

First exact records of Mediterranean Mantis, *Iris oratoria* (Dictyoptera: Mantodea: Tarachodidae) from Croatia

Petr Kment

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Abstract: First exact records of Mediterranean Mantis, *Iris oratoria* (Linnaeus, 1758) (Dictyoptera: Mantodea: Tarachodidae), in Croatia are reported based on specimens collected on Korčula Island in 1960s and on Brač Island in 2011. Additional records of *I. oratoria* from France, Greece, Spain and Turkey found in the collections of National Museum, Praha and Moravian Museum, Brno, are included.

Keywords: Dictyoptera, Mantodea, *Iris oratoria*, faunistics, Croatia

Introduction

The order Mantodea represents a group of mostly large and conspicuous predatory insects, which is mostly confined to the tropical regions and includes approximately 2366 described species in 436 genera (Ehrmann 2002, Otte & Spearman 2005). On the other hand, the fauna of Europe (excluding Cyprus, Cyclade Isl., and Canary Isl.) is quite poor in taxa, inhabited by 27 species belonging to 13 genera (Heller & Bohn 2011; Agabiti et al. 2010). The fauna of the Balkan Peninsula includes only 6 genera and 8 species, none of them endemic, which makes its mantid fauna remarkably poorer comparing with the Western Mediterranean (Portugal, Spain, France, Italy) with 10 genera and 20 species, 9 of them being endemic. Only 6 species occurs both in the Western Mediterranean and the Balkan Peninsula and only one, *Mantis religiosa* (Linnaeus, 1758), extends further north to western, central and eastern Europe (up to Belgium, Germany, Poland, and Central Russia) (Heller & Bohn 2011; Agabiti et al. 2010).

Concerning fauna of the former Yugoslavia, Us & Matvejev (1967) listed 5 genera and 8 species – *Ameles decolor* (Charpentier, 1825) (Croatia, Bosnia Herzegovina, Montenegro, Macedonia), *A. spallanzania* (Rossi, 1792) (under synonym *A. abjecta* (Cyrillus, 1787); Croatia, Bosnia Herzegovina), *A. heldreichi* Brunner von Wattenwyl, 1882 (Macedonia), *Mantis religiosa* (Slovenia, Croatia, Bosnia Herzegovina, Serbia, Kosovo, Montenegro, Macedonia), *Iris oratoria* (Linnaeus, 1758) (Macedonia), *Geomantis larvoides* Pantel, 1896 (Croatia), *Empusa fasciata* Brullé, 1832 (Slovenia, Croatia, Bosnia Herzegovina, Serbia, Montenegro, Macedonia), and *E. pennata* (Thunberg, 1815) (Croatia: Dalmatia).

The following species are listed from the former Yugoslavia in the 'Fauna Europaea' (Heller & Bohn 2011): *Ameles decolor* (Croatia, Bosnia Herzegovina, Macedonia, 'Yugoslavia (incl. Serbia, Kosovo, Voivodina, Montenegro)', *A. spallanzania* (Croatia, Bosnia Herzegovina), *Mantis religiosa* (Slovenia, Croatia, Bosnia Herzegovina, Macedonia, 'Yugoslavia'), *Iris oratoria* (Macedonia, 'Yugoslavia'), *Geomantis larvoides* (Croatia), *Empusa fasciata* (Slovenia, Croatia, Bosnia Herzegovina, Macedonia, 'Yugoslavia'), and *Rivetina balcanica* Kaltenbach, 1963 ('Yugoslavia'). Heller & Bohn (2011) consider the occurrence of West Mediterranean *E. pennata* in Croatia as doubtful, and do not list *A. heldreichi* from the former Yugoslavia at all. Unfortunately, there is a considerable confusion about the distribution of *Ameles decolor* and *A. heldreichi* in the Balkan Peninsula. Kaltenbach (1963) and Battiston & Fontana (2005) recorded from Croatia (including Dalmatian islands) only *A. decolor*. On the other hand, Agabiti et al. (2010) in a recent

