

The localities of Arctic Diptera (Insecta) collected by the Russian Kara Expedition of 1909

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One of the most important journeys of exploration to Arctic Russia was the so-called 1909 Kara Expedition, to the polar area north of the Ural Mountains. Among the scientific papers resulting from this expedition, that on the Diptera gives only the vaguest locality data, such as ‘Kara tundra’ or ‘polar Urals’, with a date. From the separately published Russian expedition narrative, we present a table giving the day-by-day stops of the expedition, so far as possible with named localities and coordinates. As a result, localities, and especially type-localities of new species, can be precisely located for the Diptera and for other taxonomic groups.

Keywords: Russia; Kara Expedition 1909; Diptera; localities; type-localities

Introduction

In the summer of 1909, an expedition sponsored by the Imperial Russian Geographical Society and the Imperial Russian Academy of Sciences spent 4 months exploring the region of the Kara River, the Karskaja tundra, Bajdaratskaya Bay and the River Shchyuchya, in the Arctic tundra of the Yugorskiy Peninsula (polar Ural region) (Figures 1 and 2). Considerable numbers of Diptera were collected, including many new species, and a detailed report in German was published by Becker et al. (1915). In this report, only the barest locality data are given (e.g. ‘aus dem Polaren Ural’ or ‘Karskaja Tundra’) together with dates of collection. Many of these new species have proved to have a widespread distribution throughout Arctic areas of the Palaearctic region (Sorokina and Pont 2010), or even across the entire Holarctic region, and so we felt it desirable to give a brief and accessible account in English of the expedition’s itinerary to provide, among other things, precise data about the type-localities of the newly described species.

The present paper is based on *A general account of the activity of the expedition by the Kuznetsov brothers to the Polar Urals* by the celebrated Russian geologist Oleg (Khalgar) Oskarovich Backlund (1911), which gives a detailed account of the itinerary and the scientific researches of the Kara Expedition.

Narrative

At the time that this expedition was proposed, scientific information about the Arctic regions of Russia was almost non-existent. The expedition plan was therefore

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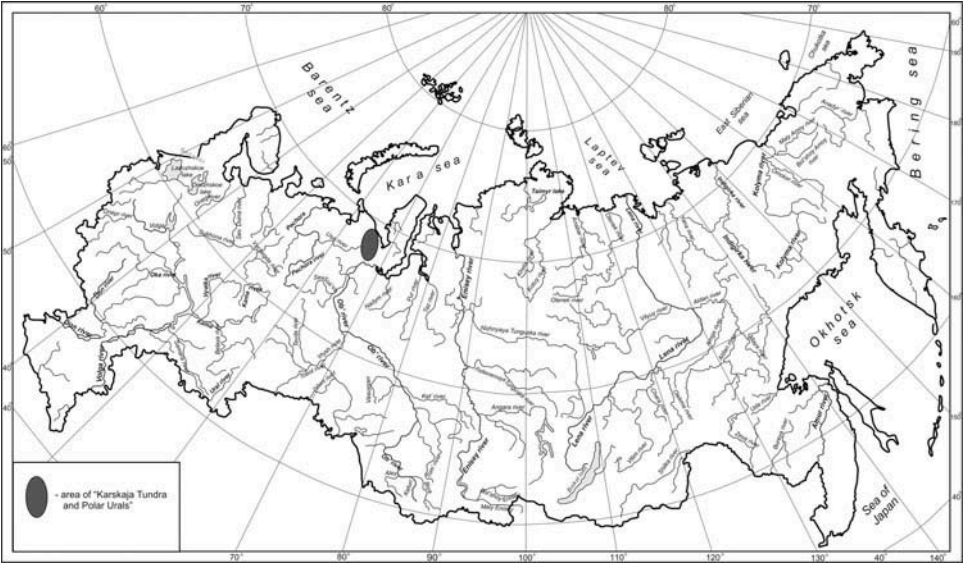


Figure 1. Map of Russia to show the location of the 'Karskaja Tundra'.

