SUMMARY

Sweet flag (*Acorus calamus* L.) belongs to a family of non-woody taro plants that live in watery environments. The roots, leaves, and rhizomes of *A. calamus* are reported to have antimicrobial and insecticidal properties so that they can be used in the prevention and treatment of several diseases, including rheumatoid arthritis, inflammatory arthritis, and digestive disorders. Despite its potential use as a medicinal plant, the main drawback of *A. calamus* is that it has low genetic diversity. The Indonesian variety of *A. calamus* is considered triploid, which means it is sterile and, therefore, cannot be hybridized or crossbred to increase its genetic diversity. Thus, induced mutation is necessary to enhance its genetic diversity. In vitro mutagenesis, a technique that combines in vitro culture with irradiation provides an opportunity to achieve the goal of enhancing genetic diversity of *A. calamus*. The objectives of this study are to determine the radiosensitivity of in vitro shoots of *A. calamus* L. resulting from gamma irradiation and to evaluate the growth of in vitro shoots of *A. calamus* L. resulting from gamma irradiation.

This research used a completely randomized design method with eight irradiation doses: 0, 10, 25, 50, 100, 150, 200, and 250 Gy, with three replications for each treatment. The dependent variable in this study was the in vitro shoot growth. The independent variable was the gamma irradiation dose. The parameters measured including the number of shoots, the number of leaves, the number of roots, and radiosensitivity. The result showed that *A. calamus* in vitro shoots exhibited radiosensitivity at 58,8 Gy. The in vitro growth of *A. calamus* is strongly impacted by gamma irradiation, including the development of the shoots, leaves, and roots. The root is the most radiation-sensitive organ.

Keywords : *Acorus calamus, gamma irradiation, in vitro, radiosensitivity.*