

VARIETIES AND FORMS OF DUTCH ORCHIDS

by

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Here follow a number of new varieties and forms of Dutch orchids, found in Holland, which will be included in the „Flora Neerlandica”. Some of these varieties comprise a number of characteristics simultaneously, others are strictly confined to striking differences of one organ only.

Some florists may think these nominations superfluous, but in my opinion this method is the only way to get out of the deadlock to which the numerous overlapping varieties have led us. Now that the type-method has been accepted as the only right manner, it would seem to me, that it is necessary to distinguish the differences of one particular organ in order to get a survey of the abundance of forms of a certain strongly-varying species. Not until this survey has been obtained will it be possible to draw up great and real varieties which possess a high systematical value within a certain area. Indeed, the contributors to the „Flora Neerlandica” had been advised to distinguish „slight” varieties and to coordinate these varieties, not to subordinate them (. . . to give to each specimen as many independent names as the variety-distinctions that have been made . . . in: Eenige aanwijzingen etc. bestemd voor de medewerkers). How troublesome the lack of such a survey may be with much varying species with a plastic genome is proved by the varieties *O. incarnata* L. var. *macrophylla* Schur [Enumer. Plant. Transsilv. (1866) p. 64], var. *latissima* Zapal. [Consp. Fl. Galic. Crit. (1906) p. 207], var. *subfoliosus* Schulze [A. u. Gr. Syn. III (1907) p. 718], var. *intermedia* Sergievskaja [in Animadvers. syst. ex Herb. Univ. Tomsk. (1929) no. 1] en var. *Gemmana* Pugsl. sub *O. latifolia* [in Linn. Soc. Journ.-Bot. (1935) p. 578], which are completely or partially overlapping, because the authors took little or no account of earlier works and because the varieties cannot be recorded according to the number of characteristics and the organs in which they differ. Not until this is realised — I hope to give such a specimen-page shortly — do I deem a rational drafting of subspecies, varieties and forms possible.

Dactylorchis incarnata (L.) Vermeulen.

Dactylorchis incarnata (L.) Vermln. in Studies on Dactylorchids, 1947, p. 65 = *Orchis incarnata* Linnaeus, 1755 = *O. latifolia* Pugsley non Linnaeus, 1935 = *O. strictifolia* Opiz, 1825 etc.

In the Netherlands I have seen the following varieties:

a. var. *latissima* (Zapalowicz) Vermln. comb. nov. = *Orchis inc.* var. *latissima* Zapal. in Consp. Florae Galic. crit. Vol. I, 1906, p. 207. Planta robustior quam in typo; 30-50 cm super tuber; foliis 5-7 erectis vel plus minus abstantibus, latioribus quam in typo; latissimo folio 2,3-3,5 cm in latitudinem (siccato \pm 20 % angustiore); spica ad 10 cm longa; cet. ut in typo.

Plant more robust than in the type, height 30-50 cm above the tuber; leaves 5-7 erect or somewhat spreading, broader than with the type; the broadest leaf fresh usually 2,3-3,5 cm broad (pressed about 20 % narrower); spike to 10 cm; for the rest like the type.

Type: In Cracow? Lectotype in herb. P. Vermeulen, Revisio Dactylorchidum no. 0387.

Exsicc.: Herb. P.V. Rev. Dact. no. 0117, Uitgeest; id. no. 0132 Baarn; id. no. 0379 Broek in Waterland; id. no. 0199 Rudley marsh (England); id. no. 0125, near Bordeaux (France); id. no. 0159 Ullerslev, Fyen (Denmark); id. no. 0116 sub. var. *intermedia* Sergievskaja (det. id. from Animadvers. syst. ex Herb. Univ. Tomsk, 1929 no. 1) etc.

This var. is synonymous for the greater part with *O. latifolia* var. *Gemmana* Pugsley, as I concluded from the determinations by Mr PUGSLEY in the Herb. Hauniense (Copenhagen) and partly also with *O. inc.* var. *intermedia* Sergievskaja l.c.

It is very difficult to decide if the robust habit is not a modification due to favourable circumstances; in several cases this indeed will be the case as I concluded from my own cultures but not in all, I think, and since the cultivation of the species *D. incarnata* always gives great difficulties it seems to be the best to maintain this var. as such.

β . var. *sublatifolia* (Asch. & Gr.) Vermln. comb. nov. = *O. inc.* *sublatifoliae* Rchb. fil. sub cohorte in Icones Vol. XIII/XIV, 1851, p. 51 p.p. = *O. inc.* *B. sublatifolius* Rchb. fil. ex Asch. und Gr. III, 1907, p. 720 (on this page line 14 from bottom read "*nicht*" for "*meist*"). Planta brevior quam in typo, sed robustior; caule plerumque tenui; foliis patentibus, brevioribus, flaccidioribus; latissimo folio plerumque 2,3-3,5 cm in latitudinem (siccato \pm 20 % angustiore), 3-4 \times longiore quam latiore. cet. ut in typo.

Plant more robust than the type but shorter stem mostly thin; leaves rather short, more spreading and more flaccid; the broadest

leaf mostly 2,3-3,5 cm wide (pressed about 20 % narrower) and its length 3-4 × its width; for the rest like the type.

Type: In herb. Rchb. fil.? Lectotype herb. P.V. Rev. Dact. no. 0123 Blokzijl.

Exsicc.: Herb. P.V. no. 0126 Zevenbergse Hoek etc.

Through the short and broad leaves this var. remembers somewhat *D. majalis* and indeed the hybrid *D. incarnata* × *majalis* also has the leaves shorter than *D. incarnata* but the var. *sublatifolia* has the flowers like those of *D. incarnata* (small!), much smaller than *D. majalis* and also smaller than the intermediair hybrid; moreover the hybrid has 60 chromosome in the roottips whereas the var. *sublatifolia* has 40! The var. as described by ASCHERSON & GRAEBNER encloses only a small part of the cohorte (not the var.!) *Sublatifoliae* of REICHENBACH; the plants depicted by this author on his tab. 47 are therefore not enclosed in this var.

γ. var. *Lobeli* Vermeulen nov. var. Planta brevis sed robustissima, plerumque non altior quam 20 cm super tuber; foliis plerumque valde a caule abstantibus et densatis; latissimo folio plus quam 3 cm in latitudinem (siccato ± 20 % angustiore); spica lata et densa, ad 10 cm longa, quod est dimidia pars totius super tuber altitudinis; bracteis infimis maximis; floribus maioribus quam in typo.

Short but very robust plant, usually not higher than 20 cm above the tuber; leaves mostly strongly spreading and close together, the widest fresh more than 3 cm in breadth (about 20 % narrower when pressed). Spike broad, dense, to 10 cm long and about half of the height above the tuber, with very large lower bracts; flowers larger than with the type.

Type: Herb. P.V. Rev. Dact. no. 0164, Terschelling, leg. Gorter.

Exsicc.: Herb. P.V. Rev. Dact. no. 0164 Terschelling; id. no. 0384 Rockanje.

Icones: LOBEL: Plantarum seu Stirpium Historia (1576) sub *Serapias palustris latifolia* (lower part of the figure not true to nature; see my work Studies on Dactylorchids p. 73/75). Dodonaeus: Pemptades (1583) sub *Satyrium Basilicum foliosum*.

δ. var. *vulgaris* Vermeulen nov. var. Planta 15-30 cm alta super tuber; foliis 4 aut pluribus, latissimo folio maxime 2,3 cm in latitudinem (siccato ± 20 % angustiore), plus quam 4 × longiore quam latiore; foliis erectis, sed tamen plerumque a caule magis abstantibus et paulo brevioribus quam in typo.

Plant 15-30 cm in height above the tuber, with 4 or more leaves, the broadest to 2,3 cm wide (about 20 % narrower when pressed) and more than four times longer than broad; leaves erect, but mostly more spreading than those of the type and also shorter.

Type: Herb. P.V. Rev. Dact. no. 0131 Vlieland.

Exsicc.: Herb. P.V. Rev. Dact. no. 0166 & 0167 Terschelling; id. no. 0165 Suffness marshes, Scotland; id. no. 0172 Dunlavin, Co. Wicklow, Ireland; id. no. 0169 & 0170 Brønderslev, Jutland, Denmark; id. no. 0171, 0173, 0176 meadows in Sealand, Denmark.

Icon: GODFERY: Mon. and Icon. of Nat. Brit. Orchidac. 1933, plate 43.

ε. var. *dunensis* (Druce) Vermln. comb. nov. = *O. inc.* var. *dunensis* Druce in Bot. Soc. & Exch. Club of the Brit. Isles, Rep. for 1915 (1916), p. 212. Planta nana 5-10 cm super tuber; spica laxa, ± 3 cm in longitudinem; foliis paulum reflexis, sursum versus paulatim angustioribus; floribus roseis.

Plant small, 5-10 cm above the tuber, spike 3 cm, loose; flowers bright rose-red, leaves more recurved, somewhat attenuated from a broad base.

Type: Herb. Druce, Oxford, original sheet with four specimens of which no. 1 is the lectotype (leg. R. & M. Corstorphine).

Exsicc. Herb. P.V. Rev. Dact. no. 0187 & 0188, Brønderslev, Denmark; id. no. 1946 Rockanje.

In KELLER und SCHLECHTER: Mon. und Icon. Vol. IV, Heft 21/22 (1938), Tafel 363, fig. 8 & 9 plants are depicted sub *O. inc.* f. *dunensis* Druce, but the spikes which are reproduced are not typical at all, being too long.

The habitats of this form are cups in sandhills and dunes and perhaps the form is only a modification due to the poor soil (see STEPHENSON in The Journ. of Bot. vol. LXI, 1923, p. 275); I saw such plants from Scotland, England, the Netherlands e.g. Rockanje.

ζ var. *brachyphylla* Vermeulen nov. var. Planta foliis brevioribus quam in typo; foliis lanceolatis; longissimi folii lamina maxime 2/5 altitudinis plantae super tuber.

Plants with shorter leaves than the type, lamina-length of longest leaf contained at least $2\frac{1}{2} \times$ in the height above the tuber.

Type: Herb. P.V. Rev. Dact. no. 0127 Uitgeest.

Exsicc.: Herb. P.V. Rev. Dact. Broek in Waterland.

Icones: NELSON and FISCHER: Die Orchideen Deutschlands etc. 1931, plate 5, no. 11 sub *Orchis incarnata* L.; REICHENBACH Icones Vol. XIII/XIV, tab. 47 or CCCXCIX sub *O. incarnata* L. I *acroglossa* and II *trifurca*.

η. var. *remota* Vermeulen nov. var. Planta foliis vaginatis tantum duobus aut tribus, evidenter inter se remotis; infimo (i.e. tertio) folio valde debili; vaginarum aperitionibus ad 7 cm inter se distantibus.

Plant with two or three (in the last case the lowest a transition leaf) complete leaves, distinctly separated (distance between the two sheath-openings to 7 cm).

Type: Herb. P.V. Rev. Dact. no. 0134 Zevenbergse Hoek.

Exsicc.: Several plants out of the Scandinavian herbaria (Uppsala, Stockholm and Lund) belong to this var.

θ. var. divaricata (Richard) Vermln. comb. nov. = *O. latifolia* β *O. (angustifolia)* Loisel. = *O. divaricata* Rich. ined. in Loisel. Deslongchamps: Flora Gallica, pars sec. 1807, p. 606; *O. divaricata* Rich. ex Loisel Desl. in F. V. Mérat: Nouv. Fl. des Env. de Paris (1812), p. 345. Planta foliis lineari-lanceolatis; latissimis foliis maxime 1,5 cm in latitudinem (siccatis ± 20 % angustioribus); sub media parte foliis latioribus, sursum versus paulatim angustioribus; tubere plerumque divaricato.

Plant with linear-lanceolate leaves, the broadest narrower than 1,5 cm (about 20 % narrower when pressed), tapering from greatest breadth near the base up to the top; tuber mostly divaricate.

Type: Herb. du Mus. Nation. d'Hist. Natur. at Paris (type of Richard with diagnosis in his own handwriting).

Exsicc.: Herb. P.V. Rev. Dact. no. 0154 Giethoorn; id. no. 0153 Tyrol.

ι. var. extensa (Hartman) Vermln. comb. nov. = *O. angustifolia* Krocker var. *extensa* Hartman in Handb. Scand. Fl. ed. 4, 1843, p. 281 = *O. inc.* var. *extensa* (Hartm.) Rchb. fil. in Icones Vol. XIII/XIV (1851), tab. 46, II. Planta elata gracilis; foliis longis, plerumque angustis, saepissime angustioribus quam 1,5 cm (siccatae ± 20 % sunt angustiores); latitudine magna ex parte consimili; bracteis longioribus quam sunt flores.

Plant slender with long mostly rather narrow leaves, usually narrower than 1,5 cm (still ± 20 % narrower when pressed), over a large part with the same width; bracts longer than the flowers.

Type: Herb. Mus. Palat. Vindob. from Rchb. fil. Herb. Orch. no. 27835, Gottland, Vänge Myr. 3 Juli 1842.

Exsicc.: Herb. P.V. Rev. Dact. no. 0128 Zevenbergse Hoek; id. Botshol.

