ISSN: 1989-6581

www.aegaweb.com/arquivos_entomoloxicos

Márquez-Rodríguez (2017)
ARQUIVOS ENTOMOLÓXICOS, **18**: 7-16

ARTIGO / ARTÍCULO / ARTICLE
Odonata records from southeast Portugal.

Joaquín Márquez-Rodríguez

Zoología. Departamento de Sistemas Físicos, Químicos y Naturales - Facultad de Ciencias Experimentales. Universidad Pablo de Olavide. A-376, Km 1. E-41013 Sevilla (ESPAÑA - SPAIN). e-mail: jmarrod1@upo.es

Abstract: An annotated list of 20 species recorded in summer between 2012 and 2016 during several journeys to SE Portugal is presented. The studied localities on the border between Portugal and Spain, rich in thermophilic species, are a favourable biotope for the settlement of African dragonflies. Species of the genera *Trithemis* Brauer, 1868 and *Crocothemis* Brauer, 1868 are the most abundant. Additional notes on the abundance and distribution in the region along the summer are given.
Key words: Odonata, Alentejo, Algarve, Guadiana River basin, Portugal.

Resumen: Registros de Odonata del sureste de Portugal. Se presenta una lista comentada de 20 especies registradas en verano entre 2012 y 2016 durante varios viajes al SE de Portugal. Las localidades estudiadas en la frontera entre Portugal y España, ricas en especies termófilas, son un biotopo favorable al asentamiento de libélulas africanas. Las especies de los géneros *Trithemis* Brauer, 1868 y *Crocothemis* Brauer, 1868 son las más abundantes. Se aportan notas adicionales sobre la abundancia y distribución en la región en verano.
Palabras clave: Odonata, Alentejo, Algarve, cuenca del río Guadiana, Portugal.

Recibido: *28 de junio de 2017*
Aceptado: *18 de julio de 2017*
Publicado on-line: *24 de agosto de 2017*

Introduction

Southwestern Iberia is one of the most interesting European regions from a faunistic point of view, constituting an important contact zone between western Palearctic and Paleotropical faunas but, odonatologically, many parts of this region, which comprises Algarve and Alentejo in Portugal, seem to be only poorly investigated. Some Afrotropical species as *Diplacodes lefebvrii* (Rambur, 1842) or *Brachythemis impartita* (Karsch, 1890) were cataloged for the first time to Europe from mainland Portugal (MOURA, 1960; FERREIRA & WEIHRAUCH, 2005) and even FERREIRA *et al.* (2006) cataloged 63 Odonata species in mainland Portugal but, according to FERREIRA & WEIHRAUCH (2005), WEIHRAUCH & WEIHRAUCH (2003) and DE KNIJF & DEMOLDER (2010), Portugal is still one poorly investigated country in western Europe regarding Odonata. In addition to the mentioned publications other odonatological researchs have been carried out in south Portugal (McLACHLAN, 1880; AGUIAR & AGUIAR, 1983, 1985; GARDINER, 1993; GARDINER & STURGESS, 1994, 1995; GARDINER & WALLIS, 1996; HARTUNG, 1996; JAHN, 1996a,b; JÖDICKE, 1996; JONES, 1996; MALKMUS, 1996, 1998; RÖHN, 1996; KAPPES & KAPPES, 1999; BONESS, 2000; LOHR, 2005a, b; MALKMUS & RUF, 2008; FULAN *et al.*, 2008; VIEIRA *et al.*, 2010; MÁRQUEZ-RODRÍGUEZ, 2013, 2014; FONSECA *et al.*, 2017; LESPARRE, 2017).

The Algarve has a year round warm climate with summer temperatures up to 35°C and maximum winter temperatures of 15°C. The Alentejo has a much more severe climate: very hot and dry summers up to 40°C, and relatively cold winters. The western and southwestern part of Portugal has a strong

Atlantic climatic influence, resulting in mild winters and not too hot summers (DE KNIJF & DEMOLDER, 2010). In this study we provide faunistic data on Odonata from Algarve and Alentejo, with special account on the phenology in summer and including a number of biological observations.

