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Crocothemis servilia (Drury, 1773) (Odonata: Libellulidae) introduced with aquarium plants to Lublin (Poland)

Crocothemis servilia (Drury, 1773) (Odonata: Libellulidae) zawleczony wraz z roślinami akwariowymi do Lublina (Polska)

SUMMARY

A larva of the Oriental dragonfly *Crocothemis servilia* was found in June 2012 in a pet shop in Lublin and brought up to the imago. This is the first record of this kind in Poland. There is evidence that the species was introduced with aquarium plants.

Keywords: Odonata, *Crocothemis servilia*, introduction, aquaristics, exotic plants, Poland, Europe

STRESZCZENIE

W czerwcu 2012 r. stwierdzono w sklepie zoologicznym w Lublinie larwę orientalnej ważki *Crocothemis servilia*. Wyhodowano ją do imago. Jest to pierwsze stwierdzenie tego rodzaju w kraju. Wykazano, że gatunek został zawleczony wraz z roślinami akwariowymi.

Słowa kluczowe: Odonata, *Crocothemis servilia*, zawleczenie, akwarystyka, rośliny egzotyczne, Polska, Europa

INTRODUCTION

Biological invasions caused by human activity result in unexpected and substantial changes in local ecosystems, also leading to the homogenisation of flora and fauna (15). Aquaristics contribute to this process. The spectacular evidence of this is the expansion in Europe of the turtle *Trachemys scripta* (Schoepff 1792). It adapted, and already develops reproductive populations, particularly in countries with warm climate. It poses a threat to the native *Emys orbicularis* Linnaeus, 1758 (5, 6).

Invasions of invertebrates related to aquaristics also constitute a dangerous phenomenon (12, 20). Some of them are spectacular too (7, 8). Aquatic plants imported from various parts of the world are frequently the vector. Dragonflies are brought with the plants (16). So far, there have been no related data from the territory of Poland. This paper presents the first record of this kind.

RESEARCH

A Libellulidae larva was observed in an aquarium in the pet store at the Leclerc hypermarket (Lublin, Turystyczna St. 1). It was transferred to an aquarium of size 15x15 cm and water depth of 1.5 cm, with gravel bottom and sticks protruding over the water surface. The rearing was conducted at room temperature. Water was changed partially every other day (up to 1/2 of the volume of the container). The food were terrestrial insects placed on the water surface: Lepidoptera larvae and imagines, Culicidae and Tipulidae (Diptera) imagines, Aphioidea (Hemiptera) larvae and imagines, *Attagenus smirnovi* Zhantiev, 1973 (Coleoptera: Dermestidae) larvae and imagines, and *Tenebrio molitor* Linnaeus, 1758 (Coleoptera: Tenebrionidae) larvae, as well as e.g. Formicidae larvae, held in tweezers and moved in front of the larva's head.

The reared imago was prepared after 8 days. The measurements of the exuvium and imago were carried out by means of an Ecotone sliding clock caliper.

RESULTS

The larva was found in a heated aquarium in the form of a cascade, at water temperature of 26–28 °C, where aquatic plants were kept. The plants represented the following families: Alismataceae – *Echinodorus amazonicus* (Rataj, 1970), *E. cordifolius* (Grisebach, 1857), *E. ovalis* Wright in Sauvalle, 1871, *Sagittaria subulata* (Linnaeus) Buchenau, 1871; Araceae – *Anubias barteri* (Schott, 1860), *Cryptocoryne wendtii* (De Wit, 1958); Araliaceae – *Hydrocotyle leucocephala* Chamisso et Schlechtendal, 1826; Cabombaceae – *Cabomba caroliniana* (Gray, 1848); Hydrocharitaceae – *Elodea canadensis* Michaux, 1803; Plantaginaceae – *Bacopa caroliniana* (Walter) Robinson, 1908; and Polypodiaceae – *Microsorum pteropus* (Ching, 1933). The plants were replaced every week. They were transported to Lublin, moistened in cardboard boxes lined with foil, without water. The aquarium was inhabited by snails (*Lymnaea* sp.), and periodically used to keep fry of the aquarium fish *Poecilia* sp. (Poeciliidae).

The larva was noticed and transferred to the aquarium on 2 June, 2012. The emergence occurred on 12 August, 2012. The reared imago was a typically coloured female of *Crocothemis servilia* (Drury, 1773). Its dimensions were as follows: body length – 32.55 mm; abdomen length – 20.65 mm; forewings length – 29.75 mm; hind wings length – 29.20 mm. The length of the exuvium remaining after the emergence amounted to 15.52 mm.

