

## First Known Image of *Cucurbita* in Europe, 1503–1508

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• **Background** The genus *Cucurbita* (pumpkin, squash, gourd) is native to the Americas and diffused to other continents subsequent to the European contact in 1492. For many years, the earliest images of this genus in Europe that were known to cucurbit specialists were the two illustrations of *C. pepo* pumpkins that were published in Fuchs' *De Historia Stirpium*, 1542. Images of fruits of two *Cucurbita* species, drawn between 1515 and 1518, were recently discovered in the Villa Farnesina in Rome.

• **Findings** An even earlier image of *Cucurbita* exists in the prayer book, *Grandes Heures d'Anne de Bretagne*, illustrated by Jean Bourdichon in Touraine, France, between 1503 and 1508. This image, which shows a living branch bearing flowers and fruits, had not been examined and analysed by cucurbit specialists until now. The image is identified as depicting *Cucurbita pepo* subsp. *texana*. Unlike some of the fruits of *Cucurbita* depicted in the Villa Farnesina a decade later, this image does not depict an esculent and does not constitute evidence of early European contact with New World agriculture. Based on the descriptive, ecological and geographical accounts of *C. pepo* subsp. *texana* in the wild, the idea is considered that the image was based on an offspring of a plant found growing along the Gulf Coast of what is now the United States.

**Key words:** *Cucurbita pepo*, *Lagenaria siceraria*, *Cucumis sativus*, *Bryonia dioica*, Cucurbitaceae, crop dispersal, crop history, plant iconography.

### INTRODUCTION

The genus *Cucurbita* L. (pumpkins, squash and some gourds) (Cucurbitaceae) is native to the Americas (Gray and Trumbull, 1883; Whitaker, 1947). Pumpkins and squash were dispersed to other continents by transoceanic voyagers at the turn of the 16th century and have become a familiar and important vegetable crop in many countries. According to the FAO, over 1500 000 ha of pumpkins, squash and gourds were harvested in 2005. Most of the total yield of nearly 19 000 000 tonnes was produced in Asia and Europe, with much of the remainder in North America (FAO, 2006). The three widely grown species, *Cucurbita pepo* L., *C. maxima* Duchesne and *C. moschata* Duchesne, are extremely polymorphic in fruit characteristics. The fast growth rate of pumpkins and squash, their large size, decorative value and role as common table vegetables have fostered fascination and wonder among people of widely different cultures (Norrman and Haarberg, 1980).

Plant iconography is the most unequivocal tool for assessing the historical presence of botanical taxa in a particular region; this is especially the case for the Cucurbitaceae (Eisendrath, 1961). The first known images of *Cucurbita* outside of the Americas had long been believed to be two illustrations of pumpkins of *C. pepo* that appeared in *De Historia Stirpium* (Fuchs, 1542), 50 years after Columbus' first voyage to the New World (Sturtevant, 1890; Zhiteneva, 1930; Whitaker, 1947; Eisendrath, 1961; Paris, 1989, 2001; Meyer *et al.*, 1999; Teppner, 2000). Recently, depictions of fruits of the North American species *C. pepo* and of the

South American species *C. maxima*, painted between 1515 and 1518, were recognized in the festoons at the Villa Farnesina in Rome (Caneva, 1992; Ravelli, 2004; Janick and Paris, 2006). These indicate the existence of New World cucurbits in Europe by that time and antedate the depictions of *C. pepo* in Fuchs' herbal by a quarter century.

Recently the authors became aware of a depiction of *Cucurbita* in the *Grandes Heures d'Anne de Bretagne*, a prayer book compiled and illustrated in Touraine, France, between 1503 and 1508, antedating the depictions in the Villa Farnesina by a decade. The objective of this paper is to describe the historical context and to present, analyse and discuss this image of *Cucurbita* in comparison with those of the two other cultivated cucurbit species illustrated in the book. The *Cucurbita* image will be identified taxonomically to the level of subspecies and then the possible origin of this New World taxon in the Loire Valley of France, within 16 years of the European contact with the Americas, will be considered briefly.

