

effected by some of the small bees or beetles which frequent flowers.

The position of the two viscid disks (which are so prominently situated, and which have their upper surface viscid, instead of the under surface as is usually the case in Orchids) shows plainly their office as steps to the forum of the galeatic chamber, one to each receptacle.

This is the only instance that I know of amongst Orchideæ in which the adaptation suggests that the tarsi of insects are the agents of fertilization, although in Asclepiads this would appear to be in some instances the normal method.



Some Observations on the Fertilization of *Disa macrantha*. By
By J. P. MANSSEL WEALE, B.A. Oxon. (Communicated by
C. DARWIN, Esq., F.R. & L.SS.)

[Read November 23, 1870.]

THE diminution in size and simplicity of structure of the labellum in some species of the genus *Disa* would seem to indicate its little service as an attractor of insects and as a necessary appendage to the fertilization of the flowers, its office being replaced by the large and often gaily-coloured posterior sepal.

In the adjoining genus *Brownleea*, this reduction is so considerable, that it may be said to be in a merely rudimentary condition, and to have altogether lost the important function it usually holds in the order. Compared with some species of *Disa*, it is comparatively large in *D. macrantha*; certainly it is in relative proportions to *D. grandiflora*.

The back spurred sepal is, on the other hand, proportionally large.

The two lateral sepals, the petals, and labellum spread outwardly from the column, so as to form a salver-like opening to the funnel-shaped posterior sepal.

The colour of the blossom varies much, from nearly pure white with a few pale mauve spots on the petals and labellum, to a bright rich purple; sometimes the spots are small and indistinct, sometimes in large blotches, scarlet and almost orange.

It emits, especially towards night, an overpowering, heavy perfume, almost too strong to be agreeable.

In the normal position of the open flower the anther lies back, behind and above the stigma, nearly at right angles to the stigmatic surface. The caudicles rise upwards and forwards from the anther-case to their junction with the viscid disks. These are placed parallel to each other in the clefts of the lofty turret-like rostellum perpendicularly to, a little behind, and considerably above the stigma.

The disks are exceedingly viscid, and take some time to harden. On withdrawal the large heavy pollinium hangs down by its own weight, and freely dangles in the air, suspended by the long and flexible caudicle.

The plants generally grow in open gullies at the base of the "Kagaberg." I have, however, met with them on the mountain itself. They are generally surrounded by high grasses and herbaceous plants, and seem to prefer moderately sheltered and moist situations.

Nothing can be simpler than the fertilization of the flower. The brilliant colouring, the heavy perfume, the conspicuous size of the plant and flowers, are sufficient to attract both by day and night flying insects; and although I have never detected any in the act of fertilizing, nor seen any with the pollinia attached, I feel assured it must be frequently visited.

The plants bear abundance of seed—in which respect they differ from *Disa cornuta*, so far as my observations go, and from *Disa grandiflora*, according to Mr. Trimen (*vide* Journ. Linn. Soc. vol. vii. no. 27, p. 144).

There is one point, however, to which I would wish to draw attention, viz. *to the frequency of self-fertilization* in this species.

A very slight jerk, when the flower is fully expanded, suffices to eject the pollinia from their widely open anther-cases, and to bring them into contact with the stigma. This in nature is not unseldom the case, as I have repeatedly found many flowers thus fertilized. I am inclined also to think that an insect withdrawing the pollinia, attached as they must be to the lower portion of its body, would probably also fertilize the same flower.

The anther in this species is supine; in *D. cornuta* it lies still further back; but in *D. grandiflora* it assumes a position slightly more erect.

In the bud the anther is nearly quite erect, and the rostellum projects right in front of and over the stigma.

Both *D. grandiflora* and *cornuta* are comparatively sterile,

although apparently so well adapted for being fertilized by insects; yet in this species, where self-fertilization cannot be rare, the flowers produce an abundance of seed. Were the anther erect, as in the bud, or still more supine, as in *D. cornuta*, self-fertilization would be impossible, and other contrivances for fertilization would be necessary. This is the case in *D. cornuta*, where the pollinium undergoes an upward movement after removal.

I mention these circumstances with the view of seeing them worked out in other species.

At present it seems strange that out of three very conspicuous species the most fertile should be one frequently liable to self-impregnation.

Mr. Trimen, in the paper referred to, has aptly observed that *Disa grandiflora* seems to be a correlative case to that of *Ophrys muscifera*: it is curious that we should find the parallel carried out in *Disa macrantha*, an instance almost corresponding to *Ophrys apifera*, in which self-fertilization would appear to be the rule instead of the exception, and whose fertility is considerably greater than that of *O. muscifera*.

Notes on some Species of *Habenaria* found in South Africa. Abstract of a paper by J. P. MANSEL WEALE, B.A. Oxon. (Communicated by Charles DARWIN, Esq., F.R. & L.SS.)

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IN a species of *Habenaria* found in December 1869 and January 1870 on my farm "Brooklyn," nine miles from King William's Town, the contraction of the caudicle takes place principally at the end attached to the viscid disk, which is seen to be very much thicker than the portion attached to the pollinium when removed from the rostellum. So great is the tension when *in situ* that it is surprising the pollinia are not often dragged from the anther, or the disk from the rostellum.

The fertilization of the plant is simple in the extreme, as any insect settling on the bridge must almost certainly deposit one or both of the pollen-masses on the stigmata.

The plant does not appear to be visited by diurnal insects, but must be very attractive to nocturnal ones, as, although each spike bears many flowers, and the plant itself grows in considerable