Reflections on linguistics as an aid to taxonomical identification of ancient Mediterranean cucurbits: the Piqqus of the Faqqous

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Abstract

There are a number of Mediterranean epithets for cucurbits that have intriguing connections in various ancient and modern languages. The most ancient and basic utterance is of Sumerian origin and includes a velar consonant (*q, k*) with a sibilant (*s, sh, z*). It is expressed in the Akkadian and Hebrew *qishu* and the Greek *sikyos*. The velar consonant without the sibilant is found in the Arabic *qatta* and doubled in the Greek *kolokynthus* and Latin *cucumis* and *cucurbita*. These and other possible linguistic implications and connections are considered with regard to cucurbit taxa of the ancient Mediterranean: *Cucumis melo*, *Lagenaria siceraria*, *Citrullus lanatus*, *Citrullus colocynthis*, and *Ecballium elaterium*.

INTRODUCTION

The extreme polymorphism and parallel variation (Vavilov 1951) among taxa of the Cucurbitaceae has made the attainment of an accurate understanding of the history of this plant family especially difficult. Moreover, an accurate understanding of the evolution under domestication of food plants requires critical evaluation and comparison of widely interdisciplinary evidence from horticulture, botany, archaeology, history, and philology (Dalby 2003). This understanding, in turn, is dependent upon the degree of descriptive detail and accuracy of the original sources as well as the accuracy of the translations of these sources.

Plant iconography has played the most important role in the accurate identification of cucurbit taxa in Europe since the Renaissance (Eisendrath 1961). For historical periods prior to the Renaissance, depictions often lack detail and accuracy, but still can be useful in identification of plant species.

Ancient, detailed, and accurate descriptions are even scarcer than ancient images. Correct understandings of these descriptions is almost totally dependent on the knowledge of ancient languages of the translators and the accuracy of their translations. As eruditely discussed by Dalby (2003), inaccurate, misleading translations, such as "ripe cucumber" for *sikyos pepon*, have made their way into standard reference books and scientific literature, becoming self-perpetuating and

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difficult to redress, but independent translations as well as interpretations by specialists in particular plant taxa can provide enlightening reassessments.

Linguistics has the potential to be an important source of evidence for better understanding crop origins and domestication (de Candolle 1886). However, this approach must be taken with caution for cucurbits, as there has been much overlapping and juxtaposition of names in various languages (Norrman and Haarberg 1980; Chauvet 2005). Often, epithets for various members of the Cucurbitaceae have changed over time to designate different taxa, and from the distant past to the present can designate various taxa in different localities (Andrews 1958). A classic example of this is the ancient Greek *pepon*, which designated watermelon (Andrews 1958; Stol 1987), which as *pepones* was used by the Latin writer Pliny (Rackham 1950) to designate particularly large *cucumis*, and which was to become eventually the modern English *pumpkin*, used for round, edible fruits of *Cucurbita*, a New World taxon. Moreover, there may be no other family of plants in which the misuse of names has been so widespread. The inaccurate and confusing use of names for various cucurbits, often spurred by commercial considerations, has continued to the present.

Our goal here is to focus on the names of various ancient Mediterranean cucurbit taxa and their implications, and trace these names across some Mediterranean languages. Herein we will be recalling some of our previous findings (Janick et al. 2007; Paris and Janick, 2008) as well as adding new reflections concerning the epithets for cucurbits in various languages.

THE ROOT CONSONANTS

The most basic utterance for a cucurbit, apparently initially referring to cucurbits in general, includes a velar consonant (*q*, *k*) with a sibilant (*s*, *sh*, *z*) (Stol, 1987). This utterance has a Sumerian origin and is expressed anciently in the Akkadian and Hebrew *qishu* (plural *qishu'im*) and the Greek *sikyos*. To understand the connection between *qishu* and *sikyos*, one must take into consideration that consonants of the same group tend to interchange with one another across languages. In addition to the velar (*q*, *k*, *c* as in English *cow*, *g* as in English *go*) and sibilant (*s, sh*, *z*, *zh*) consonants, there is, for example, a group of labial consonants (*b*, *f*, *m*, *p*, *v*, *w*). Vowels are more fluid, changing freely in different languages.

