



Original article (Orijinal araştırma)

Two new species of *Hilara* Meigen, 1822 (Diptera: Empididae) from Mount Nemrut (Bitlis, Türkiye)

Nemrut Dağı'ndan (Bitlis, Türkiye) iki yeni *Hilara* Meigen, 1822 (Diptera: Empididae) türü

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Abstract

Hilara Meigen, 1822 (Diptera: Empididae) is a very difficult genus to identify in the Empididae, however, several researchers have divided the genus *Hilara* into fourteen species groups for convenience. The current study identified two new species of *Hilara* Meigen, 1822. The materials used in this study were collected in the vicinity of Nemrut Mountain Crater Lake from Bitlis Province in May 2021 by using a collection net. *Hilara nemrutica* spec. nov. (*Hilara maura*-group) and *Hilara derenae* spec. nov. (*Hilara interstincta*-group) from Bitlis province, Türkiye, are described, male genitalia and forelegs are illustrated, and distinguished from closely related congeners.

Keywords: Bitlis, Empididae, fauna, *Hilara*, new species

Öz

Hilara Meigen, 1822 (Diptera: Empididae) cinsi Empididae familyasındaki tür teşhisi oldukça zor bir cinstir, buna rağmen birkaç araştırmacı *Hilara* cinsini sistematik olarak kolaylık sağlaması için on dört tür grubuna bölmüşlerdir. Bu çalışmada kullanılan örnekler Bitlis ilinde bulunan Nemrut Dağı Krater gölü çevresinden Mayıs 2021'de, toplama ağı kullanılarak toplanmıştır. *Hilara nemrutica* spec. nov. (*Hilara maura*-grup) ve *Hilara derenae* spec. nov. (*Hilara interstincta*-grup) Türkiye'nin Bitlis ilinden tanımlanmış, erkek genitalleri ve ön bacakların çizimleri yapılmış ve yakından ilişkili akraba türler ile ayrımları verilmiştir.

Anahtar sözcükler: Bitlis, Empididae, fauna, *Hilara*, yeni türler

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Introduction

Hilara Meigen, 1822 (Diptera: Empididae) is a rather difficult genus of Empididae to identify, with very similar general appearances of species lacking distinctive characteristics (Chvala, 2005). Despite this difficulty, several researchers have tried to classify the genus *Hilara* into species groups and currently fourteen morphologically distinct species groups are recognized (Collin, 1961; Chvala, 2005, 2008; Chvala & Merz, 2009).

In this study, one new species from the *Hilara maura*-group and one new species from the *Hilara interstincta*-group were described. The *Hilara maura*-group was initially identified by Collin (1961) with eight species and revised later with new species added by few researchers and all together there were twenty-one species known from the Middle East and Europe (Chvala, 1996, 2008; iftçi et al., 2012, 2020; Kustov et al., 2013). Chvala (1996) revised the European *H. maura*-group and placed the species into four complexes: *maura* complex, *clypeata* complex, *nitidula-femorella* complex and *media* complex.

The *Hilara interstincta*-group is defined by Chvala (2005), with eight species from Europe and characterized by a large, robust and strong bristled body. With later revisions by Chvala (2008) and Chvala & Merz (2009), this species group now includes twenty-four species from Europe and the Middle East. With additional studies by iftçi & Hasbenli (2011) and iftçi et al. (2020), two new species have been added to the group and the final number of this species-group has reached twenty-six.

These two species groups are represented by very few species from Turkiye. Only nine species from these two groups are known to be in Turkiye, including *Hilara elifae* iftçi & D. iftçi, 2020, *Hilara freidbergi* Chvala, 2008, *Hilara fusitibia* Strobl, 1899, *Hilara hasankoci* iftçi & Hasbenli, 2011, *Hilara megalochira* Collin, 1937, and *Hilara turcica* Chvala, 2008 from the *H. interstincta*-group, and *Hilara metinaktasi* iftçi, Hasbenli & zgul, 2012, *Hilara barlasi* iftçi, Hasbenli & zgul, 2012 and *Hilara hasbenlii* iftçi, 2020 within the *H. clypeata* complex from the *H. maura*-group (Chvala, 2008; iftçi & Hasbenli, 2011; iftçi et al., 2012, 2020; iftçi, 2021).

Materials and Methods

In this study, forty-four male and seventeen female specimens were used, and all the specimens were captured by collecting nets. The specimens were collected in the vicinity of Nemrut Crater Lake in Bitlis province in May 2021.

