Edible Plants Used by Siberian Yupik Eskimos

of Southeastern Chukchi Peninsula, Russia

Lyudmila Ainana and Igor Zagrebin

English translation by Richard L. Bland

principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural and cultural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for enjoyment of life through outdoor recreation.

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National Park Service
Shared Beringian Heritage Program
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Table of Contents

Preface to the English Translation vii
About the Authors ix
Translator's Note xi
Preface xiii
To the Reader xiii
The Structure of the Manual xiv
Sources of Information xv

PART I INTRODUCTION 1
The Eastern Chukotka Region 3
Natural Features of the Southeastern Chukotka Peninsula 5
Coastline and Relief 5
Climate 5
The Seasons of the Year 7
Vegetation 8
Plants in the Diet of the Central Siberian Yupik 14
Some Rules for Collecting and Preserving Edible Plants 17

PART II EDIBLE PLANTS OF THE ESKIMOS 19
Berry Plants 20
Crowberry, Blackberry 20
Low-bush cranberry, Mountain cranberry, Lingonberry 24
Bog blueberry, Alpine blueberry 26
Cloudberry, Low-bush salmonberry 28
Leafy Plants 30
Heartleaf saxifrage, Brook saxifrage 30
Mountain sorrel 32
Sweet coltsfoot 34
Sour dock, Arctic dock 36
Common English name unknown [Bering sea dock, Bering sea sorrel—Eds.] . . . 38
Oysterleaf 40
Sea beach sandwort, Beach greens 41
River beauty, Dwarf fireweed 43
Frigid shooting star 45
Weasel snout 47
Leaf and Root Plants 49
Pink plume, Bistort 49
Wild rhubarb 51
Storing Leaves 52

Roseroot 54
Willow (various species) 57
Root Plants 60
Glacier avens 60
Common bistort 62
Woolly lousewort 64
Wild potato, Wild carrot, Eskimo potato 66
Spring beauty, Tuberous spring beauty. 68
Siberian narrow-leaved spring beauty 70
Mushrooms 72
Puffballs 72
Seaweeds 74
Sea cabbage, Kelps 74
Sea cabbage 76
Sieve kelp 78
Winged kelp, dragon kelp 79
Use of Seaweeds for Food 79
Appendices 80
Appendix A: Implements Used to Collect and Preserve Plants 80
Appendix B: Lexical Constructions 82
Examples of Language Use 82
Appendix C: Edible Plants
(alphabetized by English common names) 83
Appendix D: Edible Plants
(alphabetized by Russian common names) 84
Literature 87

Preface to the English Translation

This manual was originally printed in Russian under the title *Land of the Eskimos, Edible Plants: Ethnobotany Notebook for Schools in the Chukotka Autonomous Region* by Lyudmila Ainana and Igor Zagrebin. When the opportunity arose to publish an English translation, we offered to edit the botanical content of the translation provided by Richard L. Bland.

We have sought to unify the plant nomenclature (Latinized names), substitute words and phases in both the plant and landscape descriptions with ones more likely to be used or understood by English speakers, and to make minor modifications of English grammar and syntax in ways we hope will satisfy both clarity for English readers and scientific accuracy.

In the original Russian edition, the scientific names for the plants followed the *Arctic Flora of the USSR*, edited by Tolmachev and Yurtsev, and the *Flora of the Magadan Oblast* by Khokhryakov. Since then, Russian, North American, and European taxonomists have worked to develop a mutually agreed-upon list of accepted names for arctic vascular plants. This effort became known as the Panarctic Flora Checklist (PAF) project. A team of taxonomists at the Komarov Botanical Institute (St. Petersburg), led by the late Boris A. Yurtsev, submitted draft accounts to Reidar Elven, the PAF editor-in-chief (Oslo), who then sought the comments of specialists. The results were then reviewed by the PAF editorial committee of Elven, D. F. Murray (Fairbanks), V. Yu. Razzhivin (St. Petersburg), and, until his death in 2004, B. A. Yurtsev (St. Petersburg). The result is now available online at http://nhm2.uio.no/paf. The scientific names herein are taken from PAF. The "common names" are, in the Russian version, basically translations of the Latinized name. English common names are taken from several sources and reflect those used most commonly in western Alaska.

We received help and encouragement from both Igor Zagrebin and Richard Bland during this effort. Igor Zagrebin also gave us permission to use his color images in the text, replacing the plant line drawings used in the original Russian version. Acknowledgements are offered to the following individuals for their expertise: Sandra C. Lindstrom, Department of Botany, University of British Columbia

(marine algae); Lisa Strecker, Department of Anthropology, University of Alaska Fairbanks (early Russian and German botanical references); and Sveta Yamin-Pasternak, University of Alaska Fairbanks (fungi). In addition, funds were made available for the early stages of editing by Rose Meier through the Ethnobotany Certificate Program, University of Alaska Fairbanks, Kuskokwim Campus at Bethel.

Carolyn L. Parker and David F. Murray
Herbarium, University of Alaska Museum of the North, Fairbanks

About the Authors

Lyudmila Ainana is a Central Siberian Yupik Eskimo born in the small village of Ukig'yaġak in eastern Chukotka. After finishing middle school in Provideniya, she studied at Leningrad's Herzen State Pedagogical Institute and at the Philological Department of the Division of Peoples of the Far North with specialties in teaching Russian language and literature and the Siberian Yupik language. She has taught school in the villages of Tanyurer in the Anadyr' region and in Novo Chaplino and Provideniya, Chukotka. After 1978, she worked at the Institute of National Problems of Education in Moscow. Since 1984, she has been senior science collaborator and head of both the Chukotsk Laboratory of Common Problems of Northern Schools and of the Minority Peoples of the Russian Federation. She is the author of several textbooks and educational manuals for the Siberian Yupik National School as well as educational manuals for exercises in the Siberian Yupik language for preschool institutes. She directs a large amount of community work as the president of the Yupik Society of Eskimos of Chukotka. She currently lives in Provideniya.

Igor Aleksandrovich Zagrebin is by specialty a teacher of geography and the English language. He is a graduate of Moscow's V. I. Lenin State Pedagogical Institute (1982) and has since lived in Chukotka. He worked eleven years as a teacher of geography, then as director, at the middle school at the Siberian Yupik village of Novo Chaplino. He has developed programs for school courses on the geography and

history of the Native land and the author of programs for teaching the Siberian Yupik language to adults as well as textbooks on the Siberian Yupik language. He has taught at the Provideniya Middle School and worked as a science advisor to the Institute of National Problems of Education. Since 1994 he has been a science researcher at the Regional Museum in Provideniya, where he now lives.

Translator's Note

This book was published in Provideniya in 1997. It was intended to be an ethnobotanical manual for the National Schools of the Chukotka Autonomous District. However, anyone who reads this book will realize its broader importance, particularly to Native people living on the east side of the Bering Strait. Because it was intended as an information source on the plants used in Chukotka, I felt that the common, non-Eskimo names might be of value to people who wish to communicate across Bering Strait about these plants. I have left the common Russian names in the text following the English equivalents. However, giving the plants their common English names has been much more difficult than first imagined. Many of the plants in Chukotka, though of the same genus, are of different species than the same or comparable species of western Alaska. Therefore, for example, I identify the Russian *shiksha subgolarkticheskaya* (*Empetrum subholarcticum* V. Vassil.) as "crowberry" or "blackberry" even though these names apply in Alaska to *Empetrum nigrum*. As a reference for the common plant names in English I have used *Tanaina Plantlore* by Priscilla Russell Kari (1987), *Pacific Coast: The Audubon Society Nature Guides* by Bayard H. McConnaughey and Evelyn McConnaughey (1985), and *Flora of Alaska and Neighboring Territories: A Manual of the Vascular Plants* by Eric Hultén (1968).

A frustrating aspect of any translation from Russian is deciding on a suitable form of English transliteration. None of the three systems available (U.S. Board of Geographic Names [BGN], Library of Congress [LOC], or "Linguistic" system [Ling]) seems entirely adequate. I have therefore created my own. In it I combine some of the BGN system with a slightly modified version of the LOC. For example, the "ye" of BGN is written as "e," following LOC. The Russian "ё" is also written as "e" (not "yo"), following Ling. The Russian "э" is written as "e," following BGN. Both Russian "*и*" and "*й*" are transliterated as "i," unlike any of the standard systems. The Russian soft sign appears as an apostrophe; although it is often dropped in transliterations, I have retained it here. An initial single quotation mark (') represents the Russian hard sign. The Russian "ю" and "я" are written as "yu" and "ya," following BGN. I have also settled on a single ending for words, as in English, rather than the plethora of possible endings—masculine, feminine, and

neuter singular, and plural—in Russian. Some names with aberrant spellings have already been adopted into English, thus defeating any effort at standardization. Many names, particularly those ending in "-ский," leave the translator with a variety of spellings to choose from ("-sky," "-skiy," "-skij," "skii," "-ski"). I have consistently used "-skii." Other names are semiformalized in English, and individual Russians often prefer one form or another.

I would like to thank the authors, L. Ainana and I. A. Zagrebin, for allowing me to translate and publish their work in English. I am also indebted to Nan Coppock for editorial assistance.

Richard L. Bland
Museum of Natural and Cultural History
University of Oregon
Eugene, Oregon
1997

Preface

To the Reader

This manual was formulated primarily for teachers of the Central Siberian Yupik language and is intended to be one in a series of manuals dedicated to the life, ways, culture, and traditions of the Central Siberian Yupik people of Northeast Asia. The nucleus around which the materials are assembled is their Native language.

This first manual is dedicated to edible plants that the Central Siberian Yupik collected, and still collect. The authors attempted to combine in a single volume plants (botany) and language (linguistics), as well as traditional food and uses of nature (ethnography). Therefore, it is entirely correct to call this an ethnobotanical manual.

The authors hope that this manual will help teachers in preparing and conducting lessons in the development of speech and in the study of the peculiarities of word formation in the Central Siberian Yupik language. Short descriptions of edible plants can be useful during field trips and excursions. Recipes for various meals and the methods and principles for collecting edible plants are a part of the traditional way of life of the people. Knowledge of such traditions of food, domestic life, and uses of natural resources is an integral part of understanding the lives of a people.

In this manual, twenty-nine species of edible plants are described. Is this many or few? These plants comprise approximately a tenth of all vascular plants growing on the northeastern Chukotka Peninsula, which means that the Central Siberian Yupik used approximately every tenth plant for food, and still, this list is probably not complete. This reflects the rich cultural heritage of the Central Siberian Yupik and their close connection with nature.

We also hope that this manual will be interesting not only to teachers of the Central Siberian Yupik language but also to all who want to know more about our region and the lives of the people who have lived here for centuries. The Central Siberian Yupik have been able to survive and create a unique and distinctive culture of coastal peoples only by their close unity with and the wise use of natural resources, including the native plants.

This manual does not claim to be complete or universal. The authors are open to any remarks, suggestions, and additions.

The Structure of the Manual

The manual consists of two parts and four appendices. Part I, an introduction, gives a general idea about the Central Siberian Yupik of northeast Asia, the territory of their settlement at the beginning of the twentieth century, and their present settlement. Here the natural features of the southeastern part of the Chukotka Peninsula (relief, climate, and vegetation) are described. The authors introduce the region and role of edible plants in the local traditional uses of nature and foods.

Part II consists of descriptions of the twenty-nine species of edible plants that the Central Siberian Yupik use. An attempt has been made to summarize the vocabulary connected with the vegetation (the general idea, use of plants, their names). Following the family to which the plant belongs are four names for the plant—in English, in Russian (current), in Latin (scientific/botanical), and in Central Siberian Yupik. The scientific (botanical) name in Latin is universal for all languages and is necessary in a manual intended for those who want to identify wild plants. [In the English revision, synonyms, or equivalent scientific names, have been added.—Eds.] The Central Siberian Yupik names of plants are given in the Chaplino dialect, which is the most widespread dialect among Siberian Yupik of northeast Asia. For some plants, names are given in the Naukan dialect. Names of plants in this dialect are designated as "Naukan." If the meaning (translation) of the plant name is known in the Russian language, it is given in parentheses after the Eskimo name. Below is an example of the order of names:

Family: Ericaceae (formerly Empetraceae)

Crowberry, Blackberry	Current English name
Shiksha (vodyanika, voronika)	*Current Russian name subgolarkticheskaya (genus, species, and if it exists, subspecies)*
Empetrum subholarcticum V. Vassil. = *Empetrum nigrum* L.	***Scientific (botanical) name***
	Synonym, or equivalent scientific name for the same species
PAGUNĢAĶ ("berry")	Central Siberian Yupik name, Chaplino dialect, meaning of the word in parentheses.

A description of the plant includes the plant's morphology, its forms and cycle of development, and characteristics of its habitat. Where possible, the origin of the name in Central Siberian Yupik is given as well as interesting comments about the

plant. Then follows a description of the Siberian Yupik use of the plant as food, with recipes for Eskimo dishes.

Part II is subdivided. Edible plants are grouped in four subdivisions according to the parts used as food: berry, leaf, leaf-root, and root plants. Two additional subdivisions treat mushrooms and seaweeds.

The Native people in villages on the Chukotka Peninsula still use the majority of the plants described for food, though perhaps less frequently than in former times.

The characteristics of the landscapes and vegetation in general are given for the southeastern Chukotka Peninsula where we find the sole traditional Central Siberian Yupik village, Sireniki, as well as more than half of the Asiatic Eskimos. The Chaplino dialect, spoken by the people of this region, was based on a written Siberian Yupik language.

Sources of Information

The creation of this manual, the basic content of which is connected to the material and spiritual culture of a people, would not have been possible without the information obtained from the bearers of this culture. The indigenous people of Chukotka, having as their history many centuries of surviving the severe conditions of the north and using natural resources as part of that survival, possess the unique experience of many generations. Unfortunately, the Native tradition of passing on ethnocultural knowledge from generation to generation is being lost; therefore, it is necessary to preserve, revive, and develop the material and spiritual culture of the Yupik, Chukchi, and other Native people of the north.

In the 1990s, several works appeared that were dedicated to the knowledge and values of the traditional way of life of northern people. Notable examples are: *I bylo tak…* [*And So It Used to Be…*] by Tein (1992), *Traditsionnaya terminalogiya olennykh i beregovykh chukchei Providenskogo raiona* [*The Traditional Terminology of the Reindeer and Coastal Chukchi*] by Tegret (1995), and *Chuvantsy* [*The Chuvantsy*] by Burykin (1993).

The authors of this manual express deep appreciation to the inhabitants of the villages of Sireniki, Novo Chaplino, and Provideniya who generously shared their knowledge. The descriptions of plants, methods of plant collection and storage, and recipes were obtained from the following inhabitants of the Provideniya region: Lidiya Aleksandrovna Lilen, Anna Ankan, Marina Ivanovna Sigunylik, Kavav, Petr Typykhak, and Tamara Petrovna Pivran.

The description and identification of plants are given according to the *Arkticheskayai flora SSSR* [Arctic Flora of the USSR] (Tolmachev 1980, 1983, 1987) and *Flora Magadanskoi oblasti* [Flora of the Magadan Region] (Khokhryakov 1985), as well as from the authors' personal observations. The primary botanical names of the plants are given according to *Arkticheskaya flora SSSR* [Arctic Flora of the USSR].

[Botanical/scientific names added to this English edition reflect those names currently used by Hultén (1968), the most commonly used reference for the Alaska flora, and in the *Panarctic Flora Checklist* (Elven et al. 2011).—Eds.]

PART I INTRODUCTION

Modern settlements of the Siberian Yupik

Siberian Yupik settlements of the twentieth century

The Eastern Chukotka Region

The Siberian Yupik are one of the numerically smaller ethnic groups living in the Russian Federation. The total population is 1,452 according to the 1989 census. At present they live in several places on the eastern part of the Chukotka Peninsula along the shore of the Bering Sea. The overall settlement pattern of the Siberian Yupik has not changed over the course of twenty centuries, though significant changes have occurred in the places where they live. These changes are connected to social and economic policies that were carried out by the Soviet government from the 1950s to the 1970s. The consequence of these policies (abandonment of "unpromising" villages and centralization of the economy) was that the majority of traditional Native settlements disappeared and, in some cases, people were concentrated in a single village (i.e., Novo Chaplino and Sireniki); in other cases they were relocated into new areas (i.e., Naukan, Avan, and Kivak).