The association of a velar consonant with a sibilant consonant in words designating cucurbits still exists in modern Hebrew *qishu*, Italian *cocuzza*, *cocozelle*, *zucca*, and *zucchini*, and French *courge* and *courgette*, although the taxa referred to differ among the different languages. According to de Candolle (1886), a Sanskrit name for cucumber is *soukasa* and the Chinese, who received watermelon for the first time in the 10th century, called it *si-kua*. Curiously, in the Algonquin-Indian dialect of the Atlantic coast of New England, *asq* (plural *asquash*) is the root epithet for cucurbits consumed when immature (Gray and Trumbull, 1883), specifically, non-round fruits of *Cucurbita pepo* L., leading to the common term *squash*, commonly used in American English. Another Amerind epithet, *cushaw* or *ecushaw* (Hedrick, 1919), this one designating edible non-round fruits of *Cucurbita moschata* Duchesne and *C. argyrosperma* Huber, may simply be an inversion of *squash* or *asquash*.

The velar consonant without the sibilant is found in the Arabic *qatta* (or *qatha* or *qitha*) and is doubled in the Greek *kolokynthus* and Latin *cucumis* and *cucurbita*. It is also found in the Sanskrit *carbhatah* although we are uncertain that this epithet has

a common derivation with the epithets for cucurbits in languages spoken in areas much closer to the Mediterranean Sea. Given the presence of the *r* and *b* consonants, it is tempting to associate the Persian word *kharbuza* (melon) with *carbhatah*, even though the Persian word has the initial fricative *kh* consonant instead of the initial velar consonant of the Sanskrit.

MEDITERRANEAN CUCURBIT TAXA

Melon, *Cucumis melo* L.

The *qishu'im* of ancient Egypt, that the Children of Israel longed for during their wanderings in the Sinai Desert (Numbers 11: 5), were *Cucumis melo* subsp. *melo* Chate Group (Feliks 1967; Zohary 1982). This is reflected in ancient Egyptian wall paintings (Keimer 1924). No later than by the time of the first temple in Jerusalem (6^{th}–10^{th} centuries BCE), the cultivation of *qishu'im* in Judea must have been common, as there was a special word in Hebrew for a field of them, *miqsha* (Isaiah 1: 8). Images from Roman times and later, however, indicate that longer fruits had by then been selected, and the *qishu'im* of those times and the *cucumis* of the 1^{st}-century CE Roman writers Columella (Forster and Heffner 1955) and Pliny (Rackham 1950) were mostly *C. melo* subsp. *melo* Flexuosus Group (Janick et al. 2007; Paris and Janick 2008). These vegetable melons are by far the cucurbit most frequently encountered in ancient Mediterranean images and texts, and hence must have been a widely grown and esteemed crop. Indeed, they were said to have been made specially available year-round to the leaders of two culturally very different Mediterranean communities, Emperor Tiberius of 1^{st}-century CE Rome and the Chief Rabbi, Yehuda the President, of 2^{nd}-century CE Israel (Janick et al. 2007; Paris and Janick 2008).

