

Use of and potential biodegradable alternatives for dolly rope, a.k.a 'spekking', in Belgian fisheries

Bekaert Karen, Lisa Devriese, Sofie Vandendriessche, and Els Vanderperren

Instituut voor Landbouw en Visserijonderzoek (ILVO)
Ankerstraat 1, 8400 Oostende, Belgium
E-mail: karen.bekaert@ilvo.vlaanderen.be

Marine debris or "marine litter" is defined as any persistent, manufactured or processed material that was abandoned or discarded in the marine environment or in coastal areas (Galgani *et al.*, 2010). The very slow degradation of most types of litter, mainly plastics, along with the ever-growing amounts of waste, leads to a gradual increase of microplastics and plastic debris at sea and on shore. At least 62.5% of the dredged waste in the Belgian Fishing for Litter pilot project definitely originated from fisheries (fish boxes, nets, synthetic rope, metal chains and boots). Other material could have a more general origin (paint cans, oil drums) but could also originate from fishing vessels. Since fisheries is a major source of litter, preventive measures to reduce inputs of fisheries waste need to be listed and explored. As a test case, the use of and potential alternatives for polyethylene dolly rope in Belgian fisheries was evaluated. Dolly rope consists of polyethylene fibres and is used to protect fishing nets against abrasion following friction with the seafloor. In order to estimate the quantity of dolly rope used on the different fishing locations and to evaluate the most important qualitative characteristics, a questionnaire was sent to ship owners. The results of the questionnaire indicated that an estimated 133 tons of dolly rope is used yearly by Belgian fishermen. The most important characteristics of the presently used polymer are the ease of use, the protection against abrasion and the lightness of the material. However, polyethylene dolly rope also presents several disadvantages such as accumulation of sand between the strings, blocking of the fish conveyor belt or the propeller of the ship, entanglement in the fishing net and the fast wastage and subsequent environmental pollution. Consequently, fishermen show much willingness to consider alternative and biodegradable materials, but these will have to be more sustainable, low-priced and more resistant than the classical dolly rope. A literature study focussing on alternative materials showed that natural components such as hemp, flax, manila or sisal could be used when coated or used in composites with bioplastics. Keratin from animal origin, such as hair, chicken feathers, and nails is already used in plastic applications as composite material and is a potential alternative for polyethylene. Another group of alternatives consists of biodegradable plastics such as Poly Lactid Acid (PLA), Poly Butylene Succinate (PBS), Polyhydroxyalcanoates (PHAs), cellulose and starch plastics. Essential characteristics and biodegradability of both organic and inorganic alternatives should be tested and compared in the lab and in the field before they can replace the polyethylene dolly rope. Moreover, fabrication of a new product should be economically viable to find interested manufacturers.

References

Galgani F, D. Fleet, J Van Franeker, S Katsanevakis, T Maes, J Mouat, L Oosterbaan, I Poitou, G Hanke, T Thompson, E Amato, A Birkun, and C Janssen. 2010. Marine Strategy Framework Directive Task Group 10 Report Marine Litter. EUR 24340 EN - 2010.