

**Orijinal araştırma (Original article)**

**A study on the Nepomorpha (Hemiptera) species of some provinces of Anatolia, Turkey, with new records of *Anisops debilis perplexus* Poisson, 1929 and *Notonecta reuteri* Hungerford, 1928<sup>1</sup>**

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**Summary**

In this study, 610 adults and 83 nymphs from the infraorder Nepomorpha (Hemiptera) were collected from 29 different localities in eastern Anatolia, the Black Sea region and Kelkit Valley and Hatay from 2006-2010. In addition, the unpublished materials collected in different parts of Turkey by Seidenstücker and preserved in the Zoologische Staatssammlung München were examined. 11 genera, 20 species and 2 subspecies were recorded. Of those, 20 are new records for the particular research areas and *Anisops debilis perplexus* Poisson, 1929 and *Notonecta reuteri* Hungerford, 1928 (Hemiptera: Notonectidae) are recorded for the Turkish fauna for the first time.

**Key Words:** Turkey, Nepomorpha, new records, *Anisops debilis perplexus*, *Notonecta reuteri*

**Anahtar sözcükler:** Türkiye, Nepomorpha, yeni kayıtlar, *Anisops debilis perplexus*, *Notonecta reuteri*

**Introduction**

Currently, there are 10 families and 46 genera comprising approximately 274 species and 21 subspecies of Nepomorpha Popov, 1968 in the Palaearctic region (Polhemus et al., 1995). A checklist of aquatic and semiaquatic Heteroptera from Turkey was published by Kıyak & Öz Saraç (2001) and catalogue on all Heteroptera from Turkey was published Önder et al. (2006). Nepomorpha are represented in Turkey by 51 species and 3 subspecies belonging to 20 genera of 8 families (Polhemus et al., 1995; Kıyak & Öz Saraç, 2001; Kıyak et al., 2007).

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Nepomorpha are essentially predaceous aquatic bugs, although some Corixidae may be omnivorous, but corixids prefer animal prey if it is available (Polhemus et al., 1995). Various studies on the infraorder Nepomorpha have been done in Turkey by native and foreign researchers Horváth (1883), Kiritshenko (1918), Lindberg (1922), Poisson (1933), Hungerford (1934), Hoberlandt (1952), Kiritshenko & Jaczewski (1960), Wróblewski (1962), Jansson (1986), Özemi & Önder (1988), Öz Saraç (2004), Kiyak et al. (2004, 2007). Of the investigations on the bug fauna in Turkey especially the publication by Kiritshenko (1918) is remarkable in this context. He reported several new records of Nepomorpha from East Anatolia. Amongst others he reported *Notonecta lutea* Müller, 1776 (Hemiptera: Notonectidae) and *Callicorixa praeusta* (Fieber, 1848) (Hemiptera: Corixidae) from Kars. But this was not corroborated by Kanyukova (1973) and Jansson (1986), who both do not mention these species.

The current study is the first on the infraorder Nepomorpha in eastern Anatolia, the Black Sea Region, Hatay and Kelkit Valley.

## Material and Methods

The material examined consisted of 610 adult and 83 nymphal Nepomorpha collected from 29 aquatic habitats in Ağrı, Amasya, Ardahan, Erzurum, Erzincan, Hatay, Iğdır, Kars, Samsun, Sinop, Sivas, Tokat and Van provinces in Anatolia of Turkey from 2006-2010. Furthermore the unpublished material collected in different parts of Turkey by the late Gustav Seidenstücker and preserved in the Zoologische Staatssammlung München, were examined.

The specimens were collected with either a sieve, ladle or net having a 1 mm mesh size. Coordinates of the collection localities were logged with a hand held Garmin Etrex Vista Global Positioning System (GPS). Male genitalia were used to verify some of the species. Prior to removal of the genitalia, samples were softened in 5% acetic acid (CH<sub>3</sub>COOH). The identification keys and revisions by Poisson (1929, 1933, 1957), Hungerford (1934), Stichel (1955, 1956), Kiritshenko & Jaczewski (1960), Kerzhner & Jaczewski (1964), Kanyukova (1973), Jansson (1986), Linnavuori & Hosseini, (2000) and Rabitsch (2005) were followed in identification. During the identification process, several species were compared with specimens held in the Zoologische Staatssammlung München, Germany (ZSMC).

Unless stated otherwise, the voucher specimens are preserved at the Biology Department of the Faculty of Arts and Science, Amasya University, Amasya, Turkey.

## Results

**Nepomorpha** Popov, 1968

**Nepoidea** Latreille, 1802

**Nepidae** Latreille, 1802

**Nepa** Linnaeus, 1758

**Nepa cinerea** Linnaeus, 1758

**Material examined:** Ağrı: Patnos, 39° 16' 21" N, 42° 48' 30" E, 1650m., 22.VII.2009, 4 nymphs; Sivas: Gölova, Boğazköy, 40° 05' 02" N, 38° 31' 17" E, 1160m., 17.V.2006, 1♂; Van: Çaldıran, Kaz Lake, 39° 08' 56" N, 43° 57' 23" E, 2064m., 27, 20.VII.2009, 35 nymphs.

