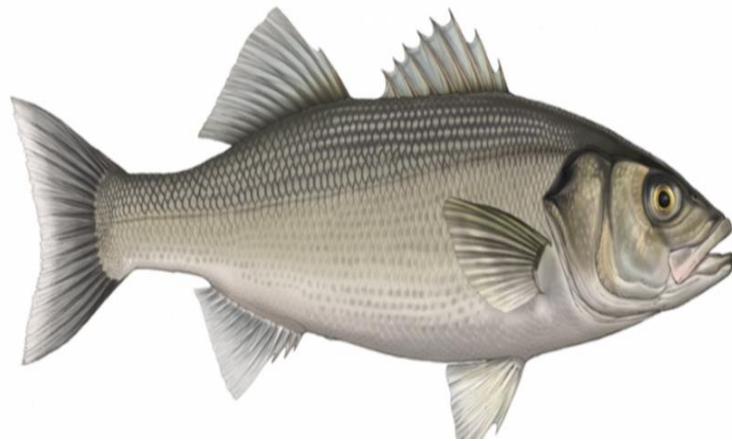


Annotated Bibliography on  
**Production of Seabass in Aquaculture Program**



Prepared by:

Fawzia Al-Buloushi

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## **Introduction:**

Aquaculture production has increased steadily in recent years; it is the fastest growing food production sector and has become a valuable component of national development. There are several ways and variables connected to the production of Seabass Fish. The environmental protection is one way into looking for Seabass production, however monitoring diseases is also an important variable. Researchers have been testing and experimenting with diets to find solutions. Thus, providing nutritional requirements to establish a safe environment for the growth of Seabass fish. Monitoring the hatchery phase is also critical, for instance, the infection of eggs that might have an impact of the eggs viability. This Bibliography cover various ways and methods researchers found to produce and grow Seabass Fish, from 2021-2023.

This benefits Aquaculture Program researchers.

**Contact NSTIC to request full-text articles.**

## **Articles Abstracts:**

- 1- Wang, Z., Li, X., Lu, K., Wang, L., Ma, X., Song, K., & Zhang, C. (2023). Effects of dietary iron levels on growth performance, iron metabolism and antioxidant status in spotted seabass (*lateolabrax maculatus*) reared at two temperatures. *Aquaculture*, 562, 738717.

**Abstract:** The increased ambient temperature is often accompanied by the enhanced metabolic rate and oxygen consumption of fish, which affects their nutritional requirements. Currently, no information compares the iron requirements of fish species under moderate and high temperatures. This study investigated the effects of dietary iron levels on growth performance, iron metabolism, and antioxidant status in spotted seabass (*Lateolabrax maculatus*) reared at two temperatures. Six diets were formulated to contain 63, 120, 188, 316, 425, and 554 mg/kg iron, each of which was fed to two groups of juveniles reared at 27°C (MT) and 33°C (HT) for 56 days. The results showed that the satisfied iron requirement for spotted seabass improved growth, feed utilization, and antioxidant capacity. Furthermore, fish fed with high-iron diets prevented iron overload by repressing intestinal iron-regulatory proteins and inducing liver hepcidin production. Iron deficiency depressed erythropoiesis and worsened HT-induced hypoxic status. Moreover, the HT compromised fish growth, feed utilization and liver hepcidin expression, while inducing lipid deposition. Compared to 27°C, the iron demand of spotted seabass was increased at 33°C as more blood erythrocyte and tissue iron deposition were required. Based on the broken-line regression analysis of weight gain, the optimum dietary iron levels for spotted seabass reared at 27°C and 33°C were 178.5 and 209.0 mg/kg, respectively.

- 2- Mansour, A. T., Fayed, W. M., Alsaqufi, A. S., Aly, H. A., Alkhamis, Y. A., & Sallam, G. R. (2022). Ameliorative effects of zeolite and yucca extract on water quality, growth performance, feed utilization, and hematobiochemical parameters of european seabass reared at high stocking densities. *Aquaculture Reports*, 26, 101321.