Icon: Rchb. Icones Vol. XIII/XIV (1851), tab. 46, fig. II.

κ. var. haematodes (M. Schulze) Vermln. comb. nov. = *O. inc.* var. *haematodes* M. Schulze in Asch. & Gr. III (1907), p. 717. Foliis in superiore superficie dense coopertis parvis obscurisque maculis, nonnumquam adeo parvulis, ut videantur punctula; quae maculae ita evanescent, ut in florescenti plantae statu haud facile plerumque discernantur.

Upper surface of the leaves densely spotted with small dark spots, sometimes small dots. These spots becoming quickly hazy are during the flowering time difficult to see.

Type: Herb. München from Gottenheimer Ried am Kaiserstuhl; Rev. Dact. 0701-0703.

Exsicc.: Herb. P.V. Rev. Dact. 0382, Tolfforsbäcken near Gävle, Sweden.

The colour of the leaves is somewhat darker in the pressed plants than the colour of the unspotted plants in the herbarium. In the Netherlands I observed this var. in the neighbourhood of Ossenzijl (Ov.). See also Stud. on Dactylorchids p. 117.

i. fa. *punctata* Vermln. nov. fa. (Stud. on Dact. p. 124 nomen nudum). Punctis solum in apicibus infimorum foliorum, non super totam superficiem.

Leaves with dots only on the tips of the lower leaves, not all over the surface.

Type: Herb. P.V. Rev. Dact. no. 0138 Wolvega.

Exsicc.: Herb. P.V. Rev. Dact. no. 0139 Wolvega; id. from Sweden.

Perhaps the difference in form and density of the spots on the leaves is caused by multiple alleles. If the leaves are young and fresh the dots are easy to see, but on older leaves the dots become to be hazy and at the end the leaves seem to be unspotted.

λ. var. *angustispicata* Vermln. nov. var. Planta cum spica angustissima (siccata \pm 1,5 cm lata), bracteis et floribus erectis.

Plant with very narrow spike, \pm 1,5 cm broad when pressed, owing to the bracts and flowers being erect.

Type: Herb. P.V. Rev. Dact. no. 0136 Zevenbergse Hoek.

Exsicc.: Herb. P.V. no. 0176 id; also from Roumania (Transylvania).

μ. var. *longebracteata* Vermln. nov. var. Bracteis longissimis, inferioribus bracteis trium fere florum longitudine, superioribus bracteis unius fere floris longitudine vel paulo longioribus.

Bracts very long, the lowest about three times as long as the flowers, the topmost about as long as the flowers or a little longer.

Type: Herb. P.V. Rev. Dact. no. 0117 Uitgeest.

This is a var. which occurs in nearly all the species of the genus *Dactylorchis*. Plants growing in luxuriant circumstances always show the tendency to have long bracts, but in normal conditions some plants have the bracts extremely long.

v. var. *rhombelabia* (Asch. et Gr.) Vermln. comb. nov. = *O. inc. rhombelabius* Asch. et Gr. Syn. III (1907) p. 717 = *O. inc. a brevicarata* aa *rhombelabia acroglossa* Rchb. fil. Ic. Vol. XIII/XIV (1851), p. 53. Labello rhombeiformi, saepius paene indiviso aut vix trilobato.

Lip lozengeshaped, often nearly divided or faintly trilobed.

Exsicc.: Herb. P.V. Rev. Dact. no. 0386, 0383, 0385 Broek in Waterland.

Icon: Rchb. fil. Ic. l.c. tab. 47, fig. 2.

Pure diamondshaped lips are very rarely found; the forma typica has the lips indistinctly threelobed with a small midlobe as have the lips of the type-specimen in Linnaeus's herbarium.

ξ. var. *triangularis* Vermln. var. nov. Labello obtriangulato, medio lobulo triangulato basi horizontali affixo.

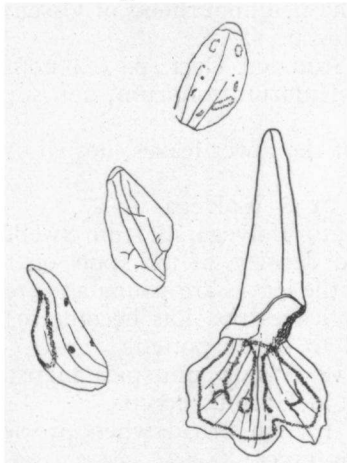


Fig. 1. *Dactylorchis incarnata*
fa. *multiangulata* Vermln. Wol-
vega. $\pm \times 3$.

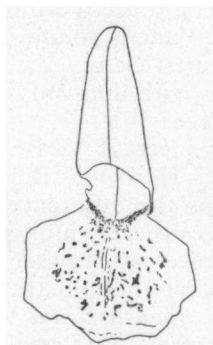


Fig. 2. *Dactylorchis incarnata*
var. *non-circumscripta* Vermln.
Baarn. $\pm \times 3$.

Mainform of the lip obtriangular with a triangular midlobe on the straight base.

Type: Herb. P.V. 1945, no. 24 Broek in Waterland.

Icones nostrae: fig. 3.

I saw this var. only in Waterland in the province Noord-Holland.

2. fa. *multiangulata* Vermln. fa. nov. Labello cuneato a basi, multiangulato, cum parvo lobulo medio; forma quinquangulata perspicua in inferioribus labellis, ambigua in superioribus.

Lip wedge shaped at the base, polygonal in outline with small attached midlobe. The pentagonal shape of the lower lips is especially distinct, higher up it is less clear.

Type: Herb. P.V. Rev. Dact. no. 0139 Wolvega.

Icones nostrae: Fig. 1.

o. var. *brevicalcarata* (Rchb. fil. em. M. Schulze) Vermln. comb. nov. = *O. inc.* 3. *brevicalcarata* Rchb. fil. emend. M. Schulze. Non *O. inc.* a *brevicalcarata* Rchb. fil. (ovario brevior). Calcarum cylindricum, amplo, recto, eadem fere longitudine qua ovarii pars dimidia.

Spur cylindrical, wide, straight, nearly as long as half the ovary.
Exsicc.: Herb. P. V. Rev. Dact. no. 0164.

REICHENBACH fil. described the type of *O. inc.* with a long spur (l.c. p. 51): "Calcar cylindraceum, obtusum, aequale, ovarium subaequans", and the var. *brevicalcarata*: "Calcare cylindraceo amplo recto ovario brevior". MAX SCHULZE, however, described the type (19, p. 2): "Sporn stets kürzer als der Fruchtknoten" and therefore his *brevicalcarata* l.c. p. 6: "Sporn zumeist sehr weit, gerade oder fast gerade, kürzer, oft kaum halb so lang als der Fruchtknoten".

If we met with large plants we often see the lower flowers with proportionally short spurs for the flowers don't enlarge in the same ratio as the rest of the plant does; the spurs are much shorter than the ovariums in such large plants. In this case we have to do with modifications due to the size of the plant, not with the var. *brevicalcarata*.

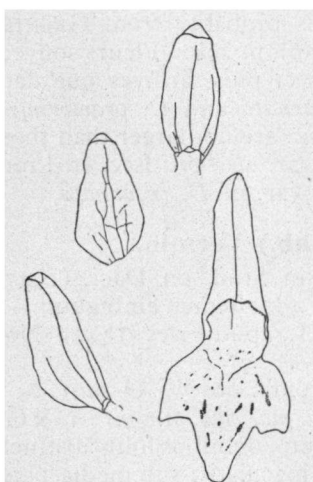
π. var. non-circumscripta Vermln. nov.
var. *Labello lineamentis parvis obscuris, sine vel cum vix visibili linea circumscripta.*

Lip with honey-guide of small dark lines, without or with hardly visible line round them.

Type: Herb. P.V. Rev. Dact. no. 0133 Baarn.

Exsicc.: Herb. P.V. 1945, no. 15, 16 etc.

Fig. 3. *Dactylorhiza incarnata*
var. *triangularis* Vermln. Broek
in Waterland. $\pm \times 3$.



Icones nostrae: Fig. 2.

ρ. var. Beckii Vermln. Sepalis lateralibus in interiore superficie maculatis.

Lateral sepals showing dots and lines on the inside.

Type: Herb. P.V. Rev. Dact. 0107, flower analyses no. 1.

Exsicc.: Herb. P.V. nearly all the Dutch plants.

Icones: GODFERY l.c. plate 43; REICHENBACH fil. Icones Vol. XIII/XIV, (1851), tab. 45; NELSON-FISCHER l.c. tab. 5, fig. 11, some flowers.

This variety is the common type. According to LINNAEUS's diagnosis, however, the sepals should be unspotted and BECK (Fl. Nieder Österr. 1. Hälfte (1890), p. 204) described his *α typica* with unspotted perigynous leaves and in contrast distinguished *β lanceata* Rchb. fil. with spotted ones. Since, however, spotted lateral sepals

are not limited to the latter variety only, I thought it better to name this variety separately.

o. var. *leucantha* Vermln. Planta floribus niveis, non ochroleucis. Flowers pure white, not yellow.

I saw such plants from Rockanje; white blooming plants were also found near Denekamp by VAN DIJK and at Texel.

The var. *albiflora* is not published by Lecoq et Lamotte but the name is *albiflora* Lec. et Lam. ex Thielens (Bull. d.l. Soc. royale de Bot. de Belg. (1873), p. 82, reprint p. 61). THIELENS added the following: "La variété *albiflora* Lec. et Lamtt. qui se distingue par ses fleurs plus grandes et plus tardives que celles de l'*O. latifolia* (= *O. majalis*) . . ." This description is probably from GRENIER et GODRON, Flore de France, Vol. III (1856), p. 296: "Fleurs souvent blanches (Lecoq et Lmtt.), plus grandes et plus tardives que dans l'*O. latifolia* (Lloyd)." Probably *D. incarnata* and *D. praetermissa* are confused here, for the flowers of *D. inc.* are not larger than those from *D. lat.* (= *D. maj.*). Therefore the var. *albiflora* Lec. et Lmtt. ex Thielens can not be maintained as a var. of *D. incarnata*.

Dactylorchis majalis (Rchb.) Vermln.

Dactylorchis majalis (Rchb.) Vermln. in Stud. on Dact. (1947), p. 67 = *Orchis latifolia* Linnaeus 1771, p. 486 (nomen ambiguum) = *O. majalis* Rchb. pat. 1828 = *O. latifolia* L. apud Fries (1842). Non *O. latifolia* L. 1753 (nomen confusum!).

a. var. *pinguis* (Asch. et Gr.) Vermln. comb. nov. = *O. latif.* A. I. *b.* *pinguis* Asch. u. Gr. Syn. III, p. 735 = *O. maj.* var. *pinguis* (A. & G.) Pugsley, 1935. Planta robusta, caule elongato, omnibus foliis distincte separatis, rectis, latis, plerumque valde maculatis; sub media parte foliis latioribus; folio latissimo minus quam 3 × longiore quam latiore; bracteis longis, praecipue inferioribus; labello ad 16 mm lato.

Plant robust, stem elongate (if fullgrown), with the leaves distinctly distant, erect, broad, mostly heavily spotted, all broadest below the middle; the broadest leaf less than 3 × longer than broad; bracts rather long, especially the lowest, much longer than the flowers; lips up to 16 mm broad.

Type: Herb. P.V. Rev. Dact. no. 0051 Limmen (N.H.), lectotype. I had this plant for some years in my garden and pressed it in two different years; from this it appeared that only plants in favorable conditions had the *pinguis*-habit.

Exsicc.: Herb. P.V. Rev. Dact. 0023 Limmen; id. no. 0025 Lezoux, Puy de Dôme; I saw the var. *pinguis* from Denmark and South Sweden, from near Lund; from Tyrol and the Pyrenees I saw similar plants.

Icones: HALLER: Historia Stirpium Helvetiae, Vol. II, tab. 32 (1768); M. SCHULZE: Die Orchidaceen (1894), taf. 21; Journ. of Bot. (1934), tab. 603.

β . var. *brachyphylla* Vermln. *O. latifolia brevifolia* Rchb. fil. Ic. XIII/XIV (1851), p. 58 p.p.? Planta brevifolia, normalis, 20-35 cm alta; foliis numero normalibus, pro portione brevissimis, non latis-simis; folio latissimo $3\frac{1}{2}$ - $5\frac{1}{2}$ longiore quam latiore, minore quam tertia pars altitudinis super tuber; spica saepe multis cum floribus.

Normal plants with short leaves, 20-35 cm in height with a normal number of proportionately short and not very broad leaves; the broadest $3\frac{1}{2}$ - $5\frac{1}{2}$ times as long as broad, less than $1/3$ of the height above the tuber, spike often rich in flowers.

Type: Herb. P.V. Rev. Dact. 0071 Hasselt-Zwartsluis.

Exsicc.: Herb. P.V. Rev. Dact. no. 0073, Blankenham; id. no. 0074 Emminkhuizen; id. no. 0075 Sloterdijk.

