A REVIEW OF THE GENERA *DIORHABDA* WEISE AND *RADYMNA* REITTER IN TURKEY AND THE COLOUR VARIATIONS OF *RADYMNA FISCHERI* (FALDERMANN) FROM TURKEY (CHRYSOMELIDAE: GALERUCINAE)

Hüseyin Özdikmen* and Neslihan Silkin*

* Gazi University, Science Faculty, Department of Biology, 06500 Ankara, TURKEY. E-mail: ozdikmen@gazi.edu.tr

[Özdikmen, H. & Silkin, N. 2016. A review of the genera *Diorhabda* Weise and *Radymna* Reitter in Turkey and the colour variations of *Radymna fischeri* (Faldermann) from Turkey (Chrysomelidae: Galerucinae). Munis Entomology & Zoology, 11 (1): 96-104**]**

ABSTRACT: Species of the genera *Diorhabda* Weise, 1883 and *Radymna* Reitter, 1913 in Turkey are reviewed and a complete checklist with provincial distributions is presented. Eight species are catalogued in total. Also the colour variations of *Radymna fischeri* (Faldermann, 1837) from Turkey are described and photographed.

KEY WORDS: *Radymna*, *Radymna fischeri*, check-list, colour variations, Turkey.

The genus *Diorhabda* was erected by Weise (1883) with the type species *Galeruca elongata* Brullé, 1832, by original designation. The genus *Radymna* was introduced by Reitter (1913) with the type species *Diorhabda rickmersi* Weise, 1900, by monotypy, formerly included in *Diorhabda*.

After Beenen (2008), *Radymna* includes all former *Diorhabda* species except for only *Diorhabda elongata* and the related species (*D. elongata* species-group) that remain in the genus *Diorhabda*. *D. elongata* species-group was revised by Tracy & Robbins (2009). These species are *D. carinata* (Faldermann, 1837), *D. carinulata* (Desbrochers, 1870), *D. elongata* (Brullé, 1832), *D. meridionalis* Berti & Rapilly, 1973 and *D. sublineata* (Lucas, 1849). Also *D. octocostata* Gahan, 1896 is correctly classified in *Diorhabda* according to Beenen (2014).

In addition some Chinese and Himalayan species have not been reviewed recently and thus have remained in *Diorhabda* too (Beenen, 2010). Beenen (2014) stated these species should also be included in *Radymna*. These species are *D. lusca* Maulik, 1936, *D. rybakowi* Weise, 1890, *D. tarsalis* Weise, 1889 and *D. trirakha* Maulik, 1936. However, key of Beenen (2014) did not included these species.

Besides, Warchalowski (2010) gave 3 species for the genus *Radymna* as *R. fischeri* (Faldermann, 1837), *R. maculipennis* (Chen, 1942) and *R. persica* (Faldermann, 1837), and 8 species for the genus *Diorhabda* as *D. carinulata* Desbrochers, 1870, *D. elongata* (Brullé, 1832), *D. koltzei* Weise, 1900, *D. octocostata* Gahan, 1896, *D. quadrimaculata* (Redtenbacher, 1850), *D. rickmersi* Weise, 1900, *D. rybakowi* Wesie, 1890 and *D. tarsalis* Weise, 1889.

However, Beenen (2014) stated the structure of antennal segments of *Clitena maculipennis* Chen, 1942 does not correspond with any of the species in *Radymna*. According to Beenen (2014), *D. quadrimaculata* (Redtenbacher, 1850) and *D. rickmersi* Weise, 1900 are in the genus *Radymna* and *Galerupipla brunnea* Maulik, 1936 is conspecific with *Galeruca turcica* Stierlin, 1867 and thus it is a junior synonym of *R. persica* (Faldermann, 1837).

