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**CONTEMPORARY SPREADING AND INFORMATION ON AGKISTRODON
HALYS CARAGANUS EICHWALD, 1831 (REPTILIA, CROTALIDAE)
NUMBERS IN KAZAKHSTAN**

Many years literary, interrogatory and authors own materials collected in the different regions of Kazakhstan are summarized in the article. The obtained data considerably enrich and work out in detail our knowledge on (Agkistrodon halys caraganus Eichwald, 1831) spreading within the area limits on insufficiently studied territories and give an idea of its numbers.

According to the latest data *A. halys* is subdivided into three subspecies: *A.h. caraganus* Eichwald, 1831; *A.h. caucasicus* Nikolsky, 1916 and *A.h. halys* Pallas, 1776. *A.h. caraganus* Eichwald, 1831 inhabits in Kazakhstan.

The common area of this species stretches from the Pacific Ocean in the east to northern Iran and Azerbaijan in the west. It seats in latitude up to 50-55° to the north and up to 35-40° to the south (Bannikov et al., 1977).

According to the maps of the natural habitat the spreading of halys viper in Kazakhstan (Paraskiv, 1956; Bannikov et al., 1977) is insufficiently studied. The «blank spaces» remained in the knowledge of its spreading are explained not only by insufficient study of the separate regions but by its low number in some regions and the irregularity of distribution as well.

As far as it is very difficult to embrace the wide and, at times, difficult of access territories inhabiting by halys viper every observation received from zoologists are of significant interest.

Literary, interrogatory and many years own data are summarized in this communication. Nearly all-concrete points of this snake's findings in Kazakhstan enumerated by A.M.Nikolsky (1915) are taken into account. We have used a series of publications containing a general information without indication of the concrete points of halys viper findings (Lesnyak, 1964; Fomina, 1970; Neruchev et al., 1989; Starikov, Prokopov, 1990 and others).

The very first findings of halys viper in the southwestern Kazakhstan adduced by A.M.Nikolsky (1915) are attributed to

Mangyshlak and Novo-Alexandrovsk as well as to the eastern littoral of Caspian Sea (Lehmann, 1840; Karelin, 1837; Bear, 1894; Abramow, 1905). Subsequently, the data on its spreading in this region are limited only by Mangyshlak (Paraskiv, 1956; Bannikov et al., 1977). As the recent data generalized by us show, this species is, undoubtedly, spread through all the territory of Ustyurt and in the south it reaches the boundaries of Turkmenistan where was found in the north of Karabogaz-Gol (Shammakov, 1981) and Karakalpak part of Ustyurt (Kostin, 1956; Bogdanov, 1960).

The scant information on Kyzylkum desert is given by A.M.Nikolsky (1915; Abramow, 1905). Within the limits of Uzbekistan, according to the data of O.P.Bogdanov, N.A.Zarudny was one the first investigators who have found halys viper in these sands. The same author indicates the snake for the regions contiguous to Ustyurt and the littoral of Aral Sea. In Kazakhstan part of Kyzylkum sands three findings of animal are known. One of them is attributed to their south part, two another to Syr-Darya river plain, on a level and to the north from Kzyl-Orda city (Paraskiv, 1956). M.L.Golubev (1990) has met halys viper in the North Kyzylkum (Chabankazan and Chirikrobat). It should be noted that during the route investigation of South-East Kyzylkum (from the vill. Akkum to the vill. Yanykurgan it was investigated six points) undertaken by us in 1989 and during the many years stationary works in the region of the hole Baymakhan (in 20-45 km south-west of vill. Bairkum) halys viper was not met. It testifies, at least, to its small number.