**Distribution in Turkey:** Kars (Kiritshenko, 1918); Burdur, Kahramanmaraş, Kayseri, Kırşehir, Nevşehir, Sakarya (Hoberlandt, 1952); Afyon (Kıyak et al., 2004); Denizli, Isparta (Kıyak et al., 2007).

**Ranatra** Fabricius, 1790

**Ranatra linearis** (Linnaeus, 1758)

**Material examined:** Samsun: Bafra, Doğanca, Cernek Lake, 41° 36' 15" N, 36° 05' 13" E, 1m., 07.VII.2010, 5 nymphs, 3♀♀, 3♂♂.

**Distribution in Turkey:** İzmir, Kayseri, Konya (Önder et al., 2006).

**Corixoidea** Leach, 1815

**Corixidae** Leach, 1815

**Micronecta** Kirkaldy, 1897

**Micronecta anatolica** Lindberg, 1922

**Material examined:** Van: Çaldıran, Kaz Lake, 39° 08' 56" N, 43° 57' 23" E, 2064m., 20.VII.2009, 2♀♀; Kahramanmaraş: Aksu, 8♀♀, Leg. G. Seidenstücker, Det. H.H. Weber, 1952; 6♀♀, 30♂♂ Leg. G. Seidenstücker, Det. A. Wróblewski (ZSMC).

**Distribution in Turkey:** İzmir (Lindberg, 1922), Adana (Hoberlandt, 1952; Wróblewski, 1962), Gaziantep (Kıyak & Özaraç, 2001; Önder et al., 2006).

**Callicorixa** White, 1873

**Callicorixa raddei** (Kiritshenko & Jaczewski, 1960)

**Material examined:** Ağrı: Doğubayazıt, 39° 33' 26" N, 44° 13' 24" E, 1496m., 19.VII.2009, 2♂♂; Van: Çaldıran, Kaz Lake, 39° 08' 56" N, 43° 57' 23" E, 2064m., 20.VII.2009, 21♀♀, 20♂♂.

**Distribution in Turkey:** Ardahan, Kars,(Kiritshenko & Jaczewski, 1960; Jansson, 1986).

***Corixa*** Geoffroy, 1762

***Corixa affinis*** Leach, 1817

**Material examined:** Ağrı: Doğubayazıt, 39° 33' 26" N, 44° 13' 24" E, 1496m., 19.VII.2009, 3♀♀, 8♂♂; Hatay: Hassa, Aktepe, 36° 41' 14" N, 36° 30' 20" E, 213m., 20.V.2010, 2♀♀; Samsun: Kurupelit, Dere, 41° 22' 07" N, 36° 11' 01" E, 150m., 25.VI.2009, 5♀♀, 3♂♂; Sivas: Gölova, Boğazköy, 40° 05' 02" N, 38° 31' 17" E, 1160m., 17.V.2006, 2♂♂.

**Distribution in Turkey:** Adana, Afyon, Ankara, Burdur (Hoberlandt, 1952); Antalya, Aydın, Çanakkale, Çorum, Eskişehir, İçel, İzmir, Kocaeli, Konya, Zonguldak (Jansson, 1986); Kırşehir (Özsaraç, 2004); Denizli, Isparta, Muğla (Kıyak et al., 2007).

***Corixa dentipes*** Thomson, 1869

**Material examined:** Kars: Çamçavuş, 40° 44' 28" N, 43° 10' 42" E, 1723m., 31.VII.2009, 2♀♀, 2♂♂; Van: Gevaş, 38° 19' 19" N, 43° 11' 18" E, 1688m., 23.VII.2009, 3♀♀, 2♂♂; Muradiye, Tansu, 39° 46' 14" N, 44° 08' 59" E, 1547m., 25.VII.2009, 1♂.

**Distribution in Turkey:** Kars (Kiritshenko, 1918); Konya (Hoberlandt, 1952).

***Corixa panzeri*** Fieber, 1848

**Material examined:** Samsun: Bafra, Doğanca, Cernek Lake, 41° 36' 15" N, 36° 05' 13" E, 1m., 07.VII.2010, 2♀♀, 3♂♂.

**Distribution in Turkey:** Ankara, Burdur, Konya (Hoberlandt, 1952; Jansson, 1986).

***Corixa punctata*** (Illiger, 1807)

**Material examined:** Ardahan: Damal, 41° 19' 43" N, 42° 51' 15" E, 2110m., 02.VIII.2009, 1♂; Samsun: Yeşilyurt, 41° 17' 30" N, 36° 16' 28" E, 250m., 25.V.2006, 7♀♀, 3♂♂.

**Distribution in Turkey:** Bursa (Horváth, 1883); Kars (Kiritshenko, 1918); Adana, Afyon, Ankara, Burdur, İzmir, Kastamonu, Konya (Hoberlandt, 1952); Ağrı, Aydın, Çanakkale, Çankırı, Kocaeli (Jansson, 1986); Kırşehir (Özsaraç, 2004); Kayseri (Önder et al., 2006); Antalya, Denizli, Isparta, Muğla (Kıyak et al., 2007).

