ABSENCE OF MICROSPORE POLARITY, SYMMETRIC DIVISIONS AND POLLEN CELL FATE IN *BRACHIARIA DECUMBENS* (GRAMINEAE).

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In the alternation of generations in plants, meiosis marks the transition from sporophyte to gametophyte. The production of fertile pollen involves a large number of genetically controlled physiological, biochemical and morphological processes within the flower. Mutations that impair the development of the stamens, differentiation of the sporogenous cells, meiosis, development of the free microspores, microspore mitosis, pollen differentiation or anthesis can result in male-sterile plants. Unfortunately the genus *Brachiaria* have been poorly studied on its cytological basis. Efforts to understanding the cytology of the genus are currently in progress. The meiotic division and male gametophyte development were analyzed in one tetraploid (2n=4x=36) accession of *B. decumbens* that showed pollen sterility. The meiotic process was typical of polyploids, with multiple chromosome associations. Precocious chromosome migration to the poles, laggards and micronuclei formation were abundant in both meiosis resulting in tetrads with some micronuclei. After callose dissolution, microspores were released into the anther locule and seems to be normal. Each microspore initiated its differentiation to pollen by the pollen mitosis, but not showing nucleus polarization. The peculiar hemispherical cell plate was not observed. The division was symmetric and the microspores lack differentiation between the vegetative and the generative cell. Both nuclei were of equal size, presented equal chromatin condensation, and showed spherical shape. After the first pollen mitosis, each cell suffered a new symmetric mitosis, also without nucleus polarization. At the end of the second pollen mitosis, four equal nuclei were observed in each pollen. After cytokinesis, the cells gave rise to four pollen grains equal sized that initially remained together, with a similar tetrad configuration. A mutation acting sporophytical and gametophytically, similar that found in this accession of B. decumbens, was never described in other species. Although sterile pollen grains resulted from this abnormal pollen mitosis, seed production in this accession is normal, confirming that the mutation is not affecting seed development and that the accession reproduces by apomixis. Órgão Financiador : CAPES