### HISTORICAL CONTEXT

Anne de Bretagne (1477–1514), Duchess of Brittany, was twice Queen of France, the first time by marrying Charles VIII in 1491 and the second time, after his death, by marrying his successor, Louis XII, 8 years later. A pious monarch, she ordered the famous artist Jean Bourdichon (1457–1521), who was official court painter to four successive French kings (Louis XI, Charles VIII, Louis XII and François I), to richly adorn an *Horae ad usum romanum*, that is, a prayer book for her personal use (Camus, 1894;

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TABLE 1. Locations and call numbers of the *Grandes Heures* and of related rare or difficult-to-access documents

Item	Document	Location	Call no.
Book	<i>Horae ad usum romanum</i> ( <i>Les Grandes Heures d'Anne de Bretagne</i> ), original copy, 1503–1508	Bibliothèque Nationale de France, Richelieu, Paris	Ms. Latin 9474
Catalogue	A. de Jussieu, <i>Catalogus Stirpium elegantissime</i> , 1722.	Bibliothèque Nationale de France, Richelieu, Paris	Ms. Nouvelles Acquisitions Françaises 5052, pp. 150–159
Treatise and catalogue	A. de Jussieu, <i>Réflexions sur diverses dénominations françaises de plantes qui sont dépeintes dans un manuscrit ancien du cabinet du roy</i> , followed by catalogue of the plants, 1722.	Bibliothèque Centrale, Museum National d'Histoire Naturelle, Paris	Ms. 1930
Transcribed treatise	A. de Jussieu, <i>Réflexions sur diverses dénominations françaises des plantes qui sont dépeintes dans un manuscrit du Cabinet du Roi</i> . Procès-verbaux de l'Académie Royale des Sciences, séance du 14 novembre, 1722.	Archives, Académie des Sciences de l'Institut de France, Paris	Volume 41, folio 292–297
Book, in two volumes	L. Curmer, <i>Le Livre d'Heures de la Reine Anne de Bretagne</i> (Vol. 1, catalogue of plants by J. Decaisne and translation of text from Latin to French; Vol. 2, facsimile), 1861.	Bibliothèque Mazarine de l'Institut de France, Paris	Res. Far. Fo. 27-1 and Res. Far. Fo. 27-2
Article in periodical containing transcribed treatise	L. Lalanne, <i>Mémoire inédit d'Antoine de Jussieu sur le livre d'heures d'Anne de Bretagne</i> . Bulletin du Comité des Travaux Historiques et Scientifiques, Histoire et Philologie, nos. 3–4, séance du lundi, 7 juin, 1886.	Bibliothèque Nationale de France, Tolbiac, Paris	Per8 Lc 18,347 bis, pp. 227–236.
Article in periodical	E. Male, Jean Bourdichon et son atelier. <i>Gazette des Beaux Arts</i> 32: 441–457, 1904.	Bibliothèque Nationale de France, Tolbiac, Paris	SER3, A46, T31
Book	L. Delisle, <i>Les grandes heures de la reine Anne de Bretagne et l'atelier de Jean Bourdichon</i> , 1913.	Bibliothèque Mazarine de l'Institut de France, Paris	9553

Bilimoff, 2001). Produced between 1503 and 1508 at Tours in the Loire Valley, where Bourdichon lived and worked, the book contains prayers, monthly calendars and full-page paintings of religious themes. On each of the many 30 × 18 cm pages that contain a prayer is a miniature painting depicting part of a plant on, or next to, which are depicted small animals, mostly insects. Well over 300 plant species are represented in the book, drawn from live specimens found in the fields, woods and Royal Gardens of Tours and Blois (Lalanne, 1886; Camus, 1894; Bilimoff, 2001). Most of these paintings are vertically oriented 165 × 45 mm rectangles placed on the outside margins of the pages of prayers; a few, located mostly in the first half of the book, frame the prayers and others, located in the latter half of the book, are in the shape of a square closing bracket, J. Each is labelled, in Gothic letters, at the top with a Latin name of the plant and at the bottom with its French vernacular name. The book is catalogued as *Ms. Latin 9474* at the *Bibliothèque Nationale de France* (Table 1) and can be browsed on-line in its entirety at <http://mandragore.bnf.fr/html/accueil.html>, by clicking on Recherche, typing *Latin 9474* in the small window *Manuscrits* and clicking on *Chercher*.