***Paracorixa*** Poisson, 1957

***Paracorixa concinna*** (Fieber, 1848)

**Material examined:** Ağrı: Baraj, 39° 43' 34" N, 43° 05' 45" E, 1644m., 21.VII.2009, 3♀♀, 1♂; Patnos, 39° 16' 21" N, 42° 48' 30" E, 1650m.,

22.VII.2009, 1♀, 1♂; Erzurum: City centre, 39° 58' 17" N, 41° 12' 46" E, 1761m., 18.VII.2009, 1♀; Kars: Çamçavuş, 40° 44' 28" N, 43° 10' 42" E, 1723m., 31.VII.2009, 1♀; Van: Muradiye, Tansu, 39° 46' 14" N, 44° 08' 59" E, 1547m., 25.VII.2009, 1♀.

**Distribution in Turkey:** Ankara, Burdur (Hoberlandt, 1952); Ağrı, Antalya, Bitlis, İzmir, Kars, Konya, Van (Jansson, 1986).

***Sigara*** Fabricius, 1775

***Sigara nigrolineata*** (Fieber, 1848)

**Material examined:** Ağrı: Doğubayazıt, 39° 33' 26" N, 44° 13' 24" E, 1496m., 19.VII.2009, 2♀♀, 3♂♂; Erzincan: Ahmetli, 39° 51' 40" N, 39° 21' 21" E 1849m., 21.VI.2007, 3♀♀, 2♂♂; Erzurum: City centre, 39° 58' 17" N, 41° 12' 46" E, 1761m., 18.VII.2009, 2♂♂; Hatay: Hassa, Yukarı Akbez, 36° 51' 17" N, 36° 32' 14" E, 536m., 19.V.2010, 1♀, 3♂♂; Iğdır: Tuzluca, 40° 02' 38" N, 43° 41' 30" E, 1092m., 28.VII.2009, 7♀♀; Samsun: Yeşilyurt, 41° 17' 30" N, 36° 16' 28" E, 250m., 25.V.2006, 2♀♀, 2♂♂; Sivas: Gölova, Boğazköy, 40° 05' 02" N, 38° 31' 17" E, 1160m., 17.V.2006, 5♀♀, 2♂♂; Tokat: Erbaa, Kaleköy, 40° 46' 08" N, 36° 30' 19" E, 203m., 25.VI.2006, 2♀♀, 1♂; Reşadiye, 40° 22' 22" N, 37° 24' 42" E, 508m., 25.V.2008, 1♀, 1♂; Van: Çaldıran, Kaz Lake, 39° 08' 56" N, 43° 57' 23" E, 2064m., 20.VII.2009, 14♀♀, 21♂♂.

**Distribution in Turkey:** Adana, Ankara, Edirne, Eskişehir, İzmir, Kilis, Konya (Hoberlandt, 1952); Ağrı, Antalya, Artvin, Bursa, Çanakkale, Diyarbakır, Gaziantep, İstanbul, Konya, Rize, Sakarya, Şanlıurfa, Trabzon, Van, (Jansson, 1986); Kırşehir (Özsaraç, 2004); Aydın, Burdur, Denizli, Isparta, Muğla (Kıyak et al., 2007).

***Sigara striata*** (Linnaeus, 1758)

**Material examined:** Ağrı: Doğubayazıt, 39° 33' 26" N, 44° 13' 24" E, 1496m., 19.VII.2009, 2♀♀; Ardahan: Çıldır Lake, 40° 56' 49" N, 43° 17' 19" E, 1959m., 01.VIII.2009, 9♀♀, 15♂♂; Damal, 41° 19' 43" N, 42° 51' 15" E, 2110m., 02.VIII.2009, 3♀♀, 2♂♂; Samsun: Bafra, Doğanca, Cernek Lake, 41° 36' 15" N, 36° 05' 13" E, 1m., 07.VII.2010, 15♀♀, 7♂♂; Van: Çaldıran, Kaz Lake, 39° 08' 56" N, 43° 57' 23" E, 2064m., 20.VII.2009, 7♀♀, 13♂♂.

**Distribution in Turkey:** Ardahan (Kiritshenko, 1918); Afyon, Ankara, Konya (Hoberlandt, 1952); Ağrı, Çanakkale, Edirne, Erzurum, İzmir (Jansson, 1986); Kayseri (Önder et al., 2006); Antalya, Aydın, Burdur, Denizli, Isparta, Muğla (Kıyak et al., 2007).

