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# OBSERVATIONS REGARDING INDUSTRIAL AIR POLLUTION IN THE NORTHWEST AREA OF BUCHAREST

Maria-Alexandra Jalbă, Elena Mitrănescu,  
Laurențiu Tudor

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# Introduction

Air pollution and its impact on the biosphere, as well as on water and soil, is one of mankind's major problems at the beginning of this millennium.

Due to favourable air currents and encouraged meteorological conditions, these limits could be increased.

Air pollution, where some sources of pollution could be permanent, noxious substances are circumscribed spread in the industrial emission zone over a distance of 10 to 15 km.



## Materials and methods

In the western area of Bucharest, all pollutants emitted into the air were recorded. The area was chosen for its proximity to a number of potentially polluting objectives for the area (industrial objectives of metal processing and waste, including household waste).

Measurements of  $\text{NH}_3$ ,  $\text{NO}_2$ ,  $\text{SO}_2$ ,  $\text{H}_2\text{S}$ , particulate matter, total number of germs (TNG) and total number of fungus (TNF) were also performed in the impact pollution monitoring grid.



## Materials and methods

Measurements were carried out at five monitoring points:

- Bucharest Giulesti area
- Bucharest Militari area
- Bucharest Drumul Taberei area
- Bucharest Crangasi area
- Bucharest Lacul Morii area

The analysis methods used were those provided by 12574 / 1987 STAS.



Fig.1. Lacul Morii area



Fig.2. Giulesti area



## Results and discussions

| Sampling point          | Pollutant        | Total number of samples | % increasings | Average concentration | Maximum admitted concentration conformingly STAS 12574/87 |
|-------------------------|------------------|-------------------------|---------------|-----------------------|-----------------------------------------------------------|
| Bucharest Giulesti area | NH <sub>3</sub>  | 258                     | 11,7          | 0,0379                | 0,100                                                     |
|                         | NO <sub>2</sub>  | 258                     | 0             | 0,0363                | 0,100                                                     |
|                         | SO <sub>2</sub>  | 258                     | 4,65          | 0,02312               | 0,250                                                     |
|                         | H <sub>2</sub> S | 258                     | 4,65          | 0,00179               | 0,008                                                     |

At the sampling point Bucharest Giulesti area, out of 258 samples, NH<sub>3</sub> concentration recorded exceedances in 32 samples with exceedances of 12.403 %, especially in July 2023, but the other gases (NO<sub>2</sub>, SO<sub>2</sub> and H<sub>2</sub>S) recorded maximum allowed concentrations in most samples, for H<sub>2</sub>S and SO<sub>2</sub> 12 samples were found with punctual exceedances.



## Results and discussions

| Sampling point          | Pollutant        | Total number of samples | % increasings | Average concentration | Maximum admitted concentration conformingly STAS 12574/87 |
|-------------------------|------------------|-------------------------|---------------|-----------------------|-----------------------------------------------------------|
| Bucharest Crangasi area | NH <sub>3</sub>  | 225                     | 10,67         | 0,05796               | 0,100                                                     |
|                         | NO <sub>2</sub>  | 225                     | 0             | 0,0883                | 0,100                                                     |
|                         | SO <sub>2</sub>  | 225                     | 0             | 0,2124                | 0,250                                                     |
|                         | H <sub>2</sub> S | 225                     | 11,12         | 0,0138                | 0,008                                                     |

In the Bucharest Crangasi area, out of 225 samples, NH<sub>3</sub> increased in 24 samples and H<sub>2</sub>S increased in 25 samples.



## Results and discussions

| Sampling point                   | Pollutant        | Total number of samples | % increasings | Average concentration | Maximum admitted concentration conformingly STAS 12574/87 |
|----------------------------------|------------------|-------------------------|---------------|-----------------------|-----------------------------------------------------------|
| Bucharest<br>Lacul<br>Morii area | NH <sub>3</sub>  | 157                     | 24,84         | 0,0978                | 0,100                                                     |
|                                  | NO <sub>2</sub>  | 157                     | 0             | 0,0834                | 0,100                                                     |
|                                  | SO <sub>2</sub>  | 157                     | 0             | 0,07244               | 0,250                                                     |
|                                  | H <sub>2</sub> S | 157                     | 21,656        | 0,0192                | 0,008                                                     |

At the sampling point Bucharest Lacul Morii area, out of 157 air samples, in 39 samples there were increases of 24.84 % in NH<sub>3</sub> and for H<sub>2</sub>S , 34 samples showed exceedances of the admissible concentration.



