

Environmental Contaminants: Microplastics

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SPEAKERS

Lara Milligan, Ricky Telg, Phillip Stokes



Ricky Telg 00:04

This is science by the slice, a podcast from the University of Florida's Institute of Food and Agricultural Sciences Center for Public Issues Education. In this podcast, experts discuss the science of issues affecting our daily lives revealed the motivations behind the decisions people make, and ultimately provide insight to solutions for our lives.



Phillip Stokes 00:32

Hello, and welcome back to Science by the Slice for episode two in our series on environmental contaminants. So if you're willing, I'd like you to take a deep breath in. I hope that felt nice. It's always a good way to start a podcast. But what I'd really like you to do now is to think about the air you're breathing in. Every time you inhale, you're breathing in a variety of gases, mainly nitrogen and oxygen. But you're also breathing in particulates, such as dust, sand, pollen, spores, smoke, and now more than ever plastic. More specifically microplastics, a term for small plastics coined by Richard Thompson, a marine ecologist at the University of Plymouth in the United Kingdom. Since scientists have started studying microplastics and looking for microplastics, they found them practically everywhere, at least everywhere. They've looked in deep oceans and Arctic ice, shellfish, table salt, drinking water, and yes, the air we breathe, from the tallest mountains to our deepest oceans, plastics are everywhere. So the question becomes, is all this a problem? And the answer to this question is complicated. And to help us sort out a bit more about microplastics I talked with Lara Milligan, the natural resources agent for UF IFAS extension in Pinellas County, Florida. Lara's work in Pinellas County focuses on wildlife, water in general environmental education on topics such as microplastics. So now, let's go to my conversation with Lara Milligan. And she'll tell you a little more about herself. And a whole lot more about microplastics. Lara Milligan, thank you so much for joining us on the PIE Center's podcast Science by the Slice, really great to have you talking with me today. So Lara, you are the natural resources, a extension agent in Pinellas County. So I do want to give you a minute to just introduce yourself. But one of the things I also want to say on Science by the slice, we talk about extension quite a bit, and the role of extension and Land Grant Universities

and at the University of Florida and IFAS. But I think you are the first extension agent that we've had on Science by the Slice. So if you're introduced yourself, you can just tell us a little bit about what you do and what that means.

L

Lara Milligan 03:04

Yeah, well, I appreciate the opportunity. And always, you know, to plug extension and explain a little bit more about who we are and what we do. But yeah, so as the natural resources agent, we always say an extension, we are an extension of the university, we have offices in every county in the state, and as natural resources agent, while what I do varies because things change and shift in the environment. I generally say like I do wildlife and water education for the public. So I teach all ages, we emphasize that everything we do is research base, you know, we're not just gonna like make up what it is that we're sharing about the environment. And I got into microplastics through actually, like, it was a Florida Seagrant training. And I kind of captured that under like my water outreach and education. And it's been very eye opening for me personally. So I'm excited to be here to share that with your audience, and hopefully not depress them too much.

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Phillip Stokes 03:56

Yeah, I don't know. Well, we'll get into all that. But yeah, hopefully, it's not not too overwhelming. But ya know, that's that it's great to have you on the show. And of course, like you let in, we're talking about microplastics. And I think first off would be great if we could just all get on the same page, and you could just help us understand what are microplastics

L

Lara Milligan 04:18

Yeah, you know, it's funny, I do a lot of outreach on the topic. And I always ask when I teach college students, you know, what do you think the definition of a microplastic is, is I was like, well, a small plastic and yes, that's awesome. And when we are talking kind of like at the scientific community level researchers, generally speaking, we say it's any plastic particle that's five millimeters in size or smaller. And I know you know, in the United States, millimeters might be a foreign thing. So it's about the size of a pencil eraser, or smaller. I will say that depending on which researchers you talk to some don't like the five millimeters in size or smaller because it's not micro, if you can see it. So some go by one, or two or even like 500 microns. So it's just getting to that smaller level where you need a microscope to see it. So, depending where you talk to you, it can vary, but generally speaking, again, a very small piece of plastic.

P

Phillip Stokes 05:17

Right? And so, I guess, um, where do they come from? Like, what are the sources? And I guess just how prevalent are they, you know, around us, especially if they are small. Sometimes you can't see them. Like you said, sometimes you can. I think we're all very familiar with pollution, right? Whether it's an bodies of water are just on the side of the road, but like, where do microplastics come from?