Since NEUMAN (Bot. Notiser (1909), p. 157) and I (Stud. on Dactylorch. (1947), p. 113) pointed out that the *brevifolia*-specimen depicted by REICHENBACH and from an unknown Swedish origin, does not belong to *O. latifolia* L. (= *O. majalis* Rchb.) and should be reckoned among *D. cruenta* (Muell.) Vermln. It seems improbable, that this var. should be synonymous with *brachyphylla*. After looking through much Scandinavian material, it also seems very improbable if not impossible to me, that the var. *brevifolia* Rchb. fil. should belong to *O. majalis* Rchb. Therefore I have preferred to choose an entirely different name for this var.

γ . var. *gracilis* (Warnstorf) Vermln. comb. nov. = *O. lat.* var. *gracilis* Warnst. in D. Bot. Mon. (1883), p. 109 = *O. lat.* var. *angustifolia* Becker in Deutsche Bot. Mon. XVI (1898) p. 68. Planta tenuis; tubere divaricato; foliis numero quatuor vel quinque, raro sex; anguste-lanceolatis, aut maculatis aut immaculatis; folio uno vel duobus foliis bracteiformibus; folio latissimo $5-8 \times$ longiore quam latiore (exempl.: folium secundum $9,2 \times 1,4$ cm); spica satis brevi et pauciflora (10-15); labello evidenter trilobato, calcari longo, ovarium aliquando subaequante.

Slender plant, tuber bipartite, leaves 4-5 (rarely 6), one or two bract-like, spotted or unspotted, narrow lanceolate; the broadest $5-8 \times$ as long as broad (e.g. second leaf $9,2 \times 1,4$ cm); spike rather short and with few flowers (10-15); lip threelobed with long spur, even as long as ovary.

Type: Herb. P.V. Rev. Dact. 0052 a Limmen (N.H.), b & c culture from other years.

Exsicc.: Herb. P.V. Rev. Dact. 0055 Bakkum (N.H.); id. no. 0068 Wageningen; id. no. 0059 's-Gravenpolder.

Icones nostrae fig. 4 & 5, Limmen (N.H.).

In some respects (long spur and big flower) the plant looks like *D. Traunsteineri* (Sauter) Vermln., but the whole habit, the occurrence among *D. majalis* without any other species, point to its being a variety of *D. majalis*.

1. fa. *ampla* (Asch. et Gr.) Vermln. comb. nov. = *O. lat.* A. I. a. *majalis* 1. a. l. β *amplus* A. u. G. Syn. III (1907), p. 735. Planta lata et brevis, foliis infimis pro portione latis et ad basim imbricatis.

Plant broad and low, the lower leaves proportionately broad and telescoped.

Type: Herb. P.V. Heilo, 13 Mei 1928.

It is these plants that on superficial view remind one a little of *D. purpurella* (Steph. p. et fil.) Vermln., but comparison with live material and a year-long culture of the latter have convinced me that *D. purpurella* does not at all occur in the Netherlands. The *ampla*-form as described here consists in early flowering, not quite developed plants.

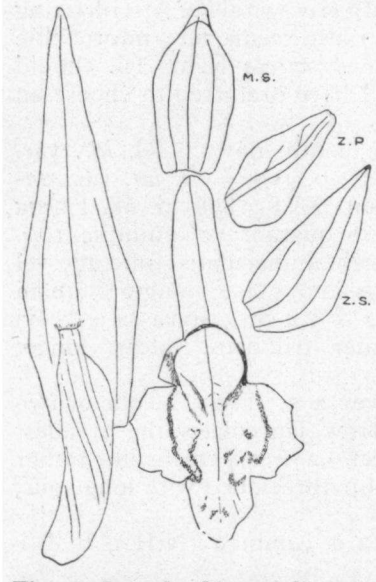


Fig. 4. *Dactylorhiza majalis* var. *gracilis* (Warnstorf) Vermln. Limmen (N.H.); lip. $\pm \times 3$.

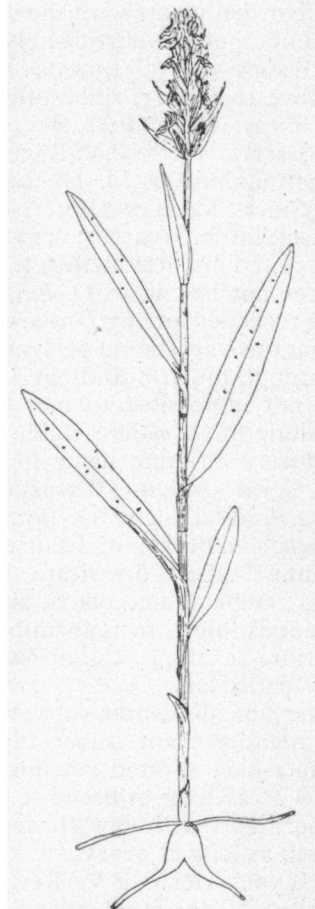


Fig. 5. *Dactylorhiza majalis* var. *gracilis* (Warnst.) Vermln.; whole plant. $\times \frac{1}{3}$.

δ. var. (fa. ?) *submaculata* (Asch. et Gr.) Vermln. comb. nov. = *O. lat. submaculatus* A. u. G. Syn. III (1907), p. 735. *O. lat. 4 submaculatae* Rchb. fil. Ic. l.c. sub cohorte p. 57 p.p. Caule plerumque prolongato; foliis plus minusve inter se remotis, cum paucis maculis aut sine maculis.

Stem mostly lengthened, leaves more or less separated with few or no spots.

Type: Herb. P.V. Rev. Dact. no. 0001 Hummelo.

Icon: Rchb. p. Pl. Crit. Vol. VI, DLXV no. 770 (1828).

This var. or form may perhaps be regarded as a modification of plants that have grown in tall grass. In culture these plants remained much shorter and in proportion their leaves were longer and narrower.

ε. var. *alpestroides* Vermln. nov. var. Planta longa ad 25 cm; infimis foliis brevibus, ovalibus, rotundatis (exempl.: folium latissimum 6 × 3,1 aut 4,7 × 2,8 cm).

Plant not higher than 25 cm with short, oval, rounded lower leaves.

Type: Herb. P.V. Rev. Dact. no. 0031 Bakkum (N.H.).

Icon: M. SCHULZE: Die Orchidac. (1894), plate 21b fig. A (sub *O. cordigera*).

In habit this var. suggests the alpine form *D. alpestris* (Pugsley) Vermln. = *O. alpestris* Pugsley = *O. majalis* ssp. *alpestris* (Pugsley) Hellm. = *O. latif. A. II. impudicus* A. u. G., but still more the picture given by SCHULZE l.c. Among *D. majalis*, however, neither the one nor the other can be expected, but it is shown by this how narrow related *D. majalis*, *D. alpestris* and *D. cordigera* are.

ζ. var. *immaculata* (Harz) Vermln. comb. nov. = *O. latif. 12 longifolia γ immaculata* Harz in Schlecht., Langet. & Schenk, Fl. v. Deutschl. 5. Aufl. 4. Band revised by Harz (1895), p. 247. Foliis semper immaculatis. Leaves always unspotted.

In a small percentage the plant is always found among the type.

η. var. *atrorubens* Vermln. nov. var. Foliis cum maculis sanguineis. Leaves with bloodred spots.

Type: Herb. P.V. Rev. Dact. no. 0014 Bakkum (N.H.).

θ. var. *laxa* (Harz) Vermln. comb. nov. = *O. latif. 4 ovato-lanceolata α laxa* Harz. l.c. p. 244. Spica laxa, longa, cylindracea. Spike loose, long and cylindrical.

Type: Herb. P.V. Rev. Dact. no. 0091 Meetkerke (België).

ι. var. *macrobracteata* (Harz) Vermln. comb. nov. = *O. lat. var. macrobracteata* Schur in Öst. Bot. Zeitschr. XX (1875), p. 275. Omnibus bracteis longioribus quam flores, inferioribus bracteis eximie latis.

Bracts all longer than flowers; the lower ones especially large.

Exsicc.: Herb. VAN SOEST, Huisduinen. To be regarded as a monstrosity?

Under favourable conditions this plant occurs as a modification.
κ. var. aequiloba (Harz) Vermln. comb. nov. = *O. lat. 9 acuminata*
α aequiloba Harz l.c. p. 245. Labello diviso in tres lobulos aequae
 latos atque aequae longos; lateralibus lobulis horizontalibus aut
 fere horizontalibus.

Lip divided into three lobes equally long and equally broad; the
 lateral ones horizontal or nearly so.

Type: Herb. P.V. Rev. Dact. no. 0037 Heilo.

Icones nostrae: Fig. 6.

Exsicc.: Exsicc. Herb. P.V. Rev. Dact. 0095 Fernpass, Tyrol.

λ. var. linguata (Harz) Vermln. comb. nov. = *O. lat. 5 acuta β*
linguata Harz. l.c. Labello angulis \pm
 quadratis, lobis lateralibus saepe incisus,
 in parte autem inferiore prope horizon-
 talibus; lobulo medio in formam linguae;
 medium si lobulum longum est et
 labellum ipsum non est valde latum,
 totius labelli latitudo longitudinem
 subaequat.

Lip more or less rectangular with often
 toothed sides and an almost horizontal
 underside on which a tongue-shaped
 midlobe. When this midlobe is long
 and the lip itself not very broad, the
 total breadth of the lip may be about
 the same as the whole length.

Type: Herb. REICHENBACH p. at Dresden, sheet with 3 specimens,
 the specimen on the right; in herb. P.V. Rev. Dact. 0002 a flower
 analysis can be found of this. If the herb. at Dresden should not have
 been preserved the flower analysis may serve as an isotype. This
 lipform regularly occurs.

Icones: MAX SCHULZE Orchidac. 1894, plate 21, fig. 4, 5. Ic. nostr.
 fig. 5.

μ. var. integra (Harz) Vermln. comb. nov. = *O. lat. suboblongi-*
folia α integra Harz. l.c. p. 245. Labello subcordato, non diviso,
 obtuso.

Lip almost heart-shaped, undivided, bent outwards and ending in
 a blunt point.

Type: Herb. P.V. Rev. Dact. 0063, lip analysis no. 29, Egmond-
 Binnen.

Icon: MAX SCHULZE l.c. fig. 2.

ν. var. brevicarata (Harz) Vermln. comb. nov. = *O. lat. 13 brevicar-*
carata Harz l.c. p. 247. Calcari brevior quam dimidia ovarii pars.

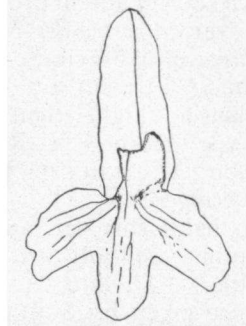


Fig. 6. *Dactylorhiza majalis*
var. aequiloba (Harz) Vermln.
 Castricum. $\pm \times 3$.

Spur shorter than half the ovary.

Type: Herb. P.V. Rev. Dact. no. 0059 's Gravenpolder.

♂. var. *magnicalcarata* (Harz) Vermln. comb. nov. = *O. lat.* 14
magnicalcarata Harz l.c. p. 247. Calcari crasso, amplo, ovarium
subaequante aut paulo longiore.

Spur thick and wide, as long as or even longer than the ovary.

Type: Herb. P.V. Rev. Dact.
no. 0064, lipanalysis no. 7 Bakkum
(N.-H.).

Icon: Fig. 7.

This long, thick spur often
occurs with var. *gracilis*. In con-
trast to the method of Harz, who
describes the lip-shape as always
connected with a certain type, I
am of opinion that it is true that
with certain varieties certain lip-
shapes are more frequent than with
others, but that the lip-shape is
generally absolutely independent
of the further habit of the plant.
Var. *magnicalcarata* is proportio-
nately more frequent with var. *gra-*
cilis than with the type, but with
the type a thick and long spur
may sometimes be found too.

The colour of the flower varies
in all shades from pale- to dark
purple, mostly in the shades of
SÉGUY 6. Besides more striking
differences occur:

• o. var. *alborosacea* (Erdner) Ver-
mln. comb. nov. in 39.u.40. Ber.
Naturw. Ver. f. Schwab. u. Neub.

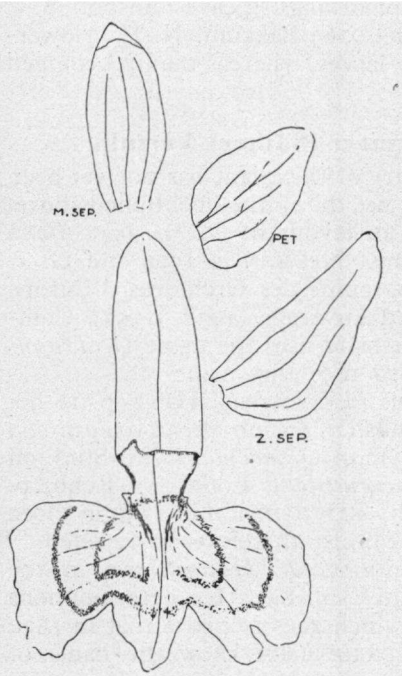


Fig. 7. *Dactylorhiza majalis* var.
magnicalcarata (Harz) Vermln. Bak-
kum (N.H.) $\pm \times 3$.

(1911) p. 142. Floribus roseis (vide Séguy 5).

