

ON THE OCCURRENCE OF *CHARAXES JASIUS* (LEPIDOPTERA:  
NYMPHALIDAE) IN ISTRIA, CROATIA

Toni KOREN

University of Primorska, Science and Research Centre, Institute for Biodiversity Studies, SI-6310 Izola, Giordana Bruna 6, Slovenia  
E-mail: koren.toni1@gmail.com

## ABSTRACT

The two-tailed Pasha, *Charaxes jasius*, is one of the largest and most impressive butterfly species in Europe. In Croatia it inhabits the Mediterranean coastal areas, from Rijeka south towards Dalmatia, and many Adriatic islands. Until now, its occurrence in the most northwesterly part of the Croatian shore, the Istrian peninsula, remained questionable. Three new records, from Palud, Premantura and Kalavojna, confirm its presence on the peninsula and expand its known range in Croatia. There are no suitable larval habitats north of the Mirna valley, and therefore the valley likely represents the northern distribution border for this species in Croatia. A map representing all published records from Croatia is provided.

**Key words:** *Charaxes jasius*, *Arbutus unedo*, Istria, distribution

PRESENZA DI *CHARAXES JASIUS* (LEPIDOPTERA: NYMPHALIDAE) IN ISTRIA, CROAZIA

## SINTESI

La Ninfa del corbezzolo, *Charaxes jasius*, è una delle farfalle più belle ed impressionanti in Europa. In Croazia la specie vive nelle aree costiere del Mediterraneo, da Fiume verso la Dalmazia, e su molte isole adriatiche. Fino ad oggi la sua presenza nelle aree più a nord-ovest della costa croata, ossia nella penisola istriana, era incerta. Tre nuove segnalazioni provenienti da Palù (Palud), Promontore (Premantura) e Calavogna (Kalavojna) confermano la sua presenza nella penisola ed espandono la conoscenza dell'area di distribuzione della specie in Croazia. A nord della valle del fiume Quieto (Mirna) non ci sono più habitat adatti alle larve. Gli autori ipotizzano quindi che la valle rappresenti il confine più settentrionale della distribuzione della specie in Croazia. Nell'articolo è riportata anche la mappatura di tutte le segnalazioni della specie in territorio croato.

**Parole chiave:** *Charaxes jasius*, *Arbutus unedo*, Istria, distribuzione

## INTRODUCTION

The Istrian peninsula, with a surface area of 348 square kilometers, is the largest and northern-most peninsula in the Adriatic Sea. It is now divided among three countries: Croatia, Slovenia and Italy (Mihelj, 2006). The largest part lies in the territory of Croatia, and is dealt with in this paper. By geologic and geomorphic structure the peninsula can be divided in three distinct regions; White Istria, Grey Istria and Red Istria. White Istria includes the north/northeastern part of the peninsula (<http://www.istrapedia.hr>). It is a typical karstic area with scarce Mediterranean vegetation and karstic surfaces. Grey Istria, which stretches across the central part of the peninsula, got its name from its composition of flysch, consisting of impermeable marl, sandstone and clay. The western shore of the peninsula, Red Istria, contains limestone traces covered with red earth. About a third of the peninsula is covered with woods. Along the coast and on the islands, pinewoods, maquis and garrigue are the main vegetation types, interspersed with holm oak (*Quercus ilex*) and strawberry trees (*Arbutus unedo*) (<http://www.istrapedia.hr>).

Butterflies inhabiting the Croatian part of Istria have never been systematically surveyed, and only limited data exist. The best-surveyed areas are probably Učka (Rebel, 1910, 1912a, 1913a), Pazin and Vela Traba (Koren & Ladavac, 2010), Rovinj (Daniel, 1971) and Brioni (Rebel, 1912b, 1913b). For other areas, only a limited number of records exists (Stauder, 1922; Withrington, 1984). With only a modest body of published research, it is likely that various butterfly species will be newly recorded on the peninsula.