L

Lara Milligan 05:42

Yeah, and that's a great question. And typically like the number one question that I get asked, and I like to explain it. When I talk about sources of microplastics. I, I like to break it into two broad categories. One is what we call primary microplastics. And then we have secondary microplastics. So for primary, those are sometimes referred to as nurdles. They're the small like raw resin pellets. They're tiny little spheres of plastic. And that's what shipped all around the world to plastics manufacturers. And then they're those are melted down in molded into the various plastic products that we see and use every day. Of course, during shipments like there can be spills of the nurdles. And then so that's kind of like one aspect, the nurdles could also not be melted down and sometimes used as stuffing and various things. One thing I like to point to is Beanie Babies. I'm not like calling out Beanie Babies as being bad. But it's just an easy one. One of the projects we do with youth is dissecting the little mini Beanie Babies and counting how many nurdles are inside. So it's a good kind of connection for the kiddos. So it can also be used in that way. And then also not as much anymore because of legislation that was passed. But we might have heard of the term microbeads. So there'll be tiny little spheres of plastic and various personal care products often associated with like exfoliation, there was the micro bead free waters act of 2015, that has now eliminated the use of microbeads and personal care products used for cleansing and exfoliating purposes. So a lot of those are no longer on the market. But there are some loopholes to legislation like there always is. So some of them do still exist. But so those are like primary sources of microplastics. Then secondary, which is more what we kind of see and hear about is when plastic products that are now molded and made and we use make it into the environment. And once they break down and they reach that size of five millimeters or smaller, then we classify them as secondary microplastics. Now, the number one source and this is like since I've started learning about microplastics. This is kind of a newer discovery in the field. And the number one source we're seeing in the research is actually from car tires. So the wear and tear, we all know that right over time, we have to replace our car tires. And there's a reason for that. And so the wear and tear, there's synthetic rubber in the tires. And it took a while for researchers, they were finding these tiny pieces of black plastic, but it takes very expensive equipment and technology to actually source the plastic and figure out where it's coming from synthetic Textiles is another big source. So really any textile material that's made, we often think of like polyester is a really common material for clothing for various for our sheets, right? We like our microfiber sheets. So lots of textiles. In the marine industry, there's not only the paint that we put on boats that is getting, you know, eroded over time. But we do a lot of sandblasting to maintain the boats to remove any like biofilms or, you know barnacles or things like that, historically sandblasting, right, hence the name was you sand, we have now shifted to using synthetic materials to do that. And of course in the process, we can lose those particles. And another big one. And this is a newer, another newer one for me. And the research that I've seen is actually road markings. So all of the markings that we see on the road that keeps us in the right lane. Those wear and tear over time it is made of synthetic material also includes paint, and paint in itself as another category. But as these things wear and tear and break down. Those are all some of the major sources of microplastics in the environment.

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Phillip Stokes 09:31

It's funny because it's not funny, but it's interesting. All of these different items that we rely on just daily Yeah, I mean, of course they're gonna break down but you don't think about it. I'm thinking about like the term like unintended consequences of just daily life with with tires. And

thinking about like the term like unintended consequences of just daily life with with lifes. And yeah, and you just hit on probably some of the high level things but you know, they're probably so many other things but

L Lara Milligan 09:58

yeah, and yeah, I know, like even when I just summarized like, and of course, like everything else that makes its way into the environment. That's a plastic product, through wave action, sunlight, chemical degradation, all these products, once they again, break down to that five millimeters in size or smaller, those are secondary. So it's really hard to like classify, and of course, data is just continuing to be done on this. But yeah, there's, there's a lot of sources and many, you know, I can't cover them all. So those are just some of the larger ones.

P Phillip Stokes 10:25

Sure, sure. Just kind of a side story. I, you know, I was doing some pressure washing, and, you know, it's pressure washing at one point, some like patio furniture that like, had some, like algae growth on it and stuff. And so like, even just like, I noticed that some of like, the very fine, you know, plastic coating, or whatever was starting to come off a bit. I'm just thinking of all of these different scenarios, not to mention, you mentioned Beanie Babies, if you need like any spare Beanie Babies for your dissection process, like we, I mean, we just have so many of these things in our house and our lives. They're just in our infrastructure and unavoidable, right?