Flowers pink.

Exsicc.: Herb. P.V. Rev. Dact. no. 0021 Bakkum (N.-H.).

Several years I cultivated the plant in my experimental garden
and the colour was constant. The spots on the leaves of the spec-
imens of this colour-variety were but faintly visible. Also at Olter-
terp (Fr.).

2. fa. *albo-lilacea* Vermln. fa. nov. Labello albo, non picto,
sepalis et petalis albo-lilaceis.

Lip white, without lipmarkings, the sepals and the petals of a very pale violet. Constant in culture.

Found at Bakkum (N.-H.).

π. var. albiflora (Zapalowicz) Vermln. comb. nov. = *O. latifolia* L.
a. *albiflora* Zap. Consp. Fl. Galic. crit. Tom. I (1906) p. 209. Floribus totaliter albis, non pictis. Foliis immaculatis.

Flowers quite white, without lipmarkings. Leaves unspotted.

Exsicc.: Herb. P.V. Rev. Dact. no. 0063 Bakkum (N.-H.) flower-analysis 114. This plant had narrow leaves, whereas the lip belonged to var. *aequiloba*.

Dactylorchis Traunsteineri (Sauter) Vermln.

An agreement on the nomenclature of this plant has not yet been reached. Whereas German botanists use the epithet mentioned above, KLINGE, in 1896, declared himself in favour of *Orchis angustifolia* Loiseleur as did the Swedish botanist NEUMAN in 1909 and G. & A. CAMUS in France in their Iconographie des Orchidées d'Europe (1909). In his Notes sur les Orch. d'Auvergne (1938, p. 53). Commandant D'ALLEIZETTE on the other hand uses the name *O. Traunsteineri* Saut. MANSFELD (1938) also uses this name.

In 1814 KROCKER published in his Fl. Siles. vol. III. 2. p. 18 no. 1513, ic. tab. III a species of the genus *Orchis* sub *Orchis angustifolia* Kroker. This seems to be a synonym of *O. maculata*. See Stud. on Dactylorch. 1947, p. 143. *Orchis angustifolia* Loisel. ex Rchb. p. was published as a later homonym by REICHENBACH in 1830 in Flora germanica excursoria and this name must therefore be rejected.

In this flora REICHENBACH mentions *O. Traunsteineri* in the "Addenda et Corrigenda" on p. 140¹⁸ sub 853^b. He here mentions the plant among *O. sambucina* L., which goes to prove that in 1830 when this flora was published, REICHENBACH knew the name of *O. Traunsteineri* Sauter, but interpreted it wrongly. In Flora XX where SAUTER himself gives a detailed diagnosis, he objects to this interpretation: "(*O. Traunst.*) wurde von REICHENBACH irrig zu *sambucina* gezogen und gehört eher zu dessen *angustifolia* Lois." Since we need not take REICHENBACH's erroneous interpretation into account, we may regard his publication (1830) as the one, in which the name of *Orchis Traunsteineri* Sauter, which apparently existed before, is laid down. In Rchb. pat.'s Flora germ. exc. l.c. the species has the following diagnosis, which should be inserted after no. 853, *O. sambucina* L.:

(1) *O. Traunsteineri* Sauter gracilior, pauciflora, labio inciso obtuse trilobo vix petala sepalaque aequante, calcarè ovario aequali inflato demisso, foliis lineari-oblongis *O. romanae*, a

qua calcare facile distinguitur. Caulis solidus, fl. saturate purpurei. — Gegend von Kitzbühl in Tyrol: Traunsteiner. — Juni und Anfang Juli, nachdem *O. latifolia* (= *O. inc.*) und *haematodes* verblüht sind. 21

Six lines further down follows *O. angustifolia* Loıs. (according to REICHENBACH) with the following diagnosis:

(2) + 856 b. *a. angustifolia* Loıs. caule fistuloso, foliis linearilanceolate canaliculatis arrecti-patulis, bracteis flores excedentibus, calcare ovarium subaequante, labii lobo medio minimo, petalis lateralibus patentibus immaculatis. Rchb. pl. crit. IX. ic. 1140. Cautius in vivo ab. Exc. Com. a *Hoffmansegg* comparata, videtur ab *O. latifolia* (= *inc.*) distincta. — Hier und da auf Sumpfwiesen. — Juni. Juli. +

On comparing (1) with (2), we are struck by the following differences:

- I. The stem of (1) is solid and of (2) hollow.
- II. The shape of the leaves of (1) is linear-oblong and of (2) linear-lanceolate.
- III. The lip of (1) is blunt and threelobed but that of (2) has a small centre-lobe.

The species, however, is so exceedingly variable that these differences may undoubtedly be classed among the range of variability of the species. Considering the points of agreement between the descriptions, we find the following:

- a) Slender habit, in the case of (2) apparent from the plate.
- b) More or less linear leaves.
- c) Long spur.
- d) Late flowering time.

Since *O. sambucina* and the kindred species of *O. romana* Seb. et Maur. have an early flowering time and this feature is comparatively constant, we may attach great value to it.

Summarizing, we must come to the conclusion that **the two diagnoses refer to one and the same plant**, notwithstanding the different places REICHENBACH gave them.

Any remaining doubt can be effaced by REICHENBACH's herbarium Dresden. In the "Staatlicher Botanischer Garten" were in 1942 two sheets from which I received two photographs, the description of which follows:

1) A sheet with two plants, the neatly-written label of which says: "*Orchis Traunsteineri* Sauter" and underneath in the same handwriting: "*angustifolia* Rchb. *Icones. Sambucina* Lin. var. *Lindl.*" The plant on the left is short-leaved and has big flowers, that on the right has bigger leaves, the lower ones are different in shape, for

whereas all the four leaves of the left specimen have the same form and are broadest below the middle, the lower leaves of the right-hand plant are different from and blunter than the upper ones. I suppose these plants originally belonged to Hoffmanssegg, for no further mention is made of the find-spot.

2) A sheet with two other plants with very narrow leaves, the label showing two handwritings. One is the same neat handwriting of the other sheet, the other is SAUTER's. The latter says: "*O. Traunsteineri* m. Moor bei Zell am See" and bears SAUTER's signature. The other handwriting says: "(SAUTER's Handschrift) Salzburg. *Orchis Traunsteineri* Sauter leg. SAUTER." Accordingly these are two specimens collected by SAUTER and apparently forwarded to REICHENBACH. They are not, however, the plants from Kitzbühl, which REICHENBACH mentions in the first diagnosis. Although they suggest some narrow-leaved varieties of *O. incarnata* L. at first sight, the big flowers are ample proof that these belong to another species. The fact that the leaves are scattered all along the stem renders it impossible to class the plants among *O. sambucina* L. and its kindred, whereas also the shape of the tubers would prevent this. Consequently there can be no doubt that these plants belong to the same species as those of the first sheet.

Looking more closely at the four plants found in the herbarium, we need not be surprised that REICHENBACH judged them to be different, for they all diverge one by one. Now that, however, we have learned to view *O. Traunsteineri* Sauter as a very polymorphous species — especially after KLINGE's work — the big flowers as well as the general habit are the features that enable us to class all four of these plants to this species.

Which plant should be considered the type? This is a delicate question, since the diagnosis of *O. Traunsteineri* given by REICHENBACH, which mentions Kitzbühl as the findspot, does not agree with the specimens in his herbarium. Therefore a choice has to be made. At present it is generally assumed that "the description prevails" and so it is obvious that here too the description should be preferred and that Kitzbühl in the Tyrol should be accepted as *locus classicus*. This is so much the easier, since this find-spot has been maintained so far and since the plants found there form a constant type, which I know from personal experience. In 1936 Dr. GAMS sent me a number of live specimens, which I partly added to my herbarium and partly cultivated. In my experiment-garden the plants proved to keep the same habits and in the lowland they maintained their late florescence too.

In his *exsiccatae* REICHENBACH issued *O. angustifolia* Lois. and

as the plants he distributed came from Kitzbühl, it is self-evident to fasten one of these specimens down as type-specimen (REICHENBACH Fl. Germ. Exsicc. no. 949). The more so since TRAUNSTEINER himself collected the plants, according to the label. A similar specimen can be found in Leyden in the Rijksherbarium sub no. *Herb. Lugd. Bat.* No. 903.16-1677. The original label is missing, but it is practically certain, that this plant belongs to that series. According to the habit the plant belongs to the common type. See Stud. on Dactylorch. plate L, fig. 12, type from Leyden.

In order to examine the characteristics of the species it may be useful to review the diagnosis SAUTER himself gave. SAUTER also found these plants near the Boden-lake near Bregenz and his description is based on this.

The original diagnosis, as given by SAUTER in Flora XX I. Band. Beibl. p. 36 (1837), reads:

Orchis Traunsteineri mihi, tuberibus palmatifidis, caule solido, foliis lineari-lanceolatis erecto-patulis, spica rara, pauciflora, bracteis flores superantibus; calcare cylindrico ovarium aequante, labio trilobo: lobo medio obtuso, petalis lateralibus patenti-ascendentibus.

Der Stengel meistens $\frac{1}{2}$ selten einen Schuh hoch, die Blätter meistens linien- selten lanzettförmig, gefleckt, die Lippe feingekerbt, an den Seiten zurückgeschlagen, die Aehre schlaff, armblihtig, gewöhnlich 6-12 selten 20 Blumen. Die Blüten fast von der Grösse der *latifolia*, von der sie sich durch die Knollen, Blätter, Lippe und die Aehre, so wie von *angustifolia* W. durch die Stengel und die Lippe unterscheidet. Sie wurde von Reichb. irrig zu *sambucina* gezogen und gehört eher zu dessen *angustifolia* Loisl. (*latifolia* = *O. majalis* Rchb.; *angustifolia* W. = *O. incarnata* L.).

SAUTER states that the plant flowers later than *O. majalis* Rchb. and *O. incarnata* L. i.e. late in June and early in July.

Characteristics for the species are, according to this description:

- 1) the stem is solid;
- 2) the leaves are linear-lanceolate, erect-spreading and spotted;
- 3) the spike is loose and flowers are scarce;
- 4) the flowers are big and the bracts longer than the flowers;
- 5) the spur is about aequally long as the ovary;
- 6) the lip is three-lobed, the side-lobes crenulated and reflexed and the mid-lobe is blunt;
- 7) the lateral sepals are spreading-ascendant;
- 8) the floescence is late.

Unfortunately the diagnosis does not mention the length of the

leaves and the place of their greatest breadth, nor the colour of the flowers and the circumference of the lip. If we want to know anything about these characteristics, we shall have to examine SAUTER's plants or plants from the original find-spot. As to the colours of the flowers, we can go by fresh material only, or have to depend on REICHENBACH's "saturate purpurei" in the diagnosis of *O. Traunsteineri*. The colour of the flowers, which I saw, ranged from dark- to light red-purple i.e. SÉGUY (Code universel des Couleurs) from tints of 6 to tints of 7.

In the work of MAX SCHULZE (Die Orchidaceen Deutschlands etc. (1894), no. 20) and FUCHS (*Orchis Traunsteineri* Saut. i. Teil, p. 19, published in 42. Bericht d. Naturw. Ver. für Schwaben u. Neuburg 1919) we meet with the description of plants from Kitzbühl, but only in the last work measures are given. Detailed diagnoses with measures also occur in the work of KLINGE (*Dactylorchidis* etc. in Acta Horti Petropol. Vol. XVII (1898), p. 176) and SCHLECHTER (KELLER & SCHLECHTER: Mon. und Icon. der Orch. etc. I. Band (1928), p. 169), whereas in the work of Dr. RUDOLF GSELL: Ueber Messungen an Orchideenblüthen (1935) several measures are given of Swiss material. Finally I myself measured some leaves and flowers of plants from the "locus classicus"; the flowers were dried, then boiled with alcohol and prepared. The following table gives a summary.

MEASURES OF ORCHIS TRAUNSTEINERI SAUTER.

Author	Leaves in cm	Lip l. × br. in mm	Spur in mm	Origin	Number
Klinge	Lowest 7-10 × 0,5	6,5-8,5 × 8-12 mostly 7 × 10	7-10 mostly 8	?	?
Schlechter	Middle one to 12 × 0,9	8 × 9	5 (!)	?	1?
Gsell	9,6 × 1,06 8,5 × 1,25	8 × 9 7,7 × 8,6	7,5 8,3	Bonaduz L. Maienf.	10 10
Fuchs	Second leaf 6-11 × 0,5-1.-	to 7(?) × 10 no mid-lobe	?	Kitzbühl	?
Vermeulen	Longest 9-11 × < 1 11,5 × 1	6,5-7,5 × 7-9 9 × 9,5	7,5-10 9,5	Kitzbühl Beieren	5 1

Finally I give here the general description of the species:

Dactylorchis Traunsteineri (Saut.) Vermln.

