



DISCIPLINA	Special Topics - Impacts of phytogetic additives on growth and health of fish				
CÓDIGO	DZO4234				
NÍVEL	M/D				
CARGA HORÁRIA	30 horas				
NÚMERO DE CRÉDITOS	Teóricos:	02	Práticos:		Total: 02

EMENTA

This overview covers the definition, types, and traditional use of phyto-genics and probiotics, comparing them with synthetic additives. It explores their mechanisms for promoting growth, enhancing immunity, and providing antimicrobial and antioxidant benefits. Key compounds, formulation methods, and their impacts on fish growth, health, and environmental sustainability are highlighted. Challenges like standardization, efficacy variability, and market acceptance are discussed, alongside future trends like nanotechnology and sustainable integration in aquaculture practices.

PROGRAMA

1. Introduction to Phyto-genics and Probiotics

1.1 Definition and types of phyto-genics (essential oils, herbs, spices, plant extracts) and Probiotics (Lactic Acid Bacteria).

1.2 History and traditional use in aquaculture and fish health.

1.3 Differences between phyto-genics, probiotics and synthetic additives.

2. Overview on Fish Growth and Health Parameters

2.1 Growth parameters: weight gain, feed conversion ratio (FCR), and specific growth rate (SGR).

2.2 Health indicators: immune response, disease resistance, oxidative stress markers, and survival rates.

2.3 Common diseases in aquaculture and their economic implications.

3. Mechanisms of Action of Phyto-genics and Probiotics in Fish

3.1 Growth Promotion:

3.1.1 Appetite stimulation and feed intake improvement.

3.1.2 Enhanced nutrient absorption and metabolism.

3.2 Immune System Modulation:

3.2.1 Activation of innate and adaptive immune responses.

3.2.2 Anti-inflammatory properties.

3.3 Antimicrobial Effects:

3.3.1 Inhibition of pathogenic bacteria and parasites.

3.3.2 Use as an alternative to antibiotics.

3.4 Antioxidant Activities:

3.4.1 Neutralizing oxidative stress.

3.4.2 Role in improving stress tolerance.

4. Key Phyto-genics/Probiotics and Their Effects

4.1 Commonly used phyto-genic compounds (e.g., curcumin, thymol, saponins, eugenol, Lactobacillus sp).

4.2 Case studies of their effects on specific fish species.

4.3 Comparison of individual vs. synergistic effects of their mixtures.

PROGRAMA

5. Formulation and Application in Aquaculture

- 5.1 Methods of inclusion in fish diets (pelleting, encapsulation, etc.).
- 5.2 Dosage optimization for various fish species and stages of growth.
- 5.3 Challenges in standardizing phytogetic formulations.

6. Impact on Fish Growth Performance

- 6.1 Effects on weight gain, FCR, and growth uniformity.
- 6.2 Role in improving protein and lipid utilization.

7. Impact on Fish Health

- 7.1 Enhancement of mucosal immunity (skin, gut, gills).
- 7.2 Disease prevention and recovery rates.
- 7.3 Effects on gut microbiota and gut integrity.

8. Environmental Benefits of Phytogetics/Probiotics

- 8.1 Reduction of nutrient discharge into water bodies.
- 8.2 Sustainable alternative to chemical treatments.

9. Limitations and Challenges

- 9.1 Variability in efficacy due to raw material quality.
- 9.2 Potential for toxicity at high doses.
- 9.3 Regulatory challenges and market acceptance.

10. Future Trends and Research Directions

- 10.1 Advances in extraction and formulation technologies.
- 10.2 Use of nanotechnology to improve bioavailability.
- 10.3 Genetic studies to understand fish responses to phytogetics/probiotics.
- 10.4 Integration with other sustainable aquaculture practices

BIBLIOGRAFIA

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CRITÉRIO DE AVALIAÇÃO

- Assessment 1: Seminar presentation, Weight 1
Assessment 2: Practical class report, Weight 1

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