

## Description of *Cheilosia naruska* Haarto & Kerppola spec. nov. from northern Europe (Diptera, Syrphidae)

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*Cheilosia naruska* Haarto & Kerppola **spec. nov.** is described from northeastern Finland (Ks: Salla). The taxon is known from four localities in Finnish Lapland and one locality in European Russia. Descriptions of male and female and relevant figures of male terminalia are provided. A partial nucleotide sequence of the mitochondrial gene cytochrome c oxidase subunit I (COI) was determined for one female paratype. The sequence is submitted to GenBank (accession number DQ417498).

Key words: *Cheilosia*, new species, Europe, Syrphidae.

### Zusammenfassung

Aus NE-Finnland wird *Cheilosia naruska* Haarto & Kerppola **spec. nov.** beschrieben. Die Art ist von vier Fundorten in finnisch Lappland und von einem Fundort im europäischen Russland bekannt. Sowohl Männchen als auch Weibchen werden beschrieben und abgebildet (incl. Abbildungen des männlichen Genitals). Eine partielle Nukleotidsequenz des mitochondrialen Gens Cytochrom c oxidase Untereinheit I (COI) wurde für einen weiblichen Paratypus ermittelt. Diese Sequenz wurde bei der GenBank eingereicht (Zugangsnummer DQ417498).

### Introduction

In 2003 the annual field trip organized by the Finnish Entomological Society was held in north-eastern Lapland. The village of Naruska in Salla served as a base, and several trips were made to vast surrounding areas. During one of the trips the authors observed some smallish, black hoverflies flying low around wild chervil (*Anthriscus sylvestris* L.). When some collected specimens were examined (under a microscope in the basecamp), they were identified as belonging to the genus *Cheilosia*. The species was, however, unknown to the authors. Almost a hundred specimens were collected to make a sound basis for further research, during which the specimens were proved to belong to a previously unknown species.

## Material and methods

Morphological studies: The material dealt with consists of dry, pinned specimens and is deposited in the private collections of Antti Haarto, Jere Kahanpää, Sakari Kerppola, Tapani Järveläinen, Veli-Matti Mukkala and Kari Varpenius. The holotype and allotype are deposited in the collection of the Zoological Museum of the Finnish Museum of Natural History in Helsinki (MZH).

DNA sequencing: DNA was extracted from legs and the abdomen of one female paratype. This DNA voucher specimen is deposited in MZH, Finland, and is labelled "Finland, Ks: Salla, Naruska, 745:59, 1.7.2003, S. Kerppola leg.", "DNA voucher specimen MZH\_Y43, G. Ståhls, FMNH, Helsinki, Finland". DNA extraction, PCR amplification and sequencing followed standard procedures, these and the primers used are described in Ståhls et al. (2004). A 1190 bp fragment of the mitochondrial gene cytochrome c oxidase subunit I (COI) was determined, and the sequence is deposited in GenBank under accession number DQ417498.

## Results

### *Cheilosia naruska* spec. nov.

Type material: Holotype, male: Finland, Ks: Salla, Naruska, Elola, 7453:593, 1.7.2003, A. Haarto leg., coll. MZH. Allotype, female: Finland, Ks: Salla, Naruska, Elola, 7453:593, 1.7.2003, A. Haarto leg., coll. MZH. Paratypes: 3 males and female: Finland, Ks: Salla, Naruska, Elola, 7453:593, 1.7.2003, A. Haarto leg.; 2 females: Finland, Ks: Salla, Naruska, 7453:594, 29.6.2003, A. Haarto leg.; 2 females: Finland, Ks: Salla, Naruska, länsipuoli, 7453:594, 30.6.2003, M. Koponen leg.; 6 males and 7 females: Finland, Ks: Salla, Naruska, 745:59, 1.7.2003, S. Kerppola leg.

