 13.07.1998, 2 ♂♂, 9 ♀♀.

General distribution: Europe, Siberia (21, 24), Middle Europe (18), Albania, Bulgaria, Crimea, Poland, Yugoslavia (23), Caucasia, Kazakhstan, Korea, North Africa, North China, Central and North Europe, European parts of Russia, Siberia (2), Europe, Central Asia, Greece (19), Azerbaijan, (26), Caucasus, Central Asia, China, Europe, Siberia, Turkey (15).

Distribution in Turkey: İzmir, Tarsus (25), Amasya, Bolu, Bursa (5), Ankara, Amasya, İçel, Sinop (7), Ankara, Isparta, Konya, Sivas, Yozgat (10), Bolu, Çorum, Kars, Sivas (11), Ankara, Artvin, Erzincan, Erzurum (12), Ankara, Bolu, Bursa, Çorum, İzmir, Kars, Kırklareli, Konya, Kütahya, Manisa, Mersin, Tokat, Zonguldak (15).

***Cryptocephalus imperialis* Laicharting, 1781**

Material examined: Aksu, Koçular village, 1300 m, 08.07.1997, ♀, Aksu, Yaka village stream, 1350 m, 13.07.1998, 2 ♂♂.

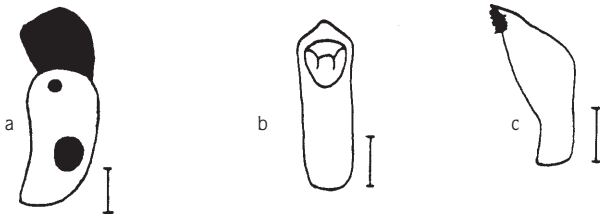


Figure 10. *Cryptocephalus bipunctatus* (Linnaeus): a) Pronotum and elytra, laterodorsal view (Scale: 1mm); b-c: Aedeagus, b) dorsal view c) lateral view (Scale: 0.5mm).

General distribution: South Europe (21, 24), Middle Europe (18), Albania, Bulgaria, Venezuela, Yugoslavia, Greece (23), Asia, North and South Europe, Turkey (19), Caucasus, Europe, Iran, Turkey (15).

Distribution in Turkey: Amasya (6), Erzurum (12), Konya, Uşak (15).

Cryptocephalus moraei (Linnaeus, 1758)

Material examined: Aksu, Anamas plateau, 1450 m, 14.06.1996, 4 ♂♂, 7 ♀♀, between Yaka village and Yenişarbademli, 1600 m, 29.05.1997, 2 ♂♂, 3 ♀♀, 14.06.1997, 12 ♂♂, 17 ♀♀, 20.06.1998, 2 ♂♂, 3 ♀♀, 04.07.1998, 4 ♂♂, 4 ♀♀.

General distribution: West Siberia, Middle Europe (24), Middle Europe (18), Albania, Bulgaria, Poland, Crimea, Venezuela, Yugoslavia (23), Europe, Caucasus, Central Asia (19), Caucasus, Europe, Iran, Jordan, Siberia, Ukraine, Turkey (15).

Distribution in Turkey: İçel (4), İzmir (27, 28), Samsun (7), Bursa (9), Ankara, Sivas (10), Bilecik, Bolu, Bursa, Giresun, İzmit, Kastamonu, Kars (11), Diyarbakır, Erzincan, Erzurum (12), Adana, Adapazarı, Afyon, Ankara, Artvin, Bitlis, Bolu, Bursa, Giresun, Gümüşhane, Hakkari, İzmir, Kars, Kastamonu, Kırklareli, Konya, Mersin, Muğla, Rize, Samsun, Trabzon, Tunceli, Zonguldak (15).

Cryptocephalus octocasmus Bedel, 1891

Material examined: Aksu, Anamas plateau, 1450 m, 29.06.1996, 6 ♂♂, 14 ♀♀, 19.07.1997, 12 ♂♂, 18 ♀♀, 11.07.1998, 3 ♂♂, 4 ♀♀, Yenişarbademli, vicinity of Pınargözü stream, 1150 m, 25.07.1998, ♂, ♀.

