

Some Hoverflies (Diptera, Syrphidae) from Mallorca (Balearic Islands, Spain) with special reference to the habitats in the Parc Natural de s'Albufera de Mallorca

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36 species of Syrphidae are recorded from s'Albufera de Mallorca and another 3 from sites outside the park. 8 species are recorded for the first time from the Balearic Islands bringing to 66 the total number of confirmed species. Notes on their ecology and distribution are given where available and the checklist is updated.

Key words: *Syrphidae, hoverflies, Mallorca, Albufera, faunistics, ecology.*

ALGUNES ESPÈCIES DE DÍPTERS (DIPTERA, SYRPHIDAE) DE MALLORCA (ILLES BALEARS, ESPANYA) AMB ESPECIAL REFERÈNCIA ALS HÀBITATS DEL PARC NATURAL DE S'ALBUFERA DE MALLORCA. Es citen 36 espècies de Syrphidae del parc natural de s'Albufera de Mallorca i altres 3 localitats exteriors al parc. Vuit d'aquestes espècies són noves citacions per a les Illes Balears, confirmant la presència d'un total de 66 espècies. Es donen algunes notes sobre la seva distribució i ecologia, així com un llistat complet de les espècies detectades.

Paraules clau: *Syrphidae, dípters, Mallorca, Albufera, faunística, ecologia.*

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Introduction

Most of the species in the Syrphidae are conspicuous colourful flies that attract the attention of humans. They are important pollinators of flowering plants. They have a diverse biology and ecology particularly in their larval stages. For these reasons they have often been the subject of field studies

relating to biodiversity, ecological monitoring and evaluation of habitat richness.

The Parc Natural de s'Albufera is an area of extensive wetlands in the north east of Mallorca. Its ecology has been the subject of study for many years. Although the greater part of the park is dominated by *Phragmites australis*, there are many other habitats within its boundary. These include: dry dunes,

parts of which have a maquis type of vegetation; freshwater canals with *Arundo donax* and *Tamarix* spp. alongside; flushed as well as dry meadows, some of which are grazed and some not; Aleppo pine *Pinus halepensis* woodland; riparian woodlands of elm *Ulmus x hollandica* and white poplar *Populus alba*; *Salicornia* salt marsh and marsh dominated by *Juncus*.

There are 56 species of hoverflies from the Balearics listed in the Catalogue of Iberia (Marcos-García *et al.*, 2002). In the Atlas of Mediterranean Hoverflies (Dirickx, 1994) there are 48 species mapped as occurring on Mallorca, but three of these: *Callicera rufa* Schummel, 1842, *Merodon aeneus* Megerle, 1822 and *Syrphus vitripennis* Meigen, 1822 are not listed in the Catalogue as occurring in the Balearics. Kassebeer (2002) critically reviewed the literature on Balearic hoverflies and accepted a number of old records on the basis of those species being common and widespread around the Mediterranean. In other cases, he questioned the validity of some old literature records where the species have never been encountered again or where the present known geographical distribution does not include the Balearic Islands. We agree with this view, but would add a word of caution to the effect that in spite of the huge surge in interest in Syrphidae over the last 20 years, the fauna of the Mediterranean and its distribution remain inadequately known and it is still possible to find species in the Balearics that might not be expected on the basis of present knowledge.

The aim of this article is to report on the species of Syrphidae and their habitat affinities as they apply to the park. We also take the opportunity to discuss the general distribution of the species found at s'Albufera and in relation to records from the Balearics, thus updating the list of species known from

the archipelago. We append this list at the end of the article (Table 3).

Methods

Most of the collecting of specimens was sporadic, using hand nets or malaise traps. Some species were collected in malaise and water traps during more systematic collecting to monitor species' occurrence and the scale of their recolonization of burnt areas. Many of the records for the more abundant species were made in the field and specimens were not collected or retained. The voucher specimens are deposited in the collection at the Bishop Laboratory in Parc s'Albufera and/or in the private collections of MJE, DG (David Gibbs) and NJR.

Results

There are 36 species recorded from the park with 5 of these being new records for the Balearics. An additional 3 new species records for the Balearics from outside the park are included in this article. The species are listed in alphabetical order for convenience. Comments are added on distribution and habitat preference where these are known. Most of the data on habits and distribution were obtained from those summarized in recent literature (Peck, 1988; Stubbs & Falk, 2002; Speight, 2006) and supplemented by our own observations.

