



Monitoring of *Aedes albopictus* (Skuse) in Southwestern part of Republic of Kosovo



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INTRODUCTION

The tiger mosquito *Aedes albopictus* is considered one of the most invasive organisms in the world and at the same time, the most invasive vector mosquito on our planet [1]. Its origine is from Southeast Asia, now found in numerous regions worldwide, including Europe, America, and parts of Africa [2].

This mosquito is recognized as a major vector for transmitting the pathogens that lead to dengue, chikungunya, Zika, and yellow fever [3]. Given the increasing presence of *Aedes albopictus* in new areas, it is essential to monitor the distribution and population dynamics to prepare for potential future public health risks.

Recent research suggests that the expansion of tiger mosquito *Aedes albopictus* is affected by various factors, including climate change, urbanization and the availability of breeding sites.

In Kosovo, the presence of the tiger mosquito was confirmed in 2020, and since it is present, the objective of this research has been to track its distribution, temporal activity and to conduct continuous monitoring.

METHODS AND MATERIALS

The study is included the municipality of Prizren (42.2166 N, 20.7333 E) cover an area of 627 km² (5.94% of Kosovo's territory), with average altitude is about 450 m above sea level occupies the southwestern part of Kosovo. The climate of this part of Kosovo is classified as Mediterranean.

Collection and identification

To detect the presence of females through egg laying we use Ovitrap. The ovitraps (500 ml black plastic cups) were filled with tap water and equipped with a masonite strip (12.5 × 2.5 cm) for egg deposition. The plastic cups were modified by two holes, punching 3 cm from the top of the cup to prevent water overflowing. 35 ovitraps were randomly distributed in seven localities [Vërmicë (5), Zhur (5), Vlashnje (5) and Prizren (5), Prizren (5), Truck Terminal, (5), Atmaxhë (5), for four Entomological survey period we used 240 ovitraps in total for two years of monitoring. The distance between the traps was 100 m at minimum. The ovitraps were left at the same place during a sampling period of 10 successive days. After 10 days, the masonite strips were collected from the traps and transferred to the labora tory at the university of Prishtina for identification based on their color, size, shape and surface sculpting [4].



Figure 1. Ovitrap locations for *Ae. albopictus* monitoring

RESULTS

During a two-year monitoring period (2020–2021) of the invasive *Aedes albopictus* species in seven localities, a total of 240 ovitraps (Masonite strips for oviposition) were inspected.

Over this period, 5,288 mosquito eggs were counted. Among the 240 ovitraps, 38 (15.83%) were negative with no eggs recorded, while 202 (84.17%) were positive. In 2020, a higher number of eggs was recorded (2,711) compared to 2021 (2,577).

The locality with the highest number of eggs in 2020 was Zhur (1,187 eggs), while in 2021, the highest number was recorded in Vlashnje (1,002 eggs), (Tab.1)

CONCLUSIONS

The southwestern region of Kosovo provides favorable environmental conditions for the reproduction and spread of one of the world's most invasive mosquitoes, *Aedes albopictus*.

The population density of this mosquito in the surveyed localities represent a significant factor, as elevated density and abundance increase the risk of transmission of infections caused by pathogens vectored by this invasive specie. In such cases, it is necessary to establish a comprehensive monitoring system to effectively observe and reduce the risk of pathogen transmission.

Table 1. Total number of eggs of *Ae. albopictus* in 2020–2021 in seven localities

Localities	2020	2021
Vërmicë	440	390
Zhur	1187	516
Vlashnje	139	1002
Prizren	786	427
Truck Terminal	40	38
Atmaxhë	119	116
Landovicë	0	88