***Sigara lateralis*** (Leach, 1817)

**Material examined:** Ağrı: Doğubayazıt, 39° 33' 26" N, 44° 13' 24" E, 1496m., 19.VII.2009, 7♀♀, 11♂♂; Amasya: Dadıköy, 40° 33' 02" N, 35° 47' 03" E, 410m., 28.VI.2009, 2♀♀; Iğdır: Aralık, Karasu River, 39° 52' 26" N, 44° 33' 07" E, 826m., 26.VII.2009, 13♀♀, 7♂♂; Karakoyunlu, Yukarı Alican, 40°

01°51'N, 44° 11'01"E, 859m., 27.VII.2009, 3♀♀, 5♂♂; Kars: Çamçavuş, 40° 44' 28" N, 43° 10' 42" E, 1723m., 31.VII.2009, 2♂♂; Samsun: Kurupelit, Dere, 41° 22' 07" N, 36° 11' 01" E, 150m., 25.VI.2009, 8♀♀, 2♂♂; Sinop: Akliman, 42° 01' 55" N, 35° 03' 31" E, 1m., 12.VII.2009, 6♀♀, 2♂♂; Van: Gevaş, 38° 19' 19" N, 43° 11' 18" E, 1688m., 23.VII.2009, 9♀♀, 2♂♂.

**Distribution in Turkey:** Ağrı, Kars (Kiritshenko, 1918) ; Adana, Afyon, Ankara, Edirne, Eskişehir, İçel, İzmir, Kilis, Kocaeli, Konya, (Hoberlandt, 1952); Artvin, Antalya, Bitlis, Burdur, Bursa, Çanakkale, Diyarbakır, Erzurum, Gaziantep, Kırklareli, Kocaeli, Rize, Tekirdağ, Van (Jansson, 1986); Kırşehir (Özsaraç, 2004); Kayseri, Kırklareli (Önder et al., 2006); Aydın, Denizli, Isparta, Muğla (Kıyak et al., 2007).

**Naucoroidae** Leach, 1815

**Naucoridae** Leach, 1815

***Ilyocoris*** Stål, 1861

***Ilyocoris cimicoides*** (Linnaeus, 1758)

**Material examined:** Ardahan: Damal, 41° 19' 43" N, 42° 51' 15" E, 2110m., 02.VIII.2009, 1♂, 6 nymphs; Kars: Çamçavuş, 40° 44' 28" N, 43° 10' 42" E, 1723m., 31.VII.2009, 21 nymphs; Samsun: Bafra, Doğanca, Cernek Lake, 41° 36' 15" N, 36° 05' 13" E, 1m., 07.VII.2010, 12 nymphs, 2♀♀, 4♂♂.

**Distribution in Turkey:** Adana (Önder et al., 2006); Aydın, Burdur, Denizli, Isparta, Muğla (Kıyak et al., 2007).

**Notonectoidea** Latreille, 1802

**Notonectidae** Latreille, 1802

***Anisops*** Spinola, 1837

***Anisops debilis perplexus*** Poisson, 1929

**Material examined:** Hatay: Hassa, Aktepe, 36° 41' 14" N, 36° 30' 20" E, 213m., 20.V.2010, 1♀.

**Distribution in Turkey:** New record for the fauna of Turkey. Now only known from one place.

**Distribution in Palearctic region:** **Europe:** Portugal, Spain, **North Africa:** Algeria, Libya, Morocco, Madeira, Tunisia, **Asia:** Iran, Iraq, Saudi Arabia, **Extralimital:** Cape Verde Is. (Polhemus et al., 1995).

**Redescription:** Viewed from above, the outline of the head is rounded. Head, pronotum and scutellum yellow. Head width 1.53 mm. Proximal of scutellum black spot (Fig.,1a). Hemelytra yellow (Fig.,1b). Pronotum length 0.71 mm, pronotum width 1.8 mm, scutellum length 1.66 mm, body length 6.91 mm, Body venter black, legs yellow and with short setae, middle and hind femur with black spot. Tibiae brown. Rostral segment I fawn coloured, segments II and

III black. Structural characteristics of examined specimen are in accordance with the measurements given by Poisson (1929) and Brooks (1951).

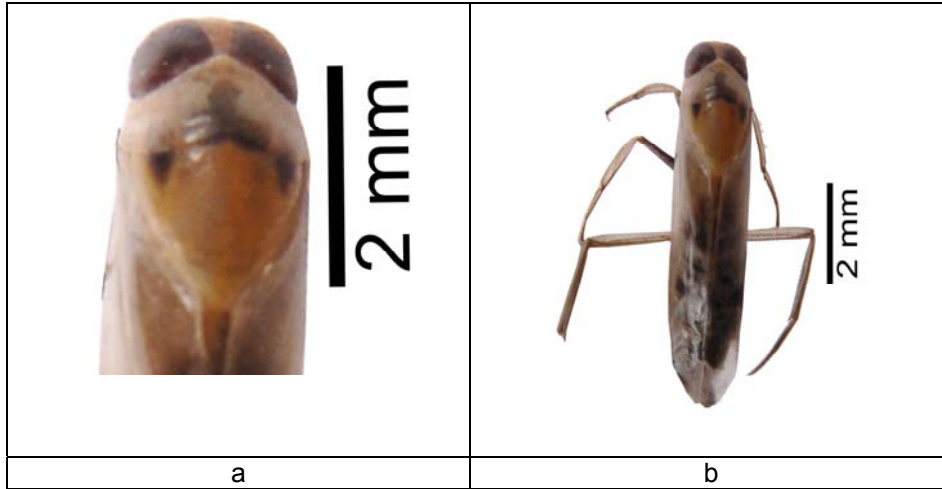


Figure 1. *Anisops debilis perplexus* Poisson, 1929, female: (a) Head, pronotum and scutellum, (b) Body.

