

CAMPYLOPUS INTROFLEXUS (DICRANACEAE, MUSCI) –  
AN ADDITION TO THE MOSS FLORA OF RUSSIA

CAMPYLOPUS INTROFLEXUS (DICRANACEAE, MUSCI) –  
НОВОСТЬ ДЛЯ ФЛОРЫ МХОВ РОССИИ

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Abstract

*Campylopus introflexus* (Hedw.) Brid., an adventive moss from the Southern Hemisphere found for the first time in Russia, in Kaliningrad Province. Two localities were found in 2000, not far from the coast of Baltic Sea, in Kurshskaya Kosa (Curonian Spit). Illustration is provided and diagnostic characters of this species are briefly discussed.

Резюме

*Campylopus introflexus* (Hedw.) Brid., адвентивный вид мха, произрастающий в естественном состоянии в Южном полушарии и появившийся в Европе впервые в 1941 г., обнаружен в России, в Калининградской области, близ побережья Балтийского моря. Кратко описывается история его распространения в Европе и обсуждаются возможные меры борьбы с экспансией этого вида, поскольку густые покровы его препятствуют прорастанию семян и могут иметь негативное последствие для естественного возобновления растительности, особенно на приморских дюнах.

There are several thousand of vascular plants which are adventive and invasive in different parts of the world. Among bryophytes this number is quite small, probably partly because many species have much wider distribution, so only a species from quite distant area can be recognized as adventive. Only three species are well-known as adventive in Europe, with the well-documented history of their invasion and spreading: *Orthodontium lineare* Schwaegr., *Campylopus introflexus* (Hedw.) Brid., *Scopelophila cataractae* (Mitt.) Broth.

*Scopelophila cataractae* is the latest newcomer, found in Great Britain in 1980s (Corley & Perry, 1985), spread to moment in Belgium, France, Germany, Holland and Spain, and still unknown in Russia. *Orthodontium lineare* appeared in Europe in 1911, became rather common in Central Europe and Scandinavia, and reached Russia, in

Kaliningrad Province in 1990 (LE!; Ignatov & Afonina, 1992).

*Campylopus introflexus* has been found in Europe in 1941, and reached Russia, Kaliningrad Province in 2000. Label information is as follow: (1) "Kaliningrad Province, Kurshskaya Kosa (Curonian Spit), 6 km of Hwy, 500 m from Hwy to the sea shore, edge of pine forest, along trail. 2.IV.2000, coll. L. V. Razgulyaeva" (MHA and Herbarium of Kaliningrad University); (2) Kaliningrad Province, Curonian Spit, 50°10'N – 20°50'E, 35 km of Hwy, 50 m from road towards the Baltic Sea in forest quartal 41, Rybachy, small patches on humus litter in open *Betula pendula*–*B. pubescens*–*Pinus sylvestris* forest, cum sporogon, coll. Ch. Wolfram, 22.X.2000 (LE and Herbarium of Kaliningrad University).

The complete review of literature on *C. introflexus* in Europe would enumerate over hundred papers, because of numerous publications of new findings. The first country-records are as follow:

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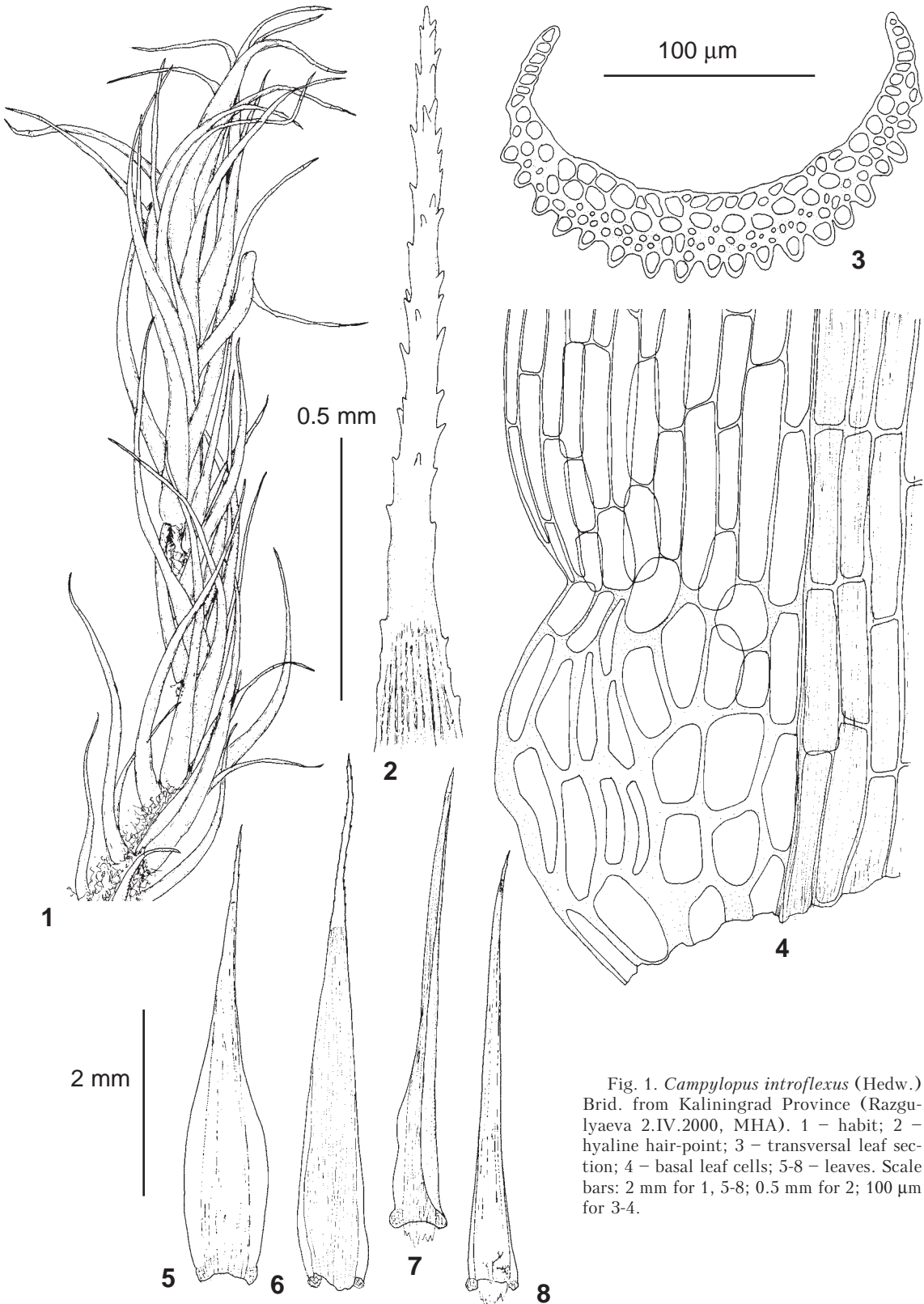


