

DERMAPTERA SPECIES IN FRUIT ORCHARDS IN THE WESTERN BLACK SEA REGION OF TURKEY

Gülay Kaçar* and Masaru Nishikawa**

* Bolu Abant İzzet Baysal University, Faculty of Agriculture and Natural Sciences, Plant Protection Department, Bolu, TURKEY. E-mail: gulaysahan@yahoo.com

** Entomological Laboratory, Faculty of Agriculture, Ehime University, Tarumi 3-5-7, Matsuyama, 790-8566, JAPAN.

[Kaçar, G. & Nishikawa, M. 2020. Dermaptera species in fruit orchards in the Western Black Sea region of Turkey. *Munis Entomology & Zoology*, 15 (2): 357-363]

ABSTRACT: Earwigs are sub-social species, with their females defending their eggs and young nymphs. They are omnivores feeding on decayed animal or plant waste, aphids, and other small insects. In the study, 345 earwig samples were collected from apple (48%), cherry (40%) and hazelnut (12%) trees from June/July to November in 2015 and 2016. The aphids were found as the most abundant insect in the apple orchards in June, but most red mites in cherry orchards were observed in July and August. Three species, *Forficula auricularia* Linnaeus, *Forficula smyrnensis* Serville, and *Guanchia hincksi* (Burr), were collected from the apple and cherry orchards in Bolu province; and *F. auricularia*, *G. hincki*, and *Apterygida albipennis* (Megerle von Mühlfeld) were collected from the hazelnut orchards in Düzce province. *F. smyrnensis* was recorded for the first time in Bolu and *G. hincksi* in Düzce. *F. auricularia* was the common species in the fruit areas of the Western Black Sea Region. This paper also discusses information on the seasonal occurrence and feeding behavior of earwigs.

KEY WORDS: Dermaptera, apple, cherry, hazelnut, Bolu, Düzce, Turkey

Dermapteran species, previously listed in the world (Haas, 2018), are also known as earwigs due to the common superstition that these insects crawl into the ears of sleeping people (Haas, 1996; Jacobs, 2013). Dermaptera are a relatively small order of insects comprising about 2200 species, distributed in tropical and warm temperate regions (Popham, 2000; Grimaldi & Engel, 2005; Anlaş & Koçarek, 2012; Haas et al., 2012). To date, 21 Dermaptera species have been recorded in Turkey, of which three belong to Anisolabididae, 13 to Forficulidae, two to Labiduridae, and three to Spongiphoridae (Haas, 2018).

The Dermaptera fauna of the Western Black Sea Region of Turkey has not been well studied, with the currently known species being limited to *Euborellia annulipes* (Lucas) (Anisolabidae), *Labidura riparia* (Pallas) (Labiduridae), *Isolaboides kosswigi* (Burr) (Spongiphoridae), *Anechura bipunctata* (Fabricius), *Apterygida albipennis* (Megerle von Mühlfeld), *Forficula aetorica* Brunner, *Forficula auricularia* Linnaeus, *Forficula lurida* Fischer, *Forficula smyrnensis* Audinet-Serville, and *Guanchia hincksi* (Burr) (Forficulidae) (Anlaş & Kocarek, 2012; Nishikawa & Kaçar, 2018). Among these 10 species, *F. auricularia* is one of the most common in Turkey, as well as being widely distributed worldwide. It is not only a well-known pest of ripe fruit trees, such as apple, apricot, peach, plum, and pear but also a predator of insects; e.g., aphids, scale insects, psyllids, and midges (Albouy & Caussanel, 1990; Bayhan et al., 2006; Capinera, 2010; Özsisli, 2016). In Turkish fruit orchards, faunistic studies on Dermaptera have been previously conducted in pomegranate (Öztürk & Ulusoy, 2011), cherry (Tezcan & Kocarek, 2009), olive (Kaçar & Nishikawa, 2014), apricot (Ayaz et al., 2009;