The data for each species are listed in chronological order with the initials of the collector at the end of each entry as follows: CC – C. Cerventes; MJE – M.J. Ebejer; JG – J. Guiu; PH – P. Hill; RK – R. King; SM – S. McKelvey; NJR – N.J. Riddiford; DS – D. Sivell; PL – P. Lupton. With some of the very widespread and abundant species the

Larval requirement	mud with rotting vegetation	pools of brackish water	dung	standing water with <i>Typha</i>	marsh with <i>Scirpus</i>
Availability & conditions	abundant; under several variable conditions	abundant; variable salinity & organic composition	frequent (bovine)	local	common; variable conditions
<i>Eristalinus</i>	x	x			
<i>Eristalis</i>	x	x	x		
<i>Helophilus</i>	x				
<i>Lejops</i>					x
<i>Neoascia</i>	x		x		
<i>Parhelophilus</i>				x	
<i>Syritta</i>	x		x		

Table 1. Summary of syrphid larval requirements known to be available in Parc s'Albufera. Species associated with wetlands, mud or mammalian dung.

Taula 1. Resum dels requeriments larvals de Syrphidae coneguts i observats en el Parc de s'Albufera de Mallorca. Espècies associades a zones humides, fang o zones fangoses remogudes pels ramats.

complete data are omitted for convenience, but where many examples have been examined this is noted. We have previously listed some Syrphidae species without specific data in a report on the Diptera of Parc s'Albufera (Ebejer, 2003). These are included in the following list with their data for completeness.

List of species

Ceriana Rafinesque 1815

Ceriana vespiformis (Latreille, 1804)

1♂ & 1♀, s'Albufera, Sa Roca, on flowers of *Foeniculum*, 22.v.2006, MJE; 1♂, s'Albufera, Camí des Polls, 28.v.2006, MJE.

A typical Mediterranean species, *vespiformis* is not uncommon. It is often found on Umbelliferae especially *Foeniculum*. It does not seem to have any specific habitat preference.

Chrysotoxum Meigen, 1803

Chrysotoxum elegans Loew, 1841 (sens. lat.)

A single specimen was seen and examined by one of us (MJE) about four years ago. It was collected on Mallorca, but unfortunately the specimen with its data appears to have been lost.

Prefers dry habitats near open woodland and scrub. It is widespread in Europe, but since it is unclear how many species are involved in this species complex, the distribution of some of these may turn out to be more restricted. First record for Balearics.

Chrysotoxum intermedium Meigen, 1822

1♀, s'Albufera, Ses Puntes, 6.v.1991, SM; 1♀, s'Albufera, Ses Puntes, 6.v.1991, 2♀♀, s'Albufera, Ses Puntes marsh, 13/v.1991 (collector unknown); 1♀, s'Albufera, Es Comú coastal dunes, *Pinus, Pistacia, Cistus*, 27.x.1995, NJR; 1♂, s'Albufera, Es Comú

coastal dunes, *Pinus*, *Pistacia*, *Cistus*, 29.iv.1999, NJR; 1♂, s'Albufera, Es Comú coastal dunes, *Pinus*, *Pistacia*, *Cistus*, 16.iv.2001, MJE; 1♀, Sa Pobla, Son Ton woods, *Pinus*, *Olea*, *Quercus*, *Arbutus*, *Pistacia*, 21.iv.2001, MJE; 1♀, s'Albufera, Ses Puntes, 21.iv.2006, DG.

This may be a species complex and more study will be required to confirm all the biological and ecological data that are currently attributed to *intermedium*. As currently interpreted, it is a widespread and common species in all habitats around the Mediterranean, although it prefers drier environments. The flight period extends over the whole twelve months, but peaks in March-May. Larva in nests of ants and possibly wasps.

Dasysyrphus Enderlein, 1938

Dasysyrphus albostrigatus (Fallén, 1817)

1♀, s'Albufera, Sa Roca, 23.x.1992, NJR; 1♂, s'Albufera, Sa Roca, 20.iv.2000, NJR.

Widespread in Europe and the Mediterranean and extends to Japan. Preferred habitats are forest and woodland margins and clearings.

Epistrophe nitidicollis (Meigen, 1822)

1♀, s'Albufera, Sa Roca, 10.iv.2004, PL; 1♀, s'Albufera, Sa Roca, on leaf of *Populus alba*, 10.iv.2004, PL; 1♂, s'Albufera, Sa Roca, MV trap, 14.iv.2006, NJR.

This is a widespread species in Europe and the Mediterranean. It extends through Palaearctic Asia to Japan and the Nearctic Region.