General distribution: West Siberia, Middle and South Europe (24, 18), Albania, Bulgaria, Crimea, Poland, Venezuela, Yugoslavia, Greece (23), West Siberia,

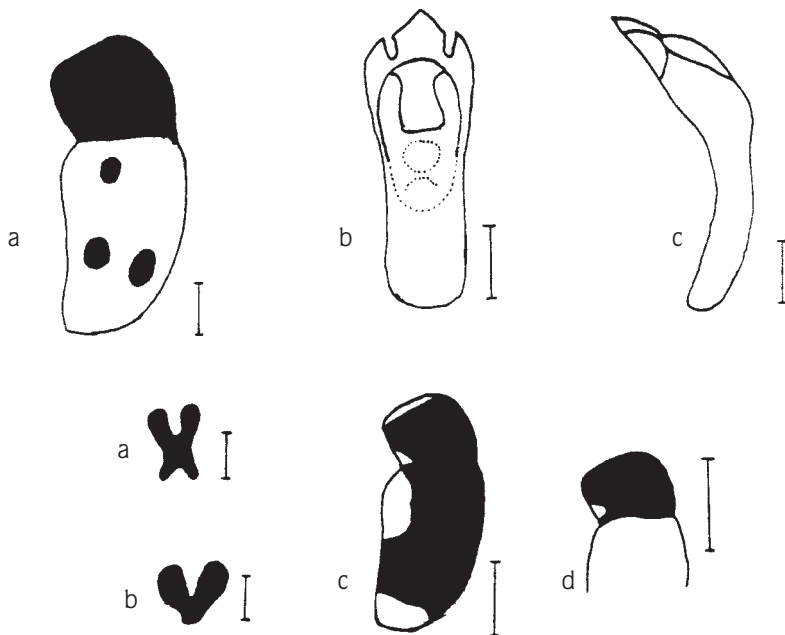


Figure 11. *Cryptocephalus imperialis* Laicharting: a) Pronotum and elytra, laterodorsal view (Scale: 1mm); b-c: Aedeagus, b) dorsal view c) lateral view (Scale: 0.5mm).

Figure 12. *Cryptocephalus moraei* (Linnaeus): a) The design on head, in male (Scale: 1mm); b) The design on head, in female (Scale: 1mm); c) Pronotum and elytra in female, laterodorsal view (Scale: 1mm); d) Pronotum and elytra in male, laterodorsal view (Scale: 1mm); e-f: Aedeagus, e) dorsal view f) lateral view (Scale: 0.5mm).

Caucasus, Kazakhstan, Kirghizstan, Northwest China, Uzbekistan, European parts of Russia (2), Europe, Caucasus, Central Asia (19, 15).

Distribution in Turkey: Ankara, Tokat (7), İzmit (6), Ankara, Kayseri, Sivas (10), Bolu, Eskişehir, Isparta (11), Bayburt, Bilecik, Erzurum, Tekirdağ (12), Adana, Adapazarı, Antalya, Bolu, Bursa, Çankırı, Diyarbakır, Eskişehir, Gümüşhane, Kırklareli, Manisa, Mardin, Muş, Nevşehir, Niğde, Samsun, Sivas, Tekirdağ, Tunceli, Zonguldak (15).

***Cryptocephalus (Burlinius) pygmaeus* Fabricius, 1792**

Material examined: Aksu, Anamas plateau, 1450 m, 30.07.1998, 2 ♂.

General distribution: Germany, Spain (21), Middle Europe (18), Bulgaria, Poland, Venezuela (23), Asia, Europe, Bulgaria, Caucasus (19).

Distribution in Turkey: İzmit (11), Afyon (12).