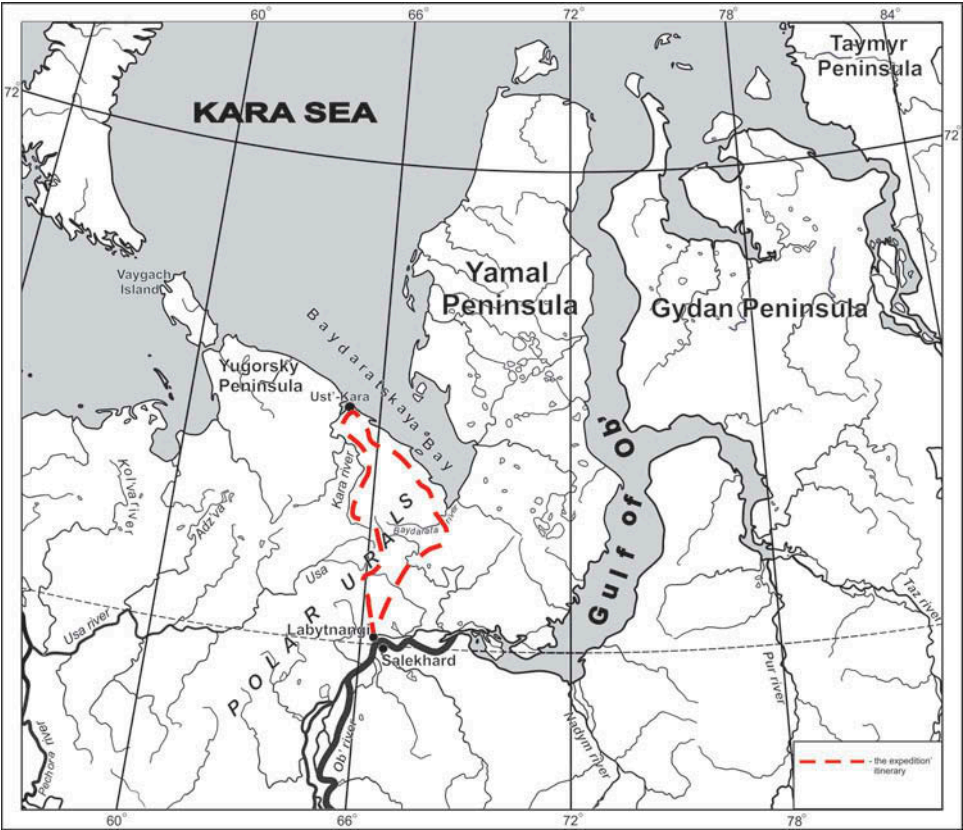


Figure 2. An outline of the expedition itinerary by the Kuznetsov brothers to the polar Urals.

formulated by two eminent scientists of the time: Anton (in the text as Michael) Grigorevich Mamurovsky, who was professor of medicine at Moscow University and was an expert in pathological anatomy and bacteriology, and academician Dmitry Nikolaevich Anuchin, a geographer. The expedition, under the leadership of O.O. Backlund, was organized by the Imperial Russian Geographical Society and the Imperial Russian Academy of Sciences and was financed by the Kuznetsov brothers, who were wealthy tea traders and who both agreed to participate in the expedition.

The research aim of the expedition was a multi-faceted study of the northern extremity of the Ural Mountains and of the lowlands adjoining it from the east. In addition to O.O. Backlund, who carried out geological research as well as the general management of the expedition, the scientific team included a botanist (V.N. Sukachev, who subsequently became an academician of the Academy of Sciences of the USSR), a geographer and meteorologist (V.G. Mukhin), a topographer (N.A. Grigoriev), two zoologists (D.J. Vadroppe and F.A. Zaytsev), and an ethnographer (D.T. Janovich).

In 4 months, the expedition covered an enormous distance, at first by steamship, then on sledges pulled by reindeer or dogs, and also on foot. The route passed through Tyumen, Obdorsk (now Salekhard) to the upper reaches of the River Khanema (now River Khan-Mey, a tributary of the River Sob), along the main watershed and a longitudinal valley to the River Shchyuchya, through Lake Shchyuchya, the upper reaches of the River Pyderata (now River Baydarata) and the Minisey Mountain, across the tundra to a mouth of the River Kara, across the tundra along the coast of the Kara Sea, up the valley of the River Baydarata and back to Obdorsk (Salekhard) (Figure 2).

In spite of the difficult mountainous and tundra terrain, the expedition collected valuable geological, botanical and zoological materials and also information on the Nenets' cults. Traces of the Quaternary glaciation were also found. On the basis of a land survey, a map was made of the area investigated (Figure 3). Backlund's report also described in detail the life and customs of the native population, for example the Ostyaks (now Khanty peoples) and the Komi–zyrjane (Komi or Zyrjan peoples).

Despite its great value, much of the collected material had not been processed and worked up before the outbreak of the First World War. O.O. Backlund gave a talk about the results of the expedition at the meeting of the Russian Geographical Society on 17 February 1910 and his published report appeared in 1911 (Backlund 1911).