The morphological studies were conducted using Nikon SMZ445 and Nikon SMZ800N stereo microscopes. All the figures were drawn by using Nikon SMZ800N microscope with drawing tube attachment. For the morphological terms used in the current study, the morphological nomenclature by the McAlpine (1981), Stuckenberg (1999) and Sinclair (2000) was followed, with a few modifications.

The material used in this study is deposited in the author's private collection.

Results

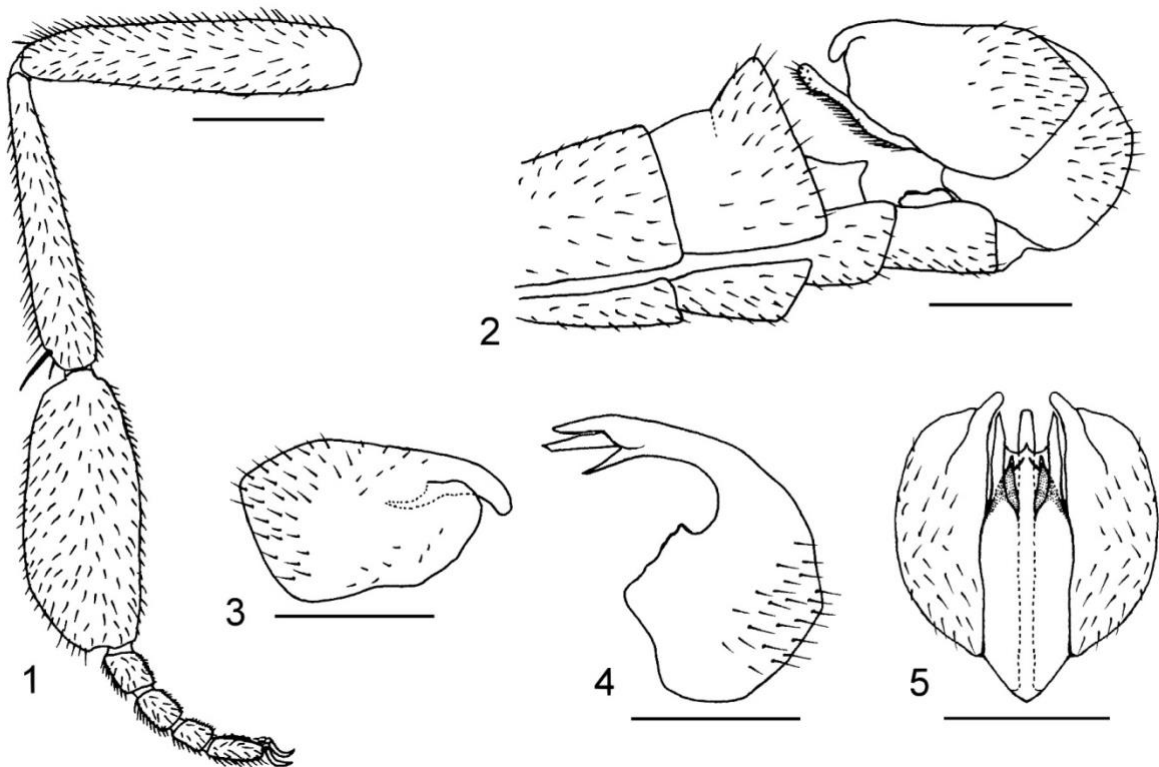
Hilara nemrutica spec. nov. (Figures 1-5)

Type material. Holotype ♂. Turkiye. Bitlis: Tatvan, Nemrut Mountain, Nemrut crater, 38°38'N, 42°14'E, 2300 m, 19.V.2021, leg. M.C. iftçi. Paratypes. 36 ♂♂, 17 ♀♀, same data as holotype.

Etymology. The name of the new species refers to its type locality, Nemrut Mountain.

Diagnosis. Large species, body length between 4,5 and 5 mm, thorax and abdomen subshining black, both with slightly grey dusting. Scutum brownish dusting with slightly visible three black stripes from anterior view. Prothoracic collar without a bristle on sides, prothoracic sensorial pit without hairs, acrostichal bristles four-serial, dorsocentral bristles two- to three-serial, all black and very short. Legs black, scarcely

subshining, “knees” (base of tibiae and distal end of femora) faintly yellowish. Fore basitarsus in male thickened and very long, hind femur and female hind tibia slender, abdominal hairs yellow.



