Ecologica Montenegrina
ISSN 2336-9744 (online) | ISSN 2337-0173 (print)

Ecologica Montenegrina 70: 148-156 (2023)
This journal is available online at: www.biotaxa.org/em
https://dx.doi.org/10.37828/em.2023.70.16

Article

The occurrence of *Otiorhynchus janovskii* Korotyaev (Coleoptera: Curculionidae) in the Pleistocene deposits of Khanty-Mansiysky Autonomous Okrug

EVGENY V. ZINOVYEV[1], ANNA A. GURINA[2,3], NATALIA I. AGRIKOLYANSKAYA[2], ROMAN Yu. DUDKO[2] & ANDREI A. LEGALOV[2,3,4*]

[1]*Institute of Ecology of Plants and Animals Ural Branch of RAS, 8th March Str., 202, Ekaterinburg, 620144, Russia.*
https://orcid.org/0000-0001-7521-1513
[2]*Institute of Systematics and Ecology of Animals, SB RAS, Frunze Street 11, Novosibirsk, 630091, Russia.*
https://orcid.org/0000-0002-9844-1423; https://orcid.org/0000-0002-6163-4555;
https://orcid.org/0000-0002-7595-9756
[3]*Kemerovo State University, Krasnaya str. 6, Kemerovo 650000, Russia.*
[4]*Altai State University, Lenina Street 61, Barnaul, 656049, Russia.*
[5]*Tomsk State University, Lenina Prospekt 36, 634050 Tomsk, Russia.*
** Corresponding author. E-mail: fossilweevils@gmail.com; https://orcid.org/0000-0001-7347-8169*

Received 2 December 2023 | Accepted by *V. Pešić*: 18 December 2023 | Published online .. December 2023.

Abstract
The South Siberian weevil *Otiorhynchus* (*Podonebistus*) *janovskii* Korotyaev, 1990 is found in the Middle Pleistocene deposits of the locality Gornopravdinsk, Khanty-Mansiysk Autonomous Okrug-Yugra: Khanty-Mansiysky District. This is the northernmost and oldest record of this species. A distribution map with modern and sub-fossil finds of *O. janovskii*, such as images of the Pleistocene remains and modern specimens of this species are provided.

Key words: Biodiversity, Curculionoidea, Entiminae, *Otiorhynchus*, West Siberia, Urals, Quaternary.

Introduction

The genus *Otiorhynchus* Germar, 1822 currently includes about 1500 species belonging to more than 100 subgenera (Alonso-Zarazaga et al. 2023). In total, more than 250 species are recorded for Russia, most of which are found in the Caucasus (Alonso-Zarazaga et al. 2023). In the Asian part of Russia, 49 species of this genus have been found, the overwhelming majority of which live south of 56°N (Legalov 2010, 2020b, 2020c; 2021a, 2021b, 2021c). There are several widespread steppe species of this genus, namely *O. velutinus* Germar, 1823 and *O. unctuosus* Germar, 1823, as part of modern ecosystems. A number of species have modern boreal, arctoboreal (*Otiorhynchus arcticus* (Fabricius, 1780) and *O. nodosus* (Müller, 1764)) and polyzonal (*O. ovatus* (Linnaeus, 1758), *O. politus* Gyllenhal, 1834, and *O. tristis* (Scopoli, 1763)) distribution. In total, five species (*O. grandineus* Germar, 1823, *O. tristis*, *O. nodosus*, *O. ovatus*, and *O.*

politus) were noted from the Khanty-Mansiysk Autonomous Okrug (Legalov, Sitnikov 2000; Legalov 2010, 2020b).

