On the Occurrence and Health Risks of the Venomous Palestine Viper (*Vipera palaestinae* Werner, 1938) in the Gaza Strip – Palestine

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**ABSTRACT**

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**Introduction**

In spite of its small area, Palestine (27,000 km²) is home to about 40 snakes, of which at least 9 are venomous [1,2]. Kochva [1] pointed out that the most venomous snakes of Palestine and Jordan are the Palestinian Viper (*Vipera palaestinae*), Painted Saw-scaled Viper or Painted Carpet Viper (*Echis coloratus*), Field’s Horned Viper (*Pseudocerastes fieldi*), Horned Desert Viper (*Cerastes cerastes*), Black Desert Cobra (*Walterinnesia aegyptia*), and the Palestinian Burrowing Asp or Palestine Mole Viper (*Atractaspis engaddensis*). Special attention was paid by the regional scientific parties on the Palestine Viper, which is endemic to Palestine and the close neighboring countries [3-8]. Hundreds of people receive venomous bites annually in Palestine and Jordan, of whom many die [3]. In the light of these facts, the Palestinian Health Authorities usually warn the public from the adverse impacts associated with biting of the most venomous Palestinian Viper (*Vipera palaestinae* or *Daboia palaestinae*). The authorities also ensured that local antivenoms are available against only two of the venomous snakes including Palestine Viper, while against others regional or European preparations are commonly used [1]. It is worth mentioning that both venomous and non-venomous snakes are active in summer and they maintain ecological balance in nature by chasing rodents and pests that disturb humans.

The current study comes to introduce data on the occurrence, ecology and risks of the Palestine Viper (*Vipera palaestinae* Werner, 1938) in the Gaza Strip–Palestine. Field observations and discussions with stakeholders (snake hunters, doctors and people exposed to bites) are capital tools used to satisfy the purpose of the study. The Palestine Viper is the most venomous snake recorded in Palestine, Syria, Jordan, Lebanon and southern Turkey. It has a widespread occurrence in the various Palestinian ecosystems of the West Bank and the Gaza Strip [9-11]. Continuous callings are commonly issued by the Health Authorities not to seize snakes; especially the Palestine Viper. They stressed the need to clean the grasses and unwanted plants around the houses, to monitor the movement and behaviors of children against poisonous creatures, not to leave doors and windows open at night especially in rural areas, and to check shoes before wearing, to pay attention to the steps when moving in agricultural lands characterized by extensive growth of weeds and grasses, etc.

**Nature & Ecology of the Palestine Viper in the Gaza Strip**

In the Gaza Strip (365 km²), the Palestine Viper prevails in all natural and agricultural environments, near animal husbandries, near various water bodies including wadis (valleys), ponds and sewage lagoons [12-14]. The sand dune ecosystem dominating the western belt of the Gaza Strip is not exception. It is not surprising to find the snake near human dwellings and buildings as well. More recently, Abd Rabou [15] ensured the occurrence of the Palestine Viper in some archeological sites and buildings of the Gaza Strip. The Palestine Viper represents one of the most preserved biological samples in the Biology Department of the universities of the Gaza Strip. Moreover, the Palestine Viper was found to be one of the most caged snakes at the zoological gardens of the Gaza Strip. Many individuals of this species have been killed in the rural areas of the Gaza strip. This, by far, reflects the widespread distribution of the...
snake in the whole Gaza Strip. All Palestinians are familiar with this venomous snake. They usually termed it as the “Hayaa Za’ara”.

It is a common phenomenon to find clever snake hunters displaying on their social media pages and other internet sites different categories of alive as well as dead specimens of snakes; particularly the venomous Palestine Viper (Figure 2). Local measurements on tens of Palestine Viper specimens either being alive, or dead indicated that the average length of the snake is 80-90 cm. Many specimens were found to exceed the threshold of 100 cm and may reach a maximum length of 130 cm. The tail represents about 15% of the snake’s total length. The snake is yellow in color; with twisted lines extend from its tail to its triangular head (often a feature of poisonous snakes) (Figure 1). Like other snakes of the Gaza Strip, the Palestine Viper feeds on rodents, lizards, frogs, birds and other small living organisms [13]. In summer seasons, the snake exhibits its maximum activity and breeding biology.

Figure 1: The Palestine Viper (Vipera palaestinae or Daboia palaestinae) is one of the commonest snakes in the Palestine environment.

