MORPHOLOGICAL AND PHYSIOLOGICAL ALTERATIONS IN AVOCADO SEX EXPRESSION ON THE ALMERIA COAST

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Avocado presents synchronous dichogamy. In this unusual breeding system every avocado flower opens twice. On the first day the flower opens as female and on the second day the flower reopens as male. The tepals close between the female and the male phase. During the female phase, the stigma is receptive, but the stamens are immature. In the male phase, stamens dehisce but the stigma is usually wilted. This pattern is followed simultaneously by most flowers in a single genotype. Genotypes are classified either as type A or type B according to their floral cycle. Type A and type B cycles complement. For a successful pollination pollen from flowers in their male phase must be delivered into flowers, usually of different cultivar, in their female phase. For the reception and transference of pollen, avocado must then attract pollinators in both female and male phases. This is achieved by the sequential production of floral rewards. During the female phase the staminods secrete nectar, as the truly nectaries do during the male phase being pollen an additional reward. During observations on ´Hass´ (type A) and 'Fuerte', 'Bacon' and 'Zutano' (type B), we have detected outstanding deviations of their floral cycle, that may bring some insight into the endogenous and environmental factors controlling the unique floral behavior of avocado. Many flowers, specially in 'Zutano', enter the male phase without the preceptory tepals closing. Female phase of ´Hass´ developed occasionally with an incomplete tepal aperture. More often, male ´Hass´ flowers lacked synchronization between the aperture of tepals and the dehiscence of the stamens. In these flowers, only some tepals and their corresponding stamens opened fully. Remaining tepals continued attached to the pistil and their annexed immature stamens under the tepals. These tepals and stamens opened the next day. We observed also that many male flowers remained open during the night, closing the next morning. The most frequent and perhaps transcendental alteration was the persistence of an apparently receptive stigma during the first hours of the male phase. Timing of nectar production also suffered changes. Staminodes extending nectar secretion during the male phase, and truly nectaries starting nectar production in the female phase were occasionally detected and seemed to increase their attraction to bees. These physiological alterations were more common during cool days. Morphological alterations as tepal conversion in stamens, stamens converted in nectaries and fused pistils were also observed. Circumstances and consequences of theses alterations will be discussed.