The two-tailed Pasha, *Charaxes jasius* (Linnaeus, 1767), is one of the largest and most colorful members of Nymphalidae family in Europe. This charismatic species flies in two broods, from April until October (Tolman & Lewington, 2008). Its habitat consists mostly of mixed scrubland, mostly maquis, which contains its larva host plant, *A. unedo*. The adults are attracted to fermenting fruit, so they can also be easily found around fig or apple trees. The species is distributed mainly in the coastal Mediterranean region, which includes Morocco, Algeria, Tunisia, Portugal, Spain, France and Italy, and separately, from Dalmatia to Greece and Turkey (Tolman & Lewington, 2008).

The aim of this paper is to present first records of this species in Istria, as well as to give an overview of the distribution of the two-tailed Pasha in Croatia.

## MATERIALS AND METHODS

The distribution of the species in Croatia was derived from available literature, of which 32 publications contain data on the presence of this species in Croatia (Germar, 1814–1817; Mann, 1869; Werner, 1895; Galvani, 1902, 1909, 1921, 1935; Abafy-Aigner, 1910; Stauder,

1913, 1922; Puschnig, 1914/1915; Muller, 1921; Schawerda, 1921, 1927; Hafner, 1930; Neustetter, 1956; Moucha, 1965; Habeler, 1976, 2008; Withrington, 1984; Waring & Thomas, 1989; Reinhardt, 1990; Jakšić, 1993; Luy, 1994, 2002; Krištović, 2007; Saga, 2007; Boljat & Šuljić, 2008; Withrington & Verovnik, 2008; Lorković, 2009; Kučinić *et al.*, 2011; Verovnik, 2011). Additionally, surveys of this species across the Istrian peninsula were conducted between 2008 and 2012, during several general surveys of butterfly fauna.

*C. jasius* was observed in these localities:

1. Palud, 1 km SE, forest edge and maquis, near the sea, 45.020577 N, 13.715416 E, 14.7.2008, 1M & 1F.
2. Pula, Premantura, Istria, edge of maquis, 44.801692 N, 13.919322 E, 15.7.2009, 1M.
3. Kalavojna, 2 km S of Rakalj, Istria, bushy area, near the forest edge, 44.963310 N, 14.053678 E, 19.7.2009, 2M.

## RESULTS AND DISCUSSION

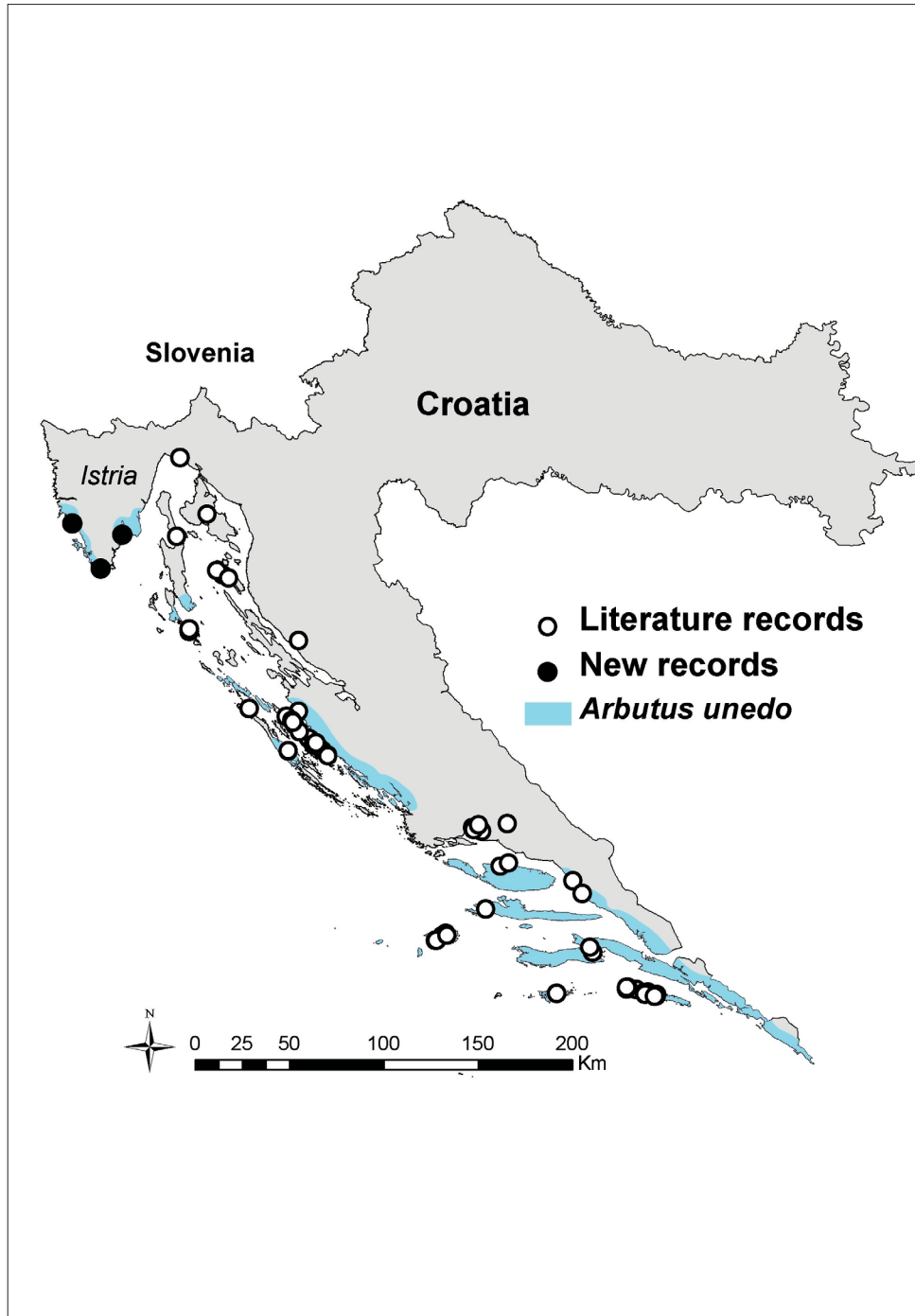
*C. jasius* was first noted in Croatia by Germar (1814–1817), who recorded its presence on two islands, Brač and Hvar. Subsequently, it has been recorded on many islands (e.g. Withrington & Verovnik, 2008; Kučinić *et al.*, 2011; Verovnik, 2011) as well as across large parts of the Croatian coast, including the Kvarner region and Dalmatia (e.g. Stauder, 1922; Habeler, 1976).

