

Morphological characteristics of the populations of *Coronella austriaca* Laurenti, 1768 (Colubridae, Reptilia) on the northern border of its habitat in Russia

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Abstract. Detailed morphological characteristics of the populations of *Coronella austriaca* on the northern border of its range, in the Vladimir and Nizhny Novgorod regions, are presented. *L.corp.* of males and females reaches 543 mm and 601 mm, respectively. *Ventr.* is 166–175 and 175–189, respectively, *Scd.* is 50–59 and 32–56, *Lab.* left/right is usually 7/7 (89.7%), *Sublab.* is 9/9 (72.4%), respectively. A high incidence of asymmetry (44.4%) was noted for Temp. I and II rows; of 23 combinations, the most common is the symmetric one 2+3/2+3 (25.9%). *L.corp./L.cd.* limits overlap in 3.1% of underyearlings and yearlings, and in 1.8% of adults. Same-sex individuals statistically significantly differ in their meristic characteristics within the studied regions: the females from a locality near the Chucha river differ from the rest ones in *Scd.* and *Sublab.*_{left}, males differ in *Scd.* and *Ventr.+Scd.*; males also significantly differ in their metric characteristics *L.corp.*, *L.cd.*, *L.total.*

Keywords: Colubridae, *Coronella austriaca*, pholidosis, morphometry

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REFERENCES

- Antipov S. A. Materials on the biology of the smooth snake (*Coronella austriaca*) in the Murom Reserve and in the adjacent territory. In: *Osobo okhraniayemye prirodnye territorii: sovremennoe sostoyanie i perspektivy razvitiya: materialy Vserossiiskoi iubileinoi nauchno-prakticheskoi konferentsii, posvia-shchennoi 25-letiiu Natsional'nogo parka "Meshchera"* [Specially Protected Natural Areas: Current State and Development Prospects. Materials of the All-Russian Anniversary Scientific and Practical Conference Dedicated to the 25th Anniversary of the Meshchera National Park]. Vladimir, Kalejdoskop Publ., 2018, pp. 89–95 (in Russian).
- Antipov S. A. Deviation in pholidosis of the smooth snake (*Coronella austriaca*) in the Vladimir region, Russia. In: *Modern Herpetology: Problems and Solutions. Materials of the Second International Youth Conference of Herpetologists in Russia and Neighboring Countries, Dedicated to the 100th Anniversary of the Department of Herpetology at the Zoological Institute of the Russian Academy of Sciences*. Saint Petersburg, Zoologicheskij institut RAN Publ., 2019, pp. 27 (in Russian).
- Antonyuk E. V. To the question of the northern border of the distribution of the smooth snake *Coronella austriaca* Laurenti, 1768 in the eastern part of its range. *Bulletin of Tambov University, Ser. of Natural and Technical Sciences*, 2013, vol. 18, no. 6, pp. 2972–2974 (in Russian).
- Bakiev A. G., Poklonceva A. A. Reptiles. In: *Mogutova gora: vzaimootnosheniya cheloveka i prirody* [Mogutova Gora: The Relationship Between Man and Nature]. Togliatti, Kassandra Publ., 2012, pp. 57–59 (in Russian).
- Bannikov A. G., Darevskiy I. S., Ishchenko V. G., Rustamov A. K., Shcherbak N. N. *Opredelitel' zemnovodnykh i presmykayushchikhsya fauny SSSR* [A Guide of