As a result, by the end of the twentieth century only one traditional Central Siberian Yupik village remained, Sireniki (however, Yupik are not the dominant portion of the population there). The only settlement with a predominant Central Siberian Yupik population is Novo Chaplino (with more than 350 Yupik). This more recent settlement arose on the inner shore of Tkachen Bay between 1957 and 1960. The location of this village, at the head of a long and deep fjord, is not traditional for the Siberian Yupik. The inhabitants of Uṇaziḳ ('Old' Chaplino), the ancient and most notable Yupik village of the past, were resettled here. The effect on the Eskimo population of the Uel'kal' village (in Kresta Bay), as well as the fate of old Naukan (on the Bering Strait), has been substantial. The occupants of this large Native settlement on the northeast part of the Chukotka Peninsula were resettled in the villages of Nunyamo and Pinakul' in 1958, which in the 1970s were, in turn, abandoned. The Naukan people were resettled in villages on the coast of the Chukotka Peninsula and did not constitute a significant group in any of them.

Relatively small groups of Central Siberian Yupik live in the villages of Uelen, Lorino, and Lavrentiya (principally Naukan people), Provideniya (Chaplino and Avan people), the city of Anadyr', and a small group in Ushakovskii village (on Wrangel' Island).

In the past, the area settled by Siberian Yupik was much larger. From the eighteenth to the beginning of the nineteenth centuries, Native settlements were found along almost the entire Chukotka coast from Cape Shelagskii to the mouth of the Anadyr' River. However, at the end of the nineteenth century, as a result of the ethnic and migrational processes that occurred on Chukotka, the indigenous populations became concentrated at the eastern fringe of the Asian mainland in the regions of Cape Peek, Cape Chaplino, and Sireniki. During work with the Jesup North Pacific Expedition, Bogoraz (1949) studied the characteristic features of Native life at the beginning of the twentieth century. He wrote:

> *The Asiatic branch of the Eskimos occupies eight villages on the coast of the Bering Sea. Seven of them extend in an unbroken line, while one is located by itself at Cape Dezhnev. In two of the villages the population is mixed, being half Chukchi. The villages are located on capes that extend into the sea or on coastal islands that face the sea. This corresponds to the fact that the Eskimos live exclusively from hunting sea mammals.*

The names of Siberian Yupik villages follow, beginning in the south:		
Serinak	**8 houses**	**58 people**
Imtuk	**12 houses**	**65 people**
Rirak	**2 houses**	**24 people**
Avak	**12 houses**	**88 people**
Tesik	**25 houses**	**142 people**
Uṇisak or Uṇasik	**61 houses**	**442 people**
Napakutak	**4 houses**	**37 people**
Nivukak	**50 houses**	**299 people**

These data on the size of the populations are based on a census conducted in April and May of 1901 in all the villages by Bogoraz. At that time, the total size of the entire Asiatic group of the Eskimos slightly exceeded 1,000 people (Bogoraz 1949).

More detailed information on the movement of the Siberian Yupik in the twentieth century can be obtained from the works of Krupnik in *Arkticheskaya etnoekologiya* [Arctic Ethnoecology] (Krupnik 1989) and *Drevnie i traditsionnye poseleniya eskimosov na yugo-vostoke Chukotskogo poluostrova* [Ancient and Traditional Settlements of the Eskimos on the Southeastern Chukotka Peninsula] (Krupnik 1983). In these works information is given on the Eskimo settlements from earliest times to the present.

Natural Features of the Southeastern Chukotka Peninsula

Coastline and Relief

The coastline of the southeastern Chukotka Peninsula is extremely dissected with coves, bays, and capes. Deeply cut bays, glacial fjords (the bays of Provideniya and Tkachen are the largest), Cape Chaplino projecting far into the Bering Sea, and the islands of Sinyavin Strait create complex landscape features along the shoreline. In many places the rocky coast falls straight into the sea. Areas of the rocky shore alternate with low beaches. Numerous shallow lagoons are separated from the sea by long sand and gravel spits. These lagoons differ in shape and size. Large ones (such as Kivak or Imtuk) are located in intermountain valleys. They are long and narrow and were once coastal bays, separated at the present time from the sea by spits. The shore in many places is so precipitous that there is not even a narrow rocky beach.

The relief of the coastal mainland is complex: irregular ridges and small ranges separated by broad plains. The elevation of the mountains seldom exceeds 900 m (3,000 ft). The mountains are usually sharp and jagged; many of them are pyramidal and conical in shape, and others are flat-topped, having the appearance of mesas. The summits of the jagged mountains are most often solid rock, while the flat-topped summits are covered with scattered weathered rock fragments. Alpine landscape features such as cirques and basins as well as deep glacial valleys are common. The mountains are covered with a cloak of talus that surrounds their bases as terraces, scree, and outwash deltas. The steep mountaintops are often inaccessible in spite of their low elevation. The southeastern Chukotka Peninsula is a kingdom of stone. The processes of destruction of the mountains have created a great diversity of landscape forms that on the whole gives this region a picturesque, though severe look.

Climate

The climate of the southeastern Chukotka Peninsula can be summarized as subarctic maritime. At times it is severe, especially in winter. This severity is not

Mountains near the coastline show both rugged and rounded rocky summits. The highest slopes are covered with talus (rock debris) supporting sparse arctic-alpine vegetation. A dry gravel floodplain meadow, in the foreground, is dominated by sedges, grasses, and flowering river beauty.

Tkachen Bay is one of several deep, glacially cut fjords reaching far inland from the rugged outer coastline. Novo Chaplino village is located at the base of the spit, at far left in this image. These fjords offer gently sloping gravel beaches, sheltered harborage, and access to a diversity of marine and coastal resources.

caused by low temperatures but rather by the strong winds. The easternmost part of the Chukotka Peninsula is very windy where it juts into the sea, especially from mid October to mid December when severe storms rage. In winter, which lasts for more than six months, blizzards roar with wind speeds up to 40 m/s (90 mph). These storms move large masses of snow on the coast. The winds drive into the valleys, bringing snow from the mountaintops. The resulting snowdrifts in the valleys, in depressions on the mountain slopes, and on the northern slopes of passes often do not melt during the short summer, thus forming permanent snow patches. During summer, the snow patches and different types of vegetation on the mountain slopes give them a multicolored appearance. The winds also firmly compact the snow on level areas of the tundra, forming *vetrovuyu dosku* (literally, "wind slabs").

A large amount of precipitation relative to other arctic regions is characteristic for the southeastern part of the Chukotka Peninsula: approximately 700 mm (28 inches) per year. Much falls as rain during summer and fall. Very often there is fog, especially in spring and fall. The conditions of high humidity and precipitation, combined with comparatively low temperatures (both in summer and winter) and low evaporation rate, results in the region being distinguished by a surplus of moisture.

The windy and humid coastal areas of this region also have a long frost-free period of more than seventy days a year.

The Seasons of the Year

Winter. If winter is considered to be all the months with temperatures below freezing, then the duration of this period is about eight months, from October to the beginning of May. Within this period, two other seasons are distinguished: pre-spring (beginning of April to second half of May) and pre-winter (end of September to end of October). These seasons are characterized by the transition of weather from winter to spring and from fall to winter, with a transition of mean temperature from –5°C to 0°C (23°F to 32°F) in pre-spring and the reverse in pre-winter. Winter on the southeastern Chukotka Peninsula is moderately cold. The average air temperature in January is –17°C (1°F). However, as already noted, strong winds, snowstorms, and high humidity make the climate quite harsh.

Pre-spring. April, the end of winter, is the calmest month, usually lacking precipitation and strong winds. May has unwelcome winds and is gloomy, often having wet snow or snow with rain, with temperatures fluctuating around 0°C (32°F). Fog and drizzle are often in the air. Bare spots appear as the snow melts on the south slopes, the sloping faces and rims of terraces are exposed, and the higher slopes release rock fall.

Spring. This season is short, from the middle of May to the beginning of June. With air temperatures above freezing, the snow melts rapidly. Toward the end of

spring a large part of the tundra is snow-free. However, throughout spring, cold weather and brief snowfalls can return.

Summer. Summer extends approximately to the middle of August. Most often on the coast, summer is foggy and gloomy, with frequent winds, rain showers, and mist, which sometimes continue for weeks. However, each year there are periods of clear sunny and calm weather. The surface of the tundra and the air near the ground is thoroughly warmed. The warmest period is the second half of July to the beginning of August. The mean air temperature in July is about 5°C (41°F) on the capes jutting into the sea. The temperature quickly increases when one moves away from the coast toward the interior. At the heads of the deeply incised bays the average temperature in July reaches 8°C (46°F). The tundra can become very warm and the air can heat up to 30°C (86°F), sometimes even higher. However, such temperatures are rare and more characteristic of the interior, continental regions of Chukotka. On the coast, the cooling effect of the ocean is strongly felt.

Fall. Like spring, fall is short (mid August to the 20th of September) and quickly changes into pre-winter. The air temperature gradually drops. Frequent winds blow and precipitation falls both as drizzling rain as well as snow and sleet. The weather is foggy and gloomy. On the mountaintops the snow starts to fall at the beginning of September, and the first frosts occur.

Pre-winter. The month of October is already pre-winter. The air temperature gradually drops to 0°C (32°F). Strong winds and falling snow are frequent, but the snow cover is not yet continuous. In pre-winter the temperature can return to 0° C and even warmer with the arrival of warm sea air. Usually at this time strong winds blow from the south, carrying a lot of moisture in the form of rain. But these warmer periods are temporary. Toward the end of October the air temperatures drop, crossing the –5°C (23°F) mark, and winter sets in. Gradually a snow cover develops.

Vegetation

Due to the severity of the climate, the general character of the vegetation of the southeastern Chukotka Peninsula is arid alpine tundra. Rocky deserts (*gol'tsy*) cover the tops of the mountain ranges and massifs. [Whereas some dictionaries make *gol'tsy* the equivalent of alpine tundra, Yurtsev (pers. comm.) applied the term to the alpine summits and uppermost slopes blanketed with block fields of shatter rock and talus that are common in Chukotka. Block fields and talus are emblematic of cold climates, hence the reference.—Eds.] Outcrops of rocks along the coast are devoid of vegetation. The mountain slopes are covered with arctic-alpine tundra, which below 100 m changes to subarctic tundra on the south-facing slopes. Shrub willow tundra appears along the river channels and streams.

Conditions for plant life on the tundra, and especially in the alpine, are extremely unfavorable and thus influence the morphology of the plants, the species

composition, their growth forms, and the features of the plants' developmental cycle.

Lush subarctic low-shrub meadow tundra is found on gentle slopes that are moist and sheltered from the strongest winds. Shown in this image are two species of dwarf willow (in foreground), flowering forbs, and mixed grasses and sedges.

The short, cold summer makes fruit and seed ripening difficult; therefore, few annuals [only one or two species are true annuals—Eds.] grow in the tundra. The overwhelming majority of species are perennials. Owing to the extreme severity of the habitat, tundra plants are distinguished by very slow growth. Wind also has a negative impact on the development of the plants. In winter, plants endure huge amounts of blowing snow at ground level. This flow of tiny ice crystals causes severe damage to the parts of plants not protected by snow cover. Those parts of the plant that are raised above the snow surface are usually lost. Strong winds exert an unfavorable impact even in summer, because they cause excessive evaporation from the surfaces of stems and leaves. This water loss is especially dangerous because the roots are located in cold soil and can only slowly absorb moisture [for translocation to the rest of the plant—Eds.].

An important limiting factor for tundra plants is the shortage of warmth. However, the summer sun heats the surface of the soil to a greater or lesser degree; therefore, the layer of air at the ground surface and the very upper layer of soil itself is warmed the most. This is why tundra plants commonly display low, spreading shoots and leaf rosettes that lie on the ground, as well as cushion-like growth

forms. Roots and other below-ground parts of tundra plants usually creep just under the soil surface or often on the surface itself.

In the tundra of the southeastern Chukotka Peninsula, mosses, lichens, and low shrubs predominate. Perennial herbs appear quite frequently, and shrubs are less widespread. In many areas several species of mosses and lichens almost completely cover the tundra. Among the lichens that live on the soil, the most widespread are various species of Iceland moss or "reindeer moss" (*Cladonia* spp., *Cladina* spp.). The low shrubs (dryads, crowberry, blueberry, cranberry, heather, Labrador tea, and various dwarf and spreading species of willows), in addition to the mosses and lichens, dominate the tundra. Perennial herbs, like the low shrubs, are characterized by having low growth forms. Shrubs (dwarf birch and some species of willows) are, on the whole, less significant, but in some habitats they can form dense thickets.

Rocky arctic-alpine tundra grows on dryer, more exposed slopes and lowlands lacking any significant soil cover. Shown in this image are low-growing cushion plants, forbs, grasses, and lichens with scattered rock fragments.

Species diversity is not great owing to the severity of the climate and alpine relief. According to the Russian arctic botanist Boris A. Jurtsev, the number of species of vascular plants in the region of Provideniya Bay is 200, at Novo Chaplino village it is 300, and on the islands of Itygran and Arakamchechen it is 310 (rounded to the greatest multiple of 10). However, it is certainly not correct to say that the vegetation of the tundra is species-poor. Those who have seen the tundra in bloom will never say it is bleak or monotonous.

The complex landscape relief and variety of habitat conditions involving warmth and moisture create a mosaic of vegetation types. On the other hand, the severity of conditions results in low, alpine-like vegetation dominating on both the mountain slopes and the low-elevation plains. On the southeastern Chukotka Peninsula typical alpine plants characteristically descend to the lowlands and even to sea level.

Alpine rock desert or gol'tsy plant community occupies the mountaintops, steep slopes, and ridgelines. Only some of the cliffs, boulders, and rubble are covered with scaly (crustose and foliose) lichens. Occasionally, in depressions sheltered from the wind and in accumulations of shallow soil on mountain slopes with southern exposure, there are patches of low alpine shrubs and clumps of shrubby (fruticose) lichens and mosses. Alpine rock deserts often descend downward on slopes facing the sea (for example, at Cape Chukotka). Along the coast, the mountain slopes above 80 to 100 m elevation usually have no significant vegetation cover, and this zone we call *gol'tsy*.

Alpine tundra is found on the rounded tops of low mountains, on passes and the upper portions of gentle slopes, on terraces of alpine rivers, and often in patches among rocky deposits. However, even on the coastal plains the vegetation is similar to alpine tundra. The rocky soil and harsh climate creates conditions for alpine tundra to exist at lower elevations and at sea level.

There are several varieties of alpine tundra: rocky with small patches of low shrubs, low meadow vegetation, lichen-covered rubble, and patterned low-shrub tundra of various forms. The essential feature of small, low-shrub alpine tundra is a single-layer cover of dwarf low shrubs, usually spreading and lying on the ground. Most often encountered are *Arctous alpina*, *Diapensia lapponica* ssp. *obovata*, *Loiseleuria procumbens*, species of spreading willow (*Salix* spp.), *Dryas* spp., spreading Labrador tea, cranberries, blueberries, crowberries, and many others. The height of these low, prostrate shrubs varies from 3 to 10 cm. This layer of low shrubs is not much taller than the accompanying layer of lichens and mosses. Here shrubby (fruticose) lichens are common, i.e. *Cladonia* and *Cetraria*, including many that have tubular and awl-like thalli [lichen plant bodies—Eds.], i.e., *Thamnolia* and *Cladonia*. Crustose and foliose lichens are widespread on the rock rubble.

Herbaceous (nonwoody) plants are usually rare in small, low-shrub alpine tundra. In spite of the variety of species, herbs do not become established with any notable richness. Isolated individual plants maintain a significant distance from each other and disappear into a background of low-shrub/lichen cover. The most striking alpine herb is the glacier avens (*Geum glaciale*).

Arid tundra is a special type of alpine tundra that develops under conditions of severe winters on snow-free surfaces. Landscapes supporting arid tundra include dome-like summits, very gentle slopes, passes, terraces in alpine valleys, and coastlines. On arid tundra, small roundish bare spots of thin soil with slightly

bulging surfaces [known as frost boils—Eds.] occur along slopes. Most often they are devoid of vegetation. The bare spots of thin soil are surrounded by stone rings [sorted circles, which can occur in networks; in Russian this is spotty tundra and in English, patterned ground—Eds.] on whose margins grow species of prostrate willows, Labrador tea, cranberries, dryads, crowberries, and lichens. Often areas of such patterned tundra have small "meadows" that are associated with animal activity. Such herbaceous vegetation is best developed around ground squirrel burrows.

Low-shrub/herbaceous (small meadow) tundra is encountered in small patches on gentle southern slopes, in the depressions of passes, and on those parts of sea beach terraces protected from the wind. In contrast to small low-shrub tundra, forbs are well developed here, represented by a large number of species. The most characteristic species found in this herbaceous vegetation are wild potato, pink plume, common bistort, *Arnica frigida*, *Claytonia* spp., sedges, sages, *Parrya nudicaulis*, buttercups, and many others.