Additional specimens: 13 males and 3 females: Finland, Ks: Salla, Särkelä, 7439:586, 29.6.2003, S. Kerppola leg.; 9 males: Finland, Ks: Salla, Särkelä, 7439:586, 29.6.2003, A. Haarto leg.; 10 males and 1 female: Finland, Ks: Salla, Särkelä, 7439:586, 30.6.2003, S. Kerppola leg.; 3 males and 3 females: Finland, Ks: Salla, Särkelä, 7439:586, 29.6.2003, A. Haarto leg.; 3 males: Finland, LkE: Pelkosenniemi, Arvospuoli, 744:52, 28.6.2003, S. Kerppola leg.; 2 males: Finland, LkE: Pelkosenniemi, Arvospuoli, 7446:523, 28.6.2003, A. Haarto leg.; 1 male: Finland, LkE: Pelkosenniemi, Arvospuoli, 7446:523, 1.7.2003, V.-M. & L. Mukkala leg.; 1 male: Finland, Obb: Pello, Pellojärvi, 7410:369, 23.6.2005, K. Varpenius leg.; 2 males and 1 female: Finland, Obb: Rovaniemi, Jängislahti, 73814:4429, 2.7.2004, J. Kahanpää leg.; 1 male: Russia: Paanajärvi, Mäntyjoki, 24.6.2003, T. Järveläinen leg.; 2 males: Russia: Paanajärvi, Mäntyjoki, 73553:6329, 24.6.2003, J. Kahanpää leg.; 2 males and 1 female: Russia: Paanajärvi, Oulankajoki, 73546:6603, 25.6.2003, J. Kahanpää leg.; 1 male: Russia: Paanajärvi, Oulankajoki, 73546:6603, 23.6.2003, J. Kahanpää leg.

**Etymology:** The name, a noun in apposition, is derived from the village Naruska, where the type locality is situated.

**Diagnosis:** *Cheilosia naruska* is similar in general appearance to *Cheilosia impressa* Loew, 1840, *C. ingerae* Nielsen & Claussen, 2001, and *C. proxima* (Zetterstedt, 1843). It is separable from *C. impressa* by the front coxa being without a hook (fig. 1). In contrast, *C. impressa* has a clear hook on the front coxa (fig. 2) (Vujić, Radenković & Stănescu 1998). *C. naruska* is separable from *C. ingerae* and *C. proxima* by its shining sternites and totally black legs, whereas *C. ingerae* and *C. proxima* have dusted sternites and partly yellow legs.

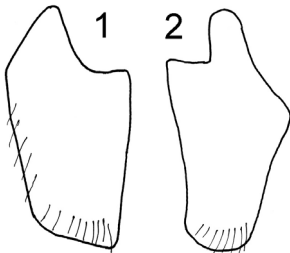
**Description:**

♂ (Fig. 3): Head (figs 5-7): Eyes uniformly covered with pale hairs that are about as long as the distance between front and hind ocellus. Angle of approximation of eyes 75°-90°. Frons thinly grey dusted, shiny along longitudinal sulcus and with long black hairs. The longitudinal sulcus of frons broadened anteriorly and usually ends before lunula. Lunula blackish brown. Antennal fossae separated. Eye contiguity slightly longer than frons. Ocellar triangle slightly longer than wide and with long black hairs. Postocular orbit narrower than the diameter of an ocellus, and with long black hairs. Face bare, thinly grey dusted. Parafacialia covered with dense grey pollinosity. Parafacialia narrower than fore basotarsomere and with short pale hairs. Antenna black, basoflagellomere about as long as wide. Arista black, pubescent and about four times as long as basoflagellomere.