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- Amphibians and Reptiles of Fauna of USSR]. Moscow, Prosveshchenie Publ., 1977. 415 p. (in Russian).
- Garanin V. I. *Zemnovodnye i presmykayushchiyesya Volzhsko-Kamskogo kraja* [Amphibians and Reptiles of the Volga-Kama Region]. Moscow, Nauka Publ., 1983. 175 p. (in Russian).
- Dudnikov D. V. *Amphibians and Reptiles in the Collection of the Vladimir-Suzdal Museum-Reserve. Catalog*. Vladimir, Vladimir-Suzdal Museum-Reserve Publ., 2011. 44 p. (in Russian).
- Idrisova L. A. *Morfologicheskaya izmenchivost' reptilii v estestvennykh i laboratornykh usloviyakh: (na primere cheshuychatykh Respubliki Tatarstan)* [Morphological Variability of Reptiles in Natural and Laboratory Conditions: (On the Example of the Scaly Republic of Tatarstan)]. Thesis Diss. Cand. Sci. (Biol.). Kazan', 2019. 21 p. (in Russian).
- Ivanter E. V. Revising the ecological concept of peripheral populations. *Russian Journal of Ecology*, 2017, vol. 48, no. 1, pp. 81–85.
- Klenina A. A. *Uzhovye zmei (Colubridae) Volzhskogo bassejna: morfologiya, pitanie, razmnozhenie* [Snakes (Colubridae) of the Volga Basin: Morphology, Nutrition, Reproduction]. Diss. Cand. Sci. (Biol.). Togliatti, 2015. 158 p. (in Russian).
- Klenina A. A., Bakiev A. G., Pavlov A. V. To the morphology of snakes in the Middle Volga region. Message 1. Determination of the sex of young individuals. *University Proceedings. Volga Region. Natural Sciences*, 2019, no. 1 (25), pp. 61–71 (in Russian).
- Krasnaya kniga Vladimirskoj oblasti* [The Red Book of Vladimir Region]. Administration of the Vladimir Region, State Inspectorate for the Protection and Use of Wildlife, State Budgetary Institution "Unified Directorate of Specially Protected Natural Areas of the Vladimir Region"; [O. N. Kanishcheva, M. A. Sergeev, eds.]. Tambov, LLC "TPS" Publ., 2018. 432 p. (in Russian).
- Krasnaya kniga Nizhegorodskoj oblasti T. 1. Zhivotnye* [The Red Book of Nizhny Novgorod Region. Vol. 1. Animals]. Nizhny Novgorod, DECOM Publ., 2014. 446 p. (in Russian).
- Kukushkin O. V., Sviridenko E. Yu. Distribution and ecological and morphological features of the smooth snake (Serpentes, Colubridae) in the Crimea. In: *Sostoianie prirodnykh kompleksov Krymskogo prirodnogo zapovednika i drugikh zapovednykh territorii Ukrainy, ikh izuchenie i okhrana: materialy nauchno-prakticheskoi konferentsii, posviashch. 80-letiiu Krymskogo prirodnogo zapovednika* [State of the Natural Complexes of the Crimean Nature Reserve and Other Protected Areas of Ukraine, Their Study and Protection: Materials of the Scientific and Practical Conference, dedicated to: 80th Anniversary of the Crimean Nature Reserve]. Alushta, 2003, pp. 148–152 (in Russian).
- Lazareva O. G. Materials on the ecology of species of amphibians and reptiles included in the Red Book of the Ivanovo region. In: *Redkie zhivotnye i griby: materialy po vedeniyu Krasnoj knigi Ivanovskoj oblasti* [Rare Animals and Mushrooms: Materials on Maintaining the Red Book of the Ivanovo Region]. Ivanovo, PressSto Publ., 2012, pp. 39–52 (in Russian).
- Lazareva O. G. Amphibians and reptiles in the regional red books of the center of the European part of Russia. In: *Nauchno-issledovatel'skaia deiatel'nost' v klassicheskom universitete: traditsii i innovatsii [Elektronnyi resurs]: materialy mezhdunarodnoi nauchno-prakticheskogo festivalia* [Research Activity at the Classical University: Traditions and Innovations [Electronic resource]: Materials of the International Scientific and Practical Festival]. Ivanovo, Ivanovskii gosudarstvennyi universitet, 1 electron. wholesale disc (DVD-ROM); 12 cm. System. Requirements: PDF reader 1.5. 2020, pp. 41–44 (in Russian).
- Murgraf E. N., Mannapova E. I., Myasnikova N. A., Cheremina O. A., Sherkunov S. A. Materials for the inventory of amphibians and reptiles of the Vladimir region. In: *Materialy k kadastru amfibij i reptilij bassejna Srednej Volgi* [Materials for the Inventory of Amphibians and Reptiles of the Middle Volga Basin]. Nizhny Novgorod, Ecocenter "Dront" Publ., 2002, pp. 154–166 (in Russian).
- Pavlov A. V., Garanin V. I., Bakiev A. G. Smooth snake *Coronella austriaca* Laurenti, 1768. In: *Zmei Volzhsko-Kamskogo kraja* [Snakes of the Volga-Kama Region]. Samara, Izdatel'stvo Samarskogo nauchnogo tsentra RAN, 2004, pp. 40–45 (in Russian).
- Pestov M. V., Mannapova E. I. Experience of carrying out herpetological works in the Nizhny Novgorod region. *Vtoraia konferentsiia gerpetologov Povolzh'ia: tezisy dokladov* [Second Conference of Herpetologists of the Volga Region: Abstracts Report]. Togliatti, Institut ekologii Volzhskogo basseina RAN Publ., 1999, pp. 46–47 (in Russian).
- Pestov M. V., Mannapova E. I., Ushakov V. A., Katunov D. P. Materials for the inventory of amphibians and reptiles of the Nizhny Novgorod region. In: *Materialy k kadastru amfibij i reptilij bassejna Srednej Volgi* [Materials for the Inventory of Amphibians and Reptiles of the Middle Volga Basin]. Nizhny Novgorod, Ecocenter "Dront" Publ., 2002, pp. 9–72 (in Russian).
- Pestov M. V., Mannapova E. I., Ushakov V. A., Katunov D. P., Bakka S. V., Lebedinsky A. A., Turutina L. V. *Amphibians and Reptiles of the Nizhny Novgorod Region. Materials for the Inventory*. Nizhny Novgorod, Ecocenter "Dront" Publ., 2001. 178 p. (in Russian).
- Poklontseva A. A., Chetanov N. A., Bakiev A. G. Comparative morphological analysis of young and adult Smooth snake *Coronella austriaca* from the Middle Volga Region. *Bulletin of Tambov University, Ser. of Natural and Technical Sciences*, 2013, vol. 18, no. 6, pp. 3062–3063 (in Russian).
- Puzanov I. I., Kozlov V. I., Kiparisov G. P. *Zhivotnyi mir Gor'kovskoi oblasti* [Animal World of the Gorky Region]. Gor'kii, Gor'kovskoe knizhnoe izdatel'stvo, 1955. 587 p. (in Russian).

