

***Dilar parthenopaeus* Costa, 1855, new to the French fauna (Corsica) (Neuroptera, Dilaridae, Dilarinae)**

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Abstract. – *Dilar parthenopaeus* Costa, 1855, is recorded for the first time from France (Corsica), with biogeographical notes. This species belongs to the *parthenopaeus*-group (*Dilar parthenopaeus*, *D. pumilus* Navás, 1903, and *D. duelli* Aspöck & Aspöck, 1995), and can be distinguished from the other species thanks to morphological features. An overview of the Dilarinae occurring in western Palearctic area is given.

Résumé. – *Dilar parthenopaeus* Costa, 1855, nouveau pour la faune de France (Corse) (Neuroptera, Dilaridae, Dilarinae). *Dilar parthenopaeus* Costa, 1855, est signalé pour la première fois en Corse, avec des précisions biogéographiques. Cette espèce appartient au complexe *parthenopaeus* (*Dilar parthenopaeus*, *D. pumilus* Navás, 1903, et *D. duelli* Aspöck & Aspöck, 1995), et peut être identifiée grâce à des critères morphologiques externes. La liste des Dilarinae connus de la zone paléarctique ouest est présentée.

Keywords. – Palearctic region, France, faunistics, new record.

Dilaridae (“pleasing lacewings”) form a small neuropterous family with worldwide distribution being absent only from Oceania, comprising about 100 described species (ASPÖCK *et al.*, 2015) split into four genera of two subfamilies: Nallachiinae Navás, 1914, with only one described genus (*Nallachius* Navás, 1909) and Dilarinae Newman, 1853, comprising three genera (*Dilar* Rambur, 1838, *Berothella* Banks, 1934, and *Neonallachius* Nakahara, 1963). According to ASPÖCK U. *et al.* (2001), BEUTEL *et al.* (2010), and ZIMMERMANN *et al.* (2011), the dilarids are positioned into the same clade as the Mantispidae, the Berothidae and the Rhachiberothidae (“Dilarid clade”). ENGEL (1999) described the only known dilarid fossil from the Baltic area († *Cascadilar eocenicus* Engel, 1999). The larvae of Dilaridae are feebly known, except for a few species (OSWALD, 1998; MONSERRAT, 2005). Males can be easily recognized by their pectinate antennae and females by their long ovipositor. The rarity of dilarids *in natura*, joined to that of collections, could explain that many species were described from a single male, and based on external morphology (unfortunately without genitalic considerations).

Concerning the genus *Dilar*, and for the western Palearctic area, the checklist of extant species is reported as follows [according to ASPÖCK H. *et al.* (1980, 2001), BADANO (2011), LORU *et al.* (2011), LETARDI (2012), MONSERRAT (2014) and ASPÖCK U. *et al.* (2015)].

– *Dilar meridionalis* Hagen, 1866: atlantomediterranean faunal element. Andorra, France (Oriental Pyrenees), Portugal, Spain.

– *D. pumilus* Navás, 1903: atlantomediterranean faunal element. Portugal, Spain.

– *D. saldubensis* Navás, 1902: atlantomediterranean faunal element (stationary). Portugal, Spain.

– *D. dissimilis* Navás, 1903: atlantomediterranean faunal element (stationary). Spain.

– *D. juniperi* Monserrat, 1988: atlantomediterranean faunal element (stationary). Spain.

– *D. turcicus* Hagen, 1858: pontomediterranean faunal element (extensive). Albania, Armenia, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, Historical Hungary (before 1920), Macedonia, Montenegro, Ukraine.

– *D. nevadensis* Rambur, 1838: atlantomediterranean faunal element (stationary). Spain.

