Bioplastics and PLA; the sneaky truth

Not all packaging is created equal. Plant-based PLA or bioplastics are a good idea in theory, as they help us lower our reliance on fossil fuel, reduce GHG emissions at production and lower the release of additional CO2 to the atmosphere. In Hong Kong, there are no suitable waste management systems for this sort of packaging. This means the effects of bioplastic can be equally detrimental as that of single use plastic on our natural environment. We believe that plastic, bio or otherwise, has no place in our planet's future!

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1. What are bioplastics?

Increasing public pressure toward sustainable packaging solutions birthed the bioplastic phenom. Bioplastics are composed of "natural" resources, such as sugarcane, which are ultra-processed to become a biodegradable plastic, technically speaking. To qualify as a bioplastic, the treated material must be bio-based, therefore these do not come from petroleum or fossil fuels. Cornstarch is a popular source of the bioplastics we see in packaging, which when treated, produces PLA (polylactic acid).

We need to understand that the requisites of "bioplastic" composition are vague. Bioplastics should be made from natural resources, so it sounds promising when we hear that bioplastic is made from corn or sugarcane. These materials, which should be sustainable, are made non-renewable due to their reliance on fossil fuel based treatment mechanisms, mirroring that of their traditional plastic counterparts. In a 2020 report by Camille Fabre, those plastics derived from virgin fossil 'feedstocks' are said to account for a whopping 90% of total production[1]. If the majority of treatment and production of bioplastics mirror those processes of traditional plastics, why would they decompose differently?

2. Why are bioplastics an Issue?

In Bioplastic we have created a monster; to address the problem of SUP we have created an increasingly complex plastic issue, made more-so by its masquerade as a solution. In order to authentically engage with, and make educated decisions about plastic consumption, we need to understand the full health risks of

[1] Fabre Camille, (2020), "When "Bio" Meets "Plastics"", A Case Study of Bioplastics and Their Impact in Hong Kong: G.R.E.E.N Hospitality Report, https://68cff22a-887b-41a6-b198-fb3915cb74ac.filesusr.com/ugd/f5f9fb_b4502bcf20b845c5a7b165b279e4a717.pdf

plastic use. Bioplastics are a symptom of a profound lack of understanding and public knowledge regarding plastic risks generally. The issue with bioplastic lies not only in its false promise of sustainability, but also the maltruth that it holds any better production means simply because it is derived from a bio source.

3. Is bioplastic biodegradable?

Philosophically speaking, if you give anything enough time it will degrade. The same report by Fabre points out that it is not a legal requirement for bioplastics to be biodegradable, which in itself sets off a symphony of red flags. These two factors alone set the tone for the reality of "biodegradable" bioplastics. If all plastic is technically biodegradable, then time is the logical variable to manipulate in the appeal of "biodegradable" bioplastics. Fabre has emphasised that the maltreatment of materials used in the creation of bioplastics render them equally toxic to SUPs, therefore what would speeding up the degradation process do? The implication is that degraded toxic microplastics would enter the soil, only more rapidly. This is the critical issue of 'drop-in' bioplastics, a term which Fabre uses to describe packaging touted as biodegradable, seen to be no more non-toxic than SUPs[2]. When we consider biodegradation, we cannot always think of it as being a good thing. We need to consider- would we want this entering the natural environment at all? The better lifecycle promises of bioplastics are hereby misleading.

4. Recycling bioplastics

The ability for bioplastics to be recycled at a local level is meagre at best; there would need to be a pretty steady and large flow of this material to justify introducing an appropriate recycling scheme. Moreover, introducing such a system would require re-educating the entire population on a new, separated recycling system. Considering the imminence of climate-change as an issue, recycling bioplastics does not present as sufficient toward a truly "sustainable" alternative for packaging. Not only are bioplastics no more appropriate for recycling than regular plastics, but this also does not tell anything of the reliability of available recycling facilities, where plastic has long been a contentious issue.