**Abstract:** The aim of the present study was to evaluate the efficiency of natural zeolite (Z) and *Yucca schidigera* extract (YE) as water treatments for European seabass, *Dicentrarchus labrax*, reared at high stocking density. A factorial design was conducted using two stocking densities (100 and 200 fingerlings/m<sup>3</sup>) and five water treatments (control, zeolite 10 g/L, zeolite 15 g/L, YE 0.75

ml/l, and YE 1 ml/L). The fish (with an initial weight of 5.83 g) were allocated into 1 m<sup>3</sup> fiberglass tanks in triplicates per each treatment and fed a commercial diet for 45 days. The results demonstrated that rearing European seabass at a high stocking density (200 fish/m<sup>3</sup>) caused a significant deterioration in water quality parameters, such as dissolved oxygen, NH<sub>3</sub>-N, NH<sub>4</sub>-N, NO<sub>2</sub>-N, and NO<sub>3</sub>-N by 11.11 %, 49.5 %, 33.33 %, 38.46 %, and 9.09 %, respectively compared to the low stocking density. Furthermore, increasing the stocking density of European seabass significantly reduced growth performance, feed utilization, and various haemato-biochemical parameters. The water treatment with both zeolite and YE significantly improved dissolved oxygen levels and decreased the nitrogen derivatives in tanks water of low and high stocking densities. Also, the water treatments ameliorated the effects of increasing stocking density on fish growth performance, feed utilization, hematological, and biochemical parameters. Whereas the highest weight gain (32.17 g), survival (93 %), and best FCR (1.9) were recorded in group treated with high zeolite level at low stocking density. Regarding the efficiency of both water treatment materials used in this study, water treatment with zeolite at the highest level (15 g/L) outperformed YE in different evaluated parameters of water quality, fish growth, and physiological performance. The mean effects of zeolite and YE at high levels showed an improvement of weight gain and feed conversion ratio by 103.68 %, 46.37 %, 30.90 %, and 23.47 %, respectively, compared to the control. Moreover, the effects of each substrate were level dependent. In conclusion, the water treatment with zeolite and YE could improve the wellbeing and production of seabass fish in favor of zeolite (15 g/l).

- 3- Pacorig, V., Galeotti, M., & Beraldo, P. (2022). Multiparametric semi-quantitative scoring system for the histological evaluation of marine fish larval and juvenile quality. *Aquaculture Reports*, 26, 101285.

**Abstract:** Gilthead seabream (GSB - *Sparus aurata*) and European seabass (ESB - *Dicentrarchus labrax*) are two of the most farmed fish species in EU. However, production of sea bream/bass in the EU has remained stagnant for the last decade and the Mediterranean EU aquaculture faces significant sustainability challenges. In consideration of this, and as it is largely recognized that the success of marine aquaculture strictly depends on the production of good quality larvae/juveniles, in this paper the authors put forward an original standardized tool for the histological assessment of GSB and ESB larva/juveniles. This tool promptly allows to highlight

problems in marine fish larval batches because of managerial practices, suggesting to fish farmers which direction take to resolve them. A Multiparametric Semi-quantitative Scoring System (scoring range 1–5) has been originally developed for larval/juvenile histological evaluation and it includes 18 descriptors related to 6 organ districts. The values of each descriptor can be summarized in two indexes: the CHI (Cumulative Histological Index), giving general information about the quality of a fish batch in that precise moment and the OCV (Organ condition value) showing the general condition of each organ and by the individual descriptors. The paper purposes are to describe the MSSS, the criteria established for the score attribution and to supply some indications for the use of the tool.

- 4- Muniesa, A., Furones, D., Rodgers, C., & Basurco, B. (2022). An assessment of disease occurrence and mortality in marine fish farming in Spain. *Aquaculture Reports*, 25, 101257.

**Abstract:** Marine fish farming in Spain, as in most Mediterranean countries, focuses on the production of European seabass (*Dicentrarchus labrax*) and gilthead seabream (*Sparus aurata*). The sector has experienced performance problems that affect the industry's competitiveness, and infectious and parasitic diseases have been described as being among the main causes of losses. Whereas companies are aware of the need to assess the impact and causes of such losses, the analysis of disease occurrence and mortality in seabass and seabream has received scarce attention from the sector and official administrations. Through information obtained from interviews and surveys, it has been possible to carry out an assessment of disease occurrence and mortality in marine fish farming in Spain. The median survival rate data for seabass and seabream was shown to be slightly higher in seabream, although no significant differences were found between species. It was not possible to further differentiate the causes of diseases or losses, as they were generally not standardized into categories and they also varied between companies. Nevertheless, the aim was to prompt producers and health management stakeholders into discussing how to improve the collection and analysis of data for relevant disease outbreaks and mortalities. Moreover, EU Regulation 2016/429 (the 'Animal Health Law') calls on Member States to implement disease surveillance programmes to investigate 'increased mortality' events in order to be alert for possible emerging diseases. Good knowledge of a disease situation and its impact on production represents a base mechanism for designing health surveillance. Therefore, the standardization of health data