***Cryptocephalus (Burlinius) connexus* Olivier, 1808**

Material examined: Aksu, Anamas plateau, 1450 m, 27.07.1996, 11 ♂, 28 ♀, Aksu, Koçular village, 1300 m, 12.07.1997, 8 ♂, 9 ♀, Aksu, Yaka village, 1325 m, 08.07.1998, 11 ♂, 23 ♀, 16.07.1998, 7 ♂, 5 ♀, between Yenişarbademli and Yaka village, 1600 m, 24.07.1998, 10 ♂, 19 ♀.

General distribution: Austria, Hungary, Romania, Russia (21, 24), Middle Europe (18), Albania, Bulgaria, Crimea, Poland, Venezuela, Yugoslavia (23), Mediterranean countries, West Turkmenia, East Europe, Caucasus, Kazakhstan, Central Europe, European parts of Russia (2), Bulgaria, Caucasus, Turkey (19), Caucasus, Central Asia, Iran, Israel, Jordan, Southern Europe, Ukraine, Turkey (15).

Distribution in Turkey: İzmir (28), Ankara, Kayseri, Sivas, Yozgat (10), Ankara, Bilecik, Bursa, Giresun Isparta, Manisa (11), Artvin, Bilecik, Erzurum (12), Adapazarı, Adıyaman, Bolu, Bursa, Giresun, Gümüşhane, Hatay, Isparta, İzmir, Kastamonu, Kırşehir, Ordu, Samsun, Siirt, Tekirdağ, Trabzon, Zonguldak (15).

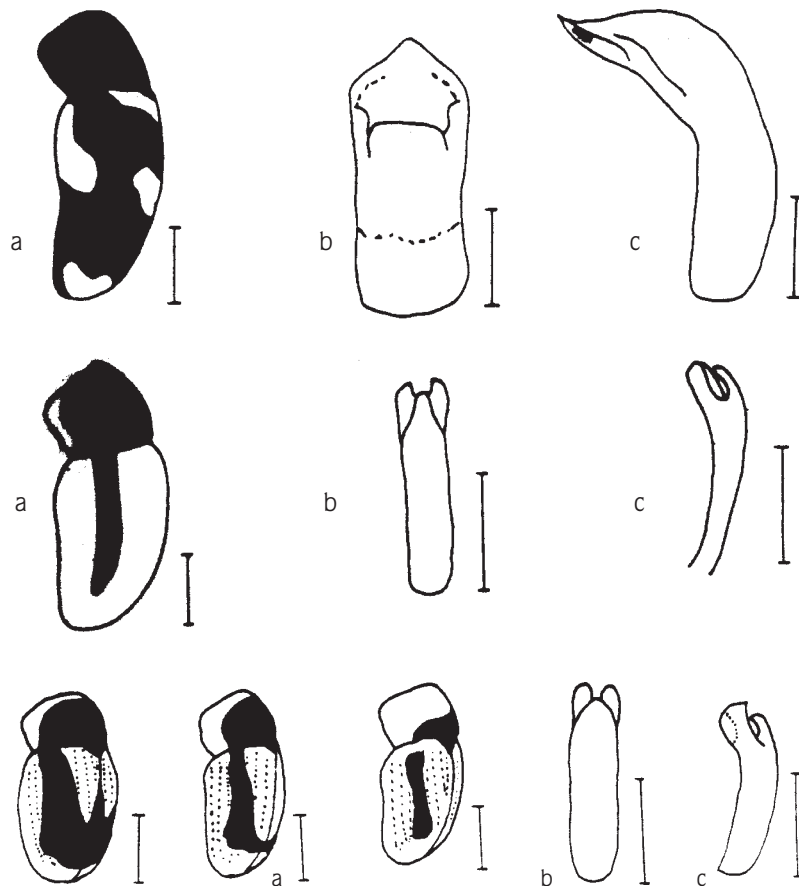


Figure 13. *Cryptocephalus octocasmus* Bedel: a) Pronotum and elytra, laterodorsal view (Scale: 1mm); b-c: Aedeagus, b) dorsal view c) lateral view (Scale: 0.5mm).