A few years later, in 1915, the dipterists Theodor Becker, Henryk Dziedzicki, Johann Schnabl and Joseph Villeneuve published a paper in German containing the dipterological results from the expedition (Becker et al. 1915). This 67-page report is divided into a number of separately authored sections. The first (p. 1) by Dziedzicki deals with the Mycetophilidae and includes the description of one new species together with male terminalia illustrations in figs 37–46 on plate 2 and figs 65–66 on plate 3. The second section (pp. 2–51) on the Anthomyiidae and Muscidae is by far the longest. It is by Schnabl and includes the descriptions of two new genera and 29 new species. Most of the illustrations in the three plates accompany this section: figs 1–24 on plate 1, figs 25–36 on plate 2, and figs 47–64 on plate 3; they comprise line drawings of male terminalia and photographs of male 5th sternites. The third section (p. 52) is by Becker and deals with the remaining Nematocera. The fourth section (pp. 53–60) is also by Becker and deals with the Orthorrhapha: Brachycera. Six new species are described, with three text-figures. The fifth section (pp. 60–62),

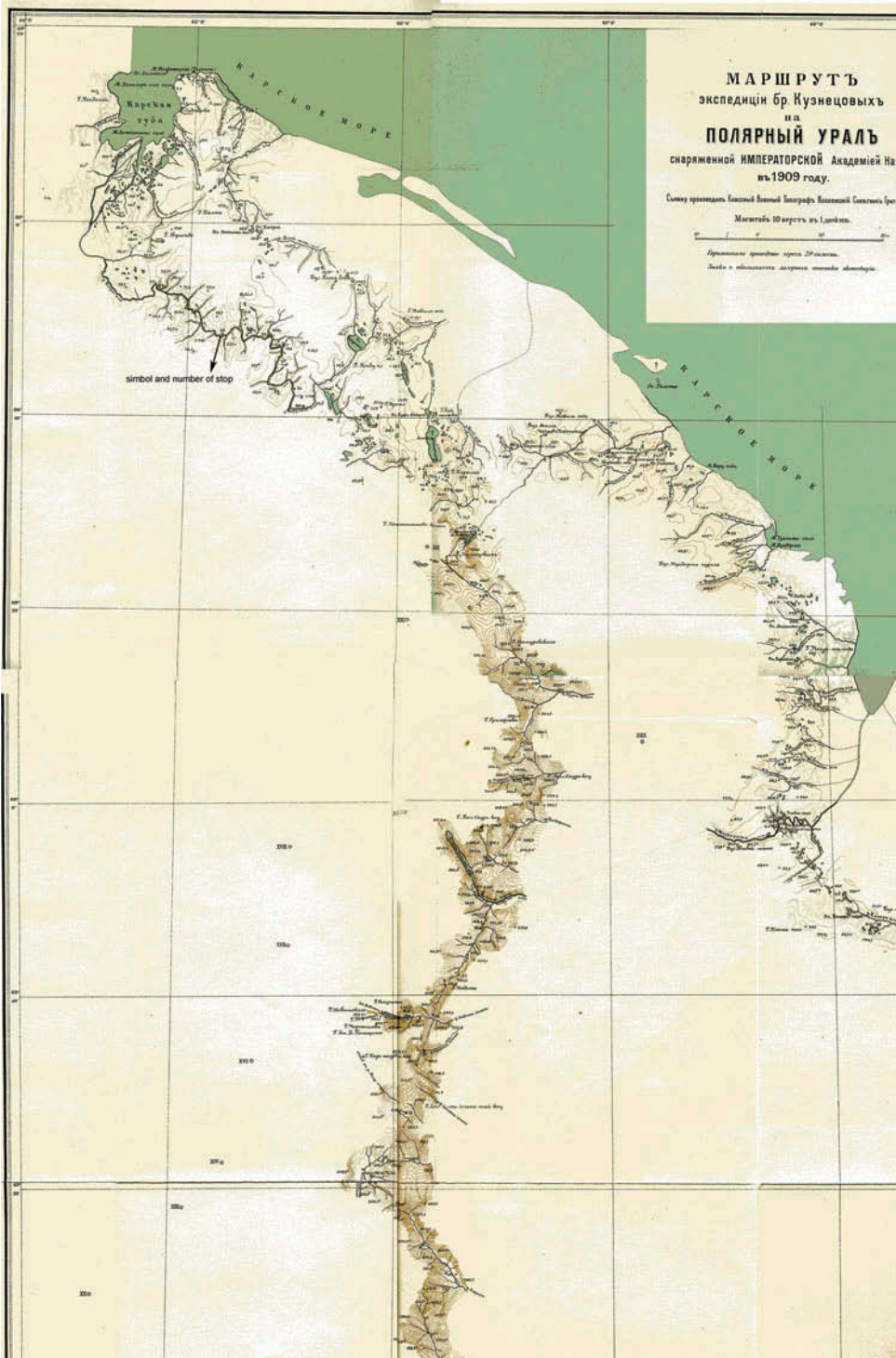


Figure 3. The itinerary of the 'Kara Expedition' by the Kuznetsov brothers to the polar Urals; from Backlund (1911).

also by Becker, deals with the Syrphidae and includes one new species with one text-figure. The sixth section (pp. 62–63) is by Villeneuve and covers the remaining Cyclorrhapha Schizophora (Calliphoridae and Oestridae). The final section (pp. 63–67) is again by Becker and deals with the Cyclorrhapha: Schizophora. It includes the description of one new genus and five new species with three text-figures.