Figures 1-5. *Hilara nemrutica* spec. nov. 1. Fore leg; 2. Postabdomen; 3. Epandrial lamella; 4. Hypandrium; 5. Tip of hypandrium and epandrial lamella in dorsal view. Scale: 0,3 mm.

Description. Male. Head black, occiput and frons almost velvety, very small part of frons above antennae with grey dusting, face grey dusting and wider than frons. Ocellar bristles as long as postpedicel without style and fine, frontal bristles finer and shorter, slightly longer than antennal style. Occipital bristly hairs black and shorter than antennal style on the upper half of head, longer, finer and yellowish white on the lower half. Palpus black with grey dusting, ventrally with dense brownish hairs and two longer bristly hairs at tip. Labrum almost as long as half-length of head.

Thorax subshining black with slightly grey dusting. Lower half of pleura densely grey dusting as all coxae. Scutum brownish dusting with slightly visible three black stripes from anterior view. Scutum and scutellum subshining and slightly brownish dusting from dorsal and posterior view and stripes invisible. All thoracic hairs and bristly hairs black, only humeri with finer yellowish hairs, humeral bristle absent. Acrostichal and dorsocentral bristles equally long, as long as pedicel, acrostichal bristles four-serial, dorsocentral bristles two- to three-serial and ends with three pairs of long and fine bristles. Bristles on scutum and scutellum short and fine, only two notopleurals, one short supra-alar, one longer postalar and four to six scutellar bristles present, posthumeral and intrahumeral bristles absent. Prothoracic collar without a bristle on sides, only with short yellow hairs nearly as long as antennal style. Proepisternum and sides of prosternum with yellow short hairs. Prothoracic spiracle black and prothoracic sensorial pit without hairs.

Wings slightly brownish, veins black, pterostigma long and dark brown. Costal bristle short, nearly as long as antennal style. Radial fork normally shapes, not acute. Squama black with pale fringes, halter completely black.

Legs subshining black scarcely grey dusting, “knees” (base of tibiae and distal end of femora) faintly yellowish especially on fore legs. All coxae densely grey dusting as lower part of pleura. All hairs and bristles on legs mostly black, anteriorly tip of fore coxa and laterally mid and hind coxae with black bristles, other hairs on all coxae fine and yellow. All femora slender, only with short hairs. All tibiae dorsally with bristly hairs as long as depth of tibiae, ventrally with densely very short hairs, fore tibia posteroventrally with longer and finer hairs on apical half, no distinct bristles on all tibiae only with short apical circlet of bristles. All tarsomeres with short hairs, fore basitarsus swollen (Figure 1), very long, nearly as long as fore tibia.

Abdomen subshining black with slightly grey dusting. Abdominal hairs short and yellow, first two segments and sides of all terga with longer yellow hairs. Hind marginal bristles on first five terga absent, tergum six with black short and fine hind marginal bristles as long as antennal style. Genitalia large (Figures 2-5), epandrial lamella also enlarged, convex and with finger-like process, tip of hypandrium with two pairs of horn-shaped projections, one pair above, one pair below and the pair above is longer than the pair below.

Body length: 4.3-5.2 mm, wing length: 4.8-5.4 mm.

Female. They are quite similar to males except for the sexual differences. General appearance almost the same, only the pleura completely grey dusting. All hairs and bristly hairs finer and shorter than in male. Legs slender, apical circlet of bristles on all tibiae shorter, hind tibia slender and simple, fore basitarsus not thickened and half the length of the fore tibia. Abdomen with yellow hairs as in males, but shorter, hind marginal bristles absent.

Body length: 4.5-5.5 mm, wing length: 4.8-5.7 mm.

Remarks: *Hilara nemrutica* spec. nov. is a species of *Hilara maura*-group and assigned to the *Hilara clypeata* complex by its simple and slender hind femur in both sexes and unguarded prothoracic sensorial pit. *Hilara nemrutica* resembles North European species *Hilara submaura* Collin, 1927 and East Mediterranean species *Hilara alboclypeata* Chvála, 2008 and *Hilara barlasi* Çiftçi, Hasbenli & Özgül, 2012 by slightly brownish clouded wing, faintly yellowish “knees” (base of tibiae and distal end of femora) and yellowish abdominal hairs. The differential features of all species are given in Table 1.