L Lara Milligan 11:07

Absolutely, it's, it is really overwhelming to avoid plastics in general. But one of the things I always say is, if you if anyone does research on like the history of plastics, and kind of when they came into production, it really wasn't mass produced until like after World War Two. So I like to remind people like we lived without plastic, there was a time in life pre plastic. So it's, it's so hard for us because it is so pervasive, and everywhere. And sometimes we really don't have the option to like, purchase certain products that aren't plastic. But there are tons of alternatives. We probably won't have time to go into all of those today. But it can be overwhelming. But hopefully, you know, we'll kind of end on some action steps and things you guys can do. And yeah, they make it not so overwhelming.

P Phillip Stokes 11:52

No, that would be great. And, you know, a little while back, I remember I was talking to my mother in law. And I don't know, somehow we started talking about plastics and recycling. And then, you know, it just came up that, you know, I said, when you were a child when you were young, was everything made of plastic? And she said no, like, we didn't have these things when I was, and that wasn't that long ago, you know, he was a child. You know, she said everything was, you know, glass or different, you know, metal products, you know, and those were the things that were a little that they recycled even then or reused or repurposed? So yeah, it's it's just the, the history of this is so recent. Yes. So now that we know, kind of what they are and where they come from, what are some of the impacts and the effects of microplastics in the

environment? And how does that affect human health? How does that affect our landscapes and our ecosystems? And the animals? Just? I know, that's a lot. But we can we can start kind of with a section of that. But how does how does that affect the environment? Overall?

 Lara Milligan 12:55

kind of the easy catch all answer is right, that we still honestly don't really know, there's so much research happening both on the aspects of human health and of course, our aquatic organisms. We know from the research, there's, you know, hundreds of taxa of different species globally around the world that had been documented to have ingested microplastics. So we know that we also know it's been found in human blood, human stool, various parts of the human body. So the animals we know, it's in us. So now it's kind of like, okay, we know it's here. So what's, what are the concerns? You know, what are the potential impacts, and in certain species, there's, you know, and again, I can't go into like all the research, but like, they're finding when we make plastic products, there's different chemicals that are added to give it either really be really strong and sturdy or very kind of soft and flexible, like think like a Ziploc bag. I should, I shouldn't say that, it's a plastic bag. And those different additives is a concern because of their potential to leach once they're either in us or in organisms, their potential to desorb or leach into the system. And what are those impacts? And that's the part that we that we don't know. So we are detecting they're called Sally Yates is one of the common additives. So we're finding those in species we found it in, like locally in Florida down in Sarasota, they found it in the urine of bottlenose dolphins. They found the presence also in the blubber of some whales that were stranded. But it wasn't to the point we could say, because of this, this is why this species died. We haven't been able to get to that level yet. And there's been tons of different studies looking at like decreased stunted growth of organisms as a result of ingestion of microplastics just feeding impairment their inability to feed as efficiently as they did prior impacts to reproduction on for various levels, and then associated impacts to their offspring and changes in gene expression which if You think, to a lot of our plastic products, one of the things we'll often see is that it's BPA free, which is again, another additive we later found is not good for human health, and therefore has been mostly stopped from production and being included in certain plastic products. So it's like, as we get this research information, we can take action. I will say, a lot of researchers caution, kind of, of course, extrapolating this data, a lot of this studies are done within lab settings. So it's not realistic to the environmental settings. And one of the more the easier accessible microplastics to use in studies is a polystyrene kind of like a foam based plastic. But that's not the majority of what we actually see in our finding out in the environment. So it's also like, there's just so many variables to consider, which makes it very challenging for scientists to to extrapolate the data to say like this is, these are the negative impacts of microplastics, kind of at the cellular level, when we think about human health, they found cell death associated with microplastics. Being in the system, and kinda like specifically to human health, there's been associations or suggestions that could cause respiratory issues, impacts to the functioning of the immune system, and potential for like neuro toxicity. So I mentioned those things leeching off. But there's also research that shows that microplastics tend to absorb or basically collect various chemicals that are out in the environment from our past history, right, we used to just dump wastewater in the ocean, like not too long ago. And so there's tons and DDT and all the things that before we knew better, and there's a lot of those are still out in the environment. And we're finding that these contaminants are being attracted to these plastic particles. And depending on the pH of the water, kind of the consistency of the microplastic, the shape of the

microplastic, it can have more or less, even things like metals. So there's extreme concern with what is on these particles that are either intentionally or unintentionally being ingested by us and by animals. But again, we just don't have the research to say this is causing x.

