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O 41. DECORATION OF SILVER NANOPARTICLES SYNTHESIZED BY GREEN APPROACH ONTO NATURALLY COLORED NYLON 6,6 NANOFIBERS: INVESTIGATION OF ANTIBACTERIAL ACTIVITY

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ABSTRACT: Since, organic dyes are non-eco friendly and expensive, recent researches have been focused on natural dyes. Natural dyes can be derived from natural sources. Most are of plant origin and extracted from roots, wood, berries, lichens, leaves, flowers, nuts, and seeds. Generally, they show various colors and contain several pigments which can be easily extracted and used as a coloring agent. However, studies regarding the dyeing process with natural dyes are very limited due to easy availability of cheap synthetic dyes. Hence, this research aimed to produce colored nanofibers using plant extracts. Metallic nanoparticles with physicochemical properties different from bulk materials are widely applied in various fields such as environmental remediation, photocatalysis, imaging, catalysis, biosensors and biomedical applications. Nanoparticles have emerged due to unique physical and chemical properties, high surface to volume ratio as novel antimicrobial agents. Among them, silver nanoparticles (AgNPs) show excellent antimicrobial efficiency against organisms such as bacteria, fungi and viruse. As a result of increasing interest in green chemistry, an eco-friendly nanoparticle synthesis that is simple, affordable, compatible with biomedical and pharmacological applications have been widely preferred. In this regard, the aim of the present work was to decorate the AgNPs synthesized by green method onto colored Nylon 6,6 nanofibers. Firstly, Nylon 6,6 nanofibers were fabricated by electrospinning method followed by dyeing process using reddish orange and onion peel extracts. During dyeing process of the nanofibers, vinegar was used as a dye fixative agent. Secondly, synthesis of AgNPs using water extract of *Alchemilla vulgaris* plant under ambient conditions was performed. The formation of AgNPs was analyzed by UV–visible spectrophotometer. Synthesized AgNPs were decorated onto nanofibers by ultrasonication technique followed by mechanical mixing. The nanofibers were characterized using Scanning Electron Microscope (SEM) and Fourier-transform infrared (FT-IR) spectrophometer. The antibacterial acitivities of obtained novel nanofibers were investigated using Gram-positive bacteria (*Staphylococcus aureus*) and Gram-negative bacteria (*Escherichia coli)*. The activity test shows that nanofibers showed better antibacterial activities against to Gram-positive bacteria (*Staphylococcus aureus*) as compared to Gram-negative bacteria (*Escherichia coli).*

Keywords: Antibacterial, nanofiber, silver nanoparticle, nylon 6,6, green synthesis

O 42. RELATIONSHIP BETWEEN THE GEOLOGICAL UNITS AND SOIL GROUPS: A CASE STUDY AROUND THE HATIP-KAŞINHANI (KONYA-TURKEY)

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ABSTRACT: In this study, it is investigated whether the soil classes in the region between Hatıp and Kaşınhanı (Konya-Turkey) are related to geological units. The Upper Triassic-Lower Cretaceous Lorasdağı formation which is composed of limestone, dolomitic limestone and dolomites and the Upper Cretaceous aged Midostepe formation consisting of clayey limestone, radiolarite, shale and marl are the basement of the area between Hatıp and Kaşınhanı (Konya). These units contain tectonic contact with the Upper Cretaceous Hatip Ophiolitic Melange and Çayırbağı Ophiolite. The Upper Miocene-Lower Pliocene aged Sille and Ulumuhsine formations are unconformably overlying these all units. All these units cut by Upper Miocene-Pliocene Erenlardağı volcanites. The Quaternary - Holocene young sediments consisting of alluvial fan and the terrestrial clastics cover all the units underneath.
According to the classic soil classification, zonal and azonal soils are located in the study area. These soils formed generally depending on the geological characteristics of the host rocks based on the preliminary observations. While the area where Lorasdağı limestone seen is called as "Bare Rock", the soils located on the ophiolitic rocks are generally zonal soils such as "Red Brown Soils" and "Brown Forest Soils". The soils located on the Ulumuhsine formation with clayey limestone, sandstone and marl alternation correspond to "Red Brown soils"' and "Brown Soils" classes from zonal soils. The soils located on the Erenlerdağ volcanites in the southwest of the study area are classified as "Limeless Brown Forest Soils" from zonal soils. Alluvium, which is composed of current terrestrial sediments, is classified as "Alluvial Soils" from azonal soils.