Tubers rather small, palmate, mostly ending in two, more rarely in 3 or 4 fingers; in living peat-moor the new tuber often higher

inserted than the old one; adventitious roots above the tuber often very long. **Height** above the (old) tuber 15-35, mostly 20-30 cm. **Stem** covered underground mostly by close-fitting sheaths, over-ground yellow-green, higher up darker and under the spike suffused with purple and faintly ridged, erect or slightly sinuous, mostly solid but sometimes higher up a little bit hollow, fairly slender, ± 4 mm diameter. **Leaves.** *Arrangement of leaves* : leaves regularly distributed along the stem (the lower somewhat closer upon each other than the upper ones), erect-spreading, sometimes the top a little bit inward, the higher bract-like leaves usually not reaching the spike. *Number of leaves* : underground 3 sheaths (the topmost sometimes with green tip or even a small lamina forming a transition to normal leaves); over-ground 2-4 complete leaves (with closed sheaths) and 1-2 bract-like leaves, the lowest leaf mostly broadest and the second longest, the higher-up leaves smaller and smaller. *Shape of leaves* : very narrow, linear-lanceolate, of the lowest two the greatest breadth mostly somewhat under the middle or equally broad over a great part, the second (longest) $6-11 \times 0,5-1,25$ cm, the higher leaves with their greatest breadth immediately above the base; the large leaves mostly distinctly keeled and somewhat folded a little bit hooded at the acute ending top. *Colour of leaves*, blade bluish-green, the under-surface somewhat lighter and shining, usually with some small dots or spots on the upper surface, the bract-like leaves often suffused with purple especially near the top and their margins. **Spike** narrow cylindrical, loose, with 5-14, mostly 7-9 flowers. **Bracts** narrow-lanceolate, spreading, erect and bent inward, green suffused with purple, the lower ones somewhat longer than the flowers, the upper bracts \pm equally long as the flowers. **Flowers** medium sized, red-purple (SÉGUY, from tints of 6 to tints of 7), the hood mostly darkest in colour. **Ovary** twisted, with purple ridges, 9-12 mm long. **Lateral sepals** oblique towards the lip, fairly acute, spreading-erect or spreading, sometimes with dark markings, $7-9 \times 2,5-3$ mm. **Middle-sepal** with the lateral petals forming a hood, on the top with a small cap, $6,5-8,5 \times 2,4-2,8$ mm. **Lateral petals** about equally broad or somewhat narrower and about equally long, $6-7,5 \times 2-2,8$ mm. **Lip** three-lobed, with the greatest breadth on or somewhat over the middle, transverse-oval and with rounded sides or obcordate and cuneately widening from the base; side-lobes sometimes a little bit reflexed mid-lobe blunt or acute, narrower than the side-lobes and between them, sometimes considerably extending; lip $6,5-8 \times 7-10$ mm, broader than long, the sides darker than before the spur, with a honey-guide of dots and stripes, bounded by a vigorous, curved line (thicker than in *O. in-*

carnata where this line is extremely fine), with sometimes markings beyond. **Spur** a little bit shorter than or about as long as the ovary, 7,5-10 × 2-3 mm, with a fairly blunt end. **Column** light coloured with glistening, shield-shaped stigma bordered by a violet line; **rostellum** forming a light-purple pouch with colourless visced discs and a white fold between the two of the anther cells; anther light-purple, blunt with two dark-purple, cells opening by fissures; pollinia bluish-green with yellow caudicles; staminodes small with granular surface. **Fruit** fairly large, seeds with nearly no thickenings in the cellwalls of the testa.

Number of chromosomes 80 diploid (for the research of the chromosomes done by Mr. ZEYLEMAKER a plant from the "locus classicus" was used (Kitzbühl)).

Flowering-time June and July.

Distribution. The type occurs in the Alps and the secondary mountain chains round them; similar plants also in Scandinavia, along the Baltic and in other parts of Europe.

Opinions as to this species differ widely. KLINGE (Act. Hort. Petrop. XVII fasc. II (1899) p. 67) began to class all sorts of narrow- and broad-laeved forms of *Dactylorchis*, which he regarded as hybrids — hybrids that had apparently become constant and maintained their owns and which he indicated as polyphyletical forms — among *O. Traunsteineri*. Consequently *O. Traunsteineri* (KLINGE calls the species *O. angustifolia* Rchb.) became a combination of the species as such with varieties and forms — indicated as monophyletical forms — on the one hand and on the other hand the polyphyletical forms, which in my opinion should have been named separately, even though they are to be considered only as endemics or species with a very limited area, such as are also found with *Hieracium*. Most of the smaller species of *Hieracium* are constant owing to their apogamy, whereas those of *Orchis* are not that in the very least, which makes the matter even more complicated, because new hybrids may be expected again and again.

FUCHS together with ZIEGENSPECK (43. Ber. d. Naturw. Ver.f. Schwab. u. Neub. 1924) and Bot. Archiv XIX (1927)) come to the conclusion that there is no such thing as a species *O. Traunsteineri*, but that we can only speak of a herd of hybridogenous forms („*O. Traunst. non est species, sed forma e gregibus Dactylorchidis hybridis*” they say in Bot. Arch. I. c. p. 264).

In my opinion the best thing is to class the plant described by SAUTER from the Alps and all the forms like it, among the species *D. Traunsteineri* (SAUT.) Vermln (ssp. *typica*) and according to

the extent of the differences either to reckon the other forms among that species as subspecies, or to consider them as small species. FUCHS took this standpoint originally and besides *O. Traunsteineri* Saut. he distinguished a great many similar forms, which he described as subspecies under *O. pseudo-Traunsteineri* Fuchs [42. Ber. d. naturw. Ver. f. Schwab. u. Neub. (1919)], but especially on the ground of a doubtful chromosome-research together with ZIEGENSPECK he after changed his opinion. ZIEGENSPECK found the number of chromosomes in the „pure” species (*O. incarnata*, *latifolia* and *maculata* to be 20 diploid and 10 haploid. Afterwards this turned out to be wrong, and *O. majalis* (= *latifolia*) and *maculata* appeared to have diploid 80 chromosomes and *O. incarnata* and *O. Fuchsii* 40. The specimens of *D. Traunsteineri* from Kitzbühl, Tyrol (received from Dr GAMS and cultivated for some years) appear to have 80 chromosomes diploid, but on the other hand a form with 40 chromosomes diploid was found in Switzerland (HEUSSER in Ber. d. Schweiz. Bot Gesell. 45, 1938, p. 571) and one with about 120 in Esthonia (Vermln, in Stud. on Dactylorch. p. 36 & 38). In consequence with this there seems to be no reason, why *D. Traunsteineri* should not be regarded as a tetraploid species (ssp. *typica* Vermln. l. c. p. 66) with related forms some of which have a different chromosome number. Narrow leaved species which may be classed with the subsection *Angustifoliae* Vermln. are decidedly found in the greater part of Europe. In Ireland and England *D. Traunsteinerioides* (Pugs.) Vermln., in Scotland perhaps *O. Francis-Drucei* Wilm., in Scandinavia many forms (Neuman in Bot. Notiser 1909; see Vermln. l. c. p. 66 & 157). Even in the Netherlands plants were found which should be reckoned among *D. Traunsteineri* (leg. JAN G. SLOFF) Here follow two vars:

a. var. *rhombilabris* Vermln. nov. var. Labello rhomboideo, lobo medio minimo, sed paulo longiore et latiore quam laterales lobuli dentati.

Lip diamond-shaped in outline, midlobe very small, but still a little longer and broader than the crenated lateral lobes.

Type: Herb. P.V. Rev. Dact. no 0333 a Mierde (N-B.)

Icones nostr.: Fig. 8A.

β. var. *Klingei* Vermln. nov. var. Labello lateribus fere parallelis, lobulo medio ad basim fere horizontalem affixo.

Lip with almost parallel sides and an almost horizontal underside on which the midlobe is placed.

Type: Herb. P. V. Rev. Dact. no 333 b, Mierde (N-B.).

Icones nostr.: Fig. 8 B.

The shape of the lip strongly resembles that of *O. Russowii* Klinge

which is described as follows: „Lippe in der Mitte am breitesten, Mittelzipfel aufgesetzt“, but yet that plant cannot be reckoned among this because then the leaves should be spreading and recurved. The habitat of the plants at Mierde was a dry *Calluna* heath. *γ. var. dunensis* (Rchb. fil.) Vermln. comb. nov. = *O. latifolia dunensis* Rchb. Ic. Vol. XIII/XIV, 1851, tab. 164, text p.59. *Planta parva tenuis, dunensis, non altior quam 15 cm; foliis maxime tribus, immaculatis, sub media parte latioribus; folio latissimo maxime 1 cm lato; longissimo folio maxime 7 cm longo; spica satis laxa, floribus paucis et majoribus; sepalis lateralibus longis et angustis, ad 8 × 3 cm; labello cuneatim a basi se dilatante; calcari ovarium subaequante (in typo 10 × 2 mm).*

Small, slender plant from the dunes, not taller than 15 cm and with not more than three green, unspotted leaves broadest below the middle; the broadest not more than 1 cm in width, the longest not more than 7 cm in length; spike rather loose with few rather big flowers, lateral sepals long and narrow to 8 × 3 mm; lip wedgeshaped and broadening from the base; spur about as long as the ovary (in the type specimen 10 × 2 mm).

Type: Herb. Ned. Bot. Ver. Leiden: Wassenaar in dunis palustribus, no 1, leg. Dozy.

Icones: Rchb. fil. l. c.

Exsicc.: Herb. Ned. Bot. Ver. Leiden: Wassenaar in dunis pal. no 3, 4, leg. Dozy; Herb. Mus. Caes. Palar. (Vienna), Rchb. fil. Herb. Orch. no 27840. Wassenaar id.

About a century ago this plant was found in some moist hollows in the dunes in the Netherlands: Schiermonnikoog, Katwijk, Wassenaar, but afterwards it was not found any more. In habit it bears resemblance with the var. *eborensis* Godfery: Mon. & Icon. 1933, p. 219, from Eastern-England. I do not think it right to identify this variety with *O. latifolia* subsp. *baltica* Klinge as was done by ASCHERSON & GRAEBNER (Syn. III, 1907, p. 738). Their diagnosis

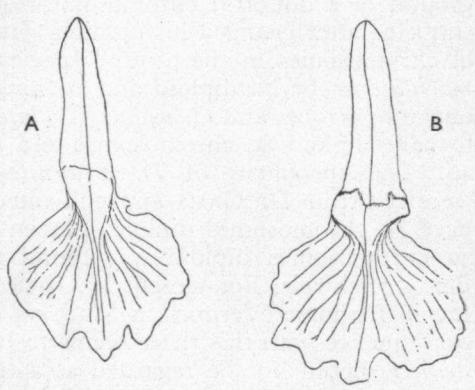


Fig. 8. *Dactylorhiza Traunsteineri* (Sauter) Vermln.

- A) var. *rhombilabris* Vermln. Mierde (N.B.).
 $\pm \times 3$.
 B) var. *Klingei* Vermln. Mierde (N.B.).
 $\pm \times 3$.

of *O. latifolius* B II. *dunensis* differs much from REICHENBACH'S and does not at all agree either with Reichenbach's material nor with his figure. Cf.: JANSEN en WACHTER in Ned. Kruidk. Arch. 30, 1920, p. 147.

Dactylorchis Deweveri Vermln. nov. spec.

Diagnosis: Planta robusta, plerumque 30-50 cm super tuber; foliis regulariter dispersis secundum caulem, erecto-patentibus, non curvis; forma foliorum: anguste lineo-lanceolata; infimo folio latissimo fere in media parte laminae; superioribus foliis semper latissimis sub media parte laminae; foliis carinatis, acutis, immaculatis; foliorum colore obscure virido. Spica cylindrica; bracteis infimis paulum longioribus quam flores. Floribus satis magnis, griseo-violaceis (Séguy 650); sepalis lateralibus erecto-patulis, non symmetris, paulo longioribus quam tertium sepalum et fere aequae latis; tribus sepalis non pictis; petalis lateralibus brevioribus et angustioribus quam sepala; labello subtiliter punctato, latiore, fere in media parte latissimo, a basi cuneato; duobus lobis lateralibus rotundatis; lobulo interposito nunc angustiore, nunc latiore; calcaris satis crasso et longo, paulo brevioris quam ovarium aut aequae brevis; gynostemio brevi, leviter colorato, ceterum simili ac *D. Traunsteineri*; ovario sine marginibus membranatis. Floret ab initio Junii m. ad Julium m.

