

Supporting SDGs through genetic research in sustainable shrimp fisheries management

Kerkhove Thomas¹, De Backer Annelies², Mol Jan³, Volckaert Filip⁴ and De Troch Marleen¹

¹ Ghent University, Department of Biology, Marine Biology Research Group, Campus Sterre S8, Krijgslaan 281, B-9000 Gent, Belgium
E-mail: thomas.kerkhove@ugent.be

² ILVO – Flanders research institute for agriculture, fisheries and food – Aquatic Environment and Quality, Ankerstraat 1, 8400 Oostende, Belgium

³ Anton de Kom University of Suriname, Faculty of Mathematics and Physics, Leysweg 86, Postbus 9212, Paramaribo, Suriname

⁴ Laboratory of Biodiversity and Evolutionary Genomics, Charles Deberiotstraat 32 - box 2439, 3000 Leuven, Belgium

Our research focusses on one of the core topics of the UN Sustainable Development Goal 14 (Life Below Water) and one of the main sectors of the blue economy: the **sustainability of fisheries**. As a case-study, we focus on the exploitation of the Atlantic seabob shrimp *Xiphopenaeus kroyeri* in the Guianan Ecoregion (Guyana, Suriname, French Guiana) in South America, where this species constitutes the most important shrimp resource for both artisanal and industrial fisheries. Concerns about the sustainability of the fishery in the Guianan Ecoregion, especially in Suriname, have led to a joint strategy taken by the artisanal and industrial fishery, NGOs, academic researchers and the government. This strategy towards a sustainable exploitation of the species is unique for a developing country, and resulted in awarding the fishery with the MSC label for sustainable practices, being the first tropical shrimp fishery worldwide obtaining this label. However, to achieve a real ecosystem approach to fisheries (EAF), important questions on the genetics of the species, more specifically on its phylogeny and population structure in the Guianan Ecoregion, still remain unanswered.

The obtained genetic data to support fisheries management has been applied in a two-pronged approach: first, analysis of several genetic markers revealed the presence of an additional, undescribed species of the seabob shrimp. This second species differs notably in its ecology, since it only inhabits the inshore zone, essentially in the area where artisanal fishermen operate. Furthermore, its densities seem to be much lower than the described seabob shrimp, which could have serious implications for its sustainable exploitation and conservation. Next to that, the stock structure of the shrimp is analysed using microsatellite markers, which were newly developed using Next Generation Sequencing (NGS). The first results indicate a genetic differentiation between different stocks in the Guianan Ecoregion, new information which has to be taken into account in fisheries management.

The extensive sampling campaign was thanks to a very close cooperation with the fisheries industry. As such, this **industry-ecology linking** is an important component of the success of the scientific research behind the MSC certification, and can act as a blueprint for supporting the SDGs. We focus on Suriname and Guyana, which are both regarded as **Small Island Developing States (SIDS)**, a group of small developing countries (not necessarily islands) which are a prime focus of the SDGs. Because of their small size and small population, SIDS experience a proportionally far greater benefit from the sustainable exploitation of marine resources than larger countries. Next to SDG 14, there are several links with the other SDGs: SDG2 (Food Security), SDG8 (Employment and Growth) and SDG12 (Responsible Consumption and Production).

This case study clearly illustrates the application of scientific insights to sustainable development and thus will contribute positively to the achievement of the SDGs. Furthermore, this model of MSC linking of industry-ecology does not only apply for developing countries but can also be brought into practice in developed countries and thus also in the Belgian part of the North Sea.

Keywords: Tropical shrimp fisheries; Genetic research; Sustainable Development Goals; MSC label