The most outstanding feature of this book is the life-like representation of so many species of living plants and small animals, even though the images are not always biologically

accurate (Camus, 1894). Indeed, the relative sizes of the various plant parts and the animals, the shapes of the leaves, and the colours of the corollas and the animals sometimes succumbed to fantasy in order to enhance the artistic effects. Nonetheless, the paintings are accurate enough to allow positive identification of many of the plants to genus and species. These paintings, together with the labels of their Latin and French names, combine to form an exceptional botanical document of the French Renaissance. Three more copies of this book were made, each differing somewhat from one another, but the original is considered the finest work (Male, 1904; Delisle, 1913).

Used by Queen Anne until her death, this book, which with time was to become known as the *Grandes Heures d'Anne de Bretagne*, remained within the collection of precious documents of the French kings. In August 1722, the 12-year-old King Louis XVth ordered the botanist Antoine de Jussieu (1686–1758) to display before him manuscripts and vellums from the royal collection that were illustrated with natural, life-like plants and animals. The presentation so pleased the King that he granted Jussieu's extraordinary request to borrow the *Grandes Heures* for a critical analysis of the plant illustrations. On 14 November 1722, Jussieu read before the French Academy of Sciences a short *mémoire* (treatise) in which he described the plant images in the *Grandes Heures* as being much more realistic than those of

earlier documents. He considered the illustrations to be of very high quality, although not as fine as some of the drawings on vellum within the royal cabinet. He observed that most of the illustrations were of plants common in Touraine. As vernacular names differed regionally and often changed over time, Jussieu presaged Linné in suggesting that plant names needed to be stabilized by the use of a dead language, such as Latin. However, he considered many of the Latin plant labels in the *Grandes Heures* to be erroneous. This led him to prepare a catalogue, in which he tabulated the Latin and French labels of the plants in the *Grandes Heures* next to Latin designations used in major botanical works such as those of L'Obel, the Bauhin brothers, and Tournefort, and contemporary French common names (Camus, 1894). Both the treatise and the catalogue were forgotten until the end of the 19th century, when Lalanne (1886) published the transcript of Jussieu's treatise, housed at the *Académie des Sciences* (Table 1), and located the catalogue (Jussieu, 1722a) at the *Bibliothèque Nationale de France*. The original treatise together with another copy of the catalogue (Jussieu, 1722b) are at the *Bibliothèque Centrale, Muséum National d'Histoire Naturelle* (Table 1); however, this second copy lacks the contemporary French names and differs in a few of the Latin designations.

In 1861, Léon Curmer, a bookseller and bibliophile, published a luxurious and expensive facsimile of the *Grandes Heures d'Anne de Bretagne*, which was sold by subscription. This special work, printed in a limited edition of 850 copies in two volumes, was purchased by the pope, the royalty of several European countries, and a number of wealthy families (Curmer, 1861; Table 1). One volume included a French translation of the Latin prayers and a catalogue of the plants. The latter was a listing of the Latin and French plant labels in the *Grandes Heures* alongside identifications to Linnean Latin and vernacular French names, the authorship attributed by Lalanne (1886) and Camus (1894) to the renowned Belgian botanist Joseph Decaisne (1807–1882). The second volume consisted of a magnificent chromolithographic facsimile of the original prayer book (Lalanne, 1886; Camus, 1894).

Camus (1894) traced the history of the *Grandes Heures* and studied critically, side-by-side, the original copy of it, a copy of the unpublished handwritten catalogue by Jussieu (1722a), the Curmer facsimile with the catalogue by Decaisne (Curmer, 1861) and the transcript of Jussieu's treatise in the article by Lalanne (1886) (Table 1). Camus concluded that Curmer's reproductions of the drawings with their names were quite exact, differing slightly from the originals only in the colours, which appear to us to be more brilliant. On the other hand, Camus observed that the Decaisne catalogue of plants was riddled with errors in transcription from the original Gothic lettering. Moreover, Decaisne apparently made his identifications without knowing that Jussieu had done a similar work over a century earlier. Camus reported that there were over 40 cases in which the identifications made by Jussieu and Decaisne did not match.

The Curmer work was in turn published as a facsimile, in a single volume and in black-and-white, by Bonnot (1979). Bilimoff (2001), in the *Promenade dans des Jardins*

*Disparus*, reproduced in colour, some whole and some in part, the plant images from the *Grandes Heures*. This book contains background information and references to Jussieu, Decaisne and Camus. It also has a catalogue, listing the names from the *Grandes Heures* alongside Latin and vernacular French names.