Description: Robust plant, mostly 30-50 cm above the usually bipartite tuber. **Stem** palegreen, changing to a purplish hue upwards and then a little hollow sometimes. **Leaves** regularly scattered along the stem; underground sheaths three, overground leaves four complete and one bractlike (without sheath), erect-spreading, not bent; *leafshape* narrow linear-lanceolate, the bottom leaf being broadest at about the middle, the higher placed leaves broadest below the middle; leaves keeled and tapering; usually the second leaf longest and also broadest (sometimes the bottom leaf broader), not broader than 1,5 cm and up to 15 cm in length, the bractlike leaf not reaching the spike; *colour of leaves* dark green and unspotted. **Spike** cylindrical, up to 8 cm in length, fairly dense. **Bracts:** the lower ones a little longer than the flowers, the higher ones shorter. **Flowers** medium-sized, grey violet in colour (Séguy 650); **lateral sepals** $\pm 7,5 \times 2,5$ mm, asymmetrical, erect spreading, slightly longer than and about equally broad as the **third sepal** $6,5 \times 2,5$ mm, without markings; **lateral petals** somewhat narrower and shorter $6,5 \times 2$ mm, forming a helmet with third sepal, faintly asymmetrical. **Lip** broadest at about the middle, less long than broad ($7-8 \times 8-10$ mm), broadening wedge-shaped from base with two rounded



Fig. 9. *Dactylorhiza Deweveri* Vermln. Venlo; height above tuber 46 cm. $\times \frac{1}{3}$.

lateral lobes and narrower or broader midlobe between them, with lip-markings of small dots. **Spur** rather thick and long, $10 \times 2,5$ mm slightly shorter than or as long as the ovary, narrowing to the top; **Gynostemium** short and light in colour, for the rest as that of *D. Traunsteineri* ssp. *typica*. **Ovary** without membranous margins. **Flowering time** from beginning June to July.

Type: Herb. P.V. Rev. Dact. no 0334 Venlo, leg. Gorter and Van Nieuwenhoven.

Icones nostrae: Fig. 9 & 10.

Exsicc.: Herb. P. V. Rev. Dact. no 335, Venlo, id. These plants form the rest of a lot of forms found formerly in the unreclaimed bogs in Limburg, as the late A. DE WEVER, one of our best botanists, told me. This species is named after him.

The type-specimen has rather short

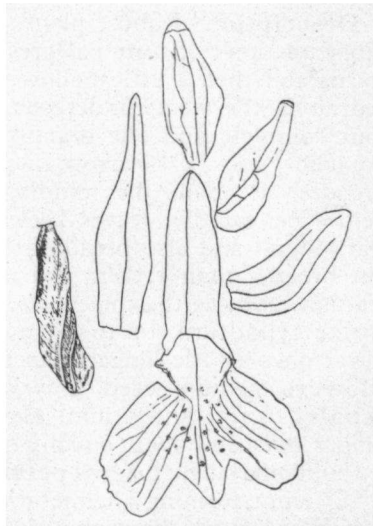


Fig. 10. *Dactylorhiza Deweveri* Vermln. Floweranalysis. Venlo. $\pm \times 3$.

leaves, length of longest leaf less than 1.3 of height. The other specimen has longer and narrower leaves and a bigger midlobe.

Similar plants are still growing in the Campines in Belgium.

***Dactylorchis praetermissa* (Druce) Vermln.**

Dactylorchis praetermissa (Druce) Vermln. in Stud. on Dactylorch. (1947) p. 67 = *Orchis praetermissa* Druce, 1913.

a var. *junialis* Vermln. emend. = *O. praetermissa* ssp. *junialis* Vermln. olim, 1934 = *O. pardalina* Pugsley 1935. Planta foliis maculatis; maculis praesertim versus inferiorum foliorum basin annuliformibus, interdum solum in medio pallidioribus; labello exhibente duas imagines obscure-violaceorum laqueorum, qui lineas et puncta includunt.

Plant with spotted leaves; spots ring-shaped, especially towards the base of the lower leaves, sometimes the spots only paler in the middle; the lip marked with two dark purple loops including spots and lines.

Icones: Ned. Kruidk. Arch, deel 3 (1933), p. 416. KOPS: Flora Batava, vol. I, tab. 20 (1800) sub *O. latifolia*.

β. var. *macrantha* (Sipkes) Vermln. comb. nov. = *O. praet.* var. *macrantha* Sipkes in De Lev. Nat. XXVI, Juni 1921, p. 52. = *O. latif.* β *macrantha* Sipkes olim in Ned. Kruidk. Arch. 28, jaarg. 1918 (1919), p. 148. Planta robusta, foliis latis et longis; spica laxa, floribus magnis; medio lobulo longo et non acuto.

Robust plant with broad, long leaves, a loose spike of big flowers with long, non-pointed midlobe.

Type: Herb. P. V. Rev. Dact. no 0222, South England, leg. Col. Godfery (midlobe not long enough) -lectotype.

Icones: De Lev. Natuur. XXII (1918), p. 274, 275.

The original plant was found at Heille in Zealand-Flandres (Zeeuws-Vlaanderen) but I did not see a herbarium-specimen.

The English authors GODFERY & STEPHENSON limit the var. *macrantha* to plants with extended midlobe, but I think this is contrary to the original description [Cf. Journ. of Bot. LXI (March 1923) p. 68 and LXII (June 1924), p. 176-177]. Should their view be the right one, this variety would probably prove to be identical with var. *cuspidata* Deinum.

γ. var. *elata* Vermln. nov. var. Planta alta, elata, plus quam 40 cm super tuber; foliis inter se remotis, plerumque satis angustis et brevibus; spica cum bracteis satis brevibus.

Tall slender plant, more than 40 cm above the tuber, with distant, mostly rather narrow and short leaves; spike with rather short bracts.

Type: Herb. P. V. Rev. Dact. no 0264 Kortenhoef.

Icon: Ned. Kruidk. Arch. 43 (1933), p. 417.

Exsicc.: Herb. P. V. Rev. Dact. no 0265, Kortenhoef; id 1945 no 60 Botshol; id no 319, 0320 Groesbeek.

Plants growing in tall grass often have the tendency to grow up high, but yet I do not believe that all high plants are only modifications, especially as I found such high plants chiefly in the Holland-Utrecht peat-bog area and near Groesbeek, not in the North of Noord-Holland, north of the Noordzeekanaal.

δ. var. *tenera* Vermln. nov. var. Planta tenera, caule tenui, foliis satis brevibus et angustis, ad 2 cm latis; longissimo folio minore quam dimidia plantae supra tuber altitudo.

Slender plant with thin stem and comparatively short and narrow leaves, the broadest narrower than 2 cm, the longest less than $\frac{1}{2}$ of the height above the tuber.

Type: Herb. P. V. 1945 no 43 Oterleek.

Exsicc.: Herb. P. V. Rev. Dact. no 0219 Limmen (N.H.) no 0304 Botshol.

When I found a plant like this I thought it was a haploid form but the plant from Oterleek appeared to have the normal number of chromosomes: 80!

ε. var. *longifolia* Vermln. nov. var. Foliis longis, $\pm 10 \times$ longioribus quam latioribus; longissimo folio majore quam plantae pars dimidia et nonnumquam ex spica exstante.

Leaves as much as ten times as long as broad; longest leaves contained less than two times in height of plant and even extending beyond spike.

Type: Herb. P. V. Rev. Dact. no 0301 Oudorp (N.H.).

Exsicc.: Rev. Dact. no 0226. Lewes, Sussex, leg. PUGSLEY; id. no 0240 & 0241 Château Landon, Seine et Marne; id. no 0237 Wenduynne, Belgium.

At first sight the plant suggests *D. incarnata*, but the shape of the flower renders it improbable that we have a hybrid here, moreover the second parent was absent from the habitat of the type. A chromosome-examination only could be decisive here. A plant from Belgium, however, which I took for the hybrid *D. praetermissa* \times *incarnata* appeared unexpectedly to possess 80 instead of 60 chromosomes, which showed that the determination was wrong.

ζ. var. *cuspidata* Deinum ex Vermln. comb. nov. = *O. praet.* var. *cuspidata* Deinum olim. Labello obtriangulato, medio lobulo triangulato, longe cuspidato.

Lip obtriangular in mainform with a long acute midlobe on the base.

Type: Herb. S. D. DEINUM, Naardermeer, 12 Juni 1943. Isotype in herb. P. V.

Icon: Ned. Kruidk. Arch. Dl. 53, p. 128.

η. var. triangularis Vermln. nov. var. Labello obtriangulato, rotundato, medio lobo parvo.

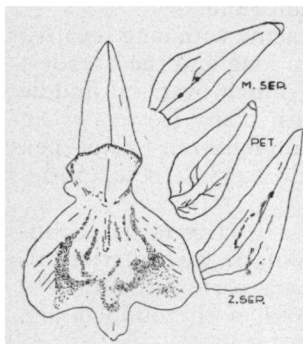


Fig. 11. *Dactylorchis praetermissa* var. *triangularis* Vermln. Botshol. $\pm \times 3$.

Mainshape of the lip triangular, broadest towards the top with rounded angles and small midlobe.

Type: Herb. P. V. 1945 no 60.

Icon: Fig. 11.

θ. var. parvifructa Vermln. Maturis in media spicae parte fructibus vix longioribus quam 1 cm.

Fruits when ripe, in the middle of the spike hardly longer than 1 cm.

Type: Herb. P. V. Rev. Dact. no 0296 Jisp.

In individual cases I saw also plants with short leaves (normal habit), with long bracts and with a short spur.

***Dactylorchis maculata* (L.) Vermln.**

Dactylorchis maculata (L.) Vermln. in Stud. on *Dactylorch.* (1947), p. 68 & p. 130. = *Orchis maculata* Linnaeus, 1753.

a. var. genuina (Rchb. fil.) Vermln. comb. nov. = *O. mac. l. genuina* Rchb. fil. Icones Vol. XIII.XIV (1851), p. 65. Planta robustior quam in typo; inferioribus foliis, quarum maxima latitudo in medio aut paulo supra jacet, obtusis aut paululum acutis, non rotundatis; latissimo folio latiore quam 3 cm; pluribus saepe foliis bractei-formibus; omnibus foliis distincte separatis; floribus saepe majoribus quam in typo.

Plant more robust than the type. The lower leaves with their greatest width on or somewhat above the middle, obtuse or a little acute (not rounded), the broadest more than 3 cm wide; often with several bractlike leaves, all the leaves distant from each other; flowers often larger than in the type. Var. *genuina* is not the type of the species.

Type in Herb. Rchb. in Mus. Caes. Palat. at Vienna?

Icon: Ic. l.c. tab. 55, CCCCVII.

Exsicc.: Herb. P. V. Rev. Dact. no 0464 Overijssel; id. no 0465, 0466, 0467 Groesbeek; id. no 0469 a Puy de Dôme.

β. var. Traunsteinerifolia (Harz) Vermln. comb. nov. = *O. mac. var. Traunsteineriaefolia* Harz in Schlechtend., Langeth. & Schenk, Fl. v. Deutschl., ed. Harz, ed. 5 (1895), p. 260. Planta ad 60 cm alta; foliis anguste lanceolatis, acute terminatis, longis cum vaginis; longissimo folio, sc. altero, longitudine ampliore quam 15

cm; latissimo folio latitudine 1-1,8 cm; foliorum inferiorum maxima latitudine aliquantum, interdum autem multum supra mediam partem jacente; spica plerumque laxa et multiflora.

Plant up to 60 cm; leaves narrow lanceolate acute with long sheaths; the longest leaf (the second) more than 15 cm long and the broadest 1-1,8 cm broad, broadest somewhat or very much over the middle towards the top. Spike mostly loose and with many flowers.

Type: Herb. P. V. Rev. Dact. no 0432 Emminkhuizen (lectotype).

Exsicc.: id. no 0434 Puy de Dôme; id. no 0438 Groesbeek; id. no 0443 Dwingelo.

γ. var. *ovalifolia* (Beck) Vermln. comb. nov. = *O. mac.* var. *ovalifolia* Beck in Fl. Nieder-Osterr. 1. Halfte (1890), p. 204. Inferioribus foliis ovalibus cum apice rotundato, in media parte latissimis.

Lowest leaves broadest on the middle, oval, with rounded top.

Type: Vienne?

Exsicc.: Herb. P. V. Rev. Dact. no 0454 Vlagtwedde; id. 0451 Lheeër zand.

δ. var. *spathulata* Vermln. nov. var. Foliis infimis evidenter spatulatis, de basi angusta terminantibus in apicem latum rotundatum.

Lowest leaves distinctly spatulate, from a narrow base ending in a broad rounded top.

Type: Herb. P. V. Ref. Dact. no 0432 Emminkhuizen.

Exsicc.: id. no 461 c Ermelo.

ε. var. (or fa.?) *compacta* Vermln. nov. var. Foliis infimis in caulis basi compactis.

The lower leaves close together at the base of the stem, just above the ground.

Type: Herb. P. V. Rev. Dact. no 0462 Oldeberkoop (Fr.).

Exsicc.: Rev. Dact. 0461 a Ermelo; id. no 0458 Terschelling; id. no 0460 St-Michielsgestel.

Although the lower leaves of *D. maculata* are always more close together than the higher ones, this is very striking in this variety, for here all the complete leaves are together within a space of 3 cm. No doubt this is partly due to external circumstances: in bare places the plants often show this phenomenon. I do not believe, however, that it is the case with all plants.

ζ. var. *concolor* Vermln. Omnibus foliis cum cellulis summae epidermidis anthocyanatis; labello floris, marginibus aliquando exceptis, rubroviolaceo, non pallido-lilaceo.

Entire epidermis of leaf surface pervaded with anthocyanine and of dark colour; lip purplish red, except for its margins.

Found at Schijndel and near Brussels.

η. var. *lineata* Vermln. Maculis normalibus in superiore infimorum

foliorum superficie; parvis lineis obscure-violaceis in foliorum vaginis atque in caule.

