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The Dactylorchid of the island of Saaremaa (Estonia), *Dactylorhiza osiliensis* PIKNER sp. nova

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Abstract. *PIKNER, T. & DELFORGE, P.- The Dactylorchid of the island of Saaremaa (Estonia)*, Dactylorhiza osiliensis *PIKNER sp. nova*. Populations of an undetermined Dactylorchid have been found in 2000 in wooded marshes of the western littoral of Saaremaa, the largest Estonian island. After 6 years of observations, detailed morphological analyses and preliminary results of genetic analyses show that the taxon represents an independant and stable entity arised very probably from an old local hybridization event. It is described here and named *Dactylorhiza osiliensis.*

Résumé. *PIKNER, T. & DELFORGE, P.- Le Dactylorhiza de l'île de Saaremaa (Estonie)*, Dactylorhiza osiliensis *PIKNER sp. nova*. Des populations d'un *Dactylorhiza* non déterminable ont été découvertes dans des forêts marécageuses du littoral occidental de Saaremaa, la plus grande île d'Estonie. Après 6 années d'observations, des analyses morphologiques détaillées et les résultats préliminaires d'analyses génétiques montrent que ce taxon représente une entité indépendante et stable issue très probablement d'une ancienne hybridation locale. Il est décrit ici sous le nom de *Dactylorhiza osiliensis.*

Ülevaade. *PIKNER, T. & DELFORGE, P.- Saaremaa sõrmkäpp (Eesti)*, Dactylorhiza osiliensis *PIKNER sp. nova*. Määramata sõrmkäppade populatsioonid leiti 2000.a. Eesti suurima saare, Saaremaa läääneranniku vööndi metsastunud madalsoodest. 6 aasta jooksul toimunud vaatlused, detailsed morfoloogilised analüüsid ja esialgsed geneetilised uuringud näitavad, et takson esindab iseseisvat ja stabiilset üksust, mis on väga tõenäoliselt sündinud pikaajalise kohaliku hübridiseerumise protsessina. Seda liiki on kirjeldatud siin ja nimetatud *Dactylorhiza osiliensis.*

Key-Words: *Orchidaceae*; *Dactylorhiza*, *Dactylorhiza osiliensis* sp. nova.; flora of Estonia.

Introduction

Estonia, the northernmost and smallest Baltic state, 45,000 km², is lying between 57°30' and 59°30' N, at the latitude of Stockholm. The Estonian flora comprises about 35 orchid species (KUUSK 1996; SCHMEIDT 1996; KULL & TUULIK 2002; KUUSK et al. 2003; DELFORGE & KREUTZ 2005) of which more than 30 are growing on Saaremaa (2,671 km²), the largest island of the country (Fig. 1).

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As the two other large Estonian islands, Muhu and Hiiumaa, Saaremaa is a flat region (highest point: 58 m in the Viidumäe nature reserve) constituted of the same limestone which emerges on the other side of the Baltic sea where it builds the Swedish islands of Gotland and Öland. Despite of its northern location, Saaremaa has a mild sub-Atlantic climate, with a mean annual temperature reaching 6°C, owing to maritime influences (KUUSK 1996). The island belongs to the Baltic (or north-central European) floristic region (MEUSEL et al. 1965). Relatively few populated, Saaremaa still possesses many large forests (56% of the territory), numerous meadows, as well as various wetlands. This natural and semi-natural habitats have not been deeply touched by industrial agriculture or intensive forestry during the Soviet period.

In June 2003, during a botanical survey, a large population of an unidentified *Dactylorhiza* is found by the first author (TP). The site is located in clearings of a *Pinus sylvestris* fen wood crossed by a gravel road bordering the Vilsandi National Park, on the territory of Lümanda municipality (westernmost part of the island of Saaremaa, fig. 1). The taxon was considered as close to *Dactylorhiza praetermissa* by e.g. V. KUUSK (Estonia), M. REITALU (Estonia), and R. KNOL (The Netherlands), an opinion contested by T. TUULIK (Estonia) who thinks that the taxon of Saaremaa is different from the *D. 'praetermissa'* he has recently found in the neighbouring island of Hiiuma (TUULIK 1990; for a discussion of the latter taxon, which does not represent a species but a clonal evanescent hybrid swarm, see DELFORGE & KREUTZ 2005).

