

**A new predatory
cladoceran *Cercopagis*
(*Cercopagis*) *pengoi*
(Ostroumov 1891)
in the Gulf of Gdańsk**

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Abstract

Cercopagis pengoi, a species native to the Ponto-Caspian area, was recorded for the first time in the Baltic Sea in the Gulf of Riga and in the open Gulf of Finland in 1992. Sampling in the shallow coastal area of the western part of the Gulf of Gdańsk at weekly intervals between April 1999 and April 2000 revealed the presence of *C. pengoi* in the zooplankton community. The species was recorded twice, at densities of 1369 indiv. m⁻³ on 30 July 1999 and 421 indiv. m⁻³ on 5 August 1999, when the water temperature was at its maximum, in excess of 21.7°C and 23.9°C respectively. *C. pengoi* had never been recorded in the Gulf of Gdańsk prior to 1999.

Predatory cladocerans of the families Podonidae and Cercopagidae are one of the groups of crustaceans native to the Ponto-Caspian region. Generally, the range of most members of these families is restricted to the Caspian Sea, but a few species have expanded their distribution to other water bodies in the Ponto-Caspian Basin. *Cercopagis pengoi* is the only species of the genus *Cercopagis* to inhabit the Black, Azov and Aral Seas, as well as stretches of rivers flowing into them, namely, the Danube, Dniester, Dnieper and Don (Mordukhai-Boltovskoi & Rivier 1971, 1987).

The genus *Cercopagis*, with its two subgenera, *Apagis* and *Cercopagis*, most probably evolved from the freshwater *Bythotrephes* (Mordukhai-Boltovskoi & Rivier 1987). The most distinctive feature of *C. pengoi* is its long caudal process terminating in a characteristically toothed loop. The body length of females varies from 1.2 to 2.3 mm, that of males from 1.1 to 2.1 mm. In length, the caudal process exceeds the main body 3–7 times (Mordukhai-Boltovskoi 1968, Mordukhai-Boltovskoi & Rivier 1987, Duriš *et al.* in press).

C. pengoi is a euryhaline species, preferring a brackish-water environment, but has also been recorded in freshwaters. This cladoceran is more abundant at a salinity of 2–10 PSU in the North Caspian Sea and is tolerant of freshwater, in which it is capable of reproducing continuously (Mordukhai-Boltovskoi & Rivier 1971, Rivier 1998).

In the Baltic Sea, *C. pengoi* was reported for the first time in 1992, in the Gulf of Riga (Ojaveer & Lumberg 1995) and in the open Gulf of Finland (Krylov *et al.* 1999). Since 1995 this species has been recorded off Finland, in the upper Neva Estuary (Bychenkov & Rodionova 1996, Avinskiy 1997) and has become abundant (Panov *et al.* 1996).

Carried out in the shallow coastal area of the Gulf of Gdańsk (near the Marine Promenade in Gdynia) between April 1999 and April 2000 at weekly intervals, the present investigations revealed the presence of *C. pengoi* in the zooplankton community. This species was noted twice, at a density of 1369 indiv. m⁻³ on 30 July 1999 and 421 indiv. m⁻³ on 5 August 1999. The water temperatures on these days were the highest recorded that summer, exceeding 21.7°C and 23.9°C respectively. Similar weekly studies were conducted in the same area in 1998, when no specimens of *C. pengoi* were found (Bielecka *et al.* in press). During a similar period, on 16 and 17 August 1999, Duriš *et al.* (in press) noted several specimens of *C. pengoi* at Hel, near the inner wall of the commercial port. Żmudziński (1998) found *C. pengoi* in August 1999 too, in the vicinity of Gdynia harbour. It is interesting that these particular specimens were recorded in the bottom fauna on sandy and sandy-muddy sea bottoms at 0.5–10 m, at a density of 1000 indiv. m⁻² (Żmudziński 1998). *C. pengoi* had never been observed in the Gulf of Gdańsk before. The first communication about the appearance of this cladoceran, though in the Wisła (Vistula) Lagoon, an area close to our study area, was published in 1999 but without any information about the sampling period (Hornatkiewicz-Żbik 1999).

According to Krylov *et al.* (1999), the concentration of *C. pengoi* in the Neva Estuary in June–October 1996 fluctuated, the highest density (305 indiv. m⁻³) being found near Berezovy Island during a cruise on 17–23 August. Ojaveer (K. Skóra personal communication) states that the

C. pengoi population in the Baltic Sea is more abundant in sheltered locations than in open areas and its size depends to a large extent on weather conditions.

With its unique structure enabling one individual to attach itself to another, *C. pengoi* is capable of forming large concentrations. The large-scale expansion of this species in the Baltic Sea could seriously affect fishing interests (Panov *et al.* 1999) in that dense aggregations could block the meshes of fishing nets and trawls (Ojaveer & Lumberg 1995). Furthermore, it competes with fish for food: grazing zooplankton is heavily predated. Ojaveer (K. Skóra personal communication) mentions moreover that the invasion of the Gulf of Riga by *C. pengoi* in the 1990s was followed by a drop in the numbers of another cladoceran *Bosmina coregoni maritime* occurring there. This latter species is also one of the dominant cladocerans in the Gulf of Gdańsk.

C. pengoi is not the only species to have immigrated to the Baltic from the Ponto-Caspian region. First recorded in the vicinity of Hel and Gdynia in 1990, the fish species *Neogobius melanostomus* (Pallas 1811) found a niche in the Gulf of Gdańsk, and its numbers and range have been expanding steadily ever since (Skóra 1996). In the 1990s two further Ponto-Caspian species of Amphipoda were reported from Polish waters: *Pontogammarus robustoides* (in 1996) and *Dikerogammarus haemobaphes* (in 1997), (Jażdżewski & Konopacka 2000). Research in 1998 along the River Wisła demonstrated that *D. haemobaphes* is currently the dominant gammarid species there (Jażdżewski & Konopacka 2000).

In the authors' opinion the zooplankton monitoring programme in the Gulf of Gdańsk should take the density of *C. pengoi* into account, in view of the possible impact of this species on the Baltic environment. Since *C. pengoi* has appeared in the Gulf of Gdańsk quite recently, it is hard to assess just now what the consequences of its occurrence will be. To discover them will require time, lengthy research projects and detailed analyses.

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