



**Where:** Polytechnic University of Valencia Campus

**When:** July 11-13, 2017

**Info at:** [www.experimenta.upv.es](http://www.experimenta.upv.es)



# TRADITOM KIDS

## SUMMER SCHOOL II:

### The rainbow tomato

Tomato is the second most consumed vegetable in the EU and a major dietary source of many nutrients, vitamins and antioxidants. Since tomato was introduced to Europe in the 16th century, local farmers have been developing a large number of varieties that shaped the genetic diversity of the traditional European tomato. The aim of **TRADITOM** ([traditom.eu/es](http://traditom.eu/es)) is to valorize the genetic diversity stored in traditional tomato varieties and to increase their resilience in order to prevent their steady replacement by higher yielding, hardier and often less tasty modern cultivars.

**TRADITOM KIDS** is a scientific dissemination activity workshop aimed to bring **TRADITOM** research to the children, encouraging motivation for and enjoyment of science while involving them as active participants in research. The **TRADITOM KIDS** activities have been designed to be playful - through play and hands-on experimentation, they seek to increase children's awareness on the importance of genetic variability and genetic resources conservation, by focusing on the case of traditional tomato.

**TRADITOM KIDS SUMMER SCHOOL** is organized to last one hour and a half and is directed to 25 children in groups from 3<sup>rd</sup> and 4<sup>th</sup> grades that are registered in the Universidad Politécnica de Valencia Summer School. The **TRADITOM KIDS** Workshop will be lead by **TRADITOM** researchers from the *Instituto de Biología Molecular y Celular de Plantas* (UPV/ CSIC) and *Instituto de Conservación y Mejora de la Agrodiversidad Valenciana* (UPV), with the help of the corresponding summer school monitors. At the end of the workshop, all participating children will receive a diploma acknowledging their participation in the **TRADITOM KIDS** workshop and highlighted as "for their valuable contribution to science".

TRADITOM KIDS SUMMER SCHOOL workshop is organized in two modules:

- Biodiversity and Nutrition
- Tomato domestication and human biodiversity: taste

The following concepts will be introduced:

- Reduction in genetic variability and biodiversity
- Plant domestication and living organisms adaptation ability
- Health and diverse nutrition

### **Biodiversity and Nutrition**

Using tomato as an example, children will learn the importance of biodiversity for the preservation of the species, as well as for the production of food and other agricultural products. The benefits they provide to humankind including nutrition will be introduced.

A playful combination of activities will be carried out by all kids in group activities in order to get familiar with the analysis of tomato variability. Taking the advantage that many traditional and commercial tomato varieties have been developed on the basis of traits such as taste, size and color, we will put a traditional and a commercial collection of fruits with different sizes, colors and shapes at the children's disposal. By matching the different types of fruits being displayed in a chart against the different tomatoes they will be handling, children will classify each fruit to 9 different shapes, 3 size types and 4-5 colors. At the end, we will count how many of the traditional tomatoes fit in each shape, color and size category. The results of the traditional tomato will be compared with the shapes of tomatoes mainly sold in the large commercial spaces and the results will be discussed on the basis of biodiversity.

### **Tomato domestication and human diversity: the color and the flavor**

One of the main consumer concerns is tomato taste. But how does a tomato taste like? Generally, people prefer sweet, juicy and firm tomatoes. However, there are both genetic and socio-cultural factors involved in the flavour of each tomato variety and how each individual perceives flavour.

In this module, we will try to evaluate if there is a relationship between flavour biodiversity and the ability to perceive tastes by means of a **blind taste test, a taste perception test and a taste bud stain**.

**Relationship between flavour and colour.** Tomatoes develop red colour during ripening. Most of tomatoes are red when ripe, with a high lycopene content although a large number of yellow, brown, orange and pink varieties exist. It is known that there is a relationship between tomato colour and its flavour which is defined by the combination of sugars, acidity and volatiles. Colour and flavour biodiversity depends on the carotene quantity produced and in which point its biosynthesis is affected. Other factors, such as chloroplast development and chlorophyll and sugar

quantities could affect tomato flavour. To demonstrate that there is a relationship between flavour and colour, in this first part we will perform an activity directed to evaluate tomato flavour based on colour through a training followed by a blinded taste. In the training taste, with the aim to associate colour with flavour, kids will taste tomatoes with different colours. In the second phase of the blinded **taste**, the child will be assigned a number. Blindfolded with the help of a scarf, children will taste and compare wedges of different colour tomatoes to see if they are capable to assign the taste to the colour of the tomato. For each one, children will annotate if they are able to guess the colour of the tomato by their taste.

Taste perception is in part a genetically determined trait and this could influence food preferences and nutritional habits. In order to illustrate the genetic diversity in taste receptors, children will participate in two activities:

- **Taste perception test:** The ability to perceive tastes is strongly related with the ability to perceive PTC (phenylthiocarbamide), a compound not found in nature with a bitter taste. PTC strips (provided by a school supply company for this purpose) allow sorting individuals on the basis of their ability to perceive the bitter taste of this compound. Some individuals perceive nothing, others a strong taste and others - the majority - find it slightly bitter. Children will be sorted as “supertasters”, “tasters” or “non-tasters” on the basis of their reaction and their answer to the question “How did you find it?”
- **Taste buds stain:** The ability to perceive taste is strongly related with the number of taste buds and their density in the tongue. Supertasters have much more of the fungiform type of buds per square centimeter than nontasters. To evaluate the number of fungiform taste buds, we will stain children’s tongues with a blue lollipop (obtained from a local candy store). Pictures of each child tongue will be taken and the number of taste buds will be counted in order to classify them as supertasters (35), tasters (35-15) o nontasters (less than 15).

At the end of this activity, we will evaluate if children are able to differentiate tomatoes based on colour and the results will be discussed on the basis of tomato diversity.

This **TRADITOM KIDS** workshop will be run in nine groups of 25 children (8-9 years) during nine different sessions between July 11-13, 2017 as part of the UPV summer school at the Universidad Politécnic de Valencia, Spain.

#### **IBMCP and COMAV people involved:**

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The results and pictures of the **TRADITOM KIDS SUMMER SCHOOL** will be uploaded in the UPV Summer School web ([experimenta.upv.es](http://experimenta.upv.es)) and to the **TRADITOM** project website ([traditom.eu/es/](http://traditom.eu/es/)).