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Late Holocene explosive activity of the Atsonupuri volcano (Iturup Island, Southern Kuril Islands): preliminary results

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Abstract. The first results of the study of Late Holocene activity of the Atsonupuri volcano (Iturup Island, Southern Kuril Islands) obtained during field work in 2013–2014 are presented. On the basis of tephrochronological studies and radiocarbon dating, it was established that at least 4 large explosive (explosive-effusive) eruptions (individual major eruptions or series of eruptions close in time) were recorded in the interval 1400–800 years ago. The period of intense explosive activity of the volcano was followed by a period of quiescence beginning around 500–600 BP and continuing to the present, as evidenced by the lack of documented eruptions in historical time. The material composition of the juvenile tephra of the Atsonupuri volcano, represented mainly by cinder, corresponds to moderate- and low-potassium basalts and andesite-basalts. Based on the data obtained, it can be assumed that in case of renewed activity of the volcano not only terminal (subterminal) eruptions but also side eruptions are probable.

Keywords:

Iturup, Atsonupuri volcano, tephra, Holocene, radiocarbon dating, explosive eruptions, volcanic activity

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References

1. Gorshkov G.S. **1967.** [*Volcanism of the Kuril island arc*]. Moscow: Nauka, 287 p. (In Russ.).
2. Fedorchenko V.I., Abdurakhmanov A.I., Rodionova R.I. **1989.** [*Volcanism of the Kuril island arc: geology and petrogenesis*]. Moscow: Nauka, 239 p. (In Russ.).
3. Ramsey C. Bronk, Lee S. **2013.** Recent and planned developments of the program OxCal. *Radiocarbon*, 55 (2-3): 720–730. https://doi.org/10.1017/S0033822200057878
4. Braslavets K.M. **1983.** History in names on the map of the Sakhalin region. Yuzhno-Sakhalinsk: Far Eastern Book Publ. House. Sakhalin Branch, 144 p. (In Russ.).
5. Gorshkov G.S. **1958.** Active volcanoes of the Kuril island arc. In: *Young volcanism of the USSR: Proceedings of the Laboratory of Volcanology of the USSR Academy of Sciences*, 13: 59–60. (In Russ.).
6. Grishin S.Yu. **2011.** Impact of volcanic eruptions on the vegetation cover of Maua Island (Kuril Islands). *Izvestiya RGO*, 143: 79–89. (In Russ.).
7. Golovnin V.M. **1819.** *The voyage of the Russian Imperial sloop "Diana", from Kronstadt to Kamchatka, completed under the command of the Fleet Lieutenant (now Captain 1st Rank) Golovnin in 1807, 1808 and 1809*. Pt I. St. Petersburg: Marine Printing House, 240 p. (In Russ.).
8. Degterev A.V., Pinegina T.K., Razjigaeva N.G., Kozhurin A.I. **2021.** [Holocene chronicle of volcanic eruptions on Iturup Island]. *Priroda = Nature*, 12: 17–22. (In Russ.). https://doi.org/10.7868/S0032874X21120036
9. Pinegina T.K., Razzhigaeva N.G., Degterev A.V., Khomchanovsky A.L. **2023.** Following the Holocene strong earthquakes of Iturup Island. *Priroda = Nature*, 3: 51–57. (In Russ.). https://doi.org/10.7868/S0032874X23030055
10. Razzhigaeva N.G., Ganzey L.A., Grebennikova T.A., Kharlamov A.A., Arslanov Kh.A., Kaistrenko V.M., Gorbunov A.O., Petrov A.Yu. **2017.** The problem of past megatsunami reconstructions on the southern Kurils. *Russian Journal of Pacific Geology*, 11(1): 34–45. https://dx.doi.org/10.1134/S1819714017010079
11. Nakagawa M., Hiragaa N., Furukawa R. **2011.** Formation of a zoned magma chamber and its temporal evolution during the historic eruptive activity of Tarumai Volcano, Japan: Petrological implications for a long-term forecast of eruptive activity of an active volcano. *Journal of Volcanology and Geothermal Research*, 205 (1-2): 1–16. https://doi.org/10.1016/j.jvolgeores.2011.05.003

12. Razjigaeva N.G., Ganzey L.A., Belyanina N.I., Grebennikova T.A., Ganzey K.S. **2008.** Paleoenvironments and landscape history of the Minor Kuril Islands since the Late Glacial. *Quaternary International*, 179(1): 83–89. https://doi.org/10.1016/j.quaint.2007.10.017
13. Razzhigaeva N.G., Matsumoto A., Nakagawa M. **2016.** Age, source, and distribution of Holocene tephra in the southern Kurile Islands: Evaluation of Holocene eruptive activities in the southern Kurile arc. *Quaternary International*, 397: 63–78. https://doi.org/10.1016/j.quaint.2015.07.070
14. Gill J.B. **1981.** Orogenic andesites and plate tectonics. Berlin: Springer-Verlag, 390 p. https://doi.org/10.1007/978-3-642-68012-0
15. Nakagawa M., Ishizuka Y., Kudo T., Yoshimoto M., Hirose W., Ishizaki Y., Gouchi N., Katsui Y., Solovyow A.W., Steinberg G.S., Abdurakhmanov A.I. **2002.** Tyatya Volcano, southwestern Kuril arc: Recent eruptive activity inferred from widespread tephra. *The Island Arc*, 11: 236–254. https://doi.org/10.1046/j.1440-1738.2002.00368.x
16. Le Bas M.J., Le Maitre R.W., Streckeisen A., Zanettin B. **1986.** A chemical classification of volcanic rocks based on the total alkali-silica diagram. *Journal of Petrology*, 27: 745–750. https://doi.org/10.1093/petrology/27.3.745
17. Peccerillo A., Taylor S.R. **1976.** Geochemistry of Eocene calc-alkaline rocks from Kastamonu area, Northern Turkey. *Contributions to Mineralogy and Petrology*, 58: 63–81. https://doi.org/10.1007/bf00384745
18. Miyashiro A. **1974.** Volcanic rock series in island arcs and active continental margins. *American Journal of Science*, 274: 321–355. https://doi.org/10.2475/ajs.274.4.321
19. Irvine T.N., Baragar W.R.A. **1971.** A guide to the chemical classification of the common volcanic rocks. *Canadian Journal of Earth Sciences*, 8: 523–548. https://doi.org/10.1139/e71-055
20. Sun S.S., McDonough W.F. **1989.** Chemical and isotopic systematics of ocean basalts: implications for mantle composition and processes. *Geological Society, London. Special Publications*, 42: 313–345. https://doi.org/10.1144/GSL.SP.1989.042.01.19
21. McDonough W.F., Sun S.S. **1995.** The composition of the Earth. *Chemical Geology*, 120(3-4): 223–253. https://doi.org/10.1016/0009-2541(94)00140-4