Figure 14. *Cryptocephalus (Burlinius) pygmaeus* Fabricius: a) Pronotum and elytra, laterodorsal view (Scale: 1mm); b-c: Aedeagus, b) dorsal view c) lateral view (Scale: 0.5mm).

Figure 15. *Cryptocephalus (Burlinius) connexus* Olivier: a) The designs of pronotum and elytra, laterodorsal view (Scale: 1mm); b-c: Aedeagus, b) dorsal view c) lateral view (Scale: 0.5mm).

***Cryptocephalus moehringi* Weise, 1884**

Material examined: Sütçüler, Ayvalpınar, 1200 m, 02.05.1998, ♀, 16.05.1998, 2 ♀♀.

General distribution: Turkey, Greece (4, 24, 23), Albania, Cyprus, Greece, Jordan, Syria, Turkey (15).

Distribution in Turkey: Amasya (21, 5), Bolu (7), Ankara, Amasya, Bilecik, Çorum (10), Ankara, Bilecik, Bolu, Bursa, Çankırı, Çorum, Eskişehir (15).

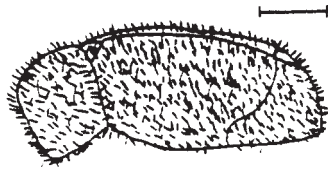


Figure 16. *Cryptocephalus moehringi* Weise: Hairs on pronotum and elytra (Scale: 1mm).

***Cryptocephalus biledjekensis* Pic, 1909**

Material examined: Sütçüler, Tota Mountain, 1700 m, 27.06.1998, ♂, 4 ♀♀, Aksu, Yaka village stream, 1330 m, 23.05.1998, ♂, 2 ♀♀, 03.06.1998, ♂, ♀, 06.06.1998, ♂, 2 ♀♀, 11.07.1998, 3 ♀♀, 13.07.1998, 6 ♂♂, 7 ♀♀.

General distribution: Turkey (21, 24), Bulgaria (19), Bulgaria, Turkey (15).

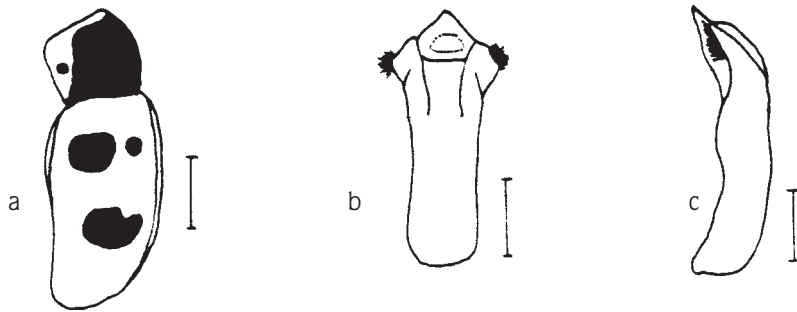


Figure 17. *Cryptocephalus biledjekensis* Pic: a) Pronotum and elytra, laterodorsal view (Scale: 1mm); b-c: Aedeagus, b) dorsal view c) lateral view (Scale: 0.5mm).

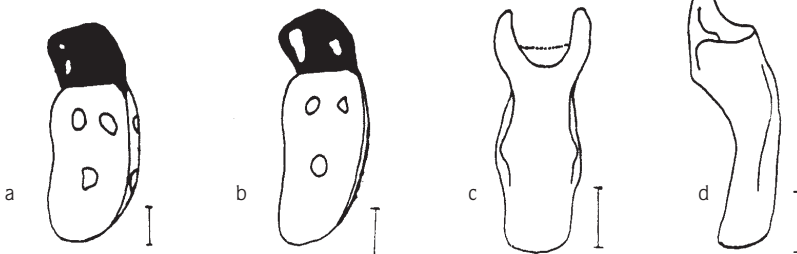


Figure 18. *Cryptocephalus (Cryptodontus) prusias* Suffrian: a) Pronotum and elytra in male, laterodorsal view (Scale: 1mm); b) Pronotum and elytra in female, laterodorsal view (Scale: 1mm); c-d: Aedeagus, c) dorsal view d) lateral view (Scale: 0.5mm).