- *D. corsicus* Navás, 1909: Tyrrhenian faunal element, only known from Corsica and Pontine's Islands.
- *D. bolivari* Navás, 1903: Algeria, Tunisia.
- *D. duelli* Aspöck & Aspöck, 1995: France (Var: massif of Esterel), Italy (Liguria, Piemonte).
- *D. parthenopaeus* Costa, 1855: polycentric adriatomediterranean-tyrrhenian faunal element. Italy (Sardinia, central and southern Italy, Sicily?)
- *D. syriacus* Navás, 1909: Lebanon. *Nomen dubium* (MONSERRAT, 1988; LEGRAND & LACHAISE, 1994).
- *D. algericus* Navás, 1909: Algeria.
- *D. kirgisus* Aspöck & Aspöck, 1967: Iran (occurs also in Kirghizia, Tajikistan, and Turkmenistan).
- *D. anatolicus* Aspöck, Liu & Aspöck, 2015: Western, central and Southern parts of Anatolia.
- *D. fuscus* Aspöck, Liu & Aspöck, 2015: Western Anatolia.

The knowledge about Tyrrhenian Dilarinae increased dramatically with the finding, in 1992, of a brachypterous female of *Dilar parthenopaeus* from Latium (Italy) (PANTALEONI & LETARDI, 1996), and by the description of *D. duelli* from France (ASPÖCK & ASPÖCK, 1995). With the finding of that last species, very similar to *D. pumilus* and *D. parthenopaeus* morphologically, ASPÖCK & ASPÖCK (1995) hypothesized that “the occurrence of Dilaridae in other isolated spots in northern Italy and in the south of France is still to be discovered”. Later, some new remarkable captures occurred: discovery of *Dilar corsicus* in Zannone island (BERNARDI IORI *et al.*, 1995), confirmation of the occurring of that species (Pantaleoni, unpublished), and discovery of *D. duelli* in Liguria (BADANO, 2011).

MATERIAL AND METHODS

Both male specimens of *D. parthenopaeus* were collected with a beating tray (“*parapluie japonais*”), by shaking the foliage of Corsican alders *Alnus cordata* (Loisel.) Duby, in woodland environments. A Panasonic DMC-FS11 (14 Mpix) digital camera was used to take photographs, either fitted on magnifying glass Stereotec 4 (habitus, wings, head, terminalia), or through microscope (genitalia). Photographs were improved by using CombineZP software. When not otherwise specified, photographs were taken by the author. The morphological measurements were taken with ocular micrometer. The length of the adult (fig. 1) was measured from the vertex to the apex of the fore wings. The length of the wings was measured from the base to the apex, and the width was taken as the maximum width perpendicular to the length measurement line. The terminalia were cleared in cold KOH solution (10 %) (by maceration for 8 hours), rinsed with acetic acid and water, and transferred to glycerine for examination. The terminology concerning the venation and genitalia respectively follows those of MONSERRAT (1988) and ASPÖCK & ASPÖCK (1995). The “nygma/nygmata” words (greek translations for *punto/puntos* in spanish) which designates the complex anatomic structures on the wing-membrane, are that used by CAPINERA (2008). The specific identification has been made by comparing both Corsican males specimens with one male of *D. parthenopaeus* which was sent to me by Roberto A. Pantaleoni, and coming from Southern Sardinia [Sardinia, Domusnovas, Pta Genna Ruxita (CA), 700 m, 21.VI.2007, *Molinu legit* (n°3811)]. The collection housed in the Muséum national d’Histoire naturelle, Paris, has been reviewed but unfortunately, most of Dilaridae displayed by LEGRAND & LACHAISE (1994) are missing. Neither type of *D. pumilus* nor type of *D. duelli* were examined by the author: the comparative diagnosis between those species and Corsican specimens was carried out basing on the descriptions released by ASPÖCK *et al.* (1980) and MONSERRAT (1988) concerning *D. pumilus*, and ASPÖCK & ASPÖCK (1995) concerning *D. duelli*.