Table 1. The differential features of *Hilara nemrutica* spec. nov. and its closely related congeners

Features	<i>Hilara submaura</i> Collin	<i>Hilara alboclypeata</i> Chvála	<i>Hilara barlasi</i> Çiftçi, Hasbenli & Özgül	<i>Hilara nemrutica</i> spec. nov.
Dusting of scutum in anterior view	grey dusting	grey dusting	brownish dusting	brownish dusting
Humeral bristle	inconspicuous	absent	short and fine	absent
Bristles on mid femur	with a pale bristle at base	without any bristles or bristly hairs, only with short hairs	anteriorly with bristly hair at base	without any bristle or bristly hairs
Dorsal bristly hairs on tibiae	present on hind tibia	absent	present on hind tibia	present on all tibiae
Epandrial lamella	with quite adjacent small and slender process	with rather short and apically narrowed process	oval and with thin, long, slightly bent upwards and hook-like process	enlarged, convex and with finger-like process
Tip of hypandrium	simple and apically slightly narrowed	long, slender and simple	slightly broad, apically narrowed and without any projection	with two pairs of horn-shaped projections

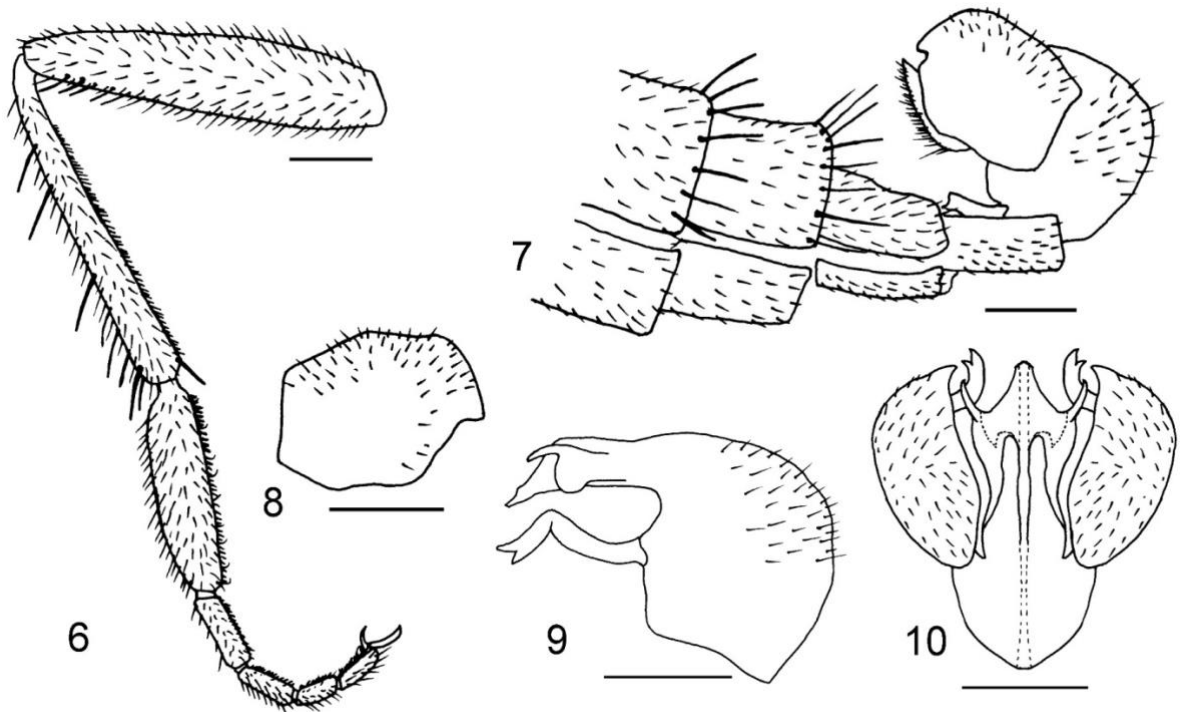
All three species and *H. nemrutica* with three blackish stripes on scutum at least visible in anterior view but *H. submaura* and *H. alboclypeata* with grey dusting scutum while *H. barlasi* and *H. nemrutica* with brownish dusting scutum in anterior view. *Hilara barlasi* closely resembles *H. nemrutica* by the general appearance but clearly distinguished by short and fine humeral bristle and mid femur anteriorly with bristly hair at base, in *H. nemrutica* humeral bristle absent and all femura without any bristle or bristly hairs. Moreover, the genital structures of the above-mentioned species, especially the epandrial lamella and tip of hypandrium, clearly distinguish them from *H. nemrutica*.