The locality data are given in the most rudimentary form, in the majority of cases as ‘Tundra des Fl. Kara’ or ‘Karskaja Tundra’ or ‘aus dem Polaren Ural’ (see Appendix 1) but with the date of capture and the collector. All 58 of the expeditionary stops were made along the right bank of the River Kara, on the east slope of the polar Urals and on the coast of the Kara Sea, and all are in the Yamalo-Nenets Autonomous Okrug. In Appendix 1 we have given precise localities according to the detailed description of the sites made by Backlund and according to the map that was included in his report (Figure 3). While we were preparing *An annotated catalogue of the Muscidae (Diptera) of Siberia* (Sorokina and Pont 2010), we consulted Backlund’s 1911 expedition narrative to pinpoint more precisely the type-localities of the Muscidae described by Schnabl. The present paper is an expansion of this work and gives, so far as is possible, precise information on all the localities where the expedition stopped and made collections.

The collector of the entomological material, Filipp Adamovich Zaytsev, was principally a Coleopterist (Arnoldi 1958), but he evidently collected most if not all insects while taking part in this expedition. All the specimens that he collected are in the Zoological Institute of the Russian Academy of Sciences, St Petersburg, Russia. Most have a printed label, in Cyrillic: ‘Karskaya tundra/s. Tobol’s. gub./F. Zaytsev’ plus the date, but a few are labelled: ‘Polyarniy Ural’/s. Tobol’s. gub./F. Zaytsev’ plus the date. The type-series of the Muscidae were reviewed by Pont (2004), who enumerated the holotypes and syntypes and discussed their condition and their labelling.

As regards the collecting dates, Schnabl (in Becker et al. 1915, p. 4, footnote) pointed out that the dates on the labels were according to the old Julian calendar, which was retained in Russia until 1918, and that they were therefore 13 days behind the Gregorian calendar, which is that now generally in use in the western world. 1 July on the data label is therefore actually 14 July, and so on.

Acknowledgements

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Appendix 1. Stops and localities of the 'Kara Expedition' by the Kuznetsov brothers to the polar Urals.

Date (Julian calendar), as given in Becker et al. (1915)	Localities as given in Becker et al. (1915)	Date (Gregorian calendar), as given in Backlund (1911)	Expedition stops and localities as given in Backlund (1911), with additional comments where relevant
17 May	'von Scherkaly, Kreis Berezow' (Villeneuve)		
1 June	'aus der Tundra von Obdorsk' (Villeneuve)		
		9–10 June	Stop 1. $t = +7\text{ }^{\circ}\text{C}$, $+15\text{ }^{\circ}\text{C}$ In the original, only the River Ob is given [we used the latitude and longitude of this stop as shown on the map in the Backlund paper and it is close to Labytnangi: see Figure 2].
		11 June	Stop 2. $t = +16\text{ }^{\circ}\text{C}$, $+7\text{ }^{\circ}\text{C}$ To the northwest from Labytnangi, tundra, small lake
		12–15 June	Stop 3. $t = +7\text{ }^{\circ}\text{C}$, $+4\text{ }^{\circ}\text{C}$, $+8\text{ }^{\circ}\text{C}$, $-3\text{ }^{\circ}\text{C}$ Valley of the River Khanema (left tributary of the River Sob)
		16 June	Stop 4. $t = +4\text{ }^{\circ}\text{C}$ Close to Mt Nyaravecha
		17 June	Stop 5. $t = +3\text{ }^{\circ}\text{C}$ Valley of the River Khanema [River Khan-Mey] (left tributary of the River Sob), 233 m
		18 June	Stop 6. $t = 0\text{ }^{\circ}\text{C}$, $-2\text{ }^{\circ}\text{C}$ Upper reaches of the River Khanema [River Khan-Mey, about $67^{\circ}02'\text{ N}$, $66^{\circ}14'\text{ E}$]
		19–20 June	Stop 7. $t = +6\text{ }^{\circ}\text{C}$, $+2\text{ }^{\circ}\text{C}$ Valley of the of River Kharava [River Kharbey] (tributary of River Ob) [about $67^{\circ}08'\text{ N}$, $66^{\circ}15'\text{ E}$]
9–10 June	'Polar-Ural' (Schnabl)	21–22 June	Stop 8. $t = +8\text{ }^{\circ}\text{C}$, $+1\text{ }^{\circ}\text{C}$

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Appendix 1. (Continued).