As this species is highly dependent on its larva host plant, *A. unedo*, the plant's distribution in Croatia, according to Nikolić (2012), is also presented on the *C. jasius* distribution map. The plant's distribution in Istria fits entirely within the known range of *C. jasius* on the peninsula. In other parts of the *C. jasius* range, however, the distributions do not appear as closely matched. This discrepancy may be explained either by insufficient floristic surveys in such areas or by the high migratory potential of *C. jasius*. In the Kvarner Islands (e.g. Lošinj, Rab) and southern Dalmatia, the species is very common and numerous, especially in locations where the maquis contain *A. unedo*. The recorded sightings of *C. jasius* generally become sparser moving south to north. The exception is the southern-most part of Dalmatia, from Dubrovnik to the border with Montenegro, generally known as Konavle region. In 2012, a butterfly survey was carried out in the area (T. Koren, *unpubl.*), but no specimens were observed. If it is present in the area, therefore, it is probably rare and localised.

During surveys over the last five years, *C. jasius* was recorded in Istria in three localities; all of them in the coastal southwestern area of the peninsula (Fig. 1). The provisional distribution maps of butterflies in Yugoslavia (Jakšić, 1988) indicate a record for the species in Istria, near the Raša River valley, but the source of this record remains unknown. Moreover, in recent literature on the butterflies of Istria (Danijel, 1971; Kučinić *et al.*, 1999; Šašić

& Mihoci, 2007, Koren & Ladavac, 2010), the species is not mentioned in this area. The Raša River valley was visited by the author on several occasions during the

last five years, but no specimens were observed. It is, however, possible that this species was or still is present near the sea, around the village Trget, as the habitat is



**Fig. 1:** The distribution of the two-tailed Pasha (*Charaxes jasius*) in Croatia with marked presence of its larva host plant, *Arbutus unedo*.

**Sl. 1:** Distribucija dvorepega paše (*Charaxes jasius*) na Hrvaškem ter zabeležena prisotnost hranilne rastline gosenic, *Arbutus unedo*.

very similar to that in Kalavojna, and *A. unedo* is also present. The sites closest to the Raša River valley where *C. jasius* has been reported are Rijeka (Stauder, 1922) and the Kvarner Islands (Withrington & Verovnik, 2008). The older records for Cres, Lošinj and Rab have been confirmed by recent surveys, with the species found to be very common in some locations (T. Koren, *unpubl.*). The presence of the species in Rijeka has never been confirmed.