Subarctic tundra occupies a limited area on the southeastern Chukotka Peninsula. On the coast, because of the conditions of climate and relief, arctic-alpine tundra dominates on all types of landscapes where moisture is not limiting.

Subarctic tundra develops on level areas with poor drainage. A varied but lower species diversity is characteristic for this tundra. Two groups predominate, cottongrass (*Eriophorum* spp.) and other sedge species [primarily *Carex* spp.—Eds.]. These sedge species create a unique tundra vegetation, a distinct low-mound relief called tussock tundra. This tussock tundra is sparsely distributed on the coast.

Sedge-cottongrass tussock tundra with frost boils develops here and there along the coast. Characteristic features for this tundra are sedge-cottongrass cover broken up by surface frost action, creating small areas (spots) of open loamy ground, e.g., frost boils and frost polygons.

Sedge-cottongrass willow-thicket/low-shrub tundra with lichens is widespread. Almost half the plant cover of this tundra is composed of various species of willows. Among them are mixed low shrubs of scrub birch, Labrador tea, blueberries, cranberries, butterbur, and cloudberries. In spite of the dominance of sedges, including cottongrass, the vegetation also includes louseworts (*Pedicularis* spp.), pink plume, coltsfoot, saxifrage, and other forbs.

Low-shrub/varied-grass tundra with lichens develops in dry, favorably exposed places at the foot of mountains and on the lower mountain slopes. In the developed layer of low shrubs are scraggly birch, spreading Labrador tea, arctic willow, crowberry, alpine bearberry, Kamchatka rhododendron, brushy Kurile tea, and *Spiraea stevenii*. One characteristic of this vegetation is the well-developed graminoids and its species richness. Most often encountered here are wild potato, arnica, sage, crazyweed, poppy, gentian, lousewort, grasses, and sedges. Fruticose lichens and mosses are widespread.

Vegetation of the sand-gravel spits and beaches. This type of vegetation develops on dry land, as well as on the portions of sandy beaches and sand-gravel spits not subject to wave action. However, some plants growing here can endure periodic wave action during severe storms. Plants grow under saline conditions arising from the soil, or from salt spray and storm-driven waves. In winter, snow does not cover the highest parts of the spit because of strong winds, thus the spits are exposed to severe freezing. But the lack of snow cover is not the limiting factor because this habitat begins to warm up earlier than other habitats in spring. Permafrost is absent beneath these surfaces.

Shore plants are most often rhizomatous and deep-rooted grasses; the most common plant in this community is wild rye (*Leymus mollis*) that occurs everywhere along the shore on sand and gravel. Very often wild rye forms almost pure stands. Other typical plants are *Mertensia maritima,* a plant with braid-like branches, gray fleshy leaves, and blue flowers; sea beach sandwort, a cushion-like plant with bright green leaves and round inflated fruits; ragwort, a rather large plant with large green leaves and bright yellow clusters of blossoms; and three-ribbed khukera, or wild camomile. Sometimes on the sandy spits roseroot also occurs, though this habitat is not where it typically grows. At the base of the spits grows crowberry, which is also tolerant of salinity.

Plants in the Diet of the Central Siberian Yupik

The material and spiritual culture and the way of life of the Central Siberian Yupik of the Chukotka Peninsula were continuously connected with the sea and the narrow coastal zone of the mainland. With the gifts of the sea the Central Siberian Yupik secured, and continue to derive, their well-being. The sea, its riches, and primarily the sea mammals became the basis on which the culture of the sea mammal hunters was formed. The sea mammals provided food, clothing, and materials for the construction of their dwellings.

The basis of the Central Siberian Yupik cuisine, even in the first half of the twentieth century, consisted of sea mammal meat and oil. According to Krupnik (1983; 1989), meat and oil occupied from 80 to 90% of their diet in 1920. Despite the westernization of their diet at the present time, and the decrease in the portion of meat and oil from sea mammals used, products of maritime harvesting remain favorite foods. In addition to meat and oil, seaweed is an important resource of the sea. Despite its insignificant portion in their diet (0.3%), seaweed is a valuable component, supplying humans with various salts, iodine, and micronutrients.

The first European researchers in Chukotka noted the absolute predominance of sea mammal meat and oil in the diet of coastal dwellers. However, they also pointed out the active use of tundra plants. The manuscript "*Opisanie obychaev i obraza zhizni chukchei*" [A Description of the Customs and Way of Life of the Chukchi] by Doctor Carl Merck, a member of the Northeastern Geographic Expedition of 1785–1795 (better known as the Billings-Sarychev Expedition), cited several species of plants used by the "Reindeer" (nomadic) and "Settled" (sea hunting) Chukchi (Merck 1978). [Many early researchers subdivided the indigenous Chukotka residents based on subsistence activity, not on their Native language.—Eds.] As the naturalist on this expedition, Merck recorded eight edible plants and described their use as well as the season they were gathered and methods used to harvest them.

The active use of plant food is connected with the characteristics of Siberian Yupik diet. Walrus meat and especially seal meat are very oily. For normal assimilation and digestion of oily foods, carbohydrates and various inorganic salts are needed. A human eating a heavy meat-oil diet needs plant foods as a source of various compounds not common in meat and as a complement to go with fresh, dried, boiled, or fermented meat. The Central Siberian Yupik partially satisfied these nutritional needs with seaweeds. But the primary sources were plants of the tundra. They comprised a small but very important part of the food ration (0.7% to 1.1%),

contributing variety to a predominantly meat diet and supplying necessary nutritional components.

The use of tundra plants as food and the traditions of collecting, preserving, and using plants developed gradually among the Central Siberian Yupik. Most likely people learned by trial and error, gradually selecting those plants that offered nutritional needs and desired qualities of taste.

The use of edible plants by Chukotka's inhabitants, and by the Central Siberian Yupik in particular, is evident indirectly from prehistoric times. In female burials at the Ekven and Uelen cemeteries, which are assigned to the beginning of our era (0 AD), mattocks for working in the earth were often found.

With the excavations of the Uelen cemetery, mattocks made of walrus tusk were found. These were intended for various kinds of excavation, digging up plants, and chopping ice. The wooden handles of these mattocks have not been preserved. As a rule, mattocks were made from a whole walrus tusk. The upper part of the mattock was fastened to a handle, and special notches were made on the tusk for attaching and fastening the handle with thongs. The dimensions and cross section of the mattocks vary. Smaller mattocks made of more slender female walrus tusks were probably intended for digging roots of edible plants.

Mattocks uncovered at the Uelen cemetery date to a period from the second half of the first millennium BC to the first half of the first millennium AD. The culture to which this burial is assigned is typical Old Eskimo and is known to archaeologists by the name Old Bering Sea. It is interesting that the technique of digging edible plants has not changed over the course of centuries. Merck's manuscript states: "For digging…roots the women use a mattock of walrus tusk" (Merck 1978).

The Central Siberian Yupik eat about thirty species of tundra plants and several species of seaweeds. Some of these plants have lost their economic importance, but others are still widely used. Among the most popular edible plants are berries, but roseroot and wild rhubarb are also collected in significant quantities. In modern times a new group of plants have appeared that the Central Siberian Yupik widely use in food; mushrooms. Prior to contact with Europeans, the Central Siberian Yupik used only one kind of mushroom, puffballs (*Bovista* spp. and *Lycoperdon* spp.), which grew in the areas where they lived. All remaining mushrooms (the capped mushrooms) were considered inedible as reflected in their names, i.e., "devil's stick" and "devil's ear." In the past people knew of another kind of mushroom, fly agaric (*Amanita* spp.), an imported mushroom from Anadyr' or the Anyuis, but evidently it was not eaten. [The fly agaric is considered by many to be poisonous, but also to have spiritual and medicinal uses.—Eds.]

The harvesting of the various gifts of nature continued all year among the Central Siberian Yupik. The economic year was divided into four seasons. Edible plants were collected in the "summer season" from June to September. Gathering leaves and roots was an important part of their traditional use of plants. In this, as

in other traditional economic activities, there was, and is now, a division of labor. The women occupied themselves with the collection and preparation of plants, and teenagers and children helped the women.

Where were edible plants collected? The economic territory of Siberian Yupik villages, in contrast to the marine region, was very narrow, usually a strip of coast measuring 1 km to 2 km wide. Most often the collection of plants was carried out directly beyond the settlement. Plants were not collected from the more distant parts of the tundra except in cases of extreme need. A territory was used jointly by all the people occupying a single village. No places were specifically limited for a certain clan to collect plants. With the development of transportation, the area of collection widened, though this expansion only applied to the collection of berries and mushrooms (for example, the current residents of Novo Chaplino collect berries in areas 25 km to 40 km from the village). As a result, the quantity of berries collected has increased. In the past, Central Siberian Yupik did not prepare berries in large quantities for future use, but now they put up a significant quantity as preserves, syrup, and juice. The place for collecting the remaining types of edible plants was still located, as before, not far from the villages.

Berries and leaves were collected exclusively by hand. A mattock was used for digging roots. In the fall, some roots were collected from caches found in mouse burrows [harvested and stored by voles, mice, or ground squirrels.—Eds.]. Central Siberian Yupik looked for these burrow caches by "trampling" on burrowed areas and listening for a hollow sound to determine where the "storeroom" of the mouse was located. Mice stored a significant quantity of various roots, including edible ones: bistort, avens, wild potato, and roseroot. Harvesters removed only the white roots, which they called *svechi* ("candles"). At present, this unhygienic method of collecting roots is no longer used. Leaves and roots were gathered in special bags sewn from old skins or modified old sealskin floats.

Most seaweed from the family Laminariaceae (sea cabbage) has a long frond (thallus) and usually grows in dense patches. Several methods were used to collect seaweed. Most often seaweed was found thrown up on the shore after severe storms. Even now after a hard storm, the previous residents of Old Chaplino will say, "We ought to go to Old Chaplino (as they call Uṇaziḳ) and gather cabbage." Such "cabbage" thrown up on Cape Chaplino is described as "fragrant," "sweet," and "crunchy." Two other methods of harvesting seaweed have a more direct approach. Central Siberian Yupik used a *nakrutka* from a *baidar* (large skin boat). This method was based on the characteristics of the growth and form of the seaweed sought. From the *baidar,* the *nakrutka*, a long stick with a transverse stick and a weight attached to the end, was lowered. They twisted the seaweed frond around this tool, tore it away from the bottom, and pulled it out of the water. The same method could be used to harvest seaweed from under the ice. This method of getting sea cabbage is characteristic for the whole Asiatic coast of the Pacific Ocean, especially for Japan. Another method is to use a *zakidushka*. A weight,

usually a stone, is fastened to a long line and thrown into a clump of seaweed. Then the line picks up seaweed as it is pulled to the shore (Aivangu 1985).

Plants are used in different ways. Young leaves of wild rhubarb and willow are eaten fresh. Throughout the summer, roots, the bark of willow roots, and seaweeds are eaten fresh. Fall was berry season.

In fall the tougher seaweed is cooked. The leaves of wild rhubarb and willow are added to meat and fish broths. Edible plants are also boiled in preparation for winter (for example, wild rhubarb, and among the Naukan, river beauty).

Only the rootstocks of wild potato and *Claytonia* are baked in coals. Roseroot is fermented.

Frequently the leaves of various species of bistort and heart-leafed saxifrage are placed in sea mammal oil both for winter preservation and for immediate consumption. Generally, though, edible plants are mainly used to season meat and fish.

A significant quantity of plant food was prepared for winter. The harvesting of plants continued into fall (roots and berries), though the leaves of willows, for example, were collected at the beginning of summer when they are tender. Early summer willow leaves were simply covered with water and weighed down by stones until the cold weather of fall. Other plants had been covered with water and cooked (sour dock, wild rhubarb, and river beauty). With the advance of cold weather the water was poured off and the plant mass frozen. Central Siberian Yupik also froze berries (crowberries with cranberries), roots of edible plants, and seaweed.

The earlier methods of preparing plants are still used today. However, new methods have also appeared such as salting plants (mountain sorrel) and processing berries with sugar.

Plants prepared for winter were preserved in old sealskin floats, walrus stomachs, and containers made of walrus hide. Later wooden casks were used. The prepared items were stored in the cold entryways of dwellings and in cache pits. Women prepared, stored, and preserved the edible plants. The men harvested seaweed and sometimes dug roots.

Some Rules for Collecting and Preserving Edible Plants

When collecting and preserving edible plants the Central Siberian Yupik follow several rules. All these rules are very appropriate and are the result of many centuries of experimentation with traditional uses of plant foods. These rules are directed toward preserving the resource base of the edible plants collected and intended for better preservation of the abundant crops of the wild plants and their nutritional value.

1. Berries are only hand collected to reduce damage to the plants.

2. Consuming the previous year's crop of crowberries that over-wintered under the snow is prohibited (probably to prevent possible poisoning by alpine bearberries, which are difficult to distinguish from edible crowberries after the passage of winter and therefore could be collected with the latter).
3. Roots for winter storage are collected in the fall, after the plants have withered (the fall roots taste better than the summer ones, because these roots have accumulated and stored many valuable nutrients during the summer).
4. There are specific rules for digging roots: first a circle is excavated around the plant, then the sod is turned over in the center of the circle (including the plant). The largest roots are harvested and the small ones are left for future growth. After collecting the roots the sod is returned to its place (so that the possibility of continued plant growth is assured).
5. While digging roots in the summer Central Siberian Yupik take only as much as is necessary for immediate consumption. If it turns out that more has been dug up than needed, the surplus roots are returned to the soil (in summer it is difficult to preserve roots that have been dug up; they quickly dry up and lose their food value).
6. When roots are dug in fall they are only cleaned of soil (unpeeled roots preserve their juiciness, taste better, and are more nutritious).
7. When collecting leaves it is necessary to constantly turn over and air the leaves and to keep them in a cool, dark place until they are processed (this rule prevents collected leaves from "burning up"). [Possibly refers to getting moldy and darkened in color.—Eds.]
8. It is prohibited to collect capped mushrooms. They are considered poisonous (because of incorrect preparation or preservation there were probably cases of poisoning or illness when eaten). [See additional comments in the section on mushrooms.—Eds.]
9. All stored plants not eaten during winter are thrown away with the advance of the new growing season. The primary method of preservation (in winter) is freezing. With the approach of summer it is seldom possible to continue this method of preservation. These older, previously prepared plants could spoil or lose their nutritional value. Eating spoiled plant products could cause illness.

Beliefs Connected With the Use of Edible Plants

A close connection between humans and the natural world that surrounds them is a characteristic spiritual view of the Central Siberian Yupik. A person's transformation into a representative of the animal or plant world, and the transmission of some properties or qualities, are favorite themes of Central Siberian Yupik folklore. Some beliefs are connected with the prohibition of eating certain plants. For instance, pregnant women cannot eat the root of wild rhubarb (*ḳusma*). The properties of this root, which is brittle and easily broken, are considered transferrable to the bones of the child developing in the mother's womb.

PART II
EDIBLE PLANTS OF THE ESKIMOS

Berry Plants

Family: Ericaceae (Heath family)

(*Empetrum* was formerly in Empetraceae,)

Crowberry, Blackberry

Shiksha (vodyanika, voronika) subgolarkticheskaya

Empetrum nigrum L.

= *Empetrum subholarchticum* V. Vassil.

PAGUNĢAĶ ("berry")

Crowberries, also called blackberries (Empetrum nigrum), spread across the surface of a large boulder.

The Central Siberian Yupik have always valued crowberries. Throughout the past and into the present, crowberries have been the most popular berry. Not without reason the Yupik word for this plant is synonymous with the generic term "berry." (*Pagungak*, 1. berry, 2. crowberry.) Among the Siberian Yupik this generic "berry" is the crowberry.

The crowberry is ideally suited to life in severe climatic conditions. The Latinized name of the genus to which the crowberry belongs reflects its hardiness: *empetrum* = "on stone."

Crowberry is a perennial low evergreen shrub with long, strongly branching stems that spread over the ground. The tips of the stems are usually slightly raised upward. Crowberry grows in patches that may represent one individual plant,

which by spreading gradually occupies more and more space as the branches become rooted. In the middle of the patch the older leafy stems die back. Few other plants of the tundra can survive the expansion of the crowberry as it spreads, forming a deep carpet.

The small leathery leaves, similar in appearance to conifer needles, densely cover the spreading branches. Their margins curl inward under the leaf. The delicate, light-green young leaves later darken. In fall, and with the approach of the cold, the leaves of crowberry turn violet-brown.