A lecture about the Dactylorchid of Saaremaa was given in Tallinn at the Estonian Orchid Society meeting on the 18th of November 2003. The taxon was compared with other morphologically more or less similar Estonian *Dactylorhiza*. It appeared that it probably did not belong to a species presently known in Estonia. A preliminary description of the taxon was published, with a short discussion (PIKNER 2004). It ended by a question: does that taxon represent an occasional hybrid or an undescribed species ?

During the meeting, the first author was informed that in July 2000, in the same area, a Finnish botanist, J. RÄSÄNEN, had also found about 100 plants of a critical marsh Dactylorchid. While RÄSÄNEN is not familiar with *Dactylorhiza,* he tentatively identified the plants also as *D. praetermissa* but that identification did not seem satisfactory to him. An identification as *D. ruthei*, another species of the *D. pratermissa* group which grows in one littoral locality of the Estonian mainland, seemed also unsatisfactory. The status of the Dactylorchid of Saaremaa remains unclear and RÄSÄNEN hoped that it could be clarified once by botanists more familiar with the genus *Dactylorhiza* (RÄSÄNEN 2002).

In 2004 and 2005, the area was intensively covered. Numerous scattered populations having a maximum total of about 3,000 flowering plants plus hundreds of vegetative individuals were found on about 2 km^2, lying at 0.5-2 km from the coast, alongside the southeastern limit of the Vilsandi National Park (UTM WGS84: 34VEK5562, 5662, 5663, sites 16, 19, and 20 in DELFORGE & KREUTZ 2005) (Fig. 1)

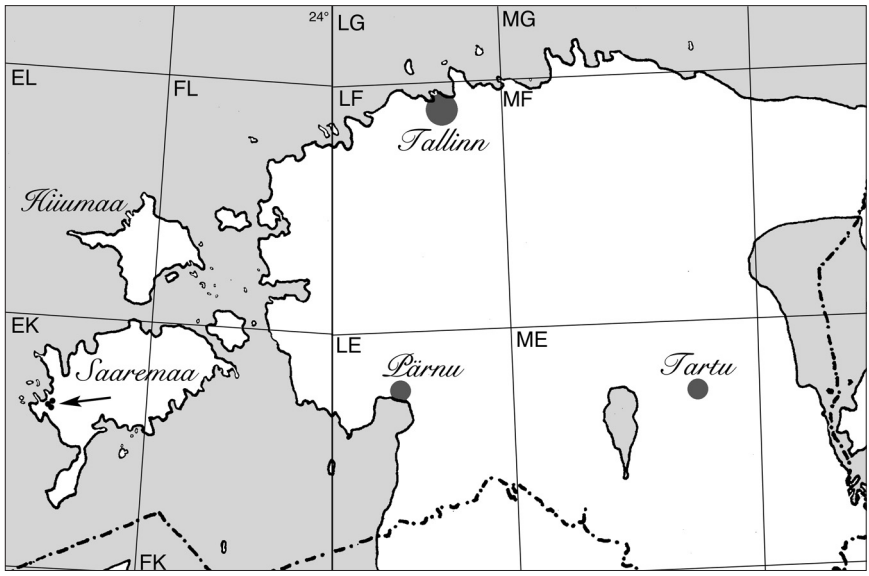

Fig. 1. Map of Estonia with localisation of the distribution of *Dactylorhiza osiliensis* in Saaremaa, indicated by an arrow.
(UTM grid 100 km × 100 km; zones 34V and 35V)

