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College of Science
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Ecophysiological study of the effect of Gaseous emissions on workers with bronchial allergy in Muthanna provence

A Thesis Submitted to the Councinal of collage of Science /Al Muthanna University as Partial Fulfillment of the Requirements for the Degree of Master of Science in Biology

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Summary

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The current study was conducted to know the effect of gaseous emissions on patients with respiratory system, Study the impact of gaseous emissions, which represent part of the air pollutants widely spread in the lower atmosphere that are in direct contact with the activities of living organisms, including humans. The study included selecting the areas that release the most gaseous emissions, which included fourteen sites in addition to the cement factory and oil refinery. The field work was extended from November 2023 to July 2024. 120 samples were collected during study period.

During the study, gaseous pollutants were identified Nitrogen dioxide, Sulfur dioxide, and Carbon monoxide, blood parameters were identified, which included White blood cells, Lymphocytes, Eosinophils, and Neutrophils, physiological parameters were identified Pulmonary function testing, which included forced vital capacity, forced expiratory volume and Peak expiratory flow, and immune parameters respectively were identified immunoglobulin E.

The results of the study showed that the highest concentration of the emitted gases NO₂, SO₂ and CO were (256.93 µg/m³, 1676.8 µg/m³, 48.98 ppm) in S4, S1 and the cement factory respectively, while the lowest concentration was (125.33 µg/m³, 436.67 µg/m³, 1.67 ppm) in S6, S6 and S5 respectively.0kk

Blood parameters showed that the highest percentage was recorded by eosinophils, which ranged from (7.60- 9.90%) in (S4, S7), followed by neutrophils, which ranged from (62.8-88.33%) in (S3, S5), white blood cells, which ranged from (7.22-10.58 10⁹/L) in (cement plant, S6), and lymphocytes, which ranged from (5.00- 17.85%) in (cement plant, S3).

Summary

Physiological parameters, FVC recorded the highest percentage, ranging from (54-81%) in (S3, S6), followed by FEV examination, where the percentage ranged from (27.33-49.75%) in (S3, S5). PEF recorded the lowest percentage, ranging from (16-26.75%) in (S2, S6). As for the immune parameters, IgE recorded a percentage ranging between (170.5 -518.3 U/ml), respectively in (S2).

According to the results study, CO gas concentrations are elevated near emission sources and significantly affected by wind and air temperature, exceeding global limits. Individuals aged 20-40 experienced greater exposure and impact from these emissions. The results indicated a higher prevalence of bronchial allergies over asthma, with significant increases in immunological (IgE) and blood parameters (WBC, Lym, Neu, Eos), while physiological parameters (FVC, FEV, PEF) showed significant decreases.