

G Binging on plastics containing bisphenol A

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EDITORIAL

Amid climate change put on steroids by the ever-growing population, the human race has pushed this planet to the brink of a sixth mass extinction. This population growth has posed a range of problems to meet growing needs. One such solution has been the use of plastic bottles and plastic goods that contain bisphenol A (BPA) that can be found in such diverse everyday items as the laptops, CDs, food cans, paper thermal receipts. With nearly 300 million tons of plastics produced annually, this industry generates a revenue of over \$600 billion (1). The industry has been growing for over 60 years. Biggest surge in plastics production was recorded in the 70s as this new low-cost and disposable material began to replace more expensive materials such as glass and metal. Most plastics are non-biodegradable and those that are biodegradable require a long time in nature before they can be degraded. However, Daniel Burd, a student at Waterloo Collegiate Institute has shown that some bacteria can break down the biodegradable plastics within 3 months (2). Manufacturing of plastic bottles requires BPA to make the bottle shatter-proof. Highest exposure to BPA has been recorded from the ink used on thermal check-out receipts (3). Canadian Health Ministry in 2008 announced a ban on BPA and thus became the first country to realize the health hazards posed by this compound (4).

BPA was originally used as a synthetic estrogen in 1930s (5) but was soon replaced by diethylstilbesterol. The affinity of estrogen receptor, in humans, for BPA is about 1000 times less than estrogen, hence only high doses of BPA were previously thought to be toxic for human consumption (6). But recent research indicates that even low doses can pose a serious threat especially for pregnant women, fetus and infants (7).

As 80% of oceanic debris comprises plastics, marine life is under a direct threat (8). Besides direct human exposure, 11000 microscopic pieces of plastic containing BPA can enter into human food chain through the consumption of shellfish (9). The most alarming association developing between BPA exposure and human health is breast cancer and tumor progression (10).

Based on the available research there is sufficient reason to believe that BPA has serious health hazards while BPA-free plastics have also been demonstrated to pose similar health risks for humans (11). It is therefore important that manufacturing and consumption of BPA and BPA containing plastics be curtailed and at best phased-out over a period of few years. The \$600 billion plastic industry provides thousands of jobs and therefore using the existing industrial set up, biodegradable plastics should gradually phase

out the existing non-biodegradable and BPA containing plastics. Although stern resistance will be offered by many stake holders, but a smooth transition can be negotiated once an alternative is offered without affecting jobs and revenues (12).

REFERENCES

1. Plastics Europe. European House–Ambrosetti. op. cit. note 1-7.
2. <http://www.aeromental.net/2010/01/06/daniel-burd-16-year-old-canadian-student-isolates-bacteria-that-degrades-plastic-bags/>
3. Biedermann S, Tschudin P, Grob K Transfer of bisphenol A from thermal printer paper to the skin. *Anal Bioanal Chem.* 2010;398:571-6.
4. <http://www.reuters.com/article/us-bpa-idUSTRE69D4MT20101014>
5. Dodds EC, Lawson W Synthetic estrogenic agents without phenanthrene nucleus. *Nature.* 1936;137:996-7.
6. Gould JC, Leonard LS, Maness SC, et al. Bisphenol A interacts with the estrogen receptor alpha in a distinct manner from estradiol. *Mol Cell Endocrinol.* 1998;142:203-14.
7. Schonfelder G, Wittfoht W, Hopp H, et al. Parent bisphenol A accumulation in the human maternal-fetal-placental unit. *Environ Health Perspect.* 2002;110:703-7.
8. Michelle A, Adam W, David S, et al. Plastic Debris in the World's Oceans. Greenpeace Accessed 2006;Aug 2, 2107.
9. Van Cauwenberghe L, Janssen C Microplastics in bivalves cultured for human consumption. *Environmental Pollution.* 2014;193: 65-70.
10. Arunoday B, Imran H, Khairul IA, et al. Bisphenol-A and diethylstilbestrol exposure induces the expression of breast cancer associated long 2014.
11. Bhan A, Hussain I, Ansari KI, et al. Bisphenol-A and diethylstilbestrol exposure induces the expression of breast cancer associated long noncoding RNA HOTAIR in vitro and in vivo. *The Journal of Steroid Biochemistry and Molecular Biology.* 2014;141: 60.
12. Fic A, Žegura B, Dolenc MS, et al. Mutagenicity and DNA Damage of Bisphenol A and its Structural Analogues in Hepg2 Cells. *Arh Hig Rada Toksikol.* 2013;64:189-200.

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