The Dactylorchid of Saaremaa

Description

Slender but vigorous plant, (40-) 50-70 (-91) [$\bar{x}$= 56.4 cm, n=16] cm tall; stem green, hollow, central hole not exceeding diameter of half stem; leaves 5-9; basal scale leave 1; foliage leaves 3-6, not reaching the inflorescence, not hooded, wider in the lower half, unspotted, yellowish green, lower side somewhat greyish green, oblong-lanceolate, 10-20 × 1.8-2.5 cm, the second the largest [$\bar{x}$= 15.7 cm], somewhat canaliculated to flat, obliquely erect, sometimes slightly curved; bract-like leaves 2-3; inflorescence dense to subdense, subovoid to cylindrical, 7-14 cm high [$\bar{x}$= 9.9 cm]; bracts lanceolate, green, exceeding flowers; lower bracts conspicuously much longer than uppermost, 35-50 mm long; flowers 20-50 [$\bar{x}$= 26.0], rather large, always purple-violet; lateral sepals narrowly ovate, 11-14 × 3-4 mm [$\bar{x}$= 12.4 × 3.5 mm], unspotted, horizontal to erect or turned up at an angle; dorsal sepal bending over the 8-9 × 3-4 mm [$\bar{x}$= 8.5 × 3.5 mm] petals, forming a rather elongated hood; labellum broader than longer, 10-12 × 12-15 mm [$\bar{x}$= 10.8 × 13.6 mm], broader in the upper half, obcordate, folded longitudinally, slightly 3-lobed, the base pale purple pink to whitish, with fine purple dashes; median lobe subacute, prominent, longer and much narrower than side lobes; side lobes flat to slightly curved forward; labellum shape index = 1.272; spur 10-11 × 3-4 mm [$\bar{x}$= 10.3 × 3.1 mm], pale purple, conical, subhorizontal, shorter than ovary: ovary 13-15 mm long (Pl. 7, p. 73).

Flowering

The Dactylorchid of Saaremaa flowers from the second half of June to the first half of July, somewhat after *Dactylorhiza incarnata*, at the same time as *D. ochroleuca*, somewhat before *D. fuchsii* var. *meyeri* and *D. curvifolia (= D. russowii)*, the latter being not strictly syntopic (for the nomenclature of the *Dactylorhiza* followed in the present paper, see DELFORGE & KREUTZ 2005).

Autecology

The Dactylorchid of Saaremaa grows in very wet conditions, preferentially in *Molinia* tufts of clearings and edges of *Pinus sylvestris* fen woods, permanently waterlogged, with a water table at, or slightly above the neutrocline substratum (pH = 6,4-6,7). In the wooded parts of the sites, *Pinus sylvestris* is dominating, accompanied by *Frangula alnus* and *Juniperus communis*. The edges are occupied by an oligotrophic humid grassland (*Molinion caeruleae*) with *Molinia caerulea* (dominating), *Carex hostiana, C. panicea, Sesleria caerulea, Calamagrostis stricta, Deschampsia cespitosa, Succisa pratensis, Potentilla erecta, Primula farinosa, Galium boreale…* In the wettest central parts of the clearings, there were streams and rich fen communities of the *Caricetum davallianae* with, notably, *Carex davalliana, C. flava, Eleocharis palustris, E. quinqueflora*. This communities are known to be endowed with specialized, strictly restricted species, and constitute refuges for many rare taxa in Europe (DEVILLERS 1986, DEVILLERS et al. 1991).

Most of the Dactylorchid of Saaremaa are growing in the opened and wettest places of the *Caricetum*, where they are strongly dominant, representing 95% of the *Dactylorhiza*. They are more scattered in the half shade of the woodlands edges. Some individuals have also been found close to the lime-rich basement of the gravel road, but they are noticeably smaller there. This could indicate that the Dactylorchid of Saaremaa is a specialized species, linked to narrow ecological exigences. In the clearings, it is strictly syntopic with few robust *D. incarnata* var. *incarnata*, *D. incarnata* var. *borealis,* and some very rare *D. incarnata* f. *ochrantha*, as well as *Epipactis palustris, Gymnadenia conopsea, Platanthera bifolia,* and *P. chlorantha*. Somewhat further, in more alkaline and open microhabitats, *Dactylorhiza ochroleuca* is present and, in apparently transitional mires, *D. fuchsii* with labellum shape transitional, but not identical, to *D. maculata*. This taxon is tentatively named *D. fuchsii* «cf. var. *meyeri*» in DELFORGE and KREUTZ (2005). *D. curvifolia* is also recorded from neighbouring zones. Some hybrids of the Dactylorchid of Saaremaa with respectively *D. incarnata* and *D. fuchsii* «cf. var. *meyeri*» have been noted.