Date (Julian calendar), as given in Becker et al. (1915)	Localities as given in Becker et al. (1915)	Date (Gregorian calendar), as given in Backlund (1911)	Expedition stops and localities as given in Backlund (1911), with additional comments where relevant
11 June	'aus dem Polaren Ural' (Becker, Villeneuve)	24 June	Upper reaches of River Kharava [River Kharbey] (tributary of River Ob) [about 67°13' N, 66°08' E] Stop 9. $t = +10\text{ }^{\circ}\text{C}$ Valley of the River Sob [about 67°20' N, 65°55' E] Stop 9.
		25–26 June	Stop 10. $t = +13\text{ }^{\circ}\text{C}$
		27–29 June	River Sob, 357 m [upper reaches of the River M. Paypudyna (tributary of River Sob, about 67°22' N, 66°58' E)] Stop 11. $t = +17\text{ }^{\circ}\text{C}$, $+10\text{ }^{\circ}\text{C}$, $+15\text{ }^{\circ}\text{C}$, $+1-3\text{ }^{\circ}\text{C}$ Upper reaches of River Longot-yugan, 525 m [about 67°27' N, 66°06' E]
17 June	'Polar-Ural, Gouv. Tobolsk' (Schnabl); 'aus dem Polaren Ural' (Becker)	30 June	Stop 11.
		1–2 July	Stop 12. $t = +5\text{ }^{\circ}\text{C}$ Valley of the River Khalong, 260 m [about 67°34' N, 66°11'] Stop 13. $t = +16\text{ }^{\circ}\text{C}$, $+19\text{ }^{\circ}\text{C}$ South bank of the River Khadata near the Khadata-yugan-lor lakes [67°37' N, 66°10' E]
		3–4 July	Stop 14. $t = +6\text{ }^{\circ}\text{C}$, $+3\text{ }^{\circ}\text{C}$, $+8\text{ }^{\circ}\text{C}$, $+4\text{ }^{\circ}\text{C}$
		5 July	North bank of the River Khadata [about 67°37' N, 66°14' E] Stop 15. $t = +15\text{ }^{\circ}\text{C}$, $+3\text{ }^{\circ}\text{C}$
		6 July	Upper reaches of the River Khadata and the River Shchyuchya, 385 m [about 67°42' N, 66°19' E] Stop 16. $t = +16\text{ }^{\circ}\text{C}$
			Upper reaches of the River Shchyuchya, 300 m [about 67°47' N, 66°27' E]

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Appendix 1. (Continued).

24 June	'aus dem Polaren Ural' (Becker)	7 July	Stop 17. $t = +11$ °C Valley of the River Shchyuchya, 220 m [about 67°50' N, 66°27' E]
25 June	'Polar-Ural' (Schnabl)	8–9 July	Stop 17. $t = +22$ °C, $+11$ °C Valley of the River Shchyuchya, 220 m [about 67°50' N, 66°27' E]
		9–10 July	Stop 18. $t = +22$ °C, $+12$ °C Environ of the Shchyuche lake, 300 m [about 67°54' N, 66°29' E]
28 June	'aus dem Polaren Ural' (Becker)	11 July	Stop 19. $t = +22$ °C, $+12$ °C, $+15$ °C, $+11$ °C Upper reaches of the River Pyderata [Baydarata], 270 m [about 67°57' N, 66°35' E]
		12 July	Stop 20. $t = +14$ °C, $+12$ °C Left tributary of the River Pyderata [Baydarata], 490 m [about 68°00' N, 66°38' E]
30 June 1909	'aus dem Polaren Ural' (Becker, Villeneuve)	13–14 July	Stop 21. $t = +17.5$ °C, $+11$ °C River Khuuta [Khuuta], 320 m [tributary of the River Baydarata, about 68°03' N, 66°34' E]
		15 July	Stop 22. $t = +10.5$ °C, $+4.5$ °C, $+13$ °C, $+9$ °C Tributary of the River Khuuta, the northeast foot of Mt Grigor'ev, 260 m [about 68°15' N, 66°39' E]
		16 July	Stop 23. $t = +20$ °C, $+11$ °C 3 km south of Mt Mamurovskiy, 275 m [Mt Khudyalakhape, upper reaches of the River Bol. Khuuta, about 68°13' N, 66°35' E]
		17 July	Stop 23. Stop 24. $t = +19$ °C, $+11.5$ °C Tributary of the River Nyarma-Yaga, 210 m [Nyarmayakha, 4 km south of Bol. Minisey Mt about 68°22' N, 66°26' E]
			Stop 24. Stop 25. $t = +23$ °C, $+13$ °C

(Continued)

Appendix 1. (Continued).

