# RESEARCH ON THE HABITATS OF *VIPERA URSINII MOLDAVICA* POPULATIONS FROM IAŞI COUNTY

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**Abstract.** *Vipera ursinii moldavica* is a species of community interest whose conservation requires the designation of special areas of conservation. In the past, *Vipera ursinii moldavica* populations were identified from Valea lui David (near the town of Iaşi), Dealul lui Dumnezeu (within the area encompassed by Românești, Avântu şi Ursoaia), and Tomeşti (near the locality of Tomeşti). In these habitats, we carried out investigations on vegetation and fauna, focusing on the existence of the optimal conditions, predators and feeding resource, for the meadow viper. We managed to find persistent populations only at Valea lui David and Dealul lui Dumnezeu, where the habitats appeared to be suitable for the meadow viper.

**Keywords:** *Vipera ursinii moldavica*, habitats.

**Rezumat. Cercetări asupra habitatelor populaţiilor de *Vipera ursinii moldavica* din Judeţul Iaşi.** *Vipera ursinii moldavica* este o specie de interes comunitar a cărei conservare necesită desemnarea ariilor speciale de conservare. În trecut, populaţii de *Vipera ursinii moldavica* au fost semnalate de la Valea lui David (în apropierea oraşului Iaşi), Dealul lui Dumnezeu (în perimetrul delimitat localităţile Românești, Avântu şi Ursoaia) şi Tomeşti (lângă localitatea Tomeşti). În aceste habitate au fost făcute investigaţii privind vegetaţia şi fauna, urmărind-se existenţa condiţiilor propice, prădătorilor şi resursei de hrană. Populaţii persistente au fost identificate la Valea lui David şi la Dealul lui Dumnezeu, unde habitatele oferă condiţii optime pentru vipera de stepă.

**Cuvinte cheie:** *Vipera ursinii moldavica*, habitate.

## Introduction

The subsecies *Vipera ursinii moldavica* (Nilson *et al.*, 1993) is one of the endangered subspecie of the *Acridophaga* compex. The geographical range of this subspecies spreads from the Carpathian Mountains to the Danube (Nilson & Andrén, 2001).

The meadow viper was identified in several localities from Moldova (Romania): Valea lui David natural reserve (Vancea & Ionescu 1954, Fuhn & Vancea 1961, Nilson *et al.* 1993), Tomeşti (Băcescu, 1933, 1937), Românești, Calaraşi, Şendriceni (Vancea *et al.* 1985), Tecuci (Băcescu, 1941) and the Rarău Mountain (Vancea *et al.* 1985).

The Moldavian meadow viper is in the second annex of the Habitats Directive 92/43/EEC which includes species of plants and animals of community interest whose conservation requires the designation of special areas of protection (European Commission, 1992; Ministerul Mediului si Gospodaririi Apelor, 2005). Steppic habitats represent natural habitat types of community interest whose conservation requires the designation of special areas of conservation and are also included in the first annex of the same directive. Additionally, the Moldavian meadow viper is included in the Red Book of the Romanian Vertebrates, as critically endangered (Iftimie, 2005).

The objectives of study are to identify the persistent populations of the Moldavian meadow viper given the lack of recent records and sometimes incomplete geographical localisation, and to assess the status of the habitats dwelt by persistent populations. Habitat status assessment is particularly important because it allows comparisons that may reveal if they are fit for the persistence of viper populations.

**Material and Methods**

The field investigations were carried out in 2006, in spring and late-summer, when the chances to observe in Moldavian meadow vipers individuals are the highest. These periods coincide with the emergence from hibernation and reproduction activities, and birth, respectively. Additionally, the tussock vegetation is so high and consequently it is easier to observe the snakes.

The investigated sites were the ones of Iasi County, i. e. Valea lui David, Dealul lui Dumnezeu, and Tomeşti (Fig. 1)

