

Contributions to the Nabidae (Hemiptera: Heteroptera) Fauna in the Thrace Region, Turkey

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ABSTRACT: The present study was conducted in 73 localities between May and September of 2013 and 2014 in Edirne Province and in two localities in 2016 in Kırklareli Province. As a result, 6 species belonging to 3 genera from Nabinae and Prostematinae subfamilies of Nabidae family were determined. Among these species, *Nabis flavomarginatus* Scholtz, 1847 and *Nabis ferus* (Linnaeus, 1758) are first records for the Heteroptera fauna of the Thrace Region and additional locality records for 4 species known from the region are given.

KEYWORDS: Nabidae, fauna, taxonomy, first record, Turkish Thrace, Turkey.

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INTRODUCTION

All species of the Nabidae family are predators and feed on eggs, larvae and adults of insects and other small Arthropods.

Most species are polyphagous, but species of the subfamily Prostematinae particularly feed on Lygaeidae, another family of Heteroptera. All Prostematinae and some Nabinae species live in soil and are found among debris or under stones. Some Nabinae species are found on grasses and some on trees.

Most species spend the winter as adults and some as eggs. Some species belonging to the subfamily Nabinae (*Nabis ferus*, *N. pseudoferus*, *N. punctatus*, *N. palifer*, *N. capsiformis* and *Himacerus apterus*) are more or less important in the control of agricultural and forest pests (Kerzhner, 1996).

Nabidae family is a small family and is represented with 500 species belonging to 21 genera in the world, 122 species belonging to 3 subfamilies and 10 genera in the Palearctic Region and 26 species belonging to 2 subfamilies and 5 genera



in Turkey (Kerzhner, 1996; Önder et al., 2006; Aukema et al., 2013).

Although the studies on the Nabidae family in Turkey started in the old years, they are quite limited. The foreign and native researchers (Horváth, 1883, 1901, 1905, 1918; Reuter, 1890; Puton, 1892; Puton & Noualhier, 1895; Kiritshenko, 1918, 1924; Fahringer, 1922; Gadeau De Kerville, 1939; Hoberlandt, 1956; Linnavuori, 1965, Tuatay et al., 1972; Önder et al., 1981, 1983, 1984, Kıyak, 1990) gave local records limited to a few species, while Erbay (1986) mentioned from 13 species in his master's thesis on Nabidae family collected from different localities from Turkey, and Dursun (2011) from 9 species in his study on Kelkit Valley Heteroptera species.

The records of the Nabidae family from the Thrace Region are very limited and so far 10 species belonging to 4 genera have been recorded (Horváth, 1918; Fahringer, 1922; Hoberlandt, 1956; Önder et al., 1984; Dursun & Fent, 2015). Nabidae family is represented by 42 species in Europe, 15 species in Greece and 17 species in Bulgaria (Aukema, 2013).

MATERIAL AND METHOD

The research material belonging to the family Nabidae were collected from different localities in terms of habitat characteristics, which were determined in Edirne Province between May and September in 2013-2014 years, especially during the spring-summer period when the species are active. In addition, the material obtained from two locations (loc.74, loc.75) from Kirklareli Province was added the study data (Table 1).

The research material was collected with the help of a sweep net from short herbaceous plants and with an aspirator from the soil. In addition, male pygophore and paramer structures are highly useful morphological characters in Nabidae family species, as in most Heteroptera suborder species. For this reason, after the male specimens were kept in hot water for about 5 minutes, the pygophore and its paramers were removed under the microscope with the help of a fine-tipped forceps and a preparation needle, and these structures were also used in the identification of the species.