RESULTS

Records. – 1 ♂ (preserved in alcohol), Evisa (Corse-du-Sud / code Insee 2A108 / 42°16'30"N - 8°51'11"E), 11.VII.2011, Aitone forest - Altitude: 1130 m. *J. Le Doaré leg.* / Matthieu Giacomino collection; 1 ♂ (preserved in alcohol), Albertacce (Haute-Corse / code Insee 2B007 / 42°16'29"N - 8°55'41"E), 11.VII.2011, along the rivulet "Colga"; "val du Niellu" forest - Altitude: 1250 m. *J. Le Doaré leg.* / Matthieu Giacomino collection.

Description. – *Dilar parthenopaesus* Costa, 1855, is not often mentioned in the literature, and very rare *in natura* as well. I do think that the description herein should provide to the readers better knowledge of this species.

Small dilarid, with brownish habitus (fig. 1). Antennae with flagellum pectinate. Wings hyaline, spotted with dark marks, fore wings longer than hind wings. Abdomen with dark brown tergites and sternites, pale pleural membrane. Ochre, slender and long legs.

Head brownish orange. Eyes brownish black. Three hairy tubercles on vertex, two posterolateral, one dorsomedial. A dark brown mark coating the dorsomedial tubercle, reaching both of posterolateral apically, extending to antenna, up to the front. A brown stripe crossing in the middle, longitudinally, the vertex up to occiput. "Capsule" (= cupule *sensu* FAUCHEUX & MEURGEY, 2009) pale. Mouthparts light brown. Antennae brown, with dark-brownish setae. Prominent scape; simple pedicel annular; both of them darker than the flagellum. Flagellum with twenty one segments (twelve basally, pectinate / nine distally, unpectinate).

Thorax. Pronotum wider than longer, with dense hairs, dark brown, with tubercles. Legs slender, pale. Tarsi with five tarsomeres, basitarsus longer than others, the last one darker. Long, pale, setae on femora, tibiae and tarsi.

Fore wings (fig. 2, 4). Membrane hyaline, strongly marked with brown spots. Length: 7.3 mm. Width: 3.1 mm. Two conspicuous nygmata present at proximal half of both wings: the first one between SR and Ma, the other one, smaller, between Ma and Mp. After forking Mp, a tiny spot between Ma and Mp1. In basal area, along R, some marks even darker than spots on membrane. Longitudinal veins with alternative pale and brownish dashes, densely setose, as subcostal veinlets; crossveins asetose. Microtrichia on membrane. Sc and R diverging distally. Wing margin densely setose (but because of storage in alcohol, wings shed hairs, for the most part). Most of cross-veins in costal field not bifurcated, those which are bifurcated basally situated. Seven cross-veins in radial field. SR three-branched. A cross vein present between first and second branch of SR, forming a closed cell. Ma distally forking, terminally four-branched in fore wings. Mp proximally two-branched, ended by bifurcate or trifurcate forks. Basis of A1 strongly diverging from the one of A2, and quickly going downwards. A1 terminally three branched in fore wings (A2 terminally branched alike).

Hind wings (fig. 3). Length: 6.3 mm. Paler than forewing. One nygma after forking SR.

Terminalia and genitalia (fig. 5-7) shorter than wings. Tergites and sternites with brownish dark marks. Male terminalia (fig. 5): 9th tergite with two bulbous lobes. Dorsoprocessus of male terminalia present, well-sclerotized and broad, with a proximal band strongly sclerotized and forking up distally (fig. 7). Supraanale [could be identified as ectoproct in ASPÖCK & ASPÖCK (2008)] with dorsal and ventral parts. On dorsal one, a transverse plate with 3 straight, spaced out, teeth which are lined up on disto-ventral margin. On ventral part of supraanale, two rounded, papillate, lobes, both with a sharply-pointed process. Distal part of gonocoxites 9 well-sclerotized and strongly angled (fig. 6).

Comparative diagnosis. – Male of *Dilar parthenopaesus* can be distinguished from the other species belonging to the *parthenopaesus*-group by examining genitalia.

It differs from *Dilar pumilus* by the following characters.