Having become aware of the presence of four cucurbits among the plants represented in the *Grandes Heures d'Anne de Bretagne* from Bilimoff (2001), the authors located the facsimile of Curmer (1861) and the complete original images on the website of the *Bibliothèque Nationale de France*. One of these, bearing the Latin name *Napus silvestris* and the French name *Naveaulx sauvages*, is bryony, *Bryonia dioica* Jacq., which grows wild but is not cultivated. Another, bearing the Latin name *Cucumer* and the French name *Concombres*, is indeed cucumber, *Cucumis sativus* L. Another cucurbit, bearing the Latin name *Cucurbita* and the French name *Quegourdes*, is bottle gourd, *Lagenaria siceraria* (Molina) Standley. These three cucurbits are of Old World origin. This paper focuses on the fourth cucurbit image, bearing the Latin name *Colloquitida* and the French label *Quegourdes de turquie*. As will be discussed, earlier writers have agreed that this image was modelled on a plant of the New World genus *Cucurbita*, but the identification of the species has been controversial and as far as is known no cucurbit specialists have examined the image and positively identified it to that taxonomic level.

#### DESCRIPTION OF THE IMAGE OF *QUEGOURDES DE TURQUIE*

The image of *Quegourdes de turquie* in the *Grandes Heures d'Anne de Bretagne* [folio 161; image 295 of the web page; chromolithograph image on page 323 in Curmer (1861); partial image on page 92 in Bilimoff (2001)] is bracket-shaped with a golden background (Fig. 1). It depicts a branch with three pistillate flowers at anthesis that closely resemble those of *Cucurbita pepo*. The large orange-yellow corollas are moderately flaring, fused at the base and parted, as petals, near the apex. The corollas are six-parted, rather than the typical five-parted, but six-parted and even seven-parted corollas do occur occasionally in *C. pepo* (Duchesne, 1786). The calyx is short and its sepals are thin, tapering to a point at the apex, like an awl. The ovaries are inferior and pyriform. A fourth pistillate flower, 1 day prior to anthesis, is depicted near the apex of the branch. Six leaf laminae and parts of three petioles are depicted. The leaf laminae are acute, serrated and deeply indented, as in *C. pepo*, but their shape is seven-parted rather than the usual more-or-less five-parted. No detail is evident for the petioles, which are spiculate in *C. pepo*, and no tendrils are depicted. The two pyriform fruits are connected to the stem by long, narrow peduncles. No detail is shown for the stem and peduncles, which are angular and furrowed, respectively, in this species. On and next to the plant are depicted a snail and four arthropods: a caterpillar, a fly, a moth and a beetle, all in life-like colour.

The two pyriform fruits of the *Quegourdes de turquie* (Fig. 1) appear to be similar to many gourd-like fruits of



FIG. 1. The paintings of *Quegourdes de turquie* (left), *Quegourdes* (centre) and *Concombres* (right) in the *Grandes Heures d'Anne de Bretagne* (1503–1508).

*C. pepo* but also resemble *Lagenaria siceraria*, the bottle gourd. However, bottle gourds have white flowers. Upon closer examination, the fruits of the *Quegourdes de turquie* can be seen to bear longitudinal stripes: broad, light yellow-green ones alternating with narrow light blue-green ones. Fruit striping, as far as is known, does not occur in *L. siceraria*. The striped colour pattern is quite common among the pyriform gourds, wild and ornamental, of *C. pepo* (Paris, 2001), although most often the broad stripes are dark green (Paris, 2000). On the mature fruits of such pyriform gourds, the broad dark green stripes alternate with narrow ivory white stripes; when the fruits are immature, the narrow stripes are light blue-green, as shown in the image. The green coloration of both the broad and the narrow stripes suggests that the fruits were immature. Cultivated ornamental gourds of *C. pepo*, as well as wild gourds from Texas, *Cucurbita pepo* subsp. *texana* (Scheele) Filov [syn. *C. pepo* subsp. *ovifera* (L.) Decker], vary considerably in fruit shape and colour (Bailey, 1937; Erwin, 1938; Bailey, 1943).