collection and its analysis will help countries in the implementation of surveillance programmes and rapid alert mechanisms in order to combat emerging diseases at an early stage.

- 5- Petereit, J., Hoerterer, C., Bischoff-Lang, A. A., Conceição, L. E. C., Pereira, G., Johansen, J., ... Buck, B. H. (2022). Adult European Seabass (*Dicentrarchus labrax*) Perform Well on Alternative Circular-Economy-Driven Feed Formulations. *Sustainability*, *14*(12), 7279.

**Abstract:** There is an increasing need in the aquaculture industry for more sustainable and functional feed concepts for marine finfish. This study provides results for the effect of alternative feed formulations on health status, welfare parameters, sensory analysis, and growth performance in European seabass (*Dicentrarchus labrax*) over an 83-day feeding trial. Fish were fed twice a day with five experimental diets. A control diet (control) and four different alternative feed concepts rich in processed animal proteins (PAP), other alternative ingredients (NOPAP), and a positive (NOPAP+) and negative (PAP-) formulation were tested. All alternative formulations contained hydrolysates from aquaculture by-products and macroalgae. The results indicate that the alternative feed concepts are more sustainable alternatives compared with the commercial diet. Equally interesting, the alternative formulations did not affect the sensory analysis of the fillet quality or the animal welfare. These are increasingly important factors in aquaculture products and, accordingly, also in the formulation of new feeds. Feed concepts that are not only more sustainable in their production, have shorter transportation distances, recycle the resources (usage of by-products), and have no adverse effect on growth or welfare parameters are highly needed. Therefore, the experimental diets tested in this study are a win-win concept for future seabass aquaculture production.

- 6- Oikonomou, S., Kazlari, Z., Papapetrou, M., Papanna, K., Papaharisis, L., Manousaki, T., . . . Chatziplis, D. (2022). Genome wide association (GWAS) analysis and genomic heritability for parasite resistance and growth in european seabass. *Aquaculture Reports*, *24*, 101178.

**Abstract:** There is an increasing demand for the breeding programs to focus on resistance against diseases since the treatments or vaccinations increase production costs and, in some cases, they are not available at all. Most of the studies focus on virus and bacterial diseases, but limited information is available for parasitic diseases in European seabass. A sample of infected fish (985)

with *Lernanthropus kroyeri* and their parents were genotyped using the recently developed MedFISH SNP array. The sample was selected (selective genotyping) in order to capture the genetic variation of the resistance against the *Lernanthropus kroyeri*. Body weight was recorded at different growth stages in the population. The genetic parameters were estimated for body weight and parasite count, using Restricted Estimation Maximum Likelihood (REML) methods utilizing a Genomic Relationship Matrix (GRM). Additionally, univariate GWAS, multitrait GWAS and Regional Heritability Mapping (RHM) were performed in order to identify genomic areas related to host resistance and growth. A moderate genomic heritability was detected for growth at sea cage (0.39) and for weight at 2, 4, 6 months after the fish were transferred to the sea cage (0.46–0.41). A moderate to low genomic correlation between growth (body weight/growth at the sea cage) and parasites was observed (0.36–0.21). GWAS results indicated two putative QTL affecting host resistance to *Lernanthropus kroyeri* count, each one of them explaining approximately 2% of the phenotypic variation.

- 7- Villanueva, B., Fernández, A., Peiró-Pastor, R., Peñaloza, C., Houston, R. D., Sonesson, A. K., . . . Saura, M. (2022). Population structure and genetic variability in wild and farmed Mediterranean populations of gilthead seabream and European seabass inferred from a 60K combined species SNP array. *Aquaculture Reports*, 24, 101145.

