

ABSTRACT

The development of information technology is increasing alongside the advancement of paludariums. Paludariums serve as home decorations by creating miniatures resembling natural dioramas with elements such as rocks, wood, water, and plants. Plants, particularly moss, play a crucial role in the beauty of paludariums. Moss requires specific attention to ensure its growth and health. The ideal air temperature for moss is 29°C, with air humidity around 68%, and optimal soil humidity for moss growth is 65%. Moss plants also need light for the photosynthesis process, with an ideal exposure not exceeding 12 hours. To address these challenges, the implementation of a PID method in the paludarium plant care system is proposed, utilizing pulse PWM output to control a 12V water pump for maintaining soil moisture, a 12V cooling fan for regulating air temperature, and a mist maker for managing soil humidity. Consequently, the plant care system in paludariums can maintain stability in parameters such as soil humidity, air temperature, and air humidity. The PID system implementation successfully increased soil humidity from 20% to 66%, with a steady-state error value of 1.53%. The overshoot level of 6.15%, time rise of 33.846 seconds, and time settling of 87.138 seconds demonstrate the responsiveness, efficiency, and capability of the system to achieve stability. The integration of these elements in the paludarium plant care system provides a comprehensive and effective solution for maintaining the environmental balance of plant growth.

Keywords: *internet of things (IoT), moss, Paludarium, PID*