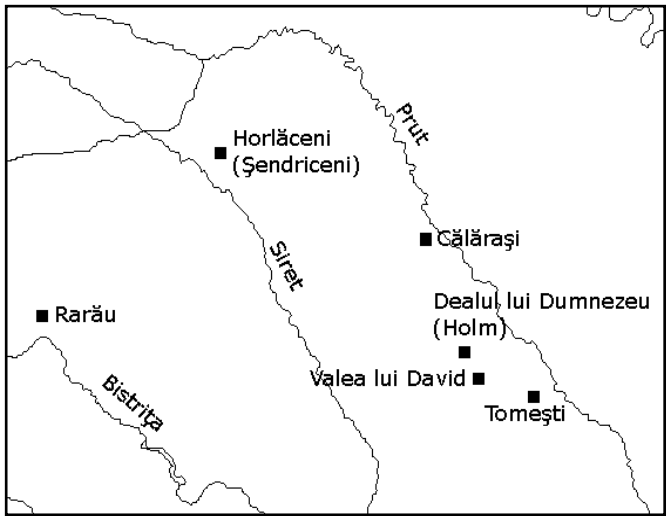


**Figure 1.** Distribution of Moldavian meadow viper in the northern part of Moldavia (Romania).

In each habitat, we investigated the communities of plants (living environment for the vipers), reptiles, orthopters (foraging source), and birds (potential predators). The phytosociologial research was performed according to the Braun-Blanquet methodology (1964). Animal community investigations consisted basically in active observations, along transects.

Consequently, the data were processed through a similarity analysis (Sorensen coefficient, centroid linkage method) (Fowler *et al.*, 2000).

**Results and Discussion**

Regarding the climatic factors, the investigated sites are divided into two groups: one consisting of Valea lui David and Dealul lui Dumnezeu (warmer and dryer climate), and the second represented by Tomeşti (cooler and wetter climate).

After the investigation, we recorded the species of reptiles, orthopers, birds, and the principal plant association, from each site (Tab. 1).

**Valea lui David.** It is a natural reserve, located close to the town of Iaşi. (47°11’31.5’’N; 27°28’06.8’’E, altitude 180 m). It is the typical site for the subspecies *V. u. moldavica*.

It is inhabited by a persistent Moldavian meadow viper population (Fig. 2). In this population we identified adults of both sexes and newborns. Other reptile species that live in this site are: *Lacerta viridis*, *Lacerta agilis*, *Natrix natrix*, and *Coronella austriaca*. The presence of *Coronella austriaca* is not a fortunate fact because this snake can feed on meadow viper juveniles.