**Abstract:** Knowledge of population structure and genetic diversity within and between wild and farmed populations of gilthead sea bream (*Sparus aurata*) and European seabass (*Dicentrarchus labrax*) is important to achieve sustainable aquaculture production of these species and to assess the risk of genetic impacts of fish escaped from farms. Previous population genetic studies on these species have been based on a limited number of genetic markers and samples. In this study, these features were assessed using samples from 24 seabream and 25 seabass populations distributed throughout the Mediterranean Sea, and 3 wild seabream Atlantic populations. Samples were genotyped with a newly developed combined species SNP array that includes ~60K SNPs. Data from sequencing pools of individual DNA from the same populations were also used. Different approaches were employed for identifying the extent of population stratification within species. The effective population size (a parameter inversely related to the rate at which genetic variability is lost) was estimated for each population based on linkage disequilibrium. Population structure results revealed a clear differentiation between wild and farmed populations in both species. Wild



populations showed a low degree of differentiation, particularly in seabream. Despite this, a slight differentiation was observed between Atlantic and Mediterranean seabream populations and between western and eastern Mediterranean seabass populations. However, farmed populations were quite heterogeneous and showed a high degree of differentiation. Some farmed populations of both species showed a genetic makeup similar to that found in wild populations. In general, the effective population size was large ( $> 1000$ ) for wild and small ( $< 100$ ) for farmed populations of both species. About 40% of the seabream and 80% of the seabass farmed populations had estimates of effective population size smaller than 50 highlighting the need of applying measures to control the rate at which genetic variability is lost.

- 8- Herrera, A., Acosta-Dacal, A., Pérez Luzardo, O., Martínez, I., Rapp, J., Reinold, S., . . . Gómez, M. (2022). Bioaccumulation of additives and chemical contaminants from environmental microplastics in European seabass (*Dicentrarchus labrax*). *Science of the Total Environment*, 822, 153396.

**Abstract:** Marine microplastic pollution is one of the biggest environmental problems we face. The growth of plastic production has not ceased since the 1950s and it is currently estimated that 368 tons of plastic were produced in 2019 (PlasticsEurope, 2020). Geyer et al. (2017) estimate that 79% of the plastic produced in the world still remains in the environment; this plastic due to the effect of degradation and subsequent fragmentation, is present in the form of microplastics in all oceans and, due to its small size can be ingested by fish and filter-feeding organisms. In addition, microplastics have additives and chemical contaminants associated with them, and the potential effect of microplastic ingestion on marine organisms, and through them, the potential risk to humans, is unknown. In the present study, European seabass (*Dicentrarchus labrax*) were fed for 60 days with three treatments: Control (feed), MP (feed with 10% virgin microplastics) and EMP (feed with 10% environmental microplastics), being the first study to evaluate long-term accumulation of contaminants due to ingestion of environmental microplastics (EMP) in fish. Both plastic additives such as PBDEs, and chemical contaminants adsorbed from the environment such as PCBs and DDE, were analyzed in the EMP, feed and liver. The concentration of microplastics in the feed was calculated based on the MPs/zooplankton wet weight (WW) ratio of 0.1 found in an area of maximum accumulation in the Canary Islands. Therefore, it is an experiment that simulates real conditions, but in the worst-case scenario, using both, concentrations based on data

obtained in oceanographic campaigns and microplastics collected from the environment. Our results show that in this scenario, additives and chemical contaminants adsorbed on EMPs bioaccumulate in fish liver due to long-term ingestion of microplastics.

- 9- Fountoulaki, E., Vasilaki, A., Nikolopoulou, D., Schrama, J., Kaushik, S. J., & Antony Jesu Prabhu, P. (2022). Faecal waste production, characteristics and recovery in European seabass (*Dicentrarchus labrax*) is affected by dietary ingredient composition. *Aquaculture*, 548, 737582.