DISCUSSION

Crocothemis servilia is one of the most widespread species in tropical and subtropical Asia, occurring from Japan to Asia Minor. It inhabits a wide variety of stagnant and slowly flowing waters, including artificial and strongly disturbed habitats (11). As an invasive species, it also colonised south Florida, the Greater Antilles and Hawaii (13, 21). *C. servilia* does not occur in Europe (10). Individual records from Romania and Portugal were regarded as false (14, 17). The boundary of its distribution area the closest to the edge of the European continent (approximately 650 km) is located in southwestern Turkey (3).

It is difficult to determine with what plant *C. servilia* was imported. All of the plants came from the company Aqua-Flora from Kurów. The majority of the species are cultivated here and reproduced in greenhouses. The remaining ones are imported from Africa and Asia – these are species with high requirements, delivered to stores or private recipients only for special orders. Only the species cultivated locally are delivered to Lublin. Therefore, the *C. servilia* larva most probably came to Poland together with a transport of plants from Asia to Kurów, and was brought to the store in Lublin secondarily, with a transport of common species.

It is not the first such case of importation of a foreign species to Poland. By courtesy of the employees of Aqua-Flora we learned that apart from various insects, also other animals are brought to Poland, including spawn of tropical fish. They are all introduced to collective rearing containers.

The *C. servilia* female reared by us had dimensions similar to those provided by Dijkstra (10), probably based on specimens from the Mediterranean Basin. The body length, however, was lower than the minimum length by 1.45 mm, and the length of rear wings exceeded the maximum value by 0.2 mm (10), although it was within the lower range of values reported from India (1). The length of the exuvium was also within the typical range (9).

Poland is already the fifth European country in which *Crocothemis servilia* has been found. The earliest record had been in the UK (4). Later it was also found in: Austria, Germany and the Netherlands (16, 25, 26, 28). Seehausen (24), who has searched for exotic dragonfly larvae in aquaria in Germany since 2011, founded *C. servilia* most often and in the highest number of specimens (40% of the collected material).

Polish odonatological literature has so far provided no data on the importation of exotic dragonflies (2). The only information from the territory of Poland was reported by Rudow (23) based on the collection of Schneider, who captured a *Mecistogaster* sp. (Pseudostigmatidae) imago in Drezdenko (German: Driesen). Considering the large scale of sale of exotic plants, this scarcity of data certainly results not from lack of such events, but from the low number of amateur

environmentalists who could more easily capture them. Publications from Europe are abundant, however. Their syntheses were provided by Kipping (16) and Martens (18). They gave information as well as new data for 37 species dominated by representatives of families Coenagrionidae and Libellulidae. Some species occurred in large numbers: *Neurothemis fluctuans* (Fabricius 1793), *Agriocnemis femina* Sélys, 1877, *Pseudagrion microcephalum* (Rambur, 1842), and *Crocothemis servilia* (18, 24). Almost all of them were brought to Europe as larvae with plants imported to aquaria, terrariums, and gardens. Only *Pantala flavescens* Fabricius, 1798 is known to have been at least twice imported as imagines in banana clusters (16, 19). The majority of the species came from various regions of Asia, and less from America and Africa. The domination of Asian species corresponds with the main direction of import of aquarium plants to Europe (18).

Dragonflies imported to Europe did not reproduce successfully so far (18), or at least no records of the fact are available. It is theoretically possible, however, as suggested by the invasion of *Crocothemis servilia* in North America and on the Greater Antilles (21). Imported plants are also introduced to waterholes in gardens, where imagines – if the transformation occurs – have the possibility of dispersion and reproduction outside confined areas. It is similar with companies mediating trade with plants. Based on data of Laister, Rabitsch (22) mentions such a company in Linz (Austria), where approximately 20 species of exotic dragonflies emerged in greenhouses, including *C. servilia*. They could fly outside through open windows. Imagines emerged in Europe as imagines included e.g.: *Ischnura senegalensis* (Rambur, 1842), *Pseudagrion microcephalum*, *Neurothemis fluctuans*, *Orthetrum sabina* Drury, 1770, and *Crocothemis servilia* (16, 19, 25, 27). Part of them emerged in greenhouses, but some also in field conditions (16, 19). In the case of higher numbers, such species may attempt to colonise the new areas, especially when they are eurytopes. The development of their local, at least ephemeral populations cannot be excluded, especially in the years particularly favourable in terms of temperature. In the case of further warming of the climate, they may commence the colonisation of Europe.

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