The image is labelled with a Latin epithet, *Colloquitida* [sic], at the top and the French vernacular name, *Quegourdes de turquie*, at the bottom (Fig. 1). The French name *quegourdes* apparently had been used during that era, first for bottle gourds and then extended to include other gourds. *Quegourdes* was to become *cougourdes* or *gourdes*,

epithets applied to forms of *Lagenaria* (Duchesne, 1786). During the 16th century, the adjective ‘Turkish’ implied an exotic origin. For example, one of the two *C. pepo* pumpkins appearing in the herbal of Fuchs (1542) is labelled ‘Türkisch Cucumer’ whilst maize (*Zea mays* L.) is labelled ‘Türkisch Korn’; both of these species, of course, are native American plants. Therefore, the gourd plant illustrated in the *Grandes Heures* was recognized as new or foreign, that is, as *de turquie*, thereby distinguishing it from the *Lagenaria* gourds.

## TWO OTHER CUCURBIT IMAGES AND INTERPRETATION

As has been asserted concerning the identity of the cucurbits illustrated in the botanical herbals of the Renaissance (Eisendrath, 1961), the identification of the plants illustrated in the *Grandes Heures d'Anne de Bretagne* must take into account the artistic style of the illustrator. Camus (1894) wrote that Bourdichon did indeed use some artistic licence. Therefore, comparison of the illustration of *Quegourdes de turquie* with that of each of the two other cultivated species of cucurbits offers valuable assistance in interpretation.

The plant branch depicted in the rectangular illustration labelled *Quegourdes* [Fig. 1; folio 81; image 142 of the web

page; chromolithograph image on p. 163 in Curmer (1861); p. 92 in Bilimoff (2001)] differs most strikingly from that of *Quegourdes de turquie* by its white (instead of orange-yellow) flowers and rounded (instead of acute) petals and leaves, and in these characteristics is true to *Lagenaria siceraria*. However, the two illustrations are similar with regard to fruit shape and lack of detail of the stem.

The bracket-shaped illustration labelled *Concombres* [Fig. 1; folio 204; image 341 of the web page; chromolithograph image on p. 409 in Curmer (1861); partial image on p. 92 in Bilimoff (2001)] does indeed appear to depict a branch of a cucumber plant, *Cucumis sativus*. The depiction shows a plant stem, eight leaves, seven bright yellow staminate flowers at anthesis and eight on the day before anthesis; two warted, more-or-less pyriform fruits are attached to the stem by long, narrow peduncles.

The stem and petioles are depicted as smooth, without any detail, even though the stems and petioles of cucumber plants typically have large, somewhat prickly hairs. The leaf laminae are angular, as in *Cucumis sativus*, but are deeply five-, six- or even seven-lobed, whilst in reality those of *C. sativus* are shallowly pentalobate (Robinson and Decker-Walters, 1997). The lack of stem and petiole trichomes and oddly lobed leaf laminae are thus common to the illustrations labelled *Concombres* and *Quegourdes de turquie*.

The staminate flowers have six petals instead of the typical five. In reality, six- or even seven-parted corollas can be found occasionally on the same cucumber plant together with five-parted corollas. The staminate flowers at anthesis in the depiction are exaggeratedly large but are similar to those of *Cucumis sativus* as regards their angular shape and intense yellow colour. The peduncles of the fruits are depicted as originating separately on the main stem rather than in leaf axils; they are very long, narrow and smooth. *Cucumis sativus* peduncles are typically spiculate and not so long, and originate in leaf axils. The hexapetalous corollas and the long, narrow, smooth peduncles not originating in leaf axils are, again, in common with the illustration of *Quegourdes de turquie*.

The fruits do not have the typical cylindrical shape of cucumbers, being instead pyriform. At first, this could have been understood as stylistic of the artist, given the similarity of the shape with the two other more-or-less pyriform-fruited cucurbits. However, there are instances in which cucumber fruits do deviate from their usual, uniformly cylindrical shape. For example, fruits can be distinctly broader at the peduncle end than at the styler end if pollination is inadequate. In the illustration, however, the fruits are broader at their styler end. Moreover, the length-to-broadest-width ratio is unusually low for a cucumber, approximately 2:1 rather than the typical 3:1 or more, suggesting that the plant had andromonoecious sexuality, which is an uncommon characteristic in cucumbers that is conferred by a single recessive gene (Robinson and Decker-Walters, 1997). The two lowest leaf petioles at the bottom of the illustration are depicted as originating oppositely, rather than alternately, on the branch. Opposite leaf arrangement at the base of the plant is another unusual characteristic. Described as occurring in the

