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2.2.3 - Article title: *Expansion of the alien East Asian river prawn *Macrobrachium nipponense* (De Haan, 1849) in southwestern Ukraine and assessment of its commercial usage prospects*

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Abstract: At this time East Asian river prawn *Macrobrachium nipponense* is present almost everywhere in the lower reaches of the Danube and Dniester basins, in the Danube-Dniester interfluves and water bodies to the east of the Dniester. Successful adaptation and favorable climatic conditions in recent years have provided a significant increase in the East Asian river prawn populations in the Danube and Dniester. High growth rates of *M. nipponense* have been observed in the Danube and Dniester. In these river basins, higher values of maximum body length of the prawn (males 115 mm, females 87 mm) than those recorded in the native range water bodies and the cooler water bodies of thermal power plants during introduction were recorded. In small shallow brackish-water reservoirs of the region (PSU 1.5–6.0) the growth rate of *M. nipponense* is significantly lower than in the freshwater Danube and Dniester deltaic zones. Female East Asian river prawn in such water bodies mature at a much smaller size. The egg-laying period of female *M. nipponense* in the Danube lasts from June to October. The peak of egg laying is observed in July and August. There have been reported cases of *M. nipponense* being affected by crustacean burn-spot disease. The prospect of organizing the fishing of *M. nipponense* in the Danube River has been determined. It is necessary to continue research to increase selectivity of fishing gears, determination of optimal terms of fishing, and places of installation of fishing gears.

Key words: palaemonids, Northern Black Sea region, Danube River basin, Dniester River basin, deltaic zones, commercial fishing, invasive species

Introduction: One of the greatest threats to biodiversity worldwide is the spread of non-indigenous species (Bij de Vaate et al. 2002; Leppäkoski et al. 2002). Within the European Union, the European Strategy on Invasive Alien Species (IAS) was developed in 2003 to establish the main criteria of invasiveness for further control of biological invasions (Council of Europe 2003; Roy et al. 2015). Finally, the list of invasive alien species of the Union Concern is updated every two years (European Commission 2014). In many cases, biological invasions result following intentional introductions, which is related mainly to commercially important species (Keller et al. 2011; Xu et al. 2014). In Ukraine, for example, the list of intentionally introduced fish consists of 32 species, which includes 17 successful cases (Kvach and Kutsokon 2017).

The East Asian river prawn (*Macrobrachium nipponense* [De Haan, 1849]) is a widespread Indo-Pacific species that inhabits estuarine and fresh waters (Yu and

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Miyake 1972; Cai and Ng 2002). In the far East Asian states, *M. nipponense* is an important commercial fisheries species, also used in aquaculture (Uno 1971; Ge 1980; New and Nair 2012). During the 2010–2018 period aquaculture provided 191–245 thousand tonnes of *M. nipponense* per year (FAO 2020).

This prawn species has been introduced into natural habitats and cooling reservoirs of thermal power stations in mainly Asian states, such as Singapore, the Philippines, Kazakhstan, Uzbekistan, Iraq, Iran, and Russia (Cai and Shokita 2006; De Grave and Ghane 2006; Salman et al. 2006). Outside Asia, the invasion is known in the US in North Carolina since 2014 in the White Oak River basin (Procopio and Daniel 2023). In Europe, cases of intentional introduction are known since the 1980s in Belarus, Moldova, and Ukraine (Vladimirov et al. 1989; Alekhovich and Kulesh 2001). Recently, the range expansion of this species covered the southwestern part of Ukraine and northern Romania (Son et al. 2013, 2020; Surugiu 2022; Zhmud et al. 2022).

In recent years, two invasion centers have formed independently in the Ponto-Caspian basin. One covers the rivers of the Azov and Caspian Seas (Afanasyev et al. 2020; Zhivoglyadova et al. 2021a, 2021b), and the other covers the lower reaches of the Dniester and Danube, as well as small river basins of the North-Western Black Sea (Stepanok 2014; Son et al. 2020; Surugiu 2022; Zhmud et al. 2022). The presented study aimed to evaluate the perspectives of control of the East Asian river prawn invasion in Ukraine and its commercial use.

Funding declaration

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