***Notonecta*** Linnaeus, 1758

***Notonecta glauca glauca*** Linnaeus, 1758

**Material examined:** Samsun: Yeşilyurt, 41° 17' 30" N, 36° 16' 28" E, 250m., 25.V.2006, 3♀♀, 2♂♂; Konya: 16.VII.1952, 1♀, leg. G. Seidenstücker (ZSMC).

**Distribution in Turkey:** Kars (Kiritshenko, 1918); Afyon, Ankara, Bursa, Erzincan, İzmir, Kastamonu (Hoberlandt, 1952); Kırşehir (Özsaraç, 2004).

***Notonecta glauca poissoni*** Hungerford, 1934

**Material examined:** Ağrı: Baraj, 39° 43' 34" N, 43° 05' 45" E, 1644m., 21.VII.2009, 2♂♂; Doğubayazıt, 39° 33' 26" N, 44° 13' 24" E, 1496m., 19.VII.2009, 1♀, 1♂; Kars: Çamçavuş, 40° 44' 28" N, 43° 10' 42" E, 1723m., 31.VII.2009, 11♀♀, 7♂♂; Van: Çaldıran, Kaz Lake, 39° 08' 56" N, 43° 57' 23" E, 2064m., 20.VII.2009, 4♀♀, 5♂♂.

**Distribution in Turkey:** Erzurum (Hungerford, 1934; Hoberlandt, 1952).

***Notonecta maculata*** Fabricius, 1794

**Material examined:** Amasya: Dadıköy, 40° 33' 02" N, 35° 47' 03" E, 410m., 28.VI.2009, 2♀♀; Hatay: Hassa, Yukarı Akbez, 36° 51' 17" N, 36° 32' 14" E, 536m., 19.V.2010, 5♂♂; Samsun: Kurupelit, Dere, 41° 22' 07" N, 36° 11' 01" E, 150m., 25.VI.2006, 5♀♀, 4♂♂; Kurupelit, Gölet, 41° 21' 01" N, 36° 10' 19" E, 160m., 10.VII.2006, 2♀♀, 2♂♂; Bafra, Bengü, 41° 19' 57" N, 35° 32' 21" E,

1050m., 15.VIII.2007, 4♀♀, 3♂♂; Sinop: Oğuzeli, 41° 40' 10" N, 35° 00' 56" E, 356m., 12.VII.2009, 2♂♂.

**Distribution in Turkey:** İstanbul (Hoberlandt, 1952); Kırşehir (Özsaraç, 2004); Antalya, Aydın, Burdur, Denizli, Isparta, Muğla (Kıyak et al., 2007).

***Notonecta meridionalis*** Poisson, 1926

**Material examined:** Hatay: Hassa, Akbez, 36° 50' 59" N, 36° 32' 22" E, 480m., 18.V.2010, 2♀♀, 2♂♂; Samsun: Kurupelit, Dere, 41° 22' 07" N, 36° 11' 01" E, 150m., 10.VII.2006, 3♀♀, 1♂; Yeşilyurt, 41° 17' 30" N, 36° 16' 28" E, 250m., 25.V.2006, 1♀, 2♂♂. Hatay: Antakya, 08.VI.1952, 1♂; Bursa: Uludağ, 2000 m., 28.VIII.1966, 45♀♀, 21♂♂ leg. G. Seidenstücker (ZSMC).

**Distribution in Turkey:** Ankara, İzmir (Poisson, 1933); Adana, Kocaeli (Hoberlandt, 1952).

***Notonecta obliqua*** Thunberg, 1787

**Material examined:** Kars: Çamçavuş, 40° 44' 28" N, 43° 10' 42" E, 1723m., 31.VII.2009, 10♀♀, 9♂♂; Samsun: Kurupelit, Dere, 41° 22' 07" N, 36° 11' 01" E, 150m., 25.VI.2006, 5♀♀, 4♂♂; 25.VI.2009, 2♀♀, 3♂♂; Yeşilyurt, 41° 17' 30" N, 36° 16' 28" E, 250m., 25.V.2006, 10♀♀, 7♂♂; Van: Çaldıran, Kaz Lake, 39° 08' 56" N, 43° 57' 23" E, 2064m., 20.VII.2009, 2♀♀, 3♂♂.

**Distribution in Turkey:** Adana, İstanbul, Kahramanmaraş, Kırşehir, Kocaeli (Hoberlandt, 1952); Antalya, Burdur, Denizli, Isparta, Muğla (Kıyak et al., 2007).