Material and methods

Odonata were surveyed in a few selected hot days in the summers from 2012 to 2016 in the two southernmost regions of Portugal, Alentejo and Algarve. We visited Portuguese locations bordering Spain as a working hypothesis, in an attempt to detect the current odonatofauna before the possible arrival of the non-native species *Trithemis kirbyi* Selys, 1891 to the westernmost region of the Iberian Peninsula. In this way, we continued a distribution study started in 2012, which suggested Guadiana River as a natural dispersion corridor of this species due to the habitat characteristics on the banks. (MÁRQUEZ-RODRÍGUEZ, 2013). Samplings were not performed on a daily basis but this approach was methodical in the way other authors have done before (WEIHRAUCH & WEIHRAUCH, 2003; LOHR, 2005a). For species identification we used ASKEW (2004), DIJKSTRA & LEWINGTON (2006) and MARAVALHAS & SOARES (2013).

The selection of the sampling localities was based on the most obviously suitable for detection of thermophilic dragonflies in the region we were passing by. At each locality we searched for adult dragonflies and exuviae near the water, and above the bank vegetation and in the surroundings. We only collected larvae in a locality by the fact that the water level was very low, making of it an isolated place within a dry watercourse. The survey lasted until we presumed it as thoroughly investigated, or as long as no new species were found anymore. Most of the species were identified through binoculars. Individuals that were difficult to identify such as exuviae, females and tenerals were collected with an insect net for determination.

List of localities visited

Portalegre district, Alentejo:

- Loc. 1: Bridge of Ayuda, over Guadiana River, a big river constituting the border between Portugal and Spain, 38°46'38"N, 7°10'18"W. 15-09-2012, 14:00 UTC. (Fig. 1).

Évora district, Alentejo:

- Loc. 2: Guadiana River, Juromenha. A broad, slow-running river, border between Portugal and Spain, 38°44'07"N, 7°14'34"W. 16-09-2012, 11:00 UTC.
- Loc. 3: Redondo, artificial lagoon with rounded shape in an urban park, 38°39'08"N, 7°32'30"W. 16-09-2012, 12:00 UTC.

Beja district, Alentejo:

- Loc. 4: Pias reservoir, about 60 km N Mértola. A dam with cement blocks. 37°59'33"N, 7°27'55"W. 24-06-2016, 15:00 UTC.
- Loc. 5: Vascão River, about 20 km S Mértola. A small course with large isolated ponds, partly stagnant river, constituting the border between the Beja and Faro districts (and at the same time between the provinces Alentejo and Algarve). Accordingly, the substrate was either sand, pebbles or rock. 37°30'49"N, 7°35'08"W. 02/08/2015, 12:00 UTC.

Faro district, Algarve:

- Loc. 6: Odeleite River. A small course with riparian vegetation upstream of the population. The substrate was sand and pebbles. 37°20'18"N, 7°29'17"W. a) 29/06/2013, 11:00 UTC. b) 02/08/2015, 10:00 UTC.
- Loc. 7: Odeleite River (<50 m to dam). A slow-running downstream of the population, very close to a dam. The substrate was sand and pebbles or rock. 37°19'58"N, 7°29'09"W. 01/08/2014, 11:00 UTC.

