

# Can the Invertebrate Fauna Associated to Pelagic *Sargassum* Landings in the Brazilian Amazon Coast Aid Us to Understand its Origin and Dispersion?

## ¿Puede la Fauna de Invertebrados Asociados al *Sargassum* Flotante Varado en la Costa Brasileña del Amazonas nos Ayudar a Comprender su Origen y Dispersión?

## Est il Possible que la Faune D'invertébrés Associé aux Décantations de *Sargassum* Pélagiques sur la Côte Amazonie Brésilienne Nous Aide à Comprendre son Origine et son Dispersion?

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### EXTENDED ABSTRACT

Since 2011, large amounts of pelagic *Sargassum* were observed in many localities of the Caribbean (e.g. Gavio et al. 2015), and reported for the first time from off the Amazon (Széchy et al. 2012). However, the *Sargassum* landings in Brazilian beaches are even more recent than those at Caribbean shorelines, beginning at 2013. The intensification of the phenomena and consequent economical losses were observed during the years of 2014 and 2015, when tons of stranded algae were reported for Pará state, Brazilian amazon coast (Martinelli-Filho 2015). The phenomenon and impacts on local economy, based on fisheries and tourism, were highlighted by the local media.

The year of 2015 showed the largest amount of pelagic *Sargassum* in the Amazon coast, but also occurring at northeastern coast and the Fernando de Noronha islands (Sissini et al. 2017). At this time, three hypotheses were raised to understand the *Sargassum* flux in the Atlantic, its origin, dispersion and consequences. *Sargassum* from the Amazon coast may be linked to the growth of large populations on the Amazon shelf (Gower et al. 2013); the transport of algal slicks from the Caribbean to Brazil (Gower and King 2011); and the transport from the African coast to the North and Northeastern Brazil (Johnson et al. 2011).

The study of the associated fauna may be a useful tool to test these hypotheses since it is known for certain regions as the Caribbean and Sargasso sea (e.g. Niermann 1986). Additional information like the proportion of *S. fluitans*: *S. natans* and community structure characteristics of the invertebrate fauna will provide clues to understand such recent *Sargassum* fluxes. Here, we provide preliminary results on the sessile, invertebrate community associated to *Sargassum* spp. (*S. natans* and *S. fluitans*) collected during the 2014 and 2015 landings at the Amazon coast.

We collected 19 samples of floating *Sargassum* at Pará state coast during 06/30/2014, 04/15, and 05/9-10/2015 and 04/23-24/2016 to describe the associated sessile fauna. The algae were collected using large plastic bags, to avoid the loss of the associated fauna. Most of the samples were collected near the beaches, at shallow depths of 2 - 5 meters at Salinópolis (0°35'S - 47°17'W), São Caetano (0°39'S - 48°01'W) and Curuçá (0°33'S - 47°50'W) municipalities. A single sample was collected offshore, during 04/23/2016 (0°27'N - 47°28'W). The wet weight of each sample was determined, and subsampling was applied for the most abundant invertebrate taxa. Quantitative analysis was considered only for the sessile fauna, since most of the sampling was collected near the beaches and most of the mobile fauna could be lost as a consequence of the intense turbulence nearshore. Species richness, frequency, and density were analyzed, although colonies of hydroids and bryozoans were not quantified yet.

Preliminary results described fourteen taxa, to be identified at species level. Between the cnidarians, hydroids from the order Leptothecata and sea anemones (unidentified) were recorded. Crustaceans (*Lepas* sp., a balanid cirriped, two gammaridean species, and hypolithid shrimp), bryozoans (*Membranipora* sp.), gastropods (two Caenogastropoda and a nudibranch), bivalves, polychaets (*Spirorbis* sp.), and a species of Ascidiacea were registered. The most frequent taxa were the hydroids, bryozoans, and serpulid polychaets (Table 1). About 70% of the animals were fixed on the blades, followed by the axis and bladders. Sessile invertebrates were present in all 19 analyzed samples, with a richness of 2 - 7 ( $3 \pm 1.3$ ). The density of attached invertebrates varied from 0.3 to 21 org./g wet weight ( $6.9 \pm 6.3$ ). Samples collected at 05/9/2015 had a higher density of associated invertebrates (7.9 org./g). Identification to species level is in course, by laboratory analysis and sending voucher specimens to taxonomists.

To verify differences from the fauna between *S. fluitans* and *S. natans* is needed and is one of the next steps in this study. We will also look for differences between *S. natans* I and VIII, since both forms were recently documented at the Caribbean. We point out that no previous results are available for comparison for the Amazon coast. Associated fauna is described only for the Caribbean, Sargasso Sea or even more distant areas. The only study for the Brazilian coast is located at the South Atlantic and described mainly the associated algae from pelagic samples of *S. hystrix* and *S. platycarpum* (Oliveira et al. 1979). Nevertheless, similarities between communities described in other regions may help to elucidate the paths of the *Sargassum* slicks until it reach the Amazon coast.

KEYWORDS: Golden tide, seaweed, climate change, Atlantic ocean

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**Table 1.** Frequency of the main invertebrate taxa associated to pelagic *Sargassum* reaching the Brazilian amazon shoreline.

Higher taxa	Taxa	Frequency (%)
Hydrozoa	Leptothecata	84
Bryozoa	<i>Membranipora</i> sp.	74
Polychaeta	Spirorbinae	74
Anthozoa	Arachnactidae	16
Bivalvia	Unidentified	16
Cirripedia	Balanidae	10
	<i>Lepas</i> sp.	5
Asciacea	Unidentified	16