***Hilara derenae* spec. nov. (Figures 6-10)**

Type material. Holotype ♂. Türkiye. Bitlis: Tatvan, Nemrut Mountain, Nemrut crater, 38°38'N, 42°14'E, 2300 m, 19.V.2021, leg. M.C. Çiftçi. Paratypes. 6 ♂♂, same data as holotype.

Etymology. This species is dedicated to author's first daughter Meryem Deren Çiftçi who really like insects.

Diagnosis. Very large, black species with slightly grey dusting and brownish wings. Body length 7 mm. Body and legs strongly black bristled. Occiput dull black, labrum long, strong and shiny black Scutum with three black stripes slightly visible from laterodorsal and anterodorsal view, acrostichal bristles two-serial. All femora ventrally spinose and all tibiae ventrally with fine short hairs. Fore basitarsus slightly wider than tip of fore tibia.



Figures 6-10. *Hilara derenae* spec. nov. 6. Fore leg; 7. Postabdomen; 8. Epandrial lamella; 9. Hypandrium; 10. Tip of hypandrium and epandrial lamella in dorsal view. Scale: 0,3 mm.

Description. Male. Head dull black, frons black, face grey dusting and wider than frons. Occiput densely long black bristled longer than antennal style. Ocellar and frontal bristles same length, nearly as long as postpedicel with style. Antennae black, antennal style thick, as long as postpedicel. Palpus black with grey dusting, ventrally with dense black hairs and three strong very long bristles. Labrum shiny black, slightly shorter than height of head.

Thorax black with slightly grey dusting, in laterodorsal and anterodorsal view scutum with three slightly visible black stripes and clearly visible only in posterior view. Lower half of pleura with densely grey dusting as coxae and upper half of pleura and edge of scutum scarcely subshining. Hairs and bristles on thorax long and dense. Acrostichal bristles two-serial, nearly as long as antennal style, dorsocentral bristles one-serial, slightly longer than acrostichal bristles, longer on posterior part and ends with three pairs of rather long bristles. Large bristle on scutum and scutellum strong and nearly as long as postpedicel with style: one humeral, one fine intrahumeral, one posthumeral, three notopleurals, anterior one finer and shorter, anterior part of notopleural depression with fine short hairs, three supra-alars, middle one finer and shorter, one postalar and four pairs of scutellar bristles, outer pair fine. Prothoracic collar with short fine hairs between two long lateral bristles as long as postpedicel. Proepisternum with few short hairs and two or three bristle-like black hairs longer than postpedicel without style, sides of prosternum with short and fine black hairs.

Wings brownish, veins black and pterostigma slightly visible and dark. Two long costal bristles as long as postalar bristle, anal vein faint and not reaching wing margin. Squama black, fringes brownish, halter black with paler stem.

Legs black, only base of tibiae and distal end of femora yellow, also trochanters partly yellow, coxae densely grey dusting, femora grey dusting, tibiae and tarsomeres slightly grey dusting. Hairs and bristles on legs short and black. Fore femur ventrally on apical half with three or four bristle-like hairs, mid femur ventrally with two rows of bristles as long as depth of mid femur and at apical half becoming thicker and shorter and also mid femur anteriorly with two bristles at base. Hind femur ventrally with strong bristles as long as depth of hind femur and mid and hind femora anteriorly with one strong bristle at tip. Apical circlets of bristles on all tibiae distinct and strong and all tibiae ventrally with short and dense pubescence. Fore and hind tibiae dorsally with long bristles, longer than depth of fore and hind tibiae, mid tibia with only one dorsal bristle at base. All tarsal segments longer than depth of tarsal segments, all hairs fine and short. Fore basitarsus cylindrical, as long as two thirds of fore tibia and not much wider than tip of fore tibia (Figure 6).

Abdomen black, densely grey dusting. All hairs black, hairs on terga slightly longer than antennal style, hairs on sterna very short and pale. Hind marginal bristles long and distinct, fine on basal segments, very strong on tergum five and six. Genitalia large (Figures 7-10), slightly grey dusting. Epandrial lamella convex with no prominent process, only a small beak-shaped projection. Tip of hypandrium wide and very enlarged with a pair of horn-shaped projections on the sides and tip of postgonite bifurcated.

Body length: 6.6-7.3 mm, wing length: 6.9-7.5 mm.

Female. Unknown.

