**DESCRIPTIVE DATA ABOUT THE PALYNOMORPHS SPREADING OF SOLANUM TYPE, IN ELBASANI REGION – ALBANIA.**

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ABSTRACT

Paleopalynological data reported in this study, obtained in depositions of last XX centuries (last historic period of New Holocene, last Quaternary), from five stations of Elbasani town.

This study provides some paleopalynological data about the palynomorphs spreading of Solanum Type member of Solanaceae family during New Holocene period. A number of biological studies are done in Elbasan city during last two-three decades.

The purpose of this article is to present the correlation between the depth and distribution for the Solanum Type palynomorphs on different periods of time.

Therefore, we collected exactly 16 sediment samples in every station, each 25 cm from the surface up to 4 m depth, through a dry drilling sonde.

Palynological data about this Type there were from any similar palynological studies before, as from foreign and local authors.

Sample treatment also microscopic examinations were performed at “La Sapienza”, University Rome. Observations, counting and photos of palynomorphs it was carried on using light microscopes, magnification up to 1000x.

To see from our perspective, some essential data were found, showing exactly the interconnection between the depth and number of spores for this Type of analysis.

Key words: Paleopalynological, New Holocene, palynomorphs, Solanum Type.

INTRODUCTION

Pollen and spores together, can undoubtedly be preserved, because the outer wall of the grains is extraordinarily resistant (Kapidani, 1996; Pacini & Franchi, 1978). Comparison of plant spores and pollen present in those primitive, allows us judging the performance of primitive and specialized features of outer wall of the grains (Pacini & Hesse, 2005).

The presented material gives palynological data of New Holocene deposits in Elbasani town. Palynology is an Interdisciplinary Science, connected to biological sciences and geology, particularly of botanical science, it is the science that studies especially the pollens and spores, but and the acritarchs, chitinozoans, scolecodonts, and above all this science includes the study of current and fossil palynoforms. (Faegri & Iversen, 1989; Davis, 1999).

Plant microfossils of this type have not been studied previouslyfrom any of the localities of Elbasan city and there is no kind of studies by foreign or native authors for spore and pollen content data about this plant in Holocene deposits in Elbasani town. (Kapidani, 1996; Kapidani & Jançe, 2004).

Information on the method of collection, preservation and laboratory processing of the pollen grains of these plants were provided by this study as well.

This type of research provides important information about the reconstruction of paleoflora, paleoclimate, stratygraphy of the Holocene. (Davis, 1999; Faegri & Iversen, 1989).

The study in New Holocene deposits provides important information about the factors which have their impact on the potential transformation of the flora in Elbasani town. (Kapidani & Jançe, 2004; Muhameti et al., 1984; Moore & Webb, 1978; Shalla, 1983; Jance & Kapidani, 2011; Forest et al., 1999).

Observations, counting and photos of palynomorphs it was carried on using light microscopes, magnification up to 1000x. Information on the method of collection, preservation and laboratory processing of the pollen grains of this plant were provided by this study as well. (Kapidani, 1996; Kapidani & Jançe, 2004).

Paleopalynological data help in the discovery of traces of history on the use and cultivation of plants, feeding mode and the origin of agriculture (Bryant & Holloway, 1996). The quantitative data through spores of *Solanum* Type deposited on the ground shows the direction of evolution of this Type, part of Solanaceae Family, mentioned in the study.

**MATERIAL AND METHODS OF WORK**

Physical-chemical composition of the spores allows pollen anthers well saved and easily extracted from soil sediments. Basically all the extraction ways, join in principle methods of physical and chemical processing of 1 cm3 sediment (Faegri & Iversen, 1989).

Palynological examination of all samples showed that all contained a large amount of organic matter that appeared suitable for pollen analysis. During this study we have taken 16 soil samples, starting from 4 meters of depth to 0.25 m. The distance between the sampling is 25 cm. For each soil sample we have prepared a significant number of preparations.

**The method of acetolysis according to Erdtman.**

The soil sampling is based on Erdtman method (Erdtman, 1960; 1969). Erdtman acetolyze method consists on processing the material with an acetolyze mixture, acetic anhydride (CH3COO) 2 and sulfuric acid (H2SO4) in a 9:1 ratio. In order to get better results first mix 1cm3 soil with 10ml KOH (10%). After that we cleaned it with distillated water, and then we mixed it with acetolyze solution, until a neutral environment is obtained.

The acetolyze method is widely used in palynology; it gives better visibility over the spores and pollens compared with the other methods used during the microscopic observation process. (Erdtman, 1960, 1969; Kapidani, 2005; Kapidani & Jançe, 2004; Moore & Webb, 1978; Davis, 1999; Jance & Kapidani, 2011).