## Results and discussions

| Sampling point                | Pollutant        | Total number of samples | % increasings | Average concentration | Maximum admitted concentration conformingly STAS 12574/87 |
|-------------------------------|------------------|-------------------------|---------------|-----------------------|-----------------------------------------------------------|
| Bucharest Drumul Taberei area | NH <sub>3</sub>  | 246                     | 19,92         | 0,06817               | 0,100                                                     |
|                               | NO <sub>2</sub>  | 246                     | 0             | 0,03756               | 0,100                                                     |
|                               | SO <sub>2</sub>  | 246                     | 0             | 0,04348               | 0,250                                                     |
|                               | H <sub>2</sub> S | 246                     | 0             | 0,05216               | 0,008                                                     |

In the Bucharest Drumul Taberei area sampling point there were also increases in NH<sub>3</sub> thus out of 246 samples, 49 had a higher concentration - 19.92 percent.





## Results and discussions

| Sampling point          | Pollutant        | Total number of samples | % increasings | Average concentration | Maximum admitted concentration conformingly STAS 12574/87 |
|-------------------------|------------------|-------------------------|---------------|-----------------------|-----------------------------------------------------------|
| Bucharest Militari area | NH <sub>3</sub>  | 241                     | 5,81          | 0,08152               | 0,100                                                     |
|                         | NO <sub>2</sub>  | 241                     | 0             | 0,0527                | 0,100                                                     |
|                         | SO <sub>2</sub>  | 241                     | 0             | 0,02449               | 0,250                                                     |
|                         | H <sub>2</sub> S | 241                     | 6,22          | 0,00215               | 0,008                                                     |

At the Bucharest Militari sampling point, out of 241 samples, increases in NH<sub>3</sub> were recorded in 14 samples and increases in H<sub>2</sub>S in 15 samples, the other gases (NO<sub>2</sub>, SO<sub>2</sub>) recorded maximum concentrations in most samples.



## Results and discussions

| Sampling point                | Total number of samples | % increasings | Average concentration | MAC conformingly STAS 12574 / 87 (mg/m3) |
|-------------------------------|-------------------------|---------------|-----------------------|------------------------------------------|
| Bucharest Giulesti area       | 214                     | 39,31         | 0,1455                | 0,150                                    |
| Bucharest Militari area       | 238                     | 22,32         | 0,13625               | 0,150                                    |
| Bucharest Drumul Taberei area | 226                     | 29,53         | 0,1378                | 0,150                                    |
| Bucharest Crangasi area       | 241                     | 48,74         | 0,1511                | 0,150                                    |
| Bucharest Lacul Morii area    | 162                     | 27,17         | 0,14515               | 0,150                                    |



## Conclusions and recommendations

The annual average concentration of air pollutants ( $\text{NH}_3$ ,  $\text{NO}_2$ ,  $\text{SO}_2$ ,  $\text{H}_2\text{S}$ ) is below the maximum permissible limit according to 12574/87 STAS.

The most significant exceedances of air gases were recorded in the Bucharest Lacul Morii area sampling point, with increases of 24.84% for  $\text{NH}_3$  and 21.656 for  $\text{H}_2\text{S}$ .

The amount of particulate matter exceeded the maximum permissible limits in June and July 2023 due to lack of precipitation. The highest exceedances were found in the Bucharest Crangasi area.

The observed exceedances can be correlated with periods when vegetation burning took place in the area, as well as with periodic reports of unpleasant odours from local residents.



## References

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# Thank you for your attention!

Jalbă Maria-Alexandra

Mobil: 0734389865

E-mail: [jalbamariaalexandra@gmail.com](mailto:jalbamariaalexandra@gmail.com)

Address: Bucharest, Romania



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