Episyrphus Matsumura et Adachi, 1917

Episyrphus balteatus (De Geer, 1776)

There are many male and female specimens

in the collection at Bishop Laboratory in the park.

Abundant everywhere in the Palaearctic. A migrant species that shows no preference for any specific habitat.

Eristalinus Rondani, 1845

Eristalinus aeneus (Scopoli, 1763)

1♀, s'Albufera, at main sluice, 5.v.1991 (collector unknown); 1♂, s'Albufera, Gran Canal, 27.iv.1998, NJR; 1♀, s'Albufera, Can Blau, 29.iv.2000, NJR; 1♂, s'Albufera, Sa Roca, 1.x.2004, MV trap, NJR.

A cosmopolitan species that is abundant in Europe, the Middle East and around the Mediterranean, especially in coastal areas. One of us (MJE) found larvae and reared them from very saline rock pools within a few metres of the sea on Malta. In May 2006 it was abundant on the coastal dunes at Es Comú and at Son Bosc, which is a relatively dry flat sandy meadow adjacent to Ses Salinetes in s'Albufera. At these two sites, *E. sepulchralis* was not seen.

Eristalinus sepulchralis (Linnaeus, 1758)

1♀, s'Albufera, Ses Puntes, 6.v.1991 (collector unknown); 1♀, s'Albufera, Ses Puntes, 13.v.1991 (collector unknown); 1♀, s'Albufera, 14.iv.1999, CC; 1♀, s'Albufera, Gran Canal, 12.iv.2000, RK; 1♂ & 1♀, s'Albufera, Gran Canal, 12.iv.2000, RK; 1♂, s'Albufera, Ses Puntes marsh, west, *Tamarix* & *Phragmites*, 16.iv.2001, MJE; 1♀, s'Albufera, Sa Roca, 30.v.2005, NJR; 11♂♂ & 7♀♀, s'Albufera, Es Rotlos, Malaise trap, 4-6.vi.2005, PH.

A common species in Europe with a preference for freshwater habitats compared to the foregoing species.

Eristalinus taeniops (Wiedemann, 1818)
1♂, s'Albufera, Son Bosc, 25.v.2006, MJE.

A very common species in the Mediterranean, Africa and the Middle East, frequenting open ground, marshes, pond and ditch margins, open sewage treatment plants and gardens. Like *E. aeneus* the adults can tolerate extremely hot and arid climates.

Eristalis Latreille, 1804

Eristalis arbustorum (Linnaeus, 1758)

4♂♂ & 2♀♀, s'Albufera, Ses Punes, 6.v.1991 (collector unknown); 2♀♀, s'Albufera, Ses Punes, 13.v.1991 (collector unknown); 1♀, s'Albufera, fossil dunes, 13.v.1991 (collector unknown); 1♀, s'Albufera, Es Forcadet, Canal del Sol & Torrent de Muro, 17.iv.2001, MJE.

Very common in all of Europe and the Mediterranean, preferring open areas near farms and gardens. In May 2006, it was very common in all habitats.

Larval requirement	plants with aphid and/or psyllid colonies	dung	trees with rot holes	trees with sap runs	plants with bulbous roots	nests of Hymenoptera
Availability & conditions	abundant & diverse	frequent (bovine)	scarce	scarce	scarce	abundant; in diverse habitats
<i>Ceriana</i>				x		
<i>Chrysotoxum</i>	x					x
<i>Dasysyrphus</i>	x					
<i>Epistrophe</i>	x					
<i>Episyrphus</i>	x					
<i>Eumerus</i>					x	
<i>Eupeodes</i>	x					
<i>Melanostoma</i>	x					
<i>Meliscaeva</i>	x					
<i>Merodon</i>					x	
<i>Myathropa</i>		x	x			
<i>Paragus</i>	x					
<i>Platycheirus</i>	x					
<i>Sphaerophoria</i>	x					

Table 2. Summary of syrphid larval requirements known to be available in Parc s'Albufera. Species associated with trees (rot holes or exuding sap), with aphids or with Hymenoptera.

Taula 2. Resum dels requeriments larvals de Syrphidae coneguts i observats en el Parc de s'Albufera de Mallorca. Espècies associades a arbres (forats o exudació de sava), amb àfids o amb himenòpters.

Eristalis tenax (Linnaeus, 1758)

1♂, s'Albufera, Es Ras, dry meadow near marsh, *Euphorbia*, 16.iv.2001, MJE; 1♂, Sa Pobla, Son Ton woods, *Pinus*, *Olea*, *Quercus*, *Arbutus*, *Pistacia*, 21.iv.2001, MJE. In addition, there are many male and female specimens in the collection at Bishop Laboratory in the park.