**Abstract:** The quantitative and qualitative characteristics of faecal waste was studied in European seabass (*Dicentrarchus labrax*) fed diets with high inclusion of different feed ingredients (field peas, PEA; feather meal, FeM; sunflower cake meal, SFM; wheat dried distillers grain with soluble, WDG; corn gluten meal, CGM and soya protein concentrate, SPC), in two different experimental trials, in order to evaluate if different ingredients affect waste production. Each of the test ingredients was partially replaced with the basal mixture used in the control diet (CON). The ingredients were chosen for their varying levels of starch, protein, soluble and insoluble non-starch polysaccharide contents. Fish having an initial body weight of 120 g were used (20 fish/tank in triplicate groups) in both trials and were fed at 1.0% in trial I and 1.5% in trial II of their body weight for 40 days. Apparent digestibility coefficients (ADC) of dry matter (DM), nutrients (protein, fat, carbohydrate, and phosphorus) of the test diets were significantly altered between groups in trial I, with SFM showing the least ADC for DM, carbohydrate and phosphorus; starch ADC was the least in PEA but only DM digestibility and phosphorus availability were different in trial II. The quantity, recovery percentage, physical characteristics, appearance and chemical composition of the faeces were affected by the test ingredients. Carbohydrate fraction of the diet was the most influential in affecting the quantity and chemical composition of faeces produced. Increased inclusion of NSP rich ingredients (WDG, soluble or SFM, insoluble) resulted in higher faecal recovery percentage, despite higher faeces load. Overall, high inclusion of alternate ingredients affected quantitative and qualitative characters of the faecal waste in European seabass, which has implications for environmental sustainability of European seabass aquaculture.

- 10- Tsiaras, K., Tsapakis, M., Gkanassos, A., Kalantzi, I., Petihakis, G., & Triantafyllou, G. (2022). Modelling the impact of finfish aquaculture waste on the environmental status in

an Eastern Mediterranean Allocated Zone for Aquaculture. *Continental Shelf Research*, 234, 104647.

**Abstract:** A modelling tool was implemented in an Eastern Mediterranean Allocated Zone for Aquaculture (AZA) (Vourlias Bay, Greece) to examine the fate of seabass/seabream aquaculture wastes from multiple farms and assess their potential impacts on the surrounding ecosystem in terms of good environmental status. The model was validated against available satellite (Chl-a) and in situ data (PO<sub>4</sub>, NO<sub>3</sub>, NH<sub>4</sub>, Chl-a, Mesozooplankton), showing a reasonable skill in reproducing the observed range and horizontal variability. Environmental status was assessed by means of two environmental indicators (TRIX, E.I.), calculated using the simulated outputs. The environmental conditions in the AZA were “good” during the well mixed period in winter and “moderate” to “poor” during more stratified periods, particularly summer, when effluents from the fish farms were higher. In the vicinity of different fish farms, environmental conditions were found to be correlated to the fish farm production, as well as to the predominant current speed/orientation. Fish farms, where stronger prevailing currents induced a more efficient off-shore dispersion of wastes, showed relatively better conditions, despite their high fish production. Changes in the food web structure from the input of fish farm wastes were mainly characterized by an increase in dinoflagellates, an indicator for eutrophication, and also nanophytoplankton and microzooplankton. A series of scenario simulations (fish farms production and position) were performed to investigate the ecological carrying capacity of the AZA and demonstrate the utility of the modelling system, as a management tool for AZA spatial planning and licensing of fish farms.

11- Giebichenstein, J., Giebichenstein, J., Hasler, M., Schulz, C., & Ueberschär, B. (2022).

Comparing the performance of four commercial microdiets in an early weaning protocol for European seabass larvae (*Dicentrarchus labrax*). *Aquaculture Research*, 53(2), 544-558.

**Abstract:** The promise of an off-the-shelf, microparticulate diet for first feeding marine larval fish is still one of the “holy grails” of the hatchery manager. Replacing the laborious live feed production facilities with high-quality microdiets will greatly increase marine larval production, improve hatchery consistency and will help in cost reduction in fry production. Over the last decades, many scientific and industrial efforts have focussed on developing microparticulate diets

to reduce or replace the use of live feed for growing marine fish larvae in hatcheries. However, in most professional hatcheries, an extended live feed period is still the standard procedure. Thus, this study aimed to compare the performance of four state-of-the-art commercially available microdiets used in an early weaning protocol to the standard Artemia-based feeding. European seabass larvae were used as a model organism. The three most relevant parameters, survival, growth and deformities were used for the performance-rating of the four different microdiets. The results of the study depict that early weaning of European seabass between 15 and 20 days post-hatching (dph) onto the commercially available microdiets still result in lower survival, reduced growth and an increase in deformities in the early-weaned treatments. Nevertheless, one microdiet outperformed the others in this study, resulting in significantly fewer deformed larvae and improved growth. However, larvae fed with Artemia only still yielded the best results considering growth, survival and deformities.