The Hebrew *qishu'im* or *qishu'in*, the plural form of the Hebrew *qishu* or *qishut*, is also linguistically connected with the Egyptian Arabic *qatta* or *qatha* or *qitha*. An illustration of the *qatta*, labelled *Cucumis aegyptius*, *chate* by Vesling (1640), leaves no doubt as to its taxonomic identity, *Cucumis melo* (Fig. 1). The *qishu'in* were described as downy in the 2^{nd}-century codex of Jewish law known as the *Mishna* (which can be viewed in its entirety on-line at Mechon Mamre 2008), in Tractate *'Oqazin* 2: 1. Likewise, the 1^{st}-century Roman authors Columella (Forster and Heffner 1955) and Pliny (Rackham 1950) described the *cucumis* fruits as hairy or downy (Fig. 2), and hence these could not have been cucumbers (*C. sativus* L.), as has been traditionally translated, but rather must have been melons (*C. melo*) (Feliks 1967; Janick et al. 2007; Paris and Janick 2008). The ancient Greek *pekos* for soft, downy hairs or their removal is the likely source for the special word *piqqus* of the Hebrew text (*Mishna*, Tractate *Ma'asrot* 1: 5) for the prescribed removal of the hairs prior to the use of the fruits in culinary preparation (Lieberman 1993; first edition, 1955, not seen by us). In Hebrew, the same consonant is used to represent both the "*p*" and the "*f*", the choice between the two determined by grammatical rules. In the *Mishna* Tractate *Ma'asrot* (1: 5), the present-singular intensive verb *mefaqqes* (removes hairs) appears. It is interesting that the consonant *kappa* of the Greek *pekos* was adopted into Hebrew using the *qof* (*q*) consonant rather than the *kaf* (*k*), with the *qof* then doubled as required in the grammatical intensive action (*pi'el*) form. Arabic retained the double "*q*" consonant, and as that language does not have a consonant for

"*p*", the "*f*" was used exclusively. Hence, it appears that in this fashion the Arabic *faqqous* was born for young, elongate fruits of *C. melo* (Fig. 3).

Figure 1. Illustration of chate melon (Vesling 1640).

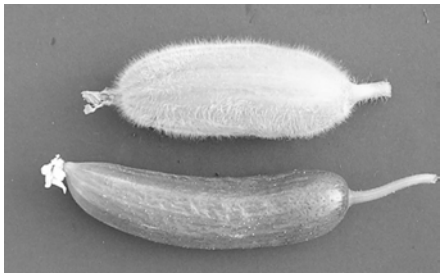

Figure 2. Young fruits of chate melon 'Carosello Barese' (top) and Bet Alfa-type cucumber 'Shimshon' (bottom). Note the hairy melon and the glabrous cucumber. Photo by H.S. Paris.

The *melopepo* was said by Pliny (Rackham 1950) to have a distinct odor, to resemble a quince, and to turn yellow and detach from the vine at maturity, indicating mature melon, *C. melo*, fruits. *Melopepo* is a combination word of *melo* and *pepo*. Latin *pepo* originated from the Greek *pepon* and probably referred to watermelon and the *melo*, meaning apple, alluded to the size and shape (Andrews 1958). Hence, the *melopepo* must have been an apple-like (small, nearly round, ripe when eaten), pleasant-tasting melon. *Melopepo* became *melafefon* in Hebrew and likewise referred to a round-fruited melon that was pleasant tasting and eaten when it was ripe, contrasting with the *qishut*, the long-fruited melon that was eaten immature (Janick et

al. 2007; Paris and Janick 2008). The similarities of watermelons and melons was what probably led the Roman author Pliny to refer to the *pepones* as being large-fruited *cucumis* (melons). *Popone* is today an Italian word for melon (Rebora et al. 1967).

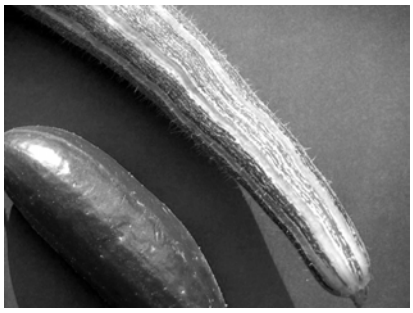

Figure 3. Young fruits of cucumber 'Shimshon' (left) and snake melon 'Striped Snake' (right). Note the glabrous cucumber and the piqqus of the faqqous, that is, the hairs of the snake melon. Photo by H.S. Paris.