Cosmopolitan and abundant. In the Mediterranean this species flies all year, but especially from March to October.

Eumerus Meigen, 1832

Eumerus barbarus (Coqueberg, 1804)

1♀, s'Albufera, Sa Roca, 22.x.1999, NJR; 1♀, St Martí, Puig de Son Fe, 23.iv.2006, DG.

A common Mediterranean species with a peak flight period in spring, but it can be encountered from March to October.

Eumerus emarginatus Loew, 1848

Mallorca: 1♀, Escorca, Cuber, 900m, 24.iv.2006, DG.

This is not a well known species. It is known from Italy, Malta and Algeria. New record for the Balearics.

Eumerus pusillus Loew, 1848

1♂, St Martí, Puig de Son Fe, 23.iv.2006, DG.

A common Mediterranean species with a long flight period from March to November. It is often encountered on the flowers of Umbelliferae and Euphorbiaceae. First record for the Balearics.

Eupeodes Osten-Sacken, 1877

Eupeodes corollae (Fabricius, 1794)

There are many male and female specimens

in the collection at Bishop Laboratory in the park, all taken in spring between 1.iv and 16.v apart from one on 9.x.2003, S'Albufera, Sa Roca.

This is probably the commonest species in this genus. It is a regular migrant and can be found anywhere. In the southern part of its range it can be found all year but most abundantly from April to May.

Eupeodes luniger (Meigen, 1822)

1♂, s'Albufera, 16.v.1991, NJR; 1♂, s'Albufera, 5.v.1995, NJR.

A regular migrant and a common species throughout Europe and the eastern Palearctic. In the Mediterranean it flies from March to November. First record for the Balearics.

Helophilus Meigen, 1822

Helophilus trivittatus (Fabricius, 1805)

1♀, s'Albufera, Ses Puntetes, 13.v.1991 (collector unknown).

A species that can be frequently found in wetlands including saline marshes. It can be common but tends to be local. Widespread in Europe and the eastern Palearctic.

Lejops Rondani, 1857

Lejops vittatus (Meigen, 1822)

1♂, s'Albufera, Son Bosc, 9.v.2006, NJR.

A relatively uncommon species associated with *Scirpus* in wetlands. Widespread in Europe. First record for the Balearics.

Melanostoma Schiner, 1860

Melanostoma mellinum (Linnaeus, 1758)

1 ♀, s'Albufera, Sa Roca, 2.xi.1999, NJR; 1 ex, s'Albufera, Sa Roca, 3.xi.1999, NJR; 1 ♀, s'Albufera, Es Rotlos, Malaise trap, 4-

6.vi.2005, PH; 4 ex, s'Albufera, Sa Roca, 16.v.2006, MV trap, NJR; 1 ex, s'Albufera, Sa Roca, 17.v.2006, MV trap, NJR; there are additional male and female specimens in the collection at Bishop Laboratory in the park.

This species shows a strong preference for moist grassy habitats particularly in sheltered areas. Widespread in Europe, the eastern Palaearctic and North America.

Melanostoma scalare (Fabricius, 1794)

2 ex, 29.iii.2003, NJR; 1 ex, 3.v.2003; 1 ex, 5.v.2003, all from s'Albufera, Sa Roca, MV trap, NJR; there are many male and female specimens in the collection at Bishop Laboratory in the park.

This species shows a stronger preference for moist grassy habitats in sheltered areas when compared to the foregoing, but they are often seen flying together. Widespread in Europe, the eastern Palaearctic and Orient.

Meliscaeva Frey, 1946

Meliscaeva auricollis (Meigen, 1822)

1 ex, s'Albufera, Sa Roca, 6.xi.2001; 2 ex, s'Albufera, Sa Roca; 29.iii.2003 1 ex, s'Albufera, Sa Roca, 23.x.2005, NJR. There are additional male and female specimens in the collection at Bishop Laboratory in the park taken between 6.v and 11.v.1991, NJR.

Shows no special habitat preference as long there are shrubs with aphid colonies. It can be found in woods as well as wetlands. Common in Europe and the Mediterranean. In the southern part of its range it can be found all year, but its population peaks in spring: March to May.

Merodon Meigen, 1803

Merodon geniculatus Strobl, 1909

1♀, s'Albufera, Es Comú Baix, inland dunes, *Pinus*, *Pistacia*, *Cistus*, 31.iii.2002, NJR.