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Phillip Stokes 17:17

So yeah, you use the term adsorbed. And so like the microplastics, are a vessel for other contaminants. Absolutely, then be interested by?

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Lara Milligan 17:31

Yes, yeah, there's a lot of a lot of research on that, and kind of more seems to be focusing on like, at what level? Is this happening? And how does it compare to more organic material that's in the environment? Because of course, those can serve a similar purpose. But focusing on microplastics, of course, is the focus a lot of a lot of the research.

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Phillip Stokes 17:50

Yeah, you know, initially, you said, we don't know, right, like, there's a lot of evidence that you just suggested, but like, the the long term impacts? And the very, I don't know, like tangible, like in your face impacts, like, yeah, like, like we don't know, that's like a kind of a challenging place to be, right. It's challenging place to sit, because people, it's our human nature, we want to know, what we need to do, what we need to not do. But this ambiguity is, is, is a challenge, thinking back to like, towards the beginning of COVID. Like, we didn't know what to do, and that was very scary. And so like, different different scenarios. I don't want to compare the two necessarily, but like, just this lack of understanding and about what to do, does create a challenge, right?

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Lara Milligan 18:39

Yeah. Yeah, absolutely not, I think it's important to highlight like, what we do know, which is, there's a lot of plastic out in the environment. And, you know, you just alluded to COVID, which, you know, you think too, that related to plastic, we can only imagine how much extra plastics enter the environment, I saw some studies specifically looking at the impact of face masks as it relates to microplastics. So, right, there's some connection there. So not totally irrelevant. I think that, you know, the research can point to certain potential impacts, whether it's from the additives leaching off or from directly, then microplastics. But again, one of the things I like to stress is, sometimes we can't, like, I know, it's very hard for us, but we can't always wait for the research to say like, Hey, this is gonna cause X, like, we don't want to wait sometimes to find that out. And really, the only way to avoid pretty much everything we're going to talk about today is right, just getting away from the use of plastics and plastic products. Of course, they have their place, right. We're very grateful for many of the purposes that they serve, but there's many things right, or they're not essential, and we can avoid them.

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Phillin Stokes 19:48

Phillip Stokes 20:10

Right. Right. I'm also thinking about, yeah, avoiding them and, and there's a lot of personal responsibility, and that, you know, I saw something recently that a survey where Americans believe that it's kind of everyone's responsibility, it's to reduce the amount of plastic. So there's just kind of this general awareness about plastics, plastic pollution, micro plastics, that that awareness is also growing. And people typically want to reduce their reliance on plastics, according to a survey, so, and they think that it's up to everyone. So it's up to individuals, right? Personal Responsibility. It's up to manufacturers, like the businesses that make some of these things, but and then it's also up to government regulators, as well. So I think people do understand that it has to be a holistic and sort of team effort, if you will. Has there been any, any amount of any legislation, you talked about the the ban on like, microbeads, or in like, shampoos and like exfoliating ingredients and stuff like that, but have there been any other legislative bans that have aimed to reduce plastics in the environment?

