

Project Update: August 2019

NB. Please note that Objective 5 of the original application is no longer part of the current project i.e. the aspect that involved assessing the perceptions of locals about plastic pollution in Knysna. However a social aspect of a similar nature will be conducted as part of near-future research in Knysna.

Assessing the occurrence of microplastics in wild-caught pipefish (*Syngnathus temminckii*)

A total of 30 pipefish (*Syngnathus temminckii*) were collected from eelgrass beds at two sites along the Knysna Estuary (34° 3'38.43"S; 23° 2'16.65"E and 34° 2'58.92"S; 22°59'58.62"E) using a seine net. Fish were collected at low tide during two sampling events in July 2019. These individuals were utilised to determine the success of a non-destructive gut flushing method to obtain any microplastic particles potentially consumed by the fish in their natural habitats. Ingested microplastics and prey items were obtained from the gut of pipefish through the adaptation of the flushing method (Castro et al. 2008) as follows: a needless plastic syringe filled with 3 ml of filtered fresh water was connected to 1 of 2 catheters (i.e. 0.90 mm Ø, 25 mm L or 1.10 mm Ø, 32 mm L) depending on the snout size of the fish. The catheter was introduced into the snout of each fish and pass the hyoid bone where freshwater was slowly flushed down to provoke the regurgitation of any ingested microplastics. Any regurgitated microplastic particles was filtered onto PES filter paper and enumerated after microscopic analysis. All fish were found to have contained microplastic particles which were predominantly fibrous in nature.

Three mortalities were accounted for during the gut flushing protocol whilst fully recovered fish were returned to the sites from which they were collected. All samples were collected as authorised by the South African National Parks (SANParks) research permit (Knysna section of the Garden Route National Park CLAA-L/2018-018). Appropriate ethical clearance was obtained from the SANParks Animal Care and Use Committee (AUCC) for scientific research (Reference no. 016 – 18).



Left: Sampling for Pipefish. Right: Searching for Prey items of Pipefish. © Louw Claassens)

Assessing the occurrence of microplastics in Prey Items of Pipefish (*Syngnathus temminckii*)

Prey Item samples of pipefish were collected at low tide during July 2019, from four sites with the highest surface water microplastic densities. These are the same

sampling sites from which juvenile fish were previously collected. A total of 120 prey items (n= 30 per site) was captured. Within each site, eelgrass beds were gently swept for prey items using a standard SASS net with 1 mm mesh. Samples were exposed to alkaline digestion to achieve tissue digestion and recover any microplastic particles that may have been ingested. Filtered samples are currently being analysed and microplastic particles enumerated. These prey items were collected to assess if one of the potential pathways of microplastic ingestion in pipefish is through feeding on their subsequent prey items.

Thesis writing update

Currently all field work has been completed and I am in the process of analysing my data and writing up draft chapters of my thesis which are being reviewed by my supervisors.