

Venomous snakes of Uzbekistan

Jadowite węże Uzbekistanu

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Streszczenie. Praca przedstawia opis i analizę fauny nocnych motyli Uzbekistanu. Fauna nocnych motyli tego kraju jest bardzo zróżnicowana pod względem pochodzenia zoogeograficznego. Analiza taksonomiczna tej grupy owadów została przeprowadzona na podstawie podziału na sześć głównych grup, tj.: endemity Azji Środkowej, motyle należące do grup Setinus, Tethys, Palearktycznej i Holarktycznej oraz gatunki poliregionalne. W pracy przedstawiono listy gatunków należących do tych sześciu grup, ich udział procentowy oraz liczbę gatunków w podrodzinach nocnych motyli.

Słowa kluczowe: motyle nocne, ekologiczna właściwość, regiony zoograficzne.

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INTRODUCTION

Few animals have captured the human imagination more than the snake. Snakes represented life, health, love, wisdom and immortality, but from the other hands they have been seen as a reason of hate, sin and death (Gold et al., 2004). Snake venom poisoning constitutes a medical emergency.

Of nearly 3,000 snake species that exist in the world, about 600 are venomous. Venomous snakes use modified saliva, snake venom, usually delivered through

highly specialized teeth, for the purpose of prey immobilization and self-defense. Snake venoms are the complex mixtures containing many biologically active substances, mostly proteins and peptides.

Envenoming resulting from snakebites is an important public health problem in many tropical and subtropical countries. The first assessment of global snakebite incidence and mortality was undertaken by Swaroop and Grab (1954). These authors estimated the number of snakebites and deaths respectively at 500,000 and 30,000–40,000 per year. These figures certainly underestimated the true burden because Swaroop and Grab lacked relevant information for their assessment. In this time data from former USSR, China and eastern European countries were unavailable.

Many people are bitten by venomous snakes in different countries. (Gold et al., 2002; Alirol et al., 2010). In 1998 Chippaux published the report based on a greater number of publications and so more reliable, which stated that about 2,5 million people, are envenomed each year, half of whom request medical care, and probably more than 100,000 individuals died (Chippaux, 1998). The highest threat of snakebite exists in South and Southeast Asia. In Asia India has long been thought to have more snakebites than any other country. The hospital-based reporting has resulted in estimates of total annual snakebite mortality in India can reach even 50,000.

The only specific treatment of the snakebite is antivenom (Stock et al., 2007), hence until the era of antivenom, bites from some species of snake were almost universally fatal. Since the time of modern treatment the majority of deaths occur in children, the elderly, and untreated or undertreated individuals.

The aim of the present review is to present the venomous snakes of Uzbekistan. The data on snakebites in Central Asia suffers from the lack of complete data. However, according to the data from International Society of Toxicology, the annual number of snakebites in Uzbekistan varied from 56 to 453 and number of deaths varied from 3 to 14. The burden of envenoming in Uzbekistan is higher than in other Central Asian countries.

VENOMOUS SNAKE SPECIES OF UZBEKISTAN



Fig. 1. *Naja oxiana*

CENTRAL ASIAN COBRA (*NAJA OXIANA*) – EICHWALD 1831

Naja oxiana or the Central Asian cobra (called also Caspian cobra) is a species of venomous snake found in major part of the Middle-East and Central Asia, i.e. in Afghanistan, NE Iran, Pakistan, Kyrgyzstan, Turkmenistan, SW Tajikistan, and Uzbekistan. In Uzbekistan, it can be mostly met in the southern part of the country near the border with Turkmenistan and in the southern slopes of Hissar Mountains (Kazakov et al., 2010). Generally, Central Asian cobra is mainly terrestrial and diurnal snake, being most active during evening and early morning. It feeds on small mammals, amphibians and birds, during the evening and morning can be found in rocky, stony foothills up to and sometimes above 3,000 m elevation. This snake is a good climber and swimmer.

The Central Asian cobra is the biggest venomous snake in Uzbekistan, reaching 200 cm. Its body uniform is yellowish, brownish, grayish, or black; may have traces of wide dark crossbands. Like other cobras, this large snake spreads its “hood” as a warning to other animals. When alarmed, it rears up and widens its neck skin by altering the position of its ribs. This species has short venomous teeth reaching only 3–4 mm. The color pattern varied from light-olive or yellowish to brown or grey.

Naja oxiana venom has been well elaborated (e.g. Grishin et al., 1973; Grishin et al., 1974; Kaplia, 1996; Feofanov et al., 2005; Samel et al., 2008). The venom of

Naja oxiana is mainly neurotoxic. The bite of this species may cause severe pain and swelling. Almost immediately after envenomation, the victim may react with sudden convulsions, drowsiness, headache, limb paralysis, loss of consciousness, nausea, vomiting, intense abdominal pain and excruciating pain around the bite wound. Increased blood pressure and cardiac output is common but by far the greatest danger is respiratory problem. Death can result due to respiratory failure. Central Asian Cobra is the most venomous snake in Uzbekistan. However, the cases of bite are very seldom, because during the meeting with people *Naja oxiana* either escapes or extend up to half of their body in a vertical upward position and "hood-out" waiting for escape of human.