**Table 1.** Species distribution in sites (VD-Valea lui David, DD-Dealul lui Dumnezeu, T-Tomeşti).

| | VD | DD | T |
|---|---|---|---|
| **REPTILEs** | | | |
| *Vipera ursinii moldavica* | + | + | |
| *Coronella austriaca* | + | + | + |
| *Lacerta agilis* | + | + | + |
| *Lacerta viridis* | + | + | + |
| **ORTHOPTERS** | | | |
| *Calliptamus italicus* | + | | + |
| *Chorthippus albomarginatus* | + | | + |
| *Chorthippus apricarius* | + | | + |
| *Chorthippus biguttulus* | + | | + |
| *Chorthippus brunneus* | + | | + |
| *Chorthippus dorsatus* | + | | + |
| *Chorthippus mollis* | + | | |
| *Chorthippus parallelus* | + | + | |
| *Conocephalus hastatus* | + | | |
| *Decticus albifrons* | + | | |
| *Decticus verrucivorus* | + | + | + |
| *Dociostaurus brevicollis* | + | | |
| *Euchorthippus declivus* | + | + | + |
| *Euchorthippus pulvinatus* | + | | |
| *Gampsocleis glabra* | + | + | + |
| *Gomphocerripus rufus* | + | | |
| *Gryllus campestris* | + | | + |
| *Isophya zubowskii* | + | | |
| *Leptophyes albovittata* | + | | + |
| *Melanogryllus desertus* | + | + | |
| *Metrioptera bicolor* | + | + | + |
| *Metrioptera roeselii* | + | | + |
| *Modicogryllus frontalis* | + | | + |
| *Oecanthus pellucens* | + | | + |
| *Omocestus haemorrhoidalis* | + | | |
| *Omocestus rufipes* | + | | |
| *Pezotettix giornae* | + | | + |
| *Phaneroptera falcata* | + | | + |
| *Platycleis striata* | + | + | |
| *Platycleis veyselii* | + | | |
| *Poecilimon brunneri* | + | | |
| *Poecilimon fussi* | + | + | + |
| *Ruspolia nitidula* | + | | |
| *Saga pedo* | + | + | |
| *Stenobothrus lineatus* | + | + | + |
| *Tetrix bipunctata* | + | | + |
| *Tetrix tenuicornis* | + | | |
| *Tetrix undulata* | + | + | |
| *Tettigonia caudata* | + | | + |
| *Tettigonia viridissima* | + | | + |
| **VEGETATION** | | | |
| *Taraxaco serotinae-Festucetum valesiacae* | + | + | |
| *Jurineo archnoideae-Stipetum lessingianae* | + | + | |
| *Agropyro pectinati-Stipetum capillatae* | + | + | |
| *Artemisio austriacae-Poetum bulbosae* | + | + | |
| *Taraxaco serotinae-Botriochloetum ischaemi* | + | + | + |
| *Xero-Phragmitetum* | + | + | |
| *Sambucetum ebuli* | + | + | |
| *Sclerocloo-Polygonetum avicularis* | + | + | |
| *Carduetum acanthoides* | + | + | |
| *Scleratho-Trifolietum arvensis* | + | + | |
| *Rorippo austriacae-Agropyretum repentis* | + | + | |
| *Agrostio-Caricetum distantis* | + | + | |
| *Galio palustris-Caricetum ripariae* | + | + | |
| *Phragmitetum vulgaris* | + | + | |
| *Astero tripoli-Juncetum gerardii* | + | + | |
| *Puccinellietum limosae* | + | + | |
| *Camphorosmetum annuae* | + | + | |
| *Anthoxantho Agrostietum capillaris* | | | + |
| *Agrostietum stoloniferae* | | | + |
| *Agrostio-Festucetum rupicolae* | | | + |
| *Festucetum rupicolae* | | | + |
| **BIRDS** | | | |
| *Accipiter gentilis* | | + | |
| *Accipiter nissus* | + | | + |
| *Acrocephalus arundinaceus* | + | + | |
| *Acrocephalus scirpaceus* | + | | |
| *Alauda arvensis* | + | + | + |
| *Anas platyrhynchos* | + | | |
| *Anthus campestris* | + | + | |
| *Apus apus* | + | | + |
| *Asio otus* | + | | |
| *Athene noctua* | + | | |
| *Buteo buteo* | + | | |
| *Buteo lagopus* | + | | |
| *Carduelis carduelis* | + | + | + |
| *Carduelis chloris* | + | + | |
| *Chlidonias hybridus* | + | | |
| *Ciconia ciconia* | | + | + |
| *Circus cyaneus* | + | | |
| *Corvus corax* | + | | |
| *Corvus corone* | + | + | |
| *Corvus frugilegus* | + | + | |
| *Coturnix coturnix* | | + | |
| *Crex crex* | + | | |
| *Cuculus canorus* | + | | + |
| *Delichon urbica* | | + | |
| *Emberiza citrinella* | + | + | |
| *Erithacus rubecula* | | | + |
| *Falco subbuteo* | + | | |
| *Falco tinnunculus* | + | + | |
| *Falco vespertinus* | + | | |
| *Fringilla coelebs* | + | + | |
| *Fulica atra* | + | | |
| *Galerida cristata* | + | | + |
| *Gallinula chloropus* | + | | |

| | VD | DD | T |
|---|---|---|---|
| *Garrulus glandarius* | | | + |
| *Hirundo rustica* | + | + | + |
| *Lanius colurio* | + | + | + |
| *Lanius minor* | + | + | + |
| *Larus cachinnans* | + | | |
| *Larus ridibundus* | + | | |
| *Luscinia luscinia* | | | + |
| *Merops apiaster* | | | + |
| *Miliaria calandra* | | + | |
| *Milvus migrans* | + | | |
| *Milvus milvus* | + | | |
| *Motacilla alba* | + | + | |
| *Motacilla cinerea* | | + | |
| *Motacilla flava* | + | | |
| *Oenanthe oenanthe* | + | | |
| *Oriolus oriolus* | + | | |
| *Pandion haliaetus* | + | | |
| *Parus major* | + | | |

| | VD | DD | T |
|---|---|---|---|
| *Passer domesticus* | + | + | |
| *Passer montanus* | + | + | |
| *Phasianus colchicus* | + | | + |
| *Pica pica* | + | + | |
| *Rallus aquaticus* | + | | |
| *Saxicola rubetra* | + | + | |
| *Saxicola torquata* | + | + | |
| *Sreptopelia turtur* | + | | + |
| *Streptopelia decaocto* | + | | |
| *Sylvia borin* | + | | |
| *Sylvia communis* | + | + | |
| *Sylvia curruca* | + | + | |
| *Sylvia nisoria* | | | + |
| *Turdus merula* | + | | + |
| *Turdus phillomelos* | + | | + |
| *Turdus pilaris* | + | | |
| *Turdus viscivorus* | + | | |
| *Upupa epops* | + | | |

