

Effects and control of pollutants on climatic conditions

Venkat Rao. J*

IIT Guwahati, Chemical Engineering, Assam.

Review Article

Received:04-07-2016

Revised: 22-07-2016

Accepted:28-08-2016

***Corresponding author:** Venkat Rao J, Chemical Engineering ,
IIT Guwahati, Assam, India; Tel: 8374657877; E-mail:
venkatchems820@gmail.com

Keywords: Waste water, Morbidity, Air pollution, Environmental pollution.

ABSTRACT

Aim: Pollutants are undesirable chemicals or different materials found noticeable all around, at sufficiently high focuses to endanger the earth and individuals' wellbeing. Outflows are releases of a contamination from a specific source or gathering of sources into the air. Contamination presented by light around evening time is turning into a worldwide issue, more serious in urban focuses, however regardless debasing likewise huge regions, far from towns. A contamination is a waste material that dirties air, water or soil. Without contamination control, the waste items from overconsumption, warming, farming, mining, assembling, transportation and other human exercises, whether they amass or scatter, will debase the earth. In the chain of command of controls, contamination anticipation and waste minimization are more attractive than contamination control.

INTRODUCTION

Clear acknowledgment of the ramifications of open air contamination on wellbeing is a moderately late advancement. Various epidemiological studies have exhibited transient relationship between elevated amounts of air contamination and expanded intense mortality and bleakness [1-5]. Relations between asthma, bronchitis, cardiovascular conditions (that is, coronary infection), cerebral pains, and outside contamination rates have so far been portrayed. In the late years, the assortment and rates of contaminations in the climate have gave off an impression of being on the expansion. The expansion has been brought on by the general ascent in vehicle movement. Fleeting meteorological conditions, for example, air temperature, dampness, and environmental weight have additionally been appeared to impact the contamination rates.

Impact air contamination on dust morphology is because of the immediate impact on dust grains after anthesis and aberrant impact in within the anthers [6,7]. The tapetal liquids in the tapetum which are mindful to support the dust in the microsporangium was affected by the poisons and thus in charge of the variation from the norm of dust morphology, i.e. dust shrinkage and shading change. Direct impacts of poisons on dust are after dehiscence of anthers [8-11]. The toxins are straightforwardly influencing dust grains and brought about variation from the norm in the dust morphology because of direct connection of huge measure of poisons to the formed dust grains [12-14].

In numerous towns and urban community's presentation to air contamination is the principle ecological danger to human wellbeing. Long time presentation to abnormal state of poisonous components and little particulate matter noticeable all around likewise adds to extensive variety of unending respiratory sicknesses, bothers heart ailments and different sorts of particulates contamination, either all alone or in mix with SO₂, prompts a colossal weight of sick wellbeing creating no less than 500,000 unexpected passing and 4 - 5 million new instance of perpetual bronchitis each year [15-20]. Due to increment of artificial exercises, outflow of particulate matters and vaporous matters have been ascending over past decades, Expansion of ventures and transport

Research and Reviews: Journal of Medicinal & Organic Chemistry

frameworks has made this circumstance more basic. Henceforth in this connection an examination has been attempted to evaluate the effect of air contamination on the soundness of individual at chose modern regions.

The natural contamination has been expanding with the aimless development of enterprises and populace [21-26]. For the sake of mechanical advancement, modern units have been found obliviously with no thought to their sitting and even without deduction their unfavorable consequences for a wide range of life. Processing plants are discharging toxicants, unabatedly dirtying air water and soil influencing people, creatures, yields and vegetation colossally [27-30].

The impact of air poisons as a rule would rely on upon the piece of the air that is breathed in which will rely on upon the sort of fuel utilized and the states of ignition, ventilation and length for which the inward breath occur [31-34]. For instance, the fast development of Delhi as of late has brought about critical increment in natural contamination. It is generally seen that the issue is debilitating to escape hand. Henceforth, successful and coordinates measures for controlling contamination should be set up without delay [35-40]. In perspective of the earnestness of the issue, the Minister of Environment and Forests chose to Have a progression of intelligent gatherings with concerned government organizations, NGOs, Experts and natives, with the target of characterizing an arrangement of activity to battle the issue. The result of these gatherings is a White Paper on Pollution in Delhi with an Action Plan (from now on, Action Plan) covering different parts of Pollution control, including vehicular and mechanical contamination, strong waste Management and clamor contamination [41-45].