The *Otiorhynchus* species are represented in the Pleistocene localities of the Urals and Asian Russia by 16 species (*O. arcticus*, *O. bardus* Boheman, 1842 = *altaicus* Stierlin, 1861 = *karkaralensis* Bajtenov, 1974 = *relicinus* Arnoldi, 1975, *O. beatus* Faust, 1890, *O. concinnus* Gyllenhal, 1834, *O. cribrosicollis* Boheman, 1842, *O. grandineus*, *O. janovskii* Korotyaev, 1990, *O. nodosus*, *O. obscurus* Gyllenhal, 1834 = *perplexus* Gyllenhal, 1834, *O. politus*, *O. pullus* Gyllenhal, 1834, *O. subocularis* Arnoldi, 1975, *O. sushkini* Arnoldi, 1975, *O. unctuosus*, *O. ursus* Gebler, 1844 = *kasachstanicus* Arnoldi, 1964, and *O. wittmeri* Legalov, 1999) (Kuzmina, Matthews 2012; Legalov et al. 2016; Zinovyev et al. 2016; Gurina et al. 2018, 2019a, 2019b, 2023; Dudko et al. 2022), but they are distributed unevenly both over the territory and over time. Representatives of the genus are most typical for the late Pleistocene (MIS 3 and MIS 2) in the south of Western Siberia and the Urals, where known 15 species. They predominate in the number of individuals in most deposits and are a characteristic component of the tundra-steppe faunas of this time (Legalov et al. 2016; Zinovyev et al. 2016; Gurina et al. 2018, 2019a, 2019b, 2023; Dudko et al. 2022). The only two species are known from the north of the region, namely *O. politus* from north of West Siberia and *O. cribrosicollis* from North-Eastern Siberia (Kuzmina, Matthews 2012; Legalov et al. 2016). In older layers of the region, only *O.* cf. *politus* was known from Isker site (early Neopleistocene) and Chembakchinsky Yar site (middle Neopleistocene) (Kosintsev et al. 2004).

In this regard, the discovery of remains of the South Siberian weevil *Otiorhynchus* (*Podonebistus*) *janovskii* in the Middle Neopleistocene deposits of the locality Gornopravdinsk in the lower Irtysh region is extremely interesting.

Material and methods

Remains of beetles were found in the layer of sand with clay pellets and numerous bone remains of small mammals from a depth of 43.6 m (Khanty-Mansiysk Autonomous Okrug-Yugra: Khanty-Mansiysky District, right bank of Irtysh River, Gornopravdinsk-2, 60°02'17.1"N, 69°56'54.7"E). The age is determined to be more than 350,000 years. Material was taken by S.E. Korkin and A.V. Borodin in 2020. The remains of the insects were extracted by an employee of the Institute of Ecology of Plants and Animals Ural Branch of the Russian Academy of Sciences, E.A. Markova when processing a sample for microteriological analysis (Borodin et al. 2023). Two remains of the weevil were found, determinate by A.A. Legalov as *Otiorhynchus janovskii*. Along with these fragments, remains of other beetles were found in this layer: one head of the ground beetle *Blethisa catenaria* Brown, 1944, one right elytra of the ground beetle *Pterostichus* (*Cryobius*) cf. *pinguedineus* (Eschscholtz, 1823), as well as one left elytra of the pill beetle *Morychus* cf. *ostasiaticus* Tshernyshev, 1997 (Borodin et al. 2023).

Specimens are kept in the Institute of Ecology of Plants and Animals Ural Branch of RAS.

The systematics of studied taxa is based on the works of Legalov (2020a) and Alonso-Zarazaga et al. (2023).

Results

Insecta: Coleoptera: Curculionoidea: Curculionidae: Entiminae: Otiorhynchini

Genus: *Otiorhynchus* Germar, 1822

Subgenus: *Podonebistus* Reitter, 1912

***Otiorhynchus* (*Podonebistus*) *janovskii* Korotyaev, 1990**
(Figs. 1-4)

Material: Two fragments attributed to *O. janovskii* were found in the layer: one left elytron (length 2.75 mm, width 2.0 mm), and one associated fragment, including the left and right elytra, thorax and abdomen (length – 3.7 mm, width – 2.5 mm). The fragments are presented in Figures 1–3. The preservation of the

remains is very good, uncharacteristic for deposits of the early-middle Neopleistocene; there is no pronounced deformation of the remains, as well as secondary microsculpture, which made it possible to make a detailed identification.

Figure 1. *Otiorhynchus janovskii*, elytra, Gornopravdinsk, middle Pleistocene: A – associated elytra; B – left elytron. Scale bar is 1 mm.

Discussion

Otiorhynchus janovskii was described in 1990 by B.A. Korotyaev, the modern distribution of this species (Fig. 5) is limited primarily to the Altai-Sayan Mountains, in the south it reaches Tuva, in the north to the downstream of the Angara River (Korotyaev 1990; Gurina et al. 2019). The locality Gornopravdinsk-2 (Fig. 5), where fragments of *O. janovskii* were found, is located 1300 km northwest of the modern range (Korotyaev 1990; Gurina et al. 2019b).