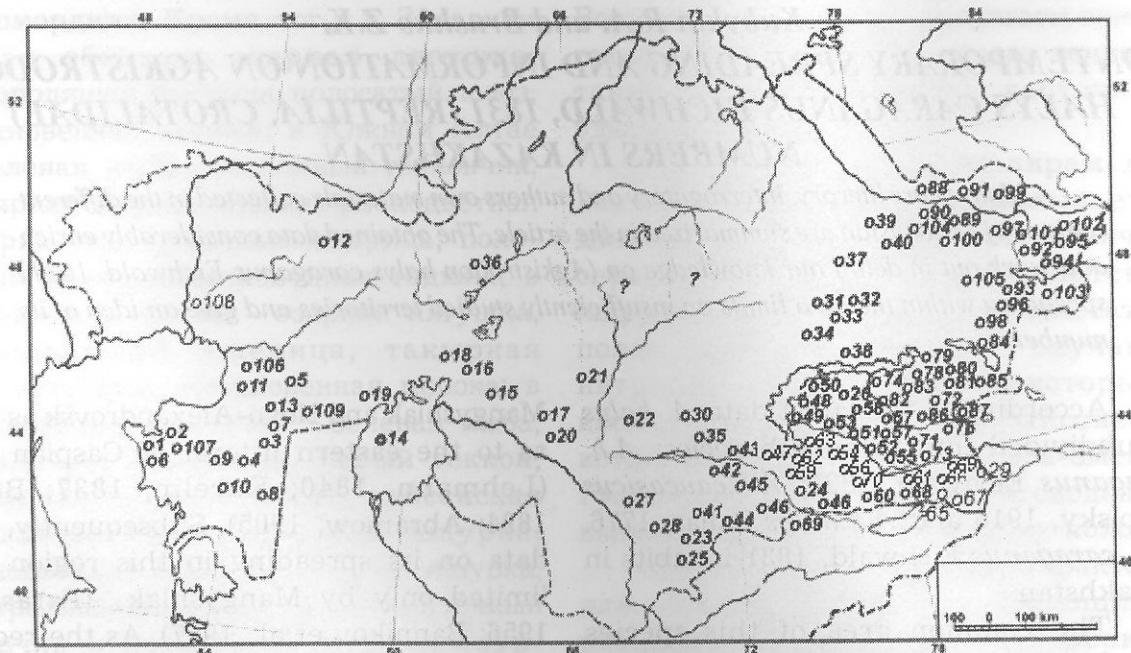


Fig. Spreading of *Agkistrodon halys caraganus* Eichwald (Reptilia, Crotalidae) in Kazakhstan
Finding places