Tabachishin V. G., Shlyakhtin G. V., Zavyalov E. V., Storozhilova D. A., Shepelev I. A. Morphometric differentiation and taxonomic status of reptiles from the Colubridae and Viperidae family. In: *Fauna Saratovskoj oblasti* [Fauna of the Saratov Region]. Saratov, Izdatel'stvo Saratovskogo universiteta, 1996, vol. 1, no. 2. pp. 39–70 (in Russian).

Tabachishina I. E. *Ekologo-morfologicheskii analiz fauny reptilii severa Nizhnego Povolzh'ia* [Ecological and Morphological Analysis of the Reptile Fauna of the North of the Lower Volga Region]. Diss. Cand. Sci. (Biol.). Saratov, 2004. 182 p. (in Russian).

Shlyakhtin G. V., Tabachishin V. G., Zavyalov E. V., Tabachishina I. E. *Zhivotnyi mir Saratovskoi oblasti. Kn. 4. Amfibii i reptilii* [Fauna of Saratov Region. Book 4. Amphibians and Reptiles]. Saratov, Izdatel'stvo Saratovskogo universiteta, 2005. 116 p. (in Russian).

Shcherbak N. N. *Zemnovodnye i presmykayushchiesya Kryma* [Amphibians and Reptiles of the

Crimea. Herpetologia Taurica]. Kiev, Naukova Dumka Publ., 1966. 240 p. (in Russian).

Antipov S. A., Doronin I. V., Milto K. D., Sergeev M. A. Records of amphibians and reptiles in the Vladimir region, Russia. *Current Studies in Herpetology*, 2018, vol. 18, iss. 3–4, pp. 168–179.

Jablonski D., Nagy Z. T.; Aziz A., Kurtulus O., Kukushkin O. V., Barbod S.-M., Jandzik D. Cryptic diversity in the smooth snake (*Coronella austriaca*). *Amphibia–Reptilia*, 2019, vol. 40, pp. 179–192.

Crnobrnja-Isailović J., Ajtic R., Vogrin M., Cor-ti C., Pérez Mellado V., Sá-Sousa P., Cheylan M., Plegu-ezuelo J., Westerström A., De Haan C. C., Tok V., Borczyk B., Sterijovski B., Schmidt B., Borkin L., Mil-to K., Golynsky E., Rustamov A., Nuridjanov D., Munkh-bayar K., Shestopal A., Litvinchuk S. *Coronella aus-triaca*. *The IUCN Red List of Threatened Species 2017*, 2017, pp. e.T157284A748852. <https://dx.doi.org/10.2305/IUCN.UK.2017-2.RLTS.T157284A748852.en>