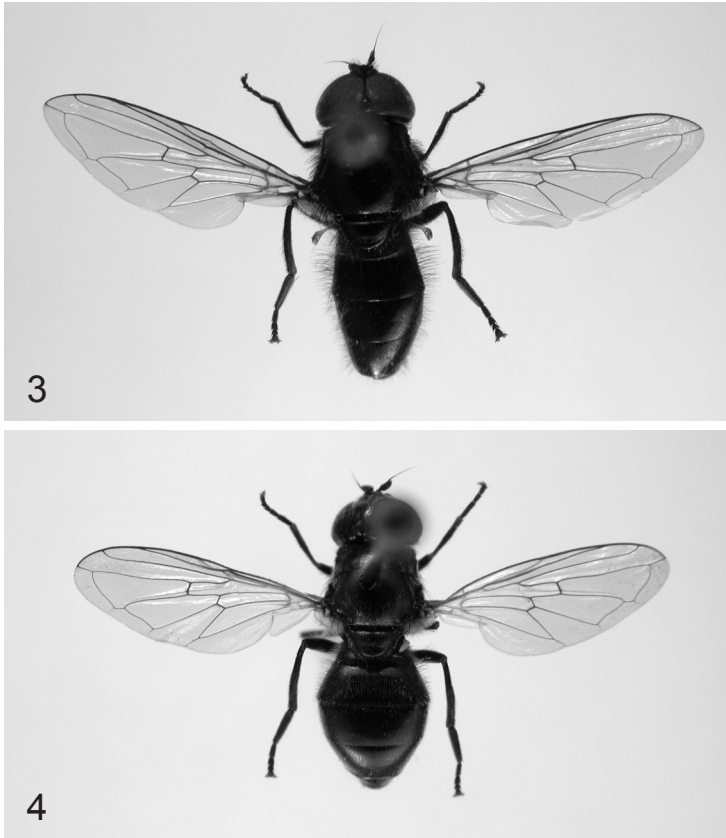
**Thorax:** Mesonotum shining bluish black except for thinly grey dusted anterior margin. Mesonotum with long black erect hairs intermixed with shorter pale erect hairs in the anterior part and short black semi-erect hairs in front of the scutellum. Postpronotum covered with short black and grey hairs and its inner side is grey dusted. Postalar callus with long black setae. Posterior margin of scutellum with 8-12 black setae that are slightly longer than hairs on scutellar disc. Pleurae predominantly shining, slightly brownish dusted. Hairs on pleurae predominantly black and long. Katepisternum ventrally with long pale hairs connected with dorsal black hairs. Anterior anepisternum and katepimeron bare. Anterior anepisternum covered with grey pollinosity. Katatergum with short brownish hairs. Metasternum with long pale hairs. Calypters whitish with pale

brownish margins and pale brownish setulae sometimes mixed with a few darker setae. Halteres yellowish with slightly darkened capitulum and brownish base of stem.

– **Legs:** Procoxa without lateral hook. All legs completely black. Coxae with pale hairs, but hind coxa also



**Figs 1-2: Right front coxa, frontal view.** – 1. *Cheilosia naruska*; – 2. *Cheilosia impressa*.



**Figs 3-4:** *Cheilosia naruska*. – 3. male; – 4. female.

with black hairs. Profemur posteriorly predominantly black with slightly longer hairs than the diameter of femora. Profemur anteriorly in basal 1/5 with short semi-addressed and yellowish brown hairs and on the other part sparse, short, yellowish brown hairs and brown microtrichia. Protibia posteriorly with black hairs that are shorter than the diameter of tibia. Protibia anteriorly with short semi-addressed and yellowish brown hairs. Protarsi dorsally with short black hairs and ventrally with short yellowish brown hairs. Mid femora anteriorly with short predominantly pale hairs, and posterodorsally with pale hairs that are longer than the diameter of femora. Mid femora posteroventrally with black hairs that are longer than the diameter of femora. Mid tibia with black and shorter hairs than the diameter of tibia. Mid tarsi dorsally and ventrally with short black hairs. Hind femora posteriorly completely microtrichose and with short pale hairs. Hind femora anteriorly on 3/4 shining with mixed long black and pale hairs, hairs somewhat

longer than diameter of femora. Hind femora ventrally with short black hairs. Hind tibia with black and shorter hairs than the diameter of tibia, except for short yellowish brown hairs ventrally and posteroapically. Hind tarsi dorsally with short black hairs and ventrally with short yellowish brown hairs. Hind basotarsomere almost as long as other segments together. Claws yellowish basally and black apically. – Wings: Yellowish brown tinged at least basally. Stigma yellowish. Veins dark brown, except for yellowish subcosta. Wing entirely microtrichose. Wing tip pointed (fig. 3).