Table 1. The localities, coordinates, altitudes and the dates of the field studies in Edirne Province

Loc No	Locality	Coordinate	Altitude	Date
1	Havsa-Arpaç	41°41'08N 26°52'33E	113m	30.08.2013
2	Havsa-Necatiye	41°30'18N 26°53'54E	57m	30.08.2013
3	Havsa-Osmanlı	41°35'00N 26°50'13E	82m	22.08.2013 11.06.2014
4	Lalapaşa-Sinanköy	41°48'55N 26°41'49E	127m	05.07.2013
5	Lalapaşa-Vaysal	41° 56' 26N 26° 52' 9E	438m	05.07.2013
6	Süloğlu -around the Süloğlu Dam	41° 46' 8N 26° 54' 36E	155m	21.07.2013
7	Edirne-Center	41°40'33N 26°33'31E	41m	12.06.2014 20.08.2014
8	Enez-Çavuşköy	40°41'17N 26°10'15E	68m	04.08.2008
9	Uzunköprü- Center	41°15'58N 26°41'19E	32m	08.07.2009 15.07.2009
10	İpsala-Center	40°55'16N 26°22'58E	19m	15.07.2009

Table 1. Continued

11	Lalapaşa-Çömlekköy	41°50'34N 26°36'38E	101m	14.08.2013
12	Enez- Center	40°43'29N 26°4'57E	24m	04.09.2013
13	Center-Bosnaköy	41°37'35N 26°36'12E	41m	29.05.2014
14	Center-Üyükütatar	41°32'19N 26°36'3E	44m	29.05.2014
15	Havsa-Bostanlı	41°36'50N 26°58'0E	90m	11.06.2014
16	Havsa-Yolageldi	41°31'0N 26°56'60E	59m	11.06.2014
17	Havsa-Tahal	41° 5'0N 26°51' 0E	42m	13.06.2014
18	Uzunköprü- Değirmenci	41°18'37N 26°42'2E	48m	13.06.2014
19	Uzunköprü-Meşeli	41°22'60N 26°43'60E	83m	13.06.2014
20	Uzunköprü-Başağıl	41°15'49N 26°47'49E	39m	03.07.2014
21	Uzunköprü-Bayramlı	41°18'24N 26°49'34E	77m	03.07.2014
22	Uzunköprü-Çöpköy	41°13'8N 26°49'18E	87m	03.07.2014
23	Uzunköprü-Gazimehmet	41°12'0N 26°55'0E	112m	03.07.2014
24	Uzunköprü-Kırcasalih	41°23'33N 26°48'11E	98m	03.07.2014
25	Uzunköprü-Muhacirkadı	41°,20',30N 26°,52',18E	27m	03.07.2014
26	Uzunköprü-Sipahi	41°13'60N 26° 52' 60E	89m	03.07.2014
27	Uzunköprü-Yağmurca	41°10'0N 26°51'0E	125m	03.07.2014
28	Uzunköprü-Çobanpınar	41°10'60N 26° 33' 0E	25m	07.07.2014
29	Uzunköprü-Karapınar	41°7' 0N 26°37'60E	50m	07.07.2014
30	Uzunköprü-Kavacık	41°11'14N 26°39'56E	53m	07.07.2014
31	Uzunköprü-Kavakayazma	41°7'60N 26°31'60E	27m	07.07.2014
32	Uzunköprü-Kırköy	41°6'0N 26°43'60E	134m	07.07.2014
33	Uzunköprü-Süleymaniye	41°7'22N 26°48'30E	261m	07.07.2014
34	Lalapaşa-Çömlekakpınar	41°51'0N 26°37'0E	148m	09.07.2014
35	Lalapaşa-Çalidere	41°55'60N 26°43'60E	197m	15.07.2014
36	Lalapaşa-Kalkansöğüt	41°58'60N 26°48'60E	414m	15.07.2014
37	Lalapaşa-Ömeroba	41°55'0N 26°55'60E	328m	15.07.2014
38	Lalapaşa-Süleymandanişment	41°53'60N 26°53'60E	383m	15.07.2014
39	Süloğlu-Taşlısekban	41°47'60N 26°52'60E	195m	15.07.2014
40	Enez-Arnavutköy	41°43'0N 26°34'60E	76m	04.08.2014
41	Lalapaşa-Kavaklı	41°47'60N 26°45'0E	174m	04.08.2014
42	Meriç-Hasırcı	41°16'0N 26°27'60E	54m	04.08.2014 24.08.2014
43	Meriç-Karayusuflu	41°15'28N 26°25'55E	24m	04.08.2014