- Loc. 8: small pond, Almada de Ouro. A puddle of a dried-up brook connected to Guadiana River, border between Portugal and Spain. Only from this sampling location were collected adults and larvae. 37°17'49"N, 7°27'12"W. 03-08-2014, 18:00 UTC.
- Loc. 9: Beliche River (<50 m to dam), exit of the reservoir. An almost stagnant, highly eutrophic drainage artificial ditch, close to a dam. 37°16'39"N, 7°30'27"W. 01/08/2014, 13:00 UTC.
- Loc. 10: Beliche River. A slow-running, small course with riparian vegetation and abundant macrophytes. 37°15'54"N, 7°28'22"W. 30/06/2012, 14:00 UTC.
- Loc. 11: small pond. A small, shallow pond feeding to a small brook in the hillside near Beliche River in the Guadiana basin. 37°15'54"N, 7°27'36"W. 03/08/2014, 16:00 UTC.
- Loc. 12: two artificial ponds, Castro Marim. Two ponds of a golf club. 37°15'07"N, 7°27'15."W. 03-08-2014, 15:00 UTC.
- Loc. 13: beach, Monte Gordo-Vila Real de Santo António. Sandy area on the dune. 37°10'36"N, 7°26'19"W. 04-08-2014, 14:00 UTC.
- Loc. 14: Pego do Inferno and Gilão River, 37°09'19"N, 7°41'44"W. Water spring with waterfall and 300 m stretch of Gilão River with big ponds almost stagnant, highly eutrophic. 37°09'19"N, 7°41'43"W. 02-08-2014, 12:00 UTC. (Fig. 2).
- Loc. 15: Olhos de Água. Urban area next to a beach. 37°05'30"N, 8°11'36"W. 29-08-2015, 14:00 UTC.
- Loc. 16: channel, Lagoa. Artificial channel: an almost stagnant, drainage ditch. 37°07'31"N, 8°27'14"W. 27-08-2015, 14:00 UTC.
- Loc. 17: Arade River, Silves. A small course with riparian vegetation. 37°11'11"N, 8°26'21"W. 29-08-2016, 14:00 UTC.
- Loc. 18: Odelouca River, Odelouca. A big lagoon with riparian vegetation connected to Odelouca River. 37°11'18"N, 8°29'18"W. 29-08-2016, 15:00 UTC.

Results

During five years we visited Portuguese locations occasionally and 20 odonate species were recorded in summer on the wing or as exuviae. An *Anax* Leach, 1815 species was recorded as larvae in Loc. 8. We also included absolute data of the species observed in the Loc. 10 (MÁRQUEZ-RODRÍGUEZ, 2014). A list of all records is given below. Abbreviations: ♂: male; ♀: female; Ex.: exuviae; La.: larvae (only sampled in Loc. 8); Td.: tandem observed.

List of records and observations

Calopteryx haemorrhoidalis (Vander Linden, 1825)
Loc. 10: 2♂♂, 5♀♀.

Chalcolestes viridis (Vander Linden, 1825)
Loc. 6: b) 1♂♂.
Loc. 8: 2♂♂.
Loc. 11: 1♂, 1♀♀.
Loc. 14: 3♂♂, 2♀♀.

Platycnemis latipes Rambur, 1842
Loc. 5: 2♂♂.
Loc. 14: 10♂♂, 6♀♀ (Td.: 3).

Ceriagrion tenellum (Villiers, 1789)
Loc. 14: 4♂♂.

Erythromma lindenii (Selys, 1840)
Loc. 14: 8♂♂, 2♀♀.

Ischnura graellsii (Rambur, 1842)

Loc. 2: 5♂♂, 14♀♀.
Loc. 4: 3♂♂.
Loc. 6: a) 1♂, b) 10♂♂, 3♀♀ (one teneral).
Loc. 8: 5♂♂, 6♀♀, 1 La.
Loc. 11: 3♂♂, 2♀♀ (Td.: 1).
Loc. 14: 6♂♂, 3♀♀ (Td.: 1).

Anax imperator Leach, 1815

Loc. 1: 2♂♂, 1♀ (Td.: 1).
Loc. 3: 11♂♂.
Loc. 5: 2♂♂.
Loc. 6: a) 2♂♂ (one teneral).
Loc. 8: 1 La.
Loc. 11: 1♂.
Loc. 14: 2♂♂, 1♀ (Td.: 1).

***Anax* sp.**

Loc. 8: 1 La.

Anax parthenope (Selys, 1839)

Loc. 15: 1♂♂, 1♀.
Loc. 17: 2♂♂.

Onychogomphus forcipatus (Linnaeus, 1758)

Loc. 6: a) 1♂, 7 Ex.
Loc. 14: 1 Ex.

Brachythemis impartita (Karsch, 1890)

Loc. 1: 1♀.
Loc. 2: 2♂♂, 1♀.
Loc. 6: a) 1♀ (Fig. 3).

