



UNIVERSITY OF
HOHENHEIM

**Establishment, multiplication and in vitro
regeneration of guava (*Psidium guajava* L.)**

Master Thesis submitted by

Andrea Christina Kauk (624130)

Program of study: Agricultural sciences

Stuttgart-Hohenheim, 12th of March 2018

In collaboration with:

University of Hohenheim

Universidad de Costa Rica

Institute of Crop Science (340)

Centro para Investigaciones en Granos y
Semilla

Stuttgart-Hohenheim, Germany

San José, Costa Rica

Supervisors:

Prof. Dr. Simone Graeff-Hönninger

Prof. Dr. Wilhelm Claupein

This work was financially supported by the Foundation fiat panis

Abstract

Guava (*Psidium guajava* L.) belongs to the family of Myrtaceae and is grown in the subtropics and tropics all over the world. The cultivar 'Cuba x Perla' is a crossbreed of two different cultivars. It is characterized by a high amount of sugar, large size and pink fruit flesh. Along a high amount of sugar contained in the pink pulp there are also several micronutrients like vitamin A and C, therefore it is interesting for combating hidden hunger in developing countries. Facing the problem of asexual propagation, which requires a lot of time, micropropagation is a method providing a large amount of genetic identical progenies within a short time. However, *in vitro* propagation of this hybrid has to be improved as problems occur in all steps of micropropagation.

Within this study, plants grown under greenhouse conditions were sprayed with the fungicides Benomil 50 WP (Compañía Costarricense del Café, Costa Rica) and Acrobat® (BASF) throughout the growing period of the buds, to prevent a high contamination of the explants. The contamination of terminal buds after being sprayed for one month, was 91 %. After pruning these plants were treated for the entire growing period of the buds and showed a contamination of 36 %. The frequent change of the culture media to reduce phenolic exudation of the explants did not show improvements regarding their growth. Low sprouting activity and a slow elongation of new shoots were treated by applying different plant growth regulators to Woody Plant Medium (WPM +BAP) with 3% (w/v) sucrose and 0.6% (w/v) agar. A supplementation of 0.5 mgL⁻¹ 6-Benzylaminopurine (BAP) and 0.5 mgL⁻¹ BAP with 0.1 mgL⁻¹ 4-[3-Indolyl]butyric Acid (IBA) to WPM had the highest shoot proliferation and elongation effect. Shoot tip necrosis appeared at one shoot at a length of 3.5 cm. To avoid further shoot tip necrosis, shoots of one centimeter were rooted. Root induction was most successful when no plant growth regulators were added to the media with a root induction of 90 % within two weeks. Rooted plantlets were transferred to the greenhouse with a survival rate of 90 % after five weeks of the transfer.