

**CHOROTYPE IDENTIFICATION
FOR TURKISH CHRYSOMELOIDEA (COLEOPTERA)
PART I – CHRYSOMELIDAE: HISPINAE AND CASSIDINAE**

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ABSTRACT: The paper gives chorotype identifications for Turkish Hispinae and Cassidinae (Coleoptera: Chrysomelidae). In association with this, some zoogeographical remarks are also given in the text.

KEY WORDS: Hispinae, Cassidinae, Chrysomelidae, Fauna, Zoogeography, Turkey.

Works on Turkish leaf beetles began in late 19th century. Especially since the last century, they were increased as chiefly faunistic and taxonomic works. Recently, they continue with an increased speed.

Clearly, there is no any work on zoogeographical regionalisation of Turkish Chrysomeloidea related the whole territories of Turkey or regions of Turkey (see below for regions in Turkey) at the present.

As known, Turkey that has continental properties, is origin of many taxons and is a refugium (an area where conditions have enabled a species or a community of species to survive after extinction in surrounding areas) for effected living creatures from geological and climatical changes has more biological importance than any land in the World. As seen the whole World, an incredible variations have also been seen among the insects which are the most influenced living creatures from these changes occurred in the past in Turkey. For the present, fauna of Turkey completely has not been investigated yet. Since Turkey appears a continental property changeable in very short distances in terms of climatical features and field structures, besides the number of studies are not enough.

Hence, a series work is planned that is aim to expose zoogeographical regionalisations of Turkish Chrysomeloidea fauna. The present study is attempted as the first step of this aim.

Turkey is divided into seven regional parts commonly. These are;

Marmara Region (North-West Turkey)

A. European Turkey (=Thracia)

1. Ergene Part (including Edirne and Tekirdağ provinces)
2. Istranca Part (including Kırklareli province)
3. Çatalca Part (including İstanbul province)

B. Asian Turkey (=North-West Anatolia)

1. Kocaeli Part (including Kocaeli and Sakarya provinces)
2. South Marmara Part (including Bilecik, Yalova, Bursa, Balıkesir and Çanakkale provinces)

Aegean Region (West Turkey)

1. Aegean Part (including Manisa, İzmir, Aydın, Muğla and Denizli provinces)

2. Central-West Anatolia Part (including Kütahya, Uşak and Afyon provinces)

Mediterranean Region (South and Sout-West Anatolia)

1. Antalya Part [= Western Mediterranean] (including Burdur, Isparta and Antalya provinces)
2. Adana Part [=Eastern Mediterranean] (including İçel, Adana, Osmaniye, Hatay, Kahramanmaraş and Kilis)

Central Anatolian Region

1. Upper Sakarya Part (including Eskişehir and Ankara provinces)
2. Konya Part (including Konya, Aksaray and Karaman provinces)
3. Central Kızılırmak Part (including Çankırı, Kırıkkale, Yozgat, Kırşehir, Nevşehir, Niğde, Kayseri and Sivas provinces)

Black Sea Region (North Anatolia)

1. Western Black Sea Part (including Düzce, Bolu, Karabük, Zonguldak, Bartın, Kastamonu and Sinop provinces)
2. Central Black Sea Part (including Samsun, Çorum, Amasya, Tokat and Ordu provinces)
3. Eastern Black Sea Part (including Giresun, Trabzon, Gümüşhane, Bayburt, Rize and Artvin provinces)

Eastern Anatolian Region

1. Erzurum-Kars Part (including Ardahan, Kars, Erzurum and Iğdır provinces)
2. Upper Fırat Part (including Erzincan, Tunceli, Elazığ, Malatya, Bingöl and Bitlis provinces)
3. Upper Murat-Van Part (including Ağrı, Muş and Van provinces)
4. Hakkari Part (including Şırnak and Hakkari provinces)

South-Eastern Anatolian Region

1. Central Fırat Part (including Gaziantep, Adıyaman and Şanlıurfa provinces)
2. Dicle Part (including Diyarbakır, Mardin, Batman and Siirt provinces)

ARRANGEMENT OF INFORMATION

Information in the present text is given in the following order:

The subfamily, genus, species and subspecies names are given simply.

For each genus, species and subspecies are presented with the author name and date of description.

The data, **Range**, **Records in Turkey**, **Remarks** and **Chorotype** under the title for each taxon is given.

Range. In these parts, the whole distribution areas in world are provided for each taxon as in Löbl & Smetana (2010) (see the cited reference for the abbreviations).

Records in Turkey. In these parts, the whole distribution areas in Turkey are provided for each taxon as in Ekiz et al. (2013) (see the cited reference for the abbreviations).

Remarks. In these parts, regional and general distribution in Turkey are given chiefly.

Chorotype. The present zoogeographical characterization.

The present zoogeographical characterization is based on the chorotype classification of Anatolian fauna, recently proposed by Vigna Taglianti et al. (1999). In the text, as far as possible one chorotype description can be identified for each taxon. But this kind of description can not be possible for some taxa, so two or more chorotypes are used for them.

With this purpose, Löbl & Smetana (2010) for the range in the world, Ekiz et al. (2013) for the provincial distribution in Turkey and Özdikmen et al. (2014) for the fauna of Turkey are used chiefly.

According to Özdikmen et al. (2014), Turkish Hispinae comprises of 2 species of 2 genera and Turkish Cassidinae includes 51 species of 6 genera.

