



## Carcinogenic effects of plastic particulates in the air, water and food articles: A brief review article

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### Abstract

In today's fast paced world, due to time crunch people are using packaged readymade food and water on a scale never seen before. Most of the packed food material, water and other beverages are served or sealed in plastic containers, plastic dissolves in miniscule quantities over a long period of time, which can lead to carcinogenic effects like respiratory, gastric tumours etc. Various short term and long-term research works are being done on this alarming condition. This article tries to throw some light on this Global health phenomena. The American Cancer Society estimates that 6% of cancers are related to environmental causes (<https://www.polymersolutions.com>).

**Key words:** Plastic container, readymade food, Particulate matter, Miniscule quantities, carcinogenic effects, packed food.

### Introduction

Cancer as we all know is a condition of unchecked growth of cells leading to pathological conditions. Cancer is of various types like carcinoma of epithelial cells, sarcoma of mesothelioma cells, etc. It is generally caused by genetic mutations triggered by various genetic and environmental factors like genetic aberrations, electromagnetic waves like X- Ray, chemical irritants and other environmental factors, innumerable other substances have been linked to be causative factor for cancer (Paul *et al.*, 2001). The American Cancer Society estimates that 6% of cancers are related to environmental causes (<https://www.polymersolutions.com>).

Plastic thought to be inert in past, was being used in almost every packaging format like packaged drinking bottles, packaging food articles, packaging of various transport materials. Till date we only knew that plastic is non-biodegradable and the waste materials stay in soil or water for decades or centuries causing soil pollution, water pollution and also leading to choking of water bodies and deaths of various animals due to ingestion of plastic leading to choking of intestine, but now a new Global phenomenon is being discovered where

plastic micro particulates are being found in dissolved or suspended in air, water and food, leading to air, water and soil pollution on an unprecedented scale never understood before. This previously unknown phenomenon is being researched all over the world at various places and latest Laboratories. The short-term effects are being seen now but the long-term manifestations can only be seen after a certain period of time. This issue is related to cancer, which can be controlled mostly by medication. Since allopathic medication has various grave side-effects and even if the patient survives the life and physical condition is unbearable, so in future role of Ayurvedic medication will be highly significant in management of others and also in cancer caused by plastic, therefore this article is being written with a view to understand the basics of Cancer caused by plastic and try to address the various treatment protocols which can be used for the treatment of cancer cause by plastic with least side effect.

The principles of food collection, food processing, food storage, till it finally consumed by the human have been elaborately discussed in *Ayurveda* under the concept of Ashta-Aahar-vidhi-visheshayatana (Agnivesha, Charaka Dridhabala, Charaka Samhita, Vimana Sthana 1/21; 2005.) (Prakriti, Karana, Samyoga, Rashi, Desa, Kala, Upayoga, Samstha, Upayokta). Acharya Sushutra (Sushrut Samhita of

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Maharshi Sushrut, Sutra sthana, 46/464 2012) has clearly emphasized the food storage equipments and their material. Patra samyoga is one of the important steps and improper storage in unsuitable utensils may lead to multiple complications as witnessed by our acharyas as Viruddha ahaar janit vikara (Agnivesha, Charaka Dridhabala, Charaka Samhita, Sutra Sthana 26/81; 2005).

### Preventions

(<https://www.treehugger.com>green- home.>)

Since this new type of cancer is being caused by plastic microparticulates, this disease can be prevented to a large extent by avoiding plastic contacts in articles related to water storage, food storage and packing material.

1. Bring your own shopping bags made of cloth or carton/ hard paper.
2. Stop buying bottled water, water storage bottles should be replaced by glass bottles, pottery utensile or steel, copper, aluminium containers etc. Always try to carry your water in thermos.
3. Bring your own thermos to coffee shop.
4. Choose card board over plastic bottle and bags.
5. Say “ No straws please”.
6. Never buy food stored in plastic containers. Get plastic off your face.
7. Skip the disposable razor.
8. Switch from disposable diapers to cloth.
9. Make your period waste free.
10. Rethink your food storage .
11. Shop in bulk.

### Discussion

The manufacture, use and disposal of various plastics pose numerous health risk of cancer. Any food and beverages, mostly the spicy acidic food materials when stored over a long period of time leads to dissolution of plastic microparticles in food, even plastic packaging of substances leads to plastic microparticles being ejected into air and remain as suspended particulate matter, thus drinking, eating or inhaling leads to plastic microparticles reaching our body and may cause cancer. Now, we discuss the case of plastic packaged water bottles which has a very low TDS (Total Dissolved Solute), normal potable water should have TDS range of 350 to 900. Due to reverse osmosis and other treatments, TDS of the so

called mineral water comes below 100, water of TDS below 100 is highly acidic but sweet in taste thus preferred by the population. This highly acidic water when stored over a long period of time leads to dissolution of plastic in water which may lead to various cancers (<https://www.treehugger.com>green- home.>)

### Conclusions

Any type of cancer is generally caused by a trigger factor, in this case plastic microparticulates, being dissolved in water, food and inhaled through air. Carcinogens do not always cause cancer, it depends on length and type of exposure and the personal genetic makeup (<https://db>ideos.in.>). Prevention being the first modality of treatment in every disease, but in the event of cancer already occurred, Ayurveda and other modes of treatment should be adapted to deal well in advance with the vast number of cases which will come in future. Since Ayurveda is the safest modality of treatment, Ayurvedic research and treatment options should be developed from now on as Allopathy has Grave side effects. A detailed understanding of the molecular biology of carcinogenetic agent has provided new ways of studying the molecular epidemiology of carcinogenetic agent in exposed humans, which in turn have provided the basis for new approaches to the prevention and treatment of carcinogenetic agent related cancer.

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