The new records from Istria represent the northernmost areas for the species on the Adriatic coast, but surprisingly, there is a literature citation for the species

in coastal Slovenia (Lelo, 2007). However, as there is no indication for this distribution in the recent butterfly atlas (Verovnik *et al.*, 2012), this record could be considered to be erroneous. As this species is not present in Slovenia, and it has not been recorded north of the Mirna River valley, even in intensive surveys (T. Koren, *unpubl.*), the valley itself could represent the distribution border for this species. And while the distribution of *C. jasius* in Croatia is relatively well known, not much is known about its biology, life history or conservation status – further researches should be directed towards these areas.

## POJAVLJANJE DVOREPEGA PAŠE (*CHARAXES JASIUS*) V ISTRI, HRVAŠKA

Toni KOREN

Univerza na Primorskem, Znanstveno-raziskovalno središče, Inštitut za biodiverzitetne študije, SI-6310 Izola, Giordana Bruna 6  
E-mail: koren.toni1@gmail.com

### POVZETEK

*Dvorepi paša* (*Charaxes jasius*) je eden največjih in najbolj prepoznavnih metuljev v Evropi. Na Hrvaškem poseljuje obalne predele od Reke proti jugu Dalmacije in mnoge Jadranske otoke. Njegov habitat predstavlja grmovje in makija, kjer rase hranilna rastlina *gosenic*, *Arbutus unedo*. Do nedavnega je bilo njegovo pojavljanje na severozahodnem delu Hrvaške, na polotoku Istra, vprašljivo. Med leti 2008–2012 je bil dvorepi paša zabeležen na treh novih lokacijah v Hrvaški Istri: Paludu, Premanturi in Kalavojni. S temi najdbami sta potrjeni njegova prisotnost na istrskem polotoku ter njegova razširjenost v severozahodnem delu Hrvaške. Razširjenost dvorepega paše na Hrvaškem se v veliki meri prekriva z razširjenostjo hranilne rastline *gosenic*. Dolina reke Mirne verjetno predstavlja mejo dvorepega paše, saj nikoli ni bil najden severneje od nje, prav tako ne v Sloveniji. Zemljevid z vsemi objavljenimi lokacijami na Hrvaškem je prikazan.