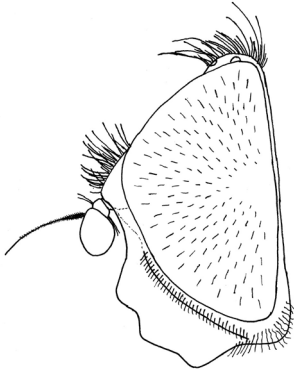
Abdomen: Tergites greenish black. T1-2 thinly brownish pollinose, when viewed obliquely from front, sides and hindmargin shining. T3 shining, except for thinly brown dusted front margin. T4 totally shining. Pregenital segments with slight grey pollinosity. Sternites shining, except for slightly dusted anterior and posterior margins, with pale hairs, except for a few black hairs on sides. Hairs predominantly erect. Hairs on posterior margin of T4 and S2 semi-adpressed. S3-4 with triangle of semi-adpressed hairs. – Male genitalia (figs 11-18): Surstylus dorsally covered with brownish pollinosity (fig. 11) Surstylus with long black hairs and internally and apically with short bristles. The left and right gonostylus are symmetrical (figs 15-16). The lateral sclerites of aedeagus are nearly symmetrical (fig. 18).

Length: Body 6.1-7.8 mm, wing 5.3-6.8 mm.

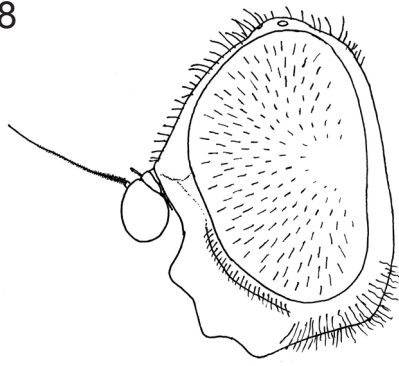
♀ (fig. 4): Head (figs 8-10): Eyes uniformly covered with pale hairs that are shorter than distance between front and hind ocellus. Frons shining, thinly grey dusted, lower part predominantly with short pale hairs and upper part with longer black hairs. The longitudinal sulcus of frons and the lateral channels indistinct or absent. Lunula blackish brown. Ocellar triangle almost equilateral, slightly longer than wide and with long black hairs. Postocular orbit slightly narrower than the length of the ocellar triangle, with long black hairs. Face bare, thinly grey dusted. Parafacialia narrower than fore basotarsomere and with short pale hairs. Parafacialia covered with dense grey pollinosity. Antenna black, basoflagellomere about as long as or slightly longer than wide. Arista black, pubescent and about four times as long as basoflagellomere.

Thorax: Mesonotum shining greenish black with short predominantly adpressed pale hairs mixed with some short black hairs. Postpronotum covered with short grey hairs and its inner side is grey dusted. Postalar callus with long black setae. Posterior margin of scutellum with 8-12 black setae, shortest setae sometimes pale. Pleurae shining, slightly brownish dusted. Hairs on pleurae pale and long. Anterior anepisternum and katepimeron bare. Anterior anepisternum covered with grey pollinosity. Katepisternum almost completely with pale hairs. Katatergum with short brownish hairs. Metasternum with long pale hairs. Calypters whitish with pale brownish margins and pale brownish setulae sometimes mixed with a few darker setae. Halteres yellowish with base of stalk brownish. – Legs: Procoxa without lateral hook. Coxae black with pale hairs. All legs completely black. Profemora posteriorly predominantly pale with slightly shorter hairs than the diameter of femora. Profemora anteriorly on basal 1/5 with short semi-adpressed and yellowish brown hairs and on the other part sparse short yellowish brown hairs