12- Cantillo, J., Martín, J. C., & Román, C. (2022). Visualization analysis of seabream and seabass aquaculture research using CiteSpace. *Aquaculture Research*, 53(1), 136-160.

**Abstract:** In terms of production, seabream and seabass are the two most important species of marine Mediterranean aquaculture, which is why they have been extensively studied in the literature. This study uses visualization analysis with the CiteSpace software to determine the research status quo and the most important trends of seabream and seabass aquaculture research. The Web of Science (WoS) database was used to select the papers associated with seabream and seabass literature from the period between 1986 and 2020. The results were separated using two indices (Science Citation Index Expand and Social Science Citation Index). The visualization analysis identified the networks for (1) author, institution, country and category co-authorship, in order to find the most prolific authors, institutions, countries and categories respectively; and (2) journal, document and author co-citation, which identifies the most relevant journals, the most important studies and the most cited and influential authors. Finally, a keywords co-occurrence network was built to identify the most important topics and the research frontiers -body of knowledge- of the seabream and seabass aquaculture research -SSAR.

13- P L Sabrina<sup>1</sup>, M R Putri<sup>2</sup> and E Noerbaeti<sup>3</sup> (2021). The Growth Rate of Seabass in Floating Net Cages, Inner Ambon Bay using 1D Ecosystem Model. IOP Conference Series: Earth and Environmental Science, 925 012030.

**Abstract:** Inner Ambon Bay is used for fishery research by the government. One of the species that has been cultivated is seabass because it has high economic value. Seabass cultivation in floating net cages has been developed by Ambon Marine Aquaculture Institute (BPBL-Ambon). The characteristics of seawater in Inner Ambon Bay (IAB) based on the observation data in the project "Ocean Current System of Indonesia Waters and Its Effect on Marine Fisheries Production" in May 2017 show that the temperature is in the range 29.8 – 30.9 °C. Meanwhile the salinity is about 26.1–31.4 PSU and the chlorophyll concentrations as much as 0.88 – 3.61 mg/m<sup>3</sup>. The 1D ecosystem model simulation is performed to know how is the growth rate of seabass is with two-way interaction between nutrient, phytoplankton, zooplankton, and detritus (NPZD) towards zooplanktonivore (fishes which consume zooplankton). The verification of model result (fish mass) with the observation data of fish mass which conduct by BPBL Ambon show the RMSE value is 0.001 kg and the correlation is 0.99. The nutrient concentration since 2016 – 2018 in the range of 3.08 – 3.78 mmolC/m<sup>3</sup>. While the phytoplankton, zooplankton, and detritus concentration during 3 years each one is 4.67 – 5.84, 11.53 – 15.77, and 16.88 – 20.67 mmolC/m<sup>3</sup>. The fastest growth rate of Seabass with the first scenario is 1.52 grams/day with the duration of 257 days and when the juvenile of seabass spread in January. The fastest growth rate of Seabass with addition feed is 2,23 grams/day during 175 days.

14- Najafpour, B., Pinto, P., Moutou, K. A., Canario, A., & Power, D. M. (2021). Factors Driving Bacterial Microbiota of Eggs from Commercial Hatcheries of European Seabass and Gilthead Seabream. *Microorganisms*, 9(11), 2275.

**Abstract:** A comprehensive understanding of how bacterial community abundance changes in fishes during their lifecycle and the role of the microbiota on health and production is still lacking. From this perspective, the egg bacterial communities of two commercially farmed species, the European seabass (*Dicentrarchus labrax*) and the gilthead seabream (*Sparus aurata*), from different aquaculture sites were compared, and the potential effect of broodstock water microbiota and disinfectants on the egg microbiota was evaluated. Moreover, 16S ribosomal RNA gene sequencing was used to profile the bacterial communities of the eggs and broodstock water from