Figure 2: A snake hunter displaying the venomous Palestine Viper after being caught in Wadi Gaza ecosystem.
Health Risks of the Palestine Viper

In spite of the causalties and fatalities caused by the Palestine Viper’s bites, it rarely attacks humans. Most snake bites targeting humans and livestock in the Gaza Strip were reported in the summer months extending from May till October. Some police, health or civil defense centers claimed that they received many calls from local people having troubles with snakes at their homes or buildings. These official parties usually deal with the dangerous organisms in a safe way. If not killed, the specimens were said to be caught and transferred to appropriate ecological locations or habitats in the Gaza Strip. However, discussions with local people including those who have been bitten by the Palestine Viper itself pointed out the following bite causes:

a. If a person stumbles on the snake deliberately or wrongly.

b. If a person tries to attack, kill or catch the snake itself, or if the person tries to touch the eggs of snakes in their dens.

c. Many snake hunters were said to be bitten because they caught the snake post to capture in a wrong way.

d. Farmers are exposed to venomous snake bites when they stumble on them during agricultural operations, irrigation and crop harvesting.

e. Many farmers were bitten when they clean irrigation canals.

f. Many local people including children were bitten when they put their hands in dark earth burrows where snakes are hiding.

Generally speaking, envenomation by the Palestine Viper in the Palestinian Territories is not restricted to humans. It was also reported in domestic animals including dogs, cats, horses, sheep, goats, chickens, rabbits, pigeons and cows [16]. The leg was found to be the most common site for biting by venomous snakes as stated by both doctors and victims. Males were found to be most vulnerable to snake bites than female. Rural populations were also at risk of biting than the populations living in the urban areas. Bites of venomous snakes cause localized severe pains at bite place. Two blue holes pointing to the place of the fangs of the venomous snake appear in the place of biting. The bite begins to swell, and then the bite area starts with blackness and ulceration. The patient may enter a strong shock after a painful bite. For this reason, it was recommended by the local health authorities to try to prevent snake venom from spreading in the rest of the body by calming the casualty and transporting him as soon as possible to nearby clinics or hospitals.

The venom or poison of venomous snakes including the Palestine Viper was found to contain a variety of toxins such as neurotoxins, hemorrhagic toxins, anticoagulants, etc. [3]. Venomous snakes of Palestine vary in their toxicity, so the antivenin used in treating people with bites vary as well depending on the toxicity of the venom and the species of venomous snakes causing the bite. An official at the Palestinian Ministry of Health pointed out that the cost of treating the Palestine Viper bite is very expensive and may exceed 20,000 US dollars. Antivenins against the Palestine Viper are usually not available in Palestinian Territories, so doctors may have to refer patients to Israeli hospitals.

Medical Symptoms and Pathological Effects

Snake envenoming can cause acute local and systemic effects due to the actions of toxic components in the venom. Meetings and discussions revealed that the symptoms of envenomation depend mostly on the bite location, amount of toxin injected, and the behavior of the infected person. In the first 15-20 minutes of bite, the patient feels severe pain in the place of bite, accompanied by swelling, general wasting, discomfort, facial blemishes, vomiting, heavy breathing and abdominal pain. This may be followed by diarrhea, peripheral hypotension, hypotension, sweating and fever, and may develop into shock. Other symptoms may include urine retention, hematuria, heart failure (Bradycardia), swallowing troubles, and so on. More or less of these symptoms or effects has been pointed out in different studies as a result of snake bites and envenomation caused by various venomous snakes [17,18]. Most snakebite patients are not followed up once they are discharged from hospitals and health centers. Although some acute pathological effects of envenoming might completely resolve within a few days of the snake bite, other pathological effects or their consequences may last for months or years as have been suggested by Jayawardana et al. [19].

Deaths are sometimes associated with the Palestine Viper bites; though deaths resulted from other venomous snakes like Painted Saw-scaled Viper (Echis coloratus) were documented in Jordan [3]. World Health Organization reported that venomous snakes caused 5.4 million bites every year around the world, of them 2.5 million suffered with envenoming and around 125,000 died [20]. According to local doctors, the fatalities usually occur due to the absence of specific vaccines, lack of first aid or treatment after biting, and delayed presentation to the hospital. Medical reports in Palestine indicated that more than 90% of snake bites have been attributed the Palestine Viper and are therefore it was considered as the most dangerous and poisonous snake in the Palestine environment [21].

