NOTES.

ANOMALIES IN THE OVARY OF *SENECIO VULGARIS*, L.—

In all the species of Compositae examined hitherto, with the exception of *Taraxacum officinale*¹ and *Zinnia* spp.,² only one ovule has been reported in each ovary. Schwere¹ figures two ovules with embryo sacs in *T. officinale*, but in this case they were apparently basal. In the present investigation of *Senecio vulgaris* several abnormalities have been observed which are of phylogenetic importance. The occurrence of biovulate ovaries was noted in several instances, two of which are figured (Figs. 1 and 2). In the former case the archesporial cell is quite distinct, and a wall two cells thick extends across the ovary. The occurrence of a biovulate, bilocular ovary is interesting confirmation of the derivation of the unilocular ovary of the Compositae from the former type. Both ovules in this case were on

FIG. 1.

FIG. 2.

one side of the ovary, but in the latter case (Fig. 2), where there is no wall, the ovules are placed on either side of the ovary. The four ancestral placentae are thus indicated. In both cases the ovules are lateral. Numerous cases of single lateral ovules were observed in the younger stages (Fig. 3), and this is an abnormality of some importance. Particular care was exercised in determining that these ovules were truly lateral; the presence of conducting cells and the arrangement of the adjacent parenchyma leave no doubt as to the actual attachment of the ovule to the side wall of the ovary. The arrow in the figures indicates the position of the axis. Fig. 3 is a longitudinal section, tangential to the axis.

¹ Schwere, S.: Zur Entwicklungsgesch. der Frucht von *Taraxacum officinale*. Flora, vol. lxxxij, 1896.

² Don, D.: On the Origin of the Ligulate Rays in *Zinnia*. Trans. Linn. Soc., vol. xvi, 1829.

Warming¹ removes the Calyceraceae from the vicinity of the Compositae, and places them near the Dipsaceae on account of the ovule, which he distinguishes as 'apotrope', i. e. placed on the anterior wall of the ovary with the raphe anterior. He argues that if the basal ovule of the Compositae, which he designates 'epitrope', were displaced so that it was pendant, the raphe would become posterior, instead of anterior as it is in the pendant ovules of the Dipsaceae and Calyceraceae. This assumes that the displacement is in the median plane of the flower, but the present observations

FIG. 3.

of the orientation of lateral, i. e. displaced, ovules show that displacement takes place in the plane at right angles to the median plane. Therefore, if the basal ovule of the Compositae were displaced so that it became pendant, the raphe would remain anterior and the ovule would have the same position as in the Calyceraceae and Dipsaceae. This displacement in the lateral plane is just what might be expected, considering the obvious derivation of the unilocular ovary of the Compositae from a bicarpellary ovary in which the carpels were on the antero-posterior plane. Therefore the Calyceraceae, in accordance with the usually accepted opinion, may be allowed to remain near the Compositae.

Van Tieghem² also removes the Calyceraceae from the vicinity of the Compositae, and places them near the Rubiaceae on account of the ovule, but the value of the ovule in the classification of this portion of the Sympetalae has been somewhat over-emphasized considering the comparative frequency of these lateral ovules, which form a transition to the Calyceraceae and Dipsaceae.

JAMES SMALL.

ARMSTRONG COLLEGE,
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¹ Warming, E.: Observations sur la valeur systématique de l'ovule. *Mindeskript f. Japet. Steenst.*, 1913.

² Van Tieghem, P.: L'œuf des plantes. *Ann. sci. nat., Bot., sér. 8, t. xiv*, 1901.

Small, James. 1916. "Anomalies in the ovary of *Senecio vulgaris*, L." *Annals of botany* 30, 191–192. <https://doi.org/10.1093/oxfordjournals.aob.a089585>.

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