Crocothemis erythraea (Brullé, 1832)

Loc. 1: 1♂, 1♀.
Loc. 2: 1♂.
Loc. 3: 22♂♂, 1♀.
Loc. 5: 1♂.
Loc. 6: a) 8♂♂, 3♀♀ (Td.: 1); b) 16♂♂, 3♀♀.
Loc. 7: 2♂♂.
Loc. 8: 2♂♂, 2 La.
Loc. 9: 6♂♂.
Loc. 14: 3♂♂, 1♀.

Together with Odonata larvae of the Locality 8, several specimens of different sizes (36 to 92 mm) of the fish *Cobitis paludica* (de Buen, 1929) were observed, registered in this paper because of the ecological importance of the breeding site of this species (Fig. 4).

Diplacodes lefebvrii (Rambur, 1842)

Loc. 14: 5♂♂ (Fig. 5).

Orthetrum brunneum (Fonscolombe, 1837)

Loc. 10: 1♂.

Orthetrum coerulescens (Fabricius, 1798)

Loc. 6: a) 5♂♂, 2♀♀ (Td.: 1).

Orthetrum cancellatum (Linnaeus, 1758)

Loc. 4: 1♂.
Loc. 11: 1♂.

Orthetrum chrysostigma (Burmeister, 1839)

Loc. 3: 3♂♂, 1♀.
Loc. 4: 1♂.
Loc. 5: 1♂.
Loc. 6: a) 1♂; b) 1♂.
Loc. 10: 2♂♂.
Loc. 14: 5♂♂, 2♀♀ (Td.: 1).

Orthetrum nitidinerve (Selys, 1841)
Loc. 10: 1♀ (teneral).

Sympetrum fonscolombii (Selys, 1840)
Loc. 1: 8♂♂, 7♀♀ (Td.: 1).
Loc. 2: 6♂♂, 3♀♀.
Loc. 3: 15♂♂, 10♀♀ (Td.: 3).
Loc. 13: 2♂♂.
Loc. 16: 1♂.
Loc. 17: 2♀♀.

Sympetrum striolatum (Charpentier, 1840)
Loc. 1: 1♂.

Trithemis annulata (Palisot de Beauvois, 1805)
Loc. 4: 4♂♂, 1 Ex.
Loc. 5: 6♂♂, 13♀♀ (Td.: 3), 32 Ex.
Loc. 6: a) 4♂♂; b) 5♂♂.
Loc. 7: 2♂♂.
Loc. 12: 5♂♂.
Loc. 14: 4♂♂, 2♀♀ (Td.: 1).
Loc. 17: 1♂, 1♀.
Loc. 18: 1♀.

Discussion

Portugal is the southwesternmost country of the European continent. Many species of the Mediterranean basin are also restricted to this region and, therefore, it is a part of a global biodiversity hotspot with a high level of endemism (MYERS *et al.*, 2000). Until recently, the odonatofauna of Portugal received little attention, despite its diverse fauna. It was only in 2005 that a first bibliography of the odonatological literature of Portugal was published (FERREIRA & WEIHRAUCH, 2005), followed in 2006 by a revised checklist of the Odonata fauna of Portugal (FERREIRA *et al.*, 2006). The southern part of Portugal has a distinct climate, much warmer and drier than the rest of the country. Consequently, several species with an African origin are observed in this region of Portugal (DE KNIJF & DEMOLDER, 2010; VIEIRA *et al.*, 2010) and our faunistic results support this idea. This is the case of *Trithemis annulata:* the first records in the Iberian Peninsula consisted of larvae and teneral adults, collected in Sierra Morena (Córdoba, Spain) in 1978 (FERRERAS-ROMERO, 1981); nowadays, nearly four decades later, this species is abundant and easily breeding throughout this mountain system, including the extreme west on the Spain-Portugal border.