Keywords: Hatıp, Kaşınhanı, soil, geology, soil classification

1. INTRODUCTION

The study area is in the region between Hatıp and Kaşınhanı to the south of Konya Province (Fig. 1). This study was conducted to determine whether there is a relationship between geological units and soil classification. The research area is in transition of Anatolides and Taurides described by Ketin (1966); According to Özgül (1976), it is in the "Bolkardağı unit" in the Taurides, According to Okay (1986), it is in the "Afyon - Bolkardağı zone". According to Özcan et al. (1988 ve 1990), the study area is located in the central part of the Kütahya - Bolkardağı Belt which forms the southern edge of the Anatolites.

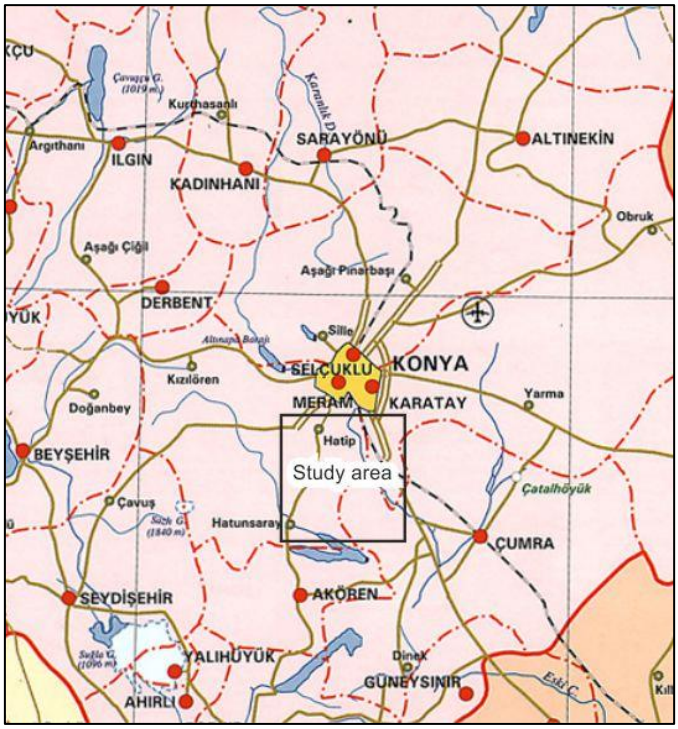

Figure 2. Location map of the study area.

2. MATERIAL AND METHOD

In order to determine whether there is a relationship between geological units and soil classification, General Directorate of Rural Services (1987) map made according to Marbut (1928) was used.

3. RESEARCH FINDINGS

The Upper Triassic-Lower Cretaceous Lorasdağı formation which is composed of limestone, dolomitic limestone and dolomites and the Upper Cretaceous aged Midostepe formation consisting of clayey limestone, radiolarite, shale and marl are the basement of the area between Hatıp and Kaşınhanı (Konya). These units contain tectonic contact with the Upper Cretaceous Hatip ophiolitic melange and Çayırbağı ophiolite. The Upper Miocene-Lower Pliocene aged Sille and Ulumuhsine are unconformably overlying these units. The Erenlardağı volcanites cut all these units. The Quaternary - Holocene young sediments consisting of alluvial fan and the terrestrial clastics cover all the units underneath (Fig. 2).