4. Can we compost bioplastics?

Technically, we can compost bioplastics. The issue is that it is definitely not happening in Hong Kong, as the process of composting Bioplastics is expensive and large-scale. These products can only be broken down under specific conditions, such as exposure to ultraviolet radiation and/or heat via industrial composting. At present, Hong Kong does not have a widely available industrial composting facility, bar some schools with progressive sustainability programs.[3]
Industrial composting is a process that requires temperatures more than 60°C and added enzymes, oxygen and mixing to transform biodegradable waste into compost/fertiliser that can be safely used in agriculture. In line with the name, this process takes place in large-scale industrial composting machines, which cost upwards of $100,000 at a minimum.

The Hong Kong Environmental Department announced an organic waste composting scheme in 2019, that was to reduce the organic waste issue in Hong Kong by making composting accessible. Even in 2022, this

[2] Fabre Camille, (2020), "When "Bio" Meets "Plastics'", A Case Study of Bioplastics and Their Impact in Hong Kong: G.R.E.E.N Hospitality Report, https://68cff22a-887b-41a6-b198-fb3915cb74ac.filesusr.com/ugd/f5f9fb_b4502bcf20b845c5a7b165b279e4a717.pdf

[3] So, Winnie Wing Mui. "Pathway of Optimisation – A Case of Education for Sustainability in Hong Kong." In Optimierung: Anschlüsse an Den 27. Kongress Der Deutschen Gesellschaft Für Erziehungswissenschaft, edited by Henrike Terhart, Sandra Hofhues, and Elke Kleinau, 1st ed., 105–22. Verlag Barbara Budrich, 2021. http://www.jstor.org/stable/j.ctv1x6773c.8.

scheme has yet to be implemented, which tells of the reality of composting in this urban sphere. Such high level composting processes as that required for bioplastic, are categorically unrealistic in the present climate.

5. Does plastic production go down with Bioplastics?

Bioplastics are made to sound appealing, and that is the selling point- it is a smokescreen. In 2015 it was estimated that 360 million tons of plastic was produced, and each year plastic production increases by about 4%, according to a 2017 report[4]. So even with the advent of Bioplastics, plastic production continues to increase. This is an issue, the industry has taken advantage of increasing consumer demand for sustainable consumption options, and used it as a loophole. With bioplastics, we see the demand for change, which is positive. But the deceit that lies within the bioplastic sham, is a disservice to consumers who purchase with sustainability in mind.

These statistics are pretty shocking to us too, especially as the global production of bioplastics is predicted to double by 2024- of which the packaging industry accounts for just below 55% of total output. This prediction is based on the current requisites for ostensible eco-friendly packaging, a figure in which Fabre has found no inclusion of truly sustainable bio-based products. With the increasing consumption of both SUPs and bioplastic packaging, we need a better solution. As Professor Frank Vanclay said in 2012, we need decision-makers to take accountability for our future well-being[5]. Fabre's study points out hope in the biobased resources provided through food-waste, in addition to natural by-products of agricultural processes . This is why we use bagasse, because they present an authentically sustainable alternative packaging solution. By trash talking bioplastics we can un-trash the planet; we hope that other sustainable packaging companies will start to take ownership over debunking the myth of bioplastics.

6. What is ethical consumption?

Ethical consumption is topical, and somewhat contentious as a subject matter. Some view it as inaccessible, some view it as a smoke-screen to the critical issues of sustainability. The truth is that we all need to engage with our consumption habits and reconsider them, because our planet does not have the resources to sustain our current consumption habits. Despite the WCED's declaration in 1987 "We need to meet the needs of the present without compromising the ability of future generations to meet their own needs". We can start with reconsidering our everyday purchasing habits, we do not need plastic food packaging, and it actually is so much more detrimental than it is beneficial[6]. We focalise on educating stakeholders about plastic consumption, toward promoting informed decision making regarding sustainability. We deliver when consumers place their trust in us, toward genuinely facilitating ethical consumption.

[4] Griggs, G. (2017). Aquatic Invasive Species. In Coasts in Crisis: A Global Challenge (1st ed., pp. 305–319). University of California Press. http://www.jstor.org/stable/10.1525/j.ctv1xxx5h.20

[5] Frank Vanclay & Esteves AM, (2012), "New Directions in Social Impact Assessment" Conceptual and Methodological Advances, ch.1 pp. 1-9

[6] Manning Lauren, (2021), "Consumer demand for sustainable packaging holds despite pandemic" Food Dive. Boston.