THE LEVEL OF AIR POLLUTION WITH SEDIMENT PARTICLES IN SĂLAJ COUNTY IN 2020

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Abstract

This paper presents the study conducted on the evolution of sediment particles in Sălaj county in 2020. The data were provided by the Sălaj County Environmental Protection Agency. This institution monitors the level of pollution with sediment particles through 16 sampling points located in various parts of Sălaj county.

These sampling points are: 7 in Zalău (at the A.P.M. office, Parcului St. no.2, Weather Station, Meterologiei St. no. 93, 22 decembrie 1989 St. no.175, Vânătorilor St. no.3 A, Sărmaş St. no. 1, CFR Station commodities Zalău North, M. Viteazu Bd. no. 100 and Cascadei St. no. 2 B), two in Jibou (Waters District, Morii St. no.1 and SC Someş Water Company SA, FN – Sewage treatment plant), Şimleul - Transilvaniei, Cehei St. no. 244, Cehu - Silvaniei, SC Someş Water Company SA, FN - Sewage treatment plant, Prodăneşti, Principală St. no.161, Şărmăşag Waters District Gării St. no. 122, Panic, Crasna and Grişeni.

Analysis of the evolution of sediment particles for 2020 shows that the maximum permissible concentration was exceeded once, in October, when the concentration was 19.48 g/m^2.

Key words: maximum permissible concentration, monitoring, sampling points, sediment particles

INTRODUCTION

Among the main sources of pollution with sediment particles we can mention power plants, which produce thermal energy and electricity using coal, clandestine burning of household waste, which has increased significantly in recent years, the huge increase in the number of cars (Măhăra, 1969, 1976, 2003; Vancea et al., 1992; Petrea, 2001; Ciulache, 2004; Dumiter, 2005; Köteles, 2011, 2016).

Sediment particles can be solid or liquid and have chemical substances in their composition. They can occur in various forms (dust, smoke, soot, nitrates, asbestos, pesticides, bioaerosols) (Mănescu, et al., 1994; Surpăţeanu, 2004; Köteles, Pereş, 2010, 2015; Moza, 2009; Peres, 2009, 2010, 2011).

MATERIAL AND METHOD

In order to study the pollution of air with sediment particles in the area of Sălaj county data provided by the Sălaj County Environmental Protection Agency, located in Zalău, were used. The data were processed mathematically and presented in charts in order to show as clearly as possible the level of pollution with sediment particles.

In the area of Sălaj county the air is monitored through observation points located in strategic zones of the county. There are 16 monitoring points, out of which 7 in Zalău (at the A.P.M. office, the weather station, 22 Decembrie 1989 St., Vânătorilor st. no.3 A, Sărmaș St. no. 1, CFR Station Commodities Zalău North, M. Viteazu Bd. no. 100 and Cascadei St. no. 2 B), two in Jibou (Waters District, Morii St. no.1 and SC Someș Water Company SA, FN – Sewage Treatment Plant), Șimleul - Transilvaniei, Cehu - Silvaniei, Prodănești, Șărmășag, Panic, Crasna and Grișeni) (www.apmsj.anpm.ro).

Due to some technical problems, monitoring of the pollutant could not be done in March and April.

The maximum permissible concentration of sediment particles is 17 g/m^2/month.

RESULTS AND DISCUSSIONS

1. Annual evolution of sediment particles

In 2020 the highest concentration of sediment particles was recorded at the Prodănești sampling point, 8.51 g/m^2, the maximum permissible concentration was not exceeded. A value close to this one was recorded at one of the monitoring points in Zalău (22 Decembrie 1989 St.), 6.58 g/m^2. The lowest values were recorded at the following sampling points: Cascadei St. no. 2 B (2.40 g/m^2), the Weather Station (2.50 g/m^2) and Grișeni (2.75g/m^2) (Fig. 1).

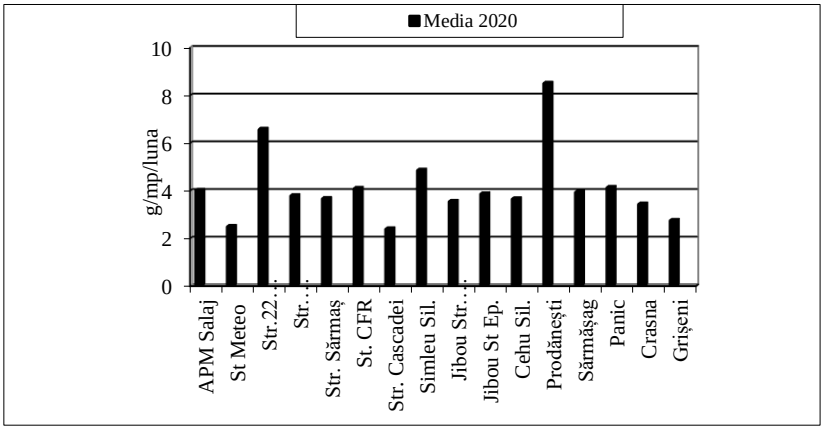

Fig. 1. Evolution of sediment particles average concentrations in Sălaj county, over the year 2020

2. Monthly average evolution of sediment particles at the 16 monitoring points

The highest average concentration of the 16 monitoring points was obtained in July, 7.95 g/m^2, followed by 6.47 g/m^2 in August and 5.88 g/m^2 in June. The lowest pollution value was obtained in January (1.47 g/m^2). The maximum permissible concentration was not exceeded (Fig. 2).

