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Microplastics Have Been Found in Air, Water, Food, and Human Blood

Dave Sumitkumar Hasmukhbhai

Department of chemistry, Surendranagar University, Wadhwan city

Dr. Juvansinh Jadeja

Assistant Professor, Department of chemistry, Surendranagar University, Wadhwan city

Abstract:

Microplastics are, as the name suggests, tiny particles of tiny particles found in various places-the oceans, the environment, and now in human blood. Microplastics are tiny bits of various types of plastic found in the environment. The name is used to differentiate them from "Microplastics" such as bottles and bags made of plastic. There is no universal agreement on the size that fits this bill-the U.S. NOAA (National Oceanic and Atmospheric Administration) and the European Chemical Agency define Microplastics as less than 5mm in length. However, for the purposes of this study. Since the authors were interested in measuring the quantities of plastic that can cross the membranes and diffuse into the body via the blood stream, the authors have upper limits on the size of particles as 0.0007 millimetres. The size of the particles that the group looked for was as small as about 700 nanometres. This is really small and it remains to be seen if there is a danger of such particles crossing the blood cell wall and affecting the organs. Also, a larger study needs to be conducted to firm up the present finding.

The study said the Microplastics could have entered the body by many routes: via air, water or food, but also in products such as particular toothpaste, lip glosses and tattoo ink. The tiny

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pieces of mostly invisible plastic have already been found almost everywhere else on Earth, from the deepest oceans to the highest mountains as well as in the air, soil and food chain.

Keywords: Colon hydrotherapy, Contaminating, Environment, Infrared radiation, Microplastics, Polyethylene.

Introduction: -

Small particles may harm over health once they have entered our bodies. Plastic products contain chemical additives. A number of these chemicals have been associated with serious health problems such as hormone –related cancers, infertility and neurodevelopment disorders like ADHD and autism. Generally apples and carrots have highest levels of Microplastics particles. However, Microplastics appeared in other crops such as pears, broccoli, lettuce, potatoes, radishes and turnips. Contaminating in fruit and vegetables is thought to occur when plants suck water and contains Microplastics up through their roots. Microplastics are tiny particles that results from both commercial products development and the breakdown of larger plastic. Microplastics are known to contain endocrine disrupting chemicals which can interfere with the body's hormones and potentially lead to brain, immune and other health problems. Microplastics are of concern because of their widespread presence in the oceans and the potential physical and toxilogical risks they pose to organisms. Microplastics can be ingested by a wide range of animals and have been found in organisms ranging in size from small invertebrates to large mammals. To get the Microplastics out of blood, more needs to be done to remove them permanently from water. A new line of inquiry focuses on using non-toxic chemicals (think plants) to pull Microplastics out of the waterways. Based on these types of studies, researchers have hypothesized that human exposure to Microplastics could lead to oxidative stress, DNA damages and inflammation, among other health problem. Particularly, when inflammation becomes chronic this can pave the way to very serious health problems. There is not much research about how Microplastics affects the body. It is known that larger pieces of plastic are eliminated through fecal matter and that absorption of small pieces is rare. Water can contain other contaminates such as Microplastics, pesticides, fertilizers, industrial chemicals, hormones, medications, heavy metals and neurotoxin micro-organisms which are not removed through boiling water. Some

authors suggest that Microplastics may have toxic effects on the brains, because in vivo studies on animals shave shown that Microplastic can impact neuronal function and behaviour. Plastic could be directly toxic to nerve cells or could impact the gut-brain axis. "There is never been any harm clearly attributable to Microplastics in the body". Given that plastic has been around for over a century, in the human body is hardly a new phenomenon. Microplastics are also present in the air and are present in the air and are inhaled by humans, which may cause deleterious effects on the respiratory system. There is no information whether inhaled microplastics would be incorporated in lung tissue. In this study, we determined the presence of microplastics in human lung tissues.

Methods and materials:

Vibrational spectroscopy, such as Raman of Fourier transform infrared (FTIR) spectroscopy are the most commonly used state of the art analytical methods in Microplastics research, because they enable the precise identification of polymer types, their abundance, shape and size. Microplastics in water were captured on 10 µm filters and nano plastic material digested in the laboratory. Microplastics ≥ 25 were analysed using Fourier transform infrared microscopy. Blanks revealed consist polyethylene (PE). Polyethylene terphthalate (PET) and Polypropyne (PE) contamination. The chemical analysis usually starts with a liquid sample that prepared differently depending on its origin. This sample is filtered onto an IR-transparent substrate and measured in its entirety by FT-IR imaging to capture all particles present on the filter. The chemical image is then analysed automatically with a robust machine learning algorithm. FT-IR microscopy is the most common approach found in Microplastics research. The workflow is super simple, and result provide high precision and, most of all, reliability, especially FT-IR imaging by focal-plane array detectors is the state – of-the-art solution. If you want to know more about our FT-IR instrument set up, take a look at our FT-IR microscope. Infrared (IR) radiation interacts with the Microplastics particles, creating characteristics IR absorption patterns. These patterns are then used to identify the particles. If you want want to catch up on the basics of FT-IR, click here by far the biggest benefit of FT-IR is its exceptional reliability and easy application. Any kind of plastic particles particle (dark coloured, filled, fluorescent…) can be analysed requiring minimal user effort. But when you combine FT-IR with a focal-plane arry (FPA) detectors things get

really interesting. The result is a very powerful imaging tool capable simplifying Microplastics analysis to routine levels, to learn about FT-IR imaging.