Distribution in Turkey: Bilecik, Gümüşhane (29), Ankara, Bilecik, İzmir, Konya, Siirt (15).

***Cryptocephalus (Cryptodontus) prusias* Suffrian, 1853**

Material examined: Aksu, Yaka village, 1325 m, 30.05.1998, 2 ♀♀, 06.06.1998, 2 ♂♂.

General distribution: Turkey (21, 24), Bulgaria, Greece (23), Azerbaijan, Bulgaria, Armenia, Yugoslavia, Turkey (29), Jordan, Syria, Turkey (15).

Distribution in Turkey: Bilecik, İstanbul, İçel (4), Amasya, Bursa (21), Amasya (5), Amasya, Gümüşhane (7), Ankara, Konya (10), Erzurum (12), Adana, Ankara, Bolu, Çankırı, Erzurum, Eskişehir, Konya, Kütahya, Mersin, Muş, Sivas (15).

***Cryptocephalus concolor* Suffrian, 1848**

Material examined: Aksu, Yaka village, 1325 m, 08.06.1996, 7 ♂♂, 5 ♀♀, 01.07.1996, 3 ♂♂, 4 ♀♀, Sütçüler, Tota Mountain, 1700 m, 27.06.1998, 5 ♂♂, 8 ♀♀, between Yenişarbademli and Yaka village, 1600 m, 11.07.1998, 9 ♂♂, 12 ♀♀.

General distribution: Caucasus, Russia, Turkey (3, 21, 24), Bulgaria, Caucasus, Turkmenia, Turkey (19), Azerbaijan, Iran, Turkmenia (30).

Distribution in Turkey: Konya (4), Ankara, Amasya, Artvin, Erzurum, Gümüşhane, İçel, Sinop, Sivas, Trabzon (7).

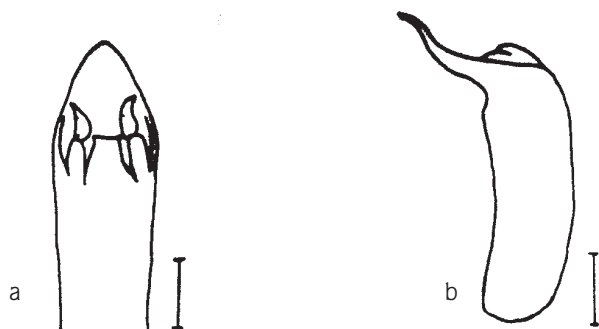


Figure 19. *Cryptocephalus concolor* Suffrian: a-b: Aedeagus, a) dorsal view b) lateral view (Scale: 0.5mm).

Cryptocephalus flavipes Fabricius, 1781

Material examined: Aksu, Anamas plateau, 1450 m, 09.06.1996, ♀, Aksu, Yaka village, 1325 m, 24.05.1998, 13 ♂♂, 27 ♀♀, Aksu, Katip village, 1350 m, 25.05.1998, 12 ♂♂, 18 ♀♀, Aksu, Terziler village, 1330 m, 30.05.1998, 8 ♂♂, 9 ♀♀, Sütçüler, Tota Mountain, 1700 m, 27.06.1998, 15 ♂♂, 12 ♀♀.

General distribution: Europe, Siberia, Turkey (21, 24), Middle Europe (18), Albania, Azerbaijan, Bulgaria, Armenia, Caucasus, Crimea, Poland, Turkey, Venezuela, Yugoslavia (23), Southwest Turkmenia, Caucasus, Kazakhstan, North China, Siberia, European parts of Russia (2), Europe, Caucasus, Central Europe, Greece (19), Caucasus, Central Asia, Europe, Iran, Israel, Siberia, Turkey (15).