Date (Julian calendar), as given in Becker et al. (1915)	Localities as given in Becker et al. (1915)	Date (Gregorian calendar), as given in Backlund (1911)	Expedition stops and localities as given in Backlund (1911), with additional comments where relevant
4–10 July	'aus dem Polaren Ural' (Becker); 'aus dem Polaren Ural' (Becker, Villeneuve); von dem arktischen Ural' (Schnabl); 'aus dem Polaren Ural', 'von Polar-Ural' (Becker); 'Karskaja Tundra' (Schnabl); 'aus der Tundra des Fl. Kara' (Becker)	18–23 July	Tributary of the River Nyarma-Yaga [Nyarmayakha], 100–210 m [about 68°24' N, 66°15' E] Stop 26. $t = +23,5^{\circ}\text{C}$, $+21^{\circ}\text{C}$, $+16^{\circ}\text{C}$, $+22^{\circ}\text{C}$, $+10^{\circ}\text{C}$ By Mt Mimisey, 180 m [about 68°27' N, 66°17' E]
11 July	'aus der Tundra des Fl. Kara' (Becker)	24 July	Stop 27 Tributary of the River Nyarma-Yaga [Nyarmayakha], 185 m [about 68°33' N, 66°16' E]
12 July	'Karskaja Tundra' (Schnabl); 'aus der Tundra des Fl. Kara' (Becker)	25 July	Stop 28. $t = +12^{\circ}\text{C}$, $+6,5^{\circ}\text{C}$ Valley of the River Nyarma-Yaga [Nyarmayakha], 80 m [about 68°36' N, 65°57' E]. This was a very productive locality.
13 July	'aus der Tundra des Fl. Kara' (Becker)	26–27 July	Stop 29. $t = +11^{\circ}\text{C}$, $+6,5^{\circ}\text{C}$, $+8,5^{\circ}\text{C}$ Upper reaches of the River Kara [about 68°39' N, 65°52' E]
15 July	'aus der Tundra des Fl. Kara' (Becker, Villeneuve)	28 July	Stop 30. $t = +14^{\circ}\text{C}$ Mouth of the River Nerusovoy-Yaga, 50 m [or Nerusovey-Yakha] (tributary of the River Kara) [about 68°41' N, 65°31' E]. Another very productive locality.
16 July	'Karskaja Tundra' (Schnabl); 'aus der Tundra des Fl. Kara' (Becker)	29 July	Stop 31. $t = +25,5^{\circ}\text{C}$, $+16,5^{\circ}\text{C}$ Right bank of the River Kara, 60 m [about 68°43' N, 65°27' E]
17 July	'Karskaja Tundra' (Schnabl); 'aus der Tundra des Fl. Kara' (Becker); 'aus dem Polaren Ural' (Villeneuve)	30 July	Stop 32. $t = +15,5^{\circ}\text{C}$, $+18^{\circ}\text{C}$ Mouth of the River Brus-Yaga [Brusyakha] (tributary of the River Kara), 40 m [about 68°48' N, 65°19' E]

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Appendix 1. (Continued).

18 July	'Karskaja Tundra' (Schnabl)	31 July	Stop 33. $t = +13^{\circ}\text{C}$, $+12^{\circ}\text{C}$ Right bank of the River Kara, 50 m [about $68^{\circ}48' \text{N}$, $65^{\circ}10' \text{E}$]
19–20 July	'Karskaja Tundra' (Schnabl)	1–2 August	Stop 34. $t = +19,5^{\circ}\text{C}$, $+16,5^{\circ}\text{C}$, $+18^{\circ}\text{C}$, $+15^{\circ}\text{C}$ Right bank of the River Kara, 60 m [about $68^{\circ}53' \text{N}$, $64^{\circ}48' \text{E}$]
21 July	'Karskaja Tundra' (Dziedzicki, Schnabl), 'Karskaja Tundra, Tobolsk Gouv.' (Dziedzicki), 'Karskaja Tundra, Gouv. V. Tobolsk' (Schnabl); 'aus der Tundra des Fl.Kara' (Becker); 'aus dem Polaren Ural' (Villeneuve)	3 August	Stop 35. $t = +18^{\circ}\text{C}$, $+12^{\circ}\text{C}$ Mouth of the River Kara [about $69^{\circ}02' \text{N}$, $64^{\circ}35' \text{E}$]. This was another productive locality.
22 July	'Karskaja Tundra' (Schnabl); 'aus der Tundra des Fl. Kara' (Becker, Villeneuve)	4 August	Stop 36. $t = +17,5^{\circ}\text{C}$, $+11,5^{\circ}\text{C}$ Right bank of the River B. Vanuyta-Yaga (tributary of the River Kara), 10 m [about $69^{\circ}03' \text{N}$, $64^{\circ}47' \text{E}$]
23–25 July	'aus der Tundra des Fl. Kara' (Becker); 'aus dem Polaren Ural' (Villeneuve)	5–7 August	Stop 37. $t = +15^{\circ}\text{C}$, $+10^{\circ}\text{C}$, $+11^{\circ}\text{C}$, $+14^{\circ}\text{C}$, $+8^{\circ}\text{C}$ Delta of the River Kara [about $69^{\circ}07' \text{N}$, $64^{\circ}54' \text{E}$]. This was another productive locality.
26–27 July		8–9 August	Stop 38. $t = +8^{\circ}\text{C}$, $+9,5^{\circ}\text{C}$ Mys Tolstoi, Karskaya guba [Kara bay, environs of Ust'-Kara village, about $69^{\circ}15' \text{N}$, $64^{\circ}56' \text{E}$]
28 July	'aus der Tundra des Fl. Kara' (Becker, Villeneuve).	10 August	Stop 39. $t = +13^{\circ}\text{C}$, $+9^{\circ}\text{C}$ Shore of Kara Sea [about $69^{\circ}12' \text{N}$, $65^{\circ}14' \text{E}$]
29 July	'aus der Tundra des Fl. Kara' (Becker)	11 August	Stop 40. $t = +11,5^{\circ}\text{C}$, $+10^{\circ}\text{C}$ Left tributary of the River Lyubi-Yaga [now Labiyakha, about $69^{\circ}09' \text{N}$, $65^{\circ}10' \text{E}$]
30–31 July	'aus dem Polaren-Ural' (Becker); 'aus der Tundra von Obdorsk' (Becker)	12–13 August	Stop 41. $t = +11^{\circ}\text{C}$, $+8^{\circ}\text{C}$, $+5^{\circ}\text{C}$ Upper reaches of the River Lyubi-Yaga [now Labiyakha, about $69^{\circ}02' \text{N}$, $65^{\circ}14' \text{E}$]
		14 August	Stop 42. $t = +5,5^{\circ}\text{C}$, $+1^{\circ}\text{C}$