1. Vicinity Fort Shevchenko. 2. 7 km from Fort Shevchenko, gorge Chulii. 3. 140 km S-W. of the sands Sam. 4. S. shore of the lake Tugarkchan. 5. N. slopes of Zheltau mountain range. 6. Novo-Alexandrovs. 7. 20 km W. Beyneu town, nearer to Kaydak sors. 8. Vicinity of Tulep town. 9. The spring Arkyramazhontyk in 45-km northward Say-Utes town. 10. 80 km S-W. of Kulsary town. 11. The Ustyurt Reserve. 12. Vicinity of Aktubinsk city. 13. 15 km N-W. of Mataykumsky crossing. 14. The Barsakelmes Reserve in the Aral Sea. 15. 125 km N. of Dzhusaly vill. 16. Northern Aral region. 17. Aryskum sands. 18. Priaralskie Karakumy. 19. Paskevich Gulf, near Turangly cape. 20. Vicinity of Kzyl-Orda. 21. N-W Betpak-Dala, Katynkum sands. 22. W. Betpak-Dala, urotshistshe Chulak-Espe. 23. Boroday Mt. range. 20 km N-W. of the vill Vannovka. 24. Copa river's basin, stud Degeres. 25. Talas Alatau, the Aksu-Dzhabagly Reserve. 26. 40 km W. of the vill Aynabulak (southern outskirts of Sary-Ishyk-Otrau sands). 27. Karatau Range. 28. Aktau Mt. range. 29. Koyandytau range, 29 km west of the vill Kaytyn. 30. Central Betpak-Dala, Kagashik meteorological-station. 31. Vicinity of Akcha-Tau Mt. 32. 120 km E. of Akchatau, May-Tas. 33. Kaunradsky district, Kyzyl-Tas Mt. 34. Bektauata Mt. 35. Vicinity of the vill Taldy-Ozek. 36. Akmin urotshistsche, on Turgay river. 37. Vicinity of Karkaralinsk town. 38. North shore of Balkhash lake. 39. Central Kazakhstan, E. part of Karaganda oblast. 40. Targyl Mt. 41. Karatau range, Berkara chine. 42. 20 km W. of the vill Furmanovka. 43. Vicinity of the vill Furmanovka. 44. Vicinity Dzhabul city. 45. 15 km N-W. of the vill Novotroitskoe. 46. The foothills of Kyrgyz range, district Lugovskoy, Shibyndy gorge. 47. Vicinity of Chokpar station. 48. Lower reach of Ili river, 25 km N-E. of the vill Karaoy, urotshistsche Ushkuduk. 49. Vicinity of the vill Karaoy. 50. Lower reach of Ili river, 40 km E. from vill Karaoy, urotshistsche Karadon. 51. Right bank of Ili river, vicinity of the vill. Bakanas. 52. Right bank of Ili river. 20 km above the vill. Bakanas. 53. Vicinity of the vill. Bakanas, in 6-18 km on N-E, and E. 54. Right coast of Ili river in 60 km northward of Almaty. 55. Urotshistsche «statue stones» in 30 km below of Kapchagay town. 56. S. coast Kapchagay reservoir, mouth of Kurchilinki river. 57. 128 km Almaty-Bakanas road and 17 km on east. 58. Malay-Sary range. 59. Vicinity of Chemolgan station. 60. Big Almaty rift, hydroelectric power station-2. 61. Vicinity Almaty city. 62. 70 km N-W of Almaty, urotshistsche Sorbulak. 63. Vill Kolshyngel - vill Bozoy road. 64. Confluence of the rivers Ili and Charyn. 65. 35 km northeast of Narynkol vill Esekart mountain. 66. Between Sumbe and Sarybastau villages, northeast of vill Narynkol. 67. Range Terskey Alatau, 7 km southeastward of Kokpak vill. 68. The Alma-Atinsky Reserve. 69. Range Zhetyzhol, vicinity of Shien vill. 70. Interflue of Chilik and Charyn rivers. 71. North slopes of Altyn-Emel range, near the mountain pass. 72. Konyrtau mountains, vicinity of Kzyl-Agach vill. 73. Chulak mountains, urotshistsche Kzylaus. 74. Karatal river's flood-plain. 75. 150 km south of Karatal river, urotshistsche Altynsay. 76. Koktal river, 7 km above of vill. Araltobe. 77. Vicinity of Konyrolen vill. 78. 10 km south of Lepsinsk vill. 79. 35 km south of Aktogay vill. 80. North slopes of Arganaty. 81. Confluence of Sarkand and Aksu rivers. 82. Lake Ushkol-3. 83. Lepsy and Karatal rivers interflue. 84. Lake Alakol, islands Kishkene-Araltobe and Ulken-Araltobe. 85. North-western coast of the lake Dzhalanashkol. 86. Valley of the river Kora. 87. Vicinity of Kopal town. 88. Vicinity of Semipalatinsk city. 89. Vicinity of Ust-Kamenogorsk city. 90. Vicinity of Shemonaicha vill. 91. Vicinity of Sennoe vill. 92. North coast of Zaysan lake, 10 km east of Arkaul lake. 93. Valley Chiliky, south foreland of Monrak range. 94. 40 km west of Buran vill. 95. Karabiruke mountain in 50 km west of Buran vill. 96. 98 km northward Zaysan town. 97. Massif Kok-Tau, the region of Serbin lakes. 98. Tarbagatay mountains, in 30 km south-west of Aktogay vill. 99. North limits Markakol depression, upper course of river Sornaya basin of Kurchum river. 100. Tavrichesky district, vicinity of the state farm Kalinin. 101. 8-km east of Sergeevka vill, left confluent of Zhenishke river. 102. Vicinity of Prirechnoe vill. 103. Markakol district, urotshistsche Achshu-Tas. 104. Ulan region, vill Kanay. 105. Kalbin Altay, Karzhakal mountains. 106. Vill Koschagyl. 107. Central Mangyshlak, the sands in 80 km east of Sartagata. 108. Lake Inder. 109. Sands Sam.