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Lara Milligan 21:04

Yeah, that's a good question. So there's recently a kind of it was pretty big national news, perhaps it's because I'm biased, and I see all things microplastics. But there is an effort underway. At the global level, there's 175 countries that are currently working on like a plastics treaty, if you want to call it that. And they're looking at like 2024, to kind of have a draft of this in place, where globally, we're going to be working together incorporating some of these massive companies that we like to always, you know, call out like, Hey, why aren't they doing anything about it? There's some onboard according to what's being discussed, of course, we won't know until its final. So I think, you know, that's exciting that we're recognizing this, like, globally is like, we have to do something about this. So we will, unfortunately, have to just wait and see. But that's exciting news that, you know, world leaders are coming together to agree to take action and recognize that it's a global issue. More locally, there is a ban, but not the kind of ban, you're talking about. There's actually it's a preemption. So there's a ban against banning plastic bags in the state of Florida. It's kind of expanded and, you know, because then people were like, Okay, well, then we'll ban straws, and will ban, you know, certain other products. And there's many aspects to that, and I won't, you know, dive into it. But what I've seen locally, because in my, in Pinellas County, they they tried kind of, to still do the band's anyway, some local cities are still trying to get away with it. And what we've really seen shift is like, why focus on like, one particular product? Why just xy? Just straws? And then how do you really enforce that? And is it effective? So like, all these questions, so people started to shift to this voluntary effort, which is more what I've seen. So we have like, we have a local group called Ocean allies. And it's a group of restaurants and hotels that are on Clearwater Beach, right? The number one Beach, people flock here, and they're realizing like, hey, we want to, we need to be green and represent and show our tourists like what we're all about. So they just started this voluntary effort, they're supporting each other to find alternative plastic products, sometimes, like getting in buying agreements to get these products cheaper. So that's more what I'm seeing is that not necessarily relying on leather legislation, but just like taking it into your own hands grassroots effort to make it change.

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Phillip Stokes 23:35

You know, what's really interesting, another kind of bigger point that I'm thinking about, you know, when we think a lot about negative environmental impacts, we think about negative actions that cause those things. Right. And I kind of alluded to this at the beginning, but it's

almost inaction that is causing the buildup of plastics, right. And so it does take a concerted effort. And that's challenging, right, a concerted effort to reduce our reliance, and the amount of plastics we purchase. And there are just so many other things that we have to worry about on a daily basis. And going back to that survey we mentioned before, I mean, you know, plastic pollution of microplastics is important, but it's a little bit lower on the list. You know, it's below the economy. It's below health, and other among other things, but it is there is some effort that has to be put in, you mentioned that sort of those grassroots efforts. So what are some of the things that people can do to take action to if they want to, you know, reduce some of their reliance on plastics?

L Lara Milligan 24:41

Yeah. And I think that's a really good point. It's kind of I always think of it like tragedy of the commons. It's like, it's so overwhelming, like, what can I really do as an individual to make a difference? And I always say, Well, you can do something right. We can all do something big or small instead of getting to this like, we're just like, this inaction. Like you said, We're just so overwhelmed that we do Don't do anything. So that's what we want to try and avoid. So my involvement with microplastics really started with the Florida microplastics Awareness Project, which is, you can just go to plasticaware.org. And on that site, if you scroll down, there's actually a link to a pledge. And the pledge gives just some really good like low hanging fruit, ideas of things people can do. So one of the things we say is, like I mentioned the personal care product. So we actually have people write on the ingredients list of any personal care product that you have, you know, it tells you it's in there, just like reading a nutrition label on your food. It'll tell you if it contains polyethylene. And so you can, you know, just start, start there, read that, if your product does, then you can write to the company or just vote by not purchasing that product again in the future. And then just anything that's reusable, right, Bring your reusable bags when you go shopping, I like to emphasize people are pretty good if you are doing reusable bags when you go grocery shopping, but like even if you're going to the mall or somewhere else, like it still applies there as well. Like I have one little one that like folds up really small. So I just always kind of have one of those in my purse, plastic drinking straws, that's a pretty easy one you can just avoid like when you if you're going out to order, you just say you know, I'd like water, no straw. Or of course, they have all these, you know, there's stainless steel straws, there's glass straws, paper straws, I see most of the younger generations bringing their own water bottles, I do feel like that's a shift I've seen just in my 10 years in extension is like plastic water bottles or more. And I don't know the research on this, this is just my observation seem to be an older generation thing. And the younger generations are like anti plastic water bottles, which is great, you know, bringing your own coffee cups, anything that's reusable. One that is kind of like maybe the next level if you do some of these other things. This would be like next level is bringing your own container for like a to go container. If you go to a restaurant, there are some collapsible containers that you can bring. I've even asked a local restaurant, could I bring my own containers? Like if I'm going to call new takeout? Can I bring my containers and you put it in there? This one said yes, I don't know if that's against health regulations. But you know, you could ask if it's a little local mom and pop shop. And then, of course recycling anything, we can do it to avoid the production of new plastics, so avoiding it to begin with or reusing what already exists out in the environment. And probably the last one, this is kind of my big what my personal big one that I focus on is choosing natural fibers and materials and the clothing that I wear. And you would be surprised how difficult it is to find 100% I'll just say cotton, because that's a very common natural material. So that I feel like is a pretty good one. If you're like, I'm not going to do the 100% cotton clothing, something you could consider is doing like more thrift store shopping instead of like, creating new

