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Soilless Culture of Pak Choi and Tomato in Iquitos (PERU)

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Abstract

In the tropics, unfavourable soil properties, extreme climate conditions and periodical floodings of cultivable land cause complications in the conventional horticultural production. Such a situation is found in the area of Iquitos in the Peruvian Amazon rainforest. There, techniques of soilless culture represent an opportunity to cultivate high-value crops year-round. By the use of simplified methods, soilless cultivation offers underprivileged populations to provide themselves with healthy vegetables. This way they have the ability to take care of their own needs and are economically independent. In Iquitos a study was conducted to the usefulness of soilless cultures to produce healthy vegetables, *e.g.* the leafy vegetable pak choi and different tomato cultivars under the special focus of different available substrates. In these trials the plants were cultivated in open systems with substrate and a standardised nutrient solution. Pak choi was cultivated in different substrates and plant container systems. After harvesting, health promoting glucosinolate contents of pak choi leaves were determined. Tests on tomatos were conducted with different cultivars using the same type of substrate and plant container. After harvest the tomato fruits were analysed for their physicochemical characteristics as well as carotinoids and amount of total phenolic substances. In all cases the collected data of the soilless culture were compared with data derived from conventional produced market crops, respectively with data of reference and conclusions were drawn about the value of soilless cultivation. Comparing data from of soilless cultures with conventional cultures did not show any significant difference in the amounts of glucosinolate in pak choi or of total phenol content and lycopene content in the different tomato cultivars. In contrast, hydroponically grown tomato showed a lower value of β-caroten and ash as well as a higher amount of fat, protein and carbohydrate. These parameters mainly depend on plant nutrition which could not be compared. Yield in hydroponically grown tomato have been high enough to produce economically tomato and pak choi even during off-season. Overall, soilless culture in Iquitos proved to be an acceptable cultivation method, especially for self-supply of underprivileged people.

Keywords: Secondary metabolites, self-supply, simplified hydroponics, soilless culture, tropics

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