Embargoed Press Release

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New global studies show health threats throughout the plastics supply chain

Health and environmental groups call for international action to control plastic chemicals, and the scaling down of plastics production, to curb growing crisis

Link to report: https://ipen.org/ToxicPlasticsinSupplyChain

Plastics pose significant threats to human health and ecosystems throughout their life cycles, according to two new studies by the International Pollutants Elimination Network (IPEN). To get a global picture of the role plastics play in transporting toxic chemicals around the world, IPEN worked with International Pellet Watch (IPW) and its NGO partners in 35 countries to investigate hazardous chemicals and pollutants present in:

- spilled or lost pre-production plastic pellets found on beaches; and
- recycled plastic pellets purchased from recycling facilities.

Both studies reveal the presence of toxic chemical additives and pollutants that pose multiple health threats to humans and the environment. The health effects include causing cancer or changing hormone activity (known as endocrine disruption), which can lead to reproductive, growth, and cognitive impairment. Many of the toxic chemical additives have several other known health impacts, persist in the environment, and bioaccumulate in exposed organisms.

IPEN science and technical advisor, and lead author of the beach pellet study, Dr. Therese Karlsson says: “These new studies further support our recommendation that international action to create more sustainable uses of plastics needs to look beyond waste to address harm and damage related to the toxic chemical additives in plastics.”

International action pending

In February 2022, countries will meet at the United Nations Environment Assembly to discuss a global instrument on plastics, largely focused on waste and marine litter. IPEN says the new studies indicate that plastics present much greater threats, especially to low- and middle-income countries that are not primarily responsible for plastics production or consumption, and do not have the capacity to manage the risks associated with toxic chemicals. These threats need to be dealt with at the international level.

Griffins Ochieng, Executive Director of the Centre for Environmental Justice and Development in Kenya, and Chair of IPEN’s Toxic Plastics Working Group, says: “New global controls are needed to combat plastics *and* the toxic chemicals that are added to them to make them function. This is critical because many communities are affected. In the case of Africa, we are not major chemical or plastic producers, yet we are plagued with the toxic reality of global production, use, and disposal of plastic products and the chemicals they contain. The IPEN studies reveal the reality behind the plastic curtain, as they expose the toxic chemical additives

contained in plastics. There is no information or labeling of plastic products on the shelves in the stores, so there is little people can do to protect themselves."

The results of the recycled pellet study are particularly concerning for plastics recyclers. Report lead author and IPEN science advisor Dr. Sara Brosché says: "The widespread use of toxic chemical additives in plastic products makes a lot of recycled plastic waste an unacceptable raw material for making new products. Continued use of toxic chemical additives in plastics render most plastics in use today 'non-circular', thus excluding plastics from any circular economy."

It is estimated (Wiesinger et al. 2021) that over 10,000 chemicals are present in plastics; around 5,000 of these are chemical additives that contribute to the function of products. Many of these chemicals are toxic, yet only a few are subject to regulatory control. In fact, regulatory information on the safety of many chemical additives is incomplete, and little is known about the risks of exposure to the complex mixtures of toxic pollutants currently being transported in and released from plastic pellets.

The chemicals assessed in the beach pellets study included ten ultraviolet (UV) stabilizers and 13 polychlorinated biphenyls (PCBs). The recycled pellets study assessed 11 flame retardants; bisphenol A; and six UV light stabilizers.

The international community has already taken some steps against plastics, primarily focusing on waste. But IPEN and IPW say all phases of plastics manufacture, transport, use, recycling, and disposal need to be addressed and regulators need to be more aware of the threats to health and ecosystems posed by the thousands of toxic chemical additives used in plastics.