Calabash or Bottle Gourd, *Lagenaria siceraria* (Mol.) Standl.

Theophrastus (371-287 BCE), the Greek philosopher and Father of Botany, referred to *sikyos* and *sikya*, along with *kolokynthe* (Liddell et al. 1968). *Sikya* (the feminine form of *sikyos*) has been defined as bottle gourd, *Lagenaria siceraria* (Liddell et al. 1968; Einerson and Link 1976). Since *Lagenaria* occurred in two forms, breast-like or bottle shaped and phallic-like or serpentine it would not be a stretch in our judgment that *sikyos* (masculine) might have been used to referred to the serpentine form. Many modern translators incorrectly assume cucumber, *Cucumis sativus* (Dalby 2003; Janick et al. 2007), although it is probable that *sikyos* also referred to long-fruited melons (*C. melo*). *Sikya* also has a secondary medical meaning of "cupping instrument" probably because the instrument was originally either the base of a *L. siceraria* gourd or shaped like a gourd. When heated (flaming of a cotton wad soaked in alcohol was one method) and then applied to the skin, blood would be drawn to the surface as a result of partial vacuum when cooled, producing a therapeutic effect. Interestingly, and certainly not a coincidence, the Latin word for this instrument was *cucurbitulae* (!) underscoring the association with the Latin word *cucurbita* (bottle gourd). Indeed, a bronze instrument for cupping blood from Pompeii's House of the Surgeon has been found and it resembles the cut off base of a bottle gourd. This suggests that the cup either resembled a bottle gourd or, perhaps more likely, that small gourds were used as cups.

The English word *calabash*, which is sometimes used for fruits of *L. siceraria*, is related to the French *calebasse* and the Spanish *calabaza*, although the latter today is used mostly in reference to pumpkins (*Cucurbita* L. sp.). All appear to be derivatives of the Latin *cucurbita* as do the Dutch *agurkje*, German *gurke*, and English "gherkin" (note that all have two velar consonants) for cucumber, *C. sativus*, and the English "gourd". It appears that *cucurbita* gave rise to *cucutia* in Late Latin by dropping of the inner *b* consonant and from that the modern *cocuzza* and its diminutive, *cocozelle*, and their inversions *zucca* and *zucchini* were derived. Modern Greek *aggouria*, which now means cucumber, may also be related to *cucurbita* and is

clearly the source of the Italian *anguria* (and variations) for watermelon although another interpretation is that *aggouria* derives from the ancient word *aggouros* meaning "cake" which may be related to the word *guros* for "round or curved."

Watermelon, *Citrullus lanatus* (Thunb.) Matsum. & Nakai

The Children of Israel, during their wanderings in the Sinai Desert, longed for the *avattihim* of the Land of Egypt (Numbers 11: 5). The Hebrew *avattihim* (singular *avattiah*) have been identified as watermelons (Feliks 1967) and watermelons are depicted in some images from ancient Egypt (Janick et al. 2007). Arabic *battikh*, for watermelon, is closely related to the Hebrew *avattiah*. Both of these languages have two distinct *t* consonants, one of which could be described as similar in pronunciation to that in European languages and the other of which could be described as mid-palatal. The same, doubled mid-palatal *t* consonant is used in both the Hebrew *avattiah* and Arabic *battikh* and is proceeded in both by a labial consonant (*v* in Hebrew, *b* in Arabic). The Arabic *battikh* is the likely source of the French *pastèque*, which has a labial consonant (*p*) and the doubled mid-palatal *t* serves as the probable cause of the rather unusual *st* combination in the French word.