Table 1. Continued

44	Uzunköprü-Çiftlikköy	41°14'0N 26° 37' 0E	10m	04.08.2014
45	Uzunköprü-Karayayla	41°15'0N 26°34'60E	25m	04.08.2014
46	İpsala-İbriktepe	41°0'35N 26°30'11E	127m	12.08.2014
47	İpsala-Sarıcaali	40°59'60N 26°22'0E	53m	12.08.2014
48	Meriç-Karaağaç	41°11'28N 26°25'25E	23m	12.08.2014
49	Meriç-Küplü	41°6'25N 26°21'7E	12m	12.08.2014
50	Meriç-Subaşı	41°08'60N 26°22'0E	19m	12.08.2014
51	İpsala-Pazardere	40°58'40N 26°34'52E	125m	13.08.2014
52	İpsala-Turpçular	40°56'28N 26°26'15E	27m	13.08.2014
53	Keşan-Begendik	40°55'57N 26°34'26E	114m	13.08.2014
54	Keşan-Altıntaş	41°00'0N 26°42'60E	185m	23.08.2014
55	Keşan-Kozköy	41°1'0N 26°36'0E	63m	23.08.2014
56	Enez-Abdurrahim	40°38'31N 26°15'25E	40m	24.08.2014
57	Enez-Hasköy	41°38'28N 26°51'31E	102m	24.08.2014
58	Enez-Işıklı	40°43'0N 26°18'0E	13m	24.08.2014
59	Enez-Koyuntepe	40°46'0N 26°20'60E	23m	24.08.2014
60	Enez-Küçükveren	40°38'60N 26°10'0E	41m	24.08.2014
61	Enez-Sultaniçe	40°37'35N 26°9'12E	11m	24.08.2014
62	Enez-Yenikarpuzlu	40°46'0N 26° 12' 0E	17m	24.08.2014
63	Keşan-Çelebi	40°40'41N 26°20'49E	135m	24.08.2014
64	Keşan-Orhaniye	41°43'0N 26°25'60E	29m	24.08.2014
65	Keşan-Bahçeköy	40°46'10N 26°40'32E	45m	26.08.2014
66	Keşan-Boztepe	40°50'60N 26°33' 0E	53m	26.08.2014
67	Keşan-Çeltik	40°40'60N 26°33'0E	117m	26.08.2014
68	Keşan-Karahisar	40°45'0N 26°30'0E	21m	26.08.2014
69	Keşan-Koruklu	40°39'60N 26°25'0E	51m	26.08.2014
70	Keşan-Mecidiye	40°38'20N 26°32'14E	29m	26.08.2014
71	Keşan-Mercan	40°44'60N 26°36'0E	72m	26.08.2014
72	Keşan-Suluca	40°41'20N 26°27'49E	145m	26.08.2014
73	Lalapaşa-Hacıdanişment	41°54'35N 26°49'26E	508m	07.06.2016
74	Kırklareli-Lüleburgaz- Evrensekiz	41°22'11N 27°29'42E	73 m	14.05.2016
75	Kırklareli- between Lüle- burgaz-Pınarhisar	41°29'57N 27°24'51E	106m	16.06.2016

Family: NABIDAE A. Costa, 1853

Subfamily: NABINAE A. Costa, 1853

Genus: NABIS Latreille, 1802

***Nabis (Nabicula) flavomarginatus* Scholtz, 1847**

Material: EDİRNE: İpsala (Turpçular), 13.08.2014, 1♂; **Keşan** (Bahçeköy), 26.08.2014, 2♂♂; **Uzunköprü** (Karapınar), 07.07.2014, 2♂♂

Distribution in Turkey: Turkey Asian part (Anatolia) (Kerzhner, 1996).