andromonoecious cucumber 'Lemon', it too is conferred by a single recessive gene and the genes conferring andromonoecy and opposite leaf arrangement appear to be linked (Robinson, 1987). The fruit bears numerous warts, typical of *C. sativus*. Considered alone, the peduncle and fruit could suggest that the illustration might be of a melon, *Cucumis melo* L. However, the leaf laminae of *C. melo* are round instead of angular (Robinson and Decker-Walters, 1997). As Bourdichon did accurately depict *L. siceraria* with rounded leaf laminae, this would have been expected if this illustration had been of a melon. Interestingly, a pyriform, warted cucumber having opposite leaves was also depicted in the botanical herbals of Chabrey (1666), Gerard (1597) and Tabernaemontani (1664). The illustration labelled *Concombres* does indeed appear to depict a cucumber, evidently of the same market type or cultivar depicted in those botanical herbals.

## DISCUSSION

The image of *Colloquitida*, *Quegourdes de turquie* (Fig. 1) was listed by Jussieu (1722a, b) with the Latin epithet *Colocynthis fr. pyriformis fl. luteo* and French epithet *Coloquinte*. Derived from the Greek *kolokynthis*, the name colocynth was initially applied only to the plant referred to today as *Citrullus colocynthis* (L.) Schrader, as shown in Fuchs (1542), Bock (1546), Dodoens (1616) and two images in Chabrey (1666). This cucurbit taxon has pinnatifid leaf laminae, small yellow flowers, and round, nearly spherical fruits. Evidently, the use of the name *coloquinte* was expanded to encompass other bitter cucurbits, most often the small-fruited *Cucurbita pepo* (Gerard, 1597; Tabernaemontani, 1664). Bauhin (1651) illustrated and described the true colocynth and listed and described briefly nine other plants that were also denoted colocynth. Seven were described as having rough foliage, probably indicative of *C. pepo*, an eighth was pyriform, probably also *C. pepo*. The last was described as having soft foliage and white flowers, evidently a small, bitter form of *L. siceraria*. Jussieu's cataloguing of the plant as a colocynth or coloquinte having pyriform fruit and yellow flowers does indicate that he identified the image with what was to become the Linnean *Cucurbita pepo*.

Decaisne (Curmer, 1861) identified the image as *Citrouille*, *Cucurbita pepo*. *Citrouille* is French for pumpkin, that is, a large, round, edible-fruited *Cucurbita*, usually *C. pepo* and sometimes for *C. moschata*; it has been in such use for several centuries (Duchesne, 1786; Jacobsohn, 2005). The illustration is not of a pumpkin but instead of a plant bearing small, pyriform fruits; the appropriate French epithet of the time would have been *cougourdette* (Naudin, 1856). Decaisne's use of the Linnean binomial leaves no doubt, however, as to his identification of the image, which is therefore in agreement with that of Jussieu.

On the other hand, Camus (1894) had been advised by a Dr Bonnet that the illustration was of *Cucurbita moschata*. Gibault (1912), who apparently was familiar with the three widely planted species of the genus *Cucurbita* and thoughtfully considered the history of their arrival in Europe, cited

this disagreement. However, he did not offer his own identification for the *Quegourdes de turquie*. Bilimoff (2001) was cautious, merely listing the image as of a *Cucurbita* sp. The striping pattern of the fruits shown in the image is not consistent with the possibility that this depiction is of the cultivated species *C. moschata*, *C. argyrosperma* Huber or *C. ficifolia* Bouché. *Cucurbita maxima* fruits can exhibit narrow light-coloured stripes, but this species has rounded, rather than angular leaves. Wild *Cucurbita* taxa invariably have round fruits, with the exception of *C. pepo* subsp. *texana*, which bears fruits that are most often oviform to globose, with pyriform variants being fairly common (Erwin, 1938; Bailey, 1943; Andres, 1987), and whilst on most fruits the broad stripes are dark, intense green, fruits having lighter-coloured broad stripes or that are even entirely light-coloured or ivory white have also been observed (Bailey, 1937; Decker-Walters et al., 1993).

*Cucurbita pepo* subsp. *texana*, one of three designated subspecies of *Cucurbita pepo*, encompasses many cultigens as well as wild plants (Paris, 2001). The cultigens include four groups of edible-fruited cultivars, which have been designated Acorn, Crookneck, Scallop and Straightneck. These esculents are collectively referred to as squash. This subspecies also encompasses one group of cultivars bearing small, generally bitter and non-edible fruits, the Oviform/Pyriform Gourds. These gourds are most often cultivated today for ornament, but may have been grown for some other purposes in the past. Often, they are indistinguishable phenotypically from wild *C. pepo* subsp. *texana*.

