



# Established breeding population of invasive calanoid *Sinodiaptomus sarsi* (Copepoda, Calanoida) in Ukraine

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## 1. Introduction

In autumn 2020, *Sinodiaptomus sarsi* (Rylov, 1923) was found in three artificial ponds in one of the capital's parks, the Nyvka Park, in Kyiv, Ukraine (Svetlichny, Samchyshyna, 2021). This was a second finding of the species after the record in the West Ukraine (Mykitchak, 2016) which was in fact a first finding for Europe.

As known, the term invasive species refers to a subset of those species defined as introduced species or non-indigenous species. *S. sarsi* is native to northern and central China, Japan, Korea, Mongolia, and southeastern Russia (Borutzky, Stepanova, Kos, 1991), hence is definitely a non-indigenous one in the fauna of Ukraine. An introduced species must survive at low population densities before it becomes invasive in a new location. It was interesting for us to check will the species be capable to establish a breeding population in Kyiv ponds and what abundance can reach? For this, we decided to trace the seasonal dynamic of *S. sarsi* in some subsequent years.

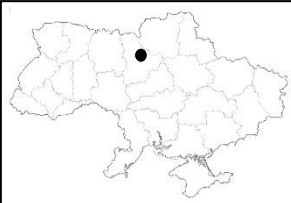


Figure 1: Map of Ukraine and location of the breeding population of *Sinodiaptomus sarsi*

## 2. Sampling

Zooplankton samples were regularly taken in 2021 from the different parts of three ponds in the Nyvka Park by filtering 100 L of water through the Apstein plankton net. Samples were processed at the Laboratory of Hydrobiology and Technologies of Cultivation of Valuable Invertebrates, Institute of Fisheries NAAS.



Figure 2: Sampled ponds in the Nyvka Park (Kyiv, Ukraine)

## 3. Results

First copepodite stages of *S. sarsi* were noticed in the plankton at the end of April. The abundance was 3600 ind/m<sup>3</sup>. The number of calanoid nauplii in that time was already as low as 10 ind/m<sup>3</sup>.

The highest abundance of adults of *S. sarsi* was recorded at the beginning of July. Abundance of females were 300 ind/m<sup>3</sup>, males were 33 ind/m<sup>3</sup>, and copepodite stages - 333 ind/m<sup>3</sup>. Many females were carrying the egg sac. Abundance of the nauplii increased until 400 ind/m<sup>3</sup>. The number of eggs were approx 23 eggs per sac.

In August, however, the species was disappeared from the plankton suddenly. The deoxygenation happened in those ponds due to high temperature and poor water exchange. Lot of fishes were died also. The sampling company was continued, but still no adults of *S. sarsi* were found but local cyclopoid species.

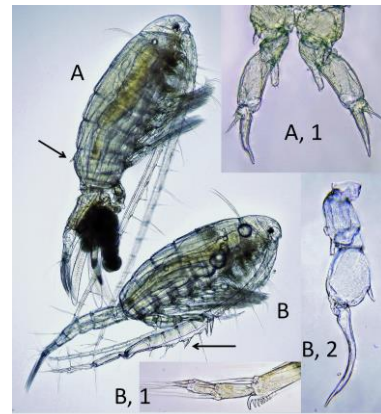


Figure 3: *Sinodiaptomus sarsi*: A — habitus of female, A1 — P5 of female; B — habitus of male; B1 — top of male antennule; B2 — right P5 of male (Photo: L. Svetlichny)

## 4. Conclusions

We can conclude that *S. sarsi* has successfully survived the winter time in Ukraine and was capable to produce a new generation in spring 2021 in the Nyvka Park ponds. The continued monitoring of the pond is highly desirable.

## References

1. Svetlichny L., Samchyshyna L. A new finding of the non-native copepod *Sinodiaptomus sarsi* (Copepoda, Calanoida, Diaptomidae) in Ukraine. *Zoodiversity*, 2021, 55 (1): 4-9. doi: [10.15407/zoo2021.01.001](https://doi.org/10.15407/zoo2021.01.001)
2. Mykitchak, T. 2016. Checklist and distribution of Cladocera and Copepoda (Calanoida, Cyclopoida) from the Ukrainian Carpathians. *Journal of Wetlands Biodiversity*, 6, 109–121. doi: [10.30970/sbi.1202.555](https://doi.org/10.30970/sbi.1202.555)