revision mapped occurrence of *A. decolor* on Adriatic coast of Balkan Peninsula but provided confirmed records only from Greece, while they examined material of the Ponto-Mediterranean *A. heldreichi* from Croatia (localities Kučište and Biševo Isl.), Montenegro, Macedonia, Bulgaria and Greece. Obertegger & Agabiti (2012) mapped overlapping distribution of *A. decolor* and *A. heldreichi* in the south-western Balkan Peninsula, but list only specimens of *A. heldreichi* from Croatia, Macedonia, and Serbia under their material examined. Obertegger & Agabiti (2012) also discussed the identification difficulties within the genus *Ameles* Burmeister, 1838, which will require the critical revision of the previous records in the future. Chobanov & Mihajlova (2010) documented occurrence of *Empusa fasciata*, *Ameles heldreichi*, *Iris oratoria*, and *Mantis religiosa* in Macedonia, while dementing the previous records of *A. decolor*. Only Abu-Dannoun & Katbeh-Bader (2007) and Ehrmann (2011) listed *Iris oratoria* from Croatia and Battiston et al. (2010) from Dalmatia, all of them without providing an exact locality.

Based on the literature, only four species of mantises were recorded from Brač Island (Central Dalmatia, Croatia): *Ameles decolor* (Werner 1920, Kaltenbach 1963), *A. spallanzania* (Werner 1920, as *A. abjecta*; Kaltenbach 1963), *Mantis religiosa* (Werner 1920; Ehrmann & Schmidt 1992), and *Empusa fasciata* (Werner 1920, Kaltenbach 1963). In the past decade, I had an occasion to visit the Brač Island for two weeks nearly every year (2002, 2004–2007, 2010–2011 between mid August and mid September; 2008–2009 in early June). During those visits, the four previously recorded species were observed regularly every year on a number of localities throughout the island – *Ameles spallanzania* (Figs. 1–2), *A. cf. decolor* (Figs. 3–4), *Mantis religiosa* (Figs. 5–6), and *Empusa fasciata* (Figs. 10–11). Only in 2011, the fifth species, *Iris oratoria* (Figs. 7–9), was collected for the first time, representing the first exact record of the species in Croatia. Nevertheless, the subsequent examination of the collections of the National Museum (Praha, Czech Republic; = NMPC) and Moravian Museum (Brno, Czech Republic, = MMBC) revealed another series of *I. oratoria* from the Korčula Island, collected already in 1960s. The localized material of *Iris oratoria* from the collections of NMPC, MMBC and Petr Kočárek (Ostrava, Czech Republic) is listed below.

***Iris oratoria* (Linnaeus, 1758)**

(Figs. 7–9)

Material examined. CROATIA: Brač Island: Sumartin, Manjana camp at the north outskirts of the village, olive orchard with fig and almond trees, N 43°17'25" E 16°52'32", ca. 40 m a.s.l., 28.viii.2011, 21:00, 1 ♂, sitting on a lamp, A. Juříčková lgt., 30.viii.2011, during day, 1 ♂, J. Černý lgt., 1.ix.2011, 21:00, 1 ♀, flying in the camp, K. Resl lgt. (NMPC). **Korčula Island:** Vela Luka [N 42°57'47" E 16°43'10"] – Blato [N 42°56'05" E 16°47'20"], 8.–11.ix.1961, 1 ♂, V. Švarc lgt., J. Mařan 1962 det. as *Iris oratoria*; Vela Luka – Blato, 24.viii.1964, 1 ♀, V. Švarc lgt.; Miljata [first two letters illegible], 26.viii.1964, 1 ♀, V. Švarc lgt.; Vela Luka, 26.viii.1964, 3 ♂♂, [without collector] (NMPC). **FRANCE: Provence-Alpes-Côte d'Azur:** Fréjus, 4.x.1912, 1 ♂ 4 ♀♀, [without collector] (NMPC). **GREECE: Rhodos:** Pefki, Lardou Bay [N 36°04'37.71" E 28°02'35.64"], 2.–10.ix.2009, 1 ♀, P. Kočárek lgt., det. & coll. **Thessalia:** Amaliapolis, at light, 11.ix.1998, 1 ♂, P. Lauterer lgt. (MMBC). **PORTUGAL/SPAIN:** Ribas [no details, precise identification of locality not possible], 1 ♀ (NMPC). **SPAIN: Valencia:** Valencia, 1 ♀, Moroder lgt. **TURKEY: Anatolia: Adana:** Kozan, Toros Dağları [Mts.], 3.–9.viii.1947, 1 ♂, Exp. N. Mus. ČSR lgt. (NMPC). **İçel:** Bűrűcek, Toros Dağları [Mts.], 29.–31.vii.1947, 2 ♂♂, Exp. N. Mus. ČSR lgt. (NMPC). **Gaziantep:** Gaziantep, 18.viii.1947, 1 ♂, Exp. N. Mus. ČSR lgt. (NMPC). All P. Kment det. or revid., unless stated otherwise.