Crowberry blooms early, at the end of May, as soon as the snow melts. Its flowering illustrates the plant's suitability for life under northern conditions. Flower buds appear at the end of a warm period in late winter. As soon as it is a little warmer, the crowberry bursts into bloom. The flowers are small, inconspicuous, and usually located singly in the axils of the leaves. The flowering bracts (not true petals) and stamens have a dark-cherry tint. Only the very attentive person notices these flowers. However, their faintly perceptible fragrance and nectar attracts tundra insects.

The fruit, a black spherical berry with a gray shimmer, ripens in August. From the berry's color the crowberry acquired the name *voronika* ("little raven"). The juice within the berry is red. The berries are very watery, and from this fact came another name for the plant, *vodyanika* ("the little watery one"). The juice of the berry has a strong coloring quality, staining hands and clothing with a dark violet color. Inside each berry are several seeds.

The fresh berries are neither sour nor sweet. However, the juice contains up to 7% vitamin C. The berries are preserved under the snow and can still be harvested in the spring. [However, note the caution that authors describe in Introduction: Some Rules for Collecting and Preserving Edible Plants.—Eds.]

Crowberry usually bears fruit every year. In August to September patches of crowberries are covered with berries. By producing new over-wintering flower buds in the fall, the plant is guaranteed a longer period of development than otherwise possible for its berries the following summer.

Crowberry is a characteristic component of the low-shrub and low-shrub/lichen dry alpine tundra of the lower slopes of the mountains. As a rule, it grows with other low shrubs (low-bush cranberry, blueberry, and Labrador tea). It is often encountered on the central areas of coastal sand-gravel spits because it can tolerate salinity. In some cases crowberry is the primary plant in parts of the low-shrub tundra, which is therefore called crowberry tundra. Crowberry is found along the entire coast of the Chukotka Peninsula and grows in especially large quantities in the extreme southeast and northeast regions.

Crowberry is the only berry significantly collected and stored over the winter. The primary collecting of berries occurs at the end of August to the beginning of September and continues up to the first frosts. After the frosts, the berries burst and become difficult to collect. Crowberry, like all the other berries, is exclusively

hand-collected. Up until the appearance of modern containers, the women used dressed, cleaned walrus stomachs as containers for berry collecting. The berries, together with low-bush cranberries, were usually poured into old sea mammal pokes (old floats) and kept in a cold place, most often in the entryway of a dwelling. No special method of preparation or processing was used (such as soaking, boiling, etc). On the whole, freezing has been used to preserve the majority of edible plants.

Central Siberian Yupik eat fresh crowberries during ripening and harvest. They use frozen berries in the winter as a component in various meals. Children enjoy thawed berries as a treat.

Some recipes for dishes in which crowberries and low-bush cranberries are used include:

- ***Crowberries with pounded (mashed) liver.*** The liver of a seal, reindeer, or duck is boiled, then pounded. Crowberries are added to the resulting mass. So that this dish is not dry, a little meat broth and warmed sea mammal oil are added.

- ***Crowberries with reindeer fat.*** Chopped reindeer fat is thawed in sea mammal oil and set to stand awhile. The pure warmed fat, without cracklings (pieces of fat or meat), is poured into a container filled with crowberries and quickly stirred. To quickly thicken, a little cold water or snow is added and later poured off. At the present time this dish is seldom prepared.

- ***Crowberries with sour reindeer blood.*** Blood is preserved during the fall butchering. To the blood, Central Siberian Yupik add heated kidneys, liver, smoked reindeer lips, and hoof meat. The prepared blood and meat mixture is preserved in a cold place in covered containers (most often in an old float or seal skin poke) and allowed to sour. Before it is eaten, berries and warmed sea mammal oil are added.

- ***Crowberries in kissel (a kind of starchy jelly).*** Flour mixed with a small amount of water is poured into boiling water. Then crowberries and warmed sea mammal oil are added. Central Siberian Yupik do not eat this dish while it is very hot.

In the past, all the preserved winter food was discarded the following spring. Containers in which berries and other edible plants were preserved were cleaned and made ready for a new harvest. The previous year's harvests are not eaten because these may have spoiled and would cause illness.

Crowberries remain the favorite berry of the Central Siberian Yupik. Current methods of crowberry preservation rely on sugar to make jelly and syrup or to sprinkle on fresh berries. A substantial portion of the collected berries is still simply frozen.

Family: Ericaceae (Heath family)

Low-bush cranberry, Mountain cranberry, Lingonberry

Brusnika obyknovennaya pv. malaya

Vaccinium vitis-idaea subsp. minus (Lodd.) Hultén

KITMIK

*Low-bush cranberry (*Vaccinium vitis-idaea *subsp.* minus*) bears bright red berries by late summer.*

Low-bush cranberry is a small, evergreen, low shrub 3 to 8 cm high with long rootstocks. It grows spreading, close to the ground, on open rocky areas of the tundra where there is little snow cover in winter. The leaves are small, roundish, compact, and leathery. The upper surface of the leaf is dark green and shiny. The lower surface is duller and paler with numerous tiny black dots. The leaves remain on the stems for two to three years, overwintering under the snow. In fall the leaves turn dark reddish-brown.

Low-bush cranberry begins blooming in June. Usually at the end of May flower buds appear on short shoots on the tips of stems that have overwintered, and later the flowers open. The blossoms are very small, a delicate pink, and similar in shape to those of bluebells (like hanging urns or bells). The flowers are usually crowded and droop in clusters of two to five.

In August, beautiful bright red, shiny berries, 5 to 8 mm in diameter develop from the flowers. These berries can have various forms, from spherical to oblong-oval and drop-shaped. The berries are quite distinctive against the dark-green leaves, but this is not the time to pick them. If the fruiting stems are raised, you can see the berries are red only on the side that is turned toward the sun. Low-bush cranberries usually ripen only at the end of August. Ripe berries have a saturated, dark-red color. The tastiest berries are found after the first frost, though overall the berries are sour and bitter.

Low-bush cranberries occur everywhere on the Chukotka Peninsula but are most abundant on the eastern coast. The plants are mostly found in dry tundra, on sand, gravel, rubble slopes, exposed areas, and along the edges of terraces. In depressions on the mountain slopes, low-bush cranberry establishes on the higher sites (low summits and ridges) where it grows with other alpine low shrubs and lichens. Usually on the coast, low-bush cranberries bloom abundantly, but profuse fruiting or ripening does not occur every year. The yield from low-bush cranberries depends primarily on the weather during summer. On warmer rocky mountain slopes and terraces, however, the small berries of low-bush cranberry ripen annually.

Due to the poor fruiting and a sour-bitter taste, the Central Siberian Yupik do not seek to collect low-bush cranberries specifically. Rather, these berries are usually gathered incidentally while collecting the preferred berry, crowberry. In that case, low-bush cranberries are jointly preserved and used with crowberries.

Family: Ericaceae (Heath family)

Bog blueberry, Alpine blueberry

Golubika bolotnaya pv. melkoplodnaya

Vaccinium uliginosum subsp. microphyllum (Lange) Tolm.

SYUĢAĶ

*Lying among lichens at ground level, these bog blueberries (*Vaccinium uliginosum *subsp.* microphyllum*) are ready to harvest.*

Bog blueberry is a widely distributed, deciduous (shedding its leaves in winter), and spreading low shrub.

The leaves are oval, 5 to 10 mm long, dull, and dark green with a distinguishing bluish-grayish (glaucous) color. From the color of the leaves as well as the bluish-gray color of the berries comes the common Russian name of this low tundra shrub. In fall the leaves take on a yellow or crimson red color; in winter the leaves fall off.

Bog blueberry blooms early and usually profusely, at the end of May. The flowers are small, rose-colored, and one to three appear at the tips of the last year's branches. In shape, the blueberry flowers are reminiscent of small inverted urns (this blossom shape is common in the Heath family).

Blueberries have a variety of forms. Most often they are roundish or pear-shaped, and blue with a grayish hue. The pulp of the berry is green.

Blueberries are one of the most valued berries of the tundra. Each berry is about 8% sugar, is rich in vitamin C (ascorbic acid), and contains many important micronutrients such as magnesium, calcium, iron, and manganese.

The berries appear in various habitats with dry to moderate moisture. Characteristic habitats include rocky, dry, open areas in broad mountain valleys and on the surface and along the margins of terraces.

On the coast of the Chukotka Peninsula, in spite of copious flowering, the blueberry goes to fruit abundantly only in the areas most favorable for growth. Bog blueberries are usually single, not very large, and sweet.

The Central Siberian Yupik use blueberries exclusively as a fresh food source due to poor fruiting in the coastal tundra and the very high rate of spoilage when berries are preserved. These berries are a treat for children.

Family: Rosaceae (Rose family)

Cloudberry, Low-bush salmonberry

Moroshka (Malina prizemistaya)

Rubus chamaemorus L.

AĶAVZIK

*The bright yellow-orange color of this cloudberry (*Rubus chamaemorus*) signals that it is ready to pick.*

This perennial herb has a long, thin rootstock. Each spring a short (5 to 10 cm) upright stem grows from the rootstock, supporting several leaves and a single flower. In winter the part of the plant above the ground dies, and in spring a new flowering shoot appears.

The simple leaves of the cloudberry are thin, often three to five-lobed, kidney-shaped, and creased along their veins. The leaves are dark green, shiny, and often brown along their margins and under surfaces along the veins.

The single flowers are large and up to 3 cm in diameter. The five petals are white. Cloudberry is a dioecious plant, meaning some plants bear only a male flower and others only a female flower.

By the end of July the large white (female) flowers develop into berries. Eventually the ripe cloudberries become amber-yellow, translucent, and succulent. These berries form from several tiny succulent fruits, each having a stony seed covered with juicy pulp. These tiny fruits fuse together to form a single aggregate fruit that nevertheless is still called a berry.

The ripe cloudberry has an agreeable taste and contains 3 to 6% sugar, citric acid, and abundant vitamin C.

The primary habitats of cloudberry are peat swamps or bogs and moss-peat tundra. It grows on peat mounds and in sedge-cottongrass tundra.

As with the bog blueberry, only fresh cloudberries are eaten by the Central Siberian Yupik because collected berries quickly turn sour. As with other berries, cloudberries are gathered by hand. In general, the cloudberry is a treat for children.

Leafy Plants

Family: Saxifragaceae (Saxifrage family)

Heartleaf saxifrage, Brook saxifrage

Kamnelomka Nel'sona

Micranthes nelsoniana (D. Don) Small

= *Saxifraga nelsoniana* D. Don

= *Saxifraga punctata* subsp. *nelsoniana* (D. Don) Hultén

AML`YUĶIRAĶ
SIĶNAĶ (Naukan)

*Heartleaf saxifrage blossoms (*Micranthes nelsoniana*) are often taller than the tundra surrounding them.*

This perennial herb belongs to the Saxifragaceae, a family found commonly throughout northern regions. Heartleaf saxifrage has all its leaves in a basal rosette. These leaves are simple and slightly fleshy, 1 to 4 cm wide and 1 to 3 cm long, and are basically heart-shaped with large pointed teeth along their margins. The upper leaf surfaces are dark green; the under surfaces and margins are reddish brown.

The single flowering stem is 10 to 25 cm tall and leafless from the basal rosette to the flower cluster. The stems are thick and brownish. The entire plant is covered with a pubescence of short fine hairs.

The small flowers of the heartleaf saxifrage are symmetrical (regular) with five petals and five sepals. The flowers are white and arranged in a multiflowered cluster. Often the plants display a terminal capitate (ball-shaped) flower cluster; however, the species can also be found with more open flowering branches, especially later in the summer.

Heartleaf saxifrage is a common tundra plant that prefers moist habitats. Most often this plant can be found along the banks of rivers, creeks, temporary ponds, and river gravels, as well as in moist tundra meadows.

The Central Siberian Yupik extensively use the roundish, heart-shaped and fleshy leaves of this plant. All groups of Eskimos in Chukotka (from the Naukan people to the Uel'kal' people) use this plant in the same way. Fresh leaves are covered with warm sea mammal oil. In this way, the leaves retain their taste. The flowers also give seal oil a pleasant flavor and aroma and tint the oil green. The leaves of heartleaf saxifrage preserved in oil are eaten with *nyfkurak* (jerked or dried sea mammal meat).

The tradition of preparing heartleaf saxifrage leaves in sea mammal oil is still practiced. Currently, the leaves are added to a large number of dishes. They are eaten with thin slices of fish and meat as well as with the liver and kidneys of sea mammals.

Family: Polygonaceae (Buckwheat family)

Mountain sorrel

Kislichnik dvustolbchatyi

Oxyria digyna (L.) Hill

ĶUGYLŅIĶ

*The erect, red flowering stems of mountain sorrel (*Oxyria digyna*) are conspicuous when growing on gravelly soils.*

Mountain sorrel can often be found on the gravel bars of creek and river valleys, by drying ponds, and in areas with late-lying snow banks. This plant is easily recognized by its distinctive leaves (described below) that are often tinted in reddish shades. The leaves of mountain sorrel have a pleasant taste and contain oxalic and citric acids, tannins, proteins, and vitamins A, B, C, and K. The leaves also contain carotene (red, yellow, and orange) pigments.

Mountain sorrel is a perennial herb with a rootstock 0.5 to 1 cm thick. The plant has a basal leaf rosette. The leaves are on long petioles, roundish or kidney-shaped, 2 to 4 cm wide, and wider than long. In general appearance the leaves are reminiscent of small hooves. The delicate, slightly fleshy leaves are sour tasting, giving the plant its Russian common name.

The flowering stem is usually single and leafless. At the top of the stem is a narrow tassel-like cluster of tiny flowers on short branches. The purple fruit is dry, flattened on both sides, and with two distinctive wings.

When fresh, mountain sorrel leaves are an agreeable treat and can be used as a seasoning for meat and fish dishes. In addition, an extract from the leaves can dye fabric a yellow or green color.

Children generally eat the fresh leaves as a treat. Some women add mountain sorrel leaves to a mixture of heartleaf saxifrage (*aml`yuḳiraḳ*) in warm oil. But most leaves are prepared together with roseroot (*nunivak*) and used as a supplement to roseroot preparation (described in Leaf and Root Plants).

Family: Asteraceae (Aster family)

Sweet coltsfoot

Belokopytnik kholodnyi (Nardosmiya kholodnaya)

Petasites frigidus (L.) Fr.

KAMGYAḲ

*The separate stems bearing large leaves and white, ripening seed heads of sweet coltsfoot (*Petasites frigidus*) are both shown in this image.*

Coltsfoot is a perennial herb with a long horizontal rhizome (buried stem). The plant has an interesting life cycle. In early spring, before the appearance of any leaves, the plant sends up a leafless flowering stem. Scaly bracts appear on this stem instead of green leaves. At the top of the stem are numerous (five to seven) flowering heads in a branched cluster. The flowers are usually white but occasionally are pink.

Two types of blossoms are characteristic of most plants in Asteraceae: those with a petal-like structure extending from their margins (ray florets) and those that are tubular-shaped with no petal-like structure (disc or tubular florets). Coltsfoot has flowers of both types.

After the plant flowers, additional erect stems of another kind appear, arising from the buried rhizome. These are long petioles, each bearing a single leaf. These leaves have a white, felt-like pubescence of fine hairs on their undersides and are dark green and hairless on the upper surface. Coltsfoot leaves are easy to

distinguish by their broadly triangular and generally heart-shaped appearance. The margins of the leaves usually have lobes and several shallow or sharply pointed teeth.

Coltsfoot is widespread throughout Chukotka. It is characteristic of wet to moist willow thickets and moist peaty tundra meadows. It grows in abundance along lakeshores and temporary drainage channels. Coltsfoot usually occurs in the vegetation found over old abandoned settlements.

The leaves and flowering stems of coltsfoot are edible when fresh, whereas the long rhizome is best roasted or baked on coals.

Central Siberian Yupik of the southeastern Chukotka Peninsula eat only the leaves of coltsfoot. Usually coltsfoot leaves are added to preparations of fermented roseroot. The Naukan Eskimos eat fresh leaves of lagotis and coltsfoot with dried sea mammal meat that has been flavored with warm oil.

Family: Polygonaceae (Buckwheat family)

Sour dock, Arctic dock

Shchavel' arkticheskii

Rumex arcticus Trautv.

AL`Ķ̣YKHKAĶ̣

*Sour dock or Arctic dock (*Rumex arcticus*) stands out when the tall flowering stems turn bright red-purple in mid summer.*

This perennial herb has an erect, stout stem up to 50 cm tall. The leaves are oblong to oval, and their bases wedge shaped or somewhat rounded. The basal leaves have

long petioles, whereas those of the stem leaves are shorter. Where the petiole is attached to the stem there is a thin, encircling sheath (a characteristic structure in Polygonaceae called an ocrea). The leaves are green in summer and turn red in the fall.