Distribution in Turkey: Eskişehir, Mersin (4), Bolu, Bursa, Samsun, Trabzon (5), Ordu (31), İstanbul, Samsun (7), Amasya, Ankara, Çorum, Konya, Sivas, Yozgat (10), Amasya, Artvin,

Aydın, Eskişehir, Gaziantep, Kastamonu, Kars, Sinop, Tokat, Trabzon, Tunceli (11), Artvin, Erzurum (12), Amasya, Artvin, Aydın, Bolu, Bursa, Çanakkale, Erzurum, Eskişehir, Gaziantep, İstanbul, Kastamonu, Kars, Malatya, Mersin, Ordu, Samsun, Sinop, Tokat, Tunceli, Trabzon (15).

Cryptocephalus turcicus Suffrian, 1847

Material examined: Aksu, vicinity of Yaka village, 1350 m, 30.05.1998, 2 ♂♂, 4 ♀♀.

General distribution: Dalmatia, France, Corsica, Greece, Turkey (21, 24), Middle Europe (18), Albania, Bulgaria, Venezuela, Turkey, Greece, Yugoslavia (23), Europe, Bulgaria, Central Asia, Greece (19), Jordan, Southern Europe, Syria, Turkey (15).

Distribution in Turkey: Eskişehir (4), Ankara, Bursa, Trabzon (5), Bilecik (7), Ankara, Bursa, Isparta, Konya, Sivas (10), Ankara, Antalya, Burdur, Çankırı, Sivas, Trabzon (15).

The subfamily Cryptocephalinae has been reported to comprise 92 species in 3 genera in Turkey so far. A total of 21 species belonging to 2 genera were determined in the research area. The type locality of the species *P. limbatus*, *P. tessellatus orientalis*, *C. prusias*, *C. bledjekensis* and *C. turcicus* is Turkey. In the area, *C. moehringi*, *C. populi*, *C. imperialis*, *C. prusias*, *C. pygmaeus*, *C. turcicus* and *P. fimbriolatus* are less frequently distributed but the other species are fairly widespread. *C. bipunctatus*, *C. turcicus*, *P. limbatus*, *P. fimbriolatus* and *P. tessellatus orientalis* have previously been recorded from Isparta and the other species are new records for the district. Only females of *C. moehringi* and *P. fimbriolatus* were found. *C. parvulus* and *C. janthinus* were not previously collected by Turkish researchers.

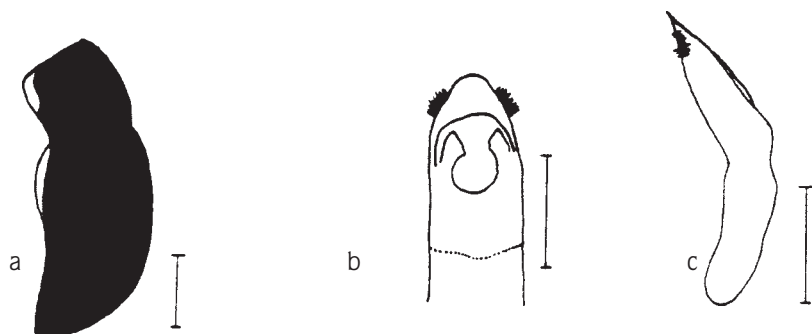


Figure 20. *Cryptocephalus flavipes* Fabricius: a) Pronotum and elytra in male, laterodorsal view (Scale: 1mm); b) Pronotum and elytra in female, laterodorsal view (Scale: 1mm); c-d: Aedeagus, c) dorsal view d) lateral view (Scale: 0.5mm).

