



Mini Review

Volume 14 Issue 4 - March 2018

DOI: 10.19080/ARTOAJ.2018.14.555926

Agri Res & Tech: Open Access J

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New Trend in Vegetable Production: Tomatillo



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Submission: February 15, 2018; **Published:** March 13, 2018

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Abstract

The present study was conducted to evaluate the germination percentage of the tomatillo seeds and physico-chemical properties of tomatillos at the Horticultural and food chemical Lab of Agricultural Faculty. The titrable acidity was 12,30g/l, pH was 3,87 and average weight without husk was 11,59g/berry. Diameter and length were measured as 2,74cm and 2,09cm respectively. The germination percent was found 25% due to the insufficient maturation. Pectin content was measured 0,82gram/10 gram. This study reveals that tomatillo can be grown in the northwest part of the Turkey (Marmara region, Trace region) and can be consumed as fresh and dry fruit or by-products in food industry such as marmelade, pickle, sauce.

Keywords: Tomatillo; *Physalis ixocarpa*; Wild species; Vegetable; Phytoremediation

Introduction

Tomatillo is belong to *Solanaceae* family like tomato, potato and tobacco. *Physalis* is a Greek word inferred to 'bladder-pouch' which refers to swollen flowers [1]. The name of tomatillo, *Physalis ixocarpa* Brot. become known in English tomatillo, husk tomato, jambeey, in Spanish; tomate de cascara, tomate de fresadilla, in Mexico; tomate milpero, tomate verde, tomatillo and Guatemala; miltomate [2]. From ancient times it has become a vegetable spreading from the South of the United States to Mexico-Guatemala and tomatillo lead the way the indigenous communities in there called Mesoamericans, have built up their livelihood based on agriculture [2]. Particularly, 78% of 90 *Physalis* species grow in Mexico in wide scope the from North America to Argentina [3]. During to the improvement of technology and industry, the agricultural sector has also developed, tomatillo taking its place cost-efficient and a manufactured product [4]. Tomatillo has the potential to become a commercial exotic vegetable that attracts attention in the food industry all over the World. Tomatillos are valuable products that exported to from several countries such as Colombia, Egypt, Zimbabwe, Kenya, Madagascar, South Africa and Asia to around the World. Among these countries, it is the most produced, consumed and exported vegetable (2nd rank of 15 vegetables or fruits) in Colombia [5,6].

The ash content of tomatillo is 7,3-7,8%. Tomatillos has less iron content and higher sodium level than tomatoes and also is rich in magnesium [7]. Organic acid composition in tomatillo is

high based citric acid while it contains more organic acid than fresh and cooked tomatoes [8]. Tomatillos contain 7% reduced sugar. In their fresh consumption, they contain less fructose and more glucose and sucrose than tomatoes. With cooked forms, fructose and sucrose increase while glucose decreases. In case of cooked tomatillo ensamples, the amount of glucose is less than that of cooked tomatoes and the quantity of sucrose is higher than that of cooked tomatoes, sucrose degree is higher and the fructose values are the equal [8]. Tomatillo comprise deconic acid and 3 times more fatty acid. In cooked tomatillos, it was observed that the amount of linoleic acid enhanced and deconic acid decreased. The presence of polyunsaturated fatty acid preserves the public health and diminishes the risk of cardiovascular diseases [8,9].

The total of pectin which is obtained from tomatillo (EA:13,9-18,3kJ/mol) is less than blackcurrant/apple (EA:32-39kJ/mol) and ad orange (EA:25kJ/mol) though, due to the activation energies of pectin formation, it is more qualified than others. In addition, the pectin of tomatillo was found having higher fragility than citrus by penetration test. Therefore, using of tomatillo origin pectins in food formulations has high potential [10-12]. A total of 52 volatile components were identified in fresh tomatillos, 22 items which were tomatillo includes; hydroxy esters, aromatic esters, decanoic acid and terpens specifically. These phenols have antioxidant and antiseptic properties

[8]. Furthermore, ixocarpalactones A ve B, ixacarpanolide, dihidrowithanolideD, with a physacarpin, philadelphicalactones A and B, 18-hydroxywithanolide D, 2,3 dihydroixocarpalactone B, 4 β , 7 β ,20R-trihydroxy-1-oxowitha-,5-dien-22,26-olide ve physalin B are isolated from *Physalis* (tomatillo) plant. These carcinogenic structures may be used in the pharmaceutical industry [13].

Tomatillo is high resistant to viruses and pesticides due to the special glandular structure in its leaves. Many species of *physalis* are thought to be well tolerated against viral diseases [14,15]. It is believed by inhabitant in Mexico, that the high lysosomal activity in the pod (based on 45/100-egg white is 100 degree) with some of the sticky sucrose esters surrounding the fruit protect tomatillo from insects and fungi [16].

Tomatillo has a flower structure of 5 (5 sepals and 5 petals). When the leaves are adjacent to each other and green, the petals are bright yellow. The characteristic of tomatillo is the intense growth of the flowers, after the focantancy of the bear, the fruit envelope during flower development [15]. Tomatillo is a climacteric fruit with under specified temperature and humidity conditions (+5 °C ve 75-80 %) to retain an acceptable level of quality attributes [17].

Discussion

In general, tomatillos consume freshly and they are used in soups, sauces and particularly green sauces which are typical for Mexican and Guatemalan cuisines. Mexican green sauce called 'Enchials verde' exhaust with chips. Another method of evaluation is making jam or canning [18]. In addition to its general use, tomatillo has also started to be used in trending fusion cooking currents. Leaves surrounding tomatillos are used amateurly to improve the rheological properties of dough in bakery products and to enrich with rice flavor. The investigate of tomatillo and its plant for their compatibility with other basic products in the food sector will also contribute greatly to the formation of new gastromomic tastes. From unexplored parts of tomatillo; It is essential to conduct academic studies in areas such as dry form consumption, sucrose esters, phenolic structure, phytoremediation (soil and wastewater treatment). Besides to revitalizing unsuitable soil types and respirable atmosphere, the husks which are surrounding the tomatillos are quite successful in elimanting heavy metals (Ni, Cd, Cu etc.) in contaminated water. Tomatillo plants were used to remove soil and water pollution, like a bio absorber of metals such as iron and manganese, which give a metallic taste to the water. By this way, harm to the environment and human health can be reduced by growing tomatillo in the contaminated soil of the industrial area [19-21].

Finally, the use of tomatillo as a food additive to the food industry as a protective component to increase the consumption of more reliable and natural products can be targeted.

Conclusion

Tomatillo adapt to the climatic conditions in Turkey will increase crop efficiency and tomatillo cultivation in Turkey. More than one harvest in a year may bring economic vitality to agriculture. In addition tomatillo facilitate to find fresh products in markets. Also high mineral content (like Mg, K and Fe etc.) and involve superior pectin can thought to be suitable for use in food processes such as jam and marmelade. Furthermore tomatillo has a similar antiinflammatory effects such as aspirin, ibuprofen and naproxen medicines in the pharmaceutical industry. Medical researches of tomatillo extractions in cancer prevention empirical studies might bring out that beneficial in promoting and sustaining the consumption of this plant itself and its products.

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DOI: [10.19080/ARTOAJ.2018.14.555926](https://doi.org/10.19080/ARTOAJ.2018.14.555926)

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