Concluding Remarks

In spite of the harmful envenomation and related causalties and even mortalities caused by the Palestine Viper in the Gaza Strip, it is necessary for the Palestinian ecological parties to raise the awareness of Palestine towards the venomous and non-venomous snakes of the Palestine and their capital ecological role. The possible ways to avoid snake bites and their adverse effects are of utmost priority and should be highlighted as well.
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References

1. Kochva E (1998) Venomous snakes of Israel: Ecology and snakebite. Public Health Review 26(3): 209-232.
2. Bar A, Haimovitch G (2011) A field guide to reptiles and amphibians of Israel. Pazbar LTD, Israel 246.
3. Disi AM (2002) Jordan country study on biological diversity: The herpetofauna of Jordan. The General Corporation for the Environment Protection (GCEP). The Hashemite Kingdom of Jordan pp. 288.
4. Disi AM, Modry D, Nesci P, Rifi L (2001) Amphibians and reptiles of the Hashemite Kingdom of Jordan: An atlas and field guide. Edition Chimaira, pp. 408.
5. Disi AM, Amr Z, Hamidan N (2014) Diversity, threats, and conservation of the terrestrial and freshwater herpetofauna of Jordan. Russian Journal of Herpetology 21(3): 221-233.
6. Hnouie Bloquet S, Sadek RA, Sindaco R, Venchia A (2002) The herpetofauna of Lebanon: New data on distribution. Zoology in the Middle East 27(1): 35-46.
7. Modry D, Rifi L, Abu Baker M, Amr Z (2004) Amphibians and reptiles of the Hashemite Kingdom of Jordan. Denisia 14(2): 407-420.
8. Al-Baba IM (2017) Venomous snakes and envenomation in Palestine. Journal of Entomology and Zoology Studies 5(2): 493-495.
9. Abd Rabou AN (2011) On the ecology of Wadi Gaza, Gaza Strip: Survey and assessment (Wildlife is focused). LAP Lambert Academic Publishing, Germany, pp. 304.
10. Handal EN, Amr ZS, Qumsiyeh MB (2016) Some records of reptiles from the Palestinian Territories. Russian Journal of Herpetology 23(4): 261-270.
11. Qumsiyeh MB (2016) Fauna of Wadi Al-Quff Protected Area: Amphibians, reptiles and mammals. Jordan Journal of Natural History 3: 70-79.
12. Yassin MM, Abd Rabou AN, Al Agha MR (2006) Preliminary survey of terrestrial vertebrate fauna and people’s awareness towards wildlife in the Northern Governorate of the Gaza Strip. Al-Azhar Bulletin of Science: Zoology & Botany 17(1): 17-41.
13. Abd Rabou AN, Yassin MM, Al Agha MR, Hamad DM, Ali AS (2007) The herpetofauna of the Gaza Strip with particular emphasis on the vicinity of Wadi Gaza. The Islamic University Journal (Series of Natural Studies and Engineering) 15(1): 111-135.
14. Abd Rabou AN (2011) Environmental impacts associated with the Beit Lahia wastewater treatment plant, North Gaza Strip, Palestine. Middle East Journal of Scientific Research (MEJSR) 7(5): 746-757.
15. Abd Rabou AN (2019) Threats facing the archaeological sites and buildings in the Gaza Strip, Palestine. The 4th International Conference on Rehabilitation of Historic Sites and Buildings within the Modern Requirements. IWAN Center for Cultural Heritage and Department of Architecture, Faculty of Engineering, Islamic University of Gaza, April 23-24, 2019, 1-30.
16. Aroch I, Harrus S (1999) Retrospective study of the epidemiological, clinical, hematological and biochemical findings in 109 dogs poisoned by Vipera xanthina palaeostinae. The Veterinary record 144(19): 532-535.
17. Sitprija V (2006) Snakebite nephropathy. Nephrology 11(5): 442-448.
18. Kumar KS, Narayanan S, Udayabaskaran V, Thulaseedharan NK (2018) Clinical and epidemiologic profile and predictors of outcome of poisonous snake bites: An analysis of 1,500 cases from a tertiary care center in Malabar, North Kerala, India. International Journal of General Medicine 11: 209-216.
19. Jayawardana S, Arambepola C, Chang T, Gnanathasan A (2018) Long-term health complications following snake envenoming. Journal of Multidisciplinary Healthcare 11: 279-285.
20. Chippaux JP (1998) Snakebite: Appraisal of the global situation. Bulletin of the World Health Organization 76(5): 515-524.
21. Al-Baba IM (2016) The herpetofauna of Palestine: A preliminary checklist. Journal of Entomology and Zoology Studies 4(4): 123-128.