Consequently the genus *Diorhabda* can include 6 species as *D. carinata* (Faldermann, 1837), *D. carinulata* (Desbrochers, 1870), *D. octocostata* Gahan, 1896, *D. elongata* (Brullé, 1832), *D. meridionalis* Berti & Rapilly, 1973 and *D. sublineata* (Lucas, 1849). Also the genus *Radymna* can include 12 species as *R. damascena* (Joannis, 1865), *R. fischeri* (Faldermann, 1837), *R. latifrons* Beenen, 2014, *R. lusca* (Maulik, 1936), *R. maculicollis* Beenen, 2014, *R. nigrifrons*

(Laboissière, 1914), *R. persica* (Faldermann, 1837), *R. quadrimaculata* (Redtenbacher, 1850), *R. rickmersi* (Weise, 1900), *R. rybakowi* (Weise, 1890), *R. tarsalis* (Weise, 1889) and *R. trirakha* (Maulik, 1936).

MATERIAL AND METHOD

A total of 44 *Diorhabda* specimens and 527 *Radymna* specimens were collected from 6 different provinces in Turkey as Aksaray, Ankara, Çankırı, Kayseri and Niğde in the years of 1993, 1997, 2013, 2014 and 2015. As a result of identification of them, one species of the genus *Diorhabda* as *Diorhabda elongata* and two species of the genus *Radymna* as *Radymna fischeri* and *Radymna persica* were determined. Among the collected specimens from Çankırı province, an aberrant variation of *R. fischeri* (Faldermann, 1837) was determined on the base of two damaged male specimens. This variation is described and illustrated in the present text. The available specimens for the present study are deposited in Gazi University and Nazife Tuatay Plant Protection Museum (NTM) (Turkey: Ankara).

Information in the present text is given in following order:

For the genus name, the type species is provided under the taxon name. For each species, reported from Turkey, are given alphabetically within the genus. The Turkish distribution patterns for each species are given only concerning provinces. Turkish endemic taxa are marked with the sign (*).

For distribution data of the taxa, Tracy & Robbins (2009), Ekiz et al. (2013), Özdikmen & Topcu (2014), Beenen (2014) for Turkey, and Döberl in Löbl & Smetana (2010) for World are used in the text chiefly.

RESULTS

Turkish *Diorhabda* and *Radymna* species are reviewed on the base of 571 specimens of 7 species from 6 different provinces in Turkey with the present work. All species of the genera *Diorhabda* Weise, 1883 and *Radymna* Reitter, 1913 in Turkey are presented as follows:

Genus *DIORHABDA* Weise, 1883

Type sp.: *Galeruca elongata* Brullé, 1836

The genus *Diorhabda* is represented by 2 species in Turkey as *D. carinata* (Faldermann, 1837) and *D. elongata* (Brullé, 1832) according to Ekiz et al. (2013), Özdikmen et al. (2014) and Özdikmen & Topcu (2014).

Diorhabda carinata (Faldermann, 1837)

Records in Turkey: Asian Turkey (Anatolia): Ağrı, Artvin, Erzurum, Iğdır and Siirt provinces.

Range: Europe: Ukraine, **Asia:** Armenia, Afghanistan, Azerbaijan, China, Georgia, Iran, Kirgizia, Kazakhstan, Pakistan, Syria, Tadjikistan, Turkmenistan, Turkey, Uzbekistan, and introduced to **Nearctic region.**

Remarks: The record of Aralık (Iğdır province) in Tracy & Robbins (2009) is given for the first time according to Ekiz et al. (2013), Özdikmen et al. (2014) and Özdikmen & Topcu (2014).

Diorhabda elongata (Brullé, 1832)

Material examined: Çankırı prov.: Hasakça, Central, 27.VII.1993, 1 specimen; **Kayseri prov.:** Süleymanlı, Central, 27.VII.1993, 39 specimens; **Çankırı prov.:** Central, İnanç village, 761 m, 24.VII.2013, 2 specimens; Çerkeş, between Karaşar-Uluköy, 901 m, 26.VIII.2013, 2 specimens.

Records in Turkey: European Turkey (Thracia): Edirne province; Asian Turkey (Anatolia): Adana, Ankara, Antalya, Artvin, Aydın, Çankırı, Diyarbakır, Eskişehir, Erzurum, Isparta, İzmir, Kayseri, Malatya, Manisa, Mersin, Samsun, Uşak, Yozgat and Zonguldak provinces.
Range: Europe: Albania, Bosnia & Herzegovina, Bulgaria, Croatia, Greece, Macedonia, Portugal, Spain, South part of European Russia, Yugoslavia, **North Africa:** Algeria, Egypt, **Asia:** Cyprus, Lebanon, Syria, Turkey, and introduced to **Nearctic region.**

Diorhabda carinata (Faldermann, 1837) was regarded as a synonym of *Diorhabda elongata* (Brullé, 1832) for a long time (e.g. Warchalowski, 2010). Since both species are similar morphologic characters. Both species can easily be distinguished by male and female genitaliae (Tracy & Robbins, 2009).