Discussion

The Dactylorchid of Saaremaa is morphologically homogeneous. Its intra- and interpopulational variations denote that it constitutes a long-settled heterozygote taxon, and not a (very large) unstabilized hybrid swarm nor a clonal and evanescent hybridogeneous morph, as the so-called *D. 'praetermissa'* of Hiiumaa (DELFORGE & KREUTZ 2005). How is it possible that in such a large area,

numerous interconnected populations of a conspicuous marsh Dactylorchid have not attracted the attention before the year 2000? Many reasons can explain that situation. The determination of *Dactylorhiza* is sometimes very difficult, even for expert orchidologists, so that the taxon may have been wrongly identified as a current Estonian species such as *D. incarnata, D. baltica* or *D. curvifolia* by general botanists. On the other hand, the sites are low valuable lands that have not found any agricultural or forestry use neither during collective farms period nor nowadays, thus very few people have entered the area during the flowerings. Furthermore, during the Soviet period, Saaremaa, as the other islands and most Estonian littoral regions, was a prohibited military zone, particularly a strip of 3 km along the coasts. From 1940 to 1991, it was thus very difficult to undertake field research in the area so that Saaremaa remains poorly investigated from both botanical and zoological standpoints.

Most morphological characters, as e.g. general robustness, floral features, hollow stem with central hole not exceeding diameter of half stem, and insertion of the flowering between those of *D. incarnata* and *D. fuchsii,* indicate that the Dactylorchid of Saaremaa is probably member of the *D. pratermissa* species group. (see e.g. DELFORGE 1994, 1995A, B, 2001, 2002, 2005). It has been effectively identified with *D. praetermissa* at first approximation by the few botanists who have seen it in the field. Nevertheless, it is necessary to explain briefly why the Dactylorchid of Saaremaa does not belong to a *Dactylorhiza* species already reported from Estonia.

Diagnoses

1. *Dactylorhiza incarnata* species group. The Dactylorchid of Saaremaa differs obviously and notably from *D. ochroleuca* by much larger flowers of different colour, and by labellum ornamentation; from *D. incarnata* (all varieties and forms) and *D. cruenta* (if that species belongs to the Estonian flora, which is not yet clear, see DELFORGE & KREUTZ 2005), the Dactylorchid of Saaremaa differs notably by the same characters as well as by its strictly unspotted not hooded leaves.

2. *Dactylorhiza majalis* species group. The Dactylorchid of Saaremaa differs notably from *D. baltica* by flowers colour, labellum shape, labellum ornamentation less marked, without lines nor loops, narrower and always unspotted leaves, and ecological exigences, much more linked to very wet habitats.

3. *Dactylorhiza traunsteineri* species group. The Dactylorchid of Saaremaa differs notably from *D. curvifolia* by robuster habitus, many-flowered and denser inflorescence, constant flower colour, labellum shape and, in most cases, labellum ornamentation restricted to the labellum base, always unspotted and longer leaves obliquely erected and never strongly curved, as well as by different ecological exigences.

4. *Dactylorhiza praetermissa* species group. From the Estonian *D. ruthei* (if the taxon named *D. ruthei* in Estonia belongs effectively to the species described from the German and Polish island of Usedom, see RÜCKBRODT & RÜCKBRODT

1996; Baumann et al. 2005, Delforge & Kreutz 2005), the Dactylorchid of Saaremaa differs notably by taller habitus, many-flowered and longer inflorescence, darker flower colour, labellum shape, and ecological exigences, much more linked to very wet habitats.

As the Dactylorchid of Saaremaa seems to constitute a long-settled heterozygote and stable taxon, the comparison with occasional hybrids or unstabilized hybrid swarms already recorded from Estonia, notably those from Hiiumaa (Tuulik 1990), is irrelevant. We must now compare the Dactylorchid of Saaremaa to *Dactylorhiza praetermissa* itself, which is not a species present in Estonia (see Delforge & Kreutz 2005).

Dactylorhiza praetermissa

Origin, distribution, variation

D. praetermissa is a 'young' hybridogeneous allotetraploid species having *D. incarnata* and *D. fuchsii* as parent species (e.g. Heslop-Harrison 1953; Summerhayes 1968, Devillers-Terschuren & Devillers 1986; Hedrén 1996a, b; Devos et al. 2003; Foley & Clarke 2005). It has an Atlantic and sub-Atlantic medio-European distribution, with Belgium as center (see e.g. Baumann & Künkele 1982; Tyteca & Gathoye 1993). Till now, it is not known from the Baltic area (e.g. Buttler 1986, 1991; Tyteca & Gathoye 1993; Delforge 1994, 1995a, b, 2001, 2002, 2005; Hedrén 1996a; Kreutz 1999; Kreutz & Dekker 2000; Baumann et al. 2005; Foley & Clarke 2005). Nordhagen (1972) has reported *D. pratermissa* from western Norway, but these populations have been identified later as *D. purpurella* by Wischmann (1989), which is certainly more consistent from both morphological and biogeographical standpoints (Tyteca & Gathoye 1993).