WEIHRAUCH & WEIHRAUCH (2003) mention two exuviae collected from Ribeira do Vascão (Loc. 5), which were later revised by FERREIRA & WEIHRAUCH (2005) as *Trithemis annulata*. Later, DE KNIJF & DEMOLDER (2010) observed more than 100 adults, constituting one of the most abundant species in this river. Our research confirms its excellent breeding success with many exuviae observed and collected (Fig. 6). This thermophilic species could compete with *Trithemis kirbyi*, a similar species present in the peninsula, for resources in the future. In fact, *T. kirbyi* is a libellulid which is in expansion in the Iberian Peninsula since 2007 (CHELMICK & PICKESS, 2008), a process of faster advance following the latitude (MÁRQUEZ-RODRÍGUEZ, 2014). For example in Spain, in 2012, when the species was observed in two extreme points with coastal influence: Tarragona (Mediterranean coast) (HERRERA-GRAO *et al.*, 2012) and Huelva (Atlantic influence) (OBREGÓN-ROMERO *et al.*, 2013; MÁRQUEZ-RODRÍGUEZ, 2013), where it seems to advance more slowly; the distance to north country is greater to west starting from the first point of observation in Andalusia (CHELMICK & PICKESS, 2008). On the other hand, this species had not been recorded in the dragonflies catalog of Portugal (MARAVALHAS & SOARES, 2013). The first observation of an isolated male is from Mértola (30 May 2016), in Ribeira das Carreiras valley belonging to the Guadiana River basin (LESPARRE, 2017). It would be advisable to carry out new samplings in the next few years to know the dynamics of the odonates from southeast Portugal, especially in the localities 4 and 5, near to the Guadiana River basin, and to know the balance between the two species of *Trithemis* Brauer, 1868 in the area. Likewise, this species

had not yet been observed in France until Chris Abbott documented this species in 2017, with photographs taken from Couiza in the Aude River valley (GROUPE SYMPETRUM, 2017).

Pego do Inferno and the Gilão River stretch studied (Loc. 14) were the most biodiverse localities, with eleven species (55% of the total observed). The presence of dams and reservoirs produces changes in the hydraulic regime from running to nearly standing water and changes of sediment discharges. This also has consequences for the lifecycles in dragonfly communities. Rheophilous species are declining or even becoming locally extinct and several multivoltine species typical of standing waters, such as *Crocothemis erythraea*, *Trithemis annulata* and *Sympetrum fonscolombii*, are becoming omnipresent along streams and rivers (DE KNIJF & DEMOLDER, 2010), as for example in Loc. 7, 9 and 18. There is a great difference in Odeleite River with respect to a nearby site located upstream (Loc. 6) where the odonate richness is greater. The most extreme situation is reached in artificial ponds with high anthropogenic influence (Loc. 12).

Some localities should be taken into account for their possible environmental protection, based on the diversity of their fauna (Loc. 5) or the existence of species with ecological interest (Loc. 8 and 10) which are more sensitive to habitat alteration.

Acknowledgements

I would like to thank Manuel Ferreras, for kindly accompanying me in the samplings in 2016.

References

AGUIAR, C. & AGUIAR, S. 1983. *Brachthemis* [sic] *leucosticta* (Burm.) and *Trithemis annulata* (P. de Beauv.) in Portugal (Anisoptera: Libellulidae). *Notulae Odonatologicae*, **2**(1): 8-9.

AGUIAR, S. & AGUIAR, C. 1985. *Paragomphus genei* (Sel.), *Hemianax ephippiger* (Burm.) and *Trithemis annulata* (P. de Beauv.) in Portugal (Anisoptera: Gomphidae, Aeshnidae, Libellulidae). *Notulae Odonatologicae*, **2**(5): 82-83.

ASKEW, R.R. 2004. *The dragonflies of Europe.* Harley Books, Colchester, 308 pp.

BONESS, M. 2000. Massenflug der Schabrackenlibelle *Hemianax ephippiger* Burmeister an der Küste der Algarve (Portugal) (Insecta, Odonata). *Atalanta*, **31**: 585.

CHELMICK, D. & PICKESS, B.P. 2008. *Trithemis kirbyi* Selys in southern Spain (Anisoptera: Libellulidae). *Notulae Odonatologicae*, **7**: 4-5.

DE KNIJF, G. & DEMOLDER, H. 2010. Odonata records from Alentejo and Algarve, southern Portugal. *Libellula*, **29**(1/2): 61-90.

DIJKSTRA, K.-D.B. & LEWINGTON, R. 2006. *Field guide to the dragonflies of Britain and Europe.* British Wildflife Publishing, Gillingham. 320 pp.