The sources of information: Andrushko (1955) - 31,32; Antipin (1955) - 27,28; Berdibaeva (1974) - 89,103, 104; Golubev (1990) - 43,81; Egorov (1990) - 97; Zinchenko et al. (1990) - 99; Karpenko (1958) - 14; Korelov (1948) - 70; Kren (1953) - 17; Kubykin (1975) - 84; Lesnyak (1964, 1966) - 53,54, 59; Lobachev, Chugunova et al. (1973) - 16; Nikolsky (1915) - 5,6, 15,20, 61,78, 87,89, 108; Paraskiv (1956) - 12, 36,37, 44,88, 90,91; Smirnovsky (1961) - 24; Cernov (1977) - 38,40, 47; Cernov (1954) - 108; Shenbrot, Semenov (1989) - 83,85, 86; Shulpin (1948) - 25. Collections: Zoological Institute of Russian Academy of Sciences - 18,19, 33,39, 51,75, 100,105, 107,109; Institute of the zoology of NAS Republic Kazakhstan - 15,21, 23,30, 34,41, 48,50, 56,59, 60,61, 64,65, 69,72-74,76-79,92,94. Observation data: Z. K. Brushko - 26 (1981), 29,35 (1989), 45, 57,63 (1978), 52 (1976), 58 (1975), 80,82 (1985); L. A. Burdelov - 13 (1974); V. A. Venetsev - 68 (1978); A. P. Gistsov - 7 (1979), 10,106 (1989); V. G. Kolbintsev - 46 (1986); I. M. Kirienko - 95 (1987); A. F. Kovshar, V. D. Krestyaninov, V. G. Kolbintsev V.K. - 25 (1961,1949, 1989); R. A. Kubykin - 42,45 (1978), 49 (1982), 52 (1969), 55,98 (1986), 68 (1995), 71 (1996), 96,101, 102 (1987); I. L. Tretyakov - 1-4 (1985); R. G. Shaymardanov - 66 (1988); R. V. Jashenko - 67 (1987).

A.M.Nikolsky (1915) cites it for Kzyl-Orda region.

It should be noted that halys viper spreading is of mosaic nature. Thus, it is unusual in fine sands near Bokter station (northwest coast of Kapchagay Reservoir). While, it is found to the west from the sands in direction to Ili river, on the massif Kerbulak and to the west.

The region of Inder lakes is one of the northern points of halys viper spreading area in the valley of Ural River (Nikolsky, 1915 - Chrictoph, 1876). At the same place it was repeatedly found by S.A.Cernov (1954). It was registered somewhat more northern, in the urotshistshe Kuagach-Kaldaygaty (Zarudny, 1895) and further to the east near Aktyubinsk city (Paraskiv, 1956).

K. P. Paraskiv and N.V. Butovsky (1960) investigated the territory of the western regions of Kazakhstan through many routes. However, they did not registered halys viper, on these grounds therefore this snake has been considered by authors as rare. Z. K. Brushko and I. M. Kirienko did not met it during the survey of Utva-Ilek interstream area in 1989-1991 years. In North-Caspian area the snake was found in Volga-Ural, Ural-Emba and Emba-Predustyurt regions (Neruchev et al, 1989).

Southeast and East Kazakhstan are comparatively well studied. Among the ancient collections of halys viper listed by A. M. Nikolsky (1915) the large territories of these regions have been indicated: Tarbagatay - Schrenck, 1844; lake Balkhash - Schrenck, 1842; near the lake Balkhash - Berg, 1903; lake Alakol - Schrenck, 1844; Semirechensk province - Abramow et Begak, 1904; Alatau - Fedchenko, 1897; Semirechie, Aksun - Kocenka, 1901; Saur mountains - Suwortzew, 1887; lake Zayssan - Sedelnikow, 1906. According to the latest data of S.V. Starikov and K.P. Prokopov (1990) halys viper is almost every where usual species in the Western, Southern and Kalbin Altay, in Saur, Monrak, Tarbagatay and Zayssan depression. According to the publications of A.P.Iesnyak (1960) and

Fomina (1970) studying the ecology of this snake, it is widely spread in Chu-Ili mountains and South Balkhash region (sands of Sary-Ishik-Otrau). K.P. Paraskiv (1956) has the material from Chu and Balkhash saxaul forests and Betpak-Dala desert.