A key for Turkish *Diorhabda* species on the base of Tracy & Robbins (2009)

1. In male: Elongate endophallic sclerite armed with spines on blade extending over an area greater than or equal to 0.31 times (or greater than about one third) the length of the sclerite, with blade extending greater than or equal to 0.43 times the total length of the sclerite; elongate endophallic sclerite sometimes bearing a lateral appendage, lateral notch (pointed basally) or hooked apex. Palmate endophallic sclerite with distal margin truncate serrate and with two to six (commonly three to five) usually distal spines (maximum one spine subdistal) and a lateral appendage, or with distal margin narrowly or acutely rounded and one or two small subdistal spines and no lateral appendage (sometimes with lateral notch). Subsutural and submarginal elytral vittae, if present, often extending from apical half of elytra into the basal half. Length 4.2–7.3 mm. In female: Vaginal palpi triangulate, narrowly rounded. Width of the widest lobe on the stalk of internal sternite VIII from 0.08–0.18 mm. Subsutural and submarginal elytral vittae, if present, often extending from apical half of elytra into the basal half. Length 4.9–8.4 mm.....*D. carinata* (Faldermann, 1837)

-. In male: Elongate endophallic sclerite armed with spines on blade extending over an area less than or equal to 0.16 times (or less than about one fifth) the length of the sclerite, and blade extending less than or equal to 0.42 times the total length of the sclerite; elongate endophallic sclerite never bearing a lateral appendage, lateral notch (pointed basally), or hooked apex. Palmate endophallic sclerite with distal margin usually broadly rounded and with one to six (commonly two to four) usually subdistal spines (maximum of two distal spines), and no lateral appendage (rarely with a lateral notch). Subsutural and submarginal elytral vittae, if present, never extending from apical half of elytra into the basal half. Length 5.3–6.8 mm. In female: Vaginal palpi broadly rounded. Width of the widest lobe on the stalk of internal sternite VIII from 0.06–0.11 mm. Subsutural and submarginal elytral vittae, if present, never extending from apical half of elytra into the basal half. Length 5.8–7.7 m.....*D. elongata* (Brullé, 1832)

Genus *RADYMNA* Reitter, 1913
Type sp.: *Diorhabda rickmersi* Weise, 1900

The genus *Radymna* had been represented by 3 species in Turkey as *R. fischeri* (Faldermann, 1837), *R. nigrifrons* (Laboissière, 1914) and *R. persica* (Faldermann, 1837) according to Ekiz et al. (2013), Özdikmen et al. (2014) and Özdikmen & Topcu (2014). After Beenen (2014), the number of species rose up to 5 with the addition of a new species and a new record as *R. maculicollis* Beenen, 2014 and *D. quadrimaculata* (Redtenbacher, 1850) respectively.

Radymna fischeri (Faldermann, 1837)