IPEN is calling for an international plastics treaty to:

- Ban the use of toxic chemical additives in plastics, identify essential uses of plastics, scale down all other production and phase out all non-circular plastics;
- Apply extended producer responsibility programs to ensure industry bears the costs of plastics throughout their life cycle;
- Require essential uses of plastics to be designed for durability and reuse;
- Ensure end-of-life treatment of plastics waste does not release toxic chemicals, litter, or contribute to climate change, and ban waste export and incineration; and
- Include funding for implementation and monitoring.

In the meantime, as the chemical and plastic industries do not disclose what is in their products throughout the supply chain, greater transparency on toxic chemical additives used in plastics is needed, along with data on the quantities of plastics made, traded, and disposed of. It should be noted that the studies only reveal some of the toxic chemicals plastics.

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Editors/reporters contact Björn Beeler, **Bjornbeeler@ipen.org,** with questions and to arrange interviews.

IPEN (International Pollutants Elimination Network) is a global environmental network of over 600 public interest NGOs in 128 countries, working to eliminate and reduce the most hazardous substances to forge a toxics-free future for all. IPEN is registered in Sweden as a public interest non-profit organization. www.ipen.org

International Pellet Watch is a nonprofit ecotoxicological research group that monitors persistent organic pollutants (POPs), plastic waste and plastic pellets around the world. Based at Tokyo University of Agriculture and Technology, Laboratory of Organic Geochemistry in Tokyo. http://pelletwatch.org/

Background information

Beach pellet study
The first study found beached pellets at 22 test locations, including sites in Africa, North and South America, Asia, Australia, the Caribbean, and Europe. The samples were analysed by Ms. Mona Alidoust and colleagues at the Tokyo University of Agriculture and Technology, led by Professor Hideshige Takada.

Chemicals assessed included:

- ***UV Stabilizers*** Ten benzotriazole UV (BUV) light stabilizers, which are intentionally added to plastics to prevent degradation by sunlight. Several are regulated in the EU and one, UV-328, is being recommended for a global ban through addition to the Stockholm Convention on Persistent Organic Pollutants (POPs); and
- ***PCBs*** Pollutants known as PCBs (polychlorinated biphenyls), were banned under the Stockholm Convention in 2001, but because of their widespread use, are still found in the environment. IPEN examined the role of beached plastic pellets in absorbing and transporting 13 different PCB compounds in the environment.

The researchers found that all samples from all locations contained all ten BUVs and all 13 PCBs included in the study. Half of the locations had samples with PCB levels that were highly or extremely polluted.

Of the beach pellet study, Professor Hideshige Takada says: “The study demonstrates how the plastics industry causes problems even before products enter the marketplace and reach the consumer. By acting as a vector for toxic chemical additives like BUVs, and existing toxic chemicals, like PCBs, pre-production plastic pellets threaten health and the environment.”

Recycled pellet study
The second study assessed toxic chemical additives in recycled high-density polyethylene (HDPE), which is one of the most used and recycled plastics today. IPEN’s NGO partners bought bags of HDPE pellets from 24 recycling companies in 23 countries (two samples were bought in different cities in India) across Africa, Latin America, Asia, and Europe.

Toxic chemical additives assessed included:

- ***Flame Retardants*** 11 flame retardants, including polybrominated diphenylethers (deca-, octa- and penta-BDE), hexabromocyclododecane (HBCD) and tetrabromobisphenol A (TBBPA), and newer, replacement brominated flame retardants including 1,2-bis(2,4,6-tribromophenoxy)ethane (BTBPE) and octabromo-1,3,3-trimethylphenyl-1-indan (OBIND);
- ***Bisphenol A***; and
- ***UV Light Stabilizers*** Six benzotriazole ultra-violet stabilizers (BUVs), including UV-327, UV-328, and UV-P.
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The samples were analyzed at the University of Chemistry and Technology Prague in the Czech Republic. All of the samples contained at least one type of toxic chemical additive and 21 samples contained additives from each of the three groups tested. Only one sample, from Vietnam, contained just a single type of contaminant. Over half of the samples contained 11 or more of the 18 toxic chemical additives analyzed.