Abstract

Cyathea atrovirens occurs in a wide range of habitats in Brazil, Paraguay, Uruguay and Argentina. In the Brazilian State of Rio Grande do Sul, this commonly found species is a target of intense exploitation, because of its ornamental characteristics. The in vitro culture is an important tool for propagation which may contribute toward the reduction of extractivism. However, exogenous contamination of spores is an obstacle for the success of aseptic long-term cultures. This study evaluated the influence of different sterilization methods combined with storage conditions on the contamination of the in vitro cultures and the gametophytic development of C. atrovirens, in order to establish an efficient propagation protocol. Spores were obtained from plants collected in Novo Hamburgo, State of Rio Grande do Sul, Brazil. In the first experiment, spores stored at 7 o C were surface sterilized with 0.5, 0.8 and 2% of sodium hypochlorite (NaClO) for 15 minutes and sown in Meyer’s culture medium. The cultures were maintained in a growth room at 26±1ºC for a 12-h photoperiod and photon flux density of 100mol/m 2 /s provided by cool white fluorescent light. Contamination was assessed at 60 days, and gametophytic development was scored at 30, 60, 120 and 130 days of in vitro culture, analyzing 300 individuals for each treatment. There was no significant difference in culture contamination among the different sodium hypochlorite concentrations tested, and all treatments allowed for the development of cordiform gametophytes at 130 days of culture. In the second experiment, spores stored at 7 and -20°C were divided into two groups. Half of the spores were surface sterilized with 2% of NaClO for 15 minutes and the other half was not sterilized. All spores were sown in Meyer’s medium supplemented with one of the following antibiotics: nystatin, Micostatin® and actidione. The culture conditions and the procedures used for evaluating contamination and gametophytic development were the same described for the first experiment. No contamination was observed in spores stored at -20°C and treated with NaClO and actidione. In all treatments, cordiform gametophytes presenting antheridia were observed at 120 days. The percentages of these gametophytes increased from 120 to 130 days and no significant differences were observed among treatments. Archegonia were observed on cordiform gametophytes at 130 days. The findings provide data relevant to in vitro propagation procedures of this species, which may increase the availability of plants for ornamental purposes, therefore contributing to the reduction of the exploitation of endangered tree ferns species. Rev. Biol. Trop. 62 (1): 299-308. Epub 2014 March 01.
Keywords
Actidione, antibiotic, gametophyte, germination, in vitro culture, surface sterilization, tree fern.