The intra- and interpopulational, and even intraclonal variation of *D. praetermissa* is important (e.g. Summerhayes 1951, 1968; Vermeulen 1958; Vanhecke 1990; Tyteca & Gathoye 1990, 1999; Roberdeau et al. 1998), but the species constitutes «a clearly separable, moderately homogeneous entity, when compared to other taxa in the group and the genus» (Tyteca & Gathoye 1993). Nevertheless, some populations tend morphologically toward closely-related species, e.g. *D. elata*, *D. sphagnicola* or *D. purpurella,* allotetraploids which share a similar origin. As *D. praetermissa,* these last ones have apparently also evolved from separated hybridization events between members of the *D. incarnata* and *D. fuchsii* groups (Tyteca & Gathoye 1993; Hedrén 1996b, 2003; Hedrén et al. 2001; Bateman et al. 2003; Pedersen 2004; Foley & Clarke 2005). Due to similar crossings resulting in similar overall morphology, some unstabilizated hybrid swarms or clonal micropopulations of *D. incarnata* (or *D. majalis*) × *D. fuchsii* have been sometimes identified as *D. praetermissa* outside its distribution area, identifications which seem erroneous (Charpin & Jordan 1990; Tyteca et al. 1991, Diemer 1992; Tyteca 1993; André et al. 1998; Roberdeau et al. 1998; Vollmar & Wenker 2001 and, for Estonia, Tuulik 1990; Delforge & Kreutz 2005).

Diagnosis

Morphology

Even if the separation of *D. praetermissa* from *D. praetermissa*-like taxa or hybrids seems sometimes difficult on the basis of morphological patterns, we have observed some noticeable morphological differences between *D. praetermissa* and the Dactylorchid of Saaremaa. They are summarized in table 1. In our comparison, we have taken into account *D. praetermissa* var. *praetermissa* and var. *integrata*. As *D. praetermissa* var. *junialis* has always spotted leaves and strongly marked labellum, reminiscent of *D. fuchsii*, its integration in the comparison is not necessary.

From the elements retained table 1, it appears clearly that the Dactylorchid of Saaremaa is, on average, slender and taller than *Dactylorhiza praetermissa*, having narrower leaves (ratio length/width 7.5 and 4.5 respectively) that are broader under the middle and not around the middle, as in the latter. Its lower bracts are much longer. The inflorescence lengths are roughly similar in both taxa, but the ratio 'number of flowers/inflorescence length' differs strongly (2.616 and 4.668 respectively), which denotes that the Dactylorchid of Saaremaa has a laxer inflorescence made up of larger flowers; for that point, its ratio is comparable to that of *D. elata*.

The larger size of flowers of the Dactylorchid of Saaremaa is obviously indicated by measures of the labellum length and width, that exceed by about 30% those of *Dactylorhiza praetermissa* (Fig. 2). The spur is also somewhat longer on average and is straight and more or less horizontal whereas curved downwards in *D. praetermissa*. Furthermore, the shape of the labellum is quite different, broader toward the top while broader at middle in *D. praetermissa* (Bateman & Denholm 1983; Tyteca & Gathoye 1993, 1999; Fig. 2).

The colour of the flowers of the Dactylorchid of Saaremaa is rather homogeneous, deep purple-violet (Pl. 7, p. 73) whereas in *Dactylorhiza praetermissa* it is usually rather pale purple or pale magenta (e.g. Bateman & Denholm 1983; Buttler 1986, 1991; Tyteca & Gathoye 1993; Kreutz 1999), darker and redder colours are rather rare, appearing more frequently in *D. praetermissa* var. *integrata* and var. *junialis* (e.g. Delforge 1994, 1995a, b:168; 2001, 2002: 201; 2005: 217; Dusak & Pernot 2002: 105). Deep purple flower colour is exceptional in *D. praetermissa* and probably indicator of hybridization.