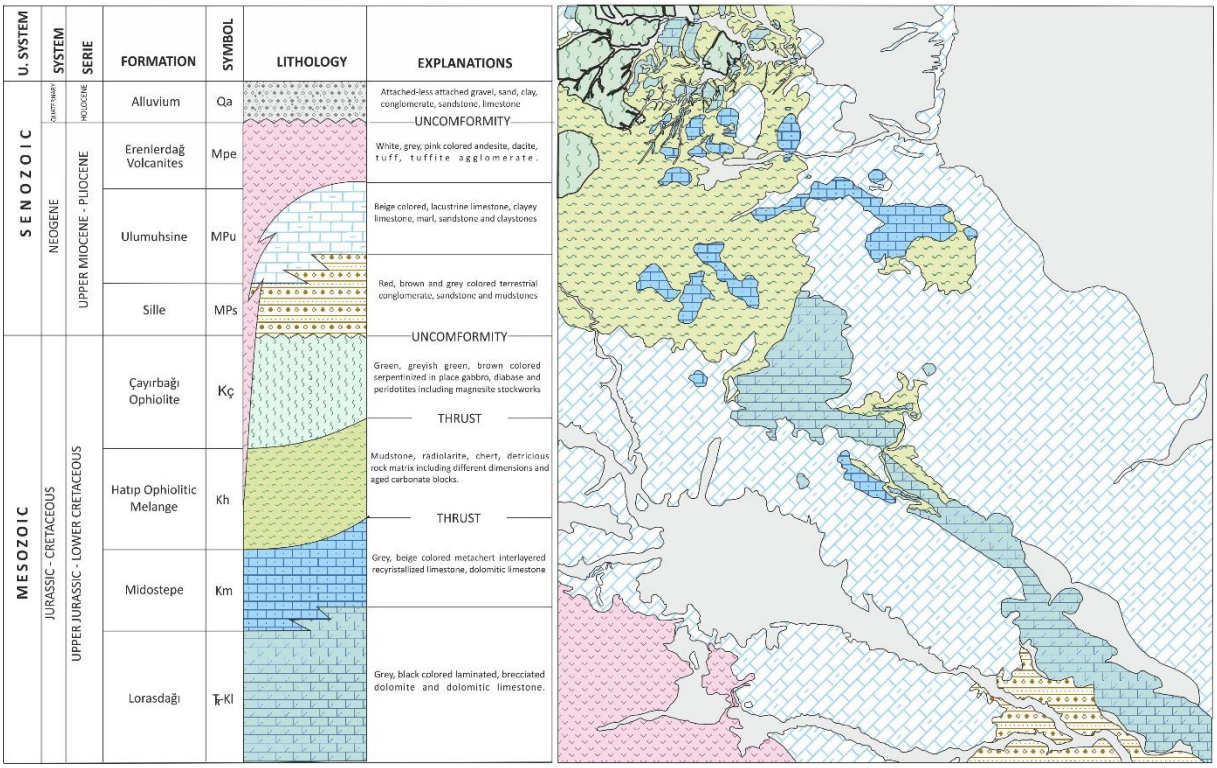

Figure 2. Simplified lithostratigraphic columnar section and geological map of the study area (modified after Yetiş, 2017; Yetiş and Arık, 2018)

As a result of the change of source material under different climates, topography and geological conditions, different soils belonging to Zonal and Azonal groups were formed. According to classical soil classification, it is seen that the soils in the study area are generally formed depending on the geological characteristics of the bedrock. “Reddish Brown Soils” are usually developed on carbonated rocks of Lorasdağı, Midostepe and Ulumuhsine formation. The soils on the ophiolitic rocks are “Reddish Brown Soils” and “Brown Forest Soils”, which are formed on the main material with high lime content. The soils on the Ulumuhsine formation consisting of limestone, clayey limestone, sandstone and marl correspond to the “Reddish Brown Soil” and “Brown Soil” classes with high lime content (Ca rich). The soils on the Erenlerdağ volcanites, which contain andesite, dacite, tuff, agglomerate, are classified as “Limeless Brown Forest Soils” consisting of lime-free soils where natural vegetation is bushes and grasses, and “Colluvial Soils” containing low-soil rough stones and debris. The soils on the alluvial deposits in the region are classified as “Alluvial Soils”, which are young soils formed on young unfixed or less attached units, and “Regosols”, which are over sandy, low water retention capacity and high permeable shallow soils formed on loose and unconnected units. The areas where the limestones of the Lorasdağı and Midostepe formations are defined as “Bare Rocks” (Fig. 3).