**Ključne besede:** *Charaxes jasius*, *Arbutus unedo*, Istra, razširjenost

## REFERENCES

- Abafi-Aigner, L. (1910):** Adalék a Magyar Tengermelék, Horvátország és Dalmácia lepkefaunájához. *Rovartani Lapok*, 17, 71–105. (*In Hungarian*)
- Boljat, J. & A. Šuljić (2008):** Inventarizacija faune dnevnih leptira Parka prirode Lastovsko otočje. Zbornik radova interdisciplinarnog istraživačkog projekta Lastovsko otočje, 2007.
- Daniel, F. (1971):** Wanderfalter in Rovinj - Südistrien 1970. *Atalanta*, 3(5), 310–311.
- Galvagni, E. (1902):** Beiträge zur Kenntniss der Fauna einiger dalmatinischer Inseln. *Verh. zool. - bot. Ges. Wien*, 52, 362–388.
- Galvagni, E. (1909):** Die zoologische Reise des Naturwissenschaftlichen Vereines nach Dalmatien im April 1906 (Beitrage zur Kenntniss der Lepidopterenfauna der Adriatischen Inseln). Sonder-Abdruck aus den *Mitt. Naturwiss. Verh. an der Univ. Wien*, 7, 154–254.
- Galvagni, E. (1921):** Nachtrag zur Kenntnis der Schmetterlingsfauna Lussins. *Verh.zool. - bot. Ges. Wien*, 72, 84–89.
- Galvagni, E. (1935):** Beiträge zur Kenntniss der Schmetterlings-fauna von Hvar (Lesina). *Mitt. Naturwiss. Ver. an der Univ. Wien*, 84, 118–121.
- Germar, E. F. (1814-1817):** Reise durch Österreich, Tyrol nach Dalmatien und in das Gebiet von Ragusa. Brockhaus, Leipzig, 1–2, 323 p.
- Habeler, H. (1976):** Beiträge zur Lepidopterenfauna Dalmatiens. *Acta Entomol. Jugosl.*, 12 (1–2), 67–87.
- Habeler, H. (2008):** Die Schmetterlinge der Adria-Insel Krk. Eine ökofaunistische Studie. Verlag H. Peks, Schwanfeld, 222 p.
- Hafner, I. (1930):** Prirodoslovna istraživanja sjevernodalmatinskog otočja, I Dugi i Kornati, Lepidoptera. *Jugoslavenska Akademija znanosti i umjetnosti u Zagrebu*, 16, pp. 45–62. <http://www.istrapedia.hr>. Accessed: 15.9.2012.
- Jakšić, P. (1988):** Provisional distribution maps of the butterflies of Yugoslavia (Lepidoptera, Rhopalocera). *Jugoslavensko entomološko društvo, Zagreb*, 214 p.
- Jakšić, P. (1993):** The M. Rogulja collection of the Rhopalocera (Lepidoptera) from the former state of Yugoslavia. *Entomol. Gaz.*, 44, 85–95.
- Koren, T. & Lj. Ladavac (2010):** Butterfly fauna (Lepidoptera: Hesperioidea & Papilionoidea) of Central Istria (Croatia). *Nat. Croat.*, 19(2), 369–380.
- Krištović, M. (2007):** Doprinis poznavanju faune leptira otoka Visa. Zbornik istraživačkih radova Udruge studenata biologije - "BIUS". *Biološki kamp Vis*, 2005, pp. 67–69.
- Kučinić, M., N. Tvrtković & E. Kletečki (1999):** The false ringlet (*Coenonympha oedippus* F.) is a member of the Croatian butterfly fauna after all. *Nat. Croat.*, 8 (4), 399–407.
- Kučinić, M., I. Mihoci, N. Tvrtković, M. Šašić, D. Bojanić-Varezić, S. Joković, M. Mazija & A. Popijač (2011):** Raznolikost danjih leptira (Insecta: Lepidoptera, Rhopalocera) otoka Mljet. In: Benović, A. & P. Durbešić (eds.): *Proceedings of the Symposium Branimir Gušić Days, Mljet 2010*, pp. 111–125.
- Lelo, S. (2007):** Dnevni leptiri Bosne i Hercegovine. Prirodno-matematički fakultet Univerziteta u Sarajevu, Sarajevo, 337 p.
- Lorković, Z. (2009):** The Rhopalocera fauna of Croatia with special respect to the fauna of Plitvice Lakes. *Entomol. Croat.*, 13(1), 15–78.
- Luy, U. (1994):** 3. Beitrag zur Tagfalterfauna der Insel Rab, Kroatien (Lepidoptera: Hesperioidea, Papilionoidea). *Nota lep.*, 16(3/4), 251–263.
- Luy, U. (2002):** 4. Beitrag zur Tagfalterfauna der Insel Rab, Kroatien. *Atalanta*, 33(1/2), 69–75.
- Mann, J. (1869):** Lepidopteren gesammelt während dreier Reisen nach Dalmatien in den Jahren 1850, 1862 und 1868. *Verh. zool.-bot. Ges. Österr.*, 19, 371–388.
- Mihelj, S. (2006):** Transformations of Imaginedary Landscapes: Istra and Šavrinija as Intercultural Narratives. In: Cornis-Pope, M. & J. Neubauer (eds.): *A Comparative History of the Literary Cultures of East Central Europe: Junctures and Disjunctures in the 19<sup>th</sup> and 20<sup>th</sup> Centuries*. John Benjamins Press, Amsterdam, pp. 364–373.
- Moucha, J. (1965):** Tagfalter – Fauna der Insel Brač (Lepidoptera). *Acta Faun. Entomol. Musei Nat. Prague*, 11(106), 265–275.
- Müller, H. (1921):** Vier Wochen auf der Insel Brazza. *Entomologischer Anzeiger*, 1(4-6), 17–18.
- Neustetter, H. (1956):** Sammelreisen nach Dalmatien (Jugoslavien). *Entomologisches Nachrichtenblatt*, 3(3), 4–8.
- Nikolić, T. (ur.) (2012):** Flora Croatica Database (<http://hirc.botanic.hr/fcd>). Prirodoslovno-matematički fakultet, Sveučilište u Zagrebu.
- Puschnig, K. (1914/1915):** Zum Dundovalde. I. E. V. 1 (1–2), 8–9.
- Rebel, H. (1910):** Lepidopteren aus dem Gebiete des Monte Maggiore in Istrien. *XXI. Jahresber. ent. Ver Wien*, 23, 97–110.
- Rebel, H. (1912a):** Lepidopteren aus dem Gebiete des Monte Maggiore in Istrien. *Jahresber. Wien. ent. Ver.*, 22, 227–240.
- Rebel, H. (1912b):** Zur Lepidopterenfauna der Brionischen Inseln. *Jahresb. Ent. Ver. Wien.*, 23, 217–222.
- Rebel, H. (1913a):** Lepidopteren aus dem Gebiete des Monte Maggiore in Istrien. II. Nachtrag. *Jahresb. Ent. Ver. Wien.*, 23, 177–205.
- Rebel, H. (1913b):** Über die Lepidopterenfauna der Brioni grande. *Jahresb. Ent. Ver. Wien*, 24, 181–201.
- Reinhardt, R. (1990):** Beitrag zur Tagfalterfauna der mitteldalmatinischen Adriaküste (Lepidoptera, Papilionoidea). *NEVA*, 11(2), 113–117.
- Saga, W. (2007):** ZGB-Exkursion in Kroatien vom 30. 04. - 06. 05. 2005. *Mitt. Zool. Ges. Braunau*, 9(3), 215–220.

