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Notes on the genus *Punctelia* in Denmark

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The genus *Punctelia* is represented in Denmark by *P. subrudecta* and *P. jeckeri* (syn. *P. ulophylla*). *P. jeckeri* is new to Denmark. Both species seem to be expanding, probably due to nutrient enrichment.

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Punctelia jeckeri (Roum.) Kalb was previously known as *P. ulophylla* (Ach.) van Herk & Aptroot. The taxon was described by Acharius (1810) as *Parmelia caperata* var. *ulophylla*. It was long overlooked or reduced to synonymy, i.a. with *Parmelia subrudecta* (Nyl.) Krog (e.g. Hale 1965). Krog (1982), when establishing the genus *Punctelia*, did not re-combine *P. ulophylla*, nor include it in the accompanying key. She probably considered it as a synonym of *P. subrudecta*. In a study on European *Punctelia* species with lecanoric acid, van Herk & Aptroot (2000) accepted the taxon and made the combination *Punctelia ulophylla*. The publication also included photographs and descriptions of *P. ulophylla* and related species as well as a key to the species. That paper gave rise to more regional papers on the group: Aptroot (2003) on North American species and Truong & Clerc (2003) on the Swiss species. *P. subrudecta* and *P. jeckeri* (as *P. ulophylla*) have also been recognized in the recent British flora by Dobson (2005), which includes colour photographs of both species. Recently Crespo et al. (2004) and Thell et al. (2005) showed that *P. subrudecta* and *P. ulophylla* were genetically distinct. Kalb (2007) discovered an older name at species level, proposed the

combination *Punctelia jeckeri*, and lectotypified the name.

As a preparatory work to a forthcoming revision of the Danish lichen checklist (Søchting & Alstrup 2007) it was decided to examine the Danish material of the genus *Punctelia*.

Materials and methods

The material of the genus *Punctelia* filed in the Danish Herbarium at the Botanical Museum of Copenhagen (C) and in the private herbarium of S. N. Christensen was studied.

Results

Six specimens, all filed under *Punctelia subrudecta*, were found. Four specimens belonged to *P. subrudecta* and were from the islands of Samsø and Romsø and Moesgård near Aarhus. The two belonging to *P. jeckeri* were from Aarhus and Stang Hede.

Discussion

The genus *Punctelia* was hitherto known in Denmark only from one specimen of *P. subrudecta* found in southernmost Jutland

(Kappel Skov) in 1913. The species was therefore considered as extinct by Søchting & Alstrup (2002). It is worth noting that between the find in 1913 and the recent finds (1988 and later) no specimens have been collected, despite the rather intensive collecting activities by M. Skytte Christiansen and S. Svane. This may indicate a recent immigration. Crespo et al. (2004) attribute the colonization of urban and suburban areas by *P. subrudecta* to falling levels of ambient sulphur dioxide and particulate air pollution. Amelioration of air quality has also taken place in Denmark since the 1970ies, especially in urban areas. However, most of the Danish occurrences are in rural areas, where sulphur dioxide levels were never very high. In the same period agricultural derived nitrogen deposition has increased considerably. The recent finds of *Punctelia subrudecta*, a species of nutrient rich and neutral bark, can be explained by the general increase in eutrophication nitrogen compounds deposited on bark. The same may be the case for *P. jeckeri*. In one specimen of *P. subrudecta* (Christensen 4627) the following associated lichen species typical for nutrient-rich conditions included *Candelaria concolor*, *Pertusaria albescens* var. *corallina*, *Phlyctis argena*, *Physcia tenella*, *Physconia grisea* and *Pleurosticta acetabulum*, in addition to *Lepraria incana*.

The ecology of the two species is still not well-known. Most statements referring to *P. subrudecta* cover both species (Wirth 1980, Jacobsen 1992). However, except for the occasional saxicolous specimens of *P. subrudecta*, the ecology of the two species are said to be essentially the same (van Herk & Aptroot 2000, Truong & Clerc 2003) and in accordance with Wirth (1980) and Jacobsen (1992). Both species occur on well-lit, solitary trees in nutrient-enriched environments. Except for the one specimen of *P. jeckeri* growing on twigs of *Quercus* at Stang Hede and for the specimen of *P. subrudecta* growing on *Quercus* in Kappel Skov, the habitat conditions of the five remaining Danish specimens are

essentially as stated above. The nutrient-enrichment may level the intrinsic differences in bark characteristics of the phorophytes (e.g. *Quercus* with poor bark and *Ulmus* with rich bark), enabling the two species to grow on a variety of trees.

In Norway, however, *P. jeckeri* (as *P. ulophylla*) was found in acidophytic communities and under more nutrient-poor conditions than *P. subrudecta* (Gauslaa 2000). This pattern is reflected in the Danish specimens, as *P. jeckeri* was found on *Quercus* while the recent finds of *P. subrudecta* occurred on *Ulmus* and *Aesculus*. Dobson (2005) also points to differences in the ecology of the two species: *P. subrudecta* grows in well-lit situations, while *P. jeckeri* (as *P. ulophylla*) grows more shaded, especially on horizontal branches, and avoids areas of high precipitation in the West of the British Isles.

In Europe both species are confined to western and central Europe (van Herk & Aptroot 2000, Truong & Clerc 2003). However, any difference in their distribution in Europe may be obscured by the inclusion of *P. jeckeri* in *P. subrudecta* in earlier work (e.g. Jacobsen 1992, Santesson et al. 2004, Vězda & Liška 1999). For the same reason statements on their conservation status should be taken with care (e.g. Jacobsen 1997, Pišút et al. 1996).

Specimens examined: Punctelia jeckeri
Denmark. *Jylland:* Aarhus, Universitetsparken, on trunk of *Quercus*, May 2002, R. Poulsen (conf. A. Aptroot, C-6147; published as *P. subrudecta* by Alstrup et al. 2004); 5 km SW of Viborg, Stang Hede at Trolde slugt, on bark of twigs of young *Quercus*, 9.VI.2006, U. Søchting 10.557 (conf. A. Aptroot; C).

Punctelia subrudecta

Denmark. *Jylland:* Samsø, SW part of Besser, wayside trees in the village, on *Ulmus*, 8.IV.1988, S. N. Christensen 4627 (det. A. Aptroot.; herb. Christensen); Moesgård, roadside trees, *Aesculus hippocastanea*, 17. VIII. 1989, S. Svane 89 SS 7940-1 (C). *Fyn:*

Romsø, on *Ulmus* near the lighthouse, 30.X.1994, V. Alstrup (C-699); The isle of Romsø in Storebælt NE of Kerteminde, 30.X.1994, S. Svane 94 SS 9603 A (C).

Note. The following specimen from South Jutland (illustrated by Galløe 1948) has not been retrieved: "On the bark of *Quercus* in Kappel Skov, Sundeved, in the peninsula of Broager, 16th May 1913, C. F. E. Erichsen". This is probably the same specimen reported by Erichsen (1957) and Krog (1970). According to Krog (1970) it is not in the herbarium of Hamburg (HBG). Erichsen (1957) distinguishes between *Parmelia dubia* (Wulf.) Schaer. s. str. (= *P. subrudecta*) and *P. dubia* var. *ulophylla* Harm., referring this specimen from Kappel Skov to *P. dubia* s. str. The drawings and the description by Galløe (1948) point in the same direction: lack of pruina and lack of confluent marginal soralia.

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