three commercial hatcheries. Proteobacteria were the most common and dominant phyla across the samples (49.7% on average). *Vibrio* sp. was the most highly represented genus (7.1%), followed by *Glaciecola* (4.8%), *Pseudoalteromonas* (4.4%), and *Colwellia* (4.2%), in eggs and water across the sites. Routinely used iodine-based disinfectants slightly reduced the eggs' bacterial load but did not significantly change their composition. Site, species, and type of sample (eggs or water) drove the microbial community structure and influenced microbiome functional profiles. The egg and seawater microbiome composition differed in abundance but shared similar functional profiles. The strong impact of site and species on egg bacterial communities indicates that disease management needs to be site-specific and highlights the need for species- and site-specific optimization of disinfection protocols.

15- Monzón-Atienza, L., Bravo, J., Torrecillas, S., Montero, D., Canales, A., de la Banda, I. G., Galindo-Villegas, J., Ramos-Vivas, J., & Acosta, F. (2021). Isolation and Characterization of a *Bacillus velezensis* D-18 Strain, as a Potential Probiotic in European Seabass Aquaculture. *Probiotics and antimicrobial proteins*, 13(5), 1404–1412.

**Abstract:** Within the food-producing sectors, aquaculture is the one that has developed the greatest growth in recent decades, currently representing almost 50% of the world's edible fish. The diseases can affect the final production in intensive aquaculture; in seabass, aquaculture vibriosis is one of the most important diseases producing huge economical losses in this industry. The usual methodology to solve the problems associated with the bacterial pathology has been the use of antibiotics, with known environmental consequences. This is why probiotic bacteria are proposed as an alternative fight against pathogenic bacteria. The aim of this study was to analyse a strain of *Bacillus velezensis* D-18 isolated from a wastewater sample collected from a fish farm, for use as probiotics in aquaculture. The strain was evaluated in vitro through various mechanisms of selection, obtaining as results for growth inhibition by co-culture a reduction of 30%; *B. velezensis* D-18 was able to survive at 1.5-h exposure to 10% seabass bile, and at pH 4, its survival is 5% and reducing by 60% the adhesion capacity of *V. anguillarum* 507 to the mucus of seabass and in vivo by performing a challenge. Therefore, in conclusion, we consider *B. velezensis* D-18 isolate from wastewater samples collected from the farms as a good candidate probiotic in the prevention of the infection by *Vibrio anguillarum* 507 in European seabass after in vitro and biosafety assays.

16- Nallala, V.S., Makesh, M., Radhika, K.P., Kumar, T.S., Raja, P., Subburaj, R., Kailasam, M., & Vijayan, K.K. (2021). Characterization of red-spotted grouper nervous necrosis virus isolated from ovarian fluids of asymptomatic wild Asian seabass, *Lates calcarifer*. *Aquaculture*, 542, 736846.

**Abstract:** Viral nervous necrosis (VNN) caused by nervous necrosis virus is a serious disease affecting a wide range of marine, brackishwater and freshwater fishes. The disease causes acute mortalities in larval and early juvenile stages while adult fishes are asymptomatic and remain as carriers of the virus. In the present study, nervous necrosis virus was isolated from ovarian fluids of asymptomatic wild-collected Asian seabass, *Lates calcarifer* in SSN-1 cell line. The complete genome of the virus was amplified by PCR from plaque purified virus and sequenced. Bioinformatic analysis of the sequence revealed that the isolate belonged to red-spotted grouper nervous necrosis virus. The virus purified from infected SSN-1 cell culture supernatants by cesium chloride gradient ultracentrifugation resulted in two bands in the gradient. Both the bands on SDS-PAGE analysis and western blot revealed a single 40 kDa capsid protein. The virus replication was optimum at 26–28 °C in vitro and the virus can be completely inactivated using 3 mM binary ethylenimine in 32 h at 25 °C. The isolated virus was infectious and caused 100% mortality in Asian seabass larvae. The inactivated virus when injected to Asian seabass fingerlings produced neutralizing antibody titre ranging from 1:320 to 1: 1280. The isolate is a potential candidate for production of an inactivated vaccine against VNN.

**Contact NSTIC for Full Text:**

**Fawzia Al-Buloushi**

[Fbuloushi@kISR.edu.kw](mailto:Fbuloushi@kISR.edu.kw)

Ext. 6059



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