Prefers open stony ground where a very diverse flora is growing. This species has a relatively short flight period from March to April. A common and typical Mediterranean species.

Myathropa Rondani, 1845

Myathropa florea (Linnaeus, 1758)

1♂, s'Albufera, at main sluice, 5.v.1991 (collector unknown); 1♀, s'Albufera, Sa Roca, 29.iv.1998, NJR; 1♂, s'Albufera, Ses Puntes, 10.v.2003, DS.

Common in Europe and the Mediterranean, it prefers woodland edges and gardens.

Neoascia Williston, 1886

Neoascia balearensis Kassebeer, 2002

1♂ & 1♀, s'Albufera, Ses Puntes marsh east, *Salicornia*, 16.iv.2001, MJE; 1♂, s'Albufera, Ses Puntes marsh west, *Tamarix* & *Phragmites*, 16.iv.2001, MJE; 1♀, s'Albufera, Es Ras, dry meadow near marsh, *Euphorbia*, 16.iv.2001, MJE; 2♂♂, s'Albufera, Camí des Polls, 21.v.2006, MJE.

In Ebejer (2003), this species was listed as *N. podagrica*, when the report was submitted in 2001. Since then the new species was described and therefore that record now requires correction. Species in this genus inhabit damp areas close to wetlands as long as there is mud and flowering vegetation. The few records that are given above are on the basis of material critically examined. However, the species was very common

everywhere in Albufera, especially on the flowers of *Ranunculus*. Flies from March to October. Endemic to the Balearics.

Paragus Latreille, 1804

Paragus bicolor (Fabricius, 1794)

1♂, s'Albufera, Sa Roca, vegetation near freshwater, *Populus*, 19.iv.2001, MJE; 1♂ & 1♀, s'Albufera, Es Colombar marsh, Malaise trap, 10-11.vi.2005, PH; 1♂, s'Albufera, Es Comú, 20.iv.2006, DG.

Common in spring and early summer in the Europe and the Mediterranean. It flies among low growing herbage especially on garigue. As with most species of *Paragus* flying in the Mediterranean, the flowers most often visited are *Euphorbia*, *Foeniculum* and *Ferula*.

Paragus haemorrhous Meigen, 1822

2♂, s'Albufera, Sa Roca, vegetation near freshwater, *Populus*, 19.iv.2001, MJE; 1♂, s'Albufera, Es Ras, dry meadow near marsh, *Euphorbia*, 16.iv.2001, MJE; 1♀, s'Albufera, Ses Punes marsh, west, *Tamarix & Phragmites*, 16.iv.2001, MJE; 2♂♂ & 3♀♀, s'Albufera, Es Rotlos, Malaise trap, 6-8.vi.2005, PH; 1♂, s'Albufera, Ses Punes, 21.iv.2006, DG.

Common in all of Europe and the Mediterranean. In the south, it may be found all year except perhaps in late December to early January.

Paragus quadrifasciatus Meigen, 1822

1♂, s'Albufera, Es Colombar marsh, Malaise trap, 10-11.vi.2005, PH.

Common in central and southern Europe through to the eastern Palaearctic. Flies from spring to late summer.

Paragus tibialis (Fallén, 1817)

1♂, s'Albufera, Es Ras, 16.iv.2001, MJE; 1♂ & 1♀, s'Albufera, Ses Punes marsh, west, *Tamarix & Phragmites*, 16.iv.2001, MJE; 1♀, s'Albufera, Es Cibollar marsh, south, *Tamarix, Salicornia, Juncus*, 19.iv.2001, MJE; 1♂, St Martí, Puig de Son Fe, 150m, *Pinus, Phillyrea, Pistacia, Quercus, Rhamnus*, 22.vi.2006, MJE; 2♂♂ & 1♀, s'Albufera, Es Comú, 20.iv.2006, DG; 1♂, s'Albufera, Son Bosc, 21.iv.2006, DG; 1♂ & 1♀, s'Albufera, Es Comú, 25.iv.2001, DG.

Almost cosmopolitan. A common spring and summer species that prefers open, dry but vegetated areas.

Parhelophilus Girschner, 1897

Parhelophilus consimilis (Malm, 1863)

1♀, s'Albufera, Camí d'Enmig, 18.iv.1999, NJR; 1♂, s'Albufera, Sa Roca, 28.iv.2000, NJR.

This and the next species are early summer species that fly close to their breeding sites, which are standing pools and ponds where *Typha* and other emergent vegetation is present. Although widely distributed from Europe to the eastern Palaearctic, the species in this genus tend to be rather local because of their strong association with their breeding grounds. First record for the Balearics.