Identification

Iris oratoria differs from other mantids occurring in the Balkan Peninsula in the following combination of characters: Vertex without conical protuberance; male antennae neither bipectinate nor ciliate; greatest width of the pronotum in about an anterior third of its length; ventral side of mid and hind legs without spinulae arranged in rows, but frequently pilose; fore femora with 5 external spines; frontal sclerite of head with two small rounded tubercles;



Figs 1-6: 1-2 – *Ameles spallanzania* (Rossi, 1792), females; 3-4 – *A. cf. decolor* (Charpentier, 1825), females; 5-6 – *Mantis religiosa* (Linnaeus, 1758). All the photographs depicting specimens from the Brač Island. (Photos: 1, 4, 5 – P. Kment; 2, 3, 6 – H. Kulíková).

colouration green (Fig. 8), rarely brown (Figs. 7, 9); hind wings anteriorly (discoidal field) reddish with small colourless translucent windows, posteriorly (anal field) with large, round, black spot, readily exposed in danger (Fig. 8); body length: ♂♂ 28–41 mm (wings surpassing apex of abdomen), ♀♀ 34–47 mm (wings shorter, not reaching apex of abdomen) (e.g., Kaltenbach 1963, 1976; Demirsoy 1979).

Distribution

Albania, Bulgaria, France (incl. Corsica), Greece (incl. Ionian Isl., Crete, and Cyclades Isl.), Italy (incl. Sardinia, Sicily), Macedonia, Portugal, Spain (incl. Balearic Isl.), 'Yugoslavia' (incl. Serbia, Kosovo, Voivodina, Montenegro), North Africa (Morocco, Algeria, Tunisia, Libya, Egypt, N Chad), Cyprus, and West Asia (Asian Turkey, Israel, Lebanon, Syria, Jordan, Iran) up to Pakistan (Ramme 1951; Kaltenbach 1963, 1976; Demirsoy 1979; Mukherjee et al. 1995; Wagan et al. 1995; Çiplak & Demirsoy 1997; Ehrmann 2002, 2011; Battiston et al. 2010; Heller & Bohn 2011; Mohammad et al. 2011). It was introduced into the south-western United States in 1930s (California, Arizona) (Maxwell & Eitan 1998). Distribution of *I. oratoria* in Macedonia was recently confirmed by Chobanov & Mihajlova (2010). Previously not recorded from Croatia (cf. Adamović 1964; Us & Matvejev 1967; Kaltenbach 1963, 1976; Heller & Bohn 2011), except for lists by Abu-Dannoun & Katbeh-Bader (2007) and Battiston et al. (2010) who provided no source of the information and their erroneous interpretation of the previous Yugoslavian records is possible. Finally, Ehrmann (2011) listed *I. oratoria* from Croatia with reference to the collection of the Staatliches Museum für Naturkunde Karlsruhe, Germany (SMNK) without further details.

Discussion

The finding of *Iris oratoria* in the Island of Brač in 2011, in a locality well-sampled in the past ten years, was surprising. Its sudden appearance may suggest its new arrival to the island and its possible spreading northwards under current favourable climatic conditions. However, the discovery of additional specimens from Croatia collected in nearby Korčula Island in 1961 and 1964 reduced such northward shift to merely 36 km. Such oscillations of the northern distributional limit would not be surprising, as they are well documented in the *Mantis religiosa*, which is currently shifting northwards in northern parts of the Central Europe (e.g., Ehrmann 2003, Liana 2007, Berg et al. 2008, Janšta et al. 2008, Gruchala 2010, Ludwig 2011), European Russia (Bolshakov et al. 2010), as well as in British Columbia (Canada) where it was introduced in 1937–1938 (Cannings 2007).

Two of the three specimens from Brač Is. were collected during an hour after dusk, one of them sitting directly on a lamp. These observations confirm those by Habeler (1996) from Greece, stating that *I. oratoria* is active not only during the day but also in the first hours of night, frequently being attracted by light.