Özgen et al., 2016), and citrus (Öztürk & Ulusoy, 2011). In addition, some Dermaptera species collected from fruit trees have been recorded in the taxonomic, faunistic or biological literature (Ulusoy et al., 1999; Önder et al., 1999; Erler, 2004; Öztürk et al., 2004; Anlaş et al., 2010; Tezcan et al., 2011; Aslan & Karaca, 2005, 2012; Aslan, 2015; Ayaz & Özgen, 2015; Ölmez-Bayhan et al., 2015; Yıldırım & Başpınar, 2015; Özsıslı, 2016; Başar & Yaşar, 2018; Nishikawa & Kaçar, 2018).

Earwigs live in cooler habitats, warm climates, and tropical regions. The females of earwigs mostly lay eggs under stones. Earwigs hide under stones or in the cracks and crevices of tree bark during the day, and eat plant debris and prey on other insects at night (Jacobs, 2013; Hollingsworth, 2019). Most species of earwigs are omnivorous but species that are predominantly phytophagous (e.g., feeding on flowers, ripening fruit, and vegetables) or predacious (e.g., feeding on aphids and other small insects) are also known. Some species live on decaying material (Haas, 1996). Predatory species feed on a variety of insects but seem to prefer soft-bodied larvae (Gibb, 2015). *F. auricularia*, primarily known as the European earwig distributed throughout European countries, preys on soft-bodied insects and scavenges on decaying vegetation, but it rarely damages ripening fruit and fresh leaves (Ayaz et al., 2009; Hollingsworth, 2019). Although there is sufficient data concerning the feeding behavior of *F. auricularia*, these behaviors have only been poorly studied in fruit trees.

The aim of this study was to contribute to the current fauna of earwigs in fruit trees in Turkey based on the samples collected from the cherry, apple and hazelnut orchards located in Bolu and Düzce.

MATERIAL AND METHODS

Study areas and collection of insects

The study was conducted in the apple and cherry orchards of Bolu province, and the hazelnut orchards of Düzce province located in the Western Black Sea Region of Turkey. This region, covering a total land of 141,000 square kilometers, is heavily forested and has a steep and rocky coast and rivers. It has a mild and humid climate and receives rain almost every season. Thus, the hazelnut is one of the most important crops of this area, in addition to some fruit varieties, such as apple, cherry, and plum that are also grown in the region.

The earwig species were collected from the apple and cherry orchards in Seben district (Bolu), and from the hazelnut orchards in Çilimli and Fevziye districts (Düzce). The samples were taken fortnightly from May/June to November in 2015 and 2016. A total of six orchards, two for each fruit species, were selected to conduct the study. The samples were collected using a mouth aspirator and a sweep net through the manual examination of the shoots and bark of the trees. Twenty-five trees per orchard were randomly selected and sampled from the main direction of each tree. A total of 100 branches per orchard were sampled using the knock-down method (Steiner & Goodwin, 1998). The forficulid samples were placed into tubes. All samples were collected by the first author and identified by the second author. The collected samples were deposited in Ehime University.

RESULT AND DISCUSSION

The total number of the collected specimens was 345, of which 164, 135 and 44 were taken from the apple, cherry and hazelnut orchards, respectively. *F. auricularia*, *F. smyrnensis*, and *G. hincki* were identified in the samples

collected from the apple and cherry orchards in Bolu while *A. albipennis*, *F. auricularia*, and *G. hincksi* were present in the samples obtained from the hazelnut orchards in Düzce. In this study, *F. auricularia* (93%) was found to be the dominant species followed by *G. hincksi* (5%) and *F. smyrnensis* (2%) (Table 1). In the literature, Tezcan & Kocarek (2009) reported four forficulid species, *F. auricularia*, *F. lurida* Dohrn, *F. smyrnensis* and *G. hincksi*, in the cherry orchards located in Manisa and Izmir, Turkey. Özgen et al. (2016) also recorded four forficulid species, *F. auricularia*, *F. lurida*, *F. aetolica* Brunner, and *Isolaboides kosswigi* (Burr) (Spongiphoridae), in the apricot orchards of Elazığ and Malatya.