***Nabis (Nabis) pseudoferus* Remane, 1949**

Material: EDİRNE: Center-Karaağaç, 12.08.2014, 2♀♀, 7♂♂; **Enez- Center** 5m 04.09.2013 1♂; Çavuşköy, 04.08.2008, 1♀, 2♂♂; Arnavutköy, 04.08.2014, 8♀♀, 5♂♂; Çelebi, 24.08.2014, 4♀♀, 3♂♂; Işıklı, 24.08.2014, 2♀♀, 4♂♂; Küçükevren, 24.08.2014, 10♀♀, 1♂; Sultaniçe, 24.08.2014, 2♀♀, 2♂♂; Yenikarpuzlu, 24.08.2014 5♀♀, 4♂♂; **Havsa-Arpaç**, 30.08.2013, 8♀♀, 13♂♂; Osmanlı, 22.08.2013, 7♀♀, 1♂; Neca-tiye, 30.08.2013, 5♂♂; Bostanlı, 11.06.2014, 18♀♀, 5♂♂; Yolageldi, 11.06.2014, 2♀♀, 1♂; Tahal, 13.06.2014, 17♀♀, 3♂♂; **İpsala-Center** 15.07.2009, 1♂; İbriktepe, 12.08.2014, 3♀♀, 2♂♂; Sarıcaali, 12.08.2014, 4♀♀, 5♂♂; Pazardere, 13.08.2014 2♀♀, 9♂♂; Turpçular, 13.08.2014 10♀♀, 8♂♂; Keşan-Beğendik, 13.08.2014, 4♂♂; Kozköy 23.08.2014, 2♀♀, 1♂; Altıntaş, 26.08.2014, 4♀♀; Bahçeköy, 26.08.2014, 6♀♀, 2♂; Boz-tepe, 26.08.2014 1♂; Çeltik, 26.08.2014, 4♀♀; Karahisar, 26.08.2014, 2♀♀, 3♂♂; Ko-ruklu, 26.08.2014, 1♀, 1♂; Mecidiye, 26.08.2014, 14♀♀, 7♂♂; Mercan, 26.08.2014 2♀♀, 2♂♂; Orhaniye, 24.08.2014, 5♀♀, 5♂♂; Suluca, 26.08.2014, 4♀♀, 2♂♂; **Lalapaşa-Sinanköy**, 05.07.2013, 8♂♂, 15♀♀; 05.07.2013, 2♀♀, 4♂♂; Vaysal, 05.07.2013, 1♂; Çömlekköy, 14.08.2013, 1♂; Çömlekakpınar, 09.07.2014, 7♂♂; Çalidere, 15.07.2014, 2♀♀, 4♂♂; Kalkansöğüt, 15.07.2014, 3♀♀, 2♂♂; Ömeroba, 15.07.2014 3♀♀, 4♂♂; Süleymandanişment, 15.07.2014, 1♂; Kavaklı, 04.08.2014, 8♀♀, 1♂; **Meriç-Karayusuflu**, 04.08.2014, 4♂♂; Subaşı, 12.08.2014, 2♀♀, 3♂♂; Hasırcı, 24.08.2014, 10♀♀, 6♂♂; **Süloğlu-** around the Süloğlu Dam. 21.07.2013, 2♀♀, 11♂♂; 21.07.2013 2♀♀; Taşlısekbani, 15.07.2014, 13♀♀, 7♂♂; **Uzunköprü-Center**, 15.07.2009, 1♂; Meşeli, 13.06.2014, 1♀; Başağlı, 03.07.2014, 6♀♀, 3♂♂; Bayramlı, 03.07.2014, 2♂♂, Çöpköy, 03.07.2014, 2♀♀, 4♂♂; Gazimehmet, 03.07.2014, 14♀♀, 10♂♂; Kircasali, 03.07.2014, 3♀♀, 1♂; Muhacirkadı, 03.07.2014, 10♀♀, 9♂♂; Sipahi, 03.07.2014, 8♀♀, 5♂♂; Yağmurca, 03.07.2014, 2♂♂; Çobanpınar, 07.07.2014, 5♀♀, 2♂♂; Kavacık, 07.07.2014, 1♀, 3♂♂; Karapınar, 07.07.2014, 40♀♀, 29♂♂; Kavakayazma, 07.07.2014, 1♀; Kırköy, 07.07.2014, 7♀♀, 4♂♂; Süleymaniye, 07.07.2014, 12♂♂; Karayayla, 04.08.2014, 10♀♀, 4♂♂.