**Schawerda, K. (1921):** Beiträge zur Lepidopterenfauna der kroatischen Küste und Neubeschreibungen. Deutsche Entom. Zeitschrift Iris, 111–138.

**Schawerda, K. (1927):** Beitrag und Nachtrag zur Lepidopterenfauna der dalmatinischen Inseln, beziehungsweise der Insel Lussin. Verh. zool. - bot. Ges. Österr., 77, 79–81.

**Stauder, H. (1913):** Weitere Beiträge zur Kenntnis der Makrolepidopterenfauna der adriatischen Küstengebiete. Boll. Soc. Adriatic, 27, 105–106.

**Stauder, H. (1922):** Die Schmetterlingsfauna der illyro-adriatischen Festland- und Inselzone (Faunula Illyro-Adriatica). Ztschr. wiss. Insektenbiologie, 17 (1/2), 14–21, (3/4), 58–64, (5/6), 83–92, (7/8), 135–147, (9/12), 165–176.

**Šašić, M. & I. Mihoci (2007):** New findings of the wood brown *Lopinga achine* (Scopoli, 1763) (Lepidoptera: Nymphalidae: Satyrinae) in Croatia. Entomol. Croat., 11(1–2), 63–67.

**Tolman, T. & R. Lewington (2008):** Butterflies of Britain & Europe. HarperCollins Publishers, London, 384 p.

**Verovnik, R. (2011):** Butterflies (Lepidoptera: Rhopalocera) of the Croatian islands: an update on published records and new surveys of Pašman and Ugljan. Entomol. Gaz., 62, 251–263.

**Verovnik, R., F. Rebeušek & M. Jež (2012):** Atlas dnevnih metuljev (Lepidoptera: Rhopalocera) Slovenije. Center za kartografijo favne in flore, Miklavž na Dravskem polju, 456 p.

**Waring, P. & R. Thomas (1989):** Butterflies of the Yugoslavian island of Mljet. 19 August - 2 September 1988. AES Bulletin, 48, 147–149.

**Werner, O. (1895):** Bilješke o makro-lepidopterima, prikupljenim na poluostrvu Pelješcu. Glasnik Zemaljskog Muzeja, 2, pp. 207–214.

**Withrington, D. (1984):** Butterflies in northern Yugoslavia. AES Bulletin, 43, 76–81.

**Withrington, D. K. J. & R. Verovnik (2008):** Butterflies (Rhopalocera) of the Croatian islands. Entomol. Gaz., 59, 3–25.