In the cherry, apple and hazelnut orchards, *F. auricularia* was predominant in Bolu and Duzce, but *F. smyrnensis* was reported for the first time. *F. auricularia* and *G. hincksi* were recorded in previous faunistic studies undertaken in Bolu (Tezcan et al., 2011; Anlaş & Kocarek, 2012). In the current study, *F. auricularia* was most abundant in the cherry orchards followed by the apple orchards (Table 1). *G. hincksi* and *F. smyrnensis* were poorly obtained from apple and cherry. In contrast, Tezcan & Kocarek (2009) recorded *F. smyrnensis* as the dominant species in ecologically managed cherry orchards in western Turkey. The authors also stated that collection of *F. smyrnensis* by fermenting bait traps was the most effective method for monitoring the presence of this species in cherry orchards. In other studies, *F. auricularia* was similarly obtained as the most abundant species in apricot and pomegranate orchards in Adana, Elazığ, Malatya, Mersin, and Osmaniye, and chesnut in İzmir and Manisa (Ulusoy et al., 2001; Ayaz et al., 2009; Anlaş et al., 2010; Öztürk & Ulusoy, 2011; Özgen et al., 2016). On the contrary, *F. lurida* was reported as the dominant species identified in the olive trees located in the south of Turkey (Nishikawa & Kaçar, 2014).

Forficula auricularia was also the common species in hazelnut. A male of *A. albipennis* (Megerle von Mühlfeld, 1825) (Forficulidae) was obtained from the hazelnut trees in Düzce. Recently, this species was reported as a previously unrecorded earwig from Turkey (Nishikawa & Kaçar, 2018). The specimens investigated in this study included some undetermined species (nymphs and exuviaevae), which were identified at the genus level, but considering that the earwigs were collected from the same orchards, it is possible to suggest that they were also *F. auricularia* and *G. hincksi* (Tables 2, 3 and 4).

Earwig species were captured in the cherry and apple orchards from June / July to November over two years. In the fruit orchards, *F. auricularia* was mostly identified in apple and cherry and least in hazelnut. For both years, a high level of *F. auricularia* captures was recorded in June in the apple and cherry orchards. In cherry, red mites and aphid species were observed and high earwig captures were recorded in June (Fig. 1). The aphids were most abundant in apple in June, but most red mites were observed in cherry during summer months. In 2015 and 2016, the forficulid species were captured on days 49 and 132, respectively in the apple, days 99 and 132, respectively in the cherry, and days 71 and 132, respectively in the hazelnut (Fig. 1). According to Özgen et al. (2016), earwig was first captured in the late May, and an increase in the population of *F. auricularia* and *F. lurida* was observed during the ripening period of apricot fruit from early June to late July. Popham (2000) suggested that forficulid species were mainly present in warm and wet tropic climates. Nishikawa & Kaçar (2015) recorded earwig species from April to December in olive orchards. In the apple and cherry orchards investigated in the current study, the aphids were found in late spring and early fall while the red mite species were present in the hot months of summer in both apple and cherry orchards of Bolu. In the hazelnut orchards, in addition to *F. auricularia* species, a high population of the fall webworm,

Hyphantria cunea (Drury) (Lepidoptera: Erebididae), was observed and considered to serve as a food reserve for *F. auricularia*. The results obtained from the two years showed that the earwig species climbed the trees in search of fruit and prey (aphids, mites, and lepidopteran eggs and larvae).

Düzce and Bolu have different natural conditions and crop distributions. For example, hazelnut is the dominant crop grown in Düzce, which is located 160 m above the Black Sea coast, while cherry and apple are the main crops of Seben, Bolu situated 665 m above sea level surrounded by mountains. In this study, cherry and apple may have been more favorable for the forficulids since these fruit trees act as the food reserves (both plant and animal origin) of earwig species by attracting their prey from June to November.