Parhelophilus versicolor (Fabricius, 1794)

1♀, s'Albufera, fossil dunes, 13.v.1991, (collector unknown); 1♂, s'Albufera, Es Forcadet, Canal del Sol & Torrent de Muro, 17.iv.2001, MJE; 1♂, s'Albufera, Camí des Polls, 28.v.2006, MJE.

Similar habits, habitat requirements and distribution to the foregoing species. First

1. <i>Callicera maquartii</i> (Rondani, 1844)	35. <i>Melanostoma mellinum</i> (Linnaeus, 1758)
2. <i>Callicera rufa</i> Schummel, 1841	36. <i>Melanostoma scalare</i> (Fabricius, 1794)
3. <i>Ceriana vespiformis</i> (Latreille, 1804)	37. <i>Meliscaeva auricollis</i> (Meigen, 1822)
4. <i>Cheilosia latifrons</i> (Zetterstedt, 1843)	38. <i>Merodon geniculatus</i> Strobl, 1909
5. <i>Cheilosia scutellata</i> (Fallén, 1817)	39. <i>Myathropa florea</i> (Linnaeus, 1758)
6. <i>Chrysotoxum elegans</i> Loew, 1841	40. <i>Neoascia balearensis</i> Kassebeer, 2002
7. <i>Chrysotoxum intermedium</i> Meigen, 1822	41. <i>Orthonevra longicornis</i> (Loew, 1843)
8. <i>Dasysyrphus albostrigatus</i> (Fallén, 1817)	42. <i>Paragus bicolor</i> (Fabricius, 1794)
9. <i>Epistrophe eligans</i> (Harris, 1780)	43. <i>Paragus coadunatus</i> Rondani, 1847
10. <i>Epistrophe nitidicollis</i> (Meigen, 1822)	44. <i>Paragus haemorrhous</i> Meigen, 1822
11. <i>Episyrphus balteatus</i> (De Geer, 1776)	45. <i>Paragus majoranae</i> Rondani, 1857
12. <i>Eristalinus aeneus</i> (Scopoli, 1763)	46. <i>Paragus quadrifasciatus</i> Meigen, 1822
13. <i>Eristalinus megacephalus</i> (Rossi, 1794)	47. <i>Paragus strigatus</i> Meigen, 1822
14. <i>Eristalinus sepulchralis</i> (Linnaeus, 1758)	48. <i>Paragus tibialis</i> (Fallén, 1817)
15. <i>Eristalinus taeniops</i> (Wiedemann, 1818)	49. <i>Parasyrphus macularis</i> (Zetterstedt, 1843)
16. <i>Eristalis arbustorum</i> (Linnaeus, 1758)	50. <i>Parhelophilus consimilis</i> (Malm, 1863)
17. <i>Eristalis similis</i> Fallén, 1817	51. <i>Parhelophilus versicolor</i> (Fabricius, 1794)
18. <i>Eristalis tenax</i> (Linnaeus, 1758)	52. <i>Platycheirus ambiguus</i> (Fallén, 1817)
19. <i>Eumerus amoenus</i> Loew, 1848	53. <i>Platycheirus fulviventris</i> (Macquart, 1829)
20. <i>Eumerus barbarus</i> (Coquebert, 1804)	54. <i>Ripponensia splendens</i> (Meigen, 1822)
21. <i>Eumerus emarginatus</i> Loew, 1848	55. <i>Scaeva albomaculata</i> (Macquart, 1842)
22. <i>Eumerus pulchellus</i> Loew, 1848	56. <i>Scaeva pyrastris</i> (Linnaeus, 1758)
23. <i>Eumerus pusillus</i> Loew, 1848	57. <i>Scaeva selenitica</i> (Meigen, 1822)
24. <i>Eumerus strigatus</i> (Fallén, 1817)	58. <i>Sphaerophoria rueppellii</i> (Wiedemann, 1830)
25. <i>Eupeodes corollae</i> (Fabricius 1794)	59. <i>Sphaerophoria scripta</i> (Linnaeus, 1758)
26. <i>Eupeodes flaviceps</i> (Rondani, 1857)	60. <i>Syrirta flaviventris</i> (Macquart, 1842)
27. <i>Eupeodes lucasi</i> (Marcos-Garcia & Laska 1983)	61. <i>Syrirta pipiens</i> (Linnaeus, 1758)
28. <i>Eupeodes luniger</i> (Meigen 1822)	62. <i>Syrphus ribesii</i> (Linnaeus, 1758)
29. <i>Eupeodes nuba</i> (Wiedemann 1830)	63. <i>Syrphus vitripennis</i> Meigen, 1822
30. <i>Ferdinandea cuprea</i> (Scopoli, 1763)	64. <i>Volucella zonaria</i> (Poda, 1761)
31. <i>Helophilus trivittatus</i> (Fabricius, 1805)	65. <i>Xanthandrus comtus</i> (Harris, 1780)
32. <i>Heringia heringi</i> (Zetterstedt, 1843)	66. <i>Xylota segnis</i> (Linnaeus, 1758)
33. <i>Ischiodon aegyptius</i> (Wiedemann, 1830)	
34. <i>Lejops vittatus</i> (Meigen, 1822)	