***Notonecta reuteri*** Hungerford, 1928

**Material examined:** Ardahan: Damal, 41° 19' 43" N, 42° 51' 15" E, 2110m., 02.VIII.2009, 2♂♂.

**Distribution in Turkey:** New record for the fauna of Turkey. Now only known from one place.

**Distribution in Palearctic region: Europe:** Austria, Belgium, Czech Republic, Finland, Germany, Latvia, The Netherlands, Norway, Poland, Russia (Central European Territory, North European Territory, South European Territory), Slovakia, Sweden, Ukraine. **Asia:** Kazakhstan (Asian part), Armenia, China (Northeastern Territory, Northern Territory, Northwestern Territory, Western Plateau), Georgia, Japan, Korea (North and South), Mongolia, Russia (East Siberia, Far East, West Siberia) (Hungerford, 1934; Poisson, 1957; Polhemus et al., 1995).

**Redescription:** Head brownish-yellow; scutellum, hemelytra and dorsum yellow (Fig. 2a). Head width 3.3mm (3.20, 3.40); vertex width 0.77mm (0.73, 0.80); head length 1.59 mm (1.51, 1.66); pronotum yellow, width of pronotum



distinctly greater than length, pronotum length 2.51 mm (2.5, 2.51), pronotum width 4.51 mm (4.41, 4.60); scutellum length 2.61 mm (2.51, 2.70); abdomen width 5.08 mm (4.94, 5.22). Proximal and middle section of exocorium brown (Fig. 2b). Ventral brown and setae black. Legs yellow, claws black (Fig. 2). Rostral segments I and II yellow, segment III yellow with apex dark brown, segment IV black.

Measurements of rostral segments I to IV: 0.60, 0.53, 0.83 and 0.46 mm, respectively. Parameres as illustrated in Figure 3. The aedeagus has no tooth-shaped spur distally (Fig. 4a). The distal end of anal region of genital capsule oval, not angled and the terminal lobe with many spurs and the lateral setae (Fig. 4b). The distal end of anal region of genital capsule oval, not angled and the terminal lobe with many spurs and the lateral setae, and of examined specimens are in accordance with the measurements given by Poisson (1957) and Hungerford (1934) (Fig. 4b).

Structural characteristics of examined specimens are in accordance with the measurements given by Poisson (1933, 1957) and Hungerford (1934). According to these authors the species has a black patch on scutellum, but the exemplars from Turkey do not have such a patch.

The parameres of examined specimens are in accordance with the measurements given by Rabitsch (2005), Poisson (1933, 1957) and Hungerford (1934).

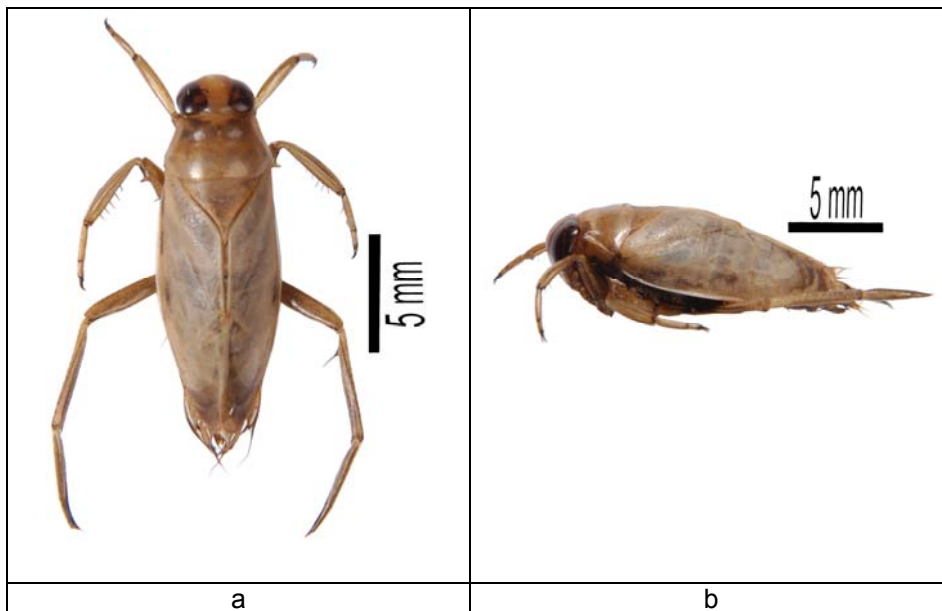


Figure 2. *Notonecta reuteri* Hungerford, 1928: Body, (a) Dorsal and (b) Lateral view (♂).