Forficula auricularia (93%) was the most common species in the fruit areas of the Western Black Sea Region of Turkey. However, even though they were abundantly present in the orchards, the earwig species captured may not reflect their actual population since they are mostly active at night but the collection from the branches of the fruit trees was performed during the day. Therefore, it is necessary to investigate earwigs by combining several collection methods in the future. This is the first study on the seasonal occurrence of earwigs in different fruit trees in the Western Black Sea Region of Turkey. In further studies, the behavior of earwigs should be examined in other fruit orchards.

ACKNOWLEDGEMENTS

The authors thank to A. S. Koca, H. Kütük and M. İmren (Bolu Abant İzzet Baysal University, Turkey) for accompanying us during some of the field surveys. We also thank the Bolu Abant İzzet Baysal University Fund for providing partial financial support for the study (grant no. 2015.10.06.874).

LITERATURE CITED

- Albouy, V. & Caussanel, C.** 1990. Dermaptères ou Perce-oreilles. Faune de France 75. Fédération Française des Sociétés de Sciences Naturelles, Paris, 245 pp.
- Anlaş, S., Haas, F. & Tezcan, S.** 2010. Dermaptera (Insecta) fauna of Bozdaglar Mountain, western Turkey. *Linz Biol. Beitr.*, 42 (1): 389-399.
- Anlaş, S. & Koçarek, P.** 2012. Current status of Dermaptera (Insecta) fauna of Turkey and Cyprus. *Turk. Entomol. Derg.-Tu*, 36: 43-58.
- Aslan, B.** 2015. Survey of the predatory and parasitoid species-complex of Aphids (Hemiptera: Aphididae) at fruit growing areas in Burdur, Turkey. *Turkey. Eegypt. J. Biol. Pest. Co.*, 25 (1): 261-265.
- Aslan, B. & Karaca, I.** 2005. Fruit tree Aphids and their natural enemies in Isparta Region, Turkey. *J. Pest. Sci.*, 78 (4): 227-229.
- Aslan, B. & Karaca, I.** 2012. Insect fauna of Kocada Lake National Park Basin (Isparta, Turkey). *Turk Entomol Derg-Tu*, 36 (4): 473-489.
- Ayaz, T., Özgen, İ. & Kaplan, M.** 2009. Prevalence, population changing and damage ratio of *Forficula auricularia* (Linnaeus, 1758) (Dermaptera: Forficulidae) in apricot orchards of Malatya (Turkey). In: III. Plant Protection Congress, 15-18 July 2009, Van, Turkey. pp.30.
- Ayaz, T. & Özgen, İ.** 2015. The population fluctuations of *Forficula auricularia* (Linnaeus, 1758) situated apricot pest in Malatya province of Turkey. *Int. J. Fruit. Sci.*, 2 (2): 39-44.
- Başar, M. & Yaşar, B.** 2018. Antalya ili zeytin bahçelerinde saptanan parazitoid ve predator türler. *Türkiye Türk. Biy. Müc. Der.*, 9 (2): 82-101 (in Turkish).
- Bayhan, S. O., Ulusoy, M. R. & Bayhan, E.** 2006. Aphids and their predators in Malatya region and around Turkey. *J. Biol. Sci.*, 6 (5): 954-957. doi: 10.3923/jbs.2006.954.957
- Capinera, J. L.** 2010. European earwig – *Forficula auricularia* Linnaeus (Insecta: Dermaptera: Forficulidae) [online]. University of Florida Website: http://entnemdept.ifas.ufl.edu/creatures/VEG/European_earwig.htm [Accessed 02 June 2019].
- Erler, F.** 2004. Natural enemies of the pear psylla *Cacopsylla pyri* in treated vs untreated pear Orchard in Antalya, Turkey. *Phytoparasitica*, 32 (3): 295-304.
- Gibb, T.** 2015. Contemporary Insect Diagnostics the art and science of practical Entomology. Academic Press is an imprint of Elsevier the Boulevard, Langford Lane, Kidlington, Oxford, OX5 1GB, UK 225 Wyman Street, Waltham, MA 02451, USA.
- Griimaldi, D. & Engel, M. S.** 2005. Evolution of the Insects. Cambridge University Press. Cambridge, New York, 772 pp.
- Haas, F.** 1996. Dermaptera, Earwigs, version 18 July 1996 (under construction) [online]. The tree of Life Web site <http://tolweb.org/tree/phylogeny.html>. [Accessed 30 May 2019].