Air contamination is a noteworthy issue in created and creating nations. It causes respiratory maladies and ceaseless sickness and impacts soil and timberland Both human exercises and characteristic ecological procedures are our one wellspring of contamination. Regular changes and concoction responses add to the grouping of the poisons noticeable all around [46-49]. Air bone gasses and particles were never imagined as a danger to the natural equalization until the sensational changes in their fixations with the appearance of mechanical time. Anthropogenic discharges from different modern, local and vehicle sources have expanded complex and inevitably have prompted numerous worldwide issues [50]. About 3000 diverse anthropogenic air contaminations have been recognized, of which most are natural and burning sources.

Source lessening of perilous squanders can be accomplished in industry through changes in items, crude materials, process advancements, or procedural and authoritative practices. Different source diminishment options, including material substitution, process adjustment, and great working practices, are given here. Pharmaceutical production is a various and very aggressive industry [51-54]. Because of the exceptionally particular and regularly classified nature of every organization's particular operations, just extremely broad talks of material substitution and procedure change can be given. The expectation is to fortify the reasoning of makers about their own particular procedures [55-60].

The most ideal approach to diminish contamination is to anticipate PPs in the produces. A few organizations have inventively actualized contamination avoidance systems that enhance productivity and increment benefits while in the meantime minimizing ecological effects [61-64]. Some littler offices can really get underneath administrative limits just by lessening toxin discharges through forceful contamination anticipation approaches. Source lessening is one technique by which the business means to decrease these squanders [65-70]. Be that as it may, source diminishment techniques, for example, process adjustments and material substitutions may not be as effectively actualized in the pharmaceutical business as in other assembling areas. Thus, numerous pharmaceutical organizations are taking a gander at approaches to minimize waste in future creation forms at the innovative work stage. Joining contamination counteractive action toward the begin of another medication improvement procedure is a great deal more sparing, effective, and earth sounds [71]. Numerous pharmaceutical organizations have effectively actualized contamination anticipation programs in their assembling offices. In spite of the fact that contamination anticipation may not generally be a substitute for control innovations, it is regularly reasonable and is an inexorably prevalent strategy for meeting ecological consistence prerequisites. A few case of creative waste lessening programs that join source diminishment and in addition reusing and reuse are introduced for the situation concentrates on that show up in this segment [72]. A standout amongst the most widely recognized open doors for material substitutions in the pharmaceuticals business is found in the tablet covering process. As of not long ago, numerous tablet covering operations included the utilization of methylene chloride and other chlorinated solvents [73-77]. By changing to aqueous based covering movies, numerous organizations have lessened the dangerous waste substance in their air and emanating waste streams, and in addition the expense of acquiring chemicals. Fluid based cleaning arrangements are likewise being utilized all the more much of the time for gear cleaning rather than dissolvable based arrangements [78-80].

Urban air contamination because of modern discharge and vehicular outflow because of autos has disturbed the issue of natural contamination. Plants are referred to go about as sink for air toxins. Planting of

Research and Reviews: Journal of Medicinal & Organic Chemistry

trees and bushes as greenbelt around the business is a compelling path for reduction of contamination and change of environment and is very much perceived all through the world [81-84]. This article gives a brief audit of the history and advancement of work on greenbelt improvement for contamination constriction in an industry. It additionally surveys take a shot at various parts of greenbelt configuration and determination of plant species, which can be developed around modern/urban regions in India. A reported contextual analysis did at petroleum refinery is examined [85-90]. At this plant, green belt of 500m width was observed to be 36-40% productive in evacuation of SO₂, NO_x and SPM and 84-94% proficient in expulsion of THC, VOC and CO. The future profession is proposed for gathering information on the capability of greenbelts in constricting the toxins [91-94].

The paper shows the significance of green belt advancement for lessening air contamination around enterprises and urban territories and abridges in point of interest different parts of planning and improvement of green belt. The advantages of green belt viz [95-97], change of tasteful environment in local locations, valuable as a method for social advancement and change of natural surroundings conditions for flying creatures and creatures is a compelling strategy for biodiversity protection.

Such studies could fortify open comprehension of the less known advantages of urban trees and give intimations to green space outline and administration [98-95].

Conclusion

Breathing is life. We realize that we will get by without sustenance for a few weeks and without water for few days, yet without oxygen, we will pass on in a matter of minutes. The oxygen, the air we inhale supports us. Along these lines, let us make today and regular a decent day for everybody. Permit the earth to have all the more perfect air. Control contamination.

