

PDF - DETERMINATION OF THE VARIABILITY TRAIT EXISTING BETWEEN THE EXOTIC AND LOCAL CULTIVARS OF TOMATO - researchcub.info

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Tomato (*Solanum lycopersicon* L.) is one of the most widely and important cultivated crops in Africa (Opena, et al., 1990). Tomato is the world's largest vegetable crop after Potato and sweet potato, but it tops the list of canned vegetables. In Nigeria, Tomato is recorded as the important vegetable after Onion and pepper (Fawusi, 1987). It is an important condiment in most diets and a few cheap sources of vitamins, with a large quantity of water (%), calcium (%), and Niacin all of great importance in the metabolic process of man. Tomato can be grown in a variety of geographical zones in open fields or in greenhouses (screen house), and the fruit can be harvested manually or by mechanical means. In 2014, the global area cultivated with tomatoes was 5 million hectares with a population of 171 million tonnes. The major tomato-producing countries are China and India. (FAO, 2017). Under certain conditions such as pruning, weeding, irrigation, frost-free environment, etc., the crop can be perennial or semi-perennial, but for commercial purposes. It is considered as annual (Geisenberg and Steward, 1986).

Although there are many types of growing systems for greenhouse tomatoes, the two principal cropping systems are: "Two crops per year and one crop per year", its significance doesn't lie only on profit, but also on the income generated in the local economy for farmers and agricultural workers (Guldinez, 2013). There are several categories of protected vegetable production methods which provide some degree of control over various environmental factors such as: greenhouse, tunnels and covered fields (Nieves-Garcia et al., 2011). Although there is no quantitative record about the world's vegetable production in greenhouses, some calculations have been made. For example, in 2012, the greenhouse vegetable production was about 81 million kilograms (kg), of which 40 million kg of the total production was tomato, and 37 million kg was cucumber. More so, in 2012, the tomato production in Northern America accounted for about 52% of the market in Canada and 22% of the market in the United States (from Credit Canada, 2012). But tomato production in Nigeria is low as compared to those of temperate zones due to differences in cropping environment conditions, lack of high yielding varieties, and cultural practices applied to the crops in the field. Commercially, tomato fruit can vary in colour, size and shape (Vaughan and Heissler, 1997). The fruit contains a large quantity of water, vitamins, minerals such as lycopene (which gives the fruit its predominantly red colour) and beta-carotene (which contains up to 3% sugar of the fresh fruit weight). Tomato also contains tomatine and alkaloids with fungicidal properties. Tomatine concentration decreases as the fruit matures which helps to determine the taxonomy of the species. Therefore, it can be useful (OECD, et al., 2018). Tomato is one of the best studied cultivated dicotyledonous plants at the molecular level and has been used as a model species for research into gene mapping, characterization (example pathogenic resistance gene) and gene transfer approaches. It is also useful to study other plant traits such as fruit ripening, hormonal function and vitamin synthesis (Chetelat, et al., 2006).

1.2 Origin and distribution of tomato

The edible tomato, often red berry of the plant *Solanum esculentum* is a species originated from Western South America and Central America. Its domestication and uses as a cultivated food may have been indigenous to the Mexicans. From there, it was brought to Europe and to other parts of the European-colonized world during the 16th century. Although there is no much history on how tomato was spread

eventually introduced to Africa in the early 19th century and finally to Nigeria.

Tomato has been cultivated since prehistoric times with the earliest agricultural techniques and its cultivation and production keeps improving and evolving. This depends on several factors such as organoleptic properties of the fruits, farming system, agronomic practices etc. Modern age of commercially grown tomato started with the effort of Alexander W. Livingston. In 2009, worldwide tomato production rose to 158.3 million tons, surpassing the previous years by 3.7%. The largest producers were China with 24% of world production, followed by United States, Turkey, India, Egypt and Italy.

1.3 Benefits of Tomatoes

Tomatoes are a great source of vitamins

A single tomato can provide about 40% of the daily recommended minimum of vitamin C. What's more, tomatoes supply vitamin A, which supports immunity, vision, and skin health; vitamin K, which is good for your bones; and potassium, a key nutrient for heart function, muscle contractions, and maintaining a healthy blood pressure and fluid balance.

They protect heart health

Tomatoes contain an antioxidant called lycopene, which is responsible for their red color. Research suggests that in terms of heart health benefits, it's more effective to eat tomatoes and tomato products than take lycopene supplements. Other studies have shown that higher blood levels of lycopene are tied to lower death rates for people with metabolic syndrome, a cluster of risk factors that raise the chances of developing heart disease, diabetes, and stroke.

Improve your vision

Lycopene is also good for your eyes. And that's not the only eye-protective nutrient in tomatoes; they contain lutein and beta-carotene as well. According to research, those nutrients support vision and protect against eye conditions including cataracts and macular degeneration.

Boost digestive health

The fluid and fiber in tomatoes may be helpful if you're prone to constipation. (According to the USDA one large tomato contains 6 ounces of fluid, and 1.5 grams of fiber.) Just be aware that in some people, the acidity from cooked tomatoes may trigger or worsen acid reflux and indigestion.

Help with diabetes management

Tomatoes may be a protective food for people with type 2 diabetes: In one study, people with diabetes who supplemented with cooked tomatoes for 30 days experienced a decrease in lipid peroxidation, a chain reaction in which substances called free radicals attack fat, leading to damage that ups the risk of heart disease. This is particularly important, because diabetes doubles the risk of stroke and heart attack.

Guard skin health

A 2011 study found that the combination of tomato paste and olive oil protected against sun damage, and boosted the production of pro-collagen, a molecule that gives the skin its structure and keeps it firm and youthful. Scientists believe that the lycopene in tomatoes is key. It's at its highest concentration when tomatoes have been cooked, and olive oil boosts its absorption from your digestive system into your bloodstream.

Protect against cancer

Observational studies have found links between the superstar compound lycopene and fewer incidences of prostate, ovarian, lung, and stomach cancers.

Tomato is a significant source of Umami flavour. This is consumed in diverse ways; raw or cooked, sources, salad and in drinks.

Tomatoes are also one of the main ingredients in hundreds of dishes and products that are sold in Supermarkets throughout the world.

Tomatoes serve as the best to people who wish to grow fruits and vegetables. It is also an essential part of many recipes as well as many produced products such as "Tomato Ketchup and Tomato Paste". Tomato is advantageous over other types of crops, such as:

High Yield which result in their high economic value

High nutritional value with high level of Pro-vitamin A and C, as well as being ranked highest in their contribution to human diet.

In competition with other vegetables, tomato is a short duration crop in term of time of production.

They are suitable in diverse cropping system used on grains and legumes.

1.4 Justification of the study

Tomato is one of the most demanding vegetable in Nigeria and Western part of the world. Mexico and India are the major supplier of tomato as far as tomato consumption is concerned. Local production is unable to meet the demand since most of the product is left to rot on farm sites due to poor storage facilities, poor road network linkage to farms and the markets in the rural and urban areas. This prevents purchasers from purchasing it from the farmers as the cost tends to increase due to the state of the roads. The perishable nature of the fruit also forms part of the reasons why local production is not able to meet the market demand.

1.5 Objective of the study

The objectives of the study were to:

Determine the variability trait existing between the exotic and local cultivars of tomato, planted in Obio Akpa.
Assess the number of fruits per plants and fruit yield per hectare.

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