Small flowers form at the top of the straight stem, forming a flowering cluster that is composed of several whorls. When in bloom the flowering cluster is purple. The fruit is a small three-sided nut.

The plant is commonly found in moist tundra, wet meadows, and herbaceous, mossy bogs.

Rumex arcticus is rarely used because it has very tough leaves. However, some people do use it when the leaves young and tender. In this case, the usage is the same as for other "docks" as described below (I. Zagrebin, pers. comm.).

Family: Polygonaceae (Buckwheat family)

Common English name unknown [Bering sea dock, Bering sea sorrel—Eds.]

Shchavel' beringiiskii

Rumex beringensis Jurtz. & V. V. Petrovsky

PAŅĢUTŅYAĢYT

*Though smaller than sour dock, the slender leaves of Bering sea dock (*Rumex beringensis*) are considered more tender for eating.*

This small, short-lived perennial herb grows in patches. The flowering stems are single with small flowering branches toward the tip. The leaves are spear-shaped (lanceolate) or linear. The sheath-like structures at the leaf-stem axils (ocrea) are reddish-brown or brown. The flowers are small and held in a compact, narrow flowering cluster. This plant is often found growing on coastal gravels.

Central Siberian Yupik use the fresh young leaves of this plant as food. It has been used primarily by inhabitants of the village of Uņaziķ, where the species grows in abundance on the gravel spit. Otherwise, wild rhubarb (*Aconogonon tripterocarpum*) and sour dock (*Rumex arcticus*) are used more widely.

By comparison, sour dock is one of few species that is boiled before being used. The Central Siberian Yupik principally collected the young leaves of sour dock (*Rumex arcticus*) and then boiled them. These leaves are not as tender as those of *Rumex beringensis* (I. Zagrebin, pers. comm.) The boiled leaves of sour dock and

wild rhubarb are then stored for winter or added to a thin soup (*akutaḳ*). Leaves prepared this way can be preserved in their broth until the autumn cold, at which time the broth is poured off and the leafy mass is frozen.

The following recipe is still made today:

- **Akutaḳ** from **al`ḳykhkaḳ** leaves. The boiled *paṇǵutṇyaǵyt* leaves, as well as boiled leaves of other wild docks, are crushed. Warm seal oil is added to the crushed leaves. Once mixed, the dish is ready.

Family: Boraginaceae (Borage family)

Oysterleaf

Mertenziya morskaya

Mertensia maritima (L.) Gray

MYTKŅAĢRAK

*The fleshy stems, leaves, and deep blue flowers of oysterleaf (*Mertensia maritima*) grow prostrate on coastal sand and gravel beaches.*

This perennial herb is common on the sea coast. Most often oysterleaf spreads out on the surface of the beach. The flowering stems are prostrate, branched, and somewhat raised upward at their tips. These prostrate stems are usually 10 to 25 cm long.

The whole plant is glabrous (hairless) and has a grayish waxy (glacous) covering. The leaves are large, fleshy, and oval to oblong or heart-shaped.

What distinguishes oysterleaf is its flowers, which are bell-shaped, small (7 to 8 mm long), and blue to light blue. The fruit is a small black nutlet (small hard nut).

The typical habitat for oysterleaf, as is suggested by its Latinized species name, is marine coastal gravels and sandy beaches.

[Oysterleaf is used with, and in ways similar to, sea beach sandwort, *Honckenya peploides*, as described next. Both species have the same Yupik name.—Eds.]

Family: Caryophyllaceae (Chickweed family)

Sea beach sandwort, Beach greens

Moryanka buterlakovidnaya

Honckenya peploides (L.) Ehrh.

MYTKŅAĢRAK

*Distinctive green mounds of sea beach sandwort (*Honckenya peploides*) grow scattered along gravel-sand beaches.*

This perennial herb grows on the sea coast. The stem is heavily branched, spreading, and recumbent, forming round, loose clumps of numerous stems.

The fleshy leaves, up to 3 cm long, are light green and turn yellow in the fall. The shape of the leaves varies from oval to oblong, and they are crowded along the stems.

The flowers are small with a green calyx and green or white petals. They are located at the axils of the fleshy leaves toward the tips of the stems. The fruit is

a fleshy, round capsule that is at first green. Once completely ripe, this capsule turns yellowish brown.

Sea beach sandwort is typically found above the high tide zone on sand-gravel spits and coastal gravels where the green-yellow patches are distinctive.

Like oysterleaf, sea beach sandwort is distinct in appearance, but both can be considered together here because they were used identically as food. It is probably for this reason they have a common Yupik name, *mytaġraḳ*. Both plants could be obtained by the local Central Siberian Yupik because of their being found in a similar and common habitat.

Central Siberian Yupik use the succulent leaves and branches of both oysterleaf and sea beach sandwort as a supplement in the preparation of *nunivak* (dark-purple roseroot). To the *nunivak*-filled cask they add either oysterleaf or sea beach sandwort, or both, depending on what the women find along the shore or based on their favorite recipe for preparing *nunivak*. Before placing either of them in the *nunivak*, *mytaġrak* is cut up into small pieces.

- ***Fish soup with greens:*** Sea beach sandwort and oysterleaf greens are combined in a pot with water and brought to a boil. Chopped fish is added. Once brought to a second boil, the fish soup is ready.

Family: Onagraceae (Evening Primrose family)

River beauty, Dwarf fireweed

Ivan-chai shirokolistnyi

Chamerion latifolium (L.) Holub

= *Epilobium latifolium* L.

AṆUKAḲ
YEYEGTYT (Naukan)

*The deep pink-purple flowers of river beauty (*Chamerion latifolium*) are among the showiest blossoms of the tundra.*

River beauty is a robust and tall (to 50 cm) perennial herb. The ascending, grayish stems have lanceolate, fleshy leaves.

The flowering cluster is short (especially when compared to the closely related narrow-leaf species, tall fireweed) [*Chamerion angustifolium*—Eds.]. The flowers are large (3 to 3.5 cm in diameter) with four pink petals and four purple, petal-like sepals.

The fruit is a long capsule (3 to 6 cm long) and narrowly cylindrical. It splits into four sections when ripe. The seeds are numerous, small, with tufts of white hairs that allow the wind to disperse them easily.

River beauty is one of several common species of plants growing on gravels along alpine rivers, creeks, and temporary ponds. It is most abundant in the open, mixed-grass vegetation on gravel; it is less prevalent in willow thickets and

floodplain meadows. River beauty also appears on talus, as well as other rocky habitats, in dry rocky tundra, on mountaintops, and along the margins of alpine terraces.

The leaves of river beauty are used as food primarily by the Naukan people. The leaves are usually collected up to the beginning of flowering and are most often eaten after they have been boiled. Even now, the Chaplino people do not gather these edible leaves because roseroot (*nunivak*) and wild rhubarb (*ḳuvykhsi*) are more abundant in their regions. The Sireniki people also rarely gather the leaves of river beauty. Like the leaves of other edible plants, the leaves of river beauty supplement the main meat and oil diet. The Sireniki people use the leaves of river beauty in the preparation of a dish with roe.

- ***River beauty with dried roe***.Fresh leaves of river beauty are covered with warm sea mammal oil and added to dried salmon roe. This meal must be eaten immediately.

- River beauty with boiled flippers.The leaves are lightly boiled and then eaten with boiled walrus flippers.

- Boiled muktuk with the leaves of river beauty. Boiled muktuk of the gray whale is placed in a cask where, alternately with flat stones, the leaves of river beauty are compacted and stored, covered with fresh cold water. Central Siberian Yupik eat this mixture only in winter. With this method, the mixture retains the plant flavoring and the muktuk is preserved for a long time (Tein 1992).

- ***Boiled walrus meat with river beauty.*** Fresh walrus meat is cut up into small pieces and boiled together with various plant species, including river beauty, oyster leaf, wild rhubarb, and seaweed (Tein 1992).

River beauty is popular among the Yupik of St. Lawrence Island, Alaska. The leaves are packed in a cask and covered with water. In fall the water is poured off and the leafy mass is allowed to freeze. It is added to warm oil, sea mammal meat, and *muktuk*.

Family: Primulaceae (Primrose family)

Frigid shooting star

Dodekateon kholodnyi (DRYAKVENNIK)

Dodecatheon frigidum Cham. & Schltdl.

SYUĢRAYKHTAĶ

*This beautiful shooting star (*Dodecatheon frigidum*) is typically found in moist alpine tundra habitats.*

The perennial shooting star is a medium-sized herb with a thick rootstock that angles downward through the ground.
All the leaves form a basal rosette. The leaves are oblong to oval with entire margins, slightly succulent, light green, and attached by short petioles.

The flowers are on the top of a leafless stem. The flowering cluster includes two or three flowers. The purple flowers droop downward when in bloom and have lobed petals that are sharply bent back and upwards.

Shooting star is predominantly an alpine species. It is a North American plant that probably came across to Chukotka (the eastern shore of the Chukotka Peninsula) during the existence of the Bering Land Bridge that linked Asia and North America during the full glacial Ice Ages. It grows in areas with moderately late snow accumulation, usually at the base of coastal slopes and on low banks along streams and temporary ponds. Under favorable conditions, if a rootstock fragments and spreads, a dense patch of plants can be formed. Shooting star is one of the most striking, colorful flowering plants along the Beringian coast of the

Chukotka Peninsula. The flowers are reminiscent in color and morphology of cyclamen flowers, a plant that is also in the primrose family.

The plant has not been widely used as food. The leaves of shooting star are gathered together with roseroot and used as a supplement in the preparation of *nunivak* (described below).

Family: Plantaginaceae (Plantain family) (formerly in Scrophulariaceae)

Weasel snout

Lagotis sizyi

Lagotis glauca Gaertn.

ŅYRŅAĶ (Naukan)

*The light blue flowers, fleshy shiny leaves, and delicate fragrance of weasel snout (*glauca*) make this plant easy to identify.*

Weasel snout is a perennial herb with a taproot that reaches deep into the soil. Its basal leaves form a small rosette. Weasel snout has a single flowering stem topped by a cylindrical flowering cluster of several light-blue flowers.

The basal leaves are simple and hairless. The leaves can vary in shape from broad oblong to oval to broadly lanceolate or even elliptical. The margin of the leaf

is crenate or dentate, rarely entire. The leaves are dark green and leathery and 2 to 12 cm long.

The single flowering stem is 10 to 15 cm tall and leafy. The stem leaves are sessile, oval, and sharp-pointed. The small flowers, each with a bell-shaped corolla, are usually light blue or blue (rarely white) and form a dense cylindrical flowering cluster at the top of the erect stems.

One distinguishing characteristic of weasel snout flowers is their pleasant delicate flowery fragrance. This is one of the few plants found on the tundra whose flowers have a detectable fragrance.

Weasel snout grows in moist places: in the vicinity of ponds, in moist depressions of alpine terraces, at the margins of snow banks, and in moist tundra meadows. It is a common plant of the eastern Chukotka Peninsula.

Naukan people use weasel snout in food, but no evidence exists to suggest the Chaplino people did. A local name for weasel snout is also lacking in the Chaplino dialect.

The Naukan people mix the leaves of weasel snout into food together with other edible plants. Most often leaves were mixed with the leaves of heartleaf saxifrage. Both of these species, weasel snout and saxifrage, share a common name: *sivuǧak*.

The two recipes below come from the Naukan people:

- Dried sea mammal meat (the ribs) is combined with the leaves of saxifrage and weasel snout, then flavored with warm oil.

- Dried sea mammal meat is combined with the leaves of weasel snout, coltsfoot, and seal oil. Leaf and Root Plants

Leaf and Root Plants

Family: Polygonaceae (Buckwheat family)

Pink plume, Bistort

Gorets ellipticheskii

Bistorta ellipticum (Willd. ex Spreng.) V. V. Petrovsky, D. F. Murray, & Elven

= *Polygonum bistorta* subsp. *plumosum* (Small) Hultén

SYUĶL`YAK

*Pink plume (*Bistorta plumosa*) is harvested for its leaves in early summer and it rootstocks in late fall.*

Pink plume is a perennial herb easily recognized by its appearance and its unusual rootstock. The thick, somewhat flattened rootstock is sinuously curved, woody, brownish to dark red, and rosy brown on the inside when freshly broken open. Older rootstocks become hollow and turn brown.

The typically single flowering stem is 5–20 cm tall and glabrous. The long basal stem leaves are oblong or elongated-elliptical, dark green above and grayish underneath.

Pink plume has an easily recognized flowering cluster of many small flowers in a compact, cylindrical spike, 2–5 cm long. At the beginning of flowering this spike is bright lilac, later it becomes paler and pink. The fruit, as in all members of this plant family, is a small three-sided nutlet.

Pink plume is a common plant of the subarctic tundra. It prefers moist habitats. Most often these habitats are found in the wetter areas within low-shrub tundra, tundra meadows, and the margins of creeks and rivers.

Both the leaves and the rootstock of pink plume are used as food. Like the heartleaf saxifrage, pink plume leaves are covered with warm sea mammal oil and eaten with sea mammal meat (*nyfkurak*, dried). The rootstocks of pink plume are added to traditional Central Siberian Yupik dishes, including soups with edible plants, or *akutaḳ*. It is used fresh, or is stored for the winter. Immediately after the snow melts, Chaplino people gather the pink plume rootstocks to make spring soup.

Spring soup

- Collected rootstocks are carefully cleaned of soil and old skin, and then boiled. Once boiled, the rootstocks are crushed and combined with warm sea mammal oil and fresh seal blood.

In summer these rootstocks are not gathered often (likewise for other edible roots and rootstocks) because the summer roots taste bitter. Central Siberian Yupik eat the rootstocks with seal meat and oil. The roots of edible plants from the tundra have a strong astringent property. Therefore adding the roots helps to flavor the substantial quantities of very oily food necessary for northerners to maintain their energy needs.

Fall digging is done until the final hard fall freezeup in order to store many rootstocks for winter use. Central Siberian Yupik eat the stored rootstocks of pink plume much as they are eaten in summer, with the oil and meat of sea mammals.

Family: Polygonaceae (Buckwheat family)

Wild rhubarb

Gorets trëkhkryloplodnyi

Aconogonon tripterocarpum (A. Gray ex Rothr.) H. Hara

= *Polygonum tripterocarpum* A. Gray

ĶUVYKHSI

*The tender spring shoots and leaves, and fall roots, of wild rhubarb (*Aconogonon tripterocarpum*) are favorite edible foods in Chukotka.*

One of the best-known edible plants in Chukotka, wild rhubarb, is widely used by the Central Siberian Yupik people. The sprouts of young wild rhubarb are the first spring delicacy that children enjoy.

Wild rhubarb is a perennial herb, 15–40 cm tall, with a stout, often branched rootstock. The leafy stems come up a few at a time from this rootstock that may be located deep below the soil surface. The rootstock of wild rhubarb has its own name in the local Siberian Yupik language, *ķusma*.

Wild rhubarb leaves are oblong to oval or lanceolate, and 1–1.5 cm wide. They are dark green on their upper surfaces. The first leaves appear at the end of May and the beginning of June. Fall leaves turn a bright red-yellow.

Wild rhubarb flowers at the end of June. The flowering cluster is open and branched. The (many) small white or yellowish flowers form a broad flowering display.

Wild rhubarb is a common plant in low-shrub tundra and tundra meadows. It prefers moist habitats. Sometimes it forms dense patches, but it is also found as scattered individual plants.

The leaves and roots of wild rhubarb have various uses as food, both fresh and cooked in soups. A significant quantity of these leaves and roots is stored for winter.

Recipes for the leaves of wild rhubarb:

- Some of the young leaves are eaten raw as a pleasant delicacy. The young leaves are very succulent and taste pleasantly sour.
- The young leaves are prepared with fat, meat, or seal liver, or are dipped in slightly soured sea mammal blood.
- ***Summer soup.*** The cooked fresh leaves of wild rhubarb are crushed. Sea mammal oil and blood are added to the crushed leaves. Central Siberian Yupik eat the soup with sea mammal meat.
- ***Spring soup.*** Boiled young leaves are crushed and added to warm oil. Fresh walrus meat is cut up into small pieces and dipped into the soup.
- When cooking sea mammal meat, leaves of wild rhubarb (both fresh and cooked) are added for additional flavor.
- ***Soup with gray whale fat (Naukan).*** Ground-up wild rhubarb leaves are eaten with fresh Gray whale fat.
- ***Maṇtak of beluga with wild rhubarb leaves.*** The skin of beluga with a layer of fat (*muktuk*) is boiled and eaten with wild rhubarb leaves.

