Assessing the impact of the invasive ctenophore *Mnemiopsis leidyi* on artisanal fisheries in the Venice Lagoon: an interdisciplinary approach

Piccardi F.[1,2 *], Poli F.[1,2,3], Sguotti C.[1,2], Tirelli V.[4,5], Borme D. [4], Mazzoldi C.[1,2,4], Barausse A.[1,2,5,6]

[1] Department of Biology, University of Padova, via U. Bassi 58/b, 35131 Padova, Italy
[2] Hydrobiological Station "Umberto D'Ancona", Isola San Domenico, 30015 Chioggia, Italy
[3] Department of Integrative Marine Ecology (EMI), Genoa Marine Centre (GMC), Stazione Zoologica Anton Dohrn–National Institute of Marine Biology, Ecology and Biotechnology, Villa del Principe, Piazza del Principe 4, 16126 Genoa, Italy
[4] National Institute of Oceanography and Applied Geophysics – OGS, via Auguste Piccard 54, 34151 Trieste, Italy
[5] National Biodiversity Future Center (NBFC), Piazza Marina 61, 90133 Palermo, Italy
[6] Department of Industrial Engineering, University of Padova, via Marzolo 9, 35131 Padova, Italy

[*] Corresponding author

The sea walnut, *Mnemiopsis leidyi*, has invaded and proliferated throughout the entire Mediterranean Sea basin. Significant blooms were also observed in the Venice Lagoon (Italy), an ecosystem high in biodiversity that supports various ecosystem services, including artisanal fishery production. To examine *M. leidyi* impacts on lagoon artisanal fisheries, we integrated fishers' local ecological knowledge, fishery landing time series statistical analysis, and field sampling. Firstly, we interviewed artisanal fishers to determine the timing of *M. leidyi* blooms. Secondly, we analyzed long-term fishery landings data to identify whether changes in landings quantity and composition were associated with the ctenophore invasion. Thirdly, we sampled catches from the lagoon fyke nets. This interdisciplinary approach addressed the limitations of individual methodologies and enabled us to reconstruct the temporal stages of *M. leidyi* invasion in the Venice Lagoon. Our findings indicate that lagoon landings significantly decreased with the blooms, which coincided with a strong rise in water temperature. Finally, we demonstrated that the mechanical obstruction of the nets, caused by the extensive ctenophore blooms, severely impacts fishing activities, although other additional mechanisms of impact can be speculated. Our results represent an initial step in evaluating the short and long-term effects of this invasive species on lagoon ecosystems, including its socioeconomic consequences, whose better understanding is crucial for informing mitigation and adaptation strategies.