***Nabis (Nabis) punctatus* A. Costa, 1847**

Material: EDİRNE: Center, 12.06.2014, 5♀♀, 1♂; Karaağaç, 12.08.2014, 1♂; **İpsala-Turpçular**, 13.08.2014, 1♂; **Meriç-Küplü**, 12.08.2014, 4♀♀, 2♂♂; **Uzunköprü-Gazimehmet**, 03.07.2014, 1♂.

***Nabis (Nabis) ferus* (Linnaeus, 1758)**

Material: EDİRNE: Center, 12.06.2014, 3♀♀, 2♂♂; Bosnaköy, 29.05.2014, 6♂♂; Üyükütatar, 29.05.2014, 2♀♀, 5♂♂; Karaağaç, 12.08.2014, 1♀, 8♂♂; **Enez-Arnavutköy**, 04.08.2014, 14♀♀, 10♂♂; Abdurrahim, 24.08.2014, 1♂; Çelebi, 24.08.2014, 3♀♀, 2♂♂; Hasköy, 24.08.2014, 1♂; Işıklı, 24.08.2014, 3♀♀, 2♂♂; Koyun-tepe, 24.08.2014, 2♀♀, 1♂; Küçükevren, 24.08.2014, 11♀♀, 3♂♂; Sultaniçe, 24.08.2014, 1♂; Yenikarpuzlu, 24.08.2014, 5♀♀, 7♂♂; **İpsala-Sarıcaali**, 12.08.2014, 2♀♀, 4♂♂; **Keşan-Kozköy**, 23.08.2014, 1♀, 1♂; Orhaniye, 24.08.2014, 2♀♀, 2♂♂; Bah-

çeköy, 26.08.2014, 2♀♀, 1♂; Boztepe, 26.08.2014, 1♂; Çeltik, 26.08.2014, 2♀♀, 2♂♂; Karahisar, 26.08.2014, 1♀, 1♂; Mecidiye, 26.08.2014, 10♀♀, 5♂♂; Mercan, 26.08.2014, 1♀, 1♂; Suluca, 26.08.2014, 2♀♀, 2♂♂; **Meriç**-Hasırcı, 04.08.2014, 12♀♀, 12♂♂; **Süloğlu**-Taşlısekban, 15.07.2014, 8♀♀, 4♂♂; **Havsa**-Bostanlı, 11.06.2014, 10♀♀, 6♂♂; Osmanlı, 11.06.2014, 2♀♀, 15♂♂; Tahal, 13.06.2014, 10♀♀, 11♂♂; **Uzunköprü**-Değirmenci, 13.06.2014 5♂♂; Çöpköy, 03.07.2014, 1♀, 4♂♂; Gazimehmet, 03.07.2014, 10♀♀, 9♂♂; Muhacirkadı, 03.07.2014, 7♀♀, 1♂; Sipahi, 03.07.2014, 6♀♀, 7♂♂; Çobanpınar, 07.07.2014, 5♀♀, 2♂♂; Karapınar, 07.07.2014, 15♀♀, 16♂♂; Çiftlikköy, 04.08.2014, 3♂♂; Karayayla, 04.08.2014, 4♀♀, 7♂♂.