Remarks. *Hilara derenae* spec. nov. belongs to *Hilara interstincta* group by the following characters: very large, robust and strongly bristled body; numerous long hairs and strong long bristles on palpus; long and strong labrum; strong and long legs and apical circlets of strong bristles on all tibiae; hind femur anteriorly with a strong spine-like bristle at tip. *Hilara derenae* resembles *Hilara interstincta* (Fallén, 1816) and *Hilara lugubris* (Zetterstedt, 1819) by its large and strongly black bristled body, two row of ventral bristles on mid femur and dorsal bristles on fore tibia. The differential features of all species are given in Table 2. *Hilara derenae* is easily distinguished from *H. interstincta* by the yellowish base of tibiae and distal end of femora, two-serial acrostichal bristles, long humeral and intrahumeral bristles, and the different shape of the epandrial lamella and the tip of the hypandrium. In *H. interstincta*, base of tibiae and distal end of femora black, acrostichal bristles four-serial, humeral bristle fine, intrahumeral bristle short, epandrial lamella with finger-shaped process and tip of hypandrium simple. *Hilara derenae* much more similar to *H. lugubris* because of brownish wings, three striped scutum, ventrally strong bristled hind femur, yellowish

knees and apically bifurcated postgonite. *Hilara derenae* can be easily distinguished from *H. lugubris* by its two-serial acrostichal bristles, shape of epandrial lamella and enlarged tip of hypandrium.

Table 2. The differential features of *Hilara derenae* spec. nov. and its closely related congeners

Features	<i>Hilara lugubris</i> (Zetterstedt)	<i>Hilara interstincta</i> (Fallén)	<i>Hilara derenae</i> spec. nov.
Acrostichal bristles	two to three serials	four serials	two serial
Humeral and Intrahumeral bristles	small and fine	Humeral bristle fine, intrahumeral bristle shorter	long, nearly as long as postpedicel with style
Bristles on mid tibia	with a row of four-five posterodorsal spine-like bristles	apically with 2-3 anteroventral and posteroventral shorter bristles	with only one dorsal bristle at base
Color of base of tibiae and distal end of femora	yellow	black	yellow
Epandrial lamella	with short process	with finger-like process	with no prominent process
Tip of hypandrium	simple	simple	wide and very enlarged with a pair of horn-shaped projections on the sides

In this study, *Hilara nemrutica* spec. nov. from the *Hilara maura*-group and *Hilara derenae* spec. nov. from the *Hilara interstincta*-group were identified. Before this study, only three species from the *Hilara maura*-group were known from Türkiye, these species are *Hilara metinaktasi* Çiftçi, Hasbenli & Özgül, 2012 from Adana province, *Hilara barlasi* Çiftçi, Hasbenli & Özgül, 2012 from Uşak province and *Hilara hasbenlii* Çiftçi, 2020 from Sivas province (Çiftçi et al., 2012, 2020). With *Hilara nemrutica* spec. nov. identified from Bitlis province (Mount Nemrut), the number of species of this group in Türkiye has increased to four. Six species from the *Hilara interstincta*-group were previously known from Türkiye, these species are *Hilara elifae* Çiftçi & D. Çiftçi, 2020, from Ardahan province, *Hilara freidbergi* Chvála, 2008 and *Hilara fusitibia* Strobl, 1899 from Siirt province, *Hilara hasankoci* Çiftçi & Hasbenli, 2011 from Çanakkale and İstanbul provinces, *Hilara megalochira* Collin, 1937 from Adıyaman province, and *Hilara turcica* Chvála, 2008 from Hatay province (Chvála, 2008; Çiftçi, 2021; Çiftçi & Hasbenli, 2011; Çiftçi et al., 2020). With *Hilara derenae* spec. nov. identified from Bitlis province (Mount Nemrut), the number of species of this group in Türkiye has increased to seven. Thus, the number of known species of these two species groups from Türkiye has reached eleven.

Hilara metinaktasi, *H. barlasi* and *H. hasbenlii* from *H. maura*-group and *H. elifae*, *H. hasankoci* and *H. turcica* from *H. interstincta*-group are endemic to Türkiye. The Eastern Mediterranean species, *H. freidbergi* is known from Israel and Türkiye, while *H. megalochira* is known from Cyprus, Israel, Syria and Türkiye, and *H. fusitibia*, which has a distinctly Mediterranean distribution, is known from Spain, Morocco, Tunisia, Greece and Türkiye (Chvála, 2008; Çiftçi, 2021).

When we look at the endemic species in Türkiye, it is seen that their distribution is in one or two provinces. This is not because their distribution is local, but because of the scarcity of studies in Türkiye. With future studies, the distribution of these species may expand.

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