- Haas, F.** 2018. Earwig Research Centre (The number of Earwig species in all countries) [online]. Web site <http://www.earwigs-online.de/> [Accessed 14 April 2019].
- Haas, F., Hwen, K. T. C. & Tang, H. B.** 2012. New evidence on the mechanics of wing unfolding in Dermaptera (Insecta). *Arthropod. Syst. Phylo.*, 70 (2): 95-105.
- Hollingsworth C. S. (editor)** 2019. Pacific Northwest Insect Management Handbook [online]. Corvallis OR: Oregon State University. Web site <http://pnwhandbooks.org/insect> [Accessed 31 March 2019].
- Jacobs, S. B.** 2013. European Earwigs [online]. Pennsylvania State University Web site <https://ento.psu.edu/extension/factsheets/earwigs> [Accessed 14 April 2019].
- Kaçar, G. & Nishikawa, M.** 2014. Forficulidae fauna of olive orchards in the Southeastern Anatolia and Eastern Mediterranean Regions of Turkey (Dermaptera). *J. Entomol. Res. Soc.*, 16 (1): 27-35.
- Nishikawa, M. & Kaçar, G.** 2018. *Apterygida albipennis* (Megerle von Mühlfeld, 1825) (Dermaptera: Forficulidae: Forficulinae), a new record for Turkey, with a Note on the nomenclatural validity of the species name. *Jap. J. Sys. Entomol.*, 4 (2): 238-242.
- Önder, F., Pehlivan, E., Karsavuran, Y., Tezcan, S. & Kismali, Ş.** 1999. Catalogue of the collection of Dermaptera preserved in the Prof. Niyazi Lodos Museum, İzmir, Turkey. *Ege Üniv. Ziraat Fak. Derg.*, 36 (1-3): 157-162.
- Özgen, İ., Ayaz, T. & Kıtır, N.** 2016. Dermaptera species in apricot orchards and its pest status in Malatya and Elazığ provinces of Eastern Anatolia, Turkey. *Biharean Biol.*, 10 (1): 58-59.
- Ölmez-Bayhan, S., Bayhan, E. & Özdemir, İ.** 2015. Predator species determined on aphid (Hemiptera: Aphididae) in Şanlıurfa and Adıyaman provinces of Turkey. *Agr. Forest.*, 61 (1): 149-152.
- Özşişli, T.** 2016. Omnivor böcek *Forficula auricularia* L. (Dermaptera: Forficulidae)'nin Türkiye'de tarımsal alanlarda alternative doğal düşman olarak rolü ve entegre mücadelede önemi. *Türk. Biy. Müc. Der.*, 7 (2): 183-194 (in Turkish)
- Öztürk, N., Ulusoy, M. R., Erkilic, L. & Bayhan, S.** 2004. Malatya ili kayısı bahçelerinde saptanan zararlılar ile avcı türler. *Bit. Kor. Bül.*, 44 (1-4): 1-13. (in Turkish).
- Öztürk, N. & Ulusoy, M. R.** 2011. Doğu Akdeniz Bölgesi nar ve turuncgil bahçelerinde, Portakal güvesi [*Cryptoblabes gndiella* Mill. (Lepidoptera: Pyralidae)]'nin parazitoit ve predatörlerinin belirlenmesi. *Türk. Biy. Müc. Der.*, (1): 19-24 (in Turkish).
- Popham, E. J.** 2000. The geographical distribution of the Dermaptera (Insecta) with reference to continental drift. *J. Nat. Hist.*, 35: 2007-2027.
- Steiner, M. Y. & Goodwin, S.** 1998. Methods for collecting and rearing thrips (Thysanoptera) and their natural enemies. *Aust. J. Entomol.*, 37: 101-106.
- Tezcan, S. & Kocarek, P.** 2009. Dermaptera fauna of the ecologically managed cherry orchards in western Turkey. *Mun. Ent. Zool.*, 4 (2): 572-576.
- Tezcan, S., Karsavuran, Y., Pehlivan, E. & Anlaş, S.** 2011. Contributions to the Dermaptera fauna of Turkey. *Mun. Ent. Zool.*, 6 (2): 929-931.
- Ulusoy, R., Vatansver, G. & Uygun, N.** 1999. Ulukışla (Niğde) ve Pozantı (Adana) yöresi kiraz ağaçlarında zararlı olan türler, doğal düşmanları ve önemlileri üzerindeki gözlemler. *Türk. Entomol. Derg.-Tu.*, 23 (2): 111-120 (in Turkish).
- Ulusoy, R., Erkilic, L., Öztürk, N., Ölmez, S. & Uygun, N.** 2001. Apricot pests and pest management. In: National Apricot Symposium, 5 April 2001, Malatya, Turkey. pp. 61-68.
- Yıldırım, E. M. & Başpınar, H.** 2015. The population fluctuations of Carob moth, *Pomyelois ceratoniae* (Zell) (Lepidoptera: Pyralidae) and Honeydew moth *Cryptoblabes anidiella* Mill. (Lepidoptera: Pyralidae), and investigation on their damage and natural enemies on pomegranate in west Aegean region of Turkey. *Agr. Food*, 3: 186-192.