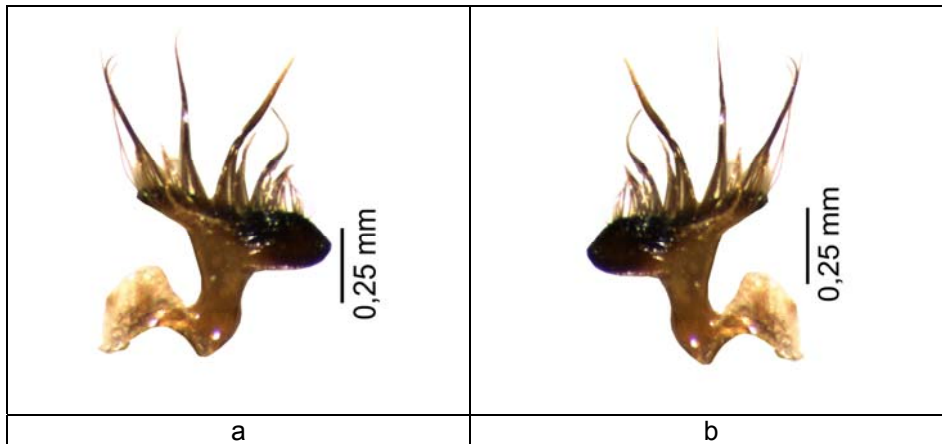


Figure 3. *Notonecta reuteri* Hungerford, 1928: a) Right paramere, b) Left paramere.

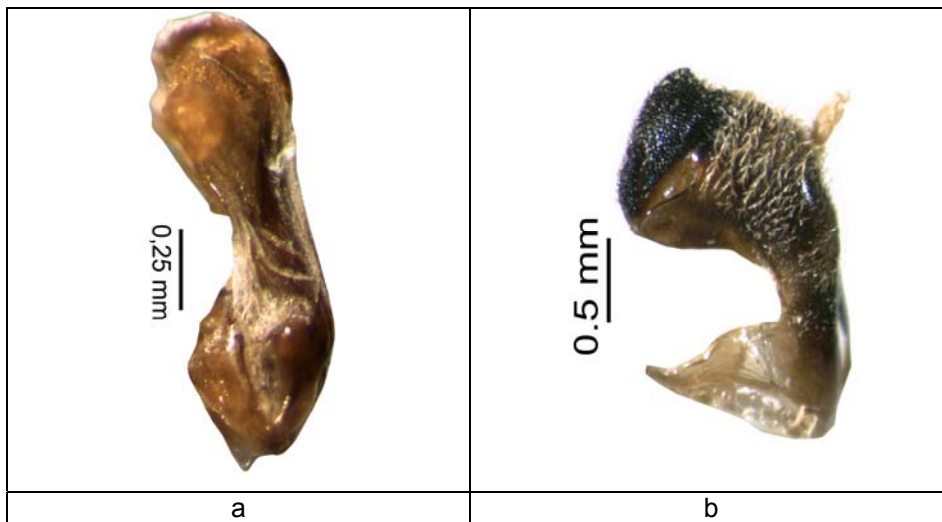


Figure 4. *Notonecta reuteri* Hungerford, 1928: a) Aedeagus (lateral view), b) Genital capsule (lateral view).

***Notonecta viridis* Delcourt, 1909**

**Material examined:** Hatay: Hassa, Aktepe, 36° 41' 14" N, 36° 30' 20" E, 213m., 20.V.2010, 2♀♀, 4♂♂; Samsun: Kurupelit, Dere, 41° 22' 07" N, 36° 11' 01" E, 150m., 25.VI.2009, 1♀, 2♂♂; Sivas: Gölova, Boğazköy, 40° 05' 02" N, 38° 31' 17" E, 1160m., 17.V.2006, 3♀♀, 2♂♂; Tokat: Erbaa, Kaleköy, 40° 46' 08" N, 36° 30' 19" E, 203m, 25.VI.2006, 1♀, 1♂; Van: Gevaş, 38° 19' 19" N, 43° 11' 18" E, 1688m., 23.VII.2009, 1♀.

**Distribution in Turkey:** Kırşehir (Özsaraç, 2004); Afyon (Kıyak et al., 2004); İzmir, Konya, Van (Önder et al., 2006); Antalya, Burdur, Denizli, Isparta, Muğla (Kıyak et al., 2007).

**Pleioidea** Fieber, 1851

**Pleidae** Fieber, 1851

**Plea** Leach, 1817

**Plea minutissima** Leach, 1817

**Material examined:** Samsun: Kurupelit, Dere, 41° 22' 07" N, 36° 11' 01" E, 150m., 25.VI.2009, 2♂♂; Bafra, Doğanca, Cernek Lake, 41° 36' 15" N, 36° 05' 13" E, 1m., 07.VII.2010, 2♀♀.

**Distribution in Turkey:** Adana, Ankara, Burdur, Konya, Nevşehir, (Hoberlandt, 1952); Kayseri (Özemesi & Önder, 1988); Antalya, Denizli, Isparta, Muğla (Kıyak et al., 2007).

## Discussion

Examination of the collected material revealed 20 species and 2 subspecies belonging to 11 genera from 5 families, i.e. the Nepidae, Corixidae, Naucoridae, Notonectidae and Pleidae.