Illustrations showing usual coloration of flowers of *D. praetermissa* var. *praetermissa* are published here (Pl. 6, p. 72) and e.g. by Summerhayes (1968: pl. 44, England), Nelson (1976: Taf. 24, France and Germany), Landwehr (1977, 1982: 199, The Netherlands), Sundermann (1981, Germany), Klopfenstein & Toussaint (1983, France), Delforge and Tyteca (1984 a, b, c, d: 40, France), Lang (1989: pl. 44, England; 2004: 119), Bournérias (1998: 177, France), Ettlinger (1998: 118, England); Roberdeau et al. (1998: 225: France); Presser (2000: 123b-c, Germany), Almers et al. (2001: 159, Germany), Baumann et al. (2005: 326, Germany), Foley & Clarke (2005: 239-242).

Plate 6. *Dactylorhiza praetermissa*. **Top**: The plants robustness and the rather broad leaves are obvious; **left**: quite dark-colored flowers (The Netherlands, Holland, dune slack, 9.VI.2001); **right**: rather rare somewhat reddish-colored flowers (Belgium, Hainaut, sandy soil formed in recently dredged material, 29.VI.1991). **Bottom**: flowers pale-colored, labellum broader around the middle; center broadly withish, strongly marked. **left**: The Netherlands, Holland, 9.VI.2001; **right**: France, Aisne, 18.VI.1980.

(photos P. DELFORGE)

Plate 7. *Dactylorhiza osilienis* (Estonia, Saaremaa, Lümanda 27.VI.2005).
Top: The plants slenderness and the narrow leaves are obvious. **Bottom**: flowers deep-colored, labellum broader in the upper half; base narrowly withish; ponctuation restricted to the labellum base; side lobes veined; spur straight.

(photos P. DELFORGE)

Table 1. Compared characteristics of *Dactylorhiza osiliensis* and *D. praetermissa* * (all measurement in mm; bold-faced types indicate the main discriminant characters)

	D. osiliensis (n=16)	*D. praetermissa* (n=171)
Plant hight	(400-) 500-700 (-910)	200-650 (-900)
— average	**564.38**	466.51
2[d] leaves length	145-200	120-210
— — average	156.56	169.07
— width	**18-25**	18-40 (-45)
— — average	20.75	23.89
— length/width	**7.545**	4.553
— largest width	**under the middle**	around the middle
— spotted	**never**	sometimes
Inflorescence length	7-14	5-15
— — average	9.938	8.916
Nb. Flowers/ inflorescence length	**2.616**	4.668
Lowermost bract length (average)	**37.875**	25.099
Labellum length	**9.7-12.3**	(6-) 7-10
— — average	**10.83**	8.38
— width	12-15	7.5-14
— — average	**13.56**	11.01
— length/width	0.797	0.779
— largest width	**toward the top**	around the middle
— colour	**deep purple-violet**	mainly pale pink, pale magenta sometimes red pink, rarely dark;
	pale near the base only	pale around median axis
— ornamentation	fine punctuation, around median axis mainly **only in the basal half**; **rarely** short lines and loops	fine punctuation, ± around median axis almost to the top; frequently short lines and loops
Spur length	9.5-11	(5-) 7.5-11 (-12.5)
— — average	10.313	9.893
— position	**straight, horizontal**	curved backward

* for *D. praetermissa* var. *praetermissa* and var. *integrata* from northern France, Belgium, The Netherlands, after Reinhard 1990; Gathoye & Tyteca 1987; Tyteca & Gathoye 1990, 1993, 1998, 1999; Delforge 2005 and Delforge pers. obs.

The ornamentation of the labellum is also different. In the Dactylorchid of Saaremaa, only the base on the labellum is paler and the markings (dots and thin dashes, rarely short lines or loops) are concentrated around the median axis of the basal half (Fig. 2 & pl. 7) whereas in *Dactylorhiza praetermissa* the whole central part of the labellum is paler and the markings (thin dashes, rather frequently lines and loops) are scattered over the whole central part, frequently reaching the central and side lobes (Fig. 2 & pl. 7 and e.g. Summerhayes 1968: pl.19; Mossberg & Nilsson 1987: 117; Kreutz 2001: 48 as well as most of the aforementionned references).