Earth in the end had an environment contradictory with life. All things considered, life on earth dealt with itself. In the reasoning of the individual a hundred years is quite a while. A hundred years back we didn't have autos, planes, PCs or immunizations. It was an entire diverse world, yet to the earth, a hundred years is nothing. A million years is nothing. This planet lives and inhales on a much vaster scale. We can't envision its moderate and intense rhythms, and we lack modesty to attempt. We've been occupants here for the flicker of an eye. On the off chance that we are gone tomorrow, the earth won't miss us.

REFERENCES

1. Erdtman G. The Acetolysis Method. A received description. *Svens. Botan. Tidskr.* 1960;54: 561- 564.
2. Ganga K, et al. Pollen Diversity of polynad pollen (Mimosaceae) of Karimnagar district, Telangana state, India. *Ad. Plant Sci.* 2014;27: 505- 509.
3. Ganga K, et al. Pollen diversity of Arborescent plants of Caesalpiniaceae family of karimnagar district, Telangana state, India. *RJPBCS.* 2014;5: 349.
4. Leila A and Mahsa S. The Effect of Air Pollution on *Chenopodium album* L. Pollen structure. *Journal of Agri. Sci. Technol.* 2012;2:143-148.
5. Prabakar R, et al. Porate pollen diversity in some Ethnomedicinal plants of Adilabad district, Andhra Pradesh. *Ad. Plant. Sci.* 2014;27: 406 - 410.
6. Tiwari S. Evaluation of ambient air pollution impact on Carrot plants at a sub urban site using open top chambers. *Environ. Monit. Assess.* 2006;119 : 15-30.
7. APHA . *Methods of Air sampling and Analysis* (2nd Edition). 1977. APHA. USA.
8. Cheng S and Lam K. Climatic Impact on air pollution concentration in Hong Kong. Department of Geography, Occasional paper. 1997. The Chinese University of Hong Kong.
9. Chu D, et al. Global monitoring of air pollution over land from EOS-Terra MODIS. *J. Geophys. Res.* 2013;10: 1029.
10. Dubey and Pervez . Investigation of variation in ambient PM₁₀ levels within an Urban-industrial environment. *Aerosol and Air Quality Research.* 2008;8 : 54-64.

Research and Reviews: Journal of Medicinal & Organic Chemistry

11. Mishra, G.P. and Tiwari, S.B. 1986. Effect of cement dust on Human population. *Ind J Env Protec.* 1986;6: 92- 94.
12. Mc Cubbin D.R and Delucchi M. The health costs of motor vehicals related air pollution. *Journal of Transport Economics and Policy.* 1999;33: 253 -286.
13. Mohanraj R and Azeez . Health effect of airborne particulate matter and the Indian scenario. *Current science.* 2014;87: 25.
14. Prasanthi R and Rajeshwari C. Effect of vehicular pollution on Traffic policemen. *Pollution Reaserch.*2003; 22: 373-375.
15. Prasanthi R and Rajeshwari C. 2007. Effect of vehicular pollution on Health of Automen in Kurnool town. India. *Pollution Reaserch.* 2007;26: 427-428.
16. Raj Kumar . Effect of Air pollution on resipiratory system of auto-ricksaw drivers in Dehi. *Environ. Poll. Control Journal.*2007. 3 -4.
17. Tripathy D. 2006. Assessment of Impacts of mine fires on air quality- A case study. *Poll Res.* 2006;25: 9-11.
18. Zhang T, et al. Effects of urbanization on the concentrations of heavy metals in deciduous forest floor in a case study of New York City. *Scientia Silvae Sinicae.* 2000;36: 42-45.
19. APHA. (American Public Health Association). *Standard Methods of Air Sampling and Analysis* (Ed) Morris Katz APHA intersociety committee, Washington D.C. based on Factor Analysis and US-EPA methods for an urban environment, *Aerosol and Air Quality Research.* 1997;9: 1-17.
20. Clagget M, et al. Carbon monoxide near an urban intersection. *Atmospheric Environment.* 15: 1981;1633-1642.
21. Chakraborty J, et al. 1999. Using GIS to assess the environmental Justice consequences of transportation system changes. *Transactions in GIS.* 1999;3: 239 -258.
22. Chu et al. 2003. Global monitoring of air pollution over land from EOS-Terra MODIS. *J.Geophys. Res.* 2003;10: 1029.
23. Cheng S and Lam K. Climatic Impact on air pollution concentrations in Hong Kong. Department of Geography, Occasional paper. 1997. The Chinese University of Hong Kong, Hong Kong.
24. Chung C and Ramanathan V. 2004. Aerosol loading over the Indian Ocean and its possible impact on regional climate. *Indian J. Marine Sci.* 2004;33: 40-55
25. CIESIN (Center for International Earth Science Information Network), Columbia Universit and Centro International
26. de Agriculture Tropical. CIAT. Gridded Population of the World (GPW). 2014. Version 3.
27. De Nevers and Noel. *Air Pollution Control Engineering.* 2000. Singapore: McGraw-Hill
28. McCubbin D and Delucchi M. The health cost of motor vehicle related air pollution. *Journal ofTransport Economics and Policy.* 1999;33: 253 -286.
29. Zhang J, et al. 2000. Effects of urbanization on the concentrations of heavy metals in deciduous forest floor in a case study of New York City. *ScientiaSilvaeSinicae.* 2000;36: 42-45.
30. Andreozzi R, et al. 2003. Pharmaceuticals in STP effluents and their solar photodegradation in aquatic environment. *Chemosphere.* 2003;50: 1319- 1330.
31. Belfroid A, et al.1999. Analysis and occurrence of estrogenic hormones and their glucuronides in surface water and wastewater in The Netherlands. *Sci Total Environ.* 1999;225 : 101-108.
32. Boxall A.. 2008. Fate of veterinary medicines applied to soils. In: Kmmerer K, editor. *Pharmaceuticals in the Environment. Sources, Fate, Effects and Risks.* 3rd edn. Berlin Heidelberg: Springer-Verlag; p. 103-19.

