OPEN ACCESS Freely available online

ISSN: 2155-9546
Journal of Aquaculture Research & Development

Opinion Article

Managing Parasitic Threats in Mediterranean Fish Farming across Generations

Felix Scott*

Department of Aquaculture, University of Tasmania, Hobart, Australia

DESCRIPTION

The Mediterranean region, with its unique climatic conditions and coastal geography, has supported fish farming for several decades. Over the past seventy years, aquaculture in this area has transitioned from traditional extensive systems to highly intensive practices. However, as fish farming intensified, so did the range and prevalence of parasitic organisms. This longstanding coexistence between parasites and aquaculture has evolved into a complex interplay affecting fish health, production efficiency and economic viability. While much progress has been made in understanding and managing parasitic diseases, their presence remains a persistent challenge to the sustainability of aquaculture in the Mediterranean.

Mediterranean fish farming

The development of fish aquaculture in the Mediterranean began in the mid-20th century, initially focusing on species such as European seabass *(Dicentrarchus labrax)* and gilthead seabream *(Sparus aurata)*. These species, favored for their commercial value and adaptability, became the cornerstone of the region's aquaculture efforts. Early farming practices involved coastal lagoons and net pens, which provided minimal environmental control and exposed stocks to native parasite populations. With time, farming systems evolved into closed and semi-closed environments, aiming for better productivity and health management. However, this increased density of fish stocks inadvertently favored parasite proliferation.

Transmission dynamics and risk factors

Parasite transmission in aquaculture systems is influenced by multiple factors, including host density, water temperature and farm management practices. High stocking densities, often necessary for economic viability, increase contact rates between infected and healthy fish, facilitating parasite spread. Temperature fluctuations, common in the Mediterranean, can alter parasite life cycles, either speeding up development or triggering outbreaks. Open-sea cages, while promoting water exchange and reducing organic load accumulation, remain susceptible to waterborne parasite introductions from wild fish populations. Furthermore, movement of juvenile fish from hatcheries to grow-out sites can also contribute to parasite dissemination if proper quarantine and screening measures are not implemented.

Economic and ecological impacts

The presence of parasites in aquaculture systems has both direct and indirect economic effects. Direct impacts include reduced growth rates, increased mortality and treatment costs. Indirect effects involve trade restrictions, lowered product quality and market rejection due to visible lesions or compromised flesh.

In addition to financial losses, parasite outbreaks can also alter the local marine environment. For example, anti-parasitic treatments such as formalin or hydrogen peroxide, when discharged into the surrounding waters, can affect non-target organisms. Furthermore, continuous use of such chemicals may contribute to resistance in parasite populations, complicating future control efforts.

Evolving challenges with climate change

Climate change introduces new variables into the parasite-aquaculture equation. Rising sea temperatures can extend the seasonal window during which parasites reproduce and thrive. Warmer waters may also allow tropical parasites to expand their range into the Mediterranean, introducing unfamiliar pathogens to local fish species and farming systems.

Additionally, climate-related stress on fish such as from temperature spikes or oxygen depletion can lower immunity, making farmed species more susceptible to infections. The resulting interplay between environmental change and disease susceptibility is expected to place increased pressure on aquaculture operators to adopt more responsive and adaptive health management practices.

Correspondence to: Felix Scott, Department of Aquaculture, University of Tasmania, Hobart, Australia, E-mail: felix.scott@utas.edu.au

Received: 25-Feb-2025, Manuscript No. JARD-25-29137; **Editor assigned:** 27-Feb-2025, PreQC No. JARD-25-29137 (PQ); **Reviewed:** 13-Mar-2025, QC No. JARD-25-29137; **Revised:** 20-Mar-2025, Manuscript No. JARD-25-29137 (R); **Published:** 27-Mar-2025, DOI: 10.35248/2155-9546.25.16.975

Citation: Scott F (2025). Managing Parasitic Threats in Mediterranean Fish Farming across Generations. J Aquac Res Dev. 16:975.

Regulatory and policy considerations

Aquaculture health regulations in Mediterranean countries vary in scope and enforcement. While EU member states follow directives that mandate regular health checks and disease reporting, implementation may differ depending on national priorities and resource availability. For non-EU Mediterranean countries, regulatory frameworks may be less developed, creating inconsistencies in parasite monitoring and control.

The history of Mediterranean fish aquaculture is deeply intertwined with the persistence of parasitic organisms. Over seventy years, this interaction has shaped farming practices, influenced research priorities and posed enduring questions for sustainability. As aquaculture moves into a more technologically advanced and environmentally conscious era, continued attention to parasite management will be essential. Through innovation, collaboration and informed policy, the aquaculture sector can mitigate parasite-related challenges and ensure a healthier future for both farmed fish and the marine ecosystems they inhabit.