Table 3. Checklist of Syrphidae Balearics; names in bold = our additions.

Taula 3. Llistat dels Syrphidae de les Illes Balears; noms en negreta = noves citacions.

record for the Balearics.

Platycheirus Le Peletier et Serville, 1828
Platycheirus fulviventris (Macquart, 1829)
1♀, s'Albufera, 18.iv.2000, RK & NJR; 1♀,
s'Albufera, 26.x.2000, NJR; 2♂♂,
s'Albufera, Es Colombars marsh, *Tamarix*,
Salicornia, 16.iv.2001, MJE; 1♂,
s'Albufera, Sa Roca, vegetation near fresh-
water, *Populus*, 19.iv.2001, MJE.

Another wetland and moist grassland species. It is common in Europe and extends to the eastern Palaearctic. First record for the Balearics.

Platycheirus sp.
1♀, s'Albufera, Sa Roca, 19.v.1995, NJR.

This specimen is a headless female. The determination label by C. Plant states: “? scambus” (Staeger, 1843), but the species identity remains in doubt. However, it is neither *ambiguus* (Fallén, 1817) which is already known from the Balearics nor *fulviventris*, recorded above.

Scaeva Fabricius, 1805
Scaeva albomaculata (Macquart, 1842)
1♀, Betlem, Artà Mts, *Ampelodesmos* grass-
land, 1.v.2006, NJR; 1♀, s'Albufera, Sa
Roca, 28.v.2006, MJE.

A common spring migrant species all over the Mediterranean, Europe and many parts of Arabia and the Middle East.

Scaeva pyrastris (Linnaeus, 1758)
1♀, s'Albufera, Es Comú, 10.iv.2004, PL.

Like the above, it is a common spring migrant species all over the Mediterranean, Europe and many parts of Arabia and the Middle East.

Sphaerophoria Le Peletier et Serville, 1828
Sphaerophoria rueppellii (Wiedemann, 1830)

1♂, s'Albufera, Es Cibollar marsh, north, *Tamarix*, *Salicornia*, *Juncus*, 18.iv.2001, MJE; 4♂♂, s'Albufera, Es Colombar marsh, Malaise trap, 10-11.vi.2005, PH; 1♂, s'Albufera, Sa Roca, 16.x.2006, MV trap, NJR; many males and females seen in May 2006 in all habitats in the park.

Widespread and common throughout Europe, the Mediterranean, the Middle East as far as the eastern Palaearctic. Flies all year in the warmer southern parts of its range.

Sphaerophoria scripta (Linnaeus, 1758)
1♂, Pollença, Vall de Son March, pools, *Quercus*, *Populus*, 21.iv.2001, MJE.
Several males and females seen in May 2006 in all habitats in the Park and additional specimens of both sexes are in the collection at Bishop Laboratory.

Very common everywhere in the Palaearctic from dry to wet habitats as long as the ground is rich in flowering herbaceous plants.

Syrirta Le Peletier et Serville, 1828
Syrirta pipiens (Linnaeus, 1758)
1♂, s'Albufera, Sa Roca, vegetation near freshwater, *Populus*, 19.iv.2001, MJE.

In May 2006, many males and females were observed in all habitats in the Park and additional specimens of both sexes are in the collection at Bishop Laboratory. Almost cosmopolitan. Found in all habitats and in warmer climates can fly all year.

Syrphus vitripennis Meigen, 1822

4♀♀, s'Albufera, Camí des Polls, 28.v.2006, MJE.

Common and widespread in the Palaearctic, Nearctic and Oriental Regions, it can be found in most habitats.

Volucella Geoffroy, 1762

Volucella zonaria (Poda, 1761)

1♂, s'Albufera, Sa Roca, 16.vi.2004, NJR;
2♀♀, s'Albufera, Son Bosc, 25.v.2006, MJE.