– Shape of gonocoxite: distal part rounded and hardly angled [*D. pumilus*] / strongly angled [*D. parthenopaesus*].

– Ventral part of supraanale: two sharply-pointed processes on each lobe [*D. pumilus*] / only one [*D. parthenopaesus*].

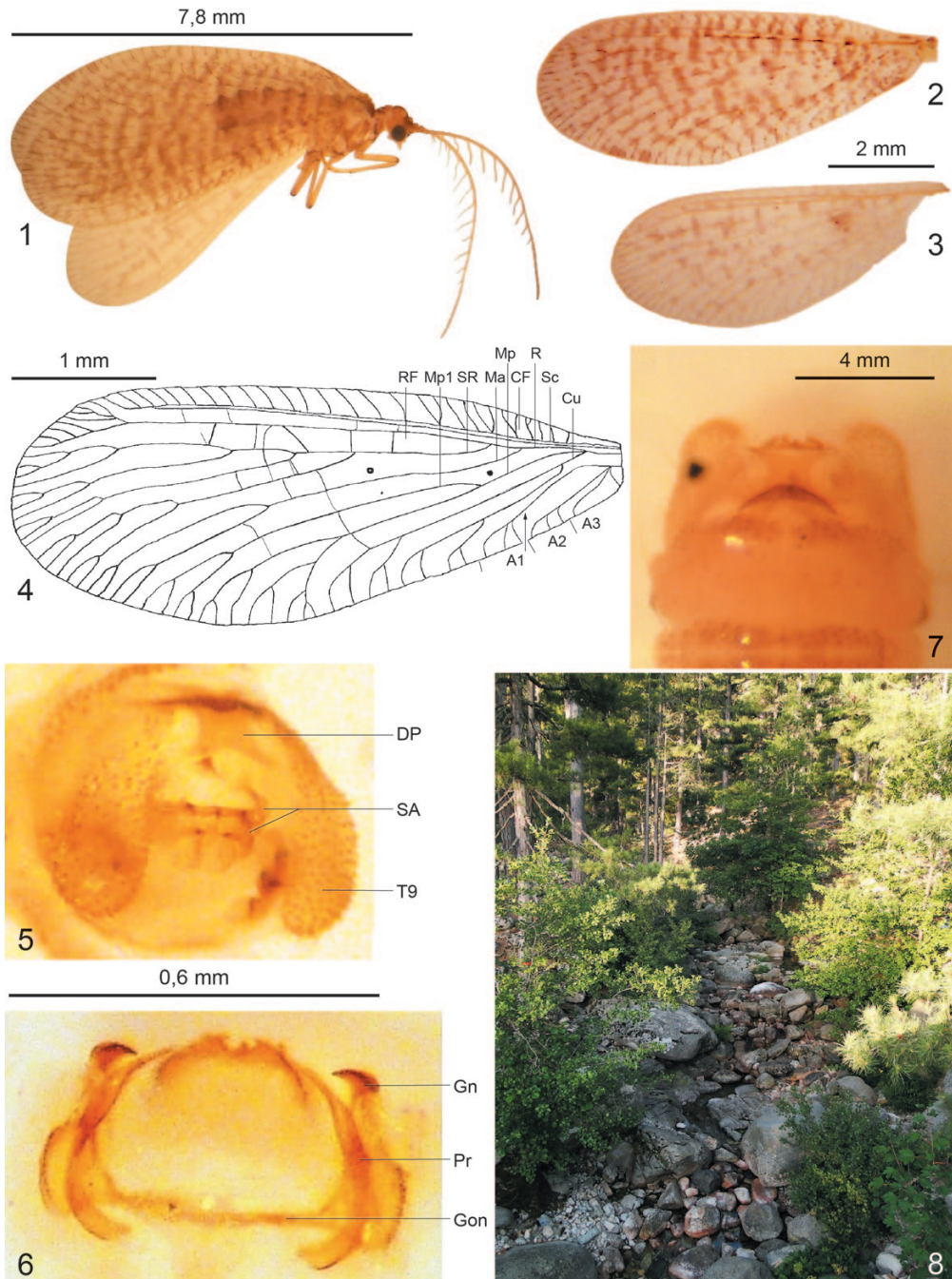


Fig. 1-8. – *Dilar parthenopaesus* Costa, ♂ from Corsica, Evisa. – 1, Habitus in lateral view from right, terminalia missing. – 2, Fore wing. – 3, Hind wing (damaged). – 4, Venation in forewing (abbreviations: A, anal vein; CF, costal field; Cu, cubitus; Ma, anterior media; Mp1, posterior media 1; R, radius; RF, radial field; Sc, subcosta; SR, sector of radius). – 5-6, Terminalia and genitalia: 5, dorsoprocessus (DP), supraanale (SA), tergite 9 (T9), caudal view; 6, gonocoxite (Gn) - paramere (Pr) - gonarcus (Gon) complex, ventral view. – 7, Terminalia, dorsal view. – 8, Sampling site in summer, stream Colga, Corsica, Albertacce (photo by Jacques Le Doaré).

It differs from *Dilar duelli* by the following characters.

– Ventral part of supraanale: two sharply-pointed process on each lobe [*D. duelli*] / only one [*D. parthenopaeus*].

– Shape of parameres (longer proximally in *D. duelli*).

– Shape of gonocoxite: not angled distally at all [*D. duelli*] / strongly angled distally [*D. parthenopaeus*].

The male of *D. parthenopaeus* is easy to distinguish from other species occurring in France —*Dilar corsicus* and *Dilar meridionalis*— by the study of terminal characters, as well.