*Quegourdes de turquie* is a representation of a pyriform gourd of *C. pepo* subsp. *texana*. Unlike the pumpkins depicted in the festoons of the Villa Farnesina, this depiction in the *Grandes Heures* is not of an esculent. Furthermore, this image cannot even be considered as evidence of early European contact with Native American horticulture. While the depicted plant might have been an offspring from a cultigen, it appears to be at least as likely that it was derived from a wild plant. Significantly, wild *C. pepo* subsp. *texana* is native to southern, south-eastern and central USA, most often being reported from Texas, particularly on the floodplains of several creeks and river systems that enter the Gulf of Mexico and including two coastal counties (Erwin, 1938; Decker and Wilson, 1986; Nee, 1990; Decker-Walters et al., 1993).

The prayer book of Anne de Bretagne, Queen of France and Duchess of Brittany, also contains an image of a bean, identified by Jussieu (1772b) as *Phaseolus flore luteo* and suggested by Camus (1894) to be the New World taxon *Phaseolus vulgaris* L. There are a number of ways by which seeds of American plants could have arrived in the Loire Valley before 1508. The harbours of Brittany (Bretagne) and Normandy had close historical and commercial ties with Great Britain (Grande Bretagne) (Tanguy, 1991) and British and French sailors reached the Americas by 1503 (Harrisse, 1892; Thomas, 2005). Moreover, the Bretons and Normans actively traded with the Spanish and Portuguese. Europeans, including Amerigo Vespucci, entered the Gulf of Mexico as early as 1498 (Mollat, 2005), offering possible opportunities for encountering

and collecting *Cucurbita pepo* subsp. *texana*. Goods brought by officially sponsored Spanish and Portuguese ships returning from the Americas were of immediate interest to European royalty and to the papacy. As early as May, 1494, Peter Martyr D'Anghera, courtier and chaplain to Queen Isabella of Spain and tutor to the royal household, sent a letter to Cardinal Asconio Sforza, secretary of state of the Vatican (published in 1511 as *De Orbo Novo*), enclosing seeds of many plants, including maize, from returning ships of the second voyage of Columbus (MacNutt, 1912; Janick and Caneva, 2005). Anne de Bretagne had strong diplomatic ties with successive popes as well as family ties with Spanish royalty (Tanguy, 1991; M. Bilimoff, pers. comm.). For Vatican and Spanish plenipotentiaries calling at the French court, seeds from the New World would have been precious, astonishing and appropriate gifts to present to a queen and duchess who was fond of plants and proud of her gardens.

## CONCLUSIONS

It is concluded that the image *Quegourdes de turquie* in the *Grandes Heures d'Anne de Bretagne* represents a branch drawn from a plant of *Cucurbita pepo* subsp. *texana*. The colour and shape of the flowers, the shape and striping pattern of the fruit, and the angular shape of the leaf laminae are collectively consistent only with this taxon. Completed no later than 1508, this image is the earliest-known representation of *Cucurbita* in Europe.

The *Quegourdes de turquie* is an image of a pyriform gourd, which is not an esculent (Paris, 2001). This depiction of *C. pepo* cannot be considered as early evidence of European contact with New World settlements because such gourds have also been found repeatedly growing wild in riverine habitats of Texas (Nee, 1990). Therefore, it is quite possible, if not likely, that this image represents a direct offspring of a wild plant found by an early explorer of the Gulf Coast of Texas. The pumpkins, that is, the edible, large, round fruits of *C. pepo* and *C. maxima*, depicted a decade later in the Villa Farnesina in Rome, remain as the earliest evidence known to us of the arrival of domesticated *Cucurbita* in Europe (Janick and Paris, 2006).

What apparently is the first image in Europe of *Cucurbita pepo*, and indeed of the genus *Cucurbita*, had until now escaped the attention of cucurbit specialists. This is easily understandable given the scarcity of the *Grandes Heures* and related documents and the difficulty of locating and accessing them. Publication of the *Promenade dans des jardins disparus: Les plantes au moyen age, d'après les grandes heures d'Anne de Bretagne* (Bilimoff, 2001) revealed to us a fascinating piece of botanical history.

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