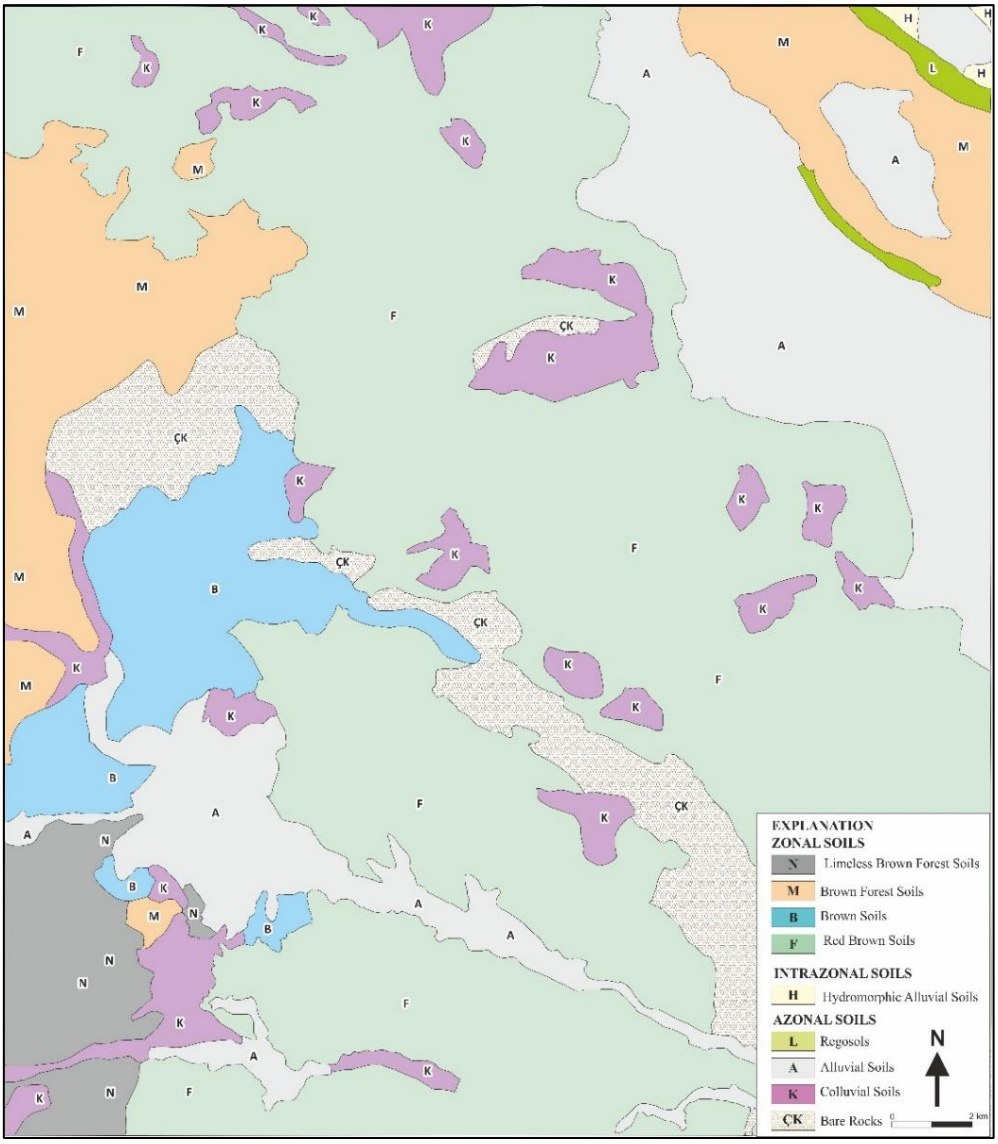

Figure 3. Soil classification map of the study area (modified from General Directorate of Rural Services, 1987).

4. CONCLUSION

In this study conducted to determine whether there is a relationship between geological units and soil classification, it is observed that “Brown, Reddish Brown and Brown Forest Soils”, which have high lime content, are generally developed on carbonated rocks of Ulumuhsine, Sille, Lorasdağı and Midostepe formations. Non-soil areas containing dense rocky limestones belonging to Lorasdağı and Midostepe formations are defined as “Bare Rocks”. Soils on the ophiolitic rocks are classified as “Reddish Brown Soils” and “Brown Forest Soils” due to the Ca content in the ophiolitic rocks, which also contain dense limestone blocks. The soils located on Erenlerdağ volcanites containing andesite, dacite, tuff, agglomerate were defined as "Limeless Brown Forest Soils" located away from the carbonate rocks and "Colluvial Soils" containing coarse stones and rubble. The soils on the alluviums are classified as “Alluvial Soils” and “Regosols”, which are the soils formed on loose units. As a result, the lithological properties of geological units are effective in soil formation, and the relationship between soil classification and geological units is clearly seen.

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