The systematic position of the genus *Iris* Saussure, 1869 is unstable, being assigned to Mantidae: Mantinae (e.g., Heller & Bohn 2011) or Tarachodidae: Tarachodinae: Tarachodini (e.g., Ehrmann 2002; Otte & Spearman 2005; Svenson & Whiting 2009; Battiston et al. 2010). However, the current system of Mantodea classification seems far from satisfactory and substantial changes are expected in the near future (cf. Svenson & Whiting 2009).

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Figs 7-11: 7-9 – *Iris oratoria* (Linnaeus, 1758); 10-11 – *Empusa fasciata* Brullé, 1832 (10 – larva, 11 – adult female). All the photographs depicting specimens from the Brač Island. (Photos: 7, 9, 10 – H. Kulíková; 8 – J. Hájek; 11 – L. Juříčková).

Reference

- Abu-Dannoun O. & Katbeh-Bader A. (2007): Mantodea of Jordan. – *Zootaxa*, 1617: 43-56.
- Adamović Ž. R. (1964): Orthopteroides collected in Dubrovnik District, Jugoslavia. – *Bulletin du Muséum d'Histoire Naturelle, Série B*, 19: 155-188.
- Agabiti B., Salvatrice I. & Lombardo F. (2010): The Mediterranean species of the genus *Ameles* Burmeister, 1838 (Insecta, Mantodea: Amelinae), with a biogeographic and phylogenetic evaluation. – *Boletín de la Sociedad Entomológica Aragonesa*, 47: 1-20.
- Battiston R. & Fontana P. (2005): A contribution to the knowledge of the genus *Ameles* Burmeister, 1838, with the description of a new species from Jordan (Insecta, Mantodea). – *Atti della Accademia Roveretana degli Agiati, Serie 8, B, Classe di Scienze Matematiche Fisiche e Naturali*, 5B: 173-197.
- Battiston R., Picciau L., Fonatana P. & Marshall J. (2010): Mantids of the Euro-Mediterranean area. WBA Handbooks 2. World Biodiversity Association, Verona, 239 pp.
- Berg M. K., Dueker C., Keller M., Krueger B., Luebcke N. & Luebcke T. (2008): The praying mantis, *Mantis religiosa* Linnaeus, 1758 (Mantodea, Mantidae), in the Free State of Saxony. – *Entomologische Nachrichten und Berichte*, 52: 93-98.
- Bolshakov L. V., Shcherbakov E. O., Mazurov S. G., Alekseev S. K., Ryabov S. A. & Ruchin A. B. (2010): Northernmost records of praying mantis *Mantis religiosa* (Linnaeus, 1758) (Mantodea: Mantidae) in European Russia. – *Eversmannia*, 23-24: 22-25.
- Cannings R. A. (2007): Recent range expansion of the praying mantis, *Mantis religiosa* Linnaeus (Mantodea: Mantidae), in British Columbia. – *Journal of the Entomological Society of British Columbia*, 104: 73-80.
- Chobanov D. P. & Mihajlova B. (2010): Orthoptera and Mantodea in the collection of the Macedonian Museum of Natural History (Skopje) with an annotated check-list of the groups in Macedonia. – *Articulata*, 25: 73-107.