Normal spots on upper surface of lower leaves, but also on leaf-sheaths and stem dark purplish-red lines.

Type: herb. P. V. Rev. Dact. no 0242 Groesbeek.

θ. var *immaculata* (Schur) Vermln. comb. nov. = *O. mac.* var. *immaculata* Schur (not seen) in Oesterr. Bot. Zeitschr. XX, 1870. p. 366. Foliis immaculatis. Leaves unspotted.

Sometimes between the other plants in certain %. Sometimes unspotted plants seem to form a whole population.

ι. var. *laxiflora* Vermln. nov. var. Spica anguste-cylindracea, foribus inter se evidenter remotis, etiam in initio florescentis status.

Spike narrow cylindrical with distinctly distant flowers; also in the beginning of floescence the flowers are clearly separated.

Type: Herb. P. V. Rev. Dact. no 0414, Groesbeek.

Exsicc.: Id 0432 Emminkhuizen.

κ. var. *densiflora* Vermln. nov. var. Spica late-cylindracea; floribus tam densis ut invisibiles sint bractee et flores vix se pandere possint.

Spike broad cylindrical, flowers so close together that nothing is seen of the bracts and the flowers have hardly space to unfold.

Type: Herb. P. V. Rev. Dact. no 0462, Oldeberkoop Fr.

Exsicc.: Id. 4075 Terschelling.

λ. var. *grandiflora* Vermln. nov. var. Labello latiore quam longiore, latiore quam 13 mm; sepalis lateralibus plerumque erectis, raro aliquantum patulis; calcari satis longo, circ. $\frac{2}{3}$ ovarii aut ovarium aequante.

Lip broader than long, over 13 mm breadth, lateral sepals mostly erect, rarely drooping, spur rather long, about $\frac{2}{3}$ × ovary or even as long as ovary.

Type: Herb. P. V. Rev. no 0462, Oldeberkoop (Fr.)

Icones nostr.: Fig. 12.

In this var. the midlobe is usually narrower but not shorter than the lateral lobes, as it is with *O. ericetorum* Linton. Moreover the spur of var. *grandiflora* is often thicker.

μ. var. *Terschellingensis* Vermln. nov. var. Labello fere obtriangulato, inferiore labelli parte fere horizontali aut rotundata, medio lobulo parvo; calcari tenui, prope filiformi, longiore quam dimidia pars ovarii.

Lip inverted triangular, the base about horizontal or rounded with small mid-lobe. Spur slender, nearly thread-like, longer than half the ovary.

Type: Herb. P. V. Rev. Dact. no 0459 T 2 (flower analysis).

Icones nostr.: Fig. 13.

v. var. *vexillum* (Lindman) Vermln. comb. nov. = *O. mac.* var. *vexillum* Lindman in K. Svenska Vet. Akad. Handl. 23, Afd. III no 1, 1897, p. 6. Labello statim se ex caldari dilatante; ovali forma aut fere rectangulata, non quidem quadrata; incisionibus haud profundis; tribus lobis brevibus, sed latis omnino satis parvis, medio praesertim lobo, qui saepissime duobus aliis lobis paulo brevior est.

Lip broadened from the spur, oval or rectangular in outline, incisions small, the three lobes short and broad, rather small, especially the midlobe, which is often somewhat shorter.

Icones: LINDMAN fig. I-II, l.c.; GODFERY, Icon. & Mon. p. 211, fig. I-II.

Exsicc.: Groesbeek, Emminkhuizen etc. (Herb. P. V.)

ξ. var. *vespertilio* (Lindm.) Vermln. comb. nov. = *O. mac.* var. *vespertilio* Lindm. l.c. Labello cuneatim se ex caldari dilatante, deinde ita se conformante, ut circuitus post angulum obtusum introrsus vergat postremoque post angulum acutum sursum flectat usque ad angustum triangularem lobum medium, effectis ita lateralibus lobis, qui rhombi speciem induunt.

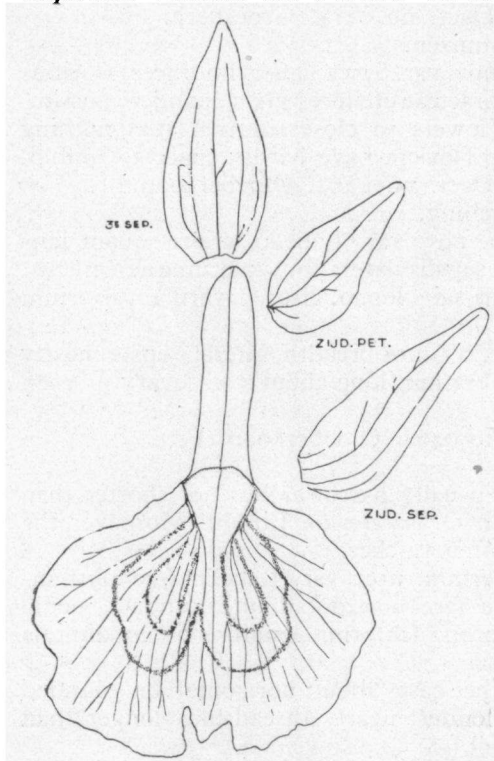


Fig. 12. *Dactylorchis maculata* var. *grandiflora* Vermln. Oldeberkoop (Fr.). $\pm \times 3$.

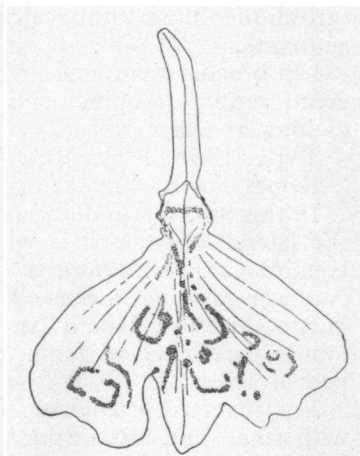


Fig. 13. *Dactylorchis maculata* var. *Terschellingensis* Vermln. Terschelling. $\pm \times 3$.

Lip broadened wedge-shaped from spur, with nearly straight margins somewhat narrowing, then bending inwards with an acute angle to the narrow, triangular midlobe, sidelobes nearly diamond-shaped.

Icones: LINDMAN l.c. fig. 19-25; GODFERY l.c. fig. 19-25.

Exsicc.: Herb. P. V. Emminkhuizen, Venlo (De Lev. Natuur IV, Aug. 1899).

In my opinion the var. *lyra* Lindman represents the type.

o. var. angustiflora Vermln. nov. var. Labello obovato, longiore quam latiore, circ. 9×7 mm in spicae medio, parve lobo medio exstante.

Lip obovate, longer than broad, about 9×7 mm in the middle of the spike, with small midlobe.

Exsicc.: Herb. P. V. Rev. Dact. 3720. Gouderak.

π . var. *Heinzeliana* (Reichardt em. Beck) Vermln. comb. nov. = *Orchis maculata* var. *Heinzeliana* Reich. em. Beck, Fl. Nied. Oesterr. 1. Hälfte 1890, p. 204 = *O. Heinzeliana* Reichardt in Abh. k.k. Zool. bot. Ges. XXVI, 1876, p. 464 (sub hybr. *O. maculata* \times *Gymnadenia conopsea*). Calcari ovarium aequante vel paulo longiore, circ. 11—12 mm. in spicae medio, saepe angustiore quam in typo.

Spur about as long as the ovarium or somewhat longer, 11—12 mm in the middle of the spike, often narrower than with the type.

The hybrid *O. maculata* \times *Gymnadenia conopsea* is much rarer than this var.

Exsicc.: Herb. P. V. Groesbeek, Gouderak.

o. var. candidissima (Krocker) Vermln. comb. nov. = *O. candidissima* Krock. Flor. siles. III, 2, 1814, p. 16. Tab. II. Floribus totaliter albis, non pictis, foliis immaculatis, polliniis flavis.

Flowers quite white, without lipmarkings, pollina yellow.

Exsicc.: Herb. P. V. Groesbeek etc.

Dactylorchis maculata subsp. elodes (Grisebach) Vermln.

D. maculata subsp. *elodes* (Griseb.) Vermln. in Stud. on Dactylorch. 1947, p. 68 = *Orchis elodes* Grisebach 1846 = *O. maculata* ssp. *elodes* (Griseb.) Camus.

a. var. ibericoides Vermln. Foliis infimis angusto-oblongo-obtusis, ceteris foliis minoribus et angustis; planta habitu *Orchidis ibericae* Marsch.-Bieb.

Lower leaves narrow-oblong-obtuse, the others smaller and narrow; plant with habit of *O. iberica* Marsch.-Bieberstein.

Icon for the habit: Rchb. fil. Ic. XIII.XIV, 1851, tab. 56.

Type: Herb. P. V. Rev. Dact. no 0484 Gennep.

Exsicc.: Id. no 0496, Overasselt.

The plant resembles *O. mac.* var. *nesogenes* Briquet, but this var. has in addition a loose spike, strongly tapering narrow sepals and petals and a deeply-three-lobed lip with narrow lobes. Not all the plants of the locus classicus in Corsica, where I gathered them myself, show these features. This var. *ibericoides* is limited to the general habit and the form of the leaves only.

β . var. *sudetica* (Poch ex Rchb. fil.) Vermln. comb. nov. = *O. maculata* var. *sudetica* Poch ex Rchb. fil. in Ic. XIII.XIV, 1851, p. 66. Planta macra, gracilis, humilis, foliis paucis, brevibus, plus minusve reflexis (\pm 3 foliis completis, latis minus quam 1 cm, longis ad 6 cm).

Spare, slender and low plant with few and short leaves, more or less recurved (about 3 complete leaves, less than 1 cm broad and to 6 cm long).

Icones: Rchb. l.c. tab. 56, I; Vermln. Stud. on Dactylorch. 1947, f (in the caption read f for g; d and e for e and f).

Type: Herb. Rchb. fil. at Vienne? Herb. P. V. Rev. Dact. 0481, Bourtangere veen (no 4) lectotype.

In the Bourtangere Moor the plants are anything but homogeneous, it is certainly a fact, that not only the type of *O. elodes* Griseb. occurs in the locus classicus; on the contrary, there are undoubtedly as many varieties as with a colony of the *D. maculata*-type.

γ . var. *vulgaris* Vermln. nov. var. Calcare longiore quam ovarii media pars, interdum ampliore quam in typo.

Spur longer than half the ovary, sometimes wider than with the type.

Type: Herb. P. V. Rev. Dact. 0483 Gennep.

Icones nostr.: Fig. 14.

Classification of genus *Orchis* Linnaeus emend. Vermeulen.

This genus is divided in the following sections and subsections:

I Sectio *Labellointegræ* Vermln. nov. sect. *Labellum indivisum* vel fere indivisum; bracteae fere aequae longae ac ovarium. Cum chromosomatibus 16 (*Saccatae* nondum examinatae).

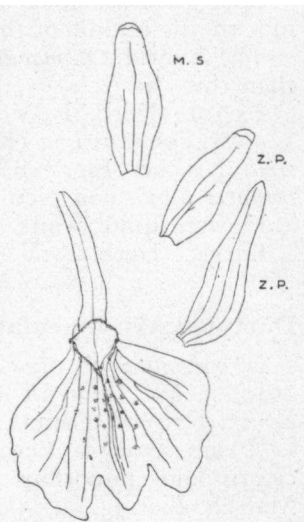


Fig. 14. *Dactylorchis maculata* ssp. *elodes* var. *vulgaris* Vermln. Gennep. $\pm \times 3$.

Lip undivided or nearly so, bracts as long as ovary. Chromosome number 16 (*Saccatae* not yet tested).

- a. Subsectio *Papilionaceae* Rchb. fil. Icon. XIII.XIV, 1851, p. 15 = sous-sect. *Papilionaceae* Parlat. ex Camus, Bergon, Camus: Mon. des Orch. 1908, p. 99 (sectio ap. Parlat.) = *Papilionaceae* Nevski Flora U.R.S.S. IV, 1935, p. 688. *Orchis papilionacea* L.; *O. caspia* Trautv.
- b. Subsect. *Saccatae* Rchb. fil. l.c.p. 35, 37 = sous-sect. *Saccatae* Parlat. ex Cam., Berg., Cam. l.c. cp. 139 (sectio ap. Parlat.) = *Saccatae* Nevski l. c. *O. saccata* Ten.; *O. chlorotica* Woron.; *O. Fedchenkoi* E. Czerniak.

II Sectio **Labellotrilobatae** Vermln. nov. sect. Labellum trilobum, lobis lateralibus rotundatis, lobo medio minore vel majore, raro subaequali, aliquando fere integro, saepius emarginate bilobo vel subbilobo. Cum chromosomatibus 18, (20), 21 haploid.

Lip threelobed, side-lobes rounded, midlobe shorter or longer, rarely of the same length, nearly undivided or often emarginated two lobed or nearly two-lobed. Chromosome-number 18(20),21 (haploid).