Previously, three records of the species were known in the Pleistocene: Dubrovino, Stepnogutovo-1 and Gornovo-IV (Fig. 5). Dubrovino site from Novosibirskaya Oblast (55°27'07.0"N, 83°15'17.7"E) locates 935 km southeast of the Gornopravdinsk-2. *Otiorhynchus janovskii* was extracted from the layer with ^{14}C date of 19444 ± 159 BP (SPb-1417) (Gurina et al. 2019b). The remains of a weevil identified as *O.* cf. *janovskii* were found in the locality Gornovo-IV (Fig. 5), Republic of Bashkortostan (54°54'27.30"N, 55°52'48.26"E) from a layer of MIS 3 age, older than 34.455 ± 159 BP (SPb-1417) (Dudko et al. 2022). *O. janovskii* was also known from the Stepnogutovo-1 site, Novosibirskaya Oblast (54°50'59.0"N, 84°52'55.8"E) from the layer with ^{14}C date of 13500±120 BP (SPb-3831) (Gurina et al. 2022) (Fig. 5).

Figure 2. *Otiorhynchus janovskii*, associated elytra, Gornopravdinsk, middle Pleistocene. The photo was taken by S.V. Zykov using a TESCAN Vega 3 scanning electron microscope.

Thus, the few finds of *O. janovskii* have been noted exclusively from the late Neopleistocene deposits comparable to the MIS 3 and MIS 2 stadia. Moreover, these three sites are located much further south (~55°N) than new locality Gornopravdinsk. Findings of this species can be expected in the Pleistocene of Northern Altai and the Kuznetsk Basin.