The vegetation comprises 6 xerophilous associations (*Taraxaco serotinae-Festucetum valesiacae*, *Jurineo archnoideae-Stipetum lessingianae*, *Agropyro pectinati-Stipetum capillatae*, *Artemisio austriacae-Poetum bulbosae*, *Taraxaco serotinae-Botriochloetum ischaemi*, *Xero-Phragmitetum*), 4 nitrophilous associations (*Sambucetum ebuli*, *Sclerocloo-Polygonetum avicularis*, *Carduetum acanthoides*, *Scleratho-Trifolietum arvensis*), 1 hygro-mesophilous association (*Rorippo austriacae-Agropyretum repentis*), 3 hygrofilous associations (*Agrostio-Caricetum distantis*, *Galio palustris-Caricetum ripariae*, *Phragmitetum vulgaris*), and 3 halophilous associations (*Astero tripoli-Juncetum gerardii*, *Puccinellietum limosae*, *Camphorosmetum annuae*). Among them, the xerophilous, halophilous and nitrophilous associations dominate, in this order. Beside the dominant, Euroasian and European floristic elements, the pontic ones reflect the strong steppic characteristic of the area (Fig. 3).

**Figure 2.** *V. u. moldavica* (Valea lui David).

**Figure 3.** Steppic vegetatio (Valea lui David).

We identified 40 species of orthopters (Tab. 1). Among them, the presence of *Saga pedo* (Fig. 4) is notable, as this species is considered an indicator of the good status of steppic habitats.

The bird fauna from Valea lui David is represented by 58 de species (Tab. 1). The pheasant is considered a menace for the meadow viper.

Despite its protective status, the area is considerably disturbed: mowing, grazing (sheep), burning (seldom), car testing (Fig. 5), and illegal capturing.

**Figure 4.** *Saga pedo* (Valea lui David).

**Figure 5.** Vehicle tracks (Valea lui David).

**Dealul lui Dumnezeu**. It is located to the northwest from Iaşi, in the area limited by the localities Epureni, Avântu, and Ursoaia (Commune Româneşti) (47°16'25.9"N, 27°24'47.0"E, altitude 190 m).

In this site there is a persistent Moldavian meadow viper population (Fig. 6). We observed both adults and juveniles.

With regard to the other characteristic, this site looks very much the same as the above motioned one. The steppic characteristic is obvious (the pontic floristic elements dominate the flora). *Saga pedo* was also identified, but pheasants were not. This zone is relatively remote and inaccessible which is the reason why the human impact resumes to grazing (sheep) and mowing. At the bottom of the valley, there are small agricultural areas (Fig. 7).

**Figure 6.** *V. u. moldavica* (Dealul lui Dumnezeu).

**Tomeşti.** It is located to the southeast from Iaşi (47°07'32.3"N, 27°42'18.3"E, altitude 80-170 m).

Our investigation of the neighbouring areas with natural vegetation failed to identify the Moldavian meadow viper. The zone between Tomeşti and Prut is dramatically modified by hydrotechnical and industrial constructions (Fig. 8).

The vegetation is dominated mostly by mesophilous associations which confer a general aspect that differs from the one of the other sites (Fig. 9).

The human influence over natural areas consists of mowing, grazing and small scale agriculture.

**Figure 7.** General View (D. lui Dumnezeu).

**Figure 8.** Prutului Valley (Tomeşti).

**Figure 9.** Mesophilous vegetation (Tomeşti).

Concerning the overall comparison of the investigated sites we observed that the habitats from Valea lui David and Dealul lui Dumnezeu are 59.6% similar (Fig. 10). The similarity between Tomeşti and the group formed by Valea lui David and Dealul lui Dumnezeu is very low (8.4%).


**Figure 10.** The similarity of the investigated sites.

## Conclusions

The populations of *Vipera ursinii moldavica* persist at Valea lui David and Dealul lui Dumnezeu. This situation results from the fact that the habitats from these sites are suited for the Moldavian meadow vipers.

The vegetation of the sites with viper populations is mainly xerophilous and has a strong steppic characteristic.

The orthopers display a high diversity and constitutes a rich feeding resource for the meadow viper.

The predators of these habitats do not inflict an exaggerated pressure on the viper populations.

The general status of the habitats is good; however the threat of ruderalisation and human impact must be taken into consideration, especially in the unprotected areas

In Tomeşti the meadow viper was not found. The habitats exhibit a strong mesophilous characteristic which makes the existence of viper populations less probable.

Given that the absence of a species is more difficult to demonstrate than the presence, we shall consider further investigations in the sites from where the viper has not been identified, as well as in adjacent potentially suited habitats.

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