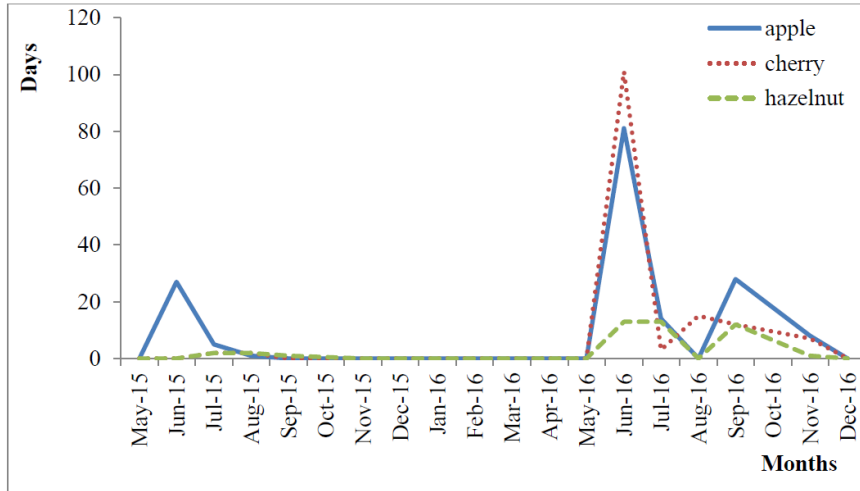


Figure 1. Earwigs collected from the apple, cherry and hazelnut orchards in Bolu and Düzce over two years.

Table 1. The number (%) of earwigs collected from various orchards in Bolu and Düzce.

