

Early History and Iconography of the Solanaceae: 2. Potato¹

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¹This SOL paper is the second in a series on the early history and iconography of the Solanaceae. The first covered mandrake (Janick and Daunay, 2007) and the present paper covers potato, in celebration of the Year of the Potato.

Potato, *Solanum tuberosum* L, a species indigenous to the New World, was cultivated throughout the Andes long before the encounter of Columbus with the Americas. The veneration of pre-Inca populations for the goddess of Earth was closely associated with the worship of various deities associated with plants, in particular *Axomama*, the mother of potato. The first traces of potato are freeze dried remnants known as chuño found in South American archaeological remains that date as far back to as 7000 years BCE (Spire and Rousselle, 1996). Potato-like potteries (Fig. 1) found in tombs of successive Andean cultures such as the Nazca (400 BCE-600 CE), Mochica (1-600), Chimu (900-1450) and Chimu-Inca (1100-1400) are testament to the importance of this species as a

food crop. At the time of the conquest of the Inca Empire in Peru (1531-1537) by Francisco Pizarro, potato was cultivated in all temperate regions of western South America, from Chile to Columbia. Its culture by the indigenous population is beautifully illustrated in a calendar of Inca agriculture presented to the King of Spain in 1580 (Fig. 2).

It is difficult to trace the first European records of potato. The approximate plant names and descriptions written by the conquistadores or their escorts often do not allow distinguishing potato from several other American tuberous species, in particular *Ipomoea batatas*, *Aracachia xanthorrhiza*, *Oxalis tuberosa*, *Ullucus tuberosus* and *Helianthus tuberosus*. According to Hedrick (1919) the first European record of the Indian *papas* (potato) was made in 1553 by Pedro Cieza de León (1520-1554), Spanish conquistador, chronicler, and historian of Peru.

Potato appears in Renaissance illustrated herbals much later than capsicum peppers, tomato and tobacco (Daunay et al., 2007, 2008), which were described about 20-30 years after Hernando Cortez conquest of the

Aztec culture in Mexico in 1519-1521. The Flemish botanist Charles de l'Ecluse (latinized as Clusius) received samples of potato tubers and fruits indirectly from the pope in 1588, and the year after a watercolor labelled *Taratoufli*, *Papas Peruänum Petri Circae* from the same source (Fig. 3), the oldest known European image of potato, now in Plantin-Moretus Museum, Antwerp, Belgium. The first published illustration (Fig. 4A) was a woodcut accompanying the description of potato by the Englishman, John Gerard in his famous herbal of 1597. He called it the *Battata virginiana*, *Potatoes of Virginia*, confusing it with the name of the sweet potato *Ipomoea batatas*, a misonomer that persists to the present day.



Figure 1: Potato as terra cotta vessel from Peru: (A) proto-Chimu period, ca 300 CE; (B) Chimu period, ca 900 CE. [Leonard, 1973].



Figure 2: Potato culture in Peru. Filipe Guaman, Poma de Ayala, 1615. (A) planting, December; (B) harvest, June. [Leonard, 1973].

He described it as follows:

... "The roote is thicke, fat, and tuberous, not much differing either in shape, colour, or taste from the common potatoes [=sweetpotato], saving that the rootes hereof are not so great nor long; some of them round as a ball, some oval or egge fashion; some longer, and others shorter: which knobbie roots are fastened unto the stalkes with an infinite number of threedie strings." ... "a food as also a meate for pleasure, equall in goodnesse and wholesomenesse unto the same, being either rosted in the embers, or boyled and eaten with oyle, vinegar, and pepper, or dressed any other way by the hand of some cunning in cookerie."

The image in Gerard's Herball was quickly followed by another woodcut in the 1598 herbal of the Italian Pietri Andreae Matthioli (Fig 4B). Clusius published his own record only in 1601 (Fig. 4C). A stunning botanical illustration of potato was published in 1613 by Besler, in his *Hortus Eystettentis* (Fig. 5).



Figure 3: Potato watercolor received by Clusius in 1589. [Blunt & Raphael, 1979].