A Sanskrit cucurbit epithet, *carbhatah*, with the *b* and mid-palatal *t*, appears to be related to *battikh*, although Glare (1982) suggested it to be root of the Latin *cucurbita*. Monier-Williams (1899) defined the similar *cirbhata* as the fruit and plant of *Cucumis utilissimus* (a synonym of *C. melo*) and *cirbhita* as "another form of gourd" indicating that *carbhatah* / *cirbhata* / *cirbhita* represents a cucurbit that might be a bottle gourd, melon, or watermelon.

Colocynth, *Citrullus colocynthis* (L.) Schrad.

The ancient Greek word *kolokynthe* / *kolokynthis* is found in Theophrastus (Liddell et al. 1968) and Dioscorides (Beck 2005). This name has been conserved throughout the millennia and can be found in Pliny as *colocynthis,* French *coloquinta,* and English *colocynth*. The plant and fruits are beautifully illustrated in Dioscoridean herbals, including the *Juliana Anicia Codex* of the 6th century CE and the *Codex Neapolitanus* of the 7th century CE. Possibly, the ancient Greek usage of the epithet *kolokynthe* could have been less specific and included a broader spectrum of cucurbits. While the origin of the word *kolokynthe* is uncertain, the doubled velar consonant does suggest that this word, too, may be ultimately derived from Sumerian. It is also possible that *kolokynthe* is the source of the Latin *cucurbita* and even *cucumis*.

Pliny (Jones 1951) mentioned that there were both, cultivated colocynths and wild colocynths, the latter having smaller fruits. Apparently, the colocynths were used when the fruit lost its green external color, becoming pale to orange yellow, resembling citrus fruit in size, shape and color. This could account for the word *citrullus* of Medieval Latin, which is derived from citron (*Citrus medica* L., Rutaceae).

C. colocynthis is described in the Bible (2 Kings 4: 39–40) as *gefen sade*, literally a vine of the field. The full name for the fruits is given as *paqqu'ot sade*. Prior to or at ripening, the fruits are moist and attractive, but extremely bitter and poisonous, as the disciples of the prophet Elisha' found out. The Hebrew name *paqqu'ot* derives from the triconsonantal root *p-q-*' (*pe – qof – 'ayin*) meaning "split",

probably in reference to the overripe or senesced fruit. Split colocynth fruits are illustrated in a number of Renaissance botanical tomes (Fig. 4).

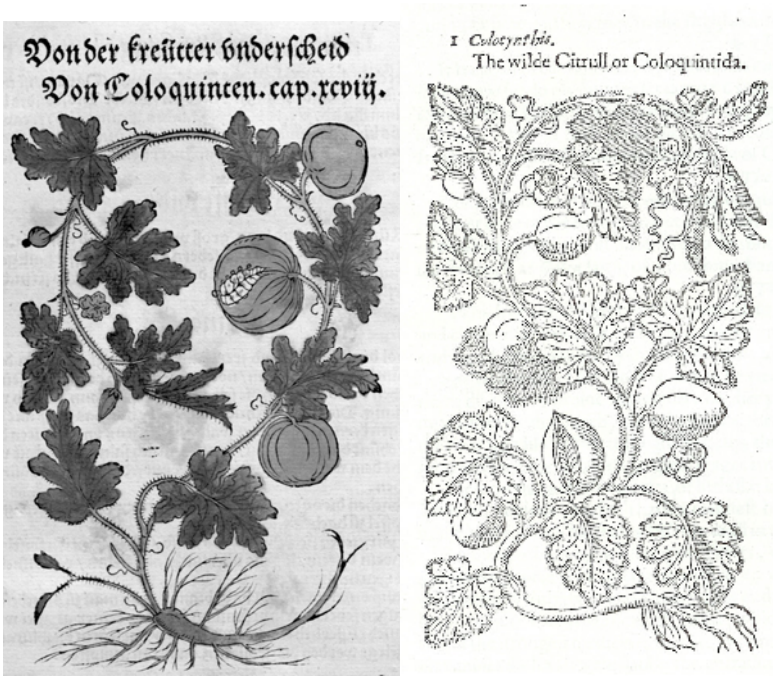

Figure 4. Colocynth as illustrated by Bock (1546), top, and Gerard (1597), bottom. Notice the split fruit in each illustration.