Storing Leaves

Wild rhubarb leaves that are to be stored for winter are generally gathered before the plant flowers. The leaves are cooked in small separate batches until they form a thick dark-green broth in which the leaves are kept until the weather becomes cold. Then the leaves are strained and packed in various quantities for freezing. In winter, the frozen leaves are thawed and used as needed, primarily for making *winter soup* in which warm oil and blood are added to the thawed leaves. This dish can also be eaten frozen.

The broth of the leaves is also used to preserve walrus meat for winter. Sometimes this broth is mixed with blood and warm oil to make a drink that is especially favored by the elderly.

The wild rhubarb root, or *ḳusma*: Central Siberian Yupik use the wild rhubarb root much like they use other edible roots. It is eaten with meat and oil, with dried fish roe, with sea mammal blood, and most commonly with oil. Wild rhubarb roots taste sweet, similar to carrots.

[*Aconogonon alaskanum* (=*Polygonum alaskanum*) of Alaska is closely related and somewhat similar in appearance to *A. tripterocarpum* of Chukotka. Called wild rhubarb in English, the young leaves and stems of *A. alaskanum* are eaten by indigenous peoples across interior and western Alaska and Yukon where it is found.—Eds.]

Family: Crassulaceae (Stonecrop family)

Roseroot

Rodiola Tëmno-purpurovaya

Rhodiola integrifolia subsp. integrifolia Raf.

= *Rhodiola atropurpurea* (Turcz.) Trautv.

= *Sedum rosea* subsp. *integrifolium* (Raf.) Hultén

NUNIVAK

The Central Siberian Yupik name for roseroot, Nunivak *(*Rhodiola integrifolia*), is linguistically tied to the name of Nunivak Island in western Alaska.*

Roseroot, or *nunivak*, is probably the most popular edible plant among the Central Siberian Yupik. Many words formed with the root word *nunivak* are associated with roseroot. In addition, Central Siberian Yupik even use the name of this plant to denote one of the summer months, August, or *Nunivak*, "the month for gathering roseroot." The word probably originates from the root *nuna*, or winter. An interesting connection can be seen between the words *nuna* (winter), *nunivak* (tundra), and *nunivak* (roseroot). Their similarities indicate the significance of roseroot in their food. It is also interesting that the word *nunivak* is widespread in other Yupik dialects as well. For example, in the language of the St. Lawrence Island Siberian Yupik, the Inupiat, and the Central Yupik in Alaska. On the coast

of Alaska there is a Nunivak Island. Roseroot is well known and widely used by the Chukchi as well who call it *yuṇev*.

Practically the entire plant is used, the stem and leaves having the name *nunivak* and the root *syuḳl`yaḳ*. What kind of plant is this and why is it so popular among all the indigenous people of the Chukotka Peninsula?

For one thing, finding roseroot in the tundra is easy due to the plant's unique appearance and abundance. Roseroot is a perennial herb with a fleshy, short taproot. The roots are golden with a faint outer mother-of-pearl luster. At its center, the root is rosy-white. The root tastes bitterly astringent. Buds along the root annually produce above ground stems. The root smells faintly of rose. The roots of roseroot contain biologically active substances such as tannins, volatile oils, and various organic acids. These substances found in the roots have stimulant properties.

Roseroot leaves are green, fleshy, sessile, and elliptical to lanceolate, or oblong. The leaf tips are acute and the margins and tips are shallowly toothed. The leaves are crowded along the stem. In fall, leaves first turn dark red along their margins and gradually become completely dark red. A dense, multiflowered dome-shaped flowering cluster crowns the stem. The four-part flowers are dark purple and unisexual (there are separate male and female flowers). In late fall, the dark-brown dried flowering stems, holding clusters of dry fruits, remain erect.

In the early spring (sometimes even in mid-May), on the sun-warmed and newly snow-free coastal tundra, small dark-red spheres of the newly emerged shoots of roseroot appear. From these the flowering stems will develop. Usually only a few stems emerge, though occasionally there are several. These stems are green, erect, unbranched, and 6–20 cm tall.

Roseroot prefers places with abundant moisture, as well as in silty soil. It is found in damp rubble and among moist rocks along the coast. It can tolerate salinity.

Scattered along the shore of the Chukotka Peninsula a type of roseroot is encountered that differs from the more common form described above in having yellow-tinted flowers. Otherwise, these two color types are very similar in appearance. [Some botanists have suggested this represents a separate species, *Rhodiola rosea* L. (Elven et al. 2011)—Eds.] A dwarfed form of this species arises due to the harvesting of the rootstock that is widely used in folk medicine.

The Central Siberian Yupik eat the succulent stems and leaves of roseroot as well as its roots. Roseroot continues to be collected in large quantities because its taste is highly favored. People gather the leaves and stems of roseroot until the plant's fruits are ripe, the period during which the plants are the most succulent.

The most traditional meal using roseroot is soured roseroot or *nunivak*.

- ***Nunivak.*** The leaves of roseroot are diced and pressed into wooden casks or other containers. The green mass is covered with a small

amount of water. A weight, such as a flat stone, is placed on top so that the greens are kept under water. The Central Siberian Yupik say that roseroot greens "die," that is, their volume decreases as it ferments. Therefore, they gather a large amount of roseroot and gradually fill the entire container. *Nunivak* is prepared according to the cook's taste. Usually it is soured with various plant additives such as frigid shooting star, oysterleaf, sea beach sandwort, sweet coltsfoot, or mountain sorrel. Many recipes are available, depending on an individual cook's taste.

- Toward winter the greens of roseroot become sour. The water and juice are poured off and the soured greens are frozen. This is then used in the preparation of various dishes. The process of preparing roseroot is very similar to the preparation of sauerkraut among the Russians.

- ***Winter Nunivak.*** Nunivak greens are eaten with frozen oil and seal meat including bearded seal. The greens are also eaten with pounded frozen meat, liver, kidneys, and oil.

- 3. ***Cakes of Nunivak.*** The soured greens are strained, the stems removed, and warm reindeer fat and sea mammal oil are added. The resulting mixture is stirred. In summer and fall this soup is eaten immediately after it is prepared. In winter, cakes are made from the greens and frozen. Hunters have always taken such cakes with them, for they take up little space and provide large amounts of energy. In addition, eating *nunivak* can quench thirst.

The roots of roseroot are dug and preserved using the same methods as for other roots. In early spring the roots are located among last year's withered stems. The roots are eaten with oil and sea mammal meat and sometimes with dried meat. A few roots are also dug up and eaten in the summer. The fall roots are dug in large quantities for winter storage, and then eaten with frozen meat and oil.

Family: Salicaceae (Willow family)

Willow (various species)

IVA

Salix spp.

ĶUĶUŅAT ("leaflets")

*The tender new leaves of some willow species (*Salix *spp.) are a welcome treat in spring. Shown here are the leaves of* Salix pulchra.

About thirty species of willow occur on Chukotka. Of these, more than a dozen grow on the Chukotka Peninsula. Among the species of this genus we find trees, tall shrubs, and dwarf shrubs, which are low growing, prostrate plants. All willows are light and moisture-loving. Only those growing along sheltered river floodplains or in places with a deep winter snow cover are able to reach the height of medium to tall shrubs. Strong winds and blowing snow affect the size of willows along the coast of the Chukotka Peninsula.

Dwarf willows growing on the tundra are true shrubs. Many, often slender and irregular, woody stems spread from a single root. Some dwarf willows have an extensive spreading growth form; among some (for example, the polar willow, *Salix polaris*) the branches are completely buried in mossy turf, while on the surface only the leaves are visible. In others (the Arctic willow, *Salix arctica*) the branches spread along the surface of the soil and rise upward slightly at their tips. It is frequently difficult to realize that such plants are low woody shrubs, not herbaceous plants.

Willows grow in places with moderate or even abundant moisture. They often sprout on the banks of rivers, creeks, and temporary ponds, in wet tundra, tundra meadows, mossy and grassy tundra, and damp rocky places along the coast.

Willows are one of the earliest flowering plants on the tundra, often flowering before their leaves appear. The (tiny) flowers of willows cluster to form compact catkins. Willows are dioecious (the male and female catkins are on different plants). The catkins are usually held upward or slightly to the side, but never hang downward. Female catkins are retained until the seeds ripen. Each seed has a tuft of long fine hairs at their base. Often the catkins look like little balls of cotton because of these tufts of fine hairs on the numerous emerging seeds.

Lacking specific names in Yupik for individual species of willows, even for those whose leaves are edible, the Central Siberian Yupik distinguish the willows only as ones that should be collected for use and those that should not. The common Yupik name for willows is *ḳuḳuṇat*. This name corresponds with how this plant was used as food. Generally, people collected the leaves. The term for "leaflets" in Yupik is *ḳuḳuṇaḳ*. It is interesting that one of the words denoting "bag" also has its origin in the word "leaflet" (*ḳuḳuṇaḳ*)—*ḳuḳuṇataḳ*, where *-ta* is a suffix indicating a container. Thus "bag" in the Yupik language is "receptacle for leaves." These language connections point to the popularity and significance of willow leaves in the Central Siberian Yupik diet.

In addition to the leaves, the bark (outer covering) of willow roots, *akuḳ* and *akuġaḳ*, is also used as food. The long roots are pulled from the ground, cleaned, pounded, and softened with flat stones. The pounded root bark is eaten raw, as well as with sea mammal oil and frozen meat. Willow roots are also stored for winter.

The Central Siberian Yupik distinguish the edible species of willows by the shape of their leaves. Willows with roundish leaves are not gathered because the leaves taste bitter. Nor do they collect the leaves of the "hairy" willows, that is, those species (for example, *Salix alaxensis* and *Salix glauca*) with pubescent branches and leaves. The leaves of "hairy" willows are not considered suitable as food, although the Central Siberian Yupik know that the Chukotsk gather them and consider them edible.

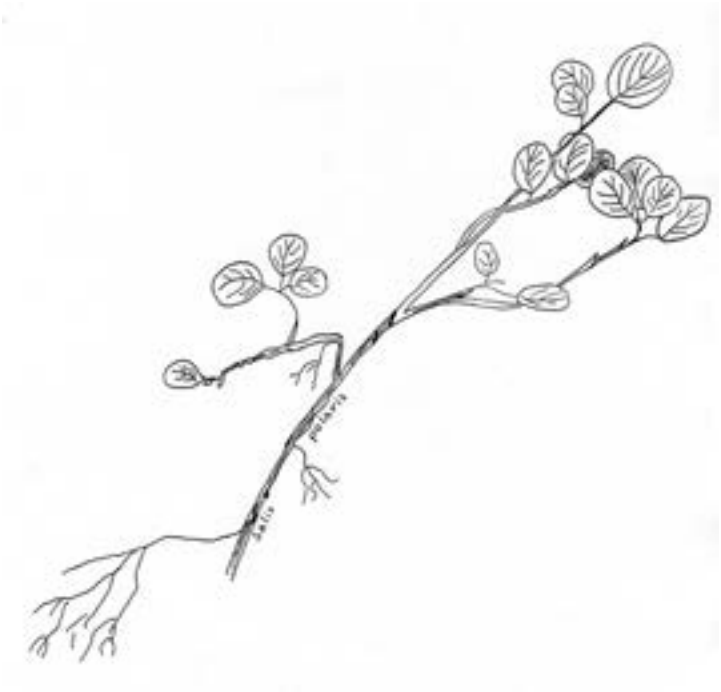
Central Siberian Yupik primarily collect the oblong-shaped leaves of willows. Mothers and grandmothers usually take their daughters to the tundra to teach them which leaves are to be collected. The identification of willows is difficult; therefore, it is possible only to assume that people collect leaves from *Salix pulchra (image on page 64)*, *Salix chamissonis*, and probably some other species. The leaves from these willows are a deep green, are oblong, obovate (egg-shaped), or elliptical, and are shiny or lustrous on their upper surfaces.

Central Siberian Yupik begin to collect willow leaves immediately after the young leaves appeared, usually in the middle of June. These tender, juicy leaves are the most valued. Once collected, the leaves are frequently used immediately or

soaked in water for winter storage. For storage, water has to cover the surface of the leaves in order to keep them from spoiling. The leaves are densely packed in a container and pressed down with a weight such as a flat stone. As winter approaches, the weight is removed, the excess water poured off, and the leaf mass allowed to freeze. The preserved leaves are taken from storage as needed and eaten with seal oil, pounded frozen sea mammal meat, and liver.

Older, and therefore tougher, leaves are also eaten but prepared differently. These leaves are graded against a rough surface. Blood and oil are added to the mixture to complete the meal. Central Siberian Yupik use the vertebral disk of a whale as a grater, one side of which has a rough surface. Some older leaves are also prepared during winter as part of soup. However, the basic winter supply of leaves consists of (preserved) young willow leaves as well as the leaves of roseroot and wild rhubarb (*ḳuḳuṇat*, *nunivaḳ*, and *ḳuvykhsit; see pages 62–63*).

When collecting willow leaves women either take them directly from the branches or break the branches off and remove the leaves after they return to the settlement. Currently this second method would be considered unsustainable, or not environmentally aware, but in early times this method not only provided leaves for winter storage but also branches for cooking and heating fires.



Root Plants

Family: Rosaceae (Rose family)

Glacier avens

Novosiversiya ledyanaya

Geum glaciale Adams ex Fisch.

= *Novosieversia glacialis* (Adams ex Fisch.) F. Bolle

ĶUL`IKAĶ ("little trousers")

*Glacier avens (*Geum glaciale*) is one of the first spring flowers to appear after the snow has melted but the tundra is still brown.*

As soon as the snow begins to melt and the first thawed patches of tundra appear, the previous year's avens can be seen. The light-brown leaves have been well preserved under the snow. After a few days, the patch is warmed and there, in the center, appear two or three bright, light-green leaves covered with delicate silver hairs. As more time passes the alpine tundra is adorned with the bright light-yellow flowers of glacier avens. Considered the herald of spring, glacier avens is one of the

earliest flowering plants of the tundra. Another distinctive characteristic of this plant is its dense pubescence of long, lustrous silvery hairs similar to the fur of the ringed seal. The entire plant is covered with dense soft hairs. It is not without reason that the Central Siberian Yupik call this plant *ḳul`ikaḳ*, "little trousers," from *ḳul`igyk*, "trousers of seal skin."

Glacier avens is a perennial herb with a cushion-shaped growth form that grows in loose patches. The rootstock is thick, dark brown, and retains the dead leaf petioles from past summers. The green living basal leaves are 4–8 cm long. The oblong leaves are deeply lobed into 11–17 teeth, some of which have a few shallow, secondary teeth near their tips. Each stem has a single flower. The large flower, about 3.5 cm in diameter, is a rich light yellow. Like all the early blooming plants, glacier avens flowers quickly but does not lose its attractiveness in mid summer. After flowering, glacier avens is crowned with small, downy, open spheres composed of many seeds, each having an erect, long feathery stalk [ormed from the many styles in each flower.—Eds.].

In fall the leaves turn yellowish-brown and dry out, yet do not fall off the plant despite being covered with snow all winter. Therefore, glacier avens can easily be found both in fall and spring. Its distinct appearance makes it easy to find throughout the year.

In fall the Central Siberian Yupik preserve glacier avens. The thick, edible rootstock is preserved in a cold location. It is eaten, like all roots, with sea mammal meat and oil. Rootstocks, found by the "hat" of last-year's dead attached leaves, are dug up early in the spring and summer and eaten immediately.

Family: Polygonaceae (Buckwheat family)

Common bistort

Gorets zhivorodyashchii

Bistorta vivipara (L.) Delarbre

= *Polygonum viviparum* L.

SYUĶL`YAGYAĶ* ("similar to *syuķl`yak")

*Both the rootstocks and bulblets of common bistort (*Bistorta vivipara*) are harvested. Image from Kodiak, Alaska, © Stacy Studebaker.*

Common bistort is similar to its relative, pink plume [*Bistorta plumosa*, described above.—Eds.]. Hence the Central Siberian Yupik language has two similar names for these plants: *syuķl`yagyaķ* "similar to *syuķl`yak*" (pink plume).

Common bistort is a small (5–15 cm tall) perennial herb with a straight stem that terminates in a narrow spike-like flowering cluster of small white flowers.

The rootstock is thick, and usually hooked or tuberous. However, relative to the oddly bent and large rootstocks of pink plume, it is small.

The leaves are oblong-oval or lanceolate. The upper surfaces of the leaves are hairless, and leathery. The leaves have downward curled margins. They are green above and grayish beneath. The basal leaves are on long petioles and the stem leaves are sessile.