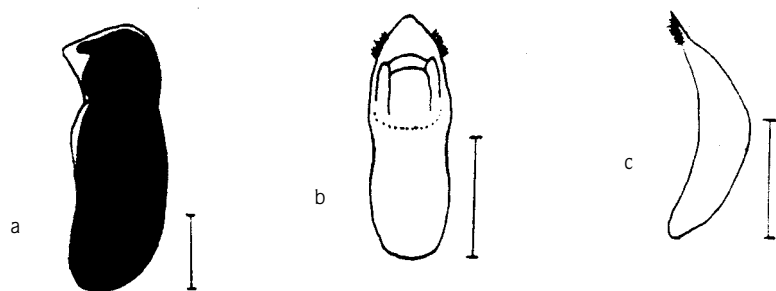


Figure 21. *Cryptocephalus turcicus* Suffrian: a) Pronotum and elytra in male, laterodorsal view (Scale: 1mm); b-c: Aedeagus. b) dorsal view c) lateral view (Scale: 0.5mm).

These two species are morphologically similar but differ in aedeagus structures and head designs. The color and structural patterns of *C. fulvus* and *C. populi* are slightly

similar and those of *C. connexus* and *C. pygmaeus* resemble each other, but they can be easily distinguished by the differences in aedeagal structures.

References

- Booth, R. G., Cox, M. L. and Madge R. B., II E Guides to Insect of Importance to Man 3. Coleoptera. Printed in the UK at The University Press, Cambridge, 384 p. 1990.
- Lopatin, I. K., Leaf-beetles (Chrysomelidae) of Middle Asia and Kazakhstan. Nauka, Leningrad, 268 p. 1977.
- Weise, J., Beitrag zur Chrysomeliden-Fauna von Amasia. Deutsch. Ent. Zeitsch., 28 (1): 157-160, 1884.
- Bodemeyer, E. V., Quer durch Klein Asien, in den Bulghar Dag; Die druck und Verlags-Aktiengesellschaft. Vormalis Dölter, Emmedingen, 169 p. 1900.
- Medvedev, L. N., A list of Chrysomelidae collected by Dr. W. Wittmer in Turkey (Coleop.). Revue Suisse De Zoologie, 77 (2): 309-319, 1970.
- Medvedev, L. N., Chrysomelidae collected by Dr. W. Wittmer in Turkey and Iran. Ent. Ges. Basel, 25 (1): 12-19, 1975.
- Tomov, V. and Gruev, B., Chrysomelidae (Col.) collected by K. M. Guichard in Turkey, Greece and Yugoslavia. Trav. Sci. Univ. Plovdiv. Bulgarica, 13 (4): 133-151, 1975.
- Tomov, V., Eine neue *Cryptocephalus*-Art (Col. Chry.) aus der Turkei. Acta Zool. Bulgarica, 5: 83-85, 1976.
- Gruev, B. and Tomov, V., Zur Kenntnis einiger in der Turkei, Jugoslaviens und Griechenlands vorkommender Arten der Familie Chrysomelidae (Col.) aus der Zoologischen Staatssammlung München. Spixiana, 2 (3): 259-267, 1979.
- Kasap, H., İç Anadolu Bölgesi Clytrinae, Cryptocephalinae, Eumolpinae, Chrysomelinae, Hispinae ve Cassidinae (Chrysomelidae, Coleoptera) Türlerinin Saptanması ve Taksonomik İncelenmesi. TÜBİTAK, Proj. No. TBAK-327 (Yayınlanmamış Rapor), 1980.
- Tomov, V., Cryptocephalinae and Galerucinae from Turkey (Col. Chry.). Fragm. Ent., Roma, 17 (2): 373-378, 1984.
- Aslan, İ. Özbek, H., The Check-List of the Subfamily Cryptocephalinae (Coleoptera, Chrysomelidae) in Turkey. Atatürk Üniv. Zir. Fak. Der., 28 (2): 235-255, 1997.
- Aslan, İ. Özbek, H., New records of the subfamilies Cassidinae and Cryptocephalinae (Coleoptera, Chrysomelidae) for the Turkish fauna. Zoology in the Middle East, 14: 87-91, 1997.
- Aslan, İ. Özbek, H., New records of the subfamily Cryptocephalinae (Coleoptera, Chrysomelidae) for the Turkish fauna. Zoology in the Middle East, 16: 85-88, 1998.
- Sassi, D. and Kismali, Ş., The Cryptocephalinae of Turkey, with Informations on their Distribution and Ecology. Mem. Soc. Ent. Ital., 78 (1): 71-129, 2000.
- Gök, A. and Ayvaz, Y., New records for the Turkish Chrysomelidae (Coleoptera) Fauna. Zoology in the Middle East, 20: 95-97, 2000.
- Portevin, G., Historie Naturelle des Coléoptères de France. Tome III. Polyphaga: Heteromera, Phytophaga. Paul le Chevalier et Fils, Paris, 374 p. 1934.
- Mohr, K. H., Chrysomelidae in: H. Freude, K. Harde, G. A. Lohse, Die Käfer Mitteleuropas. Krefeld, Vol. IX: 95-299, 1966.
- Gruev, B. and Tomov, V., Fauna Bulgarica 13. Coleoptera, Chrysomelidae, Part I, Orsodacninae, Zeugophorinae, Donaciinae, Criocerinae, Clytrinae, Cyprtocephalinae, Lamprosomatinae, Eumolpinae. in Aedibus Academie Scientiarum Bulgaricae, Sofia, 220 p, 1984.
- Warchalowski, A., Chrysomelidae Stenokowate (Insecta: Coleoptera) Część II (Podrodziny: Clytrinae i Cryptocephalinae). Fauna Polski, Tom. 13. Warszawa, 347 p. 1991.
- Clavareau, H., In Junk, W.: Coleopterorum Catalogus 24. Chrysomelidae, pars 53: Clytrinae, Cryptocephalinae. 1913.
- Burlini, M. Revisione delle specie italiane e della maggior parte delle specie europee del genere *Pachybrachis* Chev. (Coleoptera, Chrysomelidae). Mem. Soc. Ent. Ital., 47, 11-116, 1968.