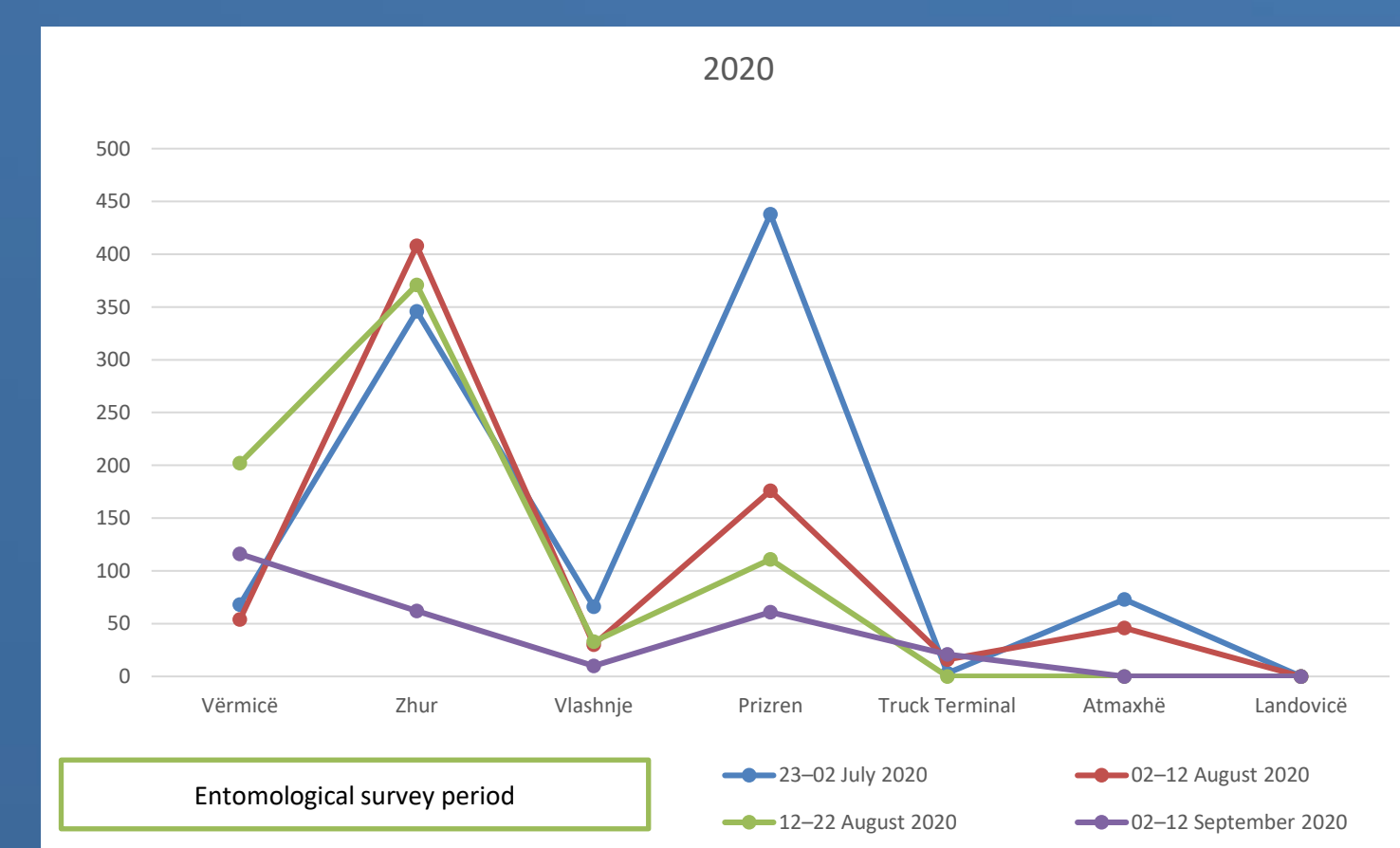


Figure 2. Distribution of mosquito eggs during four survey periods in 2020

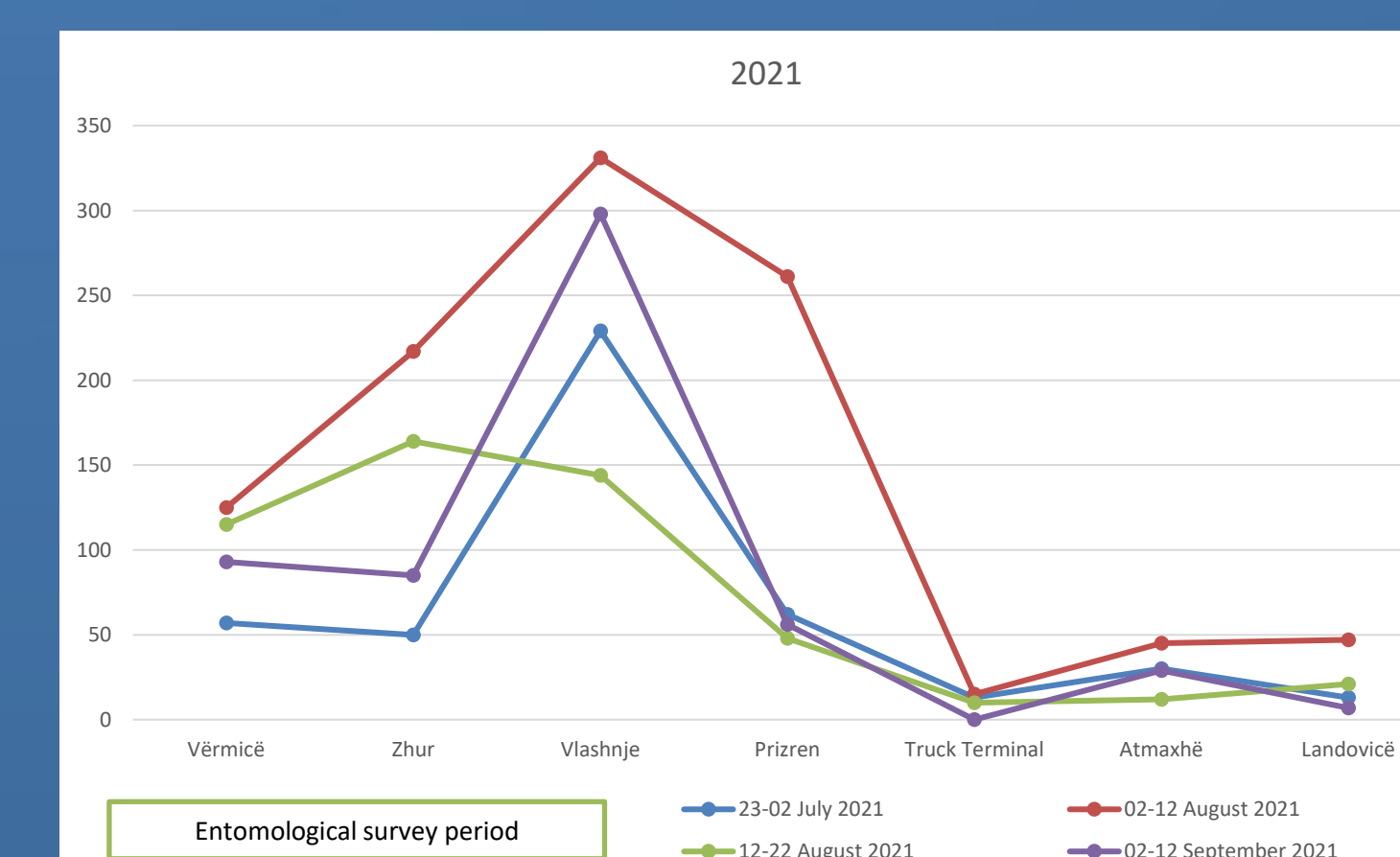


Figure 3. Distribution of mosquito eggs during four survey periods in 2021

DISCUSSION

Since the discovery of the invasive species *Aedes albopictus* in Kosovo in 2020, [5], its population and spread to new areas have continued throughout 2021. As shown in (Fig.2), no mosquito eggs were detected in Landovica during 2020. However, data from 2021, (Fig.3) indicate that the species, expanded its range to include this area, demonstrating signs of successful adaptation. Our findings show that Zhur and Vlashnje had the highest recorded numbers of mosquito eggs, while the Truck Terminal consistently exhibited the lowest counts over the two-year monitoring period (Tab. 1). The highest abundance was observed during the first and second entomological survey period, when climatic conditions were favorable for the full development of the mosquito life cycle, while the earliest egg-laying season was recorded in early June in Vërmicë.

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