Bioecological notes. – Both of male specimens of *D. parthenopaeus* were collected in similar environments (fig. 7), on granitic soils (with rocky outcrop in the form of slabs), at more than 1100 m: tree stratum dominated by *Pinus nigra* subsp. *laricio* var. *corsicana* (Loud.) Hyl., and undergrowth with *Alnus cordata* (Loisel.) Duby and *Alnus viridis* subsp. *suaveolens* (Req.) P. W. Ball.

DISCUSSION

The specimen of *D. parthenopaeus* from Sardinia is similar to both specimens of *D. parthenopaeus* from Corsica, according genitalia examination. But in regard of external morphology, there are some differences (which are considered herein as intraspecific variations).

– Habitus, body length (Sardinian specimen is paler and smaller than Corsican ones), wings width and length (larger and longer for Corsican specimens).

– Shape and coloration of distal segment of dorsoprocessus: dark brown for the Corsican specimens (fig. 5), red-brown for the Sardinian one.

– Antennae are proportionally longer for the Sardinian specimen in comparison with the Corsican ones.

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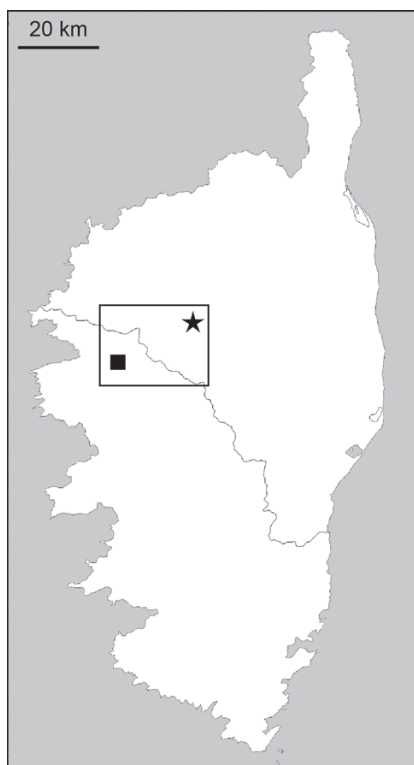


Fig. 9. – Collecting sites (■: Corsica, Evisa / ★: Corsica, Albertacce).

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