Kıyak & Öz Saraç (2001) listed 8 families of Nepomorpha from various regions of Turkey. The two publications on the Nepomorpha in Turkey, by Kıyak & Öz Saraç (2001) and Önder et al. (2006) list altogether eight families, 20 genera, 51 species and 3 subspecies for the fauna of Turkey. Besides these checklists there are very few other publications on the aquatic Heteroptera of Turkey, most of them providing new regional records (Kıyak & Öz Saraç, 2001; Kıyak et al., 2004, 2007).

In this study, the samples of the *Nepomorpha* species were obtained from stagnant waters. Specimens of the Nepidae and Naucoridae species were observed in shallow parts of lake. *Notonecta reuteri* and *Anisops debilis perplexus* are new records for the fauna of Turkey. *N. reuteri* is known from Armenia and Georgia, while *A. debilis perplexus* is known from Iran and Iraq, all the countries neighbouring the study area (Polhemus et al., 1995). This finding demonstrates how worthwhile it is to continue investigation of the bug fauna and we can expect quite interesting further data.

Among the species listed in the current communication, *Callicorixa raddei*, is obviously found only in the East of Turkey. It was previously recorded from Kars and Ardahan (Kiritshenko & Jaczewski, 1960; Jansson, 1986), in this communication it could be furthermore recorded from Ağrı and Van. A similar situation is found for *Corixa dentipes*, which was, however, also found in Central Anatolia (Konya) (Hoberlandt, 1952).

*Notonecta glauca* has two subspecies, both of which may be found in Turkey, thus there ought to be a geographic separation of the two subspecies within Turkey. Indeed it seems from the results presented here, that *N. glauca*

*glauca* is distributed in Central and Western Anatolia as well as near the Black Sea. *N. glauca poissoni*, on the other hand is to be found in Eastern Anatolia. The specimens which Kritshenko reported about in 1918 belong to the subspecies *N. glauca poissoni* since the subspecies has been described later. Furthermore some other reports seem to be misidentifications; e.g. the specimens mentioned as *N. glauca glauca* by Hoberlandt (1952) from Erzincan belong to the subspecies *N. glauca poissoni*. Also the general distribution of the two subspecies as indicated in the catalogue from Polhemus et al. (1995) needs to be revised. *N. glauca glauca* is distributed throughout Europa, North Africa and many Asian countries. But probably some of the countries mentioned here are not correct, and should be revised. *N. glauca poissoni* is found in Eastern Turkey as well as in the adjacent countries Armenia, Georgia, and Iran.

In this study, *C. raddei*, *C. dentipes* and *N. glauca poissoni* were collected from two, three and five localities, respectively. *Ranatra linearis*, *C. panzeri*, *C. punctata*, *Sigara striata*, *N. viridis* and *Plea minutissima* are first records for the Black Sea region, *C. affinis*, *Ilyocoris cimicoides* and *N. obliqua* are first records for both the Black Sea region and eastern Anatolia.

The following records are new for the respective provinces: *Paracorixa concinna* for Erzurum; *S. lateralis* for Amasya, Iğdır, Samsun and Sinop; *S. nigrolineata* for Erzurum, Erzincan, Iğdır, Samsun, Sivas and Tokat; *Micronecta anatolica* for Kahramanmaraş, and Van, *N. glauca glauca* for Konya and *N. meridionalis* for Bursa, Hatay, and Samsun. All other species are new records for the research areas.

In this study, the species of *A. debilis perplexus*, *N. reuteri*, *C. dentipes*, *C. panzeri*, *C. raddei*, *R. linearis* and *M. anatolica* were of sparse distribution. General geographical distributions of these species suggest their common distribution, but according to available records they are rarely distributed in Turkey. On the other hand, the species of *S. lateralis*, *S. nigrolineata*, *S. striata*, *C. affinis* and *C. punctata* are frequent and widely distributed in Turkey.

As a result of the current study, the list of Nepomorpha known in the research area has increased to 52 species and 4 subspecies, and the distribution of previously known species has broadend.

## Özet

### **Anadolu'nun bazı bölgelerinde Nepomorpha (Hemiptera) türleri üzerine bir araştırma ve Türkiye faunası için yeni kayıtlar: *Anisops debilis perplexus* Poisson, 1929 ve *Notonecta reuteri* Hungerford, 1928**

Nepomorpha (Hemiptera) üzerine yapılan bu çalışma; Doğu Anadolu Bölgesi, Karadeniz Bölgesi, Kelkit Vadisi, Hatay'a ait 29 farklı lokaliteden elde edilen ve Münih Zooloji Müzesi'nde bulunan, Seidenstücker tarafından Türkiye'nin farklı bölgelerinden

toplanmış, yayınlanmamış toplam 610 ergin ve 83 nimf ile gerçekleştirilmiştir. Çalışma sonucunda 11 cinse bağlı 20 tür ve 2 alttür tespit edilmiştir. Tespit edilen türlerden 20'si elde edildikleri bölgeler için ayrıca *Anisops debilis perplexus* Poisson, 1929 ve *Notonecta reuteri* Hungerford, 1928 'nin Türkiye faunası için yeni kayıt oldukları tespit edilmiştir.

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