Species	Cherry	Apple	Hazelnut	Total
<i>Forficula auricularia</i>	135 (97.8)	145 (88.4)	42 (95.5)	322 (93.1)
<i>Guanchia hincksi</i>	1 (0.7)	15 (9.1)	1 (2.2)	17 (4.9)
<i>Forficula smyrnensis</i>	2 (1.4)	4 (2.4)	0	6 (1.7)
<i>Apterygida albipennis</i>	0	0	1 (2.2)	1 (0.2)
Total	138 (100)	164 (100)	44 (100)	346 (100)

Table 2. The earwigs collected from the apple orchards in Seben (Bolu).

Date	Male, female, nymph and exuvia numbers	Species name
25.06.2015	9♂, 16♀, 1N	<i>Forficula auricularia</i>
25.06.2015	1♂	<i>Forficula smyrnensis</i>
07.07.2015	4♂, 1♀	<i>Forficula auricularia</i>
13.08.2015	1♂	<i>Forficula auricularia</i>
02.06.2016	2♂, 5♀, 34N, 1exu.	<i>Forficula auricularia</i>
02.06.2016	2♀	<i>Forficula smyrnensis</i>
17.06.2016	12♂, 8♀, 2N, 1 exu., 1 ex.	<i>Forficula auricularia</i>
30.06.2016	6♂, 6♀	<i>Forficula auricularia</i>
26.07.2016	3♂, 4♀	<i>Guanchia hincksi</i>
26.07.2016	3♂, 3♀	<i>Forficula auricularia</i>
26.07.2016	1♀	<i>Forficula smyrnensis</i>
30.09.2016	6♂, 13♀, 1N	<i>Forficula auricularia</i>
30.09.2016	4♂, 4♀	<i>Guanchia hincksi</i>
12.10.2016	3♂, 2♀	<i>Forficula auricularia</i>

N: nymph, exu.: exuvia, ex.: sex unknown, apical parts of abdomen missing

Table 3. The earwigs collected from the cherry orchards in Seben (Bolu).

Date	Male, female, nymph and exuvia numbers	Species name
13.08.2015	1♂, 1♀	<i>Forficula auricularia</i>
20.11.2015	1♀	<i>Forficula auricularia</i>
02.06.2016	25N	<i>Forficula</i> sp. (= <i>F. auricularia</i>)
17.06.2016	11♂, 14♀, 4N, 1 ex.	<i>Forficula auricularia</i>
30.06.2016	22♂, 20♀, 1 ex.	<i>Forficula auricularia</i>
30.06.2016	2♀	<i>Forficula smyrnensis</i>
26.07.2016	1♂, 1♀	<i>Forficula auricularia</i>
26.07.2016	1♀	<i>Guanchia</i> sp. (= <i>G. hincki</i>)
11.08.2016	1♂, 3♀	<i>Forficula auricularia</i>
26.08.2016	2♀	<i>Forficula auricularia</i>
30.09.2016	5♂, 4♀	<i>Forficula auricularia</i>
12.10.2016	4♂, 3♀	<i>Forficula auricularia</i>

N: nymph, exu.: exuvia, ex.: sex unknown, apical parts of abdomen missing

Table 4. The earwigs collected from the hazelnut orchards in Düzce.

Date	Male, female, nymph and exuvia numbers	Species name
31.07.2015	1♂, 1♀	<i>Forficula auricularia</i>
27.08.2015	2♀	<i>Forficula auricularia</i>
09.10.2015	1♂	<i>Forficula auricularia</i>
02.06.2016	6N, 1 exu.	<i>Forficula</i> sp.(= <i>F. auricularia</i>)
17.06.2016	1♀, 2♂	<i>Forficula auricularia</i>
30.06.2016	3♀	<i>Forficula auricularia</i>
26.07.2016	4♀, 7♂	<i>Forficula auricularia</i>
26.07.2016	1♀	<i>Guanchia</i> sp. (= <i>G. hincki</i>)
11.09.2016	1♂	<i>Forficula auricularia</i>
28.09.2016	8♂, 3♀	<i>Forficula auricularia</i>
12.10.2016	1♀	<i>Forficula auricularia</i>

N: nymph, exu.: exuvia