Material examined: Çankırı prov.: Korgun, Kayaçivi village, 1003 m, 23.IV.2013, 1 specimen; Central, İnanç village, 761 m, 24.VII.2013, 1 specimen; Kızılırmak, Karallı village return, 606 m, 25.IV.2014, 21 specimens; Central, exit of Eldivan, 857 m, 26.IV.2014, 1 specimen; Kurşunlu, Köprülü return, 1130 m, 20.V.2014, 7 specimens; Kızılırmak, exit of Cacıklar, 558 m, 12.VII.2014, 3 specimens; Kızılırmak, between Karamürsel-Boyacıoğlu, 547 m, 12.VII.2014, 36 specimens; Central, entry of Danabaşı, 582 m, 13.VII.2014, 1 specimen; Central, Aşağıçavuş village, 880 m, 15.VII.2014, 1 specimen; Central, entry of Dereçatı village, 1068 m, 09.VIII.2014, 1 specimen; Central, between Dereçatı-Başeğnez, 1099 m, 09.VIII.2014, 2 specimens; Eldivan, entry of Gölezkayı, 1022 m, 09.VIII.2014, 1 specimen; Eldivan, between Gölezkayı-Gölez, 924 m, 09.VIII.2014, 1 specimen; Kızılırmak, between Yukarı Alagöz-Alıca, 590 m, 11.VIII.2014, 53 specimens; Central, between Karadayı-Çatalelma village, 569 m, 11.VIII.2014, 96 specimens; Kızılırmak, Ovacık return, 575 m, 11.VIII.2014, 36 specimens; Kızılırmak, Yeniyapan village, 702 m, 11.VIII.2014, 1 specimen; Kızılırmak, Karadibek village, 601 m, 11.VIII.2014, 29 specimens; Kızılırmak, between Küçükbahçeli-Tepe Alagöz, 572 m, 11.VIII.2014, 26 specimens; Kızılırmak, Tepe Alagöz village, 574 m, 11.VII.2014, 48 specimens; Kızılırmak, Cacıklar road, 556 m, 11.VIII.2014, 6 specimens; Kızılırmak, between Cacıklar-Karamürsel villages, 527 m, 11.VIII.2014, 4 specimens; Kızılırmak, between Korçullu-Kenallı, 557 m, 12.VIII.2014, 18 specimens; Kızılırmak, between Saraycık-Karallı, 592 m, 12.VIII.2014, 10 specimens; Central, Danabaşı-Sarı Mehmet village return, 602 m, 13.VIII.2014, 11 specimens; Central, between Kuzuköy-Ovacık, 677 m, 13.VIII.2014, 5 specimens; Central, between Bayındır-Hasakça, 1104 m, 13.VIII.2014, 1 specimen; Bayramören, entry of Sazak, 1408 m, 21.VIII.2014, 3 specimens; Eldivan, Akbulut village return, 1076 m, 14.V.2015, 2 specimens; Central, between Külburun-Karadayı, 614 m, 16.V.2015, 21 specimens; Kızılırmak, Yukarıalagöz village, 642 m, 16.V.2015, 12 specimens; Kızılırmak, Tepealagöz return, 557 m, 16.V.2015, 7 specimens; Kızılırmak, exit of Büyükbahçeli, 611 m, 16.V.2015, 1 specimen; Kızılırmak, Kavaklı, 542 m, 16.V.2015, 3 specimens; Kızılırmak, between Korçullu-Kemalli, 586 m, 17.V.2015, 4 specimens; Kızılırmak, Karallı-Kahyalı return, 556 m, 17.V.2015, 16 specimens; Kızılırmak, Kahyalı village, 634 m, 17.V.2015, 25 specimens; Atkaracalar, between Kükürt village: Demirciler district-Yazıören, 924 m, 20.VI.2015, 3 specimens; **Niğde prov.:** Bor, Bor-Altunhisar road, Üstünkaya, 1150 m, 17.VII.1997, 2 specimens.

Records in Turkey: Asian Turkey (Anatolia): Ankara, Çankırı, Erzurum, Eskişehir, Gaziantep, Iğdır, Isparta, Kars, Kayseri, Konya (Tuz Lake), Nevşehir, Niğde and Zonguldak provinces.

Range: Europe: South part of European Russia, and **Asia:** Azerbaijan, Iran, Turkmenistan and Turkey.

Remarks: The species is recorded for the first time from Çankırı province. Also the records of Eskişehir, Konya, Nevşehir and Zonguldak provinces in Beenen (2014) are given for the first time according to Ekiz et al. (2013), Özdikmen et al. (2014) and Özdikmen & Topcu (2014).

The colour variations of *R. fischeri* (Faldermann, 1837)

R. fischeri (Faldermann, 1837) is a very variable species in terms of coloration of the body.

During the study of the collected specimens of *R. fischeri* (Faldermann, 1837) from Turkey in the years of 1997, 2013, 2014 and 2015, we have determined many variations including an aberrant variety *Galerucella fischeri* var. *subnigra* Weise, 1878.

