



KOP BÖLGESEL KALKINMA SEMPOZYUMU

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26-28 EKİM 2021



BİLDİRİ KİTABI
PROCEEDINGS BOOK

Nevşehir Hacı Bektaş Veli Üniversitesi Yayınları No: 31

Bu kitabın basım, yayım ve satış hakları Nevşehir Hacı Bektaş Veli Üniversitesine aittir. Bütün hakları saklıdır.

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Kapak Düzeni:

Öğretim Görevlisi Bülent BİLGİN

Tasarım-Dizgi:

Öğretim Görevlisi Dr. Muharrem ÖZLÜK

ISBN: 978-605-4163-49-6

1. Baskı

NEVŞEHİR HACI BEKTAŞ VELİ ÜNİVERSİTESİ, Nevşehir, 2021

VIII. Uluslararası KOP Bölgesel Kalkınma Sempozyumu
26-28 Ekim 2021, Nevşehir

8th International KOP Regional Development Symposium
26-28 October 2021, Nevşehir

Editörler:

Prof. Dr. Mustafa Hilmi ÇOLAKOĞLU

Dr. Öğretim Üyesi Gökçe BECİT İŞÇİTÜRK

E- ISBN: 978-605-4163-49-6

Bu kitapta yer alan bildirilerin sorumluluğu bildiri yazarlarına aittir.

Nevşehir

Aralık, 2021

Arıtılmış Atıksuların Tarımsal Sulamada Kullanılmasında Mikrikirletici Riski

Risik of Micropollutant in The Use of Treated Water in Agricultural Irrigation

Taylan DOLU*, Bilgehan NAS**

ABSTRACT:

During the last century, the need for fresh water resources has increased significantly due to the dramatic increase in the world population. A significant portion of water resources both in our country and the world are used for agricultural irrigation purposes. Considering that the fresh water resources in the world are very limited and will not meet the needs of the increasing world population, the reuse of treated wastewater within the scope of agricultural irrigation seems to be a great opportunity. Especially countries such as Spain and Italy use their treated wastewater at very high rates according to the principle of 'fit for purpose'. However, apart from providing significant benefits especially in arid and semi-arid regions, the use of treated wastewater in agricultural irrigation also brings some health concerns. Especially in the last two decades, it has been intensely debated whether micropollutants (MPs), also called as emerging pollutants, can limit the reuse of treated wastewater in the field of agricultural areas. At the present time, Wastewater Treatment Plants (WWTPs) are considered as very crucial resource and energy centers in terms of bringing treated wastewater into the economy through agricultural irrigation. However, many studies conducted around the world have revealed that MPs pass into receiving environments together with the discharged treated wastewater due to insufficient removal rates in WWTPs. Due to the proven different adverse effects of MPs on the ecosystems, animals and even human over time, some countries have put into practice regulations that impose limitations on this issue in order to prevent spreading of these chemicals from WWTPs.

In Konya which is the biggest city of the KOP region, a large number of agricultural lands are irrigated continuously with treated wastewater discharged from Konya WWTP throughout the main discharge canal. For this reason, treated wastewater discharged from WWTP is indispensable for the crops that farmers will grow on their agricultural lands. In this study, it has been investigated whether MPs can pass to agricultural lands being irrigated by treated wastewater and agricultural crops grown in these lands. According to the obtained results, diuron in the group of pesticide, caffeine in the group of pharmaceutical and tonalide in the group of polycyclic musk were detected in different concentrations both in investigated agricultural land and various crops grown in there. In the study, the risk of MPs entering the food chain, the possibility of people being exposed to these pollutants through edible agricultural products and the possible adverse health problems that may arise as a result were also evaluated. Finally, it is discussed what should be done in order to reduce or completely eliminate the possible risks of MPs that may occur on the environment and people that arises from treated wastewater using in agricultural irrigation.

Keywords: agricultural irrigation, micropollutants, risk, treated wastewater, water reuse

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