- Çiplak B. & Demirsoy A. (1997): Mantodea (Insecta) fauna of Malatya vicinity (Turkey) and some remarks on the mantises of Anatolia. – *Journal of Orthoptera Research*, 6: 105-111.
- Demirsoy A. (1979): Die Fangheuschreckenfauna Anatoliens. – *Entomologische Mitteilungen aus dem Zoologischen Museum Hamburg*, 6: 253-265.
- Ehrmann R. (2002): Mantodea – Gottesanbeterinnen der Welt. – *Natur und Tier*, Münster, 519 pp.
- (2003): Die Gottesanbeterin (*Mantis religiosa*), Neufunde in Deutschland. – *Articulata*, 18: 253-254.
- (2011): Mantodea from Turkey and Cyprus (Dictyoptera: Mantodea). – *Articulata*, 26: 1-42.
- Ehrmann R. & Schmidt H. (1992): Etruskerspitzmaus (*Suncus etruscus*) als Beute einer Gottesanbeterin (*Mantis religiosa*). – *Säugetierkundliche Informationen*, 3(16): 460-461 + Pl. 1.
- Gruchala Š. (2010): New records of the praying mantis *Mantis religiosa* in Northern Moravia (Czech Republic). – *Časopis Slezského Zemského Muzea, Serie A Vědy Přírodní*, 59: 96.
- Habeler H. (1996): Zum Verhalten der *Iris oratoria* (Linnaeus, 1758) an Lichtquellen (Mantodea). – *Mitteilungen Landesmuseum Joanneum, Zoologie*, 50: 79-80.
- Heller K.-G. & Bohn H. (2011): Mantodea. Fauna Europaea. www.faunaeur.org/full_results.php?id=11918 (Accessed September 10, 2011).
- Janšta P., Vrabec V., Stránský J., Mikát M. & Mocek B. (2008): The occurrence of the praying mantis (*Mantis religiosa*) (Mantodea: Mantidae) in central Bohemia and its distribution in the Czech Republic. – *Klapalekiana*, 44: 21-25.
- Kaltenbach A. (1963): Kritische Untersuchungen zur Systematik, Biologie und Verbreitung der europäischen Fangheuschrecken (Dictyoptera – Mantidae). – *Zoologische Jahrbücher, Abteilung Systematik, Ökologie und Geographie der Tiere*, 90: 521-598.
- (1976): Mantodea. Pp. 129–169. In: Harz K. & Kaltenbach A. P.: *Die Orthopteren Europas 3. Series Entomologica*. Vol. 12. 433 pp.
- Liana A. (2007): Distribution of *Mantis religiosa* (L.) and its changes in Poland. – *Fragmenta Faunistica (Warszawa)*, 50: 91-125.
- Ludwig I. (2011): Ein neuer Fund von *Mantis religiosa* (Linnaeus, 1758) in Brandenburg, LK Havelland (Mantodea, Mantidae). – *Entomologische Nachrichten und Berichte*, 55: 271.
- Maxwell M. R. & Eitan O. (1998): Range expansion of an introduced mantid *Iris oratoria* and niche overlap with a native mantid *Stagmomantis limbata* (Mantodea: Mantidae). – *Annals of the Entomological Society of America*, 91: 422-429.
- Mohammad S. K., Gadalla S. M., El-Hamouly H., Ehrmann R. & El-Den Nadder M. G. (2011): Mantodea of Egypt. – *Zootaxa*, 3044: 1-27.
- Mukherjee T. K., Hazra A. K. & Ghosh A. K. (1995): The mantid fauna of India (Insecta: Mantodea). – *Oriental Insects*, 29: 185-358.
- Obertegger U. & Agabiti B. (2012): On the usefulness of ratios for the identification of some Mediterranean species of the genus *Ameles* Burmeister, 1838 (Insecta, Mantodea). – *Zootaxa*, 3259: 34-50.
- Otte D. & Spearman L. (2005): Mantida species file. Catalogs of the Mantids of the World. Insect Diversity Association, Philadelphia, Publication Number 1, 489 pp.
- Ramme W. (1951): Zur Systematik, Faunistik und Biologie der Orthopteren Südost-Europa und Vorderasien. – *Mitteilungen aus dem Zoologischen Museum in Berlin*, 27: 1-431 + pls. I-XXXIX.
- Svenson G. J. & Whiting M. F. (2009): Reconstructing the origins of praying mantises (Dictyoptera, Mantodea): the roles of Gondwanan vicariance and morphological convergence. – *Cladistics*, 25: 468-514.
- Us P. & Matvejev S. (1967): *Catalogus Faunae Jugoslaviae*. III/6. Orthopteroidea. 43 pp, Consilium Academicarum Scientiarum Rei Publicae Socialisticae Foederative Jugoslaviae, Academia Scientiarum et Artium Slovenica, Ljubljana, 43 pp.
- Wagan M. S., Soomro N. M. & Soomro M. H. (1995): Praying Mantids (Mantodea) of Sindh Province, Pakistan. – *Journal of Orthoptera Research*, 4: 161-162.
- Werner F. (1920): V. Orthoptera – Neuroptera, pp. 213–226. In: *Beiträge zur Kenntnis der Fauna Dalmatiens, besonders der Insel Brazza. Bericht über die zweite zoologische Reise des naturwissenschaftlichen Vereins an der Universität Wien nach Dalmatien. Juli 1912. C. Spezieller Teil. Bearbeitung des gesammelten Materials*. – *Zoologische Jahrbücher, Abteilung für Systematik, Geographie und Biologie der Tiere*, 42(4) (1919-1920): 189-234.

Author's address: Petr Kment, Department of Entomology, National Museum, Kunratic 1, CZ-148 00 Praha, Czech Republic. E-mail: sigara@post.cz