In the typical form, according to original description of Faldermann (1837), body is light rust-reddish; antennae completely reddish; vertex, scutellum, underside of the body, longitudinal median stripe on pronotum black; elytral suture blackened; legs rust-reddish with tarsi dark brown.

Also Faldermann (1837) stated that var. B. is “somewhat larger, darker, especially antennae black apically”. Then this variety was described by Weise (1878) as *Galerucella fischeri* var. *subnigra*.

In this variety, according to original description of Weise (1878), the body flattaned with equally broad elytra, with extremely finely pubescence (the hairs seem to be more abraded). The head is forward, often only the frons and two frontal tubercles red-brown. Pronotum red-brown, exactly twice as wide as long,

with a broad black longitudinal median stripe on disc. Elytra with a wide black sutural stripe which begins basically, occupies at least 1/3 of length of each elytron and does not reach the apex; a second black longitudinal stripe on the outer edge, which covered the middle 3/5 of the edge of elytron and also 1/3 of the width of elytron, so that at any of the same, only the middle third in the form of a wider longitudinal stripe, elytron in front and rear of the stripe red-brown colored. The antennae black with sometimes first 4 antennomeres pitch-brown, antennomeres 1, 3 and 4 stretched, antennomere 4 slightly longer than 3, antennomeres 2 and 5-8 among themselves equal long, 9 to 11 slightly longer. The whole underside black, joints between the femora and tibiae in form of ringed expansion reddish-yellow.

Among the collected specimens from Çankırı province, two damaged male specimens were determined as an aberrant variation *R. fischeri* var. *subnigra* (Weise, 1878) of the species *R. fischeri* (Faldermann, 1837). This variation is described and illustrated as follows:

Material examined: Çankırı prov.: Eldivan, Akbulut village return, 40˚ 30' 48" N, 33˚ 30' 36" E, 1076 m, 14.V.2015, 2 males.

This aberrant variation, *R. fischeri* var. *subnigra* (Weise, 1878), is also known from Isparta province in Turkey according to R. Beenen (pers. comm., 2015).


Description: Length 4,65-4,70 mm. Humeral width: 2,000-2,125 mm.

Head bicolorous. Mouth parts including labrum blackish-brown; labrum unpunctured; frons and frontal tubercles entirely red-brown, without pubescence and almost unpunctured; vertex black, rather closely deeply punctured; head behind the eyes reddish; head clothed with yellowish-white pubescence except for frons and frontal tubercles. Antennae relatively short and robust. First four antennomere mostly reddish-brown, the remaining antennomeres black. Antennomeres 3 and 4 with equal length.

Pronotum clearly transversal, yellowish with a broad black longitudinal median stripe; each medio-lateral part of pronotum with a hollow; pronotal disc rather closely deeply punctured; pronotum clothed with yellowish-white pubescence.

Scutellum black, punctured and clothed with pubescense.

Elytra reddish-brown, clothed with yellowish-white pubescence; each elytron with a broad sutural and a broad lateral black stripe; sutural stripe absent only in 1/7 apical part of elytral length. Lateral stripe can only be showed along the mid part, absent in basal and apical parts of elytra. Elytra densely deeply randomly punctured. Pygidium black. Epipleura rather long, gradually narrowed towards apex, extends to ¼ apical part of elytral length.

Ventral side of the body black, clothed with rather long, dense slanting whistish pubescence.

Legs entirely black except for reddish-brown trochanters.

Aedeagi of these specimens are completely fitting to that of *R. fischeri* (Faldermann, 1837).

Consequently, the species *R. fischeri* (Faldermann, 1837) has many colour variations between the unicolorous form (light rust-reddish) and *R. fischeri* var. *subnigra* (Weise, 1878). All forms known by us are described in respect of parts of the body.

Coloration of head

Entirely light rust-reddish to more or less black vertex with the exception for darkened mouth parts.

Usually mouth parts darkened (dark brown to blackish-brown); frons and two frontal tubercles always pale (light reddish-brown to dark reddish-brown); vertex light rust-reddish or more or less black.



Coloration of antennae

Entirely reddish to entirely black.

