

Supporting Information to

Microplastics in the environment: much ado about nothing? A debate

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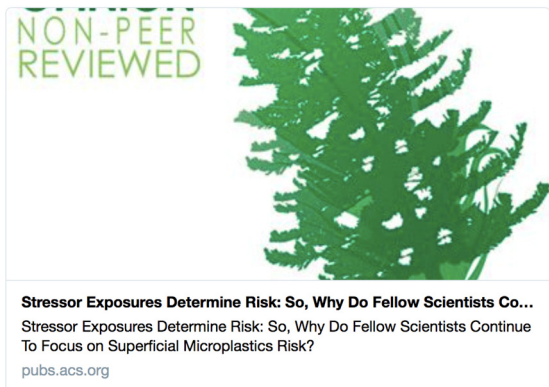
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The following is a word-by-word transcript of our debate on Twitter, conducted on Nov 21, 2017.

**Martin Wagner (@MartiWag)**

Okay, I am also sometimes annoyed by #microplastics hype bc I believe it seriously conflicts with scientific rigour. But the view Allen Burton presents on env. risks in @EnvSciTech is clearly too simplistic.



I/II: In 280 chars: In his piece, Burton  
- assumes low exposure based on studies of very large MP not covering relevant sizes

**Thomas Backhaus (@ThoBaSwe)**

I have to admit that I tend to agree with Allen. Where is his argumentation too simplistic? I certainly might be overlooking something...

## Martin Wagner (@MartiWag)

- assumes no hazard based on handful of tox studies conducted mainly with PS beads

Bottom line: Does risk assessment in absence of required knowledge

Well, he claims no risk throughout the piece. Leaving this aside, #microplastics are just another aspect of #globalchange that we need to look out for. When, where and if there will be risk I cannot even best guess today. Does that mean we should stop investigating? #Idontthinkso

stated in ~500 AD a currently held, toxicological truth: *All things are poisons at the right dose.* My concern that microplastics in marine and freshwater ecosystems aquatic environment are not a risk due to LOW concentrations (i.e., low exposures) is slowly being realized and certainly applies to other contami-

Otherwise, I agree with him that authors, reviewers and editors need to raise the bar, resist the hype and significantly increase quality of [#microplastics](#) research.

## Thomas Backhaus (@ThoBaSwe)

Well, he does not really do a risk assessment. But he argues that we know that there are massive ecosystem-wide risks, which we should study first. Unless we have at least an idea when/how/where MP could actually have env. impacts. Do we have that (honest question)?

That's an interesting question... In a world with sufficient resources for env research: certainly not. In the current situation: maybe we should focus our time, effort and resources on more pressing matters?

The statement that I actually don't agree with, is the notion that we should not bother to limit unnecessary env. exposures, unless we already

## Martin Wagner (@MartiWag)

Indeed, waiting for "final proof" (which does not exist anyway) may be missing the last bus. Plus: Societies and politics have decided to act on [#plasticpollution](#) already. W/o consulting us. May be blow to scientist's ego but we need to accept and work on what they task us with.

No either or here: #plasticpollution and #microplastics are the same. Just different in size. Problem is that we cannot dump #macroplastics on whales in the lab.

And different in numbers (I expect exponentially more nano than micro than macro).

II/II: What I find simplistic is that Burton treats MP as one entity whereas in fact it is a huge group of potential stressors. Furthermore, his view is solely thru ecotox lens, ignoring wider ecological & societal implications of #plasticpollution. We must be more holistic here.

## Thomas Backhaus (@ThoBaSwe)

know they're causing harm (and not a minute earlier). [#precautionaryprinciple](#)

[#plasticpollution](#) is an absolutely critical environmental issue, no doubt. I think we completely agree on that. But are [#microplastics](#) ?

Btw, I hope you're right in your assessment that society and politics actually DO start to act.

But I actually beg to differ. There's clearly proven harm caused by macroplastics to macrofauna. And it's completely reshaping ecosystems (an effect of which we know far too little).

In all fairness, Allen doesn't touch upon the general issue of #plasticpollution Which might be a shortcoming of the paper, indeed. But being holistic would also imply to realize where

**Martin Wagner (@MartiWag)**

**Thomas Backhaus (@ThoBaSwe)**

Sure. Big issues are #consumerism and linear economy. Unfamiliar deckchairs for ecotoxicologist to sit on, I admit. But either we can stay seated or help to redesign...

First, I'm not convinced our discipline has managed to prioritize very well. Second, I believe everybody going after the one ring is not how we should approach #globalchange. Third, this is especially true for #microplastics. Diversification needed. Hampered by funding practice.

At this point: Start determining env. conc. of #microplastics < 300  $\mu\text{m}$  (preferably down to 2  $\mu\text{m}$ , which is technically feasible) and you will find tons.

For which you will burn on a pile of plastic waste, of course. In terms of scepticism I am with you. In terms of closing the case

the big issues are, not re-arranging deckchairs on the Titanic.

Yeah, let's go down into the engine room! But even from an ecotox perspective... perhaps there are more pressing issues to explore?

I'm not saying that #microplastic research is pointless. But more critical distance would sometimes be good.

No, we're lousy at prioritizing. That's basically Allen's point, isn't it? And there are myriads of "rings" out there that need urgent attention... What kind of diversification would you like to see in #microplastic research? Or better: where do you see the critical issues?

...in what volumes of water / sediment? And, even if so, does it matter - or is it just another type of organic particle?

Heretical questions, I know. Sorry...

**Martin Wagner (@MartiWag)**

not. Rather want to know more before moving on to the #nextbigthing.

Absolutely, perverse incentives in academia is something that needs addressing as urgent as #plasticpollution.

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**Thomas Backhaus (@ThoBaSwe)**

Maybe that's what I'm arguing for: let's limit the hunt for the #nextbigthing a bit. Instead let's do more solid, bread-and-butter, middle-of-the-road research instead.

But yeah, that wouldn't sit well with a lot of funding agencies... Unfortunately.

Yepp, I was just about to send a link to that paper also...!