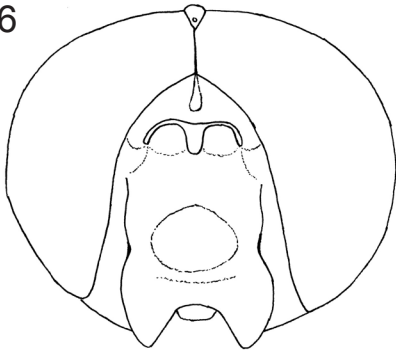
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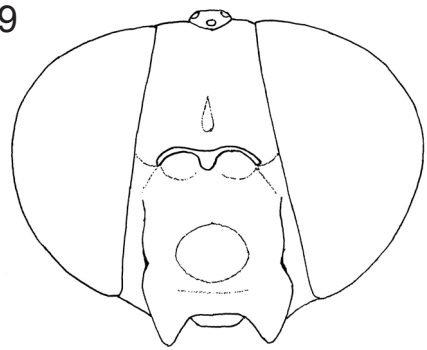
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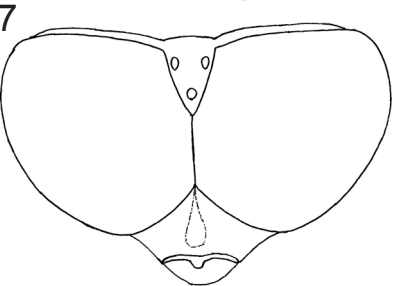
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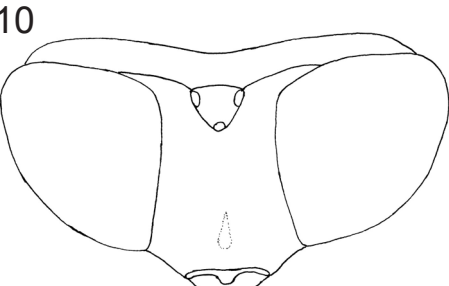
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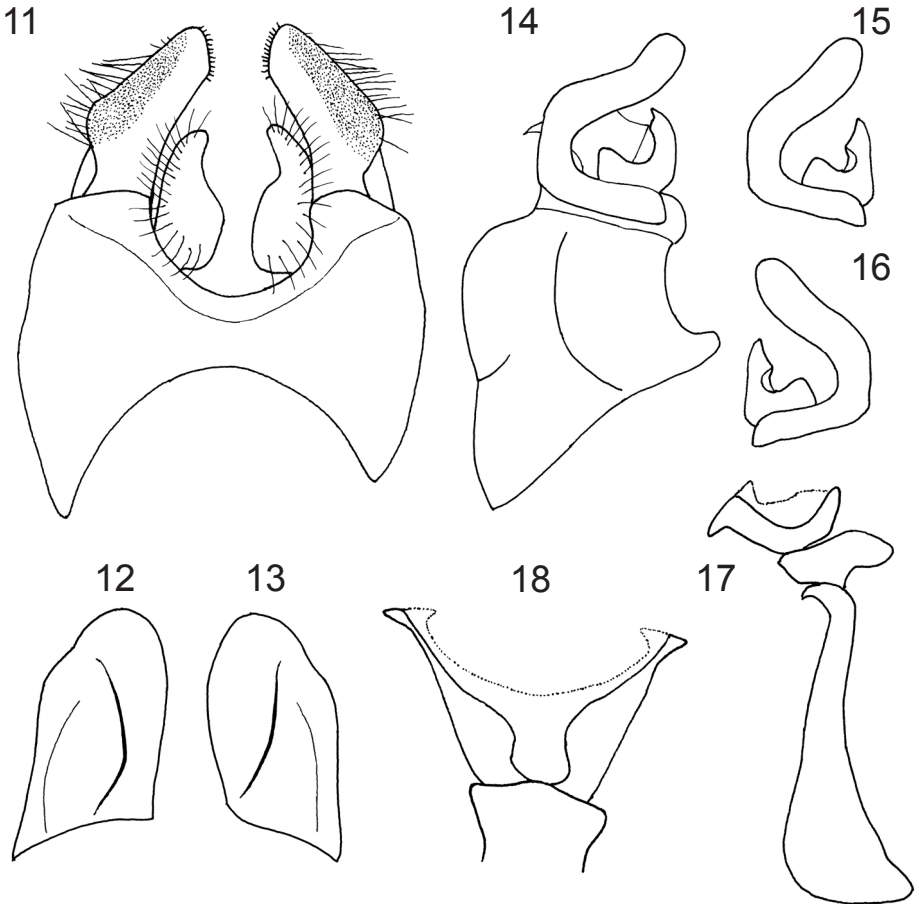
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**Figs 5-7: *Cheilosia naruska*, male head.** – 5. lateral view; – 6. anterior view; – 7. dorsal view.