We then use this method to assess the paleoclimateand paleoelevation represented by the assemblage and will discussthe results in terms of their implications for the uplift historyof the Elbasan region.

**Fixture of prepared composites.**

The fixture of prepared composites was realized by using the method of glue-preparations through gel-glycerin. The gel-glycerin was prepared based on the Kisser method (Kisser, 1935) by using 50gr of gelatin, 175 ml of distillate water, 150gr glycerin, 7gr phenol (crystals). Once the distillate water was heated up to 50oC, the gel was dropped into it.

Then the glycerin and the composite were added and boiled till the liquid became thicker and viscose. After the phenol was added to the mixture, a uniform melted composition was taken. The prevention of air bubbles that might emerge during the process of composite preparation was made by warming up in advance all equipment used over the process. The final composite was isolated to the edges of microscope slide with spray or paraffin and after 3 days it was ready to be used and stored.

RESULTS AND DISCUSSIONS

On table 1 are presented the data about the number of spores for *Solanum* type, representative of Solanaceae family according to the depth and the total number of spores for this Type.

Table 1. Number of spores according to the depth

|  |  |  |
| --- | --- | --- |
| Sample | Depth (meters) | Number of spores(Solanum Typ - Solanaceae) |
| 1 | 4 | 20 |
| 2 | 3.75 | 30 |
| 3 | 3.5 | 45 |
| 4 | 3.25 | 46 |
| 5 | 3 | 49 |
| 6 | 2.75 | 63 |
| 7 | 2.5 | 74 |
| 8 | 2.25 | 99 |
| 9 | 2 | 112 |
| 10 | 1.75 | 127 |
| 11 | 1.5 | 129 |
| 12 | 1.25 | 138 |
| 13 | 1 | 140 |
| 14 | 0.75 | 143 |
| 15 | 0.5 | 135 |
| 16 | 0.25 | 146 |
| Total number of spores | 1496 |

The minimum number (20 spores per sample) is taken exactly in 4 m of depth while the maximum number of spores of *Solanum* Type (146 spores per sample) is taken close to surface in 0.25 m of depth.



Figure 1. The spore’s dispersion of Solanaceae family according to the depth

On figure 1 is clearly shown a great increasing for the number of spores for *Solanum* Type, representative of Solanaceae family (Photos 1) from the bottom towards the surface.



Figure 2. The total number of spores according to four Genres of Solanaceae family

Based on the data presented in table 1 and figure 2 the spore’s total number of *Solanum* Type is respectively significant with the total number of 1496 spores. (Figure 2).

From the survey results of Table 1 for all stations noted that, all palynomorphs for *Solanum* Type are present at all depths. Also as shown in Figure 1, the Solanaceae family forms, from the bottom toward the surface increasing their overall presence.

The main reason for this increase in the spores’ presence of *Solanum* Type perhaps should be linked to the gradual impact in times of anthropogenic factors for the transformation of the natural landscape herbal through cultivation of fruit plants and necessary cultivars for them, the result of which is the actual landscape with whole fields planted with tobacco, potato, tomato etc. in Elbasani town. (Group of authors, 2003).

But another reason may be related to the fact that new forms of pollen are stored better than older ones to meet the depths samples. But in this storage may have affected the ecological factors and climatically factors.

Elbasan city crowns today is mainly composed of fruit trees and a rich vegetation grass, the major part of which is cultivated. The impact of human activity is the main cause during the crowns transformations of Elbasan city. (Group of authors, 2003).

Landscape of the Elbasan city with plant surrounded by gentle hills of the Mediterranean climate must have been the subject of major transformations to increase the area of olives, grapes and other agricultural plants. Elbasan region for centuries mentioned as an important exporter of olive oil, wine, tobacco and other agricultural products. (Panajoti, 2008).

We are entitled to think that the trend towards increasing to the pollen of Solanaceae family in the samples should be on the impact of agricultural policies over the years to increase the plantation of fruit trees and cultivated plants associating with them.

The quantitative data through spores and pollens variety of *Solanum* type shows the direction of evolution of this family mentioned in the study.

CONCLUSIONS

1. The spore’s number of *Solanum* type is increasing their overall presence from the bottom toward the surface
2. The representatives of Solanaceae family are present for depth 4 meters up near the surface 0.25.
3. We believe that the rate of growth of particles pollen of *Solanum* Type in all of these samples, in addition to the impact of ecological factors in maintaining good, must be related to the influence of anthropogenic factors in the cultivation of plants needed to.

Appendix 1. Microscopic photos



Ph. 1. Solanum Type pollens

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