FERREIRA, S.; GROSSO-SILVA, J.M.; LOHR, M.; WEIHRAUCH, F. & JÖDICKE, J. 2006. A critical checklist of the Odonata of Portugal. *International Journal of Odonatology*, **9**(2): 133-150.

FERREIRA, S. & WEIHRAUCH, F. 2005. Annotated bibliography of odonatological literature from continental Portugal, Madeira, and the Azores (Odonata). *Libellula*, **24**(1/2): 109-128.

FERRERAS ROMERO, M. 1981 (1980). Un odonato nuevo para la fauna ibérica, *Trithemis annulata* (Palisot de Beauvais, 1805) (Anisoptera, Libellulidae). *Boletín de la Asociación española de Entomología*, **4**: 191-193.

FONSECA, N.; SOARES, A; FÉLIX, R.M. & LEITÃO, D. 2017. First evidence of breeding of *Zygonyx torridus* (Odonata: Libellulidae) in Portugal. *Notulae Odonatologicae*, **8**(9): 319-374.

FULAN, J.A.; RAIMUNDO, R. & FIGUEIREDO, D. 2008. Habitat characteristics and dragonflies (Odonata) diversity and abundance in the Guadiana River, eastern of the Alentejo, Portugal. *Boletín de la Asociación Española de Entomología*, **32**(3-4): 327-340.

GARDINER, A.[J.] 1993. The dragonflies of Quinta da Rocha: September to December 1992. *A Rocha Observatory Report for the Year 1992*: 89-91.

GARDINER, A.[J.] & STURGESS, P. 1994. Dragonflies on Quinta da Rocha in 1993. *A Rocha Observatory Report for the Year 1993*: 80-84.

GARDINER, A.[J.] & STURGESS, P. 1995. Dragonflies on Quinta da Rocha in 1994. *A Rocha Observatory Report for the Year 1994*: 50-53.

GARDINER, A.[J.] & WALLIS, P. 1996. Insect recording on Quinta da Rocha in 1995. *A Rocha Observatory Report for the Year 1995*: 58-67.

GROUPE SYMPETRUM, 2017. http://www.sympetrum.fr/spip.php?breve9 (online : 06/07/2017).

HARTUNG, M. 1996. Odonata from the Iberian Peninsula with a description of *Calopteryx haemorrhoidalis almogravensis* ssp. n. from Portugal. *Advances in Odonatology* (Suppl.), **1**: 53-59.

HERRERA-GRAO, T.; BONADA, N.; GAVIRA, O.; BLANCO-GARRIDO, F. 2012. First record of *Trithemis kirbyi* Sélys, 1891 in Catalonia (Odonata, Libellulidae). *Boletín de la Asociación española de Entomología*, **36**(3-4): 457-459.

JAHN, P. 1996a. Dwarf forms of dragonflies in Portuguese coastal waters (Zygoptera: Calopterygidae; Anisoptera: Libellulidae). *Advances in Odonatology* (Suppl.), **1**: 61-63.

JAHN, P. 1996b. Libellen im Einzugsgebiet des Guadiana in Südostportugal. *Advances in Odonatology* (Suppl.), **1**: 65-76.

JÖDICKE, R. [ed.]. 1996. Faunistic data of dragonflies from Portugal. *Advances in Odonatology* (Suppl.), **1**: 149-153.

JONES, S.P. 1996. Notes and observations on dragonflies in southern Portugal. *Advances in Odonatology* (Suppl.), **1**: 113-116.

KAPPES, E. & KAPPES, W. 1999. Südliche iberische Halbinsel – Naturkundliche Reisenotizen. Algarve/Portugal 22. bis 29. März 1997; Andalusien/Spanien 3. bis 17. April 1998; 11. bis 27. September 1998; Route; Artenliste: Säugetiere, Vögel, Libellen, Tagfalter, Amphibien/Reptilien, Farbfotos. *Naturkundliche Reiseberichte*, **13**: 1-112.

LESPARRE, D. 2017. Première observation de *Trithemis kirbyi* Sélys, 1891 (Odonata: Libellulidae) au Portugal. *Boletín de la Sociedad Entomológica Aragonesa*, **60**: 363–364.

