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Application of SEM for Studying the Changes in Apices of White Marigold (*Tagetes erecta* L.) to Form Flower

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Scanning electron microscopy (SEM) is a well established technique which has allowed a considerable advancement in studies on floral morphogeneses. Shoot tips of white marigold (*Tagetes erecta* L.) were dissected under a stereomicroscope magnified 9 to 40 times. The developmental stage of the apices was identified. The SEM technique was applied to study on the floral morphogenesis changes. Apices were fixed in 1% glutaraldehyde in 0.1 M phosphate buffer, pH 6.8, by adding fixative during dissection and then exposing to fixative for 2 h, during which time they were continuously rotated. The apices were then washed with three changes of 0.1 M phosphate buffer pH 6.8. Postfixation was with 1% osmium tetroxide in phosphate buffer pH 6.8 for 1 h. After washing in three changes of distilled water and dehydration using a graded ethanol series (30% to 100%), apices were critical –point- dried through carbon dioxide and stored in a desiccator for 2 d before being mounted on aluminium SEM stubs. The stubs were dagged with dag solution 154. The apices were examined and photographed using a Jeol JSM 6400 scanning electron microscope operating at an accelerating voltage of 5 to 7 kV coupled with Robinson backscattered electrons. Apices without pronounced swelling were considered vegetative. The intermediate phase or flower initiation phase showed as a mounding of the apex between two young leaves. The leaf premordia was still seen (Fig. 1). The prefloral phase appeared with the development of involucal bracts. The last set of leaves developed into involucal bracts. This was in order to be the base of the flower (Fig. 2) and covered the flower later on. Following, in the reproductive phase, the ray florests and the disc florests initiated and developed. These developments were from the outer whorl of the flower to the center of the flower (Fig. 3). At the end of the reproductive phase, the petal of both ray florests and disc florests were seen. Lastly, the stamens developed and the pistil initiated. This knowledge could be used to improve the size of marigold flowers.

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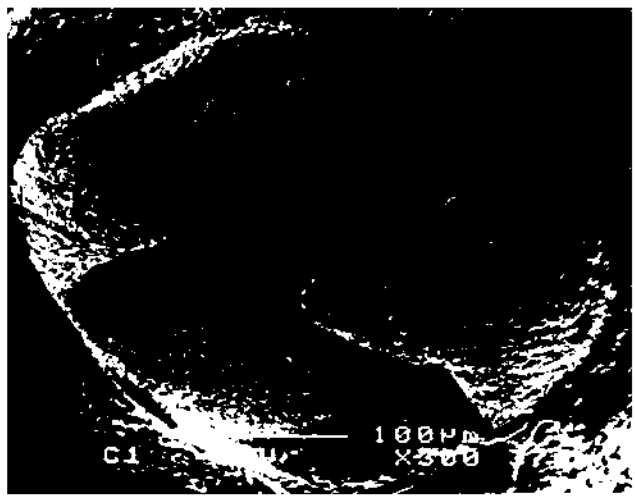

Figure 1 intermediate phase or flower initiation phase; showed as a mounding of apex (am) between two young leaves (l), the leaf primordia (l p) was seen.

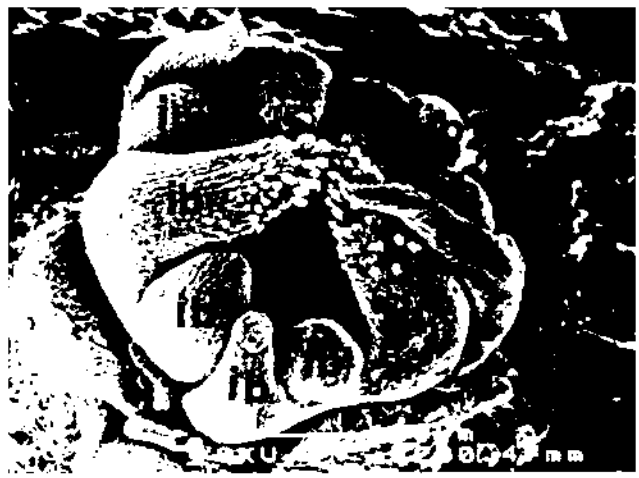

Figure 2 Prefloral phase; showed the development of involucal bracts (ib) which are developing from the leaves.

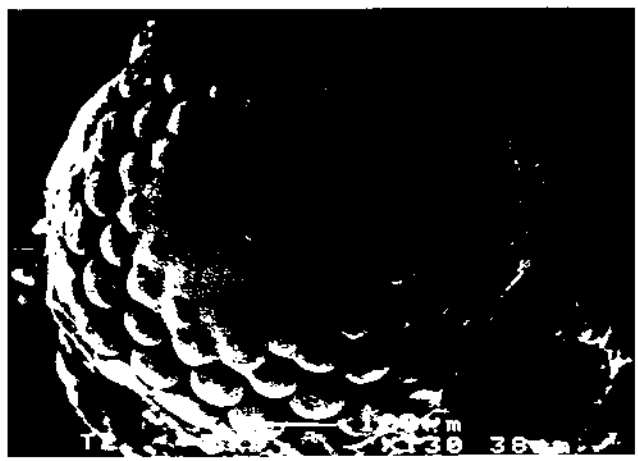

Figure 3 Reproductive phase; showed the development of the ray florests (r) and the disc florests (d), which devleoped from the outer whorl to the inner whorl of the flower from (am).