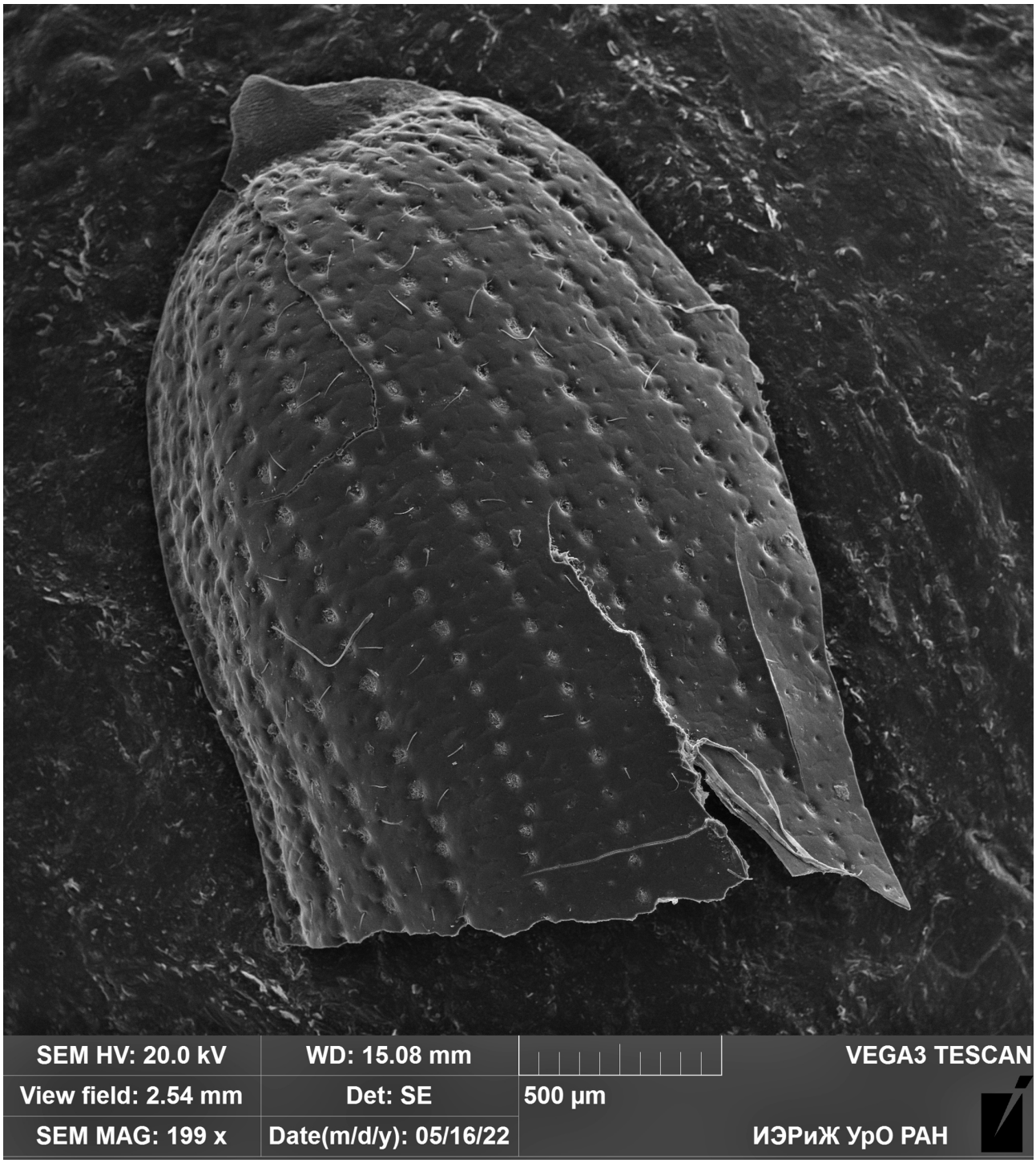

Figure 3. *Otiorhynchus janovskii*, left elytron, Gornopravdinsk, middle Pleistocene. The photo was taken by S.V. Zykov using a TESCAN Vega 3 scanning electron microscope

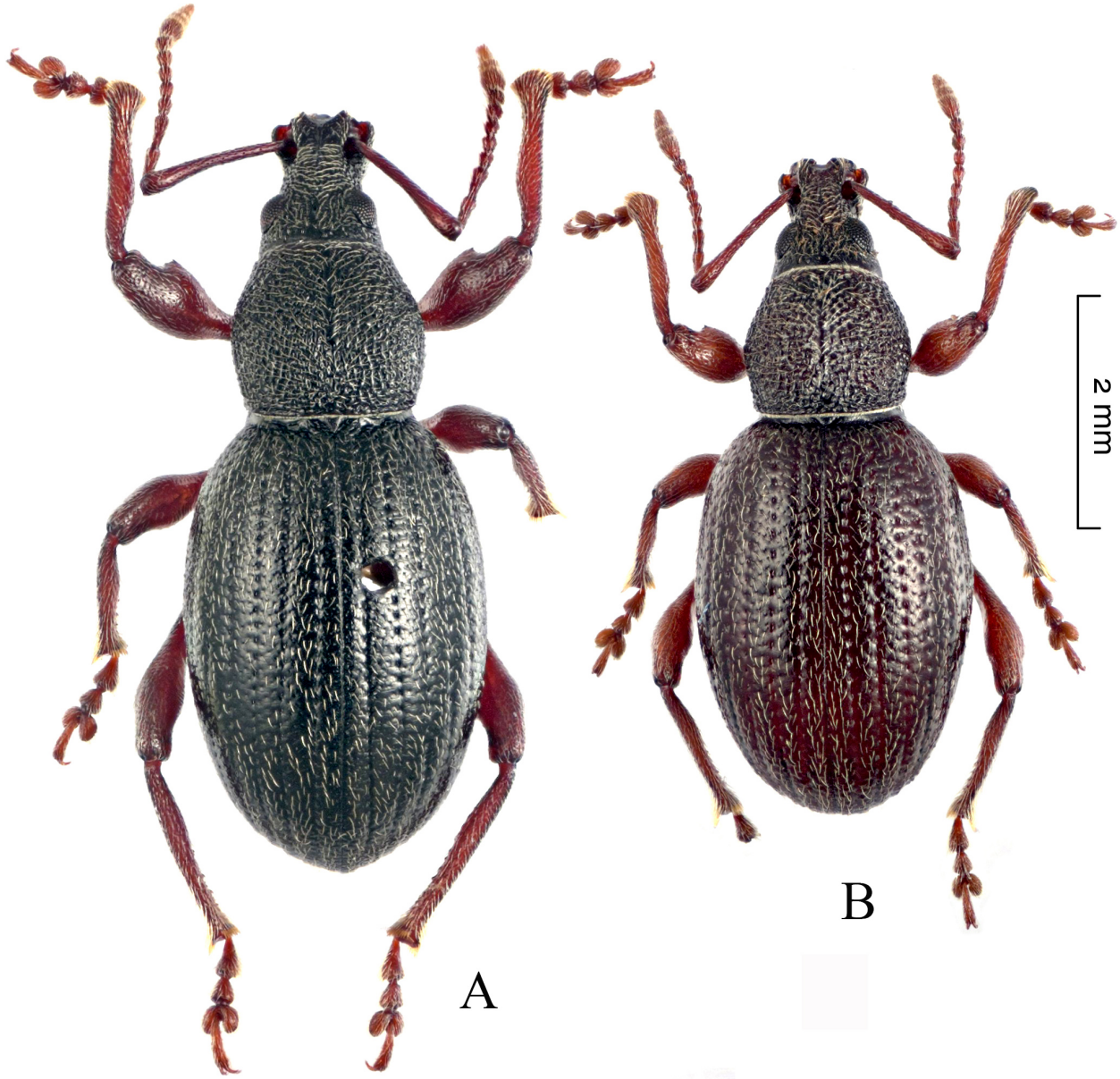

Figure 4. *Otiorhynchus janovskii*, habitus. A – male, paratype, Western Sayan, Krasnoyarskii Krai , B – female, Tyva, Malyi Shivilig River.