Early European iconography of potato is scarce and does not permit a clear representation of tuber size, shape and color of the first introduced forms, though it is acknowledged among potato specialists that the first forms cultivated in Europe belonged to the subspecies *andigena* (Spire and Rousselle, 1996).

The botanical names allocated to potato, as for most plants, were numerous and unreliable prior to the establishment of the nomenclature system established by Linnaeus in the mid 18th century. Gaspard Bauhin provided the name *Solanum tuberosum* with the plant description in his *Phytopynax* of 1596.

Only a few hints of suspicion towards potato as a proper and healthy food are found in the late 16th century and 17th century herbals, even though the herbalists recognized some similarities with its European solanaceous cousins such as mandrake, henbane, and black nightshade with their unwholesome and unsavoury reputations. The subsequent development of potato cultivation in Europe was slowed somewhat, because of remnants of medieval prejudice, contempt, and fear towards everything growing directly in the soil. Thus, the potato which was to become one of the ten most important food crops in present day agriculture had a slow and precarious beginning in the West.

Figure 4: First potato illustrations in European herbals. (A) Gerard, 1597; (B) Matthioli (1598); (C) Clusius, 1601. [(B) and (C), Courtesy of Musée Requien, Avignon, France].

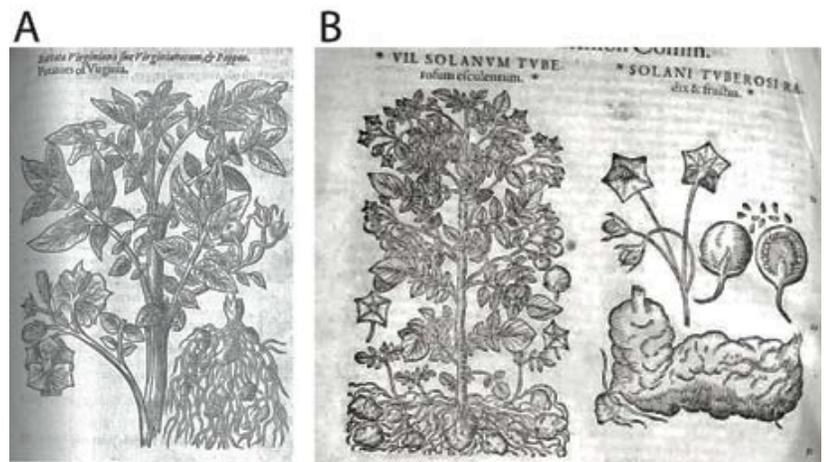


Figure 5: Potato in the *Hortus Eystettentis* of B. Besler, 1613. [Der Garten von Eichstatt, Taschen Köln, Germany, 1999].



Literature List

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Tomato Sequencing Updates



Chromosomes 1, 10 (US)

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Since our last report, the Stack lab at Colorado State University has localized an additional seventeen BAC clones using fluorescence in situ hybridization (FISH) on tomato pachytene synaptonemal complex spreads. We have now positioned a total of 164 BACs, distributed among the chromosomes: 1 – 31; 2 – 12; 3 – 13; 4 – 16; 5 – 10; 6 – 9; 7 – 13; 8 – 4; 9 – 18; 10 – 20; 11 – 13; 12 – 5. BAC clones recently FISHed on 2Q (included in a contig sequenced by Korea) are being used in an ongoing study to determine the resolution of our BAC FISH method. The newly localized clones are listed in the table to the right.

Chromosome Arm

1P

1Q

2Q

10Q

BAC ID

LE_HBa0291L11

LE_HBa0305J13

LE_HBa0263P17

LE_HBa0033C15

LE_HBa0128J14

LE_HBa0057A01

LE_HBa0034P21

SL_EcoRI0034H10

SL_EcoRI0042D07

LE_HBa0098J01

SL_EcoRI0061K08

LE_HBa0032J10

LE_HBa0206B16

LE_HBa0071D20

LE_HBa0204I05

LE_HBa0189B10

LE_HBa0248A13