Prefers open areas, but can be found in and around forests. It is somewhat local, but not rare. It occurs throughout Europe, the Mediterranean and the eastern Palaearctic.

Discussion

We confirm the presence of *Epistrophe nitidicollis* (Meigen, 1822), *Eupeodes luniger* (Meigen, 1822), *Melanostoma scalare* (Fabricius, 1794) and *Syrphus vitripennis* Meigen, 1822. We list the following 7 species as new records for the Balearics: *Chrysotoxum elegans* Loew, 1841; *Eumerus emarginatus* Loew, 1848, *E. pusillus* Loew, 1848, *Lejops vittatus* (Meigen, 1822), *Parhelophilus consimilis* (Malm, 1863), *P. versicolor* (Fabricius, 1794), and *Platycheirus fulviventris* (Macquart 1829). Thus the number of species now known from the Balearics is 66. Of these, 36 occur in s'Albufera de Mallorca. *Lejops* and *Parhelophilus* require specific habitats such as those provided in the park, making this site a very important one for these Syrphidae. The two species of *Eumerus* were found outside the park, but they could both easily occur within its boundaries.

Hoverflies are more abundant and exhibit more species diversity in mosaics of

habitats where sunshine, water and diverse flowering vegetation abound. S'Albufera contains a wide range of habitats that could support the larval stages of many hoverfly species (Tables 1, 2). Ferrar (1987) summarizes the breeding habits, but more data has been accumulating since then, owing to the enormous growth in interest in the biology of Syrphidae over the last two decades. The diversity of habitats in s'Albufera would have been expected to support a larger number of species of Syrphidae. In fact this is not the case. However, it must be noted that many Mediterranean islands are nowhere as rich in species as the mainland adjacent to them even where there is great similarity of habitat. Species poverty is a known feature of islands generally, and is governed by a complexity of interacting factors including geological antiquity, the effect of geographical distance on immigration rates, island size, habitat diversity, habitat size and integrity, limitations on other resources, human history, occupation and influence (MacArthur & Wilson, 1967 (2001); Whittaker, 1999). Early results suggest that s'Albufera meets the rule of fewer species than would be expected at a mainland site of similar size, habitats and geographical area.

Most species of hoverflies, during the adult phase, do not restrict their activities in proximity to their breeding sites. Adults wander far, sometimes very far from their breeding sites in search of flowers for pollen and nectar (Szymank, 2002). Therefore, diversity of breeding habitat in the park is only one factor that has a bearing on the diversity of hoverfly species encountered as adults. Another important factor is food resource for the adults, the most important of which is a wide range of flowering plants, where the fly has access to pollen and nectar. Thus many species of the Leguminosae would not be suitable plants. Plants in the

families Umbelliferae, Compositae and Euphorbiaceae are easily the most preferred sources of pollen and nectar by the majority of hoverflies in the Mediterranean and none of these plants are particularly common in the park.

Ongoing studies in Lepidoptera (Honey & Ferriz, pers. com.) indicate that the islands of Menorca and Mallorca have more species affinities with the northern Mediterranean than does Ibiza, which is the island closest to mainland Spain and with which it has more affinities than the other two islands. In order to understand the species composition of Syrphidae in the Balearics and how the distribution compares between the islands, more sampling is essential. The flight period and the number of generations per year are both greater in the Mediterranean than in northern Europe where most studies of European Syrphidae have taken place. Early spring species can be expected to fly from February to March and if bivoltine, they can be found again in October. This may account for why species in the large genera *Cheilosia* and *Eumerus*, with one exception, have not been recorded yet from s'Albufera (although two species of *Eumerus* have been found just outside the park and are therefore included in this article). Also, habitats are different at high altitude and species that fly in summer at sea level in northern climates may indeed be found in summer in Mallorca only at high altitude. To date we have conducted fieldwork in April-May and in October and most of it at sea level. Therefore it is essential to sample not only more widely in all three major islands, but also to expand the sampling season before considering that a reasonably comprehensive list of species of Syrphidae for the Balearics is compiled.

We suggest that even at this early stage of limited studies, s'Albufera has great con-

servation value for Syrphidae, particularly those species dependent on wetlands for their larval stages (Table 1). This is because of its comparatively large size, the diversity of habitats and the quality and number of species already encountered there.

Finally, it must also be stated that the syrphid fauna of the Balearics is still too poorly studied to draw reliable conclusions and a lot more field work is required to help us understand the occurrence and distribution of species in these islands.

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