International Journal of Advances in Scientific Research
ISSN: 2395-3616 (Online)
Journal DOI: 10.7439/ijasr
Research Article

Evaluation of ambient Air quality of nearby village effected by LCL composting plant

Shahid Raza, Jalil Ahmad and Ayesha Ameen*

Department of Biological Sciences, University of South Asia, Lahore, Pakistan

***Correspondence Info:**
Ayesha Ameen
Department of Biological Sciences,
University of South Asia, Lahore, Pakistan
E-mail: mianrs@yahoo.com

Abstract

Air monitoring is important to check the quality of air affected by the industry. The Lahore compost Pvt Ltd is a part of Saif group of companies. The LCL utilizes tons of municipal solid waste to make organic bio fertilizer. Almost 8,000 tons of organic waste is transported to the landfill site. This study was designed to check the effect of composting plant on nearby village of Mahmood Booti. The parameters for air monitoring were PM 10, CO and TSP. The results were satisfactory and below the baseline. The results are according to the standards provided by WHO for air quality.

Keywords: Supraclavicular brachial plexus block, Subclavian perivascular approach, bupivacaine, ropivacaine.

1. Introduction

The Lahore Compost (LCL) is a part of the Saif Group of Companies. This company is working by utilizing organic waste and produce organic bio fertilizer which can be used as a soil conditioner. They have operational composting plant. The municipal solid waste components are transported and collected to the land fill side near Mahmood Booti, ring road Lahore. The composting facility has been developed under the exclusive concession awarded by the City District Government Lahore. 8,000 tons waste is collected daily and transported in Lahore to landfill side. This company adapted windrow aerobic composting. These windrows are prepared on rectangular platform. Proper mixing is provided to ensure the availability of oxygen. Lahore compost Pvt Ltd is conducting different tests e.g. air monitoring and water quality to ensure any type of damage and harm to the nearby community [1].

The purpose of air monitoring is to identify and quantify airborne contaminants in order to determine the level of worker protection needed [2]. Air monitoring is an important parameter to evaluate the ambient air quality of the area where process of composting takes place. There are many species of bacteria and fungi present in the organic waste windrow which take active part in degradation of waste in to components. This microflora could be pathogenic. Some fungal and bacterial species are highly pathogenic and able to cause different diseases in plants and pollute environment. In order to accelerate and control the aerobic composting a specially formulated biological inoculums is used to treat the organic waste, which is the key element in aerobic composting. The properties of microbes can be used as an indicator for composting process, besides the characteristics of control the composting process through physiochemical activities [3]. Since air can play a central role as a reservoir for microorganisms, in controlled environments such as operating theatres regular microbial monitoring is useful to measure air quality and identify critical situations [4].

2. Methodology

The sample of air was taken when the process of composting was initiated in the composting plant. The parameters for air quality were PM 10, TSP and CO. The filters were used in the air monitoring apparatus to collect the air sample. These filters were later taken to lab and insert in apparatus that evaluate PM 10, TSP and CO.

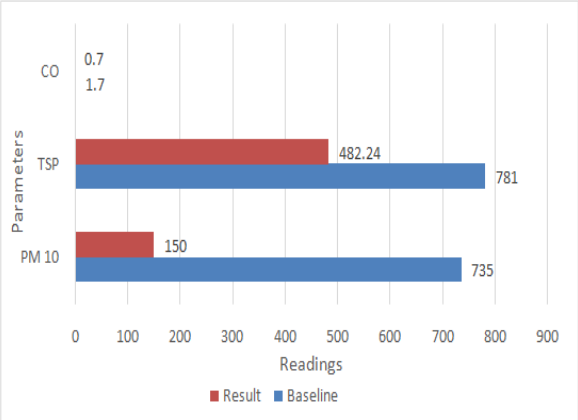
3. Results and discussion

The results were taken for air quality (PM 10, TSP and CO). These results were satisfactory and according to the standards of WHO. The Reading for PM 10 was recorded 150 and the baseline of WHO standard is 735. The reading for TSP was recorded 482.2 and the standard value for it by WHO is 781. The reading for CO was recorded 0.7 and the baseline for it is 1.7 (Table 1).

Table 1: Evaluated parameters to check air quality of nearby Village of composting plant

Sr. No	Parameter	Baseline	Result
1	PM 10	735	150
2	TSP	781	482.24
3	CO	1.7	0.7

Figure 1: Comparison of Parameters to the baseline



The composition of PM 10 is a combination of primary and secondary particles. These particles have long lifetime in the atmosphere and it can travel to long distances. Nitrate, sulphate, trace elements, ammonium and organic carbon and water are the main constituents of PM 10. Primary particles are emitted directly in to the atmosphere. The main constituents of these primary particles are soil related carbon from combustion of fossil fuel. The combustion also release many trace metals. The main type of secondary particles or aerosols are nitrate and ammonium sulphate. These aerosols are formed from emission of NOX and SO_2 when they react with ammonia. While the inorganic precursor gas relationships are more predictable, the extent to which VOCs contribute to PM2.5 formation is not well understood and additional measurement data are needed to quantitatively link specific source types to ambient PM2.5 concentrations. The coarse inhalable particle size fraction, PM10-2.5, consists of more localized fugitive dust which usually travels lesser distances than finer particle sizes and represents an important urban air quality parameter. Periodic natural events (e.g., dust storms, forest fires) can also contribute to elevated background levels [5]. The municipal solid waste also contains components of primary particles from soil and these particles can be incorporated in to PM 10. The composting plant could have effect on the PM 10. The results are below baseline set by the WHO, and shows that the composting plant do not affect much on the PM 10 quality [6].

Carbon monoxide is an important component in oxidant photochemistry and ground-level ozone formation. In urban areas, CO measurements provide an index of anthropogenic emissions and, when linked with NOX and VOC measurements, can provide important information related to emissions verification and the efficiency of emissions controls, especially as they relate to the transportation sector. In rural settings, CO provides an index of the level of anthropogenic influence on air mass chemistry and, to some degree, the age of the air mass [7].

References

[1] Environmental impact assessment (2011), Lahore compost Pvt. Ltd

[2] NIOSH. 1985. Certified Equipment List as of October 1, 1984. DHHS (NIOSH) No. 85- 101. National Institute for Occupational Safety and Health, Cincinnati, OH. Updated annually

[3] Cadena, E., Colón, J., Artola, A., Sánchez, A., & Font, X. Environmental impact of two aerobic composting technologies using life cycle assessment. *The International Journal of Life Cycle Assessment*, 2009; 14(5): 401-410.

[4] Napoli, C., Marcotrigiano, V., & Montagna, M. T. Air sampling procedures to evaluate microbial contamination: a comparison between active and passive methods in operating theatres. *BMC Public Health*, 2012; 12(1): 1.

[5] Environment Canada (EC) 2009b. Method for the Operation of TEOM Samplers for PM2.5 Monitoring in the NAPS Network. Environment Canada, Ambient Air Quality Section. No. 8.05/1.3/M. December 29, 2009. December 29, 2009. Environment Canada (EC) 2009c.

[6] Chow, J. C., Watson, J. G., Lu, Z., Lowenthal, D. H., Frazier, C. A., Solomon, P. A., & Magliano, K. Descriptive analysis of PM 2.5 and PM 10 at regionally representative locations during SJVAQS/AUSPEX. *Atmospheric Environment*, 1996; 30(12): 2079-2112.

[7] Operating Procedures for BAM-1020 PM2.5 Monitors in the NAPS Network. Environment Canada, Ambient Air Quality Section. No. 8.04/1.3/M. December 29, 2009. December 29, 2009.