(Continued)

Appendix 1. (Continued).

Date (Julian calendar), as given in Becker et al. (1915)	Localities as given in Becker et al. (1915)	Date (Gregorian calendar), as given in Backlund (1911)	Expedition stops and localities as given in Backlund (1911), with additional comments where relevant
4 August	'Karskaja Tundra' (Dziedzicki); 'aus der Tundra des Pe-mal' (Becker)	15 August	Upper reaches of the River Ngoy-Yaga [tributary of the River Ngosoveiyakha, about 68°55' N, 65°38' E] Stop 43. <i>t</i> = +3.5 °C, +3 °C Upper reaches of the River Navyl'-Yaga, 65 m [left tributary of the River Ngosoveiyakha, about 68°48' N, 65°59' E] Stop 44. <i>t</i> = +6.5 °C, -1 °C Bank of M. Ern-Osovey lake [Malyi Ngosovey, about 68°40' N, 66°09' E] Stop 45. <i>t</i> = +3 °C, +1.5 °C, +8 °C, +2 °C Upper reaches of the River B. Ngoy-Yaga, 4 km north of Mt Kharapay [about 68°36' N, 66°18' E] 'Pe-mal' is probably the Yamal Peninsula
6 August	'aus dem Polaren Ural' (Becker)	19–20 August	Stop 46. <i>t</i> = +8.5 °C, +2 °C, +3 °C, +5 °C Upper reaches of the River Tyumbe (tributary of the River Minisey-yaga and Talota-yaga) [about 68°37' N, 66°30' E] Stop 47. <i>t</i> = +3 °C, +5.5 °C Tributary of the River Talota-yaga [about 68°36' N, 66°59' E] Stop 48. <i>t</i> = +3 °C, +6 °C Right bank of the River Talota-yaga [about 68°37' N, 67°20' E] Stop 49. <i>t</i> = +7 °C, +10 °C Right tributary of the River Tungami-Yaga (or Tulomy) [about 68°28' N, 67°32' E]
11 August	'aus dem Pe-mal' (Becker)	24 August	Stop 50. <i>t</i> = +17 °C, +7.5 °C Right bank of the River Nunderma-yaga (or Nganunderma) [about 68°24' N, 67°41' E]

(Continued)

Appendix 1. (Continued).

