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Habanero chili plants: Hardness dependency on the type of soil

Ramirez-Sucre M O and **Rodríguez-Buenfil I M**
CIATEJ, Mexico

Statement of the Problem: The Habanero chili of the Yucatan Peninsula (Mexico) has its appellation of origin since 2010. This is of great economic importance: 80% of the total annual production is commercialized as fresh fruit. The fruits of *Capsicum chinense* contains phytochemicals like fatty acids, essential oils, pigments, resins, minerals, and pungent compounds (capsaicinoids) which concentration varies depending on the variety of chili, climatic conditions, fruit maturation stage and type of soil. Soil conditions in the southeastern region makes the states of the Yucatan peninsula the main producers of habanero. The aim of this study was to analyze the development of habanero chili plants in three types of soils: stony (0 ch'ich 'lu'um), black (Box lu'um) and red (K'aankab lu'um).

Methodology: The hardness was measured (2-4 tests) using a downward compression polarity and a displacement and speed limit of 1.0cm/min and 2.0cm, respectively, to samples of the stem, leaves, or fruit obtained from plants harvested on days 7, 13, 20, 40, 53 and 75.

Findings: The stem increased its hardness during the lifetime elapsed, with maximums of 89.94, 61.15, 112.12N for stony, black and red soils, respectively, while the leaves reached a maximum hardness at day 13 (<4.50N) from which it decreased. The still green fruits presented a hardness of 21.53 for stony, 32.15 for black, and 37.04N for red soils. The values of fruit harvested in stony soil (~20N) allowed to significant texture structuration after 12 days of matured orange fruits (>75N).

Conclusion & Significance: Habanero plants develop texture during the experiment time, unlike leaves. The fruit hardness values showed a significant increase. Correlating texture for determining the physiological state of the *C. chinense* plants (nutrition, turgidity) and the quantity of capsaicinoids is a priority to define the best harvest time and the best soil type.

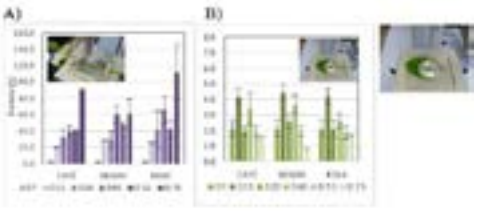

Figure 1: Hardness of habanero chili plants (for 75 days): A) stem and B) leaves. Image on the top: methodology

Recent Publications:

1. Butcher J Crosby K, Sun Y K and Patil B S (2012) Environmental and genotypic variation of capsaicinoid and flavonoid concentrations in habanero (*Capsicum chinense*) peppers. HortScience 47(5):574–579.
2. Canto-Flick A, Balam-Uc E, Bello-Bello J, Lecona-Guzman C, Solís-Marroquín D, Aviles-Viñas S, Gómez-Uc E, López-Puc G and Santana-Buzzy N (2008) Capsaicinoids content in habanero pepper (*Capsicum chinense* Jacq.): hottest known cultivars. HortScience 43(5):1344-1349.

Biography

Ramírez-Sucre M O has his expertise in rheological evaluations. He belongs to the National Research System, Mexico since 2013. He is a coordinator of the strategic alliance for the sustainable development of the South Pacific Region (ADESUR) in 2016. For four years he was in charge of the pilot plant in the Southeast Unit of CIATEJ; responsible of five projects, two of which are technological developments, they will produce final products for and exportation; eight international publications related to rheological and mechanical properties of food; One patent application (MX / a / 2014/015444: Microaspersion Drying Process of the Hesperidin / Cyclodextrin complex); One academic exchange (Institute of Agrochemistry and Food Technology, Valencia, Spain) for the study of protein-hydrocolloid interactions and Director of four thesis. He is a coordinator of various subjects like Food Physics, Food Chemistry, Economic Engineering.

oramirez@ciatej.mx