A narrow spike of small white blossoms makes up the flowering cluster. Bulblets form at the base of the flowering cluster and fall off to give life to a new

plant vegetatively (without seeds). Common bistort obtained the species name *viviparum* ("giving live birth") because of this distinctive type of reproduction.

Common bistort lives in habitats similar to those of pink plume; moist areas of the tundra, riverbanks, and coastal terraces.

Common bistort is a well-known edible plant. The fleshy bulblets contain up to 30% sugar and 8% starch by dry weight and are edible raw or cooked. The rootstock, which contains up to 50% starch and about 6% sugar, can be eaten cooked.

Due to the severe weather of the Chukotka Peninsula coast, common bistort is distinguished here by its small size and small rootstock. Thus people seldom dig up these rootstocks. In the past, common bistort rootstocks, along with other edible roots, were taken from food caches stored by mice. These rootstocks were used the same ways in food as other roots or rootstocks. No evidence exists on how the bulblets from the stems were cooked. Relative to the other northern plants, these buds are very small and have little food significance.

Today, common bistort is seldom eaten.

Family: Orobanchaceae (Broomrape family) (formerly in Scrophulariaceae)

Woolly lousewort

Mytnik sherstistyi

Pedicularis lanata Willd. ex Cham. & Schltdl.

= *Pedicularis kanei* Durand

ĶAKYĶAĶ ("bitter")

*Woolly lousewort (*Pedicularis lanata*) offers a nutrient-rich taproot that is eaten when other favorite root plants are scarce.*

Woolly lousewort is a perennial, predominantly alpine plant having dense white hairs. It is often encountered in low-shrub, rocky tundra on the Chukotka Peninsula. The plant is low, only 5–10 cm tall. The vertical taproot is thick and straight. Fresh roots are yellowish-white. The flowering stem is usually single and erect.

The leaves of woolly lousewort are linear-lanceolate. They form a basal rosette and are arranged alternately up the flowering stem. The leaves are pinnately dissected into narrow toothed lobes and are dark reddish-green.

The flowers form a dense, often long cylindrical, spike-like cluster. Each flower is two-labiate, consisting of an upper hood and a lower lip. The newly opened flowers are bright rosy purple, then turn darker and fade with age. The fruit is an egg-shaped acutely tipped capsule.

Woolly lousewort received its name due to its dense white downy pubescence that is especially conspicuous during the early stage of development (before flowering). Woolly lousewort is one of the earliest flowering plants of the tundra. By the second half of May, on rocky tundra and snow-free sites, round, dark-red flowering spikes with a cottony pubescence appear. As these flowering spikes gradually elongate, the covering of soft hairs diminishes, and by early June bright-pink "candles" [flowering spikes—Eds.] are seen on the tundra.

Woolly lousewort usually inhabits dry rocky alpine tundra and alpine terraces, often common along with low shrubs (*Dryas* spp., various species of dwarf willows, *Diapensia lapponica*, Kamchatka rhododendron, alpine azalea, and many others).

The edible root of woolly lousewort does not have a very pleasant taste. The Central Siberian Yupik name the plant *kakyḳaḳ*, from *kakylġi* ("bitter," "bitterish"). This root was seldom used and then generally by those less aware of the local uses. Usually woolly lousewort roots were collected when a region was lacking in better tasting roots (such as wild rhubarb, glacier avens, and wild potato). Woolly lousewort root was collected and prepared similar to other edible roots. They were eaten with the meat and oil of sea mammals.

Presently, people from St. Lawrence Island and the city of Nome in Alaska eat lousewort roots.

Family: Fabaceae (also Leguminosae) (Pea family)

Wild potato, Wild carrot, Eskimo potato

Kopeechnik kopeechnikovyi

Hedysarum hedysaroides (L.) Schinz & Thell.

UNATAĶ

*The rootstocks of wild potato (*Hedysarum hedysaroides*) can be eaten fresh, baked, boiled, or added to oil.*

Wild potato is a perennial herb with a long thick root. The stems, 25–40 cm tall, support two to three flowering branches. The compound leaves are pinnately dissected into many small, paired leaflets. The leaflets are oval or oblong-lanceolate and have a conspicuous network of veins on their surface.

The flowers are arranged in a one-sided cluster at the tips of leafy stems. The flower morphology is typical for northern members of the pea family. The five petals include a large, upper petal, called a flag or banner, two lateral petals called

wings, and two lower petals (usually fused) forming the so-called little boat, or keel. On wild potato, the keel is longer than the wings and the banner.

The petals are lilac-violet and about 1 cm long. The flowering stems, pedicles, and the fused sepals have a bristly pubescence.

The pods, or fruits of wild potato, are flat, elongated, and have distinctive constrictions (pinchings) between the single-seeded segments.

Wild potato roots are gathered and stored in much the same way as is done for other roots. However, its preparation shows greater variation; the roots can be baked, boiled, or eaten fresh or frozen.

- Fresh, uncooked roots, stored for winter, are usually eaten just with oil.

- Fresh summer roots are added to broth and boiled with sea mammal meat or eaten with meat that has been boiled.

- In the past, the large, thickest roots were baked in coals and eaten with sea mammal oil.

Family: Portulacaceae (Spring Beauty family)

Spring beauty, Tuberous spring beauty

Klaitoniya klubnevidnaya

Claytonia tuberosa Pallas ex Willdenow

UL`ĶIĶ

*The deeply buried small tuber of this spring beauty (*Claytonia tuberosa*) shares its Yupik name with the imported 'Russian' potato. Image from northwest Alaska, © Stefanie Jeffers.*

Spring beauty, like all species of *Claytonia*, is a perennial herb. The distinctive character of this *Claytonia* species is its almost spherical root tuber 1–2 cm in diameter.

From the deeply buried tuber arises a single slender flowering stem. The basal leaves are few (usually one or two) and often deteriorate early in the growing season. There are two fleshy stem leaves that are opposite and linear-lanceolate with acute tips. There are two sepals and five petals. Five stamens sit opposite their respective petals. The petals are white with a yellow spot at their base.

Spring beauty, preferring moist habitats, usually grows on moist moss patches in low-shrub tundra and on the banks of streams.

The spring beauty tuber, up to and after flowering, is edible both raw and cooked.

In the past, the Central Siberian Yupik ate the small spring beauty tubers. Often the tubers were collected from the caches stored by mice and ground squirrels. The main way to prepare the tubers was to cook them with sea mammal oil.

In the Central Siberian Yupik language the word "*ul`ḳiḳ*" has two meanings: (1) spring beauty, and (2) potato. This illustrates how a word can take on a new meaning. The appearance of imported potatoes decreased the number of spring beauty tubers collected. In addition, it is difficult to gather the small tubers of spring beauty, whose nutritional value (rich in starch) is primarily the same as potatoes. For local people it was easier to buy the large potatoes rather than to search in moist places for the small spring beauty tubers. The word used to denote spring beauty eventually came to mean "potato."

Family: Portulacaceae (Spring Beauty family)

Siberian narrow-leaved spring beauty

Klaitoniya ostrolistnaya

Claytonia acutifolia Pall. ex Willd. (and possibly Claytonia eschscholtzii Cham.)

[Note: It is unclear from the original description and the single line drawing that accompanied it which of these two spring beauty species are used in eastern Chukotka where they both occur. They differ in subtle leaf characters and preferred substrate; however, overall they appear very similar and can be found growing in close proximity. It is possible both were harvested.—Eds.]

PUPUĶA

*Siberian narrow-leaved spring beauty (*Claytonia acutifolia*) is gathered for its long, thick, starchy taproot.*

This perennial herb has a thick, long-tapering taproot. Numerous basal leaves are surrounded at their base by broad membranous sheaths. The basal leaves are linear to lanceolate, and become narrower toward their base. The leaf tips are acute, a characteristic reflected in one of the species Latinized name noted above. The leaves are fleshy, dark green, and shiny. The two stem leaves are smaller, opposite,

and sessile. Several large flowers top the flowering stems, each having five white or pale pink petals.

Claytonia acutifolia grows in a variety of moist and mossy low-shrub tundra habitats [acidic or peaty.—Eds.], preferring places with abundant moisture. [*Claytonia eschscholtzii*, which can grow in the same area, tends to grow on more basic or calcareous soils.—Eds.]

The starchy roots are edible. Central Siberian Yupik consider the roots of *Claytonia acutifolia*, together with wild potato roots (*Hedysarum hedysariodes*), the "sweetest" of all roots. They use *Claytonia* much the same way they use wild potato. The only difference is that in winter the stored *Claytonia* roots dry up a little. The roots are cooked in sea mammal meat broths or with the meat. In summer the roots are baked in the fire and mixed with sea mammal oil.

Note: According to I. Zagrebin (pers. comm.) it is likely that the thick taproots of both *Claytonia acutifolia* and *C. eschscholtzii* are collected and eaten in similar ways

Mushrooms

Family: Agaricaceae (formerly Lycoperdaceae)

Puffballs

Porkhovka (Bovista), Dozhdevik (various species)

Bovista spp. and Lycoperdon spp.

ATYĶYRYGAĶ ("cracklings")

Puffballs (both Bovista *spp. and* Lycoperdon *spp.) are favored only for a brief period when the inner flesh is firm and entirely white.*

Mushrooms in these two genera belong to those included under the name *nutreviki*. Most mushrooms consist of a capped stalk, thus the name "capped" mushrooms. The *nutreviki*, in particular mushrooms in the genera *Bovista* and *Lycoperdon*, have spherical fruiting bodies sitting directly on the ground surface without a supporting stalk.

Both genera have broad distributions, are especially common in northern regions, and are found in several habitats. Species known to occur in eastern Chukotka include *Bovista nigrescens*, *B. vadicata*, and *Lycoperdon perlatum* (Gorlenko, 1991) These mushrooms all display the typical "puffball" morphology and life cycle.

The fruiting bodies of *Bovista* and *Lycoperdon* are spherical and a bit flat-topped with a white outer membrane or covering. The internal part of the mushroom is at first soft and white, later becoming ocher or olive-colored, then at complete maturity purple-brown. (*Lycoperdon* turns brown). As the mushroom ripens the outer membrane also darkens. When mature it becomes blackish-brown, thin, and tough. When fully mature, a hole appears on the fruiting body summit, and a cloud of spores explodes outward in small puffs under the impact of passing animals or gusts of wind.

Mycelium threads connecting the fruiting body of *Bovista* and the belowground mycelium are broken at maturity, and the fruiting body lies unattached on the ground. In *Lycoperdon,* these threads are well developed and do not break after the spores ripen. Hence, the fruiting body of *Lycoperdon* remains connected to the belowground mycelium.

Bovista and *Lycoperdon* are edible when the fruiting body is young and the inner part is still white. From the moment the soft inner part of the mushroom begins to turn yellow it is no longer edible [reflecting the maturation of spores—Eds.].

In earlier times, the Central Siberian Yupik clearly did not prefer capped (stalked) mushrooms as food. The local names for these capped mushrooms reflect negative attitudes: *Tuġnyġam sigutaṇa* is a mushroom, but it literally means "devil's ear" among the Chaplino people, or *tuġnyġam ayaviġa*—"devil's staff" or "walking stick" among the Sireniki people. The common name for mushrooms in the Central Siberian Yupik language—*sigutmykytaḳ*—derives from the word *sigun* ("ear") and is probably related to capped mushrooms.

It can be supposed that the Central Siberian Yupik did not consider *Bovista* and *Lycoperdon* to be (true) mushrooms, inasmuch as they had their own name with a different origin. (Indeed, the Siberian Yupik viewed capped mushrooms as a completely separate group from the puffballs described above.—I. Zagrebin, pers. comm.)

The word *atyḳyrygaḳ* refers to: (1) *Lycoperdon*, puffballs, and (2) cracklings from rendered walrus fat. (The white, firm fruiting bodies of puffballs have the same color as a piece of walrus fat, whereas older puffballs look like brown rendered walrus fat, or cracklings.—I. Zagrebin, pers. comm.)

Puffballs have no special significance in the diet of the Central Siberian Yupik. *Bovista* and *Lycoperdon* are not specifically collected. If mushrooms are found, they are usually given to the children as treats. The young, white and firm fruiting bodies of puffballs are eaten fresh.

(In early times, puffballs were the only mushroom group used by Siberian Yupik and Chukchi people. As a result of recent Russian contact, knowledge and use of all mushrooms has expanded considerably.—S. Yamin-Pasternak, pers. comm.).

Seaweeds

Phylum: Ochrophyta (formerly Phaeophyta)
Class Phaeophyceae (Brown algae)
Order: Laminariales

Sea cabbage, Kelps

A young Yupik girl collects sea cabbage (brown algae) along a Chukotkan beach.

One large group of brown seaweed (algae) belongs to the order Laminariales, many representatives of which are eaten and known under the common name "sea cabbage." Most Laminariales are large, some reaching lengths up to 10 m. They are called "brown" because of their brown pigment, resulting in brown, yellowish-green, and dull-green plants.

The main body of these marine plants, called the thallus, consists of a blade, a stipe, and a basal holdfast. The flattish blade can vary in shape, but most often is linear, lanceolate, or broadly lanceolate. The blade can be entire or dissected. The cylindrical or compressed stem-like stipe may be 3–70 cm long, about 1 cm or more thick, and widens toward its upper end to form the blade. The holdfast, similar in appearance to roots, attaches the stipe to the sea floor. The thalli (plural of thallus)

of many kelp species have mucilage canals. The mucilage produced protects the plant from desiccation during low tides.

Laminariales most often grow along open northern shores in Chukotka where constant strong ocean currents or surf deliver nutrients to the plant. At sites lacking a current, they grow in habitats where there is a steady inflow of organics, for example, near bird colonies or in silty sites. The most typical habitat for Laminariales is at capes jutting far out into the sea. Dense populations of brown algae are located at depths of 4–10 m below sea level.

The majority of Laminariales are perennial plants. The reproductive portion of the blade decomposes after spores are released [this does not happen in all species—Eds.], and a new blade originates from the meristem, where the stipe and blade meet. Rapid growth takes place in spring, when the plant is tender and more succulent. Growth is slowed with an increase in water temperature, but the seaweed also becomes less tender and palatable.

Laminariales are rich in various micronutrients (especially iodine, bromine, and potassium), vitamins, organic acids and sugars. Central Siberian Yupik also use many species of the order Laminariales medicinally.

Family: Laminariaceae

Sea cabbage

Laminariya (the Russian name from the original text does not reflect recent changes in scientific nomenclature. Of the species known from this region, only *Laminaria solidungula* remains in the genus Laminaria.—S. C. Lindstrom, pers. comm.)

Saccharina spp. and Laminaria solidungula J. Ag.

L`ḲYAḲ

*One species of sea cabbage (*Saccharina groenlandica*) is shown exposed on the Alaska coastline during low tide. Image by Mandy Lindeberg, courtesy of seaweedsofalaska.com.*

Several species of *Saccharina* grow along the coast of the Chukotka Peninsula. Identification of species is often difficult; the marine habitat often results in plants being damaged and/or developing into a variety of growth forms. It is believed that *Saccharina bongardiana* and *Saccharina gurjanovae* are most common to the area. All species of *Saccharina* and *Laminaria* found in Chukotka are considered edible.

The common name for sea cabbage among the Central Siberian Yupik is *l`ḳyaḳ*; however, special names are given to individual parts of the thallus. Thus the blade is called *ystykhtak* and the stipe is called *yftyġruk*. Two words denote a definite type of *Saccharina*. *Masiḳ* refers to *Saccharina* with a broad blade and salty taste. It is distinct from *aġnasiḳ* ("female"), which is similar in appearance to *masik*, but sweeter. (The taste may differ depending on the season of harvest or the habitat of

the plants.—I. Zagrebin, pers. comm.) [It is uncertain if two species or two growth forms are being described here.—Eds.]

Saccharina gurjanovae (A. D. Zinova) Selivanova, Zhigadlova & G. I. Hansen

= *Laminaria gurjanovae* A. D. Zinova

This member of Laminariaceae appears in great quantities along the Chukota coast and has economic significance. The perennial thallus can reach 7 m in length but is usually shorter. The blade is simple and long (oval, lanceolate, or wedge-shaped). The blade can be smooth or wrinkled with dark longitudinal bands, sometimes with two longitudinal rows of dents and protuberances (These are also called bullations.—S. C. Lindstrom, pers. comm.). The mucilage canals are located only on the blade. The holdfast fastens the thallus to the sea floor. *Saccharina gurjanovae* grows to a depth of 20 m.