			'Pe-mal' is probably the Yamal Peninsula Stop 51. $t = +10\text{ }^{\circ}\text{C}$, $+7\text{ }^{\circ}\text{C}$ Valley of the River Nemzi-yaga [about $68^{\circ}20'\text{ N}$, $67^{\circ}55'\text{ E}$] Stop 52. $t = +9\text{ }^{\circ}\text{C}$, $+8\text{ }^{\circ}\text{C}$ Right bank of the River Nemzi-yaga, 55 m [about $68^{\circ}17'\text{ N}$, $67^{\circ}53'\text{ E}$] Stop 53. $t = +8\text{ }^{\circ}\text{C}$, $+7\text{ }^{\circ}\text{C}$ Right tributary of the River Pensigou-Yaga (or Pensingou), 60 m [about $68^{\circ}18'\text{ N}$, $67^{\circ}50'\text{ E}$] Stop 54. $t = +7\text{ }^{\circ}\text{C}$, $+6\text{ }^{\circ}\text{C}$ Right bank of the River Khalimer-yaga, 70 m [tributary of the River Baydarata, about $68^{\circ}07'\text{ N}$, $67^{\circ}45'\text{ E}$] 'Pe-mal' is probably the Yamal Peninsula Stop 55. $t = +6\text{ }^{\circ}\text{C}$, $+7.5\text{ }^{\circ}\text{C}$, $+4\text{ }^{\circ}\text{C}$ Right bank of the River Pyderata, [now Baydarata, about $67^{\circ}58'\text{ N}$, $67^{\circ}43'\text{ E}$] Stop 56. $t = +9.5\text{ }^{\circ}\text{C}$, $+9\text{ }^{\circ}\text{C}$, $+10.5\text{ }^{\circ}\text{C}$, $+5.5\text{ }^{\circ}\text{C}$ Left bank of the river Pyderata [now Baydarata, about $67^{\circ}57'\text{ N}$, $67^{\circ}47'\text{ E}$] Stop 57. $t = +7\text{ }^{\circ}\text{C}$, $+13\text{ }^{\circ}\text{C}$, $+14\text{ }^{\circ}\text{C}$ Right bank of the River Nyada-yaga, 65 m [tributary of the River Baydarata, $67^{\circ}53'\text{ N}$, $67^{\circ}55'\text{ E}$] Stop 58. $t = +15\text{ }^{\circ}\text{C}$, $+3.5\text{ }^{\circ}\text{C}$ Upper reaches of the River Enser-yaga, 120 m [River Ensor-yakha, $67^{\circ}46'\text{ N}$, $67^{\circ}11'\text{ E}$] Stop 59. $t = +10.5\text{ }^{\circ}\text{C}$ Valley of the River Shchyuchya, shore of Lake Khu-lor 'Pe-mal' is probably the Yamal Peninsula Stop 60. $t = +10.5\text{ }^{\circ}\text{C}$, $+14\text{ }^{\circ}\text{C}$ Valley of the River Shchyuchya, shore of Lake Paudey-lor Stop 61. $t = +12-13\text{ }^{\circ}\text{C}$ Left bank of the River Shchyuchya
25 August			
26 August			
27 August			
28 August			
29–30 August			
31 August–1 September			
2–4 September			
5 September			
6 September			
7 September			
8 September			
15 August	'Pe-mal' (Dziedzicki), 'Pe-mal Tobolsk- Gouv.' (Schnabl); 'aus dem Pe-mal' (Becker)		
23 August	'aus dem Pe-mal' (Becker)		

(Continued)

Appendix 1. (Continued).

Date (Julian calendar), as given in Becker et al. (1915)	Localities as given in Becker et al. (1915)	Date (Gregorian calendar), as given in Backlund (1911)	Expedition stops and localities as given in Backlund (1911), with additional comments where relevant
27 August	'Obdorskaja Tundra' (Dziedzicki); 'aus der Tundra von Obdorsk' (Becker)	9 September	Stop 62. $t = +17,5^{\circ}\text{C}$, $+10^{\circ}\text{C}$ Right bank of the River Shchyuchya, on the opposite side
31 August	'Obdorskaja Tundra' (Dziedzicki, Schnabl); 'aus der Tundra von Obdorsk' (Becker)	10–11 September 12–13 September	Stops 63, 64. $t = +8^{\circ}\text{C}$, $+11^{\circ}\text{C}$, $+12^{\circ}\text{C}$, $+4^{\circ}\text{C}$ Valley of the River Longot-yegan
'32 August'		September	Stop 65. $t = +6^{\circ}\text{C}$, $+7^{\circ}\text{C}$, $+4,5^{\circ}\text{C}$ Bank of the River Malaya Ob
1 September	'aus der Tundra von Obdorsk' (Becker); 'von Tundra von Obdorsk' (Villeneuve)	12–13 September	Stop 65. $t = +6^{\circ}\text{C}$, $+7^{\circ}\text{C}$, $+4,5^{\circ}\text{C}$ Bank of the River Malaya Ob
		September	This date, recorded by Becker, is evidently a misprint, for 30 or 31 August
		14–19 September	Stop 66. $t = +3^{\circ}\text{C}$, $+7^{\circ}\text{C}$, $+5^{\circ}\text{C}$, $+11^{\circ}\text{C}$, $+2^{\circ}\text{C}$, $+4^{\circ}\text{C}$ Khalas-pugor [Khalas-pugor village]