**Figs 8-10: *Cheilosia naruska*, female head.** – 8. lateral view; – 9. anterior view; – 10. dorsal view.

and brown microtrichia. Protibia posteriorly with black hairs shorter than the diameter of tibia, and anteriorly with short semi-adpressed, yellowish brown hairs. Protarsi dorsally with short black hairs and ventrally with short yellowish brown hairs. Mid femora anteriorly with short pale hairs and posteriorly with pale hairs that are shorter than or as long as the diameter of femora. Mid tibia with black hairs, shorter than the



**Figs 11-18: *Cheilosia naruska*, male genitalia.** – 11. epandrium, dorsal view; – 12. left surstylus, lateral view; – 13. right surstylus, lateral view; – 14. hypandrium, lateral view; – 15. left gonostylus; – 16. right gonostylus; – 17. aedeagus, lateral view; – 18. lateral sclerites of aedeagus, ventral view.

diameter of tibia. Midtarsi with short black hairs. Hind femora posteriorly completely microtrichose and with short pale hairs. Hind femora anteriorly shining with pale hairs that are shorter than the diameter of the femora. Hind femora ventrally with black hairs. Hind tibia with black hairs shorter than the diameter of tibia, except for short yellowish brown hairs ventrally and apical part posteriorly. Hind tarsi dorsally with short black hairs and ventrally with short yellowish brown hairs. Hind basotarsomere almost as long as other segments together. Claws yellowish basally and black apically. – Wings: Yellowish brown tinged at least basally. Stigma yellowish. Veins dark brown, except



for yellowish subcosta. Wing entirely microtrichose. Wing tip roundish (fig. 4).

Abdomen: Tergites greenish black. T1-2 thinly brown dusted, when viewed obliquely from front, sides and hind margin shining. T3-T5 completely shining. Sternites shining, except for slightly dusted anterior margins, and with short pale hairs. Hairs on tergites predominantly adpressed, except for long erect pale hairs on sides of T1-T3. Hairs on S2 and hind margin of S4 long and erect.

Length: Body 6.1-7.8 mm, wing 5.1-6.7 mm.

#### Taxonomical remarks

Males and females of *C. naruska* belong to "Group D" (Sack 1932) with hairy eyes, a bare face and with distinct black scutellar marginal bristles. In northern Europe only three other species of "Group D" with completely black legs occur (*C. impressa* Loew, 1840, *C. fasciata* Schiner & Egger, 1853) or with otherwise black legs but brownish base of tibiae (*C. semifasciata* Becker, 1894) (Vujić, Radenković & Stănescu 1998, Schmid 2000). The general appearance of *C. fasciata* and *C. semifasciata* is clearly different to that of *C. naruska*. The COI nucleotide sequence was contrasted against available selected homologous sequences of other *Cheilosia* species (partly from Ståhls et al. 2004), showing the lowest uncorrected pairwise divergence of 5.7% between *C. naruska* and *C. aerea* Dufour, 1848.

#### Biology and distribution

All the Finnish specimens were found in humid meadows with wild chervil or cow parsley *Anthriscus sylvestris* (L.) (fig. 19). Male specimens do not hover to defend their territory but they sit on sunny leaves near the ground (fig. 20) and then chase other males away from their territory. Early stages are not known, but it is possible that the larval host plant is *A. sylvestris*. Almost one hundred specimens were collected and none of them were found in meadows without *A. sylvestris*. The flight period is from mid June to the first week of July.

*C. naruska* is so far found in Finland and the European part of Russia (fig. 21).

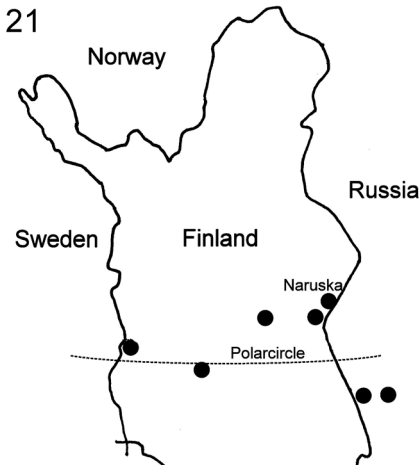


Fig. 21: Known distribution of *Cheilosia naruska* in northern Europe.





**Fig. 19:** Typical environment of *Cheilosia naruska*.

**Fig. 20:** Male of *Cheilosia naruska*.

## Acknowledgements

We would like to thank all the contributors who have made their *Cheilosia* material available to us. Anatolii Barkalov, Zoological Museum of the Institute of Animal Systematics and Ecology, Novosibirsk, Russia, offered some valuable comments. Niina Kerppola edited the language. Imagophotos are by Jari Flinck.

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