LOHR, M. 2005a. Libellenbeobachtungen in Südportugal (Odonata). *Libellula*, **24**(1/2): 87-107.

LOHR, M. 2005b. *Selysiothemis nigra* new for Portugal. *Notulae Odonatologicae*, **6**: 57-58.

MALKMUS, R. 1996. Libellen im Gebiet des unteren Rio Guadiana, Portugal. *Advances in Odonatology* (Suppl.), **1**: 123-126.

MALKMUS, R. 1998. Frühjahrsbeobachtungen von Libellen in Portugal. *Libellula*, **17**(1/2): 91-96.

MALKMUS, R. & RUF, T. 2008. Herbstaktive Libellen in Südportugal (Odonata). *Libellula*, **27**(1/2): 123-132.

MARAVALHAS, E. & SOARES, A. 2013. *The Dragonflies of Portugal*. Booky publisher, 336 pp.

MÁRQUEZ-RODRÍGUEZ, J. 2013. Seguimiento en el comportamiento y proceso de colonización atlántica de *Trithemis kirbyi* Sélys, 1891 (Odonata: Libellulidae) en la Península Ibérica. *Revista gaditana de Entomología*, **4**(1): 159-167.

MÁRQUEZ-RODRÍGUEZ, J. 2014. Primera cita de *Orthetrum nitidinerve* (Selys, 1841) (Odonata: Libellulidae) en el Algarve (sur de Portugal). *Arquivos Entomolóxicos*, **10**: 65-68.

McLACHLAN, R. 1880. Notes on the Entomology of Portugal. II. Pseudo-Neuroptera (in part) & Neuroptera-Planipennia. *The Entomologist's monthly magazine*, **17**: 103-108.

MOURA, A.R. 1960. Contribução para o conhecimento dos Odonata portugueses. Género e espécie novos para Portugal: *Brachythemis leucosticta* (Burm.). *Memórias e Estudos do Museu Zoológico da Universidade de Coimbra*, **264**: 1-5.

MYERS, N.; MITTERMEIER, R.A.; MITTERMEIER, C.G.; DA FONSECA, G.A.B. & KENT, J. 2000. Biodiversity hotspots for conservation priorities. *Nature*, **403**: 853-858.

OBREGÓN-ROMERO, R.; CANO-VILLEGAS, F.J.; TAMAJÓN-GÓMEZ, R. & LÓPEZ TIRADO, J. 2013. Primeras citas de *Trithemis kirbyi* Sélys, 1891 (Odonata, Libellulidae) en las provincias de Ciudad Real y Huelva, y nuevas aportaciones para la provincia de Badajoz (España). *Boletín de la Sociedad Andaluza de Entomología*, **22**: 88-93.

RÖHN, C. 1996. Frühjahrsbeobachtungen von Libellen im zentralen und südlichen Teil der Iberischen Halbinsel. *Advances in Odonatology* (Suppl.), **1**: 129-137.

VIEIRA, C.; GONÇALVES, V.; CARDOSO, A.C. & PATANITA, I. 2010. Registo de quatro novas espécies de Odonata para a Ribeira do Vascão, Sítio de Interesse Comunitário do Guadiana (Portugal). *Boletín de la Sociedad Entomológica Aragonesa*, **47**: 461-462.

WEIHRAUCH, F. & WEIHRAUCH, S. 2003. Spring Odonata records from Alentejo (Portugal), Andalusia and Extremadura (Spain). *Opuscula Zoologica Fluminensia*, **207**: 1-18.

Fig. 1.- The bridge of Ayuda, over Guadiana River: an ideal breeding habitat for *Trithemis* spp.

Fig. 2.- Pego do Inferno: an ideal breeding habitat to native species.

Fig. 3.- *Brachythemis impartita* (male) in Guadiana River.

Fig. 4.- *Cobitis palludica* cohabiting with *Crocothemis erythaea* in Loc. 8.

Fig. 5.- *Diplacodes lefebvrii* in Gilão River.

Fig. 6.- Exuviae of *Trithemis annulata* collected from Ribeira do Vascão.