**Benefits of essential oils in aquaculture**

Prof Dr Eduardo Luis C. Ballester

Federal University of Parana, Brazil

In the last 15 years, Brazilian aquaculture has experienced significant growth. Currently, the production is estimated at more than one million tonnes, representing a gross revenue of around US$ 1,2 billion. Freshwater fish is predominantly produced, followed by marine shrimp, the main farmed species are Nile tilapia (*Oreochromis niloticus*), tambaqui (*Colossoma macropomum*) and the Pacific white shrimp (*Penaeus vannamei*). Together with this expansion, concerns about sustainability, the spread of diseases, overuse of antimicrobials, and animal health and welfare are raised. In aquaculture systems, routine husbandry practices such as handling, biometric measurements, and transport can cause stress to farmed animals, negatively affecting their immunological defenses, welfare and growth performance. Chronic stress impacts animals’ state of physiological homeostasis and increases the production of reactive oxygen and nitrogen species (RONS). To mitigate these, torpor procedures (e.g., thermal shock) and chemical anaesthetic substances are used. Nevertheless, hypothermia may cause inappropriate analgesia and anaesthesia. Likewise, synthetic substances can cause adverse effects on both aquatic animals and farmers, as well as on the environment. Scientific advances, environmental protection, and consumers' preference shift towards food that is produced more sustainably and considers animal welfare are key elements that encourage the implementation of good practices in the sector. In this context, the use of natural substances is encouraged. Essential oils (EOs) are natural mixtures of compounds distilled from plant materials with broad biological activity, e.g., antibacterial, antifungal, antioxidant, and anti-inflammatory properties. Our research team have conducted several experiments with different EOs extracted from Brazilian plants, e.g., clove basil (*Ocimum gratissimum*) and lemon beebrush *(Aloysia triphylla*). Our results have shown the benefits of the EOs mainly in sedation, anaesthesia and the antioxidant systems of numerous farmed species of freshwater fishes and prawns. In this presentation, we are showing our main results.