As a whole, there are, for the present, insufficient data on *A.h. caraganus* Eichwald, 1831 spreading details, and first of all, in Central Kazakhstan, Betpak-Dala and Kyzylkum.

Thus, the limits of halys viper area are not changed since the appearance of the report of K.P. Paraskiv (1956). The northern boundary from West to East is determined by the following points: lake Inder, Aktyubinsk, urotshistshe Akmin on Turgay, Karkaraly mountains, Semipalatinsk, Ust-Kamenogorsk. The northern inhabitation limit on the largest part of the Central Kazakhstan is not clear as before. To the south halys viper inhabits everywhere, reaching the boundaries of the neighboring republics.

The data on halys viper, numbers are very scant and have subjective nature. Thus, in Aral Karakum (Lobachev, Chyugunova, et al, 1975) and in Semirechie (Golubev, 1990) one attribute it to the common snake species. On Mangyshlak it is found in small number (Paraskiv, 1956). It is not unusual Mugodzhari in mountains (Zarudny, 1895). On the territory of the Western Kazakhstan it is rare (Paraskiv and Butovsky, 1960). It is considered as numerous between Chilik and Charyn, and in Kazakh plateau (Korelov, 1958; Andrushko, 1954). In Karatau, except Aktau, are rare (Antipin, 1955).

The data listed below, taking into account the duration of the population estimation, or enumerated on one square unit, present more objective notion on halys viper quantity. Thus, in Volga-Ural interstream area in the region of the lake Inder during hour-long excursion it was met 9 individuals (Cernov, 1954). In Zheltau mountain ridge (eastern extremity of Guriev oblast) when the total length of routes was 210 km and 55 km in nighttime (width of the route 5-10 and 1-3 m

correspondingly) the snake was registered only two times (Kireev, 1981). Near the station Otar (Almaty oblast) halys viper the population density of her was equal to 2,6 individuals per hectare (Bogdanov, 1965). In Sary-Ishyk-Otrau in the region of Bakanas village during 10 days in June of 1961 en route 70-km long 185 snakes were registered. Here, the «snake foci» with population density 88 individuals per ha. Were met, and in the next to them it was only 3-8 individuals per ha (Lesnyak, 1966). In 1958-1963 years he has registered in Chu-Ili Mountains, according to the summary data, 567 animals. In Chu-Ili interstream area in June-July of 1967 and in April-May of 1968 were collected the material on 428 snakes (Fomina, 1970).

High number of halys viper knows the island Barsa-Kelmes (Aral Sea). In June and October of 1936 year it was obtained here 694 individuals (Pestinsky, 1939). In 1936-1947 years it was caught near 2448 head. The population density in «snake foci» was about 80 individuals per ha (Karpenko, 1958).

It can be judged about the number of halys viper in Dzhabbul region of Almaty oblast by the number of studied snakes and bitten agricultural animals. In days of the inspection of the stud farm «Degeres» territory from 15 July 1937 to 1941 Smirnovsky B.N. (1948) 1078 snakes used. During 9 years (1932-1940) the number of bitten horses was 1194, 299 were died. During 8 years (1947-1954) correspondingly 2514 and 688. The number of sheep bitten during 6 years (1947-1951, 1954) was 1534, of died 422.

Unfortunately, the special estimations of venomous snakes were not made and their actual resources are unknown. Nevertheless, the needs for halys viper venom exist and the territory of the republic remains the place of halys viper poaches catching for the serpentarias of the neighboring countries.

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РЕЗЮМЕ

В статье обобщены многолетние литературные, опросные и собственные материалы, собранные в различных областях Казахстана. Полученные сведения значительно обогащают и детализируют наши знания о распространении западного щитомордника () в пределах ареала на слабо изученных территориях и дают представления о его численности