

ABSTRACT

A comparative study was undertaken of the wild type species of *Warszewiczia coccinea* as well as the 'David Auyong' cultivar, with a view to recording the floral biology and establishing cytological relationships.

Studies of development of the flower were carried out on stained paraffin embedded sections while cytological studies were carried out on fresh acetoorcein preparations of root tips of seedlings and anther cells. In vitro studies of pollen behaviour were carried out on pollen grains germinated in 4% sucrose solution and stained with acetoorcein. Seeds were germinated and anatomical/morphological studies were carried out on seedlings cleared in lactophenol and stained with cotton blue.

Results obtained show that the only morphological difference between the wild type and the 'David Auyong' cultivar is the larger number of transformed calyx lobes in the latter. The flower is protogynous. In the young bud the receptive stigma is elevated above the other floral parts. Later, due to growth of the filaments and corolla tube, the mature anthers are

elevated above the stigma.

Anthers develop along typical Rubiaceae lines, the epidermis and middle layers of the wall persisting throughout development while the tapetum is used up during development of the microspores. During meiosis microspore mother cells become surrounded by a thick gelatinous wall, which later surrounds the microspores. More than 80% of pollen grains are well formed and produce pollen tubes.

Warszewiczia coccinea is a many seeded species of Rubiaceae. The embryo sac is neotenic, pollination occurring before it reaches maturity. Neoteny also occurs in the seedling which emerges without a radicle. The protomeristem of the root is embedded in tissue at the base of the hypocotyl. The newly emerged seedling has a set of root hairs at the base of the hypocotyl. As the root apex is formed another set of root hairs arises. Thus older seedlings possess two sets of root hairs.

Cytologically, the 'David Auyong' cultivar is similar to the wild type, both containing 44 chromosomes in the diploid nucleus. Associations of chromosomes have been observed to occur in

Warszewiczia coccinea and several hypotheses have been advanced as possible explanations for this.

Finally, an attempt was made to establish relationships between *Warszewiczia coccinea* and other members of the Rubiaceae.

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