- a. Subsect. *Moriones* (Rchb. fil) Parlat. ex Cam., Berg., Cam. l.c.p. 102 = *Pictae* Nevski l.c.p. 686. Chromosome-number 18 haploid. *O. Morio* L.; *O. Morio* ssp. *picta* (Loisel.) Camus; *O. longicornu* Poir.
- b. Subsect. *Patentes* Nevski l.c.p. 685. *O. patens* Desf.; *O. Spitzelii* Saut.; *O. viridifusca* Albov.
- c. Subsect. *Masculae* Nevski l.c.p. 683. Chromosome number 21 (20) haploid. *O. mascula* L.; *O. pallens* L.
- d. Subsect. *Provinciales* Nevski l.c.p. 684. Chromosome 21 haploid. *O. provincialis* Balb.; *O. pauciflora* Ten.
- e. Subsect. *Laxiflorae* Nevski l.c.p. 680. Chromosome number 21 haploid. *O. laxiflora* Lam.; *O. palustris* Jacq.

III. Sect. **Coriophorae** Parlat. l.c.p. 468 = *Coriophoranthus* Schlechter in KELLER und SCHLECHTER, Mon. und Icon. I, 1928, p. 160, 209. Labellum trilobum, lobis lateralibus majoribus, oblique truncatis, lobo medio longiore, integro, acuto vel obtuso. Cum chromosomatibus 19 haploid.

Lip threelobed, side-lobes oblique truncated, mid-lobe longer, undivided, pointed or obtuse. Chromosome number 19 haploid.

- a. Subsectio *Coriophorae* Parlat. ex Cam. Berg. Cam.l.c.p. 133 = *Coriophorae* Nevski l.c.p. 681.
O. coriophora L.; *O. sancta* L.

IV Sectio **Militares** Parlat. l.c.p. 471 = *Heranthus* Schlechter l.c.p. 160, 211 = Sect. 2. *Anthropochilon* Nevski l.c.p. 690. Labellum in

circuito homiforme, duobus linearibus lobis lateralibus ad labelli basin affixis, lobo intermedio bifido vel apicem versus bilobulato-dilatato. Cum chromosomatibus 21 haploid.

Lip in outline resembling a human figure with 2 linear-lengthened side-lobes at the base, mid-lobe bifid or bilobed-divergent to the top. Chromosome-number 21 haploid.

a. Subsectio *Ustulatae* Nevski l.c.p. 690.

O. ustulata L.

b. Subsectio *Tridentatae* Nevski l.c.p. 691.

O. tridentata Scop.; *O. lactea* Poir.

c. Subsectio (*Eu-*)*Militares* Nevski l.c.p. 692.

O. militaris L.; *O. simia* Lam.

d. Subsectio *Purpureae* Nevski l.c.p. 694.

O. purpurea Huds.; *O. maxima* C. KOCH.

e. Subsectio *Punctulatae* Nevski l.c.p.695.

O. punctulata Stev. ex Lindl.; *O. Schelkownikovii* WORON.

Orchis Morio Linnaeus.

Orchis Morio L.

a. var. *valida* Vermln. nov. var. Planta fortior quam forma vulgaris, brevior quam 30 cm; bracteis infimis cum 7-9 nervis; floribus maioribus quam in typo.

Plant more robust than common form, under 30 cm, the lower bracts with 7-9 nerves and with bigger flowers than type.

Icon: De Lev. Nat. 21 (1917) p. 343, photo as var. *robusta*.

Exsicc.: Herb. P.V. 18 Mei 1934, Assendelft. Besides found in numerous places, such as Doetinchem, Bergen (N.H.), Limmen (N.H.).

The var. *robusta* in De Lev. Nat. probably refers to var. *robustior* Chenevard ap. Schulze. in Öst. Bot. Zeits. XLVIII (1898) p. 50, which, however, is said to be taller than 30 cm. I saw such tall specimens for instance from the neighbourhood of Clermont-Ferrand (Herb. Ch. d'Alleizette). ASCHERSON and GRAEBNER adopt var. *robustior* [Syn. III (1907) p. 666], but say: "Pflanze sehr kräftig, bis 3 dm hoch"; "bis" is evidently a misprint for "über". As far as I know LINDINGER did not describe a var. *robusta*. The robust habit of var. *valida* may be a genotypical characteristic (and if so, constant in culture), but this form may also be due to an active fungus in the soil or to very favourable conditions of the soil.

β. var. *irregularis* Vermln. nov. var. Floribus se aperientibus non ab imo usque ad summum, sed irregulariter.

Opening of flowers not upwards from the bottom of the spike but irregular.

Mentioned by HOOGENRAAD in De Lev. Nat. IV (1899) p. 47 and by SIPKES in De Lev. Nat. XXI (1917) p. 344. With *O. Boryi* Rchb. fil., which is akin to *O. Morio* and which is found in Crete, the spike opens from top downwards. Var. *irregularis* is found at Bergen (N.-H.) and Rijswijk (Z.-H.).

1. fa. *unilobata* Houzeau de Lehaie ex P. Vermeulen. Labello integro, sine mediolobulo, sed semper dentato.

Lip without mid-lobe, but often dentate.

Type: Herb. P.V. Limmen (N.-H.), 22 Mei 1943. Exsicc: Bergen (N.-H.).

The fa. was already distinguished but without diagnosis (nomen nudum) in Bull. Soc. Roy. Bot. Belg. LXI (1928) p. 3.

2. fa. *bilobulata* Houzeau de Lehaie ex P. Vermeulen. Labellum cum mediolobulo bipartito.

Lip with midlobe cleft in two.

Exsicc.: Herb. P.V. no. 61.01, Limmen (N.-H.), 28 April 1935 (type).

This fa. too was already mentioned in l.c. as a "nomen nudum". It is certainly found in numerous places.

Gymnadenia conopsea (Linnaeus) R. Brown.

Gymnadenia conopsea (L.) R.Br.

var. *friesica* Schlechter monstr. *foliosa* Vermln. nov. monstr. Foliis numero pluribus quam normaliter, multis foliis bractei-formibus.

More than normal number of leaves and also many bract-like leaves.

Exsicc.: Herb. Kerbert, 1035, sub *Orchis conopsea*, Breesaap, in Herb. Ned. Bot. Ver. Leiden sub *Gymn. conops.* var. *densiflora*. (19 leaves, 7 of which are bract-like).

Platanthera chlorantha (Custer) Reichenbach p.

Platanthera chlorantha (Cust.) Rchb. p.

a. var. *robusta* Vermln. nov. var. Planta robustissima, spica satis densa, foliis breve-petiolatis, latis plerumque plus quam 4,5 cm (longitudine $\pm 3 \times$ latitudinem superante).

Very robust plant with fairly dense spike. Leaves short-stemmed and more than 4,5 cm broad (length $\pm 3 \times$ breadth).

Exsicc.: Herb. Vuyck, Leiden: Geleenderbosch 22.6.1900; Herb. P.V. H. Höppner-Orchid. exsicc. fasc. II, no. 31. Wachendorf bei Münstereifel(type).

Platanthera bifolia (Linnaeus) L. C. Richard.*Platanthera bifolia* (L.) Rich.*a. var. spathulata* Vuyck em. Vermln. *P. bifolia* Rchb. f. fol. *longe spathulatis* Vuyck. Foliis longis et spathulatis.

Leaves long and spatulate.

Exsicc.: Herb. P.V. no. 82.06, Limmen (N.-H.), 1943.

β. var. brachyphylla Vermln. nov. var. Magna folia, sed brevia; altitudo plantae supra tuber 5 × vel amplius longitudinem folii laminae superat.

Big leaves short. Height of plant above the tuber 5 or more times length of lamina.

Type: Herb. H. W. GROLL, no. 17 (Ned. Bot. Ver.) Leiden, sub *Orchis bifolia* . . . bij Deventer.1. fa. *rotundata* Vermln. nov. fa. Apicibus infimorum foliorum rotundis, non acutis.

Leaftops of lower leaves round, not pointed.

Type: Herb. Ned. Bot. Ver. Leiden: Wanneperveen, Juni 1898, Goethart & Lako.

2. fa. *apetiolata* Vermln. nov. fa. Folia lamina apetiolata.

Lamina passing into leaf-sheath without stalk.

Type: Herb. P.V. no. 82.04 a Oldenhaverveld (Dr.) (type).

3. fa. *multifoliolata* Vermln. nov. fa. Duobus foliis normalibus, plus quam quinque foliis bracteiformibus.

Two normal leaves and more than 5 bractlike leaves.

Type: Herb. P.V. 82.12 Wageningen-Binnenveld.

Exsicc.: Herb. Ned. Bot. Ver. no. 900.209-36, Stamproy, Goethart & Jongm.

4. fa. *densispicata* Vermln. nov. fa. Spica densiflora, floribus plus quam decem per 5 cm.

Spike dense, more than 10 flowers per 5 cm.

Type: Herb. P.V. 82.12. Wageningen, Binnenveld.

γ. var. brevicarata Vermln. nov. var. Florum infimorum calcaribus longitudine unam et dimidiam ovarii partem non superantibus.Spur of lower flowers shorter than $1\frac{1}{2}$ × ovary.

Type: Herb. P.V. no. 82.04. a. Oldenhaverveld (Dr.).

Epipactis Helleborine (Linnaeus) Crantz = *E. latifolia* Allioni.*Epipactis Helleborine* (L.) Crantz.*a. var. neerlandica* Vermln. nov. var. Rhizomate multis radicibus, saepe in contabulatione; caule in inferiore parte plerumque violaceo, foliis brevibus, firmis, compactis; racemo brevior, aliquando

longiore, densifloro; axe densipubescente; ovario aliquando satis densipubescente; petalis violaceis; tuberibus parvis, non aut paululum rugatis in epichilio plus minus violaceo; rostello permanente.

Rhizome with many roots springing from the various nodes at different depths. Lower part of stem often purple, with short, firm leaves, placed close together. Raceme short to fairly long and densely flowered, axis rough with short hairs. Ovary sometimes fairly dense-hairy. Flowers with purple petals and small, slightly or not wrinkled bosses on heart-shaped, often purplish epichilium. Rostellum permanent.

Type: Herb. P.V. *E. latifolia* var. *neerlandica* m. Overveen, II.VIII.44 a (type), b.

SCHLECHTER (Mon. und Icon. Orchid. Eur. u. Mittelm. I (1928) p. 271) distinguishes this variety as var. *dunensis* Godfery of *E. latifolia*. On close comparison, however, of the diagnosis of *E. dunensis* Godfery with Schlechter's, it appears that the plant from our sand-dunes is quite different, among other things in the permanent rostellum. For this reason another name has been used.

β. var. *diversifolia* Vermln. nov. var. Planta robusta, in media caulis parte transitione inexpectata a foliis normalibus ad folia bracteiformia.

Robust plants, showing an abrupt transition between normal and bract-like leaves in the middle of the stem.

Type: Herb. P.V. *E. latifolia* var. *diversifolia* m. Teteringen (N.-B.), 29 Juli 1943, a (type), b; leg. pater Schouten.

γ. var. *densiflora* Vermln. nov. var. Racemo denso, in media floris aetate floribus 15 vel amplius per 10 cm (in medio racemo).

Raceme dense, in mid-florescence 15 or more flowers per 10 cm in the middle of the raceme.

Exsicc.: Herb. P.V. Oirschot (N.-B.), 21 Aug. 1941.

δ. var. *laxiflora* Vermln. nov. var. Racemo laxo; in media racemi parte floribus numero minore quam quindecim per 10 cm.

Raceme loose-flowered, fewer than 15 flowers per 10 cm in the middle of raceme.

Type: Herb. P.V., Höppner, Orchidac. exsicc. fasc. II no. 40, 23.VII.1920. Krefeld (type).

ε. var. *phoenicea* Vermln. nov. var. Floribus atropurpureis; sepalis quoque atropurpureis.

Flowers quite purple, sepals likewise.

Found at Castricum, Scheveningen (Herb. Van Soest).

ζ. var. *chlorantha* Vermln. nov. var. Floribus totaliter viridibus vel flavo-viridibus; labello quoque viridi vel flavo-viridi.

Flowers quite green to yellowish-green, lip likewise.

Found at Scheveningen.

Epipactis atrorubens Schult.*Epipactis atrorubens* Schult.

a. var. dilatata (Graber) Vermln. (comb. nov.) *Helleborine atropurpurea* (Rafin.) Schinz et Keller var. *dilatata* Graber: La Flore des Gorges de l'Areuse etc. Diss. Zürich (1924) p. 180. Foliis 4 (3-5), ovalibus, acuminatis, planis; internodiorum longitudine foliorum adjacentium longitudinem circiter aequante; summo folio bracteiformi non usque ad racemum pertinente.

Number of leaves 4 (3-5), oval, acuminate, flat, about as long as corresponding internodium. Topmost bract-like leaf not reaching to the raceme.

Exsicc.: Herb. Leiden. Sint-Pietersberg.

Hammarbya paludosa (Linnaeus) Kuntze.*Hammarbya paludosa* (L.) Kuntze.

a. var. robusta Vermln. nov. var. Planta robusta, foliis latis (\pm 1,8 cm), spica longa et densa.

Robust plant; leaves \pm 1,8 cm in breadth, spike long and dense.

Exsicc.: Herb. P.V. Ilperveld, 18.IX.1941, leg. Wim Meijer.

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