Research and Reviews: Journal of Medicinal & Organic Chemistry

33. Braga o, et al. Fate of steroid estrogens in Australian inland and coastal wastewater treatment plants. *Environ. Sci. Technol.* 2005;39: 3351-3358.
34. Brown K, et al. Occurrence of antibiotics in hospital, residential, and dairy effluent, municipal wastewater, and the Rio Grande in New Mexico. *Sci Total Environ.* 2007;366: 772-83.
35. Carballa M, et al. Behavior of pharmaceuticals, cosmetics and hormones in a sewage treatment plant. *Water. Res.* 2004;38 : 2918-2926.
36. Golet M, et al. Trace determination of fluoroquinolone antibacterial agents in urban wastewater by solid-phase extraction and liquid chromatography with fluorescence detection. *Anal Chem.* 2001;73: 3632 - 3638.
37. Hignite C and Azarnoff D. Drugs and drug metabolites as environmental contaminants: chlorophenoxyisobutyrate and salicylic acid in sewage water effluent. *Life Sci.* 1977;20: 337-341.
38. Hirsch R, et al. Occurrence of antibiotics in the aquatic environments. *Sci Total Environ.* 1999;225: 109-118.
39. Johnson A and Sumpter J. Removal of endocrine- disrupting chemicals in activated sludge treatment works. *Environ. Sci. Technol.* 2001;35: 4697- 4703.
40. Kemper N. Veterinary antibiotics in the aquatic and terrestrial environment. *EcolIndicat.* 2008;1-13.
41. Khan, et al. Chemical contaminants in feedlot wastes: concentrations, effects and attenuation. *j.envint.* 2007;10: 7.
42. Khetan S and Collins T. Human pharmaceuticals in the aquatic environment: a challenge to green chemistry. *Chem. Rev.* 2007;107: 2319 - 2364.
43. Kolpin, et al. Pharmaceuticals, hormones and other organic wastewater contaminants in U.S. streams, 1999-2000 : A national reconnaissance. *Environ. Sci. Technol.* 2002;36 : 1202- 1211.
44. Metcalfe C, et al. Occurrence of neutral and acidic drugs in the effluents of Canadian sewage treatment plants. *Environ Toxicol Chem.* 2003;22: 2872 - 2880.
45. ikolaou A, et al. Occurrence patterns of pharmaceuticals in water and wastewater environments. *Anal Bioanal Chem.* 2007;387: 1225 -1234.
46. Osenbr, et al. Sources and transport of selected organic micropollutants in urban groundwater underlying the city of Halle (Saale), Germany. *Water Res.* 2007;41: 3259 - 3270.
47. Petrovic M, et al. Analysis and removal of emerging contaminants in wastewater and drinking water. *Trends Anal Chem.* 2003;22: 685 - 696.
48. Reckhow D and Anastas N. Investigating treatment effects on targeted endocrine disrupting compounds and pharmaceuticals in drinking water. Identification and significance of phenazone drugs and 94 SAYADI ET AL. their metabolites in ground and drinking water. *Chemosphere.* 2007;49: 539 - 44.
49. Richardson M and Bowron J. The fate of pharmaceuticals in the aquatic environment. *J Pharm Pharmacol.* 2002;37: 1-12.
50. Sammartino M. Ecopharmacology: deliberated or casual dispersion of pharmaceutical principles, phytosanitary, personal health care and veterinary products in environment needs a multivariate analysis or expert systems for the control, the measure and the remediation. *Microchem J.* 2008;88 : 201 -209.