production of these materials is just using what's already out in the environment. So again, kind of this reuse idea. So those are just some low hanging fruit ideas that we list on the pledge. Of course, there's many more, you could bring your own utensils, they have little like bamboo utensil kits, and it's kind of like bring your own everything. And then again, some other little ideas.

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Phillip Stokes 28:19

Yeah, those are wonderful. And yeah, I'm so glad that you mentioned kind of that short list there of some things that people can do that are listening. Yeah, I'm gonna mention something, and we'll see if this makes the final cut. But there's also this kind of overwhelming, or maybe overarching. So sort of social paradigm going on, right? Because a lot of the people that may be taking part in some of these actions, like, yeah, they feel it in their core, that that's something that they should be doing. And then there's also maybe an idea of not wanting to support those things, because maybe the individuals, your you surround yourself, your community thinks there's their negative associations with being green, or you know, those types of things. I don't really know where I'm going with this. But But I think generally, these actions, I mean, they they help everyone, so I don't know, what have you noticed within your community in Pinellas County? You know, of course, we talked about the beginning and extension, you work with people all the time. I mean, what are you hearing in general, just from your constituents and the residents in your area about this?

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Lara Milligan 29:32

Yeah, I can kind of I was relating to what you were saying because one of the things I like to always try to do in my job is, is realize that not everybody lives in my environmental bubble. In fact, the majority of people do not. And that's been really helpful for me like since becoming a mom, I have a new mommy group, most of whom are not environmentally minded people. And so just having conversations with them has been very eye opening for me to realize like this is what the majority of the public thinks or like, literally does not think about at all, which like, they do not think about or care about plastics, the majority of them. But I think that just further emphasizes the point for those of us that do care, the actions that we take can ultimately like impact them, like perhaps a store gets enough push for, like, why are you even offering plastic bags, and perhaps your friend shops at that store. And now like, without them even knowing now, like, Oh, they're kind of forced to bring a reusable bag or just like carry out their materials. So, so it's hard. I mean, we can't necessarily reach everybody directly, but there are ways we can reach them indirectly. And I think another way that we can do that, so I mentioned, like, you're kind of voting by the products that you purchase. So like, I'll give another example. So I like I like Newman's Own spaghetti, okay, that's my go to one day, I'm going down the aisle. And they had switched from a glass jar to a plastic jar. And I was like, ah, like, okay, you've just lost me as a customer. And of course, I'm upset because this is like the one spaghetti sauce that I found that I love. So I write to the company, they give me some answer that I was not satisfied with. But since that time, you know, I'm not saying it was me, but perhaps enough people wrote in that they are now back to glass containers. So I think just, you know, reaching out, like, if you have a minute, like I literally just did this on Facebook, I miss found Newman's Own on Facebook and sent them a message. So I think, you know, we have a lot more accessibility as consumers, there's a lot more to consume as well, which can be overwhelming, but I think asking, definitely never hurts. I even got the University of Florida to offer 100%

Cotton shirts for employees, because most of them were blends and nobody had thought about it. Because, again, microplastics are so new, and in the world of, of research. So just I think speaking up can really lead to some big change that, you know, maybe we might not ever see the impacts, or perhaps we do down the road. And I don't know, if my one message on Facebook made a difference. I don't really know. But somehow it changed. So

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Phillip Stokes 31:58

and I'm what you're saying kind of makes me think back to a previous guest we had on our podcast, but just about like, not understating your impact, or the power that you can or may have, you know, stepping away from, if you feel strongly about something, whatever that whatever you're want to advocate for, whether it's the environment for agriculture, for natural resources issues, whatever. Yeah, don't understate the power of, of groups of individuals to be able to make an impact. Yeah, I think that's a probably a pretty powerful thing to remember. And so I'm glad that you stated that. One thing I was also thinking about with plastics and natural fibers versus synthetic fibers. I don't know there's just kind of this little like, joke conversation going on in my head where someone years ago said, Hey, I need a pair of socks, right? Well, why don't we drill up some oil? Make a synthetic bead, melt it down, turn it into these long fibers, make a sock? And then here you get, you know, like, how did we get to that spot? It's there's a lot of steps that had to get there. And like you said at the beginning, I mean, we there are a lot of things that probably a lot of medical equipment and other things that we rely on. But there are things that we may not have to rely on for plastics.