23. Warchalowski, A., Biogeographische Studien über die Blatkäfer der Pontischen Provinz (Coleoptera, Chrysomelidae), Bulletin Ent. de Pologne, Tom. 46: 29-94, 1976.
24. Winkler, A., Catalogus Coleopterorum regionis Palearcticae Albert Winkler XVIII, Dittesgrasse II. Vienna, 1698 p, 1932.
25. Sahlberg, J., Coleoptera mediterranea orientalia, quae in Aegypto, Palaestina, Syria, Caramania atque in Anatolia occidentali anno 1904. Öfversigt af Finska Vetenskaps-Societeten's Förhandlingar 55. A (19) 1-281, 1913.
26. Samedov, N. G. and Mirzoeva, N. B., A review of the leaf-beetle fauna (Coleoptera, Chrysomelidae) of the Tugai Forests of Azerbaijan. Ent. Rev., 65 (1): 110-122, 1986.
27. Kerville, H. G., Voyage Zoologique d'Henri Gadeam de Kerville Asie-Mineure (Auril-Mai 1912). Tome I: Paris Paul Lechevalier. 106-108, 1939.
28. Gül-Zümreoğlu, S., İzmir Bölge Zirai Mücadele Araştırma Enstitüsü Böcek ve Genel Zararlılar Kataloğu. 1928-1969 (I. Kısım). T.C. Tarım Bakanlığı, Zirai Mücadele ve Zirai Karantina Genel Müdürlüğü Yayınları. İzmir, 48-52, 1972.
29. Tomov, V., Über die Nomenklatur zweier *Cryptocephalus*-Arten (Col. Chry.) Acta Zool. Bulgarica. 11: 60-64, 1978.
30. Lopatin, I. K., Leaf-beetles (Coleoptera, Chrysomelidae) of Iran, results of the Czechoslovak-Iranian Expeditions, 1973-1977. III. Ent. Rev., 63 (1) : 63-75, 1984.
31. Tuatay, N., Kalkandelen, A. ve Aysev, N., Nebat Koruma Müzesi Böcek Kataloğu. T.C. Tarım Bakanlığı. Zirai Müc. ve Zirai Karantina Gen. Müd. Yay., Ankara, 55-57, 1972.