Entirely reddish; black with first 4 antennomeres pitch-brown; black with first four antennomeres light reddish-brown to dark reddish-brown; entirely black.

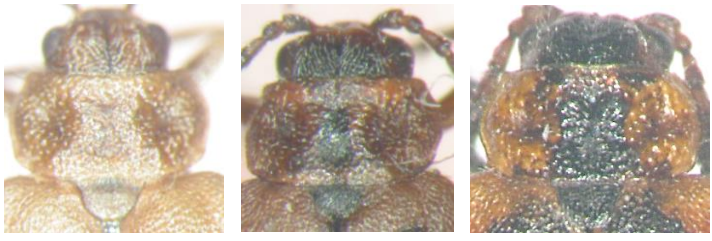
Coloration of pronotum

Entirely light rust-reddish-brown to red-brown with a black longitudinal median stripe on disc.

Entirely light rust-reddish-brown; light rust-reddish, red-brown or yellowish with a black longitudinal median stripe which narrow or more or less broad, reaches or does not reach to anterior and posterior margins of pronotum.

Coloration of scutellum

Entirely black or entirely light rust-reddish.



Coloration of elytra

Entirely light rust-reddish to red-brown with a broad black sutural stripe and a broad lateral black stripe.

Entirely light rust-reddish or light rust-reddish with blackened suture; entirely light reddish-brown; red-brown with a darkened sutural stripe; entirely brown or dark reddish-brown with a darkened sutural stripe; red-brown with a broad black sutural stripe and a broad lateral black stripe.

Coloration of underside of the body

At most parts light rust-reddish to entirely black.

Entirely black; black with red-brown anal sternite; light rust-reddish with blackened mesosternum and metasternum.

Coloration of legs

Almost entirely pale to almost entirely black.

Entirely pale with reddish-brown femora, yellowish tibiae, and darkened claws; entirely pale with red-brown femora and tibiae, darkened joints between femora and tibiae, and darkened tarsi; red-brown to dark red-brown with darkened joints between femora and tibiae, and darkened tarsi; light rust-reddish with dark brown tarsi; light rust-reddish with darkened joints between femora and tibiae, and darkened tarsi; entirely black with reddish-yellow joints between the femora and tibiae in form of ringed expansion; entirely black except for reddish-brown trochanters.

***Radymna maculicollis* Beenen, 2014**

Records in Turkey: Asian Turkey (Anatolia): Bingöl province.
Range: Asia: Iran, Israel and Turkey.

***Radymna nigrifrons* (Laboissière, 1914)**

Records in Turkey: Asian Turkey (Anatolia): Iğdır and Kars provinces.
Range: Asia: Armenia and Turkey.

***Radymna persica* (Faldermann, 1837)**

Material examined: Aksaray prov.: Zengen, Yukarı Göndelen, 1060 m, 23.06.1997, 1 specimen; **Ankara prov.:** Şereflikoçhisar, Tuz Gölü, 980 m, 03.06.1997, 2 specimens; **Kayseri prov.:** Yahyalı, Derebağı, Şelale district, 1280 m, 25.06.1997, 4 specimens; **Konya prov.:** Kulu, Tavşançalı, 1000 m, 31.05.1997, 1 specimen.
Records in Turkey: Asian Turkey (Anatolia): Aksaray, Ankara, Kayseri, Konya and Kars provinces.
Range: Europe: Greece, and **Asia:** Afghanistan, Armenia, Azerbaijan, China, Cyprus, Georgia, Iran, Iraq, Israel, Kazakhstan, Pakistan, Russia, Syria, Tadjikistan, Turkmenistan and Turkey.

***Radymna quadrimaculata* (Redtenbacher, 1850)**

Records in Turkey: Asian Turkey (Anatolia): Bingöl, Elazığ and Tunceli provinces.
Range: Asia: Iran and Turkey.
Remarks: The records from Turkey in Beenen (2014) are given for the first time according to Ekiz et al. (2013), Özdikmen et al. (2014) and Özdikmen & Topcu (2014).

Key to the species of *Radymna* Reitter, 1913 was presented by Beenen (2014).