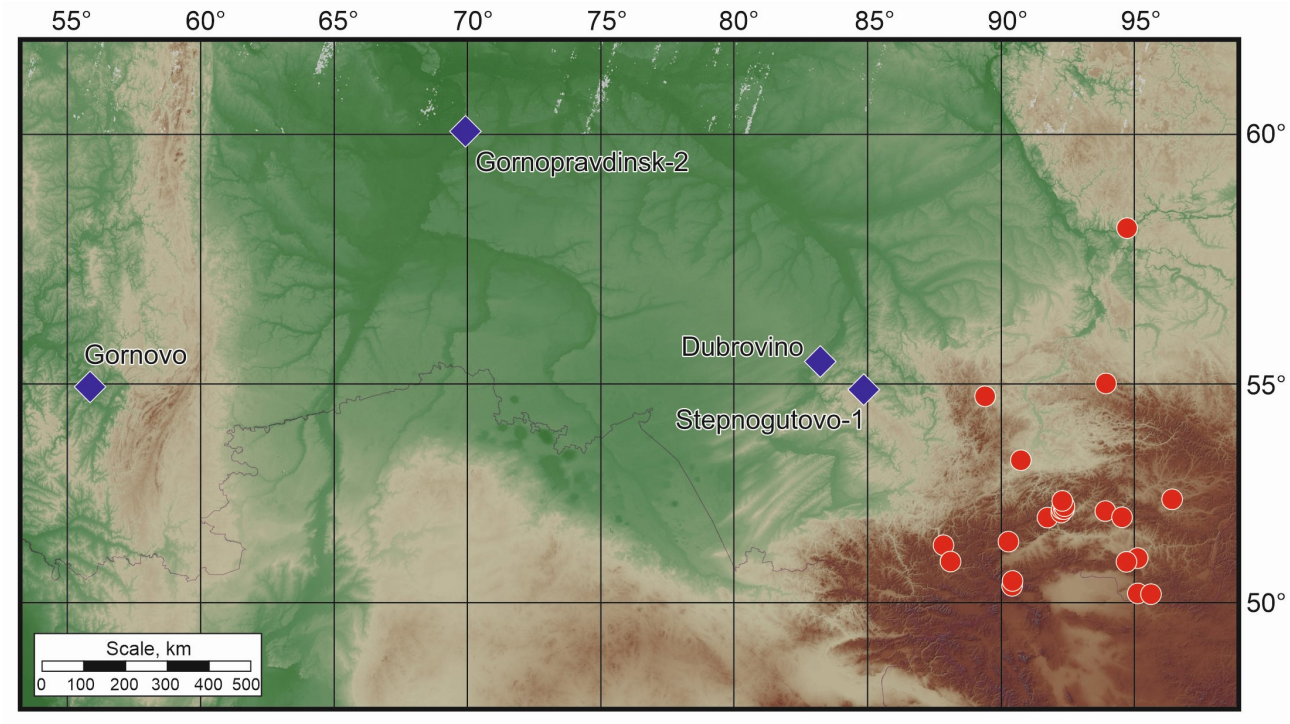

Figure 5. Distribution map of *Otiorhynchus janovskii*. Red circles – modern finds, blue rhombuses – the Pleistocene records.

Acknowledgements

The authors thank B.A. Korotyaev (Saint-Petersburg) for providing type specimens of *O. janovskii* for study. Special thanks to S.V. Zykov for assistance in photographing *O. janovskii* fragments on a TESCAN Vega 3 scanning electron microscope. The study of A.G. was carried out under the Russian Science Foundation (grant No. 23-74-01024), the study of A.L. was supported by the Tomsk State University Development Programme (Priority-2030), the study of E. Zinovyev was carried out under a government contract with the Institute of Plant and Animal Ecology, Ural Branch of the Russian Academy of Sciences (research subject FUWU-2022-0005), study of (N.A. and R.D) was carried out under the Federal Fundamental Scientific Research Program (grant No. 1021051703269-9-1.6.12).

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