TURAN BLUNT-NOSED VIPER (*MACROVIPERA LEBETINA TURANICA*)
– CERNOV 1940



Fig. 2. *Macrovipera lebetina turanica*

Macrovipera lebetina turanica is a venomous viper subspecies of *Macrovipera lebetina* found in Turkmenistan, Uzbekistan, Tajikistan, Kazakhstan, Afghanistan and Pakistan. It is also called Lebetine viper, Levant viper, or Levantine viper. This species is currently subject to review and it is possible that certain subspecies will soon be elevated to valid species status (Mallow et al., 2003). In Uzbekistan, it can be mostly met in the river valleys and dry slopes overgrowing with bushes (Kazakov et al., 2010).

This is a large snake, with females reaching 130 cm in length and males a little more.

The color pattern consists of a dark ground color with a lighter, orange dorsal zigzag pattern. The head which is triangular and distinct from the neck is usually uniformly colored, although it can occasionally be marked with a dark V-shape. Dorsally, the ground color for the body can be gray, brown, beige, pinkish, olive or khaki. The pattern, if present, is darker, can be gray, bluish, rust or brown in color, and may consist of a middorsal row or double row of large spots (Maslow et al., 2003).

Not much is known about its venom but it contains procoagulants (fibrinogenases) and likely contains myotoxins. It's also possible that it contains hemorrhagins and cytotoxins (Golay et al., 1993). Recently a protein possessing special activity which inhibits angiogenesis both in vitro and in vivo was discovered (Pilorget et al., 2007) Bite of this species is dangerous to human. About 10% of bites can be fatal.

STEPPE VIPER (*VIPERA RENARDI*) – CHRISTOPH, 1861



Fig. 3. *Vipera renardi*

Meadow and steppe vipers are a group of small venomous snake specialized to life in grasslands from eastern Europe to Central Asia (Gvozdik et al., 2012). One of the member of this group is the snake commonly named steppe viper (*Vipera renardi*) Christoph, 1861, sometimes also classified as *Vipera ursini*. Currently *Vipera renardi* is treated as synonym of *V. ursini* by McDiarmid et al. (1999) although *Vipera renardi* is fully accepted name.

Snake this species grows sometimes to 100 cm in length, but usually to about 50–60 cm. Females are larger than males. The body of this viper is thick with

narrow head. It is gray, tan, or yellowish with a dark undulating dorsal stripe, which is edged with black. There are always several large scales or plates on the top of the head.

The venom of this species has been intensively investigated since the beginning of 1980s (Lyubimtseva, Yukelson, 1983). The main components of the venom are phospholipases with antocoagulant properties. The presence and type of action of this enzymes were recently confirmed (Tai et al., 2011). The bite of this snake is not very dangerous and fatal cases are rare.

MULTISCALE SAW-SCALED VIPER (*ECHIS MULTISQUAMATUS*)

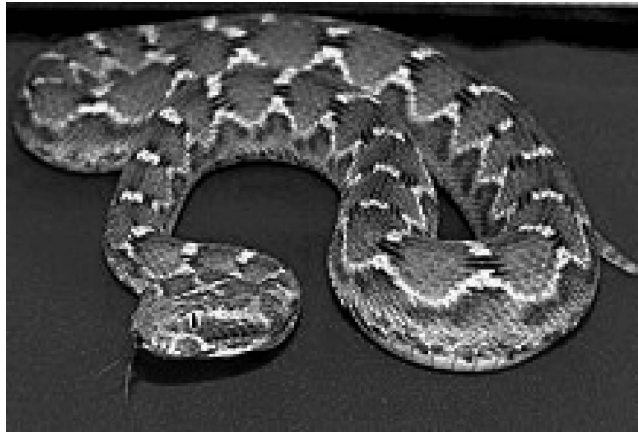


Fig. 4. *Echis multisquamatus*

This snake was formerly describes as *Echis carinatus*. It was classified as a separate species, *Echis multisquamatus*, when first described by Cherlin (1981). It is also referred to as *Echis carinatus multisquamatus* with common names: multiscale saw-scaled viper or transcaspian saw-scaled viper. This venomous viper is found in Uzbekistan and also in Turkmenistan, Tajikistan, Iran, Afghanistan and Pakistan.

This species or subspecies grows to 80 cm in length, but usually no more than 60 cm. Its head mark is always cross-shaped; its lateral white line is continuous and undulating; narrow transverse white bands occur on the middorsum.

Snake of this species can be found on a range of different substrates, including sand, rock, soft soil and in scrublands. Often found hiding under loose rocks. This species is mostly crepuscular and nocturnal, although there have been reports of activity during daylight hours.

The venom of this species is a complex mixture of toxins that contribute to its lethality and has been investigated for many years, as it has been used in the manufacture of several drugs. The venom contains many enzymes (Kornalik, Blomback, 1975). Some of them affect the mammalian blood coagulation system, in particular those that cause acute thrombosis (Yamada et al., 1996). Hence, one of the most dangerous systemic symptoms are hemorrhage and coagulation defects (Guerranti et al., 2010). The mortality rate from bites of *Echis multisquamatus* can reach about 20 percent.

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