It comes down to a fully automated approach than can tolerate a lot of contamination on the filter (e.g. from a sediment) without any negative impact on the measurement results. Ultimately, FT-IR imaging ensures that no particle remains undetected. Providing almost reliability and measurement speed. Traditionally microplastics spectral reference libraries and provide stastastical analysis of size, number and identity. But there is a limit to what such libraries can offer. If you need a very reliable and robust analysis, you must greatly increase the number of spectra within the library, which slows down the analysis considerably. Aluminium oxide filters are the best choice for microplastics analysis. But of course there are other materials available, like silicon, PTEF, or gold coated polycarbonate filters which all have distinct advantages and disadvantages. However, since aluminium oxide filters have become the standard for FT-IR analysis of Microplastics.

Results and discussions: -

To get the Microplastics out of blood, more needs to be done to remove them permanently from water. A new line of inquiry focuses on using non-toxic chemicals (thick plants) to pull Microplastics out of the waterways. Microplastics can block the gastrointestinal tracts of organisms or trick them into thinking they do not need to eat, leading to starvation. Many toxic chemicals can also adhere to the surface of plastic and, if ingested, contaminated Microplastics could expose organisms to high concentrations of toxins.

How to reduce our exposure to Microplastics.

1 Do not drink out of plastic water bottles.

2 When you go grocery shopping, take a reusable cloth bag with you instead of using plastic grocery bags.

3 Watch your seafood intake.

4 Drink loose leaf tea instead of bagged tea.

5 For your babies: Do not heat their bottles in the microwave.

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Microplastics deep in the lungs of living people. Tiny plastic debris – some so small you can not see it-has previously been found in human blood, excrement and in the depth of the ocean. Microplastics cause damage to human cell in the laboratory at the levels known to be eaten by people via their food, a study has found. The harm included cell death and allergic reactions and the research is the first to show this happens at levels relevant to human exposure. Microplastics often contain mixtures of EDCs, which mimic oestrogen. These may be particularly hazardous. Ingestion of Microplastics can cause inflammation and irritation. This may potentially leads to DNA damage and promote cancer.

According to Lusher, the plastic will leave your system after a day since its small and your body tries to get rid of anything that cannot dissolved or used effectively. But, constantly eating plastic or food that is packaged in plastic can leave long-term side effects that you want to avoid. “Rice is a staple food around the world, so it is important we understand the quantity of Microplastics we could be consuming,” Dr. brien said “ our study found we may be consuming three to four milligrams of plastic through a single-serve or 100 grams of rice. Microplastics are ubiquitous in the environment and have been detected in marine water, wastewater, fresh water, food air and drinking water, both bottled and tap water. The average person, eats, drinks and breaths between 78000 and 211000 Microplastics particles every year – and that is considered an underestimate. A reverse osmosis filter has a pore size of approximately 0.0001 micron so its, by far, best way to remove Microplastics (or anything else) from your drinking water due to its ability to completely separate solids from water. Avoid eating frozen pre-packaged meals that you heat in the microwave. Those foods have been in contact with plastic for a long time and heating them up in the plastic release Microplastics into the food. “There has never been and harm clearly attributable to Microplastics in the body”. Given that plastic has been around for over a century, Microplastics in the human body is hardly new phenomenon.

Conclusions: -

Microplastics cause damage to human cells in the laboratory and air pollution particles are already known to enter the body and cause millions of early deaths a year. In general, babies and young children are more vulnerable to chemical and particle exposure. Eat an abundance

of organic cruciferous vegetable. Broccoli and cauliflower are miracle workers to help guard and detoxify from those dangerous chemicals. Colon hydrotherapy, infrared saunas when used correctly, juice cleanses, and castor oil packs applied to the liver can also be useful. In a study published earlier this year in environment international researchers found polymer particles between 700 nm and 500000 nm in 17 out of 200 blood samples from healthy donors. Half of all samples tested positive for PET, 36% contained polymerized styrene, and 23% had polyethylene.

Microplastics can also pose a great risk to some more than others, people who work in construction, or have hobbies involving cutting or fitting plastics, should be particularly careful.

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