Subfamily HISPINAE

Genus *Hispa* Linnaeus, 1767

H. atra Linnaeus, 1767

Range: E: AL AU BE BH BU BY CR CT CZ DE FR GE GR IT MC MD NL PL PT RO SK SL SP SV SZ TR UK YU **A:** AF ES HEB HEI IN KI KZ MG TR WS XIN **Records in Turkey:** TR-A: AKS, ANK, ANT, ART, BAL, BOL, BRS, CAN, DEN, DIY, EZU, GAZ, HAK, ISP, IST, IZM, KAR, KAY, KOC, KON, KUT, MAL, MAN, MAR, NIG, ORD, SAK, SII, TOK, YAL – TR-E: IST **Remarks:** The species is widely distributed in Turkey. It has been recorded from all Turkish regions. But it has not been recorded only from Ergene Part and Istranca Part for European Turkey in Marmara Region, Adana Part for Mediterranean Region and Upper Murat-Van Part for Eastern Anatolian Region until now. **Chorotype:** Sibero-European

Genus *Dicladispa* Gestro, 1897

D. testacea Linnaeus, 1767

Range: E: AL BU CR FR GR IT PT SP SZ TR YU **N:** AG MO TU **A:** SY TR **Records in Turkey:** TR-A: ADA, ANT, AYD, BRS, GIR, HAT, ISP, IST, IZM, KAS, MAN, MER, MUG, OSM, SAK, SIV, TRA, ZON – TR-E: IST **Remarks:** The species probably is rather widely distributed in Turkey. It has been recorded from 5 Turkish regions. But it has not been recorded from Eastern Anatolian Region and South-Eastern Anatolian Region until now. **Chorotype:** Mediterranean

Subfamily CASSIDINAE

Genus *Cassida* Linnaeus, 1758

C. algerica Lucas, 1849

Range: E: AL FR GR IT SP **N:** AG TU **A:** TR **Records in Turkey:** TR-A: ORD, VAN **Remarks:** The species should be distributed wider than known in Turkey according to known records. Because It has been recorded only from 2 Turkish regions as Black Sea Region and Eastern Anatolian Region. It, however, should be distributed at least W and S Turkey due to it has Mediterranean chorotype. **Chorotype:** Mediterranean

C. atrata Fabricius, 1787

Range: E: AL AU BH BU CR CZ FR GE GR HU IT LA MC MD PL RO SK SL TR UK YU **A:** TR **Records in Turkey:** TR-A: ANK, BOL, BRS, COR, ESK, ISP, MER, NIG – TR-E: EDI **Remarks:** The species probably is rather widely distributed in Turkey. It has been recorded only from 4 Turkish regions. But it has not been recorded from Aegean Region, Eastern Anatolian Region and South-Eastern Anatolian Region until now. **Chorotype:** C and E-European

C. azurea Fabricius, 1801

Range: E: AU BE BU CR CZ FR GE HU IT PL RO SK SP SZ UK **N:** AG **A:** ES KZ TR WS **Records in Turkey:** TR-A **Remarks:** Provincial distribution of the species is unknown. **Chorotype:** Palearctic or Sibero-European

C. bella Faldermann, 1837

Range: E: AR GG ST **A:** TR **Records in Turkey:** TR-A: ART, DUZ, IZM, KAS, KRB, MER, SAK **Remarks:** The species is widely distributed in N Turkey. It has been recorded from 4 Turkish regions. But it has not been recorded only from Central Anatolian Region, Eastern Anatolian Region and South-Eastern Anatolian Region until now. **Chorotype:** SW-Asiatic (Anatolo-Caucasian)

C. berolinensis Suffrian, 1844

Range: E: AU BU CT CZ GE HU PL SK SV UK **A:** ES HEB KI KZ MG NMO SHX TR WS

XIN Records in Turkey: TR-A: BIL **Remarks:** The species should be distributed also at least in European Turkey. Because, it has been recorded only from 1 Turkish region as Asian Turkey in Marmara Region until now. **Chorotype:** Sibero-European

***C. brevis* Weise, 1884**

Range: E: AR GR TR A: AF IN IQ IS LE SY TM TR **Records in Turkey:** TR-A: ADI, AFY, AMA, ANT, ISP, KAS, KUT, MER, MUS, SII **Remarks:** The species probably is rather widely distributed in Turkey. It has been recorded from 5 Turkish regions. But it has not been recorded only from Central Anatolian Region and Marmara Region until now. **Chorotype:** Turano-European

***C. canaliculata* Laicharting, 1781**

Range: E: AU BH BU CR CZ FR GE HU IT MD PL RO SK SL SZ UK YU A: KZ TR **Records in Turkey:** TR-A **Remarks:** Provincial distribution of the species is unknown. **Chorotype:** European or C, S, E-European

***C. denticollis* Suffrian, 1844**

Range: E: AL AU BE BH BU BY CR CZ DE EN FI FR GB GE GR HU IT LA LT MC MD NL NR NT PL PT RO SK SL SP SV SZ UK YU A: ES KZ MG WS **XIN Records in Turkey:** TR-A: KON **Remarks:** The species has been known only from Central Anatolian Region in Turkey. **Chorotype:** Sibero-European

***C. elongata* Weise, 1893**

Range: E: BU ST UK A: KZ **Records in Turkey:** TR-A: KON **Remarks:** The species has been known only from Central Anatolian Region in Turkey. **Chorotype:** E-European

***C. fausti* Spaeth & Reitter, 1926**

Range: E: BU MC ST UK A: TR **Records in Turkey:** TR-A: ADA, AFY, ANK, BOL, ISP, IZM, KAR, KAS, KON, KRB, NEV, NIG, SAM – TR-E: EDI **Remarks:** The species probably is rather widely distributed in Turkey. It has been recorded from 6 Turkish regions. But it has not been recorded only from South-Eastern Anatolian Region until now. **Chorotype:** E-European

***C. ferruginea* Goeze, 1777**

Range: E: AU BH BU CR CZ EN FR GE GR HU IT LA PL RO SK SL ST SV SZ UK YU N: AG **Records in Turkey:** TR-A: SAK (Şen & Gök, 2013) **Remarks:** The species has been known only from Marmara Region in Turkey. **Chorotype:** Europeo-Mediterranean

***C. flaveola* Thunberg, 1794**

Range: E: AL AU BE BH BU BY CR CZ DE EN FI FR GB GE GR HU IT LA LT MC MD NL NR PL RO SK SL SP SV SZ UK YU N: AG A: FE HEI **NAR Records in Turkey:** TR-A: ANK, EZU **Remarks:** The species has been recorded only from 2 Turkish regions as Central Anatolian Region and Eastern Anatolian Region now. **Chorotype:** Holarctic

***C. hablitziae* Motschulsky, 1838**

Range: E: AR GG ST A: TR **Records in Turkey:** TR-A: BOL, IST, TRA, ZON **Remarks:** The species is widely distributed only in N Turkey. It has been recorded only from 2 Turkish regions as Black Sea Region and Marmara Region until now. **Chorotype:** SW-Asiatic

***C. hemisphaerica* Herbst, 1799**

Range: E: AU BE BH BU CR CZ DE EN FI FR GB GE GR HU IT LA LT MR NL NR NT PL PT RO SK SL SP SV SZ UK YU N: AG CI MO TU A: ES TR **Records in Turkey:** TR-A **Remarks:** Provincial distribution of the species is unknown. **Chorotype:** Europeo-Mediterranean or Sibero-European + N-Africa

***C. inquinata* Brullé, 1832**

Range: E: AB AL AR AU BH BU CR CZ FR GG GR HU IT MC PT RO SK SL SP ST TR YU N: AG MO TU A: IS LE SY TM TR **Records in Turkey:** TR-A: BAL, BRS, CAN, GIR, IZM,

MAN, MUG, SAM, TRA – TR-E: KRK, TEK, EDI (Ekiz et al., 2013; pers. comm., 2013)
Remarks: The species is rather widely distributed only in N and W Turkey. It has been recorded only from 3 Turkish regions as Aegean Region, Black Sea Region and Marmara Region until now. **Chorotype:** Turano-Europeo-Mediterranean

***C. lineola* Creutzer, 1759**

Range: E: AU BH BU CZ FR HU LA PL RO SK ST SZ UK A: CE ES FE JA KI KZ MG NC NE NO SC SE ST SW UZ WS **Records in Turkey:** TR-A: KRS **Remarks:** The species has been recorded only from Eastern Anatolian Region in Turkey until now. **Chorotype:** Asiatic-European

***C. linnavuorii* Borowiec, 1986**

Range: E: A: IQ LE TR **Records in Turkey:** TR-A: MAR **Remarks:** The species has been recorded only from South-Eastern Anatolian Region in Turkey until now. **Chorotype:** E-Mediterranean (Palaestino-Taurian) or SW-Asiatic

***C. margaritacea* Schaller, 1783**

Range: E: AB AL AU BE BH BU CR CZ DE FR GB GE GR HU IT LA LT MC NL PL RO SK SL SP SZ UK YU N: AG A: SY TR **Records in Turkey:** TR-A: ADA, ART, BOL, DIY, KAR, KAY, MER, TRA **Remarks:** The species probably is rather widely distributed in Turkey. It has been recorded from 4 Turkish regions. But it has not been recorded from Aegean Region, Eastern Anatolian Region and Marmara Region until now. **Chorotype:** Europeo-Mediterranean

***C. murraea* Linnaeus, 1767**

***C. m. murraea* Linnaeus, 1767**

Range: E: AL AU BE BH BU CR CZ DE EN FI FR GB GE GR HU IT LA LT MC NL PL RO SK SL SV SZ TR UK YU A: ES FE KZ MG TR WS XIN **Records in Turkey:** TR-A: BAR, BOL, DUZ, GIR, KAS, KRB, ORD, RIZ, SAK, SIN, TRA – TR-E: EDI, TEK **Remarks:** The subspecies is widely distributed only in N Turkey. It has been recorded only from 2 Turkish regions as Black Sea Region and Marmara Region until now. **Chorotype:** Sibero-European

***C. nebulosa* Linnaeus, 1758**

Range: E: AL AU BE BH BU CR CZ DE EN FI FR GB GE GR HU IT LA LT MC MD NL NR NT PL RO SK SP SV SZ TR UK YU A: CE ES FE KZ MG NC NE NO NW SC SW TD TR UZ WS **Records in Turkey:** TR-A: ANK, ART, BAL, BRS, CAN, DUZ, GIR, GUM, IZM, KAS, KON, SAK, TOK, YOZ **Remarks:** The species is rather widely distributed only in N and W Turkey. It has been recorded only from 4 Turkish regions. But it has not been recorded from Mediterranean Region, South-Eastern Anatolian Region and Eastern Anatolian Region until now. **Chorotype:** Asiatic-European

***C. nobilis* Linnaeus, 1758**

Range: E: AL AU BH BU CR CZ DE EN FI FR GB GE GR HU IT LA LT MD NL NR NT PL RO SK SL SP SV SZ TR UK YU N: AG A: ES HEI IS JA KI KZ MG NC SC TR UZ WS XIN **Records in Turkey:** TR-A: AMA, ANK, ANT, AYD, BAL, CAN, COR, DEN, EZU, ISP, IZM, KAS, KOC, KON, MER, NIG, SAK, SAM, SIN, TOK **Remarks:** The species is widely distributed in Turkey. It has been recorded from 6 Turkish regions. But it has not been recorded only from South-Eastern Anatolian Region until now. **Chorotype:** Palearctic

***C. palaestina* Reiche, 1858**

Range: E: AR GG A: AF CY IN IQ IS LE KI KZ SY TD TM TR **Records in Turkey:** TR-A: ADA, BRS, DIY, HAT, IZM, KIL, MER **Remarks:** The species is rather widely distributed only in S and W Turkey. Its distribution range in Turkey, however, is very likely wider than known. It has been recorded only from 4 Turkish regions. But it has not been recorded from Black Sea Region, Central Anatolian Region and Eastern Anatolian Region until now. **Chorotype:** Turanian or Turanian + Centralasiatic

***C. pannonica* Suffrian, 1844**

Range: E: AU BH BU CZ FR GE GR HU LA MC PL RO SK UK YU **A:** IS LE KI KZ SY TR UZ WS XIN **Records in Turkey:** TR-A: ADA, ANK, ANT, BAL, BIL, BRS, COR, DUZ, GAZ, HAK, HAT, IZM, KAS, KON, KRB, KRS, MER, MUG, MUS, NIG, OSM, SAM, TUN (Ekiz et al., 2013; pers. comm., 2013) **Remarks:** The species is widely distributed in Turkey. It has been recorded from all Turkish regions. But it has not been recorded only from Kocaeli Part of Asian Turkey and all European Turkey in Marmara Region, Central-West Anatolia Part in Aegean Region, Eastern Black Sea Part in Black Sea Region and Dicle Part in South-Eastern Anatolian Region until now. **Chorotype:** Sibero-European

***C. parvula* Boheman, 1854**

Range: E: BU CT GG RO ST UK **A:** CE CP FE KI KZ MG NO NW TM UZ XIN **Records in Turkey:** TR-A: ANT, KON **Remarks:** The species has been recorded only from 2 Turkish regions as Central Anatolian Region and Mediterranean Region in Turkey until now. **Chorotype:** Asiatic-European

***C. persica* Spaeth, 1926**

Range: A: IN IQ **Records in Turkey:** TR-A **Remarks:** Provincial distribution of the species is unknown. It, however, must be distributed very likely only in SE Turkey. **Chorotype:** SW-Asiatic (Irano-Anatolian)

***C. prasina* Illiger, 1798**

Range: E: AL AU BE BH BU CR CZ DE FI FR GE GR HU IT LA LT MC NL NT PL RO SK SL SP SV ST SZ TR UK YU **A:** ES JIL KZ TR WS XIN **Records in Turkey:** TR-A: ANT, AYD, BAL, BAR, BIL, BOL, DEN, DUZ, GAZ, GIR, HAT, IZM, KAH, KAR, KAY, KIL, KON, KRB, MAN, MER, SAK, TOK, TUN, ZON - TR-E: KRK **Remarks:** The species is widely distributed in Turkey. It has been recorded from all Turkish regions. But it has not been recorded only from Ergene Part and Çatalca Part of European Turkey in Marmara Region, Central-West Anatolia Part in Aegean Region, Upper Sakarya Part in Central Anatolian Region, Erzurum-Kars Part, Upper Murat-Van Part and Hakkari Part in Eastern Anatolian Region and Dicle Part in South-Eastern Anatolian Region until now. **Chorotype:** Sibero-European

***C. pusilla* Wlthl, 1835**

Range: E: AL CR FR GR IT PT SP SZ **N:** AG MO TU **Records in Turkey:** TR-A: IZM **Remarks:** The species has been recorded only from Aegean Region in Turkey until now. **Chorotype:** Mediterranean

***C. reitteri* Weise, 1892**

Range: E: AR **A:** TR **Records in Turkey:** TR-A: ANK **Remarks:** The species has been recorded only from Central Anatolian Region in Turkey until now. **Chorotype:** SW-Asiatic (Anatolo-Caucasian)

C. rubiginosa* Müller, 1776**C. r. rubiginosa* Müller, 1776**

Range: E: AL AU BH BU CR CZ DE EN FI FR GB GE GR HU IT LA LT MC NL NR NT PL RO SK SL SP SV SZ TR UK YU **N:** AG MO **A:** CE CP ES FE IS JA KZ NC NO SC SE TR WS **NAR Records in Turkey:** TR-A: ADA, AFY, ANK, ANT, BAL, BOL, BRS, COR, ESK, EZU, GIR, ISP, IZM, KAS, KON, KRB, KUT, MAN, MER, SAK, SAM, SIV, ZON - TR-E: EDI, KRK, TEK **Remarks:** The subspecies is widely distributed in Turkey. It has been recorded from 6 Turkish regions. But it has not been recorded only from South-Eastern Anatolian Region until now. **Chorotype:** Holarctic

***C. rufovirens* Suffrian, 1844**

Range: E: AU BE BH BU CR CZ FR GE GG HU PL RO SK SZ UK **A:** TR **Records in Turkey:** TR-A: ANK, ANT, ISP, KRS **Remarks:** The species is probably wider distributed than the known in Turkey. It has been recorded only from 3 Turkish regions as Central Anatolian Region, Eastern Anatolian Region and Mediterranean Region until now.

Chorotype: C and E-European

***C. sanguinolenta* Müller, 1776**

Range: E: AL AR AU BE BH BU CR CZ DE EN FI FR GB GE GR HU IT LA LT MC NL NR NT PL RO SK SL SP ST SV SZ UK YU **N:** AG **A:** KZ TR WS **Records in Turkey:** TR-A: BIL, IZM, KAH, KUT, MUS, SIN **Remarks:** The species is probably rather widely distributed in Turkey. It has been recorded from 5 Turkish regions. But it has not been recorded only from Central Anatolian Region and South-Eastern Anatolian Region until now. **Chorotype:** Sibero-European

***C. sanguinosa* Suffrian, 1844**

Range: E: AU BH BY CR CT CZ DE EN FI FR GB GE HU IT LA LT NL NR NT PL SK SL SP SV UK **N:** AG MO **A:** ES KZ WS **Records in Turkey:** TR-A: BAR, KAS **Remarks:** The species has been recorded only from Black Sea Region in Turkey until now. **Chorotype:** Palearctic

***C. saucia* Weise, 1889**

Range: E: AB AR **A:** IN TR **Records in Turkey:** TR-A: AMA, ANK, BAL, COR, DUZ, GAZ, KIL, KAY, SII **Remarks:** The species is probably rather widely distributed in Turkey. It has been recorded from 4 Turkish regions. But it has not been recorded from Aegean Region, Mediterranean Region and Eastern Anatolian Region until now. **Chorotype:** SW-Asiatic (Anatolo-Caucasian + Irano-Caucasian + Irano-Anatolian)

***C. seladonia* Gyllenhal, 1827**

Range: E: AU BE BH BU CZ DE FR GE GR HU IT LA LT PL SK SP SV UK **N:** AG MO **A:** TR **Records in Turkey:** TR-A **Remarks:** Provincial distribution of the species is unknown. **Chorotype:** Europeo-Mediterranean

***C. seraphina* Ménétrés, 1836**

Range: E: AR GR ST TR **A:** KZ TR **Records in Turkey:** TR-A: AMA, ANK, ANT, BAL, BIL, BOL, BUR, BRS, CNK, COR, DUZ, ESK, EZU, ISP, IST, IZM, KAS, KON, KSH, KUT, SAK, SAM, SIV, TOK, USA **Remarks:** The species is rather widely distributed in Turkey. It has been recorded from 6 Turkish regions. But it has not been recorded only from South-Eastern Anatolian Region until now. **Chorotype:** SW-Asiatic

***C. stigmatica* Suffrian, 1844**

Range: E: AU BE BU CR CZ DE FI FR GE GR HU IT LA MC NL PL RO SK SP SZ UK **N:** TU **A:** AF ES KI KZ TR WS XIN **Records in Turkey:** TR-A: ADA, ANK, BOL, CAN, KAS, KON, KUT **Remarks:** The species is probably rather widely distributed in Turkey. It has been recorded from 5 Turkish regions. But it has not been recorded only from Eastern Anatolian Region and South-Eastern Anatolian Region until now. **Chorotype:** Palearctic or Sibero-European + N-Africa

***C. strejceki* Sekerka, 2006**

Range: A: TR **Records in Turkey:** TR-A: MUS **Remarks:** The endemic species has been recorded only from Eastern Anatolian Region in Turkey until now. **Chorotype:** Anatolian

***C. subreticulata* Suffrian, 1844**

Range: E: AL AU BE BH BU CR CZ FR GE GR HU IT LA MC PL RO SK SZ UK YU **A:** ES FE IN JA KZ MG TM TR WS XIN **Records in Turkey:** TR-A: ANK, ISP, KAS, KON, KRB, MER, NEV, ORD, TOK **Remarks:** The species is probably wider distributed than the known in Turkey. It has been recorded only from 3 Turkish regions as Black Sea Region, Central Anatolian Region and Mediterranean Region until now. **Chorotype:** Sibero-European or Asiatic-European

***C. vibex* Linnaeus, 1767**

Range: E: AL AU BE BH BU CR CZ DE EN FI FR GB GE GR HU IT LA LT MC NL NR NT PL RO SK SL SP SV SZ TR UK YU **A:** HEB KZ MG TR XIN **Records in Turkey:** TR-A:

ANK, ANT, BAR, BOL, COR, ISP, IZM, KAS, MER, NEV, NIG, SAM – TR-E **Remarks:** The species is probably rather widely distributed in Turkey. It has been recorded from 5 Turkish regions. But it has not been recorded from South-Eastern Anatolian Region and Eastern Anatolian Region until now. **Chorotype:** Asiatic-European

***C. viridis* Linnaeus, 1758**

Range: E: AL AU BE BH BU CR CZ DE EN FI FR GB GE GR HU IT LA LT MC NL NR NT PL PT RO SK SL SV SZ UK YU N: MO A: ES FE HEI JA KZ NC SC SY TR UZ WS XIN
Records in Turkey: TR-A: ADA, AKS, AMA, ANK, BAL, BOL, CAN, CNK, DIY, EZU, HAT, ISP, IZM, KAH, KAS, KAY, KON, KSH, MUS, NEV, NIG, OSM, SAK, TOK, TRA, TUN, URF, ZON – TR-E: TEK (Ekiz et al., 2013; pers. comm., 2013) **Remarks:** The species is widely distributed in Turkey. It has been recorded from all Turkish regions. But it has not been recorded only from Istranca and Çatalca Parts of European Turkey in Marmara Region, Central-West Anatolia Part in Aegean Region and Hakkari Part in Eastern Anatolian Region until now. **Chorotype:** Palearctic

***C. vittata* Villers, 1789**

Range: E: AU BE BH CR CZ DE EN FR GB GE GR HU IT LA LT PL PT RO SK SP SV SZ UK N: AG MO TU A: ES IS JA KZ SC TR WS UZ **Records in Turkey:** TR-A: AMA, BAL, BUR, DEN, MER, NEV, NIG, TOK **Remarks:** The species is probably rather widely distributed in Turkey. It has been recorded from 4 Turkish regions. But it has not been recorded from Central Anatolian Region, Eastern Anatolian Region and South-Eastern Anatolian Region until now. **Chorotype:** Palearctic

Genus *Hypocassida* Weise, 1893

***H. cornea* (Marseul, 1868)**

Range: E: AU BU CR FR GR HU IT PT SP ST N: AG EG LB MO TU A: CY SY TR AFR
Records in Turkey: TR-A **Remarks:** Provincial distribution of the species is unknown.
Chorotype: Afrotropico-Mediterranean

***H. meridionalis* (Suffrian, 1844)**

Range: E: FR IT PT SP N: MO A: IS TR **Records in Turkey:** TR-A: ORD **Remarks:** The species has been recorded only from Black Sea Region in Turkey until now. **Chorotype:** Mediterranean

***H. subferruginea* (Schrank, 1776)**

Range: E: AL AU BE BH BU CR CZ DE EN FI FR GE GR HU IT LA LT MC NL NT PL PT RO SK SL SP SV SZ TR UK YU N: AG EG MO A: AF ES FE HEB HEI IS KI KZ MG SHA TD TM TR UZ WS XIN **Records in Turkey:** TR-A: ADA, AGR, AKS, AMA, ANK, ANT, AYD, BAL, BIL, BIT, BRS, BOL, BUR, CAN, CNK, COR, DEN, DUZ, ERZ, ESK, EZU, HAT, ISP; IST, IZM, KAH, KAR, KAS, KAY, KOC, KON, KRB, KUT, MAN, MER, MUS, NIG, OSM, RIZ, SAK, SAM, SII, SIN, SIV, URF, YOZ, ZON – TR-E: EDI, IST, TEK (Ekiz et al., 2013; pers. comm., 2013) **Remarks:** The species is widely distributed in Turkey. It has been recorded from all Turkish regions. But it has not been recorded only from Istranca Part of European Turkey in Marmara Region and Hakkari Part in Eastern Anatolian Region until now. **Chorotype:** Palearctic

Genus *Ischyronota* Weise, 1891

***I. desertorum* (Gebler, 1833)**

Range: E: AR RO ST UK A: AF IN IS KI KZ MG PA SY TM TR UZ XIN **Records in Turkey:** TR-A: AGR, CNK, IGD, IZM, KAY **Remarks:** The species is probably rather widely distributed in Turkey. It has been recorded from 4 Turkish regions. But it has not been recorded from Marmara Region, Mediterranean Region and South-Eastern Anatolian Region until now. **Chorotype:** Asiatic-European

***I. jordanensis* Borowiec, 1986**

Range: A: JO TR **Records in Turkey:** TR-A: ANK **Remarks:** The species has been recorded only from Central Anatolian Region in Turkey until now. **Chorotype:** E-

Mediterranean (Palaestino-Taurian)

Genus *Macromonycha* Spaeth, 1911

***M. anatolica* (Weise, 1900)**

Range: A: TR **Records in Turkey:** TR-A: ADA, MER, NIG **Remarks:** The endemic species has been recorded only from Central Anatolian Region and Mediterranean Region in Turkey until now. **Chorotype:** Anatolian

***M. apicalis* (Gebler, 1845)**

Range: E: AB AR A: AF IN IQ IS KI KZ SY TR UZ **Records in Turkey:** TR-A **Remarks:** Provincial distribution of the species is unknown. It, however, must be distributed very likely only in SE and E Turkey. **Chorotype:** Sibero-European

***M. kantnerorum* Sekerka, 2008**

Range: A: JO TR **Records in Turkey:** TR-A **Remarks:** Provincial distribution of the species is unknown. It, however, must be distributed very likely only in S Turkey. **Chorotype:** E-Mediterranean (Palaestino-Taurian)

Genus *Oxylepus* Desbrochers des Loges, 1884

***O. deflexicollis* (Boheman, 1862)**

Range: E: CR FR GR IT SP N: EG MO TU A: IN IS TR **Records in Turkey:** TR-A **Remarks:** Provincial distribution of the species is unknown. It, however, must be distributed very likely only in S and SE Turkey. **Chorotype:** Mediterranean

Genus *Pilemostoma* Desbroch. des Loges, 1891

***P. fastuosum* (Schaller, 1783)**

Range: E: AL AU BE BH BU BY CR CZ DE FR GB GE GR HU IT LA MC MD NL PL RO SL SP ST SV UK YU A: ES IN KI KZ MG TR WS **Records in Turkey:** TR-A: BAR, KAH, KON, KRB **Remarks:** The species is probably wider distributed than the known in Turkey. It has been recorded only from 3 Turkish regions as Black Sea Region, Central Anatolian Region and Mediterranean Region until now. **Chorotype:** Sibero-European

ZOOGEOGRAPHICAL ANALYSIS

Turkish Hispinae includes only 2 species. 1 species, namely 50 % of the species has "Mediterranean" chorotype and also 1 species, namely 50 % of the species has "Sibero-European" chorotype.

For zoogeographical evaluation, the all known species of Turkish Hispinae are presented as follows:

One species as *D. testacea* has "Mediterranean" chorotype.

One species as *H. atra* has "Sibero-European" chorotype.

Turkish Cassidinae includes 51 species. 9 species, namely 17.65 % of the species have "Sibero-European" chorotype. 7 species, namely 13.73 % of the species have "Palearctic" chorotype. 6 species, namely 11.77 % of the species have "SW-Asiatic" chorotype. 5 species, namely 9.80 % of the species have "Asiatic-European" chorotype. 4 species, namely 7.84 % of the species have "Mediterranean" chorotype. Also 4 species, namely 7.84 % of the species have "Europeo-Mediterranean" chorotype. 3 species, namely 5.88 % of the species have "E-Mediterranean" chorotype. 2 species, namely 3.92 % of the species have "Anatolian" chorotype. 2 species, namely 3.92 % of the species have "E-European" chorotype. Also 2 species, namely 3.92 % of the species have "C and E-European" chorotype. And also 2 species, namely 3.92 % of the species have "Holarctic" chorotype. Each of the remaining 5 species has a different chorotype. One species, namely about 1.96 % of the species has "Afrotropico-Mediterranean" chorotype.

One species, namely about 1.96 % of the species has “European” chorotype. One species, namely about 1.96 % of the species has “Turanian” chorotype. One species, namely about 1.96 % of the species has “Turano-European” chorotype. And one species, namely about 1.96 % of the species has “Turano-European-Mediterranean” chorotype (Fig. 1). So the dominant chorotype for Turkish Cassidinae is “Sibero-European” (17.65 %). “Palearctic” (13.73 %) and “SW-Asiatic” (11.77 %) chorotypes follow it respectively. Also the members of “Asiatic-European” (9.80 %), “Mediterranean” (7.84 %) and “Europeo-Mediterranean” (7.84 %) chorotypes present important contributions for Turkish fauna.

For zoogeographical evaluation, the all known species of Turkish Cassidinae are presented as follows:

A total of 9 species have “Sibero-European” chorotype as *C. berolinensis*, *C. denticollis*, *C. murraea*, *C. pannonica*, *C. prasina*, *C. sanguinolenta*, *C. subreticulata*, *M. apicalis* and *P. fastuosum*.

A total of 7 species have “Palearctic” chorotype as *C. azurea*, *C. nobilis*, *C. sanguinosa*, *C. stigmatica*, *C. viridis*, *C. vittata* and *H. subferruginea*.

A total of 6 species have “SW-Asiatic” chorotype as *C. bella*, *C. hablitziae*, *C. persica*, *C. reitteri*, *C. saucia* and *C. seraphina*.

A total of 5 species have “Asiatic-European” chorotype as *C. lineola*, *C. nebulosa*, *C. parvula*, *C. vibex* and *I. desertorum*.

A total of 4 species have “Europeo-Mediterranean” chorotype as *C. ferruginea*, *C. hemisphaerica*, *C. margaritacea* and *C. seladonia*.

A total of 4 species have “Mediterranean” chorotype as *C. algerica*, *C. pusilla*, *H. meridionalis* and *O. deflexicollis*.

A total of 3 species have “E-Mediterranean” chorotype as *C. linnavuorii*, *I. jordanensis* and *M. kantnerorum*.

A total of 2 species have “Anatolian” chorotype as *C. strejceki* and *M. anatolica*.

A total of 2 species have “E-European” chorotype as *C. elongate* and *C. fausti*.

A total of 2 species have “C and E-European” chorotype as *C. atrata* and *C. rufovirens*.

A total of 2 species have “Holarctic” chorotype as *C. flaveola* and *C. rubiginosa*.

One species as *H. cornea* has “Afrotropico-Mediterranean” chorotype.

One species as *C. canaliculata* has “European” chorotype.

One species as *C. palaestina* has “Turanian” chorotype.

One species as *C. brevis* has “Turano-European” chorotype.

One species as *C. inquinata* has “Turano-European-Mediterranean” chorotype.

On the other side, the regional distributions of all known species of Hispinae and Cassidinae in Turkey are presented as follows (Table 1):

For the subfamily Hispinae:

2 species are represented in Marmara Region (100 %)

2 species are represented in Aegean Region (100 %)

2 species are represented in Mediterranean Region (100 %)

2 species are represented in Central Anatolian Region (100 %)

2 species are represented in Black Sea Region (100 %)

1 species are represented in Eastern Anatolian Region (50 %)

1 species are represented in South-Eastern Anatolian Region (50 %)

So Turkish Hispinae that includes only 2 species, are regarded widely distributed in all Turkish Regions.

Turkish Cassidinae includes a total of 51 species. However, provincial distributions of 9 species are unknown. So Turkish Cassidinae have 2 different evaluations necessarily. But, results of both assessments are the same except the occurrence ratio.

For the subfamily Cassidinae (according to all species):

22 species are represented in Marmara Region (43 %)

19 species are represented in Aegean Region (37 %)

21 species are represented in Mediterranean Region (41 %)

25 species are represented in Central Anatolian Region (49 %)

27 species are represented in Black Sea Region (53 %)

16 species are represented in Eastern Anatolian Region (31 %)

9 species are represented in South-Eastern Anatolian Region (18 %)

For the subfamily Cassidinae (according to known provincial distribution of 42 species):

22 species are represented in Marmara Region (52 %)

19 species are represented in Aegean Region (45 %)

21 species are represented in Mediterranean Region (50 %)

25 species are represented in Central Anatolian Region (60 %)

27 species are represented in Black Sea Region (64 %)

16 species are represented in Eastern Anatolian Region (38 %)

9 species are represented in South-Eastern Anatolian Region (21 %)

So Turkish Cassidinae that includes a total of 51 species or 42 species of which are known provincial distributions in Turkey, are widely distributed in all Turkish Regions. The most number of species is represented in Black Sea Region. Central Anatolian Region follows it. Marmara Region, Mediterranean Region and Aegean Region are represented with an important number of species. However, Eastern Anatolian Region and especially South-Eastern Anatolian Region are represented with a rather little number of species now. Because, last two regions have been inadequately worked until now.

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Table 1. The regional distribution of all known species of Hispininae and Cassidinae in Turkey.

SPECIES	R	E	G	I	O	N	S
	MAR	AER	MER	CAR	BSR	EAR	SEAR
Subfamily HISPINAE							
<i>H. atra</i>	+	+	+	+	+	+	+
<i>D. testacea</i>	+	+	+	+	+	-	-
Subfamily CASSIDINAE							
<i>C. algerica</i>	-	-	-	-	+	+	-
<i>C. atrata</i>	+	-	+	+	+	-	-
<i>C. azurea</i>	?	?	?	?	?	?	?
<i>C. bella</i>	+	+	+	-	+	-	-
<i>C. berolinensis</i>	+	-	-	-	-	-	-
<i>C. brevis</i>	-	+	+	-	+	+	+
<i>C. canaliculata</i>	?	?	?	?	?	?	?
<i>C. denticollis</i>	-	-	-	+	-	-	-
<i>C. elongata</i>	-	-	-	+	-	-	-
<i>C. fausti</i>	+	+	+	+	+	+	-
<i>C. ferruginea</i>	+	-	-	-	-	-	-
<i>C. flaveola</i>	-	-	-	+	-	+	-
<i>C. habitziae</i>	+	-	-	-	+	-	-
<i>C. hemisphaerica</i>	?	?	?	?	?	?	?
<i>C. inquinata</i>	+	+	-	-	+	-	-
<i>C. lineola</i>	-	-	-	-	-	+	-
<i>C. limavuurii</i>	-	-	-	-	-	-	+
<i>C. margaritacea</i>	-	-	+	+	+	-	+
<i>C. murreae</i>	+	-	-	-	+	-	-
<i>C. nebulosa</i>	+	+	-	+	+	-	-
<i>C. nobilis</i>	+	+	+	+	+	+	-
<i>C. palaestina</i>	+	+	+	-	-	-	+
<i>C. pannonica</i>	+	+	+	+	+	+	+
<i>C. parvula</i>	-	-	+	+	-	-	-
<i>C. persica</i>	?	?	?	?	?	?	?
<i>C. prasina</i>	+	+	+	+	+	+	+
<i>C. pusilla</i>	-	+	-	-	-	-	-
<i>C. reitteri</i>	-	-	-	+	-	-	-
<i>C. rubiginosa</i>	+	+	+	+	+	+	-
<i>C. rufovirens</i>	-	-	+	+	-	+	-
<i>C. sanguinolenta</i>	+	+	+	-	+	+	-
<i>C. sanguinosa</i>	-	-	-	-	+	-	-
<i>C. saucia</i>	+	-	-	+	+	-	+
<i>C. seladonia</i>	?	?	?	?	?	?	?
<i>C. seraphina</i>	+	+	+	+	+	+	-
<i>C. stigmatica</i>	+	+	+	+	+	-	-
<i>C. strejceki</i>	-	-	-	-	-	+	-
<i>C. subreticulata</i>	-	-	+	+	+	-	-
<i>C. vibex</i>	+	+	+	+	+	-	-
<i>C. viridis</i>	+	+	+	+	+	+	+
<i>C. vittata</i>	+	+	+	-	+	-	-
<i>H. cornea</i>	?	?	?	?	?	?	?
<i>H. meridionalis</i>	-	-	-	-	+	-	-
<i>H. subferruginea</i>	+	+	+	+	+	+	+

<i>I. desertorum</i>	-	+	-	+	+	+	-
<i>I. jordanensis</i>	-	-	-	+	-	-	-
<i>M. anatolica</i>	-	-	+	+	-	-	-
<i>M. apicalis</i>	?	?	?	?	?	?	?
<i>M. kantnerorum</i>	?	?	?	?	?	?	?
<i>O. deflexicollis</i>	?	?	?	?	?	?	?
<i>P. fastuosum</i>	-	-	+	+	+	-	-

Abbreviations: MAR: Marmara Region, AER: Aegean Region, MER: Mediterranean Region, CAR: Central Anatolian Region, BSR: Black Sea Region, EAR: Eastern Anatolian Region, SEAR: South-Eastern Anatolian Region.

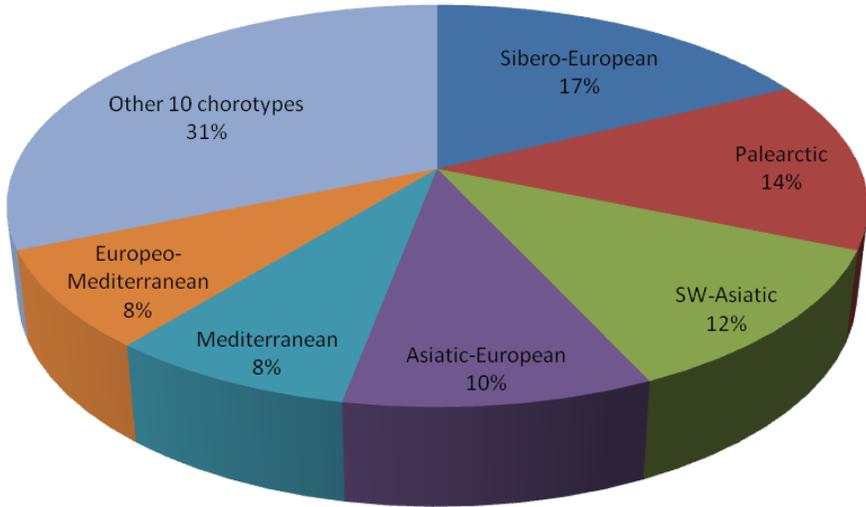


Figure 1. Chorotypical distribution of Turkish Cassidinae.