

What's in a Family?

The Solanaceae

Jimson Weed, *Datura stramonium*, growing on a sandy river bank in Mexico.

photo by Frederick B. Essig

by Frederick B. Essig

Imagine Marco Polo returning from China, desperate for some good Italian cooking. He sits down to a sumptuous feast that includes eggplant and potato smothered in a rich tomato sauce spiced with chili peppers. The salad is garnished with strips of avocado, tomato, red and green bell peppers, corn kernels, pineapple and sunflower seeds. For dessert, he has a dish of Neapolitan ice cream. Then he lights up a pipe filled with his favorite tobacco. What's wrong with this story?

Aside from the fact that they didn't have ice cream in the 13th



photo by Frederick B. Essig

Petunias brighten up the winter landscape in Florida, blooming non-stop from November to May.

century, the main problem is that none of these foods - or tobacco

- existed in Europe at the time. They all come from New World plants introduced to Europe after the voyages of Columbus. Italians are particularly indebted to the Tomato Family, or the Solanaceae, that includes tomatoes, potatoes, eggplants and peppers. Imagine Italian food without tomato sauce!

So what's in a family? Botanists group similar species into genera, and similar genera into families. This classification system is an extremely important framework for storing, retrieving and communicating information about different kinds of plants. Plants within a family are



photo by Frederick B. Essig

Brazilian nightshade (Solanum seaforthianum) has lilac-like flowers in summer, followed by scarlet berries.



Tomato flowers display the typical 5 equal petals and stamens pressed together in the center.

related to one another and share important characteristics.

Tomatoes, potatoes, peppers, etc. are all related to one another, and share the identifying floral features of 5 equal petals fused together at the base and spreading in a cup, tube or wheel-like configuration with radial symmetry. They also typically have 5 stamens often pushed together in the center, and fruits with 5 chambers that may be fleshy like a tomato or form into a dry capsule.

The family provides many attractive and reliable ornamentals for Florida gardens, including *Petunia*, *Salpiglossus*, *Brunfelsia*, *Solandra*, *Nicotiana*, *Brugmansia* and *Solanum*. *Petunias* are a mainstay of our cool-season flower beds; *Salpiglossus* and ornamental

Nicotiana (tobacco) are other annuals. *Brunfelsia* (yesterday, today, and tomorrow), *Brugmansia* (angel's trumpet) and *Solandra* are tropical shrubs that give us summer color, while *Solanum* is a huge genus that gives us some ornamentals as well as potatoes, eggplant and tomatoes.

Where would we be without potatoes? The history of both Ireland and the United States would have been drastically different. Potatoes (*Solanum tuberosum*) came from the Andes region

of South America, where as many as 150 different varieties can still be found. Europeans distrusted it at first, as it was

clearly a relative of deadly nightshade (*Solanum nigrum*). When the Irish warmed up to the potato, it greatly expanded their food supply, causing a population boom. When the crop was virtually wiped out by a blight, millions either starved or moved to America. Think about the numerous Irish-Americans who never would have been. Talk about alternate time-lines!

Though it's hard to see how eggplants (*Solanum melongena*) could cause similar rips in the time/space continuum, the lack of tomatoes (*Solanum lycopersicum*) in Italy would have led to drastically different recipes for pizza, spaghetti and numerous other delights that are as much a part of American culture as Italian. It may also be that overindulgence in fiery habanero or cayenne peppers (*Capsicum annum*) may have added their own wrinkles to the cosmic timeline. Although not as well known as its cousins, the tomatillo, *Physalis philadelphicus*, is a cherished



Chalice vine (Solandra) puts on a spectacular display in summer. Species are hard to tell apart.



Angel's trumpet (*Brugmansia* spp.) comes in a variety of colors.

food in Mexico.

That brings us to chemistry. Tomatoes contain the red pigment Lycopene, which has been shown to be a valuable antioxidant in our diet. Potatoes, on the other hand, can be poisonous if they sit around too long. When exposed to light, the skin and young shoots that may emerge from the "eyes" are loaded with the alkaloid solanine. Entire schools full of children have been sickened by improperly handled potatoes in cafeterias. Then there's capsaicin, the essential component of hot peppers. It can be the object of pleasure for culinary daredevils. Interestingly, the much milder bell peppers stem from the same original species.

The wolfberry or "Goji" berry (*Lycium barbarum* and *L. chinense*) is also in the Solanaceae, and provides a

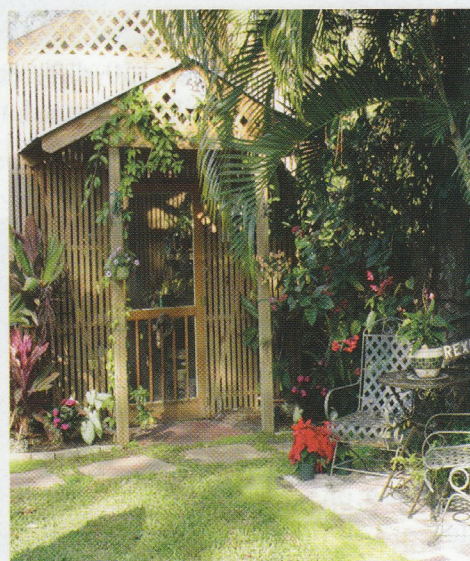
traditional Chinese medicine particularly valued for maintaining the health of the eyes. It has recently been discovered by Americans, who pay too much for it in health food stores. (Look for it instead in Chinese or Asian grocery stores!). It is sold in its dry, raisin-like form, and can be eaten as such or included in teas, soups or stews.

You might be surprised to know that the family also includes even more potent drugs, including nicotine (from *Nicotiana tabacum*), atropine (from *Atropa belladonna*), scopolamine (from several

species, including jimson weed, *Datura stramonium*) and hyoscyamine (from henbane, *Hyoscyamus niger*). All of these are in the plants to protect them from herbivores. For us they have many medicinal uses, sometimes with hallucinogenic properties, and all can kill in high enough doses.

This is the Solanaceae, a family filled with master chemists, as well as foods and distinctive garden flowers. Just be sure you know which is which!

Dr. Essig, an Associate Professor of Biology at USF in Tampa, wrote "Taming the Wild Morning Glories" in our Oct/Nov 2011 issue. Don't miss his blog on <http://botanyprofessor.blogspot.com>. It's like taking a college course without the exams!



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