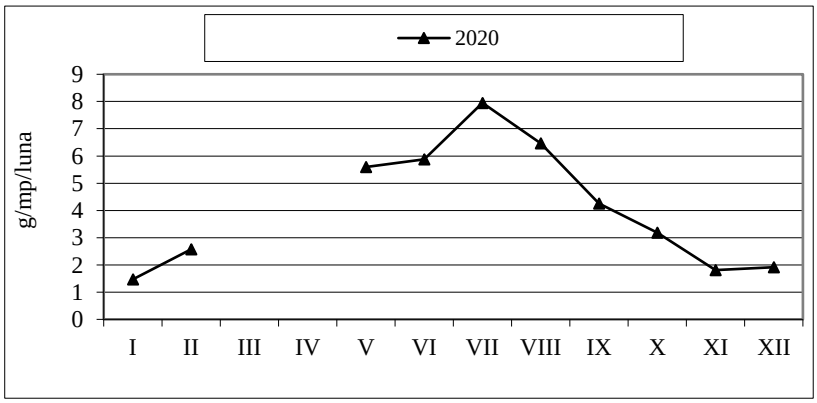

Fig. 2. Monthly pattern of sediment particles in Sălaj county, over the year 2020

3. Monthly evolution of sediment particles at A.P.M. Zalău

It can be seen that the highest values at the A.P.M. Zalău office sampling point were recorded in August (7.60 g/m^2), July (7.06 g/m^2) and May (6.01 g/m^2). Low values were recorded in January, 1.00 g/m^2, and November, 1.11 g/m^2 (Fig. 3).

The maximum permissible concentration of 17 g/m^2/month was not exceeded.

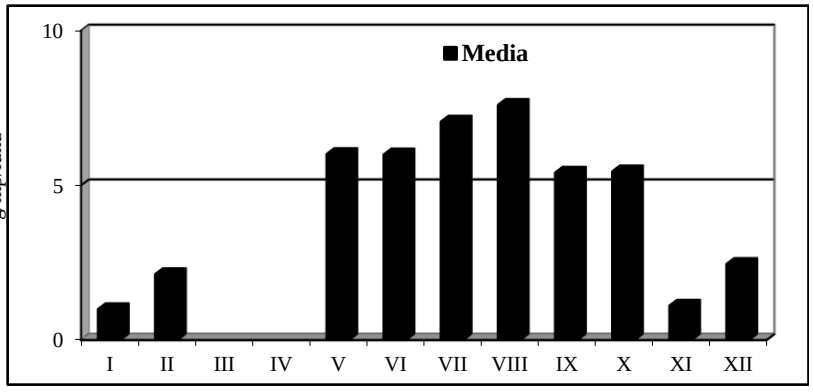

Fig. 3. Monthly pattern of sediment particles at the APM Zalău sampling point

4. Monthly evolution of sediment particles at the Prodăneşti sampling point

At the Prodăneşti sampling point the maximum permissible concentration was exceeded once, in October, when the value recorded was 19.48 g/m^2, and that was followed by two other high values in September and July, 15.21 g/m^2 and 15.16 g/m^2 respectively (Fig. 4).

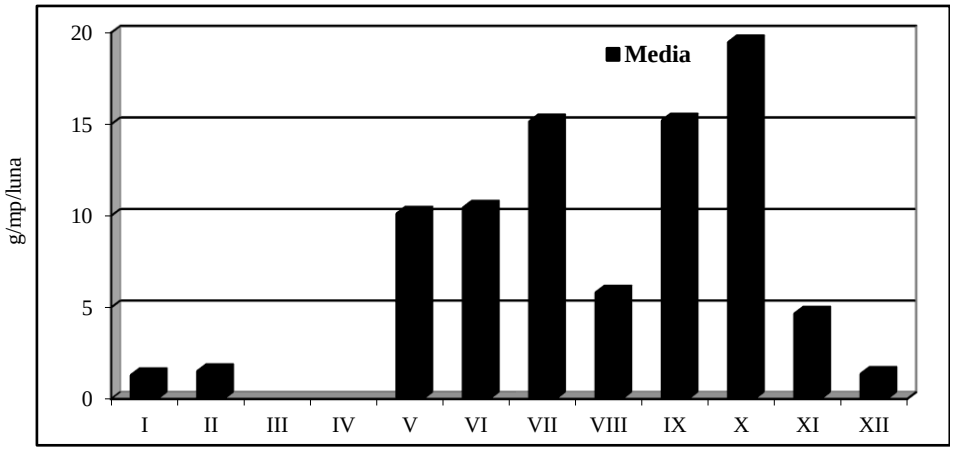

Fig. 4. Monthly pattern of sediment particles at the Prodăneşti sampling point

CONCLUSIONS

Analysis of the air pollution level with sediment particles for the year 2020 shows that the highest concentration in the county was recorded in Prodăneşti, 8.71 g/m^2. The lowest value was recorded at Cascadei St. in Zalău (2.40 g/m^2).

The most affected area in respect of pollution with sediment particles is Prodăneşti, where the maximum permissible concentration (17 g/m^2) was exceeded in October (19.48 g/m^2).

Higher concentrations of sediment particles were recorded in the summer and autumn months, and lower concentrations in the winter months.

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