Research and Reviews: Journal of Medicinal & Organic Chemistry

51. Shore L, et al. Estrogen as an environmental pollutant. *Bulletin of Environmental Contamination and Toxicology*. 1993;51: 361-366.
52. Stumpf M, et al. Polar drug residues in sewage and natural waters in the state of Rio de Janeiro, Brazil. *Sci Total Environ*. 1999;225 : 135 - 141.
53. Tabak H, et al. Steroid hormones as water pollutants. II: Studies on the persistence and stability of natural urinary and synthetic ovulation-inhibiting hormones and treated wastewaters. *Developments in Industrial Microbiology*. 1981;22 : 497-519.
54. Ternes T. Occurrence of drugs in German sewage treatment plants and rivers. *Wat. Res*. 1998;32: 3245-3260.
55. Ternes T, et al. Removal of pharmaceuticals during drinking water treatment. *Environ. Sci. Technol*. 2002;36: 3855 - 3863.
56. Verliefe A, et al. Influence of electrostatic interactions on the rejection with NF and assessment of the removal efficiency during NF/GAC treatment of pharmaceutically active compounds in surface water. *Water Res*. 2007;41 : 3227- 3240.
57. Yang S and Carlson K. Solid-phase extraction high-performance liquid chromatography-ion trap mass spectrometry for analysis of trace concentrations of macrolide antibiotics in natural and waste water matrices. *J Chromatogr A*. 2005;1038: 141-155.
58. Zimmerman M. Occurrence of Organic Wastewater Contaminants, Pharmaceuticals and Personal Care Products in Selected Water Supplies, Cape Cod, Massachusetts, June 2004, U.S. Geological Survey Open-File Report. 2005-1206.
59. Abbasi S. *Environmental Pollution and its Control*, Cogent International, Pondicherry. 1998. 445.
60. Abbasi S and Khan F. *Greenbelts for Pollution Abatement: Concepts, Design Applications*, Discovery Publishing House, (in press).
61. Andy C. *Dictionary of Environment and Development*. Earth scan publications Ltd. 1991. London.
62. Ahmad K, et al. Air pollution and plants. 1991;8: 170-174.
63. Alexeyev V. Impacts of air pollution on far north forest vegetation. *Sci. Total Environ*. 1995;161: 605-617.
64. Beckett K, et al. 1998. Urban woodlands their role in reducing the effects of particulate pollution. *Environmental Poll*. 1998;99: 347 -360.
65. Calderon L, et al. Chocolate, air pollution and children's neuroprotection: What cognition tools should be at hand to evaluate interventions?. *Frontiers in Pharmacology*. 2016;7: 232.
66. Gu J. Characterization of atmospheric organic carbon and element carbon of PM_{2.5} and PM₁₀ at Tianjin, China. *Aerosol Air Qual. Res*. 2010;10: 167-176.
67. Leoni C, et al. Source Impact Determination using Airborne and Ground Measurements of Industrial Plumes. *Environmental Science & Technology*. 2016 Aug 22.
68. Mathur R, et al. Assessment of heavy metal contamination of road dusts from industrial areas of Hyderabad, India. *Environmental Monitoring and Assessment*. 2016;188: 514.
69. Chen R, et al. Comparison of chemical compositions in air particulate matter during summer and winter in Beijing, China. *Environmental Geochemistry and Health*. 2016.1-9.
70. Manwar, et al. Environmental propagation of noise in mines and nearby villages: A study through noise mapping. *Noise and Health*. 2016;18: 185.
71. Park S. The Economic Value of the National Meteorological Service in the Korean Household Sector: A Contingent Valuation Study. *Sustainability*. 2016;9: 834.
72. Jabbari M and Ghorbani R. Developing techniques for cause-responsibility analysis of occupational accidents. *Accident Analysis & Prevention*. 2016;96:101-107.