Saccharina bongardiana (Postels & Ruprecht) Selivanova, Zhigadlova & G. I. Hansen

= *Laminaria bongardiana* Postels & Ruprecht

The thallus of this species varies according to environmental conditions during growth. On the whole, splits in the blade are typical. However, depending on depth of the water, speed of the current, and character of the sea bottom, the appearance of the plant also changes. It has either a short and narrow stipe with a simple ribbon-shaped blade or a long stipe with a short blade. In addition, there can be a short stipe with a broad, but not very large, blade. A branched holdfast fastens the plant to the sea floor.

Laminaria kopytnaya

[Based on the description below, we believe this to be the Arctic kelp species currently recognized as *Laminaria solidungula* J. Ag.—Eds.]

This small brown seaweed grows to 60–70 cm long but can grow larger under favorable conditions. The blade is elongated and egg-shaped. The stipe widens from its base upward, and again narrows at the transition to the blade. A disc-like holdfast fastens the plant to the sea floor.

Family: Costariaceae (formally in Laminariaceae)

Sieve kelp

Agarum

Agarum spp.

AGATU ("repeatedly clinging")

*This species of sieve kelp (*Agarum clathratum*) is found along both the Alaska and Chukotka coastlines. Image by Mandy Lindeberg, courtesy of seaweedsofalaska.com.*

In this group of brown seaweeds the broad, oval blade has a long midrib and numerous sieve-like holes. The tough thallus, lacking mucilage canals, is fastened to the sea floor by a branched holdfast. The most widely known *agarum* is the perforated form. The holes in the blade are up to 2 cm in diameter. *Agarum* has a unique flavor and is not generally eaten. When it is eaten, the Central Siberian Yupik add *agatu* to sea mammal meat.

Family: Alariaceae

Winged kelp, dragon kelp

Alariya

Eualaria fistulosa (Postels et Ruprecht) M.J. Wynne

= *Alaria fistulosa* Postels et Ruprecht

L`ĶYAĶ

This seaweed, similar to members of Laminariaceae, usually consists of a blade with a longitudinal midrib. The blade is long and entire (not dissected). The blade margin can be entire, or split into lateral lobes. Many members of this group produce small spore-bearing blades on slender petioles along the sides of a strongly or weakly flattened stipe. [These appear below the main blade—Eds.] The thallus reaches 2–3 m in length. This seaweed prefers habitats with a continuously moving current. Like Saccharina spp., this seaweed inhabits the coastal waters of the Chukotka Peninsula.

Use of Seaweeds for Food

Many species of seaweeds continue to be widely used in the Central Siberian Yupik diet. Active collection and storing of seaweed for winter use is still considered part of the local tradition.

Harvesting of seaweed is carried out in two ways; with *nakrutki* (*ķiptasiķ*) and *zakidushki* (*ipugrasiķ*). Although not considered a plant by the Central Siberian Yupik, seaweeds are the only plants that men gather because of their relationship to the sea. Everything that is connected with gathering food from the sea is considered men's work. Women, however, collect seaweed (*l`ķyatyl`yķ*) on the shore after storms.

Most seaweed is eaten fresh. The juicy, succulent spring seaweed is especially valued as an important addition to meat and fish broths. The firmer and less tender seaweed collected in the fall is usually boiled. Fall seaweed is also stored for winter. The less tender blades of fall seaweed can be rolled and preserved by freezing. Seaweed is also dried and added to broth in winter.

To varying degrees all parts of seaweed is eaten except the holdfast. The young stipe (*yftyġruk*), long and tender, is eaten, as are younger blades, added to broth. However, the blade is the primary edible part of the plant.

Appendices

Appendix A: Implements Used to Collect and Preserve Plants

It should be noted that at the present time, the containers and other utensils described below have practically disappeared from everyday use. New materials and utensils for harvesting (metal and plastic buckets, cans, saucepans, etc.) have replaced traditional items for collecting plants in many cases. However, the vocabulary and descriptions of traditional materials are interesting, not only as ethnographic information, but also as contemporary information in language development that reflects some of the processes that have occurred in the Siberian Yupik language. The vocabulary connected with these items has been preserved in the language and in some cases attached to modern items of daily life. For example, the vertebral disk of a whale, *uzivaḳ* (a grater of whale disk), preceded the modern metal or plastic grater.

Akmagutaḳ. (1) A leather container having a large capacity, sewn together from walrus hide. Its shape is that of a broad and not very tall cylinder. Usually roseroot (*nunivak*), prepared for winter, was preserved in it. (2) A wooden cask.

Ayatapak. A float. Old floats (skins of small seals removed intact) were used as bags for various purposes; containers for collecting, preserving edible plants; and for eating from. The opening of a float was usually widened to make the bag easy to use.

Ipugrasiḳ. A *zakidushka* (tool) for harvesting sea cabbage (seaweed). This simple tool for pulling up sea cabbage from the near-coastal zone consists of a slender strap with a stone attached to it.

Kalṇagaḳ. A container for gathering greens. It is a cylindrical skin container with a shoulder strap. The tops of old summer boots (sewn from sea mammal skin with the fur removed) were used. A bottom piece (round or oval in shape) and a strap were sewn on to the (original) boot top. Children's containers were small, while women's were more spacious. When the containers were filled, the greens and roots were poured into larger bags made of old floats, or *ayatapak*.

Siġnaḳ. A container made of walrus stomach. Walrus stomachs were washed, cleaned of the inner mucous membrane, and split. Then they were inflated and dried. They were used for gathering and storing plants for winter, for storing sea mammal oil, and for storing prepared dishes such as the leaves of heartleaf saxifrage and wild rhubarb mixed with warm sea mammal oil.

Sikl`yaḳ. A mattock or digging tool for digging roots. Mattocks were made of walrus tusks, deer (caribou, reindeer) antlers, and bones. They are distinguished from other digging tools by being long and narrow.

Uzivaḳ. The intervertebral disk from a whale has a smooth surface on one side and a rough one on the other. The rough surface was used as a grater in preparing edible plants to be added to soups.

Uiġakhtaḳ. A press. This was usually a cobble used to weigh down soaking leaves of roseroot, willow and wild rhubarb, keeping them constantly under water. *Uiġakhtaḳ* is from *uiġak* (stone).

[Yupik name not offered.—Eds.] A container made of bearded seal flipper. The rear flippers of large bearded seals are removed and cleaned. They are then inflated and hung up to dry. Wild rhubarb is usually kept in such containers.

*Winged kelp (*Eualaria fistulosa*), pictured here in Alaska, is also found along the Chukokta coast. Image by Mandy Lindeberg, courtesy of seaweedsofalaska.com.*

Appendix B: Lexical Constructions

Collective Words	Specific Words
Aǵulyaḳhḳuǵaḳuḳ—goes to collect some edible plants.	*Nuniviḳuḳ*—collects roseroot. *Ḳuvykhsiḳuḳ*—collects the leaves of wild rhubarb.
	Ḳuḳuṇiḳuḳ—collects the leaves of willow.
	Mytagrakhtaḳuḳ—collects the leaves of sandwort and oysterleaf.
Inǵuyaǵaḳuḳ—goes to collect some berries.	*Pagunǵataḳuḳ*—collects crowberries.
	Aḳavzikhtaḳuḳ—collects cloudberries.
	Syuǵataḳuḳ—collects blueberries.
Sikl`yaǵ'yaǵaḳuḳ—goes to dig some roots of plants.	*Ḳusmataḳuḳ*—to dig wild rhubarb roots. *Ḳus'mamyn*, *sikl`ǵaḳuḳ*—digs wild rhubarb roots.
	Syaḳl`yakhtaḳuḳ*—digs roseroot roots. *Syaḳl`yagmyṇ sikl`ǵaḳuḳ—digs roseroot roots.
Tutmaǵyaǵakuḳ—to look for rodent root caches by tramping on the ground.	*Unatataḳuḳ tutmaǵyaǵlyuku*—collects spring beauty roots by tramping on the ground to find rodent caches.
Ysniḳyaǵaḳuḳ—goes to collect animals and seaweed cast up on the beach.	*Yl`ḳuataḳuḳ*—collects sea cabbage.
	Upataḳuḳ—collects ascidians (sea squirts).
	Am'yakhtaḳuḳ—collects mussels.
Typataḳuḳ—collects animals cast up on the beach.	*Imanataḳuḳ*—collects cockles.
	Aǵnaǵutaḳuḳ—collects stalked ascidians (sea squirts).

Examples of Language Use

Apa aǵulyaḳuǵaḳuḳ unaḳun`yǵaku. The grandmother goes to collect plants every day.

Apa nuniviyaǵaḳuḳ tapamun. The grandmother goes to collect roseroot on the spit.

Ysniḳyaǵaḳuḳ yl`ḳyaǵanuṇ typanun. Goes on the beach to collect sea cabbage, ascidians (sea squirts), and other bottom-dwelling inhabitants.

Upalygnun piḳuḳ ysnamun. Goes to the shore for ascidians (sea squirts).

Appendix C: Edible Plants (alphabetized by English common names)

English Name	Central Siberian Yupik Name	Plant Part Used
Agarum, Sieve kelp	*Agatu*	seaweed
Avens, glacier	*Ḳul`ikaḳ*	roots
Bistort, common	*Syuḳl`yagyaḳ*	roots
Blueberry, bog	*Syuġaḳ*	berries
Cloudberry	*Aḳavzik*	berries
Coltsfoot, sweet	*Kamgyaḳ*	leaves
Cranberry, low-bush	*Kitmik*	berries
Crowberry	*Paguṇġaḳ*	berries
Dock, Bering sea	*Paṇġutṇyaġyt*	leaves
Dock, sour	*Al`ḳykhkaḳ*	leaves
Laminaria (various species), Sea cabbage	*L`ḳyäḳ*	seaweed
Lousewort, woolly	*Mytnik*	roots
Oysterleaf	*Mytaġrak*	leaves
Pink plume	*Syuḳlyak*	leaves and roots
Potato, wild	*Unataḳ*	roots
Puffballs (various species)	*Atyḳyrygaḳ*	mushrooms
Rhubarb, wild	*Ḳuvykhsi*	leaves and roots
River beauty	*Aṇukaḳ*	leaves
Roseroot	*Nunivak*	leaves and roots
Sandwort, sea beach	*Mytaġrak*	leaves
Saxifrage, heartleaf	*Aml`yuḳiraḳ*	leaves
Shooting star, frigid	*Syuġraykhtaḳ* (*suġrakhtaḳ*)	leaves
Sorrel, mountain	*Ḳugylṇiḳ*	leaves
Spring beauty, Siberian narrow-leaved	*Pupuḳa*	roots
Spring beauty, tuberous	*Ul`ḳiḳ*	roots
Weasel snout	*Ṇyrṇaḳ* (Naukan)	leaves
Willow (various species)	*Ḳuḳuṇaḳ*	leaves and roots
Winged kelp	*L`ḳyäḳ*	seaweed

Appendix D: Edible Plants (alphabetized by Russian common names)

Russian Name	Central Siberian Yupik Name	Chukchi Name	Latinized Botanical Name	English Common Name
Agarum prodyryavlennyi	*Agatu*	*Avchemyrgo, ḳoḳomyrgo*	*Agarum cribrosum* Bory	Sieve kelp
Alariya	*L`ḳyäḳ*	*Myrgomyr*	*Eualaria fistulosa* (Postels et Ruprecht) M.J. Wynne	Winged kelp
Belokopytnik kholodnyi	*Kamgyaḳ*	*Lyamḳolgyn* (*lemḳut*)	*Petasites frigidus* (L.) Fr.	Sweet coltsfoot
Brusnika obyknovennaya pv. malaya	*Kitmik*	*Verivych`yn*	*Vaccinium vitis-idaea* subsp. *minus* (Lodd.) Hultén	Lingonberry, Low-bush cranberry
Golubika bolotnaya pv. melkoplodnaya	*Syuġaḳ*	*Liṇyl* (*Linlin*)	*Vaccinium uliginosum* ssp. *microphyllum* Lange	Bog blueberry
Gorets zhivorodyashchii	*Syuḳl`yagyaḳ*		*Bistorta vivipara* (L.) Delarbre	Common bistort
Gorets trëkhkryloplodnyi	*Ḳuvykhsi*	*Rymavtyn*	*Aconogonom tripterocarpum* (A. Gray ex Rothr.) H. Hara	Wild rhubarb
Gorets ellipticheskii	*Syuḳlyak*	*Iikit* (*iikilgyn*)	*Bistorta plumosa* (Small) Greene	Pink plume, Bistort
Dodekateon kholodnyi	*Syuġraykhtaḳ* (*suġrakhtaḳ*)		*Dodecatheon frigidum* Cham. & Schltdl.	Frigid shooting star
Iva (razl. vidy)	*Ḳuḳuṇaḳ*	*Ḳuḳuṇen*	*Salix* spp.	Willow (various species
Ivan-chai shirokolistnyi	*Aṇukaḳ*	*Vevegtyt*	*Chamaenerion latifolium* (L.) Holub	River beauty, Dwarf fireweed
Kamnelomka nel'sona	*Aml`yuḳiraḳ*	*Sylḳyṇat*	*Micranthes nelsoniana* (D. Don) Small	Heartleaf saxifrage
Kislichnik dvustolbchatyi	*Ḳugylṇiḳ*	*Vechogtyt* (*vechochtylgyn*)	*Oxyria digyna* (L.) Hill	Mountain sorrel
Kopeechnik kopeechnikovyi	*Unataḳ*	*Miimii*	*Hedysarum hedysaroides* (L.) Schinz & Thell.	Wild potato, Wild carrot, Eskimo potato

Russian Name	Central Siberian Yupik Name	Chukchi Name	Latinized Botanical Name	English Common Name
Klaitoniya klubnevidnaya	*Ul`ḳiḳ*	*Kymchek*	*Claytonia tuberosa* Pall. ex Willd.	Spring beauty, Tuberous spring beauty
Klaitoniya ostrolistnaya	*Pupuḳa*	*P`opoḳylgyn*	*Claytonia acutifolia* Pall. ex Willd.	Siberian narrow-leaved spring beauty
Lagotis sizyi	*Ṇyrṇaḳ* (Naukan)	*Ṇyrgot*	*Lagotis glauca* Gaertn.	Weasel snout
Laminariya (razlichnye vidy)	*L`ḳyäḳ*	*R`arḳamyrgot*	*Laminaria* spp.	Sea cabbage
Mertenziya morskaya	*Mytaġrak*	*Myt`et*	*Mertensia maritima* (L.) Gray	Oysterleaf
Moroshka	*Aḳavzik*	*Ryttylgyn* (*ryttyt*)	*Rubus chamaemorus* L.	Cloudberry, Low-bush salmonberry
Moryanka buterlakovidnaya	*Mytaġrak*	*Vilyulgyt* (?)	*Honckenya peploides* (L.) Ehrh.	Sea beach sandwort, Beach greens
Mytnik sherstistyi	*Ḳakyḳaḳ*		*Pedicularis lanata* Willd. ex Cham. & Schltdl.	Woolly lousewort
Novosiversiya ledyanaya	*Ḳul`ikaḳ*	*K,ulikken* (*k,ulikkelgy*)	*Geum glaciale* Adams ex Fisch.	Glacier avens
Porkhovka (razlichnye vidy)	*Atyḳyrygaḳ*		*Bovista* spp. *Lycoperdon* spp.	Puffballs
Rodiola temno-purpurovaya	*Nunivak*	*Yun,ev*	*Rhodiola integrifolia* subsp. *integrifolia* Raf.	Roseroot
Shiksha subholarkticheskaya	*Paguṇġaḳ*	*Lygoon`ylgyn*	*Empetrum nigrum* L.	Crowberry, Blackberries
Shchavel' arkticheskii	*Al`ḳykhkaḳ*	*Vechovtyt*	*Rumex arcticus* Trautv.	Sour dock, Arctic dock
Shchavel' beringiiskii	*Paṇġutṇyaġyt*	*Vechovtyt*	*Rumex beringensis* Jurtz. & V.V. Petrovsky	Bering sea dock

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Shared Beringian Heritage Program

The Shared Beringian Heritage Program at the National Park Service is an international program that recognizes and celebrates the natural resources and cultural heritage shared by the United States and Russia on both sides of the Bering Strait. The program seeks local, national, and international participation in the preservation and understanding of natural resources and protected lands, and works to sustain and protect the cultural traditions and subsistence lifestyle of the Native peoples of the Beringia region.

In pursuit of these goals, the Beringia Program funds projects that link people across the Bering Strait. For over twenty years, the program has facilitated cooperation and exchanges between students, teachers, researchers, government officials, scientists, and indigenous residents of the region. For more information on the program and the annual request for proposals, please see www.nps.gov/akso/beringia.