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Lara Milligan 33:21

Yeah, yeah. And there's been, I mean, since, like, microplastics came to the forefront and especially in like the textile industry. For me, it was so fleece jackets, were kind of one of the number one in terms of clothing that was studied. Because if you think about how they're designed, they're like, We love them because they're soft and cozy. Because the way that they're woven, which is very loosely. And so when we wash those, they shed a lot of these synthetic fibers. So a lot of research was like, Okay, how many fibers are they shedding? And now we're at the point of, okay, like, what can we do to prevent this? So there's tons I mean, this is people's jobs, like literally to, there's a whole textile industry. So they're trying to figure out like, different ways that we can weave so there are less fiber shed, and of course, like alternatives altogether. So it's like, you know, of course, as we have problems, we're always looking for solutions. So, and we wouldn't be looking for these solutions. If we didn't know we had a problem. So there's, you know, some back and forth there. But yeah, we can't really make change, right, unless we know there's a problem or assume, you know, through the precautionary principle that there will be a problem.

P

Phillip Stokes 34:25

Lara is there any, are there any other topics you want? want to mention about microplastics? Anything about effects on on the environment? I know you do a lot in marine environments as well. So just want to open it up to see if there's anything that we didn't touch on?

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L

Lara Milligan 34:44

Not I mean, of course, you know, I can touch on a million things, but I think we kind of hit the high points, you know, and I think to kind of like summarize, as we do know, there's microplastics everywhere. I know we didn't get into the fact that they're in the air but like, right, we're ingesting them where we have direct contact with them. And I think yeah, again, just like stressing, like, we know this is here, we know there's the potential for there to be a problem. So I just encourage people to, you know, take the small steps like just start, I always say, start with one, like, if straws is going to be your thing that that, go for it, get it, go big or go home. But don't, it's very easy to get overwhelmed with, like, all the things that you could do. So I say start with one. And you'll find like, okay, you've mastered that one note, you can do another one. And I think the power of leading by example to like, anytime I do a microplastics talk, I show everybody what's in my purse, which is like, you know, my folded up reusable bag, my reusable utensils, my straw. Like all these things, they probably think I'm psycho, and that's fine. But perhaps I you know, I inspired one person. And that to me, you know that success. So I just encourage people not to focus on the doom and gloom, but like to take whatever small step it is, you know, even if that's sharing what you learned today with somebody else like that, in itself is helpful. So

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Phillip Stokes 35:58

and also, learning more and going to the what the website you mentioned, plasticaware.org, right, the plastic awareness project. To learn more about that

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Lara Milligan 36:09

there's tons of resources out there, of course, to learn about microplastics through NOAA and various other resources. But one of the cool things on the plasticaware.org website is also on the main page. And there's a link to a Google map that shows so the project is focused on citizen science and outreach and education. And the citizen science piece is people going out collecting water sample like locally, and filtering them and analyzing them for the presence of microplastics. So you can literally zoom in to your county, and see if anyone's doing that research. And like if you have it, right there, I think the project is cool, because it localizes the problem, it's easy to think about plastics as a global problem. And therefore, there's inaction because we don't feel like it impacts us. But when we're like, oh, they're finding, you know, 10 pieces of plastic per leader, right on Clearwater Beach. Like I could do something to help that. So that could be helpful for you. And if you see there's no dots on the map in your area, you can reach out there's coordinators all throughout the state. So we can definitely build that build that database and increase awareness that way.

P

Phillip Stokes 37:12

Well, Lara Milligan, thank you so much for being on Science by the Slice and talking today about microplastics. And just the incredible work you do in the community. They're in Pinellas County and throughout the state of Florida. So we're so happy to have you on the podcast today.



Lara Milligan 37:25

Well, thank you so much. I appreciate the opportunity.



Ricky Telg 37:32

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