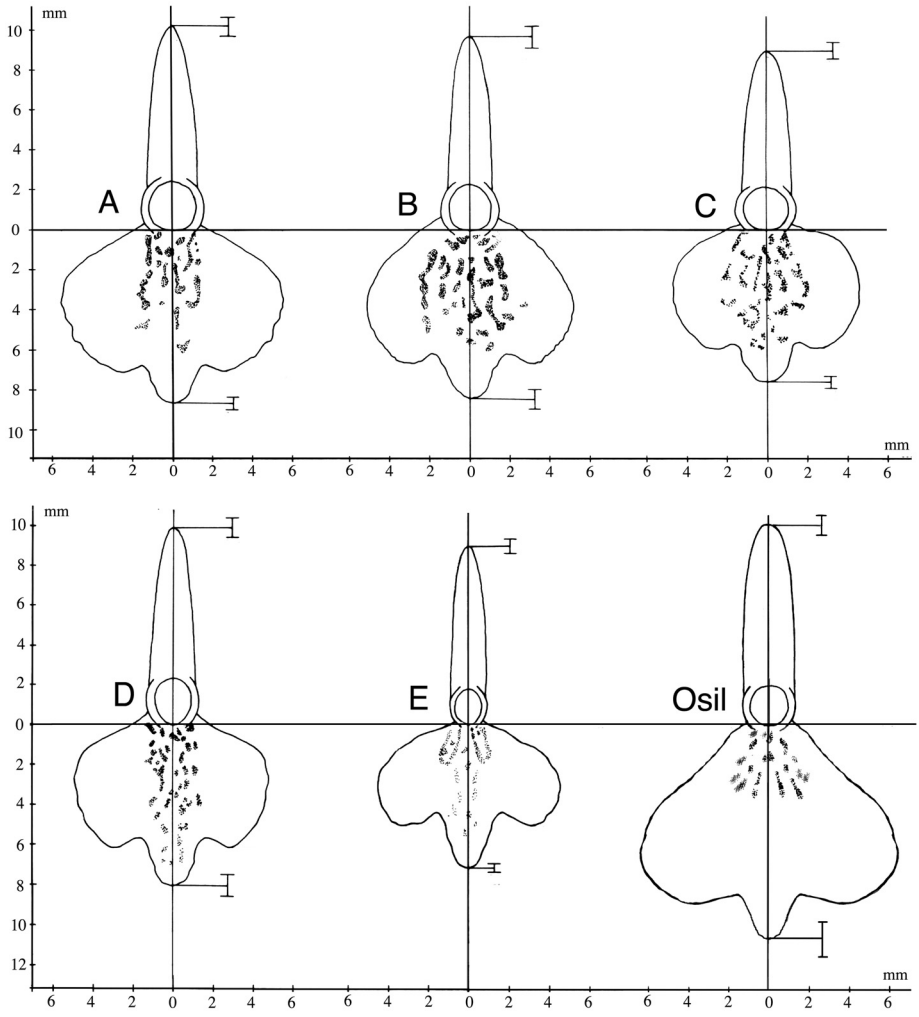

Fig. 2. Lip and spur drawings representing a sample of *Dactylorhiza osiliensis* (Osil) and 5 samples of *D. praetermissa* from Belgium (A), northern France (B-C), and The Netherlands (D-E). The 95% confidence intervals are indicated for the labellum and spur lengths

(A-E after TYTECA & GATHOYE 1990, 1993, modified)

The relatively dark flowers colour of the Dactylorchid of Saaremaa and the configuration of the labellum markings indicate perhaps that, beside *Dactylorhiza fuchsii* and *D. incarnata*, *D. curvifolia* is involved in its genesis.

Ecology

Dactylorhiza praetermissa is reported from a quite broad range of habitats: rather dry, moderately damp or marshy basicline to neutrocline meadows, neutrocline marshes, alkaline oligotrophic to strongly eutrophic fens, alkaline dune

slaks, rarely semi-dry to dry calcareous grasslands (e.g. Bateman & Denholm 1983; Tyteca & Gathoye 1993; Bournérias 1998; Devillers & Devillers-Terschuren 1998; Kreutz & Dekker 2000; Kreutz 2001; Foley & Clarke 2005; PD pers. obs.); it is sometimes documented from artificial habitats, as e.g. willow wood on sandy soil formed in recently dredged material (e.g. Petit 1980, 1981; Terschuren & Devillers 1981; Adcock et al. 1983; Gangloff 1983; Gathoye & Tyteca 1987; Coulon 1989, 1990, 1999; Voet 1991; Tyteca & Gathoye 1993; Delforge 1994, 1995a, b: 131-132; 2001, 2002: 161; Ettlinger 1997; Foley & Clarke 2005). On the contrary, the Dactylorchid of Saaremaa grows almost exclusively in the wettest parts of neutrocline rich fen communities of the *Caricetum davallianae*. The few plants observed in more calcareous and dry places (embankment of the gravel road) are obviously smaller and seem badly developed. From ecological standpoint, it seems narrowly specialized.