Fig. 1. *Campylopus introflexus* (Hedw.)  
Brid. from Kaliningrad Province (Razgulyaeva 2.IV.2000, MHA). 1 - habit; 2 -  
hyaline hair-point; 3 - transversal leaf section; 4 - basal leaf cells; 5-8 - leaves. Scale  
bars: 2 mm for 1, 5-8; 0.5 mm for 2; 100 μm for 3-4.



Fig. 2. Localities of *Campylopus introflexus* (Hedw.) Brid. in Kaliningrad Province.

- 1941 – Great Britain (Richards, 1963)
- 1942 – Ireland (Richards, 1963)
- 1954 – France (Frahm, 1972)
- 1961 – Netherlands (Sipman, 1977)
- 1966 – Belgium (Frahm, 1972)
- 1967 – Germany (Frahm, 1972)
- 1968 – Denmark (Frahm, 1972)
- 1976 – Sweden (Johansson, 1977).

Later it was found in Norway (Ovstedal, 1978), Poland (Lisowski & Urbanski, 1989), Iceland (Söderström, 1996), Czechia (Novotny, 1990), Portugal (Sérgio, 1997).

*Campylopus introflexus* is probably the most harmful of adventive mosses in the world. It is a pioneer species by its strategy and is able to colonize easily open and disturbed places. The dense carpet formed by *C. introflexus* may restrict seed germination of some vascular plants and substitute natural moss and lichen communities especially on sandy soils of sea coastal areas (Equihua, & Usher, 1993; van der Meulen & al., 1987). The strong decrease of diversity of rich lichen flora and low herbaceous vascular plants due to *C. introflexus* invasion was described in Netherlands (Biermann & Daniels, 1997) and coastal area in Germany (Biermann, 1999). The latter author concluded that *C. introflexus* decrease the diversity of both

habitats and species, especially of some rare species. Westhoff (1994) called this moss a pest in Netherlands. Van der Meulen & al. (1987) suggested, that the burying of *C. introflexus* by calcareous sand may reduce its abundance.

In other places of the Kaliningrad Province *Campylopus introflexus* has not been found yet, including the Vistula Spit which has a similar landscape with the Curonian Spit and which was studied by us for its moss flora in 1998-2000.

The locality of *C. introflexus* in Curonian Spit is separated from the known neighboring localities in Poland by more than hundred kilometers. It is quite probably, that it has been brought to the Curonian Spit by birds: Curonian Spit is situated on the way of mass bird migration, and according to Biermann (1999) the spreading by birds takes place in this species fairly often.

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*Campylopus introflexus* is easy to recognize among other Russian bryophytes, since it is the only species of Dicranaceae with costa excurrent in hyaline hair-point. One more species with similar hair-point, *Campylopus atrovirens* De Not., was reported for Ukraina by Savicz-Ljubitskaya & Smirnova (1970), but later was excluded from this country (Partyka & Vichenko in Ignatov & Afonina, 1992). However, the key and descriptions given by Savicz-Ljubitskaya & Smirnova (1970) for separation of *C. atrovirens* and *C. introflexus* (as a species possible to find in USSR) are incorrect, leading to misidentification of *C. introflexus* as *C. atrovirens*. These authors noted that alar group is poorly developed to absent in *C. introflexus*, though according to other authors (Frahm, 1972; Smith, 1978; Gradstein & Sipman, 1978) it is well developed and pellucid, which agree with the specimen from Kaliningrad Province and other European collections seen by us.

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