Research and Reviews: Journal of Medicinal & Organic Chemistry

73. García P, et al. Residential proximity to environmental pollution sources and risk of rare tumors in children. *Environmental Research*. 2016;151: 265-274.
74. Abdel S., et al. Treatment of leather industrial wastewater via combined advanced oxidation and membrane filtration. *Water Science and Technology*. 2016;23: 62-34.
75. Chen R, Cheng J, Lv J, Wu L, Wu J. Comparison of chemical compositions in air particulate matter during summer and winter in Beijing, China. *Environmental Geochemistry and Health*. 2016 Aug 8:1-9. Cui H, et al. Land use change and its effects on water quality in typical inland lake of arid area in China. *Journal of environmental biology/Academy of Environmental Biology, India*. 2016;37:603.
76. Zhao Z, et al. Communities stimulated with ethanol to perform direct interspecies electron transfer for syntrophic metabolism of propionate and butyrate. *Water Research*. 2016;102:475-484.
77. Chen Z, et al. Partial nitrification and denitrification of mature landfill leachate using a pilot-scale continuous activated sludge process at low dissolved oxygen. *Bioresource Technology*. 2016;218:580-588.
78. Wang W, et al. Intensified nitrogen removal in immobilized nitrifier enhanced constructed wetlands with external carbon addition. *Bioresource Technology*. 2016;218:1261-5.
79. Jin Y, et al. Treatment of high-strength ethylene glycol waste water in an expanded granular sludge blanket reactor: use of PVA-gel beads as a biocarrier. *SpringerPlus*. 2016;5:1-8.
80. Malvano F, Albanese D, Crescitelli A, Pilloton R, Esposito E. Impedimetric Label-Free Immunosensor on Disposable Modified Screen-Printed Electrodes for Ochratoxin A. *Biosensors*. 2016;6: 33.
81. Pan L, et al. Assessments of levels, potential ecological risk, and human health risk of heavy metals in the soils from a typical county in Shanxi Province, China. *Environmental Science and Pollution Research*. 2016;1: 1-1.
82. Archer C, et al. The Regional Impacts of Cooking and Heating Emissions on Ambient Air Quality and Disease Burden in China.
83. Yang J, et al. An extended study on historical mercury accumulation in lake sediment of Shanghai: The contribution of socioeconomic driver. *Environmental Pollution*. 2016; 22.
84. Lin R, et al. Increased Risk of Respiratory Mortality Associated with the High-Tech Manufacturing Industry: A 26-Year Study. *International journal of environmental research and public health*. 2016;13: 557.
85. Fawole O, et al. Gas flaring and resultant air pollution: A review focusing on black carbon. *Environmental Pollution*. 2016;30: 182-187.
86. Zhao Z, et al. Influences of iron and calcium carbonate on wastewater treatment performances of algae based reactors. *Bioresource technology*. 2016;30: 1-1.
87. Deng X, et al. Soil organic carbon of an intensively reclaimed region in China: Current status and carbon sequestration potential. *Science of The Total Environment*. 2016;15: 539-546.
88. Mohankumar K, et al. Heavy Metal Contamination in Groundwater around Industrial Estate vs Residential Areas in Coimbatore, India. *Journal of clinical and diagnostic research: JCDR*. 2016;10: 05.

89. Wan D, et al. Preliminary Assessment of Health Risks of Potentially Toxic Elements in Settled Dust over Beijing Urban Area. *International journal of environmental research and public health*. 2016 May 2016;13: 491.
90. Liu C, et al. A simulation research on the natural degradation process of tetrabromobisphenol A in soil under the atmospheric different environments. *Environmental Science and Pollution Research*. 2016;10: 1-1.
91. Bednarek A, et al. Modulation of the response to stress factors of *Xerolycosa nemoralis* (Lycosidae) spiders living in contaminated environments. *Ecotoxicology and environmental safety*. 2016;30:1-6.
92. Maurer D, et al. Summary of performance data for technologies to control gaseous, odor, and particulate emissions from livestock operations: Air management practices assessment tool (AMPAT). *Data in brief*. 2016;7: 1413-1429.
93. Dickson LC, Karasek FW. Mechanism of formation of polychlorinated dibenzo-p-dioxins produced on municipal incinerator flyash from reactions of chlorinated phenols. *Journal of Chromatography A*. 1987 Jan 1;389: 127-37.
94. Thanikaivelan P, et al. Progress and recent trends in biotechnological methods for leather processing. *TRENDS in Biotechnology*. 2004;22: 181-188.
95. de Melo Gurgel, et al. Ecotoxicological water assessment of an estuarine river from the Brazilian Northeast, potentially affected by industrial wastewater discharge. *Science of The Total Environment*. 2016;572 :324-332.