C. colocynthis has had several uses since ancient times. Dried fruits were used as a medicinal since antiquity through the Middle Ages and even into modern times (Amar and Hazot 2003). Dried fruit rinds were employed as vessels (*Mishna*, Tractate *Kelim* 17: 17) (Feliks 1968). The oil pressed from the seeds is useful for illumination, and was even a commodity in ancient Egypt (Darby et al. 1977). Young shoots of colocynth plants can be eaten after brining (*Mishna*, Tractate *'Oqazin* 3: 4).

Squirting Cucumber, *Ecballium elaterium* (L.) Rich.

Ecballium elaterium is a common wild plant in Mediterranean countries. Dioscorides (Beck 2005) and Pliny (Jones 1951) indicated that this plant was the source of the medicinal product elaterium, which was extracted from the fruit that "springs back" or "spurts" when squeezed. The plant is illustrated in the *Juliana Anicia Codex* and the *Codex Neapolitanus*. Indeed, the ripe fruits of this plant, when touched, vigorously squirt their seeds, hence the common name in English. *E. elaterium* was identified by Löw (1928) as the *yeroqat hamor* of the *Mishna* (Tractate *Oholot* 8: 1). The epithet *hamor* means "donkey". The Hebrew text has *yeroqat* mis-spelled by an inversion of consonants, making it appear, at first, to mean "green" or "herb." However, the Hebrew root actually means "spit". Hence, *yeroqat hamor* is perhaps best rendered in English "donkey's spitter". Quite interesting, then, is the name given to this plant by Ibn al-Baytar (d. 1248), an Arabic writer of Medieval

Spain: *qitha al-himar*, "donkey's cucurbit," translated into French by Leclerc (1883) as *concombre des ânes*. Gerard (1597) labeled his illustration of it *cucumis asininus*. How this taxon could have been associated with asses is open to speculation, but our best guess is that as these animals were an important mode of transportation, they encountered these plants frequently, inducing them to squirt or spit the contents of their ripe fruits.

DISCUSSION AND CONCLUSION

Epithets for cucurbits have been passed on from one language to another. In so doing, they have tended to change in pronunciation and over time have tended to change in regard to their taxonomical designations. We have traced a few of the more interesting epithets with regard to five Mediterranean cucurbit taxa. Notably, cucumber (*C. sativus*), native to the foothills of the Himalayas, is not among these taxa, in spite of the frequent and deep-rooted mistranslations that resulted in the idea that the ancient Egyptians, Greeks, and Romans were familiar with this taxon. Indeed, we were unable to find evidence for the presence of *C. sativus* around the Mediterranean of Roman times (Janick et al. 2007, Paris and Janick 2008), indicating that cucumbers were introduced into this region later. The earliest pictorial evidence of *C. sativus* in this region that we know of is from ca. 1335, in the Manfred de Monte Imperiali from Pisa, Italy, which is preserved at the Bibliothèque Nationale de France (ms. *Latin 6823*) and post-dates the Mongol invasions. The conquests of Genghis Khan and his followers allowed, for the first time, a relatively safe, contiguous, overland route through Asia, the most famous user being Marco Polo. On the other hand, Amar (2000) noted the association of the use of the Arabic *khiyar* with *C. sativus*, considering this as evidence for the presence of cucumber in Moorish Spain. From de Candolle (1886), it would appear, indeed, that the epithet *khiyar* has an Asiatic geographic origin very distant from the Mediterranean. Thus *C. sativus* appears to have first arrived in Europe, specifically Spain, during the Medieval period, prior to the Mongols, but it is neither known if that taxon disseminated into the rest of Europe from Moorish Spain nor if it had a continuous presence in Europe prior to the first half of the 14th century.

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