Distribution in Turkey: Ağrı, Amasya, Antalya, Bursa, Diyarbakır, Elazığ, Erzurum, Giresun, Iğdır, Hatay, Kahramanmaraş, Kars, Tokat (Hoberlandt, 1856; Dursun, 2011; Yıldırım et al., 2013).

Genus: HIMACERUS Wolff, 1811

Himacerus (Aptus) mirmicoides (O. Costa, 1834)

Material: EDİRNE: Center-Sarayıcı (Tavukormanı), 20.08.2014, 1♀.

Subfamily: PROSTEMMATINAE Reuter, 1890

Genus: PROSTEMMA Laporte, 1832

Prostemma sanguineum (Rossi, 1790)

Material: EDİRNE: Lalapaşa-Hacıdanışment, 07.06.2016, 1♂, 3 nimf; KIRKLAELİ: Lüleburgaz-Evrensekiz, 14.05.2016, 1♀, 1♂; between Lüleburgaz-Pınarhisar, 16.06.2016, 2♂♂.

RESULTS AND DISCUSSION

In this study, 6 species belonging to 3 genera from Nabinae and Prostemmatinae subfamilies of Nabidae family were determined in Turkish Thrace. Among these species, *Nabis flavomarginatus* Scholtz, 1847 and *Nabis ferus* (Linnaeus, 1758) are new records for the Heteroptera Fauna of the Thrace Region and additional records of 4 known species from the region were given.

The first findings of *Nabis flavomarginatus* for the Thrace Region, was detected in 3 localities located in the south of Edirne (Uzunköprü - Karapınar, İpsala - Turpçular, Keşan - Bahçeköy). When taking into account the distributional data of the species in Turkey (Kerzhner, 1996; Aukema, 2020), it is given only as the "Asian part" without specifying the locality. The species, which has a wide distribution in Europe and Asia in the Palearctic distribution, also spreads in Alaska, Canada, Greenland in the Nearctic Region, apart from the Palearctic.

Nabis (Nabis) ferus has a wide distribution, and was detected in 37 different localities in Edirne Province in this study.

Although its known distribution from Anatolia is based on quite old years, it is not very common in Anatolia.

In the Palearctic Region, it shows a very wide distribution in Europe and Asia, including Turkey and the neighboring countries to the research area (Kerzhner, 1996). This species was recorded for the first time in the Thrace Region during this study. It is very similar to *N. pseudoferus* and *N. punctatus* species in terms of general appearance, but it is easily distinguished from these two species by the fact that the apex of the paramer in the male is pointed in the form of spines.

The other 4 species, *Nabis pseudoferus*, *N. punctatus*, *Himacerus mirmicoides* and *Prostemma sanguineum* identified in this study, are very common both in Turkey and in their general geographical distribution. *N. pseudoferus* was also detected in many localities during the research.

The species of the genus *Nabis* were generally detected in the alfalfa fields or the wild green grasses on the field or roadside during our research. These habitats, where the species are detected, are generally rich in other soft-bodied insect larvae or adults hunted by the species. It is thought that *Nabis* species chose these habitats because of the convenience in finding prey by them. *Prostemma sanguineum* was found on the ground in the alfalfa fields, and under stones and *Himacerus mirmicoides* in the mixed forest dominated by poplar.

In the study, when the most common species in 75 localities where field studies were carried out were evaluated respectively; *Nabis pseudoferus* was detected from 62 localities, *N. ferus* from 37 localities, *N. punctatus* from 5 localities, *N. flavomarginatus* and *Prostemma sanguineum* from 3 localities, and *Himacerus mirmicoides* from only 1 locality.

When the data obtained as a result of the research were evaluated, the number of species of Nabidae family in the Thrace Region increased to a total of 12 with the addition of two new records. In addition, new data on the distribution of previously known species were obtained.

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