Genetics

Samples of the Dactylorchid of Saaremaa have been collected in June 2004 and sent to M. Hedrén (Lund University, Sweden) for analyses of plastid dna. Preliminary results show that the Dactylorchid of Saaremaa is «clearly different» from samples of *D. praetermissa* from The Netherlands (Hedrén 2005 in litt. TP) indicating that the Estonian taxon have a regional origin different to *D. praetermissa* from The Netherlands (Hedrén et al. 2001).

Conclusion

As some other allotetraploid species (e.g. *D. sphagnicola*, *D. elata*…), the Dactylorchid of Saaremaa is morphologically rather close to *D. praetermissa* but also well differentiated by morphology (Table 1) and it is adapted to a specific habitat. It is also very isolated biogeographically, separated by about 1,000 km from the known distribution area of *D. praetermissa*; it is growing in the eastern Baltic zone while *D. praetermissa* seems to be a strictly Atlantic species. Furthermore, the Dactylorchid of Saaremaa does not possess the same genetic material as Dutch or British *D. praetermissa* (Hedrén in litt. TP) and *D. curvifolia* could be involved in its origin, which is not the case for *D. praetermissa*. That means that the Dactylorchid of Saaremaa contains an unique combination of morphological and genetical characters, arising very probably from a local hybridation event. It may be viewed as an evolutionary unit evolving relatively independently (Hedrén et al. 2001: 1880), which is a species in accordance at least with both biological and evolutionary species concepts (e.g. Coyne & Orr 2004). On the other hand, it seems that allotetraploids evolve only in rare occasion from the parental group (Hedrén et al. 2001: 1868). Therefore, the Dactylorchid of Saaremaa represents a local original entity that deserves effective conservation mesures on equal terms with diploid ancestral or tetraploid species with large distribution (Hedrén et al. 2001: 1868, 1880). For all these reasons, it seems necessary to give a formal taxonomic rank to the Dactylorchid of Saaremaa which does not belong to an already described taxon. We propose to name it:

Dactylorhiza osiliensis T. PIKNER **sp. nova**

Descriptio: Herba ad Dactylorizae praetermissae gregem pertinens. *Herba* procera, 60 cm alta. *Caulis* fistulosus. *Folia* 7, flavovirentia, sine maculis, anguste lanceolata, latiora in inferiora dimidia, suberecta patentiaque, non cucullata, inflorescentiae basin non adtingentia; folium basale breve; folium secundum, 150 × 19 mm; folium tertium maximum, 165 × 21 mm; folia superiora bracteiformia 2. *Inflorescentia* satis densa, 80 mm longa. *Bracteae* foliaceae, viridiae, inferiores longe floribus superantes; bractea inferiora 36 × 5 mm, omnino viridis. *Flores* 34 satis magni, ianthini. *Sepala* lateralia anguste ovala, 12 × 4 mm, sine maculis. *Labellum* obcordatum, trilobatum, circum jugulum pallidum, cum punctis ianthinis, lobo mediano laterales paulum excedente, lobis lateralis omnino ianthinis, patentibus, marginibus recurvatis. *Calcar* conicum, subhorizontale, 10 mm longum. *Ovarium* 13 mm longum. Floret a medio Junii ad medium Julii in paludibus Osiliae.

Holotypus (hic designatus): Estonia, insula Osilia (Saaremaa), Lümanda (UTM: 34V EK5562), alt. s.m. 10 m, 25.VI.2003. Leg. T. PIKNER. In herb. Instituti Zoologici et Botanici Tartuensis (TAA) sub n° 10143 conservatur.

Syntypi (hic designati): leg. T. PIKNER. In herb. Instituti Zoologici et Botanici Tartuensis (TAA) sub n° 10142 et 10144.

Icones: fig 3 et pl. 7 p. 73 in hoc op.; RÄSÄNEN 2002: 73, figs 14 et 15 sub nom. «*An orchid, which we haven't been able to determine*».

Etymology: *osiliensis, is, e*: from the island of Saaremaa (Estonia), named *Osilia* in Latin.

Fig. 3. Holotype of *Dactylorhiza osiliensis*

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