A key for Turkish *Radymna* species on the base of Beenen (2014)

1. Elytra brown to olive-green with yellow spots at humerus and elytral apex, which may merge.....2
-. Elytra yellow, or yellow with suture and lateral margin dark.....3

2. Pronotum mostly black or black with yellow margins. Aedeagus narrow with blunt apex. Length 4.60-4.75 mm.....*R. quadrimaculata* (Redtenbacher, 1850)
-. Pronotum yellow with elongate central black marking which is wide at base and narrows towards front margin. Aedeagus broad with asymmetrical sharp apex. Length 4.60-4.75 mm.....*R. maculicollis* Beenen, 2014

3. Lateral depressions on pronotum deep. Elytra yellow, or yellow with suture and lateral margin dark. Length 4.50 mm.....*R. nigrifrons* (Laboissière, 1914)
-. Lateral depressions of pronotum shallow. Elytra brown to olive-green.....4

4. Pronotum relatively wide. Fourth antennomere in male on underside slightly excavated, with a brush of setae. Aedeagal sides more or less parallel and the apex blunt Length 4.0-5.0 mm.....*R. fischeri* (Faldermann, 1837)
-. Pronotum relatively narrow. Fourth antennomere in male normal, without a brush of setae. Aedeagal sides regularly converging and the apex sharply pointed or in some populations slightly blunt Length 4.20-5.40 mm.....
.....*R. persica* (Faldermann, 1837)

LITERATURE CITED

Beenen, R. 2008. Taxonomical and nomenclatural changes in Palaearctic Galerucinae and description of a new species (Chrysomelidae). Entomologische Blätter, 103/104: 63-80.
Beenen, R. 2010. Galerucinae. In: Löbl, I. & Smetana, A. (ed.), Catalogue of the Palaearctic Coleoptera 6: 74-75, 443-491. Apollo Books, Stenstrup.
Beenen, R. 2014. Key to the species of Radymna Reitter, 1913 with taxonomic and faunistic comments and description of two new species (Coleoptera, Chrysomelidae, Galerucinae). Entomologische Blätter und Coleoptera, 110: 87-100.
Döberl, M. 2010. Alticinae. Pp. 491-563 in: Löbl, I. & Smetana, A. (eds). Catalogue of Palaearctic Coleoptera, Vol. 6. Chrysomeloidea. Stenstrup: Apollo Books.
Ekiz, A. N., Şen, İ., Aslan, E. G. & Gök, A. 2013. Checklist of leaf beetles (Coleoptera: Chrysomelidae) of Turkey, excluding Bruchinae, Journal of Natural History, 47 (33-34): 2213-2287.
Faldermann, F. 1837. Fauna entomologica trans-caucasica. Coleoptera. Pars II. Nouveaux Mémoires de la Société Impériale des Naturalistes de Moscou 5: 3-433.
Özdikmen, H., Mercan, N., Cihan, N., Kaya, G., Topcu, N. N. & Kavak, M. 2014. The importance of superfamily Chrysomeloidea for Turkish biodiversity (Coleoptera). Munis Entomology & Zoology, 9 (1): 17-45.
Özdikmen, H. & Topcu, N. N. 2014. Chorotype identification for Turkish Chrysomeloidea (Coleoptera) Part VI – Chrysomelidae: Galerucinae. Munis Entomology & Zoology, 9 (1): 214-226.
Reitter, E. 1913. Fauna Germanica. Die Käfer des Deutschen Reiches. Band IV. Stuttgart, [1912]: 1-236.
Tracy, J. L. & Robbins, T. O. 2009. Taxonomic revision and biogeography of the *Tamarix*-feeding *Diorhabda elongata* (Brullé, 1832) species group (Coleoptera: Chrysomelidae: Galerucinae: Galerucini) and analysis of their potential in biological control of *Tamarisk*. Zootaxa, 2101: 1-152.
Weise, J. 1878. [new taxa]. In Schneider, O. & Leder, H. (ed.). Beiträge zur Kenntnis der kaukasischen Käferfauna. Brünn: W. Burkart, 358 pp.
Weise, J. 1883